



## Spectrum Manual

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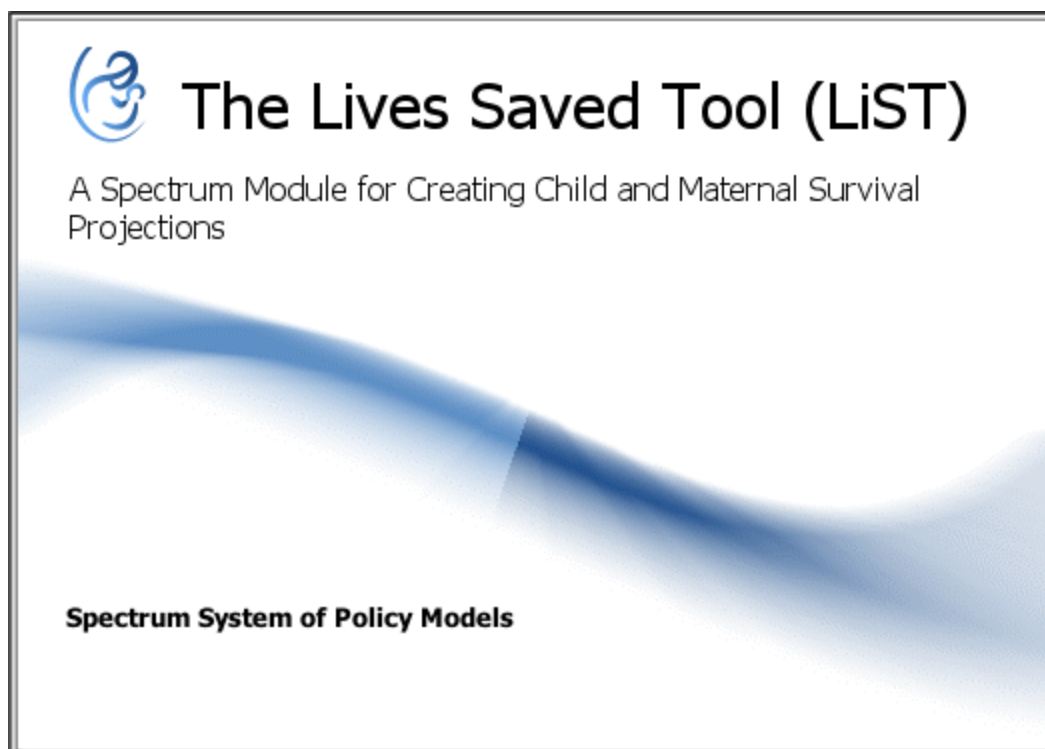
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# Part I

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# 1 Spectrum Modules

## 1.1 LiST



### 1.1.1 What is LiST?

The Lives Saved Tool (LiST) is a computer-based application for modeling the impact of maternal and child health interventions. LiST is included as a module within Spectrum, a policy modeling system comprised of several software components. To estimate maternal, child, or stillbirth outcomes in a projection, LiST models changing coverage for a wide range of maternal and child health interventions over time combined with inputs from the following Spectrum modules: 1) **DemProj**, the demography module, provides demographic information for the projection; 2) **AIM** (AIDS Impact Module), incorporates the impact of HIV/AIDS and trends in HIV/AIDS treatment; and 3) **FamPlan** incorporates determinants of fertility into the projection.

LiST is based on the initial work of the Bellagio Child Survival Study Group, the Child Health Epidemiology Reference Group (CHERG), and the International Child Development Steering Group. Their work has sought to further specify the global burden of disease for neonates and children under five years of age both by region and by cause, and to identify and assess those interventions that will be the most effective in increasing child survival and developmental potential. This work has been published in *The Lancet*'s global health series on child survival, neonatal survival, maternal survival, and infant and young child nutrition.

LiST allows for detailed editing of projection inputs such as: intervention coverage by year, baseline health status, child and maternal mortality rates, stillbirth or abortion information, economic status data, effectiveness of interventions, and the impact of undernutrition on

mortality. Subnational projections for LiST may be created by making modifications to related components in LiST as well as DemProj, AIM, and FamPlan.

The LiST module is a work in progress that is continuously adapting to meet the needs of users in countries, institutions, and partner organizations. LiST has been used for global planning, project planning, and project evaluation purposes. In addition to updates for nutrition indicators and interventions, the components for maternal health and stillbirths and the ability to link to an external costing module are now included.

Please visit [www.livessavedtool.org](http://www.livessavedtool.org) for further information and resources. You can also view the following training video: [Introduction to the Lives Saved Tool](#) (26 minutes).

## 1.1.2 Standard LiST analysis

### Overview of Basic Analysis

1. Create or edit a projection so it contains all of the appropriate baseline data. You can do so by clicking on "[Configuration](#)" and "[Health status, mortality and economic status](#)." Save this with a name which indicates that it is your baseline projection. This projection will be your counterfactual or do-nothing scenario, so that you can compare your scale-up projection to this reference.
2. Open the baseline projection and use "Save as" to save a second file, renaming it as the scale-up of interest. Edit the coverage values in "[Coverage](#)" to create the scale-up as desired. Save these changes. Check the results by looking at the "Additional deaths prevented in children under five years of age by intervention relative to impact year" to ensure that only the interventions that you have scaled up display any changes (excluding the HIV interventions) and that the first year ("impact year") has 0 deaths averted. Correct as needed. When finished save changes and close the projection.
3. Repeat step 2 as many times as necessary to create all the comparisons of interest.
4. Open the baseline projection and additional projections of interest so that their results can be displayed simultaneously for easy comparison. They will only open if the configuration years and modules are identical for all projections.
5. Display the results and right-click to choose "copy all" in order to copy the relevant tables into Excel. Figures can also be exported by copying and pasting to Word, Excel, or PowerPoint.

### Detailed Steps for Basic Analysis

1. Click "New projection" or "Open projection" to create or edit a projection. For a new projection, you will need to set the following: projection file name, first and final years for the projection, active modules (select LiST and any others of interest), and the country or global region of interest.
  2. Click the "Modules" tab on the top toolbar and click "LiST" under the MNCH options. A horizontal toolbar will appear directly below the menu tabs.
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3. Select "[Configuration](#)" from the horizontal toolbar, the first item from the left-hand side.
4. "Base year of coverage" is set by default to the first year of the projection; change if needed. Note that if you select a base year that is in the future, LiST will use the most recent available data.
5. The "First year of intervention program" refers to the baseline year from which you are calculating the impact of a specific coverage change (i.e., for a program to introduce rotavirus vaccine starting in 2012, the first year of intervention program would be 2011).

*NOTE: It is always a good idea to save your changes as you go along to prevent the loss of data. Remember to "Save as" when you start working on a new projection so you can return to your original projection if needed.*

6. Select "[Health status, mortality, and economic status](#)" from the horizontal toolbar, the second item from the left-hand side. Make any modifications necessary to the default baseline data.
7. Select "[Coverage](#)" from the horizontal toolbar, the third item from the left-hand side.
8. Edit the coverage values from the baseline year to the first year of intervention. To change the coverage values independently for items which are linked to other coverage values, see the bottom of the coverage editor as to which box to uncheck. This will de-link the items.
9. Edit the coverage values from the first year of intervention to the target/end year. An easy way to change this coverage is to set a coverage level in the target year, and then highlight the row from the first year of intervention to the target year. Then click the "Interpolate" button displayed at the bottom of the screen (or press Ctrl+I) to create a linear trend between the first and last years (or right-click and choose "Interpolate" from the pop-up menu for more options).
10. Click on the "File" menu and choose "Save As." You now have your "Scenario 1" projection.
11. If you would like to create alternate scenarios to compare against Scenario 1, you can do this by using "Save As" to rename this projection to indicate it is a comparison to Scenario 1 (e.g., Senegal Scenario 2 - Vaccines).
12. Do not change the baseline health, mortality, or economic status from Scenario 1, or the intervention coverage levels in the baseline year. Otherwise Scenario 2 will not compare accurately against Scenario 1 in terms of the impact of changes in intervention coverage. When you have finished all coverage changes, click OK. Be sure to save your work on Scenario 2.
13. Repeat as many times as necessary to create alternate comparisons. Please note, when you are working with multiple projections, be sure that you are editing the correct file. The title of the projection that you are currently modifying will be highlighted in bold with an \* at the bottom of the screen.

14. To display the results of your projections, open the projections of interest and click "Results" to select your output. Please note, whichever projection you open first will display first in the results tables.
15. A "Configure" window will appear allowing you to choose the display format for the indicator chosen (e.g. table, line graph, etc.). Select the first and final years to match the years of interest in the projection. Only LiST interventions modeled by the user should contribute to the total(s) for any deaths averted (with the exception of PMTCT, Cotrimoxazole, and ART from AIM). If that is not the case, then unintentional changes may have been made and should be corrected. In addition, the number of deaths averted in the first year of intervention program ("impact year") should be 0. Make any necessary corrections. Save and close the projection.

### 1.1.3 LiST input editors

#### 1.1.3.1 LiST configuration

[First year of intervention program](#) [Display sensitivity bounds around results](#) [Direct entry of stunting/wasting](#) [Direct entry of fertility risks](#) [Manage interventions](#)

1. Select the **first year of intervention program** from the drop-down menu. This refers to the baseline year from which the impacts of coverage changes are calculated (i.e., for a program to introduce rotavirus vaccine starting in 2012, the first year of intervention program would be 2011). This is the first year for which LiST will show outputs for results related to "additional deaths prevented relative to impact year." Although Spectrum technically anchors a projection based on DemProj and AIM data from the year specified as the start year for the projection, selecting the first year of intervention program will allow you to narrow the LiST output of the projection. [Top](#)

**NOTE:** To ensure that intervention coverage data for your baseline year is accurate, check the data sources for the country of your projection (go to "Results" - "Tools" - "Source Summary") to see whether a nationally representative household survey (DHS or MICS) was conducted recently preceding your baseline year. If not (i.e., baseline data is significantly out of date), and you are not able to replace this with your own data, please interpret your results with caution.

2. [Optional] You may select "**Display sensitivity bounds around results**" if you would like to display an upper and lower bound around your estimates of impact in LiST Results. This is done by using an upper and lower estimate of the effectiveness value of each intervention in LiST. [Top](#)
3. [Optional] You may select "**Direct entry of stunting**" and/or "**Direct entry of wasting**" if you would like to directly enter stunting and/or wasting values yourself in Coverage. Select this option if you have country-specific stunting/wasting data and want to look at the impact of changing stunting/wasting distributions on mortality.

When direct entry of stunting/wasting is on, the user should enter data on stunting/wasting distributions in the "Stunting"/"Wasting" tab of the "Coverage" menu (these tabs will only be visible when "direct entry" is turned on). In this setting, LiST will not calculate stunting/wasting distributions from intervention coverage change. Instead, mortality impact comes from the directly entered stunting/wasting distributions. If an intervention has mortality impact only via the stunting/wasting pathway, the user will be

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unable to edit this intervention when direct entry is on (the intervention will be grayed out). The user will still be able to edit coverage of interventions that affect mortality through multiple pathways that include stunting/wasting. These interventions will continue to affect mortality via the other pathways. For example, when direct entry of stunting is on, zinc supplementation does not affect stunting distribution, but does still have an impact on diarrhea and pneumonia mortality.

If direct entry is on and user does not enter data on stunting/wasting distribution, the mortality impact of interventions affecting stunting/wasting will be underestimated.

If direct entry is off, LiST calculates stunting/wasting distribution based on the change in coverage of interventions affecting stunting/wasting. [Top](#)

4. [Optional] You may select "**Direct entry of fertility risks**" if you would like to directly enter fertility risk values yourself on the Fertility Risk tab in Coverage. This will automatically be checked if the family planning module (FamPlan) is not selected. [Top](#)
5. [Optional] Finally, if you would like to create a custom intervention not currently included in LiST, click on the "**Manage interventions**" button and follow the instructions provided in the "[Manage interventions](#)" box. [Top](#)

### 1.1.3.2 Manage interventions

[Create custom interventions](#) [Link interventions](#) [Export interventions](#)

This menu (within the "[LiST configuration](#)" menu) allows users to create customized analyses that include features that are not part of the validated and standardized model. These include creating new interventions from scratch, allowing interventions to have non-standard effects, and copying custom interventions to other LiST projections. The results of any changes made in this menu are solely the responsibility of the user. The LiST team is responsible for the functionality but not the results themselves.

## Create custom interventions

In this section, the users can create an intervention which is not part of the standard LiST package.

1. First enter the name of this intervention. It should not be the same as any existing intervention within Spectrum.
2. Select the type of intervention time period in which the intervention is to be delivered. Only one may be selected, even if the intervention actually crosses many periods.
  - a. If the period/type is Vaccines, then the user must also select at least one specific cause of death which this intervention can affect. This will create the space to configure herd effects/indirect effects as well.

Once the intervention has been created, the user must also enter the coverage of the intervention in the main coverage tabs as well as the effectiveness of the intervention in the effectiveness tabs. Note that these custom interventions can only affect causes of death. They cannot affect intermediate outcomes such as breastfeeding, stunting, or wasting.

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## Link interventions

The link feature creates a special link between any selected existing intervention(s) (not custom interventions) and all causes of death. It allows the user to specify effects that are not part of the standard LiST package. It does not modify the existing linkages. To use this feature, the user must simply check the On/Off box to identify which existing interventions need to be allowed to affect non-standard causes of death.

Once the intervention has been linked, the user needs to enter the effectiveness tab for the relevant cause of death. On that tab, select "Show all interventions options." The selected intervention will appear and the user can enter their individual effectiveness and affected fraction information. It will be saved when the projection is saved.

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## Export interventions

This feature allows the user to copy the information in a custom intervention into an already existing projection. This will copy selected custom interventions as well as any links created with the "Link interventions" feature. Identify the projections you would like to add this information into. Currently, effectiveness levels are being copied, but affected fractions are not.

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### 1.1.3.3 Health status, mortality, and economic status

This editor grouping gives what could be termed the "baseline status" of a mother, neonate, or child born in the country or region you are analyzing. It provides specific information about nutritional deficiencies, nutritional status at birth, incidence of certain illnesses, stunting and wasting distributions, pathogen distributions, baseline mortality rates and proximate causes for death, abortion incidence, stillbirth rate, and household economic details.

1. Review the default values for all the indicators under each tab and these data can be modified if more appropriate or updated data sources are available.
2. To change the data, click on that box to highlight and type to enter the data. If you have changed the base year away from the default, ensure that the values are appropriate for the year of interest.
3. Remember to enter a record of any changes you make to the data sources and assumptions. To document this, right click on the table and select "All sources" or "Data Source (row)".

#### Baseline child health status

[Percent vitamin A deficient](#) [Percent zinc deficient](#) [Status at birth](#) [Incidence of diarrhea](#)  
[Incidence of severe diarrhea](#) [Incidence of severe pneumonia](#) [Incidence of bacterial meningitis](#)

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## Percent vitamin A deficient

- **Definition:** Vitamin A deficiency is defined as serum vitamin A concentrations of less than 0.70 mol/L in children < 5 years of age.
- **Default data source:** Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013; 382(9890): 427-51. <http://www.ncbi.nlm.nih.gov/pubmed/23746772>.
- **Notes:** These values are regional estimates of deficiency.

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## Percent zinc deficient

- **Definition:** Percent of the population with inadequate intake of zinc.
- **Default data source:** Wessells KR, Brown KH. Estimating the global prevalence of zinc deficiency: Results based on zinc availability in national food supplies and the prevalence of stunting. *PLoS One* 2012; 7(11): e50568. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3510072/>. (Supplementary table S2.)
- **Notes:** This was calculated based on a combination of both food availability and biological needs. See article for details.

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## Status at birth

- **Definition:** Percentage of children born in one of four categories: Pre-term and small for gestational age (SGA), pre-term and appropriate for gestational age (AGA), term and SGA, and term and AGA. SGA is defined as <10th percentile; pre-term is defined as <37 weeks.
- **Default data source:** Lee AC, Katz J, Blencowe H, et al. National and regional estimates of term and preterm babies born small for gestational age in 138 low-income and middle-income countries in 2010. *Lancet Global Health* 2013; 1(1): e26-36. <http://www.ncbi.nlm.nih.gov/pubmed/25103583>.
- **Notes:**

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## Incidence of diarrhea

- **Definition:** Number of episodes of diarrhea that would be observed per child-year.
- **Default data source:** Fischer Walker CL, Rudan I, Liu L, et al. Global burden of childhood pneumonia and diarrhoea. *The Lancet* 2013; 381(9875): 1405-16. <http://www.ncbi.nlm.nih.gov/pubmed/23582727>.

- **Notes:** The standard DHS estimates cannot be used as they are typically collected in the dry season. The values are regional values.

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### Incidence of severe diarrhea

- **Definition:** Number of episodes of severe diarrhea that would be observed per child-year.
- **Default data source:** Fischer Walker CL, Rudan I, Liu L, et al. Global burden of childhood pneumonia and diarrhoea. *The Lancet* 2013; 381(9875): 1405-16.  
<http://www.ncbi.nlm.nih.gov/pubmed/23582727>.
- **Notes:** The standard DHS estimates cannot be used as they are typically collected in the dry season. The values are regional values.

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### Incidence of severe pneumonia

- **Definition:** Number of episodes of severe pneumonia that would be observed per child-year.
- **Default data source:** Rudan I, O'Brien KL, Nair H, et al. Epidemiology and etiology of childhood pneumonia in 2010: Estimates of incidence, severe morbidity, mortality, underlying risk factors and causative pathogens for 192 countries. *Journal of Global Health* 2013; 3(1). <http://www.ncbi.nlm.nih.gov/pubmed/23826505>. (Online supplementary material.)
- **Notes:**

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### Incidence of bacterial meningitis

- **Definition:** Number of episodes of bacterial meningitis that would be observed per child-year.
- **Default data source:** Calculated from the following sources:

Davis S, Feikin D, Johnson HL. The effect of Haemophilus influenzae type B and pneumococcal conjugate vaccines on childhood meningitis mortality: A systematic review. *BMC Public Health* 2013; 13(Suppl 3): S21.  
<http://www.ncbi.nlm.nih.gov/pubmed/24564188>.

See also the WHO online companion table referenced in the following articles: Watt JP, Wolfson LJ, O'Brien KL, et al. Burden of disease caused by Haemophilus influenzae type b in children younger than 5 years: Global estimates. *Lancet* 2009; 374(9693): 903-911.  
<http://www.ncbi.nlm.nih.gov/pubmed/19748399>.

O'Brien KL, Wolfson LJ, Watt JP, et al. Burden of disease caused by Streptococcus

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pneumoniae in children younger than 5 years: Global estimates. *Lancet* 2009; 374(9693): 893-902. <http://www.ncbi.nlm.nih.gov/pubmed/19748398>.

- **Notes:**

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### Baseline maternal health status

[IPTp](#) [Percent of women exposed to falciparum](#) [Percent of pregnant women with anemia](#) [Percent of non-pregnant women with anemia](#) [Percent of anemia among pregnant women due to iron deficiency](#) [Percent of anemia among non-pregnant women due to iron deficiency](#) [Percent of pregnant women with severe anemia](#) [Prevalence of low BMI among WRA](#)

## IPTp (Intermittent preventive treatment of malaria in pregnancy)

- **Definition:** This will be checked by default if IPTp or sleeping under an insecticide treated bednet (ITN) is recommended by the national government during pregnancy.
- **Default data source:** van Eijk AM, Hill J, Alegana VA, et al. Coverage of malaria protection in pregnant women in sub-Saharan Africa: a synthesis and analysis of national survey data. *Lancet Infect Dis* 2011; 11(3): 190-207. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3119932/>.
- **Notes:** By default, IPTp can only benefit populations where the government has recommended that IPTp be used. The user can check the box if they would like to see the benefit of IPTp in other populations.

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## Percent of women exposed to falciparum

- **Definition:** Percent of women exposed to falciparum malaria during pregnancy.
- **Default data source:** Guerra CA, Gikandi PW, Tatem AJ, et al. The limits and intensity of *Plasmodium falciparum* transmission: Implications for malaria control and elimination worldwide. *PLoS Medicine* 2008; 5(2): e38. <http://www.ncbi.nlm.nih.gov/pubmed/18303939>.

- **Notes:**

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## Percent of pregnant women with anemia

- **Definition:** Percent of pregnant women with hemoglobin levels < 110 g/L.
- **Default data source:** Stevens GA, Finucane MM, De-Regil LM, et al. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995-2011: a systematic analysis of population-representative data. *Lancet Global Health* 2013; 1(1): e16-25. <http://www.ncbi.nlm.nih.gov/pubmed/25103581>. (Unpublished data from the authors.)

- **Notes:**

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### Percent of anemia among pregnant women due to iron deficiency

- **Definition:** Among pregnant women with hemoglobin levels < 110 g/L, the percentage where anemia is amenable to iron supplementation.
- **Default data source:** Stevens GA, Finucane MM, De-Regil LM, et al. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995-2011: a systematic analysis of population-representative data. *Lancet Global Health* 2013; 1(1): e16-25. <http://www.ncbi.nlm.nih.gov/pubmed/25103581>. (Unpublished data from the authors.)

- **Notes:**

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### Percent of non-pregnant women with anemia

- **Definition:** Percent of non-pregnant women aged 15-49 with hemoglobin levels < 120 g/L.
- **Default data source:** Stevens GA, Finucane MM, De-Regil LM, et al. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995-2011: a systematic analysis of population-representative data. *Lancet Global Health* 2013; 1(1): e16-25. <http://www.ncbi.nlm.nih.gov/pubmed/25103581>. (Unpublished data from the authors.)

- **Notes:**

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### Percent of anemia among non-pregnant women due to iron deficiency

- **Definition:** Among non-pregnant women aged 15-49 with hemoglobin levels < 120 g/L, the percentage where anemia is amenable to iron supplementation.
- **Default data source:** Stevens GA, Finucane MM, De-Regil LM, et al. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995-2011: a systematic analysis of population-representative data. *Lancet Global Health* 2013; 1(1): e16-25. <http://www.ncbi.nlm.nih.gov/pubmed/25103581>. (Unpublished data from the authors.)

- **Notes:**

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### Percent of pregnant women with severe anemia

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- **Definition:** Percent of pregnant women with hemoglobin levels < 50 g/L.
- **Default data source:** Stevens GA, Finucane MM, De-Regil LM, et al. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995-2011: a systematic analysis of population-representative data. *Lancet Global Health* 2013; 1(1): e16-25. <http://www.ncbi.nlm.nih.gov/pubmed/25103581>. (Unpublished data from the authors.)
- **Notes:** See the LiST Technical Note on "[Anemia and Maternal Mortality in LiST](#)" for details on how severe anemia relates to maternal mortality risk.

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### Prevalence of low body mass index (BMI) among women of reproductive age (WRA)

- **Definition:** Percent of women aged 15-49 with BMI <18.5
- **Default data source:** Finucane MM, Stevens GA, Cowan MJ, Danaei G, Lin JK, Paciorek CJ, Singh GM, Gutierrez HR, Lu Y, Bahalim AN, et al. National, regional, and global trends in body-mass index since 1980: Systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9.1 million participants. *Lancet*. Elsevier Ltd; 2011;377:557–67. [http://dx.doi.org/10.1016/S0140-6736\(10\)62037-5](http://dx.doi.org/10.1016/S0140-6736(10)62037-5) (Unpublished data from the authors.)
- **Notes:**

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#### Nutritional status distributions

[Stunting Distributions](#)   [Wasting Distributions](#)

### Stunting distributions

- **Definition:** Distribution of the percent of children falling into one of four Z-score categories for height for age: <-3Z (severe stunting), -3 to -2Z (moderate stunting), -2 to -1Z (mild stunting), and >-1Z (not stunted). Stunting reflects chronic undernutrition.
- **Default data source:** Data have been recalculated for consistency across countries, using DHS and MICS datasets. This also ensures that the values reflect the exact age groups of interest.
- **Notes:** Disaggregated data are not available for 0-1 and 1-5 months. As a proxy, the 0-6 month values are applied to both age groups.

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### Wasting distributions

- **Definition:** Distribution of the percent of children falling into one of four Z-score categories for weight for height: <-3Z (severe wasting), -3 to -2Z (moderate wasting), -2 to -1Z (mild wasting), and >-1Z (not wasted). Wasting reflects acute undernutrition.
- **Default data source:** Data have been recalculated for consistency across countries, using DHS and MICS datasets. This also ensures that the values reflect the exact age groups of interest.
- **Notes:** Disaggregated data are not available for 0-1 and 1-5 months. As a proxy, the 0-6 month values are applied to both age groups.

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## Pathogens

[Diarrhea](#) [Pneumonia](#) [Meningitis](#)

This tab of the editor contains data on pathogen distribution in the absence of effective interventions.

## Diarrhea

- **Definition:** Proportion of incident cases of severe diarrhea categorized by the causal pathogen. Proportion of deaths due to diarrhea categorized by the causal pathogen. Both proportions assume prior to rotavirus vaccine introduction.
- **Default data source:** Fischer Walker CL, Rudan I, Liu L, et al. Global burden of childhood pneumonia and diarrhoea. *The Lancet* 2013; 381(9875): 1405-16. <http://www.ncbi.nlm.nih.gov/pubmed/23582727>.
- **Notes:** Vaccine B and Vaccine C serve as placeholders for future diarrhea analysis work.

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## Pneumonia

- **Definition:** Proportion of incident cases of severe pneumonia categorized by the causal pathogen. Proportion of deaths due to pneumonia categorized by the causal pathogen. Both proportions assume prior to Hib and pneumococcal vaccine introduction.
- **Default data source:** Rudan I, O'Brien KL, Nair H, et al. Epidemiology and etiology of childhood pneumonia in 2010: Estimates of incidence, severe morbidity, mortality, underlying risk factors and causative pathogens for 192 countries. *Journal of Global Health* 2013; 3(1). <http://www.ncbi.nlm.nih.gov/pubmed/23826505>. Please refer to the online supplementary document.
- **Notes:** Note that this only refers to severe cases, not all cases.

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## Meningitis

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- **Definition:** Proportion of incident cases of meningitis categorized by the causal pathogen. Proportion of deaths due to meningitis categorized by the causal pathogen. Both proportions assume prior to Hib and pneumococcal vaccine introduction.
- **Default data source:** Davis S, Feikin D, Johnson HL. The effect of Haemophilus influenzae type B and pneumococcal conjugate vaccines on childhood meningitis mortality: A systematic review. *BMC Public Health* 2013; 13(Suppl 3): S21. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847464/>.

- **Notes:**

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### Baseline child mortality

[Neonatal mortality rate](#) [Infant mortality rate](#) [Under-five mortality rate](#) [Percent of child deaths by proximate cause](#)

You may choose to review and leave the default values for baseline child mortality (neonatal mortality rate, infant mortality rate, and under-five mortality rate), or you may click anywhere in the table of interest to begin entering data. You may also review the distributions for child deaths by proximate cause (neonatal and post-neonatal), and adjust as appropriate.

### Neonatal mortality rate

- **Definition:** Number of deaths during the neonatal period (first 28 completed days of life) per 1,000 live births.
- **Default data source:** Estimates developed by the UN Inter-Agency Group for Child Mortality Estimation (<http://www.childmortality.org/>).
- **Notes:** All values can be replaced with DHS/MICS or other estimates if they are more appropriate for the analysis that will be completed.

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### Infant mortality rate

- **Definition:** Number of deaths of children under one year of age per 1,000 live births.
- **Default data source:** Estimates developed by the UN Inter-Agency Group for Child Mortality Estimation (<http://www.childmortality.org/>).
- **Notes:** All values can be replaced with DHS/MICS or other estimates if they are more appropriate for the analysis that will be completed.

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### Under-five mortality rate

- **Definition:** Probability of a child born in a specific year or period dying before reaching the age of five, if subject to age-specific mortality rates of that period.

- **Default data source:** Estimates developed by the UN Inter-Agency Group for Child Mortality Estimation (<http://www.childmortality.org/>).
- **Notes:** All values can be replaced with DHS/MICS or other estimates if they are more appropriate for the analysis that will be completed.

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## Percent of child deaths by proximate cause

- **Definition:** The proportion of under-five deaths due to one of eight neonatal causes (diarrhea, sepsis, pneumonia, asphyxia, prematurity, tetanus, congenital anomalies, and other) and nine post-neonatal causes (diarrhea, pneumonia, meningitis, measles, malaria, pertussis, AIDS, injury, and other).
- **Default data source:** WHO estimates for years 2000-2015.  
[http://www.who.int/healthinfo/global\\_burden\\_disease/estimates/en/index1.html](http://www.who.int/healthinfo/global_burden_disease/estimates/en/index1.html).

Liu L, Oza S, Hogan D, et al. Global, regional, and national causes of under-5 mortality in 2000-15: an updated systematic analysis with implications for the Sustainable Development Goals. *Lancet* 2016. <https://www.ncbi.nlm.nih.gov/pubmed/27839855>.

- **Notes:** All causes of death can be modified in this table except the HIV deaths, which are brought in from the AIDS Impact Module (AIM). To modify these, you will need to open and edit within AIM. Also note that the sum of these causes should equal 100%.

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## Baseline maternal mortality

[Maternal mortality ratio](#) [Percent of maternal deaths by proximate cause](#)

You may choose to review and leave the default values for the maternal mortality ratio and the percent of maternal deaths by proximate cause, or you may click anywhere in the editor screen to begin entering data.

## Maternal mortality ratio

- **Definition:** The ratio of the number of maternal deaths per 100,000 live births. A maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.
  - **Default data source:** WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Trends in maternal mortality: 1990 to 2015.  
<http://www.who.int/reproductivehealth/publications/monitoring/maternal-mortality-2015/en/>
  - **Notes:** All values can be replaced with DHS/MICS or other estimates if they are more appropriate for the analysis that needs to be completed.
-

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## Percent of maternal deaths by proximate cause

- **Definition:** The proportion of maternal deaths due to one of nine causes (anteartum hemorrhage, intrapartum hemorrhage, postpartum hemorrhage, hypertensive disorders, sepsis, abortion, embolism, other direct causes, and indirect causes).
- **Default data source:** Say L, Chou D, Gemmill A, et al. Global causes of maternal death: A WHO systematic analysis. *Lancet Global Health* 2014; 2(6): e323-33. <http://www.ncbi.nlm.nih.gov/pubmed/25103301>. Data are from unpublished tables associated with this article.

- **Notes:**

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## Abortion

[Percent of pregnancies ending with spontaneous abortion](#)   [Abortion incidence ratio](#)

Review the default percent of pregnancies ending with spontaneous abortion and the abortion incidence ratio, and make any changes necessary. If you have FamPlan active, you may click on "Calculate abortion ratio based on FamPlan outputs" if you would like the abortion ratio to be calculated from FamPlan inputs such as method mix and proximate determinants of fertility.

## Percent of pregnancies ending with spontaneous abortion

- **Definition:** The spontaneous end of a pregnancy at a stage where the embryo or fetus is incapable of surviving independently, generally defined in humans as prior to 20 weeks of gestation. Spontaneous abortions are not easily measured and are thus assumed to average 13% of pregnancies in all countries.
- **Default data source:** Gold, R. *Abortion and Women's Health: A Turning Point for America?* New York and Washington, DC: The Alan Guttmacher Institute; 1990.
- **Notes:**

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## Abortion incidence ratio

- **Definition:** The abortion incidence is expressed as a ratio of abortions per 100 live births.
- **Default data source:** Sedgh G, Bearak J, Singh S, et al. Abortion incidence between 1990 and 2014: global, regional, and subregional levels and trends. *Lancet* 2016; 388: 16-22. <http://www.ncbi.nlm.nih.gov/pubmed/27179755>. (Unpublished calculations based on abortion incidence rates in paper.)
- **Notes:** Values are by subregion.

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## Stillbirth

[Stillbirth rate](#) [Percent of stillbirths by proximate cause](#)

You may choose to review and leave the default values for the stillbirth rate and the percent of stillbirths by proximate cause, or you may click anywhere in the editor screen to begin entering data.

### Stillbirth rate

- **Definition:** The number of stillbirths per 1,000 births. For international comparisons, WHO considers stillbirths as pregnancy losses at or after 28 weeks of pregnancy, or a birth weight of at least 1,000 grams.
- **Default data source:** WHO estimates for years 2000-2015. Data available at: <http://dx.doi.org/10.17037/DATA.25>.

Blencowe H, Cousens S, Jassir FB, et al. National, regional, and worldwide estimates of stillbirth rates in 2015, with trends from 2000: a systematic analysis. *Lancet Global Health* 2016; 4(2): e98-108. <https://www.ncbi.nlm.nih.gov/pubmed/26795602>.

- **Notes:**

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### Percent of stillbirths by proximate cause

- **Definition:** Stillbirths are not categorized by cause due to a lack of data. Rather, they are categorized by time period, either antepartum (prior to delivery) and intrapartum (during delivery).
- **Default data source:** Lawn JE, Blencowe H, Waiswa P, et al. Stillbirths: rates, risk factors, and acceleration towards 2030. *Lancet* 2016; 387: 587-603. <http://www.ncbi.nlm.nih.gov/pubmed/26794078>. (Supplementary appendix.)
- **Notes:** Values are by region.

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## Household status

[Poverty/food security](#) [Average household size](#)

### Poverty/food security

- **Definition:** The percent of the population living on less than \$1.90/day according to purchasing power parity (adjusted to 2011 international dollars).
  - **Default data source:** World Bank, Development Research Group. Poverty headcount ratio at \$1.90 a day (PPP) (% of population). <http://data.worldbank.org/indicator/SI.POV.DDAY>.
-

Where national-level rates were not available, estimates by World Bank [country income level group](#) were used.

- **Notes:** This is used as a proxy for the percent of the population who is food insecure.

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### Average household size

- **Definition:** The average number of people living in a household.
- **Default data source:** Data are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:** This is only used to estimate households in need for costing purposes.

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#### 1.1.3.4 Coverage

This section describes the types of interventions which are available within *LiST* for modification. Each type is characterized by either the time in which the intervention is delivered (i.e., during pregnancy) or by the mode of activity (i.e., vaccines or curative). All items which fall under the categories of breastfeeding, preventive, vaccines, and curative occur after birth. Select any one of the types/time periods for more information on all interventions which are included.

To enter coverage data:

1. Click on the tab for the editor screen that you wish to work in, to bring that screen to the forefront.
2. Review the default values listed for each child health intervention for all years displayed.
3. Edit the coverage targets for future years past the first year of intervention manually if you have data you feel is more accurate than what is listed. *If you would like to make this first projection a "do nothing" scenario (or a theoretical counterfactual for your intended coverage changes), where the intervention coverage is by default held constant from the first year of intervention, do not change the default values after the first year of intervention. Click "Ok" and save the projection through the "Home" tab of the Spectrum menu. Then, proceed to reviewing effectiveness values.*
4. Edit the coverage values from the first year of intervention to the target year. **By changing the target, you will be able to project the impact upon child survival in your country.** Most often, users set a target for the final year of the projection (2015 in the case of the MDGs) and interpolate between the base year and the target year.
5. An easy way to change this coverage is to set the coverage in the target year and highlight from the first year of intervention to the target year. Then right click and scroll to "interpolate". There are four different interpolate options. Choose the one that best suits your data. Use the duplicate function if you would like several adjoining data boxes in a row or column to have the same value.

## Periconceptual

[Contraceptive use](#) [Folic acid supplementation/fortification](#) [Blanket iron supplementation/fortification](#) [Safe abortion services](#) [Post-abortion case management](#) [Ectopic pregnancy case management](#)

### Contraceptive use

- **Definition:** Coverage and effectiveness of Family Planning interventions are specified in the FamPlan module.

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### Folic acid supplementation/fortification

- **Definition:** Percent of women 15-49 that are taking folic acid supplements (5.0 mg folic acid per day) or have appropriate food fortification around the time of pregnancy.
- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
- **Notes:** This is not the same indicator as iron/folate supplementation during pregnancy.

The effect size used by default in LiST is for fortification of staple foods with folic acid. If the user wishes to model periconceptual folic acid supplementation instead, the effect size should be modified to 0.62. Both values are from the same source paper, cited directly below.

- **Effect size reference:** Blencowe H, Cousens S, Modell B, et al. Folic acid to reduce neonatal mortality from neural tube disorders. *International Journal of Epidemiology* 2010; 39(Suppl 1): i110-i121. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2845867/>.

Imdad A, Yakoob MY, Bhutta ZA. The effect of folic acid, protein energy and multiple micronutrient supplements in pregnancy on stillbirths. *BMC Public Health* 2011; 11(Suppl 3): S4. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231910/>.

De-Regil LM, Pena-Rosas JP, Fernandez-Gaxiola AC, et al. Effects and safety of periconceptual oral folate supplementation for preventing birth defects. *Cochrane Database Syst Rev* 2015. <http://www.ncbi.nlm.nih.gov/pubmed/26662928>.

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### Blanket iron supplementation/fortification

- **Definition:** Percent of women 15-49 that are taking daily iron supplements or have appropriate food fortification around the time of pregnancy.
  - **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
-

- **Notes:** This is not the same indicator as iron supplementation during pregnancy.

The effect size used by default in LiST is for daily iron supplementation among women of reproductive age. If the user wishes to model fortification of staple foods with iron instead, the recommended effect size is 0.36 (effect of iron fortification on anemia, studies from low- and middle-income countries only, from [Das et al. 2013](#)).

- **Effect size reference:** Low MS, Speedy J, Styles CE, et al. Daily iron supplementation for improving anaemia, iron status and health in menstruating women. *Cochrane Database Syst Rev* 2016. <http://www.ncbi.nlm.nih.gov/pubmed/27087396>.

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## Safe abortion services

- **Definition:** Among women who get an abortion, the percent who get a safe abortion (defined as via D&C, vacuum aspiration, or medical abortion).
- **Default data source:** Sedgh G, Singh S, Shah IH, et al. Induced abortion: Incidence and trends worldwide from 1995 to 2008. *Lancet* 2012; 379(9816): 625-32. <http://www.ncbi.nlm.nih.gov/pubmed/22264435>.
- **Notes:** Country-specific estimates are not available. Regional data are being used.
- **Effect size reference:** Pollard SL, Mathai M, Walker N. Estimating the impact of interventions on cause-specific maternal mortality: A Delphi approach. *BMC Public Health* 2013, 13(Suppl 3): S12. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847442/>.

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## Post-abortion case management

- **Definition:** Percent of women who have had an abortion who get the appropriate post-abortion case management at a Basic Emergency Obstetric Care (BEmOC) level.
- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
- **Notes:**
- **Effect size reference:** Pollard SL, Mathai M, Walker N. Estimating the impact of interventions on cause-specific maternal mortality: A Delphi approach. *BMC Public Health* 2013, 13(Suppl 3): S12. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847442/>.

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## Ectopic pregnancy case management

- **Definition:** Percent of women with an ectopic pregnancy who receive case management at a Basic Emergency Obstetric Care (BEmOC) level.

- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.

- **Notes:**

- **Effect size reference:** Pollard SL, Mathai M, Walker N. Estimating the impact of interventions on cause-specific maternal mortality: A Delphi approach. *BMC Public Health* 2013, 13(Suppl 3): S12. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847442/>.

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### Pregnancy

[Antenatal care](#) [TT - tetanus toxoid vaccination](#) [IPTp - pregnant women protected via intermittent preventive treatment of malaria](#) [Syphilis detection and treatment](#) [Calcium supplementation](#) [Multiple micronutrient supplementation](#) [Iron supplementation](#) [Balanced energy-protein supplementation](#) [Hypertensive disorders case management](#) [Diabetes case management](#) [Malaria case management](#) [MgSO<sub>4</sub>- management of pre-eclampsia](#) [FGR-fetal growth restriction detection and management](#) [PMTCT - Prevention of mother to child transmission of HIV](#)

### Antenatal care

- **Definition:** Percent of women who attend four or more antenatal care visits during their pregnancy (ANC 4+).
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:** This has no direct impact and is not currently displayed in the LiST editor. It is used as a component in the regression formulas used to determine the coverage of certain interventions delivered as a part of ANC. For details on the calculation of coverage of antenatal care interventions in LiST, please see this [LiST Technical Note](#) and publication by [Kanyangara and Chou, 2017](#).

Kanyangara M and Chou V. Linking household surveys and health facility assessments to estimate intervention coverage for the Lives Saved Tool (LiST). *BMC Public Health* 2017; 17(Suppl 4):780. <https://www.ncbi.nlm.nih.gov/pubmed/29143639>.

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### TT - tetanus toxoid vaccination

- **Definition:** Percent of neonates who are protected at birth (PAB) from tetanus infection. PAB is defined as the percent of women who received two doses of tetanus toxoid during this pregnancy or ever: Received at least 2 doses, the last within 3 years; received at least three doses, the last within 5 years; received at least 4 doses, the last within 10 years; or received at least five doses during lifetime. Also known as TT2+.



- **Default data source:** WHO/UNICEF. Immunization surveillance, assessment, and monitoring. "Protected at birth" indicator ([http://apps.who.int/immunization\\_monitoring/globalsummary/timeseries/tswucoveragepa.html](http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragepa.html)). The most recent available data are through 2013.
- **Notes:** Default data can be replaced with data from DHS/MICS or other sources as appropriate.
- **Effect size reference:** Blencowe H, Lawn J, Vandelaer J, et al. Tetanus toxoid immunization to reduce mortality from neonatal tetanus. *International Journal of Epidemiology* 2010; 39(Suppl 1): i102-i109. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2845866/>.

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### **IPTp - pregnant women protected via intermittent preventive treatment of malaria**

- **Definition:** Percent of pregnant women receiving 2+ doses of Sp/Fansidar during pregnancy.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys. This also includes Malaria Indicator Surveys.
- **Notes:** By default, this indicator can only be modified if the national government recommends IPTp. This can be changed on the "[Baseline child health status](#)" tab of the "Health status, mortality, and economic status" menu.

The effect is only applied to the first and second pregnancies among women who are exposed to malaria.

If data on Sp/Fansidar is not available for a given country, data on the percentage of pregnant women sleeping under an insecticide-treated bednet (ITN) can be used instead.

- **Effect size reference:** Eisele TP, Larsen D, Steketee RW. Protective efficacy of interventions for preventing malaria mortality in children in Plasmodium falciparum endemic areas. *International Journal of Epidemiology* 2010; 39(Suppl 1): i88-i10. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2845865/>. (The effect size for ITN/IRS is used as a proxy for IPTp.)

Pollard SL, Mathai M, Walker N. Estimating the impact of interventions on cause-specific maternal mortality: A Delphi approach. *BMC Public Health* 2013; 13(Suppl 3): S12. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847442/>.

Ishaque S, Yakoob MY, Imdad A, et al. Effectiveness of interventions to screen and manage infections during pregnancy on reducing stillbirths: A review. *BMC Public Health* 2011; 11(Suppl 3): S3. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231903/>. (The effect size for ITN usage is used as a proxy for IPTp.)

Radeva-Petrova D, Kayentao K, Ter Kuile FO, et al. Drugs for preventing malaria in pregnant

women in endemic areas: Any drug regimen versus placebo or no treatment. *Cochrane Database Syst Rev* 2014. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4498495/>.

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## Syphilis detection and treatment

- **Definition:** Percent of pregnant women tested for syphilis and given treatment if needed.
- **Default data source:** Coverage data for this indicator are not typically available. As a proxy, coverage is calculated using a regression formula based on components of antenatal care available in DHS/MICS surveys (e.g., timing of first antenatal care visit, blood sample taken, urine sample taken, coverage of ANC4+). For details on this calculation, please see the [LiST Technical Note](#) and publication by [Kanyangara and Chou, 2017](#).

Kanyangara M and Chou V. Linking household surveys and health facility assessments to estimate intervention coverage for the Lives Saved Tool (LiST). *BMC Public Health* 2017; 17(Suppl 4):780. <https://www.ncbi.nlm.nih.gov/pubmed/29143639>.

- **Notes:**
- **Effect size reference:** Blencowe H, Cousens S, Kamb M, et al. Lives Saved Tool supplement detection and treatment of syphilis in pregnancy to reduce syphilis related stillbirths and neonatal mortality. *BMC Public Health* 2011; 11(Suppl 3): S9. <http://www.ncbi.nlm.nih.gov/pubmed/21501460>.

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## Calcium supplementation

- **Definition:** Percent of pregnant women taking 1g of calcium daily.
- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
- **Notes:** The effect size is applied to the percentage of the population living below \$1.90 a day (a proxy for percentage of who are food insecure). This is a country-specific value found in the "Health status, mortality and economic status" tab under "Household status."
- **Effect size reference:** Jabeen M, Yakoob MY, Imdad A, et al. Impact of interventions to prevent and manage preeclampsia and eclampsia on stillbirths. *BMC Public Health* 2011; 11(Suppl 3): S6. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231912/>.

Ronsmans C, Campbell O. Quantifying the fall in mortality associated with interventions related to hypertensive diseases of pregnancy. *BMC Public Health* 2011; 11(Suppl 3): S8. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231914/>.

Imdad A, Jabeen A, Bhutta, ZA. Role of calcium supplementation during pregnancy in reducing risk of developing gestational hypertensive disorders: a meta-analysis of studies

from developing countries. *BMC Public Health* 2011; 11(Suppl 3): S18.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231891/>.

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## Multiple micronutrient supplementation

- **Definition:** Percent of pregnant women taking a multiple micronutrient supplement daily. A multiple micronutrient supplement is defined as a supplement containing at least iron, folate, and additional vitamins/minerals.
- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
- **Notes:** The sum of multiple micronutrient supplementation and iron supplementation cannot be greater than 100%.
- **Effect size reference:** Smith ER, Shankar AH, Wu LSF, et al. Modifiers of the effect of maternal multiple micronutrient supplementation on stillbirth, birth outcomes, and infant mortality: a meta-analysis of individual patient data from 17 randomised trials in low-income and middle-income countries. *Lancet Global Health* 2017; 5(11): e1090-e1100.  
[http://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(17\)30371-6/fulltext](http://www.thelancet.com/journals/langlo/article/PIIS2214-109X(17)30371-6/fulltext)

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## Iron supplementation

- **Definition:** Percent of pregnant women taking an iron supplement daily, for at least 90 days.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:** The sum of iron supplementation and multiple micronutrient supplementation cannot be greater than 100%.
- **Effect size reference:** Yakoob MY, Bhutta ZA. Effect of routine iron supplementation with or without folic acid on anemia during pregnancy. *BMC Public Health* 2011; 11(Suppl 3): S21.  
<http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0031947/>.

Haider BA, Yakoob MY, Bhutta ZA. Effect of multiple micronutrient supplementation during pregnancy on maternal and birth outcomes. *BMC Public Health* 2011; 11(Suppl 3): S19.  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231892/>.

Pena-Rosas JP, De-Regil LM, Garcia-Casal MN, et al. Daily oral iron supplementation during pregnancy. *Cochrane Database Syst Rev* 2015.  
<http://www.ncbi.nlm.nih.gov/pubmed/26198451>.

LiST Technical Note: Justification for iron and MMN supplementation effect sizes in LiST.

[http://livesavedtool.org/images/documents/Technical\\_Notes/Iron-and-MMN-effect-sizes.pdf](http://livesavedtool.org/images/documents/Technical_Notes/Iron-and-MMN-effect-sizes.pdf)

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## Balanced energy-protein supplementation

- **Definition:** Percent of pregnant women who are food insecure who receive balanced energy-protein (BEP) supplementation.
- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
- **Notes:** The effect size is applied to the percent of the population living on less than \$1.90/day, used as a proxy for food insecurity (the "[Household Status](#)" tab of the "Health status, mortality, and economic status" menu).
- **Effect size reference:** Imdad A, Bhutta ZA. Effect of balanced protein energy supplementation during pregnancy on birth outcomes. *BMC Public Health* 2011; 11(Suppl 3): S17. <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0031506/>.  
  
Ota E, Hori H, Mori R, et al. Antenatal dietary education and supplementation to increase energy and protein intake. *Cochrane Database Syst Rev* 2015. <http://www.ncbi.nlm.nih.gov/pubmed/26031211>.
- **Affected fraction reference:** Jackson BD, Walker N, Heidkamp R. Metrics for Identifying Food Security Status and the Population with Potential to Benefit from Nutrition Interventions in the Lives Saved Tool (LiST). *J Nutrition* 2017, 147(11S): 2147S-2155S. <https://doi.org/10.3945/jn.116.243808>

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## Hypertensive disorders case management

- **Definition:** Percent of women receiving detection and appropriate management of moderate to severe hypertension during pregnancy.
  - **Default data source:** Coverage data for this indicator are not typically available. As a proxy, coverage is calculated using a regression formula based on components of antenatal care available in DHS/MICS surveys (e.g., timing of first antenatal care visit, blood sample taken, urine sample taken, coverage of ANC4+). For details on this calculation, please see the [LiST Technical Note](#) and publication by [Kanyangara and Chou, 2017](#).  
  
Kanyangara M and Chou V. Linking household surveys and health facility assessments to estimate intervention coverage for the Lives Saved Tool (LiST). *BMC Public Health* 2017; 17(Suppl 4):780. <https://www.ncbi.nlm.nih.gov/pubmed/29143639>.
  - **Notes:**
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- **Effect size reference:** Pollard SL, Mathai M, Walker N. Estimating the impact of interventions on cause-specific maternal mortality: A Delphi approach. *BMC Public Health* 2013; 13(Suppl 3): S12. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847442/>.

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## Diabetes case management

- **Definition:** Percent of pregnant women screened for diabetes and managed appropriately, if needed.
- **Default data source:** Coverage data for this indicator are not typically available. As a proxy, coverage is calculated using a regression formula based on components of antenatal care available in DHS/MICS surveys (e.g., timing of first antenatal care visit, blood sample taken, urine sample taken, coverage of ANC4+). For details on this calculation, please see the [LiST Technical Note](#) and publication by [Kanyangara and Chou, 2017](#).

Kanyangara M and Chou V. Linking household surveys and health facility assessments to estimate intervention coverage for the Lives Saved Tool (LiST). *BMC Public Health* 2017; 17(Suppl 4):780. <https://www.ncbi.nlm.nih.gov/pubmed/29143639>.

- **Notes:** This currently only impacts stillbirths.
- **Effect size reference:** Syed M, Javed H, Yakoob MY, et al. Effect of screening and management of diabetes during pregnancy on stillbirths. *BMC Public Health* 2011; 11(Suppl 3): S2. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231893/>.

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## Malaria case management

- **Definition:** Percent of pregnant women experiencing malaria that are appropriately managed.
- **Default data source:** Coverage data for this indicator are not typically available. As a proxy, coverage is calculated using a regression formula based on components of antenatal care available in DHS/MICS surveys (e.g., timing of first antenatal care visit, blood sample taken, urine sample taken, coverage of ANC4+). For details on this calculation, please see the [LiST Technical Note](#) and publication by [Kanyangara and Chou, 2017](#).

Kanyangara M and Chou V. Linking household surveys and health facility assessments to estimate intervention coverage for the Lives Saved Tool (LiST). *BMC Public Health* 2017; 17(Suppl 4):780. <https://www.ncbi.nlm.nih.gov/pubmed/29143639>.

- **Notes:** The intervention covers the entire period between conception and six weeks after delivery.
- **Effect size reference:** Pollard SL, Mathai M, Walker N. Estimating the impact of interventions on cause-specific maternal mortality: A Delphi approach. *BMC Public Health* 2013; 13(Suppl 3): S12. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847442/>.

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## MgSO<sub>4</sub>- management of pre-eclampsia

- **Definition:** Percent of pregnant women with pre-eclampsia who are treated with intravenous magnesium sulfate (4-6g).
- **Default data source:** Coverage data for this indicator are not typically available. As a proxy, coverage is calculated using a regression formula based on components of antenatal care available in DHS/MICS surveys (e.g., timing of first antenatal care visit, blood sample taken, urine sample taken, coverage of ANC4+). For details on this calculation, please see the [LiST Technical Note](#) and publication by [Kanyangarara and Chou, 2017](#).

Kanyangara M and Chou V. Linking household surveys and health facility assessments to estimate intervention coverage for the Lives Saved Tool (LiST). *BMC Public Health* 2017; 17(Suppl 4):780. <https://www.ncbi.nlm.nih.gov/pubmed/29143639>.

- **Notes:**
- **Effect size reference:** Ronsmans C, Campbell O. Quantifying the fall in mortality associated with interventions related to hypertensive diseases of pregnancy. *BMC Public Health* 2011; 11(Suppl 3): S8. <http://www.ncbi.nlm.nih.gov/pubmed/21501459>.

Jabeen M, Yakoob MY, Imdad A, et al. Impact of interventions to prevent and manage preeclampsia and eclampsia on stillbirths. *BMC Public Health* 2011; 11(Suppl 3): S6. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231912/>.

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## FGR - fetal growth restriction detection and management

- **Definition:** Percent of pregnancies screened for fetal growth restriction (including BMI, fundal height, ultrasound, and/or Doppler) and managed with appropriate obstetric intervention, including early delivery, if needed.
- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
- **Notes:** Based on a review by Imdad and colleagues, the impact of detection and management of fetal growth restriction was added to LiST. (Imdad A, Yakoob MY, Siddiqui S, et al. Screening and triage of intrauterine growth restriction (IUGR) in general population and high risk pregnancies: a systematic review with a focus on reduction of IUGR related stillbirths. *BMC Public Health* 2011, 11(Suppl 3): S1. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231882/>.) The review found that proper detection and management of IUGR (fetal growth restriction) could reduce stillbirths by 20%. However, this analysis depends on proper management, often including induced labor and Cesarean sections, that may not be available in low-resource settings. In addition, by producing earlier births, management does reduce the stillbirths, but the child of the resulting birth may be premature and appropriate management of premature babies, especially those very premature, may not be available. The users who choose to scale up

FGR should be aware of these difficulties and will need to specify the effectiveness of the intervention.

- **Effect size reference:** The effect size is currently set to 0 (see above); use the "[Effectiveness](#)" menu to modify if necessary.

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## **PMTCT - Prevention of mother to child transmission of HIV**

- **Definition:** Coverage and effectiveness of PMTCT interventions are specified in the AIM module.
- **Default data source:**
- **Notes:**

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### **Childbirth**

[Skilled birth attendance \(SBA\)](#) [Health facility delivery](#) [Unassisted delivery](#) [Assisted delivery at home](#) [Essential care](#) [BEmOC](#) [CEmOC](#) [Clean birth practices](#) [Immediate assessment and stimulation](#) [Labor and delivery management](#) [Neonatal resuscitation](#) [Antenatal corticosteroids for preterm labor](#) [Antibiotics for PPRoM](#) [MgSO<sub>4</sub>-management of eclampsia](#) [AMTSL-active management of the third stage of labor](#) [Induction of labor for pregnancies lasting 41+ weeks](#)

Within the "Childbirth" tab, LiST will automatically calculate the distributions of delivery levels and coverage levels of childbirth interventions, unless you uncheck "Allow LiST to calculate place and level of delivery" to manually change level and place of delivery or uncheck "Allow LiST to calculate intervention coverages" to manually enter coverage for childbirth interventions.

Please note that to manually edit coverage of childbirth interventions you must (after unchecking "Allow LiST to calculate intervention coverages") specify which of the childbirth interventions are available at which level of care, before proceeding to the tab for the each delivery level to enter coverage values. Coverage for each intervention can be entered as either the percentage of all deliveries, or as the percentage of that delivery level specifically. If you need to return the box where you specify the availability of childbirth interventions, you must recheck and then uncheck the "Allow LiST to calculate intervention coverages" box. This will require you to reenter all changes made.

## **Skilled birth attendance (SBA)**

- **Definition:** Percent of children born with a skilled attendant present, including doctors, nurses, or midwives, in a facility or at home. An SBA in the home is defined as a skilled birth attendant who delivers the infant at home without benefit of referral to a facility in case of emergency. An SBA in a facility is defined as a medically skilled attendant who has the ability and facilities needed to monitor labor progress with a partograph and detect complications. Episiotomy is available, if needed. Infection control is covered under clean birth practices.

- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:** This intervention has no effect alone. It is used to calculate the coverage of home delivery interventions. See assisted deliveries at home below. The value for SBA must be greater than or equal to Facility Deliveries. (We are aware that not all deliveries at a facility have a skilled attendant. However, in the absence of additional data, we have chosen to make this assumption.)

Within EasyLiST, when one intervention is selected, the other must also be selected.

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### Health facility delivery

- **Definition:** Percent of children born in a health facility.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:** This intervention has no effect alone. It is used to calculate the estimated coverage of all childbirth care interventions in combination with skilled birth attendance.

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### Unassisted delivery

- **Definition:** Percent of deliveries in the home without skilled attendance.
- **Default data source:** This is calculated by subtracting the percent of births with SBA from 100% of all births.
- **Notes:** This value can only be modified by adjusting the other Facility Delivery and SBA values. The sum of the five levels of delivery must be 100%. It is assumed that there is no referral for complications and that an unassisted delivery is the highest level of care available.

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### Assisted delivery at home

- **Definition:** Percent of deliveries in the home with a skilled birth attendant present.
- **Default data source:** If the "Allow LiST to calculate place and level of delivery" box is checked, this is automatically calculated as SBA minus Facility Delivery.
- **Notes:** It is assumed that there is no referral to a facility for complications and that the SBA at home is the highest level of care available to the women.

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## Essential care

- **Definition:** Deliveries at this level of care are assumed to be in facilities that include monitoring of labor progress with a partograph, detection of complications, infection control via a clean delivery, and episiotomy if needed. For the neonate, this includes routine care practices including immediate drying, skin-to-skin contact or immediate wrapping for thermal care, and clean cord cutting.

In LiST, the default assumption is that all Essential Care facilities provide clean birth practices, immediate assessment and stimulation of the newborn, labor and delivery management, and neonatal resuscitation. This can be modified by unchecking the box labeled "Allow LiST to calculate intervention coverages" on the "Childbirth" tab.

- **Default data source:** The percentage of deliveries at this level are calculated from Health Facility Deliveries (FacilDeliv) according to the following formula:
  - If FacilDeliv is less than 30%, then Essential care deliveries are 90% of FacilDeliv
  - If FacilDeliv is between 30% and 50%, then Essential care deliveries are 50% of FacilDeliv
  - If FacilDeliv is between 50% and 95%, then Essential care deliveries are 25% of FacilDeliv
  - If FacilDeliv are 95% or greater, then Essential care deliveries are 0% of FacilDeliv
- **Notes:** It is assumed that there is no referral to a BEmOC or CEmOC facility for complications and that Essential Care is the highest level of care available to the women.

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## BEmOC

- **Definition:** Deliveries at this level of care are assumed to be in facilities that meet the WHO's guidelines for Basic Emergency Obstetric and Newborn Care (BEmOC). BEmOC facilities must be able to perform seven signal functions: administer parenteral antibiotics; administer parenteral anticonvulsants; administer parenteral oxytocics; manual removal of placenta; removal of retained products (manual vacuum aspiration); assisted vaginal delivery (with vacuum extractor or forceps); and neonatal resuscitation with bag and mask.

In LiST, the default assumption is that all BEmOC facilities provide clean birth practices, immediate assessment and stimulation of the newborn, labor and delivery management, neonatal resuscitation, antibiotics for pPRoM, MgSO4 management of eclampsia, and active management of the third stage of labor (AMTSL). This can be modified by unchecking the box labeled "Allow LiST to calculate intervention coverages" on the "Childbirth" tab.

- **Default data source:** The percentage of deliveries at this level are calculated from Health Facility Deliveries (FacilDeliv) according to the following formula:
  - If FacilDeliv is less than 30%, then BEmOC deliveries are 0% of FacilDeliv
  - If FacilDeliv is between 30% and 50%, then BEmOC deliveries are 30% of FacilDeliv
  - If FacilDeliv is between 50% and 95%, then BEmOC deliveries are 15% of

FacilDeliv

- If FacilDeliv are 95% or greater, then BEmOC deliveries are 0% of FacilDeliv

- **Notes:** It is assumed that there is no referral to a CEmOC facility for complications and that BEmOC is the highest level of care available to the women.

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## CEmOC

- **Definition:** Deliveries at this level of care are assumed to be in facilities that meet the WHO's guidelines for Comprehensive Emergency Obstetric and Newborn Care (CEmOC). CEmOC facilities must be able to perform the seven signal functions of BEmOC, plus surgery (e.g. Caesarean section) and blood transfusion.

In LiST, the default assumption is that all CEmOC facilities provide clean birth practices, immediate assessment and stimulation of the newborn, labor and delivery management, neonatal resuscitation, antibiotics for pPRoM, MgSO<sub>4</sub> management of eclampsia, active management of the third stage of labor (AMTSL), and induction of labor for pregnancies lasting 41+ weeks. This can be modified by unchecking the box labeled "Allow LiST to calculate intervention coverages" on the "Childbirth" tab.

- **Default data source:** The percentage of deliveries at this level are calculated from Health Facility Deliveries (FacilDeliv) according to the following formula:
  - If FacilDeliv is less than 30%, then CEmOC deliveries are 10% of FacilDeliv
  - If FacilDeliv is between 30% and 50%, then CEmOC deliveries are 20% of FacilDeliv
  - If FacilDeliv is between 50% and 95%, then CEmOC deliveries are 60% of FacilDeliv
  - If FacilDeliv are 95% or greater, then CEmOC deliveries are 100% of FacilDeliv

- **Notes:**

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## Clean birth practices

- **Definition:** Percent of deliveries where clean birth practices are performed, including handwashing by the attendant, cleaning the maternal perineum, using a clean birth surface, clean cutting and tying of the cord, and hygienic cord and skin care immediately after delivery.
  - **Default data source:** The default assumption is that 100% of SBAs in the home and 100% of institutional deliveries are using clean birth practices.
  - **Notes:** The assumptions should be adjusted based on local knowledge and data. One potential choice is to use a clean delivery kit in the home for unassisted deliveries as an indicator of clean birth practices.
  - **Effect size reference:** Note that the effectiveness of this intervention differs by level of delivery (see [Effectiveness](#) menu).
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Blencowe H, Cousens S, Mullany LC, et al. Clean birth and postnatal care practices to reduce neonatal deaths from sepsis and tetanus: A systematic review and Delphi estimation of mortality effect. *BMC Public Health* 2011; 11(Suppl 3): S11.

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231884/>.

Pollard SL, Mathai M, Walker N. Estimating the impact of interventions on cause-specific maternal mortality: A Delphi approach. *BMC Public Health* 2013; 13(Suppl 3): S12.

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847442/>.

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## Immediate assessment and stimulation

- **Definition:** Percent of deliveries where rubbing and drying of the neonate immediately after delivery is performed.
- **Default data source:** The default assumption is that 100% of SBAs in the home and 100% of institutional deliveries are using appropriate and immediate assessment and stimulation.
- **Notes:**
- **Effect size reference:** Note that it is possible to vary the effectiveness of this intervention by level of delivery (see [Effectiveness](#) menu).

Lee AC, Cousens S, Mullany LC, et al. Neonatal resuscitation and immediate newborn assessment and stimulation for the prevention of neonatal deaths: A systematic review, meta-analysis and Delphi estimation of mortality effect. *BMC Public Health* 2011; 11(Suppl 3): S12. <http://www.ncbi.nlm.nih.gov/pubmed/21501429>.

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## Labor and delivery management

- **Definition:** Percent of women receiving labor and delivery management from a skilled birth attendant.
- **Default data source:** The default assumption is that 100% of SBAs in the home and 100% of institutional deliveries have access to the appropriate facilities for the given level of care.
- **Notes:** The default assumption is that 100% of SBAs in the home and 100% of facility deliveries are able to provide labor and delivery management. However, the nature of this labor and delivery management is assumed to differ based on the location at which the delivery occurs (because of the differing availability of supplies, equipment, and skills of birth attendants at different levels of care). For this reason, the intervention of "labor and delivery management" has different effectiveness values at different levels of care.
- **Effect size reference:** Note that the effectiveness of this intervention differs by level of delivery (see [Effectiveness](#) menu).

Lee AC, Cousens S, Darmstadt GL, et al. Care during labor and birth for the prevention of

intrapartum-related neonatal deaths: A systematic review and Delphi estimation of mortality effect. *BMC Public Health* 2011; 11(Suppl 3): S10. <http://www.ncbi.nlm.nih.gov/pubmed/21501427>.

Yakoob MY, Ali MA, Ali MU, et al. The effect of providing skilled birth attendance and emergency obstetric care in preventing stillbirths. *BMC Public Health* 2011; 11(Suppl 3): S7. <http://www.ncbi.nlm.nih.gov/pubmed/21501458>.

(Maternal mortality effect size from unpublished calculations based on: Pollard SL, Mathai M, Walker N. Estimating the impact of interventions on cause-specific maternal mortality: A Delphi approach. *BMC Public Health* 2013; 13(Suppl 3): S12. [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847442/.](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847442/))

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## Neonatal resuscitation

- **Definition:** Percent of deliveries with access to detection of breathing problems and resuscitation (with a mucous extractor).
- **Default data source:** The default assumption is that 100% of institutional deliveries have access to neonatal resuscitation, if needed.
- **Notes:** We do not assume that neonatal resuscitation is performed in the home.
- **Effect size reference:** Note that the effectiveness of this intervention differs by level of delivery (see [Effectiveness](#) menu).

Lee AC, Cousens S, Mullany LC, et al. Neonatal resuscitation and immediate newborn assessment and stimulation for the prevention of neonatal deaths: A systematic review, meta-analysis and Delphi estimation of mortality effect. *BMC Public Health* 2011; 11(Suppl 3): S12. <http://www.ncbi.nlm.nih.gov/pubmed/21501429>.

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## Antenatal corticosteroids for pre-term labor

- **Definition:** Percent of women with premature labor receiving an intramuscular injection of betamethasone sodium phosphate (6mg, every 12 hours for 2 days).
  - **Default data source:** The default assumption is that 0% of births receive antenatal corticosteroids; user should enter local data if possible and available.
  - **Notes:** Antenatal corticosteroids (ACS) were previously included in LiST as an intervention that could be effective in reducing deaths due to prematurity in 2006, based on work for the 2005 Lancet Neonatal series. (Darmstadt GL, Bhutta ZA, Cousens S, et al. Evidence-based, cost-effective interventions: how many newborns can we save and at what cost? *Lancet* 2005; 365: 988-97. <http://www.ncbi.nlm.nih.gov/pubmed/15767001>.) (Mwansa-Kambafwile J, Cousens S, Hanset T, et al. Antenatal steroids in preterm labour for the prevention of neonatal deaths due to complications of preterm birth. *International Journal of Epidemiology* 2010; 39(Suppl 1): i122-i133. [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2845868/.](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2845868/))
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Since that time, there has been an increasing amount of information that finds that there can be negative consequences to the use of ACS, especially when provided in weaker health care systems. (Althabe F, Belizan JM, McClure EM, et al. A population-based, multifaceted strategy to implement antenatal corticosteroid treatment versus standard care for the reduction of neonatal mortality due to preterm birth in low-income and middle-income countries: the ACT cluster-randomised trial. *Lancet* 2015; 385:629-39. <http://www.ncbi.nlm.nih.gov/pubmed/25458726>.)

(Azad A, Costello A. Extreme caution is needed before scale-up of antenatal corticosteroids to reduce preterm deaths in low-income settings. *Lancet Global Health* 2014; 2: e191-2. <http://www.sciencedirect.com/science/article/pii/S2214109X14700208>.)

We have decided that the best way to ensure that users do not miss-apply the possible impact of ACS on neonatal mortality is to leave the intervention in LiST, but to change the default effectiveness of this intervention to zero. This way if users do want to model the impact of ACS when provided effectively in a stronger health care system they can do so, but will need to specify the effectiveness of the intervention.

- **Effect size reference:** The effect size is currently set to 0 (see note above); use the "Effectiveness" menu to modify if necessary.

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## Antibiotics for pPRoM

- **Definition:** Percent of pregnant women with premature rupture of the membranes (pPRoM) who are not in labor and are given oral erythromycin (250mg, 4 times daily for 7 days) to prevent infection.
- **Default data source:** The default assumption is that 100% of BEmOC and 100% of CEmOC deliveries have access to antibiotics for preterm prelabor rupture of membranes, if needed.
- **Notes:**
- **Effect size reference:** Note that it is possible to vary the effectiveness of this intervention by level of delivery (see [Effectiveness](#) menu).

Cousens S, Blencowe H, Gravett M, et al. Antibiotics for pre-term pre-labour rupture of the membranes: Prevention of neonatal deaths due to complications of preterm birth and infection. *International Journal of Epidemiology* 2010; 39(Suppl 1): i34-i43.

<http://www.ncbi.nlm.nih.gov/pubmed/20348116>.

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## MgSO<sub>4</sub> - management of eclampsia

- **Definition:** Percent of pregnant women receiving magnesium sulfate for eclampsia during delivery.
- **Default data source:** The default assumption is that 100% of BEmOC and 100% of CEmOC deliveries have access to MgSO<sub>4</sub> for eclampsia, if needed.
- **Notes:**

- **Effect size reference:** Note that it is possible to vary the effectiveness of this intervention by level of delivery (see [Effectiveness](#) menu).

Ronsmans C, Campbell O. Quantifying the fall in mortality associated with interventions related to hypertensive diseases of pregnancy. *BMC Public Health* 2011; 11(Suppl 3): S8. <http://www.ncbi.nlm.nih.gov/pubmed/21501459>.

Jabeen M, Yakoob MY, Imdad A, et al. Impact of interventions to prevent and manage preeclampsia and eclampsia on stillbirths. *BMC Public Health* 2011; 11(Suppl 3): S6. <http://www.ncbi.nlm.nih.gov/pubmed/21501457>.

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### **AMTSL - Active Management of the Third Stage of Labor**

- **Definition:** Percent of women with their third stage of labor managed actively. Active management of the third stage of labor (AMTSL) is defined as controlled cord traction, uterine massage, and appropriate oxytocics.
- **Default data source:** The default assumption is that 100% of BEmOC and 100% of CEmOC deliveries have appropriate active management during and after delivery.
- **Notes:** Note that it is possible to vary the effectiveness of this intervention by level of delivery (see [Effectiveness](#) menu).

Pollard SL, Mathai M, Walker N. Estimating the impact of interventions on cause-specific maternal mortality: A Delphi approach. *BMC Public Health* 2013; 13(Suppl 3): S12. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847442/>.

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### **Induction of labor for pregnancies lasting 41+ weeks**

- **Definition:** Percent of women who are 41 or more weeks pregnant who are managed with induction of labor as appropriate.
- **Default data source:** The default assumptions are that 100% of CEmOC deliveries have access to induction of labor for post-term pregnancies, if needed.
- **Notes:** The current impact of this intervention is only on stillbirths.
- **Effect size reference:** Note that it is possible to vary the effectiveness of this intervention by level of delivery (see [Effectiveness](#) menu).

Hussain AA, Yakoob MY, Imdad A, et al. Elective induction for pregnancies at or beyond 41 weeks of gestation and its impact on stillbirths: A systematic review with meta-analysis. *BMC Public Health* 2011; 11(Suppl 3): S5. <http://www.ncbi.nlm.nih.gov/pubmed/21501456>.

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## Breastfeeding

[Exclusive breastfeeding](#) [Predominant breastfeeding](#) [Partial breastfeeding](#) [Any breastfeeding](#)  
[No breastfeeding](#) [Early initiation of breastfeeding](#) [Breastfeeding promotion](#)

In the "Breastfeeding" tab, data may be entered by either **breastfeeding prevalence** or **breastfeeding promotion**. If prevalence is selected (default), the rates of exclusive, predominant, and partial breastfeeding may be modified. If promotion is selected, the coverage of breastfeeding promotion as an intervention may be modified and breastfeeding rates are automatically calculated as a result.

### Exclusive breastfeeding

- **Definition:** Percent of children receiving only breastmilk for food (plus medication, vaccines, and vitamins).
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys; however, they have been recalculated from the raw data sources to reflect the entire age period of interest.
- **Notes:** This applies to children 0-1 months and 1-5 months of age.

If recalculated data are not available, 0-2 months can be used as a proxy for 0-1 months while 4-5 months can be used as a proxy for 1-5 months.

- **Effect size references:** Lamberti LM, Zakarija-Grkovic I, Fischer Walker CL, et al. Breastfeeding for reducing the risk of pneumonia morbidity and mortality in children under two: A systematic literature review and meta-analysis. *BMC Public Health* 2013; 13(Suppl 3): S18. <http://www.ncbi.nlm.nih.gov/pubmed/24564728>.

Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013; 382(9890): 427-51. <http://www.ncbi.nlm.nih.gov/pubmed/23746772>.

LiST Technical Note: Breastfeeding effect sizes on mortality in LiST.

[http://livessavedtool.org/images/documents/Technical\\_Notes/Breastfeeding-effect-sizes-on-mortality.pdf](http://livessavedtool.org/images/documents/Technical_Notes/Breastfeeding-effect-sizes-on-mortality.pdf)

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### Predominant breastfeeding

- **Definition:** Percent of children receiving only breastmilk plus water and/or other non-milk liquids such as juices (plus medication, vaccines, and vitamins).
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys; however, they have been recalculated from the raw data sources to reflect the entire age period of interest.

- **Notes:** This applies to children 0-1 months and 1-5 months of age.

If recalculated data are not available, 0-2 months has been used as a proxy for 0-1 months while 4-5 months has been used as a proxy for 1-5 months.

- **Effect size references:** Lamberti LM, Zakarija-Grkovic I, Fischer Walker CL, et al. Breastfeeding for reducing the risk of pneumonia morbidity and mortality in children under two: A systematic literature review and meta-analysis. *BMC Public Health* 2013; 13(Suppl 3): S18. <http://www.ncbi.nlm.nih.gov/pubmed/24564728>.

Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013; 382(9890): 427-51. <http://www.ncbi.nlm.nih.gov/pubmed/23746772>.

LiST Technical Note: Breastfeeding effect sizes on mortality in LiST. [http://livessavedtool.org/images/documents/Technical\\_Notes/Breastfeeding-effect-sizes-on-mortality.pdf](http://livessavedtool.org/images/documents/Technical_Notes/Breastfeeding-effect-sizes-on-mortality.pdf)

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## Partial breastfeeding

- **Definition:** Percent of children receiving breastmilk plus complementary foods and/or milk-based liquids (plus medication, vaccines, and vitamins).
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys; however, they have been recalculated from the raw data sources to reflect the exact age period of interest.
- **Notes:** This applies to children 0-1 months and 1-5 months of age.

If recalculated data are not available, 0-2 months has been used as a proxy for 0-1 months while 4-5 months has been used as a proxy for 1-5 months.

- **Effect size references:** Lamberti LM, Zakarija-Grkovic I, Fischer Walker CL, et al. Breastfeeding for reducing the risk of pneumonia morbidity and mortality in children under two: A systematic literature review and meta-analysis. *BMC Public Health* 2013; 13(Suppl 3): S18. <http://www.ncbi.nlm.nih.gov/pubmed/24564728>.

Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013; 382(9890): 427-51. <http://www.ncbi.nlm.nih.gov/pubmed/23746772>.

LiST Technical Note: Breastfeeding effect sizes on mortality in LiST. [http://livessavedtool.org/images/documents/Technical\\_Notes/Breastfeeding-effect-sizes-on-mortality.pdf](http://livessavedtool.org/images/documents/Technical_Notes/Breastfeeding-effect-sizes-on-mortality.pdf)

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## Any breastfeeding

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- **Definition:** The percent of children still receiving any breastmilk.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys; however, they have been recalculated from the raw data sources to reflect the exact age period of interest.
- **Notes:** This applies to children 6-11 months and 12-23 months of age. No health benefit is assumed to accrue to children breastfed after 24 months of age.
- **Effect size references:** Lamberti LM, Zakarija-Grkovic I, Fischer Walker CL, et al. Breastfeeding for reducing the risk of pneumonia morbidity and mortality in children under two: A systematic literature review and meta-analysis. *BMC Public Health* 2013; 13(Suppl 3): S18. <http://www.ncbi.nlm.nih.gov/pubmed/24564728>.

Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013; 382(9890): 427-51. <http://www.ncbi.nlm.nih.gov/pubmed/23746772>.

LiST Technical Note: Breastfeeding effect sizes on mortality in LiST. [http://livessavedtool.org/images/documents/Technical\\_Notes/Breastfeeding-effect-sizes-on-mortality.pdf](http://livessavedtool.org/images/documents/Technical_Notes/Breastfeeding-effect-sizes-on-mortality.pdf)

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## No breastfeeding

- **Definition:** The percent of children not receiving any breastmilk.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:** This can apply to children of any age group 0-23 months. It is calculated automatically as 100% minus the percentage of children in that age group with any level of breastfeeding.
- **Effect size references:** Lamberti LM, Zakarija-Grkovic I, Fischer Walker CL, et al. Breastfeeding for reducing the risk of pneumonia morbidity and mortality in children under two: A systematic literature review and meta-analysis. *BMC Public Health* 2013; 13(Suppl 3): S18. <http://www.ncbi.nlm.nih.gov/pubmed/24564728>.

Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013; 382(9890): 427-51. <http://www.ncbi.nlm.nih.gov/pubmed/23746772>.

LiST Technical Note: Breastfeeding effect sizes on mortality in LiST. [http://livessavedtool.org/images/documents/Technical\\_Notes/Breastfeeding-effect-sizes-on-mortality.pdf](http://livessavedtool.org/images/documents/Technical_Notes/Breastfeeding-effect-sizes-on-mortality.pdf)

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## Early initiation of breastfeeding

- **Definition:** The percent of children who begin breastfeeding within 1 hour of birth.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:**
- **Effect size references:** NEOVITA Study Group. Timing of initiation, patterns of breastfeeding, and infant survival: prospective analysis of pooled data from three randomised trials. *Lancet Global Health* 2016; 4(4): e266-75. <https://www.ncbi.nlm.nih.gov/pubmed/27013313>.

LiST Technical Note: Breastfeeding effect sizes on mortality in LiST.

[http://livesavedtool.org/images/documents/Technical\\_Notes/Breastfeeding-effect-sizes-on-mortality.pdf](http://livesavedtool.org/images/documents/Technical_Notes/Breastfeeding-effect-sizes-on-mortality.pdf)

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## Breastfeeding promotion

- **Definition:** Percentage of children whose mothers receive activities designed to promote breastfeeding. Breastfeeding promotion can either be one-on-one or group meetings. Promotion activities can take place within the health system, at the home/community level, or both.

Health system interventions include the Baby-Friendly Hospital Initiative, establishment of rooming-in practices, organizational support on breastfeeding outcomes, etc.

Home/community level interventions include one-on-one counseling by home visit or telephone, home support by father or grandparent, group counseling, group meetings, social mobilization, mass media, social media, etc.

- **Default data source:** Coverage data for this indicator are not typically available. As a proxy, the level of breastfeeding promotion is set by default to equal the percent of children 1-5 months of age that are exclusively breastfed; user should enter local data if possible and available.
- **Notes:** It is assumed that children 1-5 months of age who are exclusively breastfed do not need this behavior.

Breastfeeding promotion is applied to breastfeeding prevalence as an increased odds of "age-appropriate breastfeeding" (that is, exclusive breastfeeding for children under 6 months, and any/continued breastfeeding for children 6-23 months). Each of the three promotion channels (health system, home/community, or both) has a different impact on breastfeeding prevalence.

- **Effect size reference:** Haroon S, Das JK, Salam RA, et al. Breastfeeding promotion interventions and breastfeeding practices: A systematic review. *BMC Public Health* 2013; 13(Suppl 3): S20. <http://www.ncbi.nlm.nih.gov/pubmed/24564836>.
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Bhutta ZA, Das JK, Rizvi A, et al. Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? *Lancet* 2013; 382(9890): 352-77. <http://www.ncbi.nlm.nih.gov/pubmed/23746776>. (Supplemental material, page 16.)

Sinha B, Chowdhury R, Sankar MJ, et al. Interventions to improve breastfeeding outcomes: A systematic review and meta-analysis. *Acta Paediatrica* 2015; 104(467): 114-34. <http://www.ncbi.nlm.nih.gov/pubmed/26183031>.

Sinha B, Chowdhury R, Prakash Upadhyay R, Taneja S, Martinez J, Bahl R, Jeeva Sankar M; Integrated Interventions Delivered in Health Systems, Home, and Community Have the Highest Impact on Breastfeeding Outcomes in Low- and Middle-Income Countries. *Journal Nutr* 2017. 147(11S): 2179S-2187S, <https://doi.org/10.3945/jn.116.242321>.

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## Stunting

When the "direct entry of stunting" option is checked in the [LIST configuration](#) menu, the stunting tab appears in the Coverage menu. Within this tab, users may modify stunting rates either through the "single indicator for stunting" option or the "detailed indicators for stunting" option.

The purpose of the single indicator is aggregate the bottom (worst) two stunting categories to create a single percentage of children who are stunted. (For example, if 2% of children are in the <-3 Z-score category and 5% of children are in the -3 to -2 z-score category, the single indicator will display "7% of children stunted.") It also aggregates across age groups, weighting by the number of months in each age range (i.e., <1 month is assumed to represent 1/60 of children, 1-5 months is assumed to represent 5/60 of children, etc.).

When the "single indicator" option is selected, the first (baseline) year of the single indicator will be grayed out and the rest of the years will be active. In the detailed display, the first year will be active (allowing users to edit baseline data here if necessary), but the following years will be grayed out. When the "detailed display" option is selected, the single indicator will remain visible but will be entirely grayed out, and the detailed display will be fully active.

Please note that in a healthy population (assumed to have a normal distribution of height for age), approximately 2.275% of the population will fall below -2 z-scores (i.e., more than 2 standard deviations below the median). As a result, we do not recommend setting the single indicator for stunting at a rate below 2.275%, as this is below what is considered normal for a healthy population.

## Stunting distributions

- **Definition:** Distribution of the percent of children falling into one of four Z-score categories for height for age: <-3Z (severe stunting), -3 to -2Z (moderate stunting), -2 to -1Z (mild stunting), and >-1Z (not stunted). Stunting reflects chronic undernutrition.
- **Default data source:** Data have been recalculated for consistency across countries, using DHS and MICS datasets. This also ensures that the values reflect the exact age groups of interest.

- **Notes:** Disaggregated data are not available for 0-1 and 1-5 months. As a proxy, the 0-6 month values are applied to both age groups.

### Preventive

[Clean postnatal care practices](#) [Chlorhexidine](#) [Complementary feeding - education only](#)  
[Complementary feeding - education and supplementation](#) [Vitamin A supplementation](#) [Zinc supplementation](#) [Improved water source](#) [Water connection in the home](#) [Improved sanitation](#)  
[Hand washing with soap](#) [Hygienic disposal of children's stools](#) [ITN/IRS](#)

### Clean postnatal care practices

- **Definition:** Percent of neonates where the mother washes her hands frequently, the child lives in a clean environment, and no harmful practices are performed.
- **Default data source:** Coverage data for this indicator are not typically available. As a proxy, it is assumed that all neonates receiving a preventive postnatal visit within 48 hours of delivery will subsequently receive adequate clean postnatal practices in the home. Coverage data for this proxy indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:**
- **Effect size reference:** Blencowe H, Cousens S, Mullany LC, et al. Clean birth and postnatal care practices to reduce neonatal deaths from sepsis and tetanus: A systematic review and Delphi estimation of mortality effect. *BMC Public Health* 2011; 11(Suppl 3): S11. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231884/>.

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### Chlorhexidine

- **Definition:** Percent of neonates with chlorhexidine applied after birth to the cord.
- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
- **Notes:**
- **Effect size reference:** Imdad A, Mullany LC, Baqui AH, et al. The effect of umbilical cord cleansing with chlorhexidine on omphalitis and neonatal mortality in community settings in developing countries: A meta-analysis. *BMC Public Health* 2013; 13(Suppl 3): S15. <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0061555/>.

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### Complementary feeding - education only

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- **Definition:** Percent of mothers intensively counseled on the importance of continued breastfeeding beyond six months and appropriate complementary feeding practices. As a proxy, the percent of 6-23 month old children receiving minimum dietary diversity (4+ food groups) is used.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:** This is applied to the food secure population. The proxy used is those living on more than \$1.90/day. This proxy can be modified in the [Household Status](#) tab of the "Health status, mortality, and economic status" menu.

As a default, the two complementary feeding coverage indicators are equal (using the same proxy indicator of minimum dietary diversity). The user should enter local data to differentiate between the two indicators (education only vs. education and supplementation) if possible and available.

The combined effect of both complementary feeding indicators will appear under Results as "appropriate complementary feeding."

- **Effect size reference:**

Panjwani A and Heidkamp R. Complementary Feeding Interventions Have a Small but Significant Impact on Linear and Ponderal Growth of Children in Low- and Middle-Income Countries: A Systematic Review and Meta-Analysis. *J Nutr* 2017, 147(11S):2169S-2178S. <https://doi.org/10.3945/jn.116.243857>

Imdad A, Yakoob MY, Bhutta ZA. Impact of maternal education about complementary feeding and provision of complementary foods on child growth in developing countries. *BMC Public Health* 2011; 11(Suppl 3): S25. <http://www.ncbi.nlm.nih.gov/pubmed/21501443>.

Bhutta ZA, Ahmed T, Black RE, et al. What works? Interventions for maternal and child undernutrition and survival. *Lancet* 2008; 371: 417-40. <http://www.ncbi.nlm.nih.gov/pubmed/18206226>.

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## Complementary feeding - education and supplementation

- **Definition:** Percent of mothers intensively counseled on the importance of continued breastfeeding beyond six months and appropriate complementary feeding practices, and given appropriate dietary supplementation. As a proxy, the percent of 6-23 month old children receiving minimum dietary diversity (4+ food groups) is used.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:** This is applied to the food insecure population. The proxy used is those living on less than \$1.90/day. This proxy can be modified in the [Household Status](#) tab of the "Health status, mortality, and economic status" menu.

As a default, the two complementary feeding coverage indicators are equal (using the same proxy indicator of minimum dietary diversity). The user should enter local data to differentiate between the two indicators (education only vs. education and supplementation) if possible and available.

The combined effect of both complementary feeding indicators will appear under Results as "appropriate complementary feeding."

- **Effect size reference:** Imdad A, Yakoob MY, Bhutta ZA. Impact of maternal education about complementary feeding and provision of complementary foods on child growth in developing countries. *BMC Public Health* 2011; 11(Suppl 3): S25. <http://www.ncbi.nlm.nih.gov/pubmed/21501443>.

Bhutta ZA, Ahmed T, Black RE, et al. What works? Interventions for maternal and child undernutrition and survival. *Lancet* 2008; 371: 417-40. <http://www.ncbi.nlm.nih.gov/pubmed/18206226>.

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## Vitamin A supplementation

- **Definition:** Percent of children 6-59 months of age receiving two doses of Vitamin A during the last 12 months.
- **Default data source:** UNICEF - Vitamin A coverage. <http://data.unicef.org/nutrition/vitamin-a>. Updated annually.
- **Notes:** The full indicator is typically not available from a DHS/MICS or other household survey. However, the percent of children 6-59 months receiving 1 dose of Vitamin A in the past 6 months can be used if necessary from these sources.
- **Effect size reference:** Imdad A, Yakoob MY, Sudfeld CR, et al. Impact of vitamin A supplementation on infant and childhood mortality. *BMC Public Health* 2011; 11(Suppl 3): S20. <http://www.ncbi.nlm.nih.gov/pubmed/21501438>.

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## Zinc supplementation

- **Definition:** Percent of children 12-59 months of age who are given daily supplements of 10mg zinc.
  - **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
  - **Notes:** This is not the same indicator as zinc treatment for diarrhea.
  - **Effect size reference:** Yakoob MY, Theodoratou E, Jabeen A, et al. Preventive zinc supplementation in developing countries: impact on mortality and morbidity due to diarrhea, pneumonia and malaria. *BMC Public Health* 2011; 11(Suppl 3): S23. <http://www.ncbi.nlm.nih.gov/pubmed/21501441>.
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Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013; 382(9890): 427-51.

<http://www.ncbi.nlm.nih.gov/pubmed/23746772>. (Supplemental material, page 18-19.)

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## Improved water source

- **Definition:** Percent of households with access to an improved water source within a 30 minute walk.
- **Default data source:** WHO/UNICEF Joint Monitoring Program (JMP) for Water Supply and Sanitation (<https://washdata.org/>). Data are available for all countries from 1996 to 2015.
- **Notes:** It is assumed that the interventions "improved water source" and "improved sanitation" are only effective if used in combination. Thus, the lower coverage value between these two interventions is limiting, as this represents the maximum percentage of the population that could be receiving both interventions. The software will automatically apply the combined effect of the interventions to the lower coverage value between the two interventions. The combined impact of these interventions will appear in results with the label "improved water source and improved sanitation."

Water connection in the home is considered a subset of improved water source. As a result, the value of this indicator must be greater than or equal to water connection in the home.

- **Effect size reference:** Fisher-Walker et al., publication forthcoming

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## Water connection in the home

- **Definition:** Percent of households with a household connection, including water piped into the home or yard.
- **Default data source:** WHO/UNICEF Joint Monitoring Program (JMP) for Water Supply and Sanitation (<https://washdata.org/>). Data are available for all countries from 1996 to 2015.
- **Notes:** This is a subset of households with access to an improved water source. As a result, the value of this indicator must be less than or equal to the value of improved water source. The model automatically ensures no double-counting of impact.
- **Effect size reference:** Cairncross S, Valdmanis V. Water supply, sanitation, and hygiene promotion. In: Jamison DT, Breman JG, Measham AR, et al., editors. Disease control priorities in developing countries. Washington DC: The World Bank, 2006; p. 771-792. <http://www.ncbi.nlm.nih.gov/books/NBK11728/>.

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## Improved sanitation

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- **Definition:** Percent of households using an improved sanitation facility (defined as flush or pour flush to piped sewer system, septic tank, or pit latrine; ventilated improved pit (VIP) latrine; pit latrine with slab; or composting toilet).
- **Default data source:** WHO/UNICEF Joint Monitoring Program (JMP) for Water Supply and Sanitation (<https://washdata.org/>). Data are available for all countries from 1996 to 2015.
- **Notes:** It is assumed that the interventions "improved water source" and "improved sanitation" are only effective if used in combination. Thus, the lower coverage value between these two interventions is limiting, as this represents the maximum percentage of the population that could be receiving both interventions. The software will automatically apply the combined effect of the interventions to the lower coverage value between the two interventions. The combined impact of these interventions together will appear in results with the label "improved water source and improved sanitation."
- **Effect size reference:** Fisher-Walker *et al.*, publication forthcoming

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## Hand washing with soap

- **Definition:** Percent of mothers using appropriate hand washing practices, including washing hands with soap, ash, or other materials and using adequate water, after handling feces and before preparing food. As a proxy, the percent of households which have a hand washing station that is equipped with a cleansing agent is used.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys. Where country-specific data are unavailable from nationally representative surveys, estimates from Curtis *et al.* 2009 are used.

Curtis VA, Danguah LO, Aunger RV. Planned, motivated and habitual hygiene behaviour: An eleven country review. *Health Education Research* 2009; 24(4): 655-73.

<http://www.ncbi.nlm.nih.gov/pubmed/19286894>. Table 3 of this paper provides data for a small set of countries (Ghana, Kenya, Kyrgyzstan, Madagascar, Peru, Senegal, Tanzania, and Uganda). All other countries are set by default to 17%, the global average cited in the paper, if data from nationally representative surveys are not available.

- **Notes:** Neither reported hand washing behavior nor availability of hand washing materials in the home are appropriate indicators. Observational data are required.
- **Effect size reference:** Darvesh N, Das JK, Vaivada T, *et al.* Water, sanitation and hygiene interventions for acute childhood diarrhea: a systematic review to provide estimates for the Lives Saved Tool. *BMC Public Health* . 2017 Nov 7;17(Suppl 4):776. doi:10.1186/s12889-017-4746-1.

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## Hygienic disposal of children's stools

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- **Definition:** Percent of children's stools that are disposed of safely and contained. Stools are considered to be contained if: 1) the child always uses a toilet/latrine, 2) the feces are thrown in the toilet/latrine, or 3) the feces are buried in the yard.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:** In some countries, utilization of disposable diapers may be considered hygienic disposal, but this is included on a country-by-country basis as the DHS/MICS has chosen.

Currently, this intervention is assumed to have no quantifiable effect on diarrhea incidence, child mortality, or any other outcome modeled in LiST due to a lack of high quality evidence, as determined by a 2010 Cochrane review on the topic.

- **Effect size reference:** Clasen TF, Bostoen K, Schmidt W-P, *et al.* Interventions to improve disposal of human excreta for preventing diarrhoea. *Cochrane Database of Systematic Reviews* 2010, Issue 6. Art. No.: CD007180. doi: 10.1002/14651858.CD007180.pub2

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### **ITN/IRS - household ownership of insecticide treated bednet (ITN) and/or protected by indoor residual spraying (IRS)**

- **Definition:** Percent of households owning at least one insecticide treated bednet (ITN) and/or protected by indoor residual spraying (IRS).
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys. This includes Malaria Indicator Surveys.
- **Notes:** For historical trends where data on IRS are not available, data on percent of households with one or more ITN are used instead; this is considered a reasonable minimum bound. Data points where this substitution is used are indicated in the source notes. ITNs are assumed to have been introduced in 2000, so a linear "scale-up" trend from zero in 1999 to the first available data point for the country is automatically computed.

The indicator can be substituted with trends in "children sleeping under an ITN," but the estimate will be conservative. The default effect size is based on household ownership, not utilization. Note that any bednet (treated or untreated) is not an adequate indicator.

- **Effect size reference:** Eisele TP, Larsen D, Steketee RW. Protective efficacy of interventions for preventing malaria mortality in children in *Plasmodium falciparum* endemic areas. *International Journal of Epidemiology* 2010; 39(Suppl 1): i88-i101. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2845865/>.

Radeva-Petrova D, Kayentao K, Ter Kuile FO, *et al.* Drugs for preventing malaria in pregnant women in endemic areas: Any drug regimen versus placebo or no treatment. *Cochrane Database Syst Rev* 2014. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4498495/>.

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## Vaccines

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Vaccines given to children in their first year of life have protective effects until they are five years of age. When editing vaccine coverage, users will have to specify coverage in the four years prior to the base year of coverage of the LiST module. This will allow the model to correctly compute the protective effects of vaccines for children in different age groups in a given year.

For each vaccine, the number of doses that is considered "full coverage" is displayed on the "Vaccines" tab. To enter coverage of incomplete doses and/or supplemental vaccination, double-click on the relevant vaccine. There are no default effectiveness estimates for supplemental vaccination (additional doses or "boosters"), although there are effectiveness estimates for suboptimal dosing. The sum of all the doses must be less than or equal to 100% of children.

If a supplemental campaign is being modeled, check the box for "supplemental vaccination - campaign implemented" in the relevant year. Then enter data on geographic coverage, low and high age groups targeted, and the average number of doses per child. Select the radial button at the top of the page to enter either the number of doses provided or the percent of target population reached, and then enter those values at the bottom of the page. Default values are not available for this section of the model.

## BCG

- **Definition:** Percent of live births receiving at least one dose of BCG.
- **Default data source:** Default data from WHO/UNICEF ([http://apps.who.int/immunization\\_monitoring/globalsummary/timeseries/tswucoveragebcg.html](http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragebcg.html)), updated annually. These data can be replaced with DHS/MICS data if necessary.
- **Notes:** BCG is included in LiST to indicate that it is an important intervention delivered during the first five years of life.
- **Effect size reference:** The current assumption is that BCG has no measurable impact upon under-five mortality.

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## Polio

- **Definition:** Percent of children who survive the first year of life who have received at least three doses of polio vaccine.
  - **Default data source:** Default data from WHO/UNICEF ([http://apps.who.int/immunization\\_monitoring/globalsummary/timeseries/tswucoveragepol3.html](http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragepol3.html)), updated annually. These data can be replaced with DHS/MICS data if necessary.
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- **Notes:** Polio vaccination is included in LiST to indicate that it is an important intervention delivered during the first five years of life.
- **Effect size reference:** The current assumption is that polio vaccination has no measurable impact upon under-five mortality.

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## Pentavalent

- **Definition:** Percent of children who survive the first year of life who have received 3 doses of pentavalent vaccine.
- **Default data source:** Default data from WHO/UNICEF ([http://www.who.int/immunization/monitoring\\_surveillance/en/](http://www.who.int/immunization/monitoring_surveillance/en/)), updated annually. These data can be replaced with DHS/MICS data if necessary.
- **Notes:** Changing the pentavalent vaccine coverage will automatically change the coverage of DPT, Hib, and HepB. See the individual vaccines for effect information.

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## DPT

- **Definition:** Percent of children who survive the first year of life who have received 3 doses of DPT vaccine.
- **Default data source:** Default data from WHO/UNICEF ([http://apps.who.int/immunization\\_monitoring/globalsummary/timeseries/tswucoveredtp3.html](http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveredtp3.html)), updated annually. These data can be replaced with DHS/MICS data if necessary.
- **Notes:** The effect of DPT is only on pertussis mortality. There is currently no impact on tetanus or diphtheria mortality. Default herd effect is 0. Note that [herd immunity](#) can be adjusted if desired.
- **Effect size reference:** Fulton TR, Phadke VK, Orenstein WA, et al. Protective Effect of Contemporary Pertussis Vaccines: A Systematic Review and Meta-analysis. *Clinical Infectious Diseases* 2016; 62(9): 1100-1100. <http://www.ncbi.nlm.nih.gov/pubmed/26908803>.

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## Hib

- **Definition:** Percent of children who survive the first year of life who have received 3 doses of Hib vaccine.
- **Default data source:** Default data from WHO/UNICEF ([http://apps.who.int/immunization\\_monitoring/globalsummary/timeseries/tswucoveragehib3.html](http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragehib3.html)), updated annually. These data can be replaced with DHS/MICS data if necessary.
- **Notes:** Default herd effect is 0. Note that [herd immunity](#) can be adjusted.

- **Effect size reference:** Griffiths UK, Clark A, Gessner B, et al. Dose-specific efficacy of Haemophilus influenzae type b conjugate vaccines: A systematic review and meta-analysis of controlled clinical trials. *Epidemiology and Infection* 2012; 140(8): 1343-1355. <http://www.ncbi.nlm.nih.gov/pubmed/22583474>.

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## HepB

- **Definition:** Percent of live births who have received at least three doses of Hepatitis B vaccine.
- **Default data source:** Default data from WHO/UNICEF ([http://apps.who.int/immunization\\_monitoring/globalsummary/timeseries/tswucoveragehepb3.html](http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragehepb3.html)), updated annually. These data can be replaced with DHS/MICS data if necessary.
- **Notes:** Hepatitis B vaccination is included in LiST to indicate that it is an important intervention delivered during the first five years of life.
- **Effect size reference:** The current assumption is that hepatitis B vaccination has no measurable impact upon under-five mortality.

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## Pneumococcal

- **Definition:** Percent of children who survive the first year of life who have received 3 doses of Pneumococcal vaccine.
- **Default data source:** Default data from WHO/UNICEF ([http://apps.who.int/immunization\\_monitoring/globalsummary/timeseries/tswucoveragepcv3.html](http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragepcv3.html)), updated annually. These data can be replaced with DHS/MICS data if necessary.
- **Notes:** Default herd effect is 0. Note that [herd immunity](#) can be adjusted.
- **Effect size reference:** Lucero MG, Dulalia VE, Nillos LT, et al. Pneumococcal conjugate vaccines for preventing vaccine-type invasive pneumococcal disease and pneumonia with consolidation on x-ray in children under two years of age. *Cochrane Database Syst Rev* 2009. <http://www.ncbi.nlm.nih.gov/pubmed/19821336>.

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## Rotavirus

- **Definition:** Percent of children who survive the first year of life who have received 2 or 3 doses of Rotavirus vaccine (according to manufacturer's schedule).
  - **Default data source:** Default data from WHO/UNICEF ([http://apps.who.int/immunization\\_monitoring/globalsummary/timeseries/tswucoveragerot](http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragerot))
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[a\\_last.html](#)), updated annually. These data can be replaced with DHS/MICS data if necessary.

- **Notes:** The effect size varies by geographic region. Default herd effect is 0. Note that [herd immunity](#) can be adjusted.
- **Effect size reference:** Fisher Walker CL, Black RE. Rotavirus vaccine and diarrhea mortality: Quantifying regional variation in effect size. *BMC Public Health* 2011; 11(Suppl 3): S16. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231889/>.

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## Measles

- **Definition:** Percent of children who survive the first year of life who have received 1 dose of measles vaccine.
- **Default data source:** Default data from WHO/UNICEF ([http://apps.who.int/immunization\\_monitoring/globalsummary/timeseries/tswucoveragemc v.html](http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragemc v.html)), updated annually. These data can be replaced with DHS/MICS data if necessary.
- **Notes:** The default model is appropriate for vaccines which have already been rolled out, but not necessarily for new vaccines. The model may not necessarily correctly estimate the time to elimination of disease (at the very extremes of coverage) but will correctly model control of disease. Note that the impact of [herd immunity](#) can be adjusted. Default herd effect is 100% at 95% coverage. The effect of supplemental campaigns and second-opportunity measles vaccination can also be calculated.
- **Effect size reference:** Sudfeld CR, Navar AM, Halsey NA. Effectiveness of measles vaccination and vitamin A treatment. *International Journal of Epidemiology* 2010; 39(Suppl 1): i48-i55. <http://www.ncbi.nlm.nih.gov/pubmed/20348126>.

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## Meningococcal A

- **Definition:** Percent of children who survive the first year of life who have received a full course of Meningococcal A vaccine (according to manufacturer's schedule).
- **Default data source:** There is no data currently available.
- **Notes:** For default, we assume a single dose is full coverage. This is a placeholder for research purposes. There is no default effect size. To use this indicator, the user must enter their predicted data. This indicator is not available in the standard model.
- **Effect size reference:** None.

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## Diarrheal Vaccine Pathogen B

- **Definition:** Percent of children children who survive the first year of life who have received a full course of Pathogen B vaccine.
- **Default data source:** N/A
- **Notes:** For default, we assume a single dose is full coverage. This is a placeholder for research purposes. There is no default effect size. To use this indicator, the user must enter data. This indicator is not available in the standard model.
- **Effect size reference:** None.

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## Diarrheal Vaccine Pathogen C

- **Definition:** Percent of children children who survive the first year of life who have received a full course of Pathogen C vaccine.
- **Default data source:** N/A
- **Notes:** For default, we assume a single dose is full coverage. This is a placeholder for research purposes. There is no default effect size. To use this indicator, the user must enter data. This indicator is not available in the standard model.
- **Effect size reference:** None.

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## Malaria Vaccine

- **Definition:** Percent of children who survive the first year of life who have received a full course of malaria vaccine.
- **Default data source:** N/A
- **Notes:** For default, we assume a single dose is full coverage. This is a placeholder for research purposes. There is no default effect size. To use this indicator, the user must enter data. This is indicator is not available in the standard model.
- **Effect size reference:** None.

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## Vaccine D

- **Definition:** Percent of children who survive the first year of life who have received a full course of vaccine D.
  - **Default data source:** N/A
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- **Notes:** For default, we assume a single dose is full coverage. This is a placeholder for research purposes. There is no default effect size. To use this indicator, the user must enter data. This indicator is not available in the standard model.
- **Effect size reference:** None.

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### Curative

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## Maternal sepsis case management

- **Definition:** Percent of newly delivered mothers with suspected sepsis managed at a Basic Emergency Obstetric Care (BEmOC) level.
- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
- **Notes:**
- **Effect size reference:** Pollard SL, Mathai M, Walker N. Estimating the impact of interventions on cause-specific maternal mortality: A Delphi approach. *BMC Public Health* 2013; 13(Suppl 3): S12. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847442/>.

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## Case management of premature babies

- **Definition:** This refers to the sum of the three levels of management of prematurely born infants in the neonatal period: thermal care, Kangaroo mother care, and full supportive care for prematurity. See below for details on each intervention.
- **Default data source:** N/A
- **Notes:** The sum of the coverage values for the three levels of care must be less than or equal to 100%.
- **Effect size reference:** This intervention does not have a direct effect, but refers to the sum of the three indicators listed below.

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## Thermal care

- **Definition:** Percent of neonates whose mother delays the infant's bath and practices skin-to-skin contact in order to maintain thermal control of the infant.
- **Default data source:** Coverage data for this indicator are not typically available. As a proxy, it is assumed that all babies delivered in a health facility will receive appropriate thermal care. (See [pregnancy intervention coverage](#) for further information on delivery locations.)
- **Notes:** This only benefits premature infants.
- **Effect size reference:** Bhutta ZA, Das JK, Bahl R, et al. Can available interventions end preventable deaths in mothers, newborn babies, and stillbirths, and at what cost? *Lancet* 2014; 384(9940): 347-70. <http://www.ncbi.nlm.nih.gov/pubmed/24853604>. (Supplemental material, page 33.)

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### KMC - Kangaroo Mother Care

- **Definition:** Percent of premature neonates receiving facility-based Kangaroo Mother Care (KMC). KMC is defined as continuous skin-to-skin contact between a mother and her newborn as well as frequent and exclusive breastfeeding.
- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
- **Notes:** This only benefits premature infants. The affected fraction is the percent of premature births that survive to day 3 (an average of 58%).

There is inadequate data to include community-based KMC.

KMC has an effect in LiST on rates of exclusive breastfeeding (through the breastfeeding promotion component of KMC). This will appear in LiST results under "changes in breastfeeding" (rather than being attributed directly to KMC).

- **Effect size reference:** Lawn JE, Mwansa-Kambafwile J, Horta BL, et al. 'Kangaroo Mother Care' to prevent deaths due to preterm birth complications. *International Journal of Epidemiology* 2010; 39(Suppl 1): i44-i54. <http://www.ncbi.nlm.nih.gov/pubmed/20348117>.

Boundy EO, Dastjerdi R, Spiegelman D, et al. Kangaroo mother care and neonatal outcomes: A meta-analysis. *Pediatrics* 2016; 137(1). <http://www.ncbi.nlm.nih.gov/pubmed/26702029>.

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### Full supportive care for premature babies

- **Definition:** Percent of prematurely born neonates who have access to and receive hospital-based full supportive care, including KMC, feeding support/IV fluids, infection prevention/management, oxygen provision, management of neonatal jaundice, nasal CPAP/IPPV (as required), and surfactant for Respiratory Distress Syndrome.



- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
- **Notes:**
- **Effect size reference:** Bhutta ZA, Das JK, Bahl R, et al. Can available interventions end preventable deaths in mothers, newborn babies, and stillbirths, and at what cost? *Lancet* 2014; 384(9940): 347-70. <http://www.ncbi.nlm.nih.gov/pubmed/24853604>.

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### Case management of severe neonatal infection

- **Definition:** This refers to the sum of the three levels of case management for severe infection in the neonatal period: oral antibiotics, injectable antibiotics, and full supportive care. See below for details on each intervention.
- **Default data source:** N/A
- **Notes:** The sum of the three levels of care must be less than or equal to 100%.
- **Effect size reference:** This intervention does not have a direct effect, but refers to the sum of the three indicators listed below.

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### Oral antibiotics

- **Definition:** Percent of neonates with suspected sepsis/pneumonia treated with oral antibiotics.
- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
- **Notes:**
- **Effect size reference:** Zaidi AK, Ganatra HA, Syed S, et al. Effect of case management on neonatal mortality due to sepsis and pneumonia. *BMC Public Health* 2011; 11(Suppl 3): S13. <http://www.ncbi.nlm.nih.gov/pubmed/21501430>.

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### Injectable antibiotics

- **Definition:** Percent of neonates with suspected sepsis/pneumonia treated with injectable antibiotics.
- **Default data source:** Coverage data for this indicator are not typically available. As a proxy, it is assumed that all babies delivered in a health facility will receive injectable antibiotics if needed. (See [pregnancy intervention coverage](#) for further information on delivery locations.)

- **Notes:**

- **Effect size reference:** Zaidi AK, Ganatra HA, Syed S, et al. Effect of case management on neonatal mortality due to sepsis and pneumonia. *BMC Public Health* 2011; 11(Suppl 3): S13. <http://www.ncbi.nlm.nih.gov/pubmed/21501430>.

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### Full supportive care for sepsis/pneumonia

- **Definition:** Percent of neonates with suspected sepsis/pneumonia treated with hospital-based full supportive care, including oxygen, IV fluids, IV antibiotics, blood transfusion, phototherapy, etc. as needed.
- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.

- **Notes:**

- **Effect size reference:** Zaidi AK, Ganatra HA, Syed S, et al. Effect of case management on neonatal mortality due to sepsis and pneumonia. *BMC Public Health* 2011; 11(Suppl 3): S13. <http://www.ncbi.nlm.nih.gov/pubmed/21501430>.

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### ORS - oral rehydration solution

- **Definition:** Percent of children 0-59 months with suspected diarrhea treated with oral rehydration solution (ORS), including sachets or pre-mixed solutions. This indicator does not include homemade sugar-salt solution or recommended home fluids due to lack of adequate data.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:** It is assumed that 88% of diarrhea mortality is susceptible to treatment with ORS. (Source: Rahman AE, Moinuddin M, Molla M, et al. Childhood diarrhoeal deaths in seven low- and middle-income countries. *Bulletin WHO* 2014. <https://www.ncbi.nlm.nih.gov/pubmed/25378757>.) To change this assumption, visit the [Effectiveness menu](#) to alter the affected fraction.

This is an indicator of appropriate diarrhea treatment. This does not suggest that increased fluids, continuous feeding, or ORT should not be recommended.

- **Effect size reference:** Munos M, Fischer Walker CL, Black RE. The effect of oral rehydration solution and recommended home fluids on diarrhea mortality. *International Journal of Epidemiology* 2010; 39(Suppl 1): i75-i87. <http://www.ncbi.nlm.nih.gov/pubmed/20348131>.

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## Antibiotics - treatment for dysentery

- **Definition:** Percent of children 0-59 months with bloody diarrhea who receive appropriate antibiotic treatment (including ciprofloxacin, ceftriaxone, and pivmecillinam).
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:** It is assumed that 12% of diarrhea mortality is due to dysentery, and hence susceptible to treatment with this intervention. (Source: Rahman AE, Moinuddin M, Molla M, et al. Childhood diarrhoeal deaths in seven low- and middle-income countries. *Bulletin WHO* 2014. <https://www.ncbi.nlm.nih.gov/pubmed/25378757>.) To change this assumption, visit the [Effectiveness menu](#) to alter the affected fraction.
- **Effect size reference:** Das JK Ali A, Salam RA, et al. Antibiotics for the treatment of Cholera, Shigella and Cryptosporidium in children. *BMC Public Health* 2013; 13(Suppl 3): S10. <http://www.ncbi.nlm.nih.gov/pubmed/24564492>.

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## Zinc - treatment of diarrhea

- **Definition:** Percent of children 0-59 months with suspected diarrhea treated with 20mg of zinc daily.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys.
- **Notes:**
- **Effect size reference:** Fischer Walker CL, Black RE. Zinc for the treatment of diarrhea: Effect on diarrhea morbidity, mortality and incidence of future episodes. *International Journal of Epidemiology* 2010; 39(Suppl 1): i63-i69. <http://www.ncbi.nlm.nih.gov/pubmed/20348128>.

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## Oral antibiotics for pneumonia

- **Definition:** Percent of children with suspected pneumonia (symptoms of acute respiratory infection) for whom advice or treatment was sought from a health facility or provider.
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys. Careseeking for pneumonia is used as a proxy for treatment with oral antibiotics.
- **Notes:**
- **Effect size reference:** Theodoratou E, Al-Jilaihawi S, Woodward F, et al. The effect of case management on childhood pneumonia mortality in developing countries. *International*

*Journal of Epidemiology* 2010; 39(Suppl 1): i155-i171.  
<http://www.ncbi.nlm.nih.gov/pubmed/20348118>.

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### Vitamin A - treatment of measles

- **Definition:** Percent of children with measles treated with Vitamin A.
- **Default data source:** Coverage data for this indicator are not typically available. As a proxy, the percent of children 6-59 months receiving two doses of vitamin A in 12 months ([preventive Vitamin A supplementation](#)) is used.
- **Notes:**
- **Effect size reference:** Sudfeld CR, Navar AM, Halsey NA. Effectiveness of measles vaccination and vitamin A treatment. *International Journal of Epidemiology* 2010; 39(Suppl 1): i48-i55. <http://www.ncbi.nlm.nih.gov/pubmed/20348126>.

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### Antimalarials - Artemisinin compounds for malaria

- **Definition:** Percent of children treated within 48 hours of the onset of fever in malaria-endemic areas with an artemisinin-containing compound (artemisinin-based combination therapy, or ACT).
- **Default data source:** Coverage data for this indicator are drawn from DHS, MICS, and other nationally representative household surveys. This includes Malaria Indicator Surveys.
- **Notes:** Historic data often measures treatment with any antimalarial in 48 hours, rather than ACTs specifically. These data can be used to create a historical trend, but there is not a good way to translate "any antimalarial" into an estimate of ACT coverage due to differing levels of effectiveness.
- **Effect size reference:** Thwing J, Eisele TP, Steketee RW. Protective efficacy of malaria case management for preventing malaria mortality in children: A systematic review for the Lives Saved Tool. *BMC Public Health* 2011; 11(Suppl 3): S14. <http://www.ncbi.nlm.nih.gov/pubmed/21501431>.

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### Therapeutic feeding for severe wasting (severe acute malnutrition (SAM))

- **Definition:** Percent of severely wasted children (<-3 Z-score) receiving therapeutic feeding. Therapeutic feeding is outpatient treatment including supplementation with ready-to-use therapeutic foods (RUTF) and maternal education.
  - **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
-

- **Notes:** Therapeutic feeding is only applied to the percent of children severely wasted. It shifts children from the severely wasted category to moderately (-3 to -2 Z-score) and mildly (-2 to -1 Z-score) wasted categories.
- **Effect size reference:** Lenters LM, Wazny K, Webb P, et al. Treatment of severe and moderate acute malnutrition in low- and middle-income settings: A systematic review, meta-analysis and Delphi process. *BMC Public Health* 2013; 13(Suppl 3): S23. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847503/>.

Bhutta ZA, Das JK, Rizvi A, et al. Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? *Lancet* 2013; 382(9890): 352-77. <http://www.ncbi.nlm.nih.gov/pubmed/23746776>. (Supplemental material, page 15.)

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### Treatment for moderate acute malnutrition (MAM)

- **Definition:** Percent of moderately wasted children (-3 to -2 Z-score) receiving outpatient treatment including supplementation with ready-to-use supplementary foods (RUSF) and maternal education.
- **Default data source:** Coverage data for this indicator are not typically available. Currently set at 0 for baseline; user should enter local data if possible and available.
- **Notes:** Treatment for MAM shifts children from the moderately wasted category into the mildly wasted category (-2 to -1 Z-score).
- **Effect size reference:** Lenters LM, Wazny K, Webb P, et al. Treatment of severe and moderate acute malnutrition in low- and middle-income settings: A systematic review, meta-analysis and Delphi process. *BMC Public Health* 2013; 13(Suppl 3): S23. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847503/>.

Bhutta ZA, Das JK, Rizvi A, et al. Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? *Lancet* 2013; 382(9890): 352-77. <http://www.ncbi.nlm.nih.gov/pubmed/23746776>. (Supplemental material, page 15.)

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### Cotrimoxazole

- **Definition:** Coverage and effectiveness of AIDS and HIV interventions are specified in the AIM module.
- **Default data source:**
- **Notes:**

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## ART (for children)

- **Definition:** Coverage and effectiveness of AIDS and HIV interventions are specified in the AIM module.
- **Default data source:**
- **Notes:**

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### Wasting

When the "direct entry of wasting" option is checked in the [LiST configuration](#) menu, the wasting tab appears in the Coverage menu. Within this tab, users may modify wasting rates either through the "single indicator for wasting" option or the "detailed indicators for wasting" option.

The purpose of the single indicator is aggregate the bottom (worst) two wasting categories to create a single percentage of children who are wasted. (For example, if 2% of children are in the <-3 Z-score category and 5% of children are in the -3 to -2 z-score category, the single indicator will display "7% of children wasted.") It also aggregates across age groups, weighting by the number of months in each age range (i.e., <1 month is assumed to represent 1/60 of children, 1-5 months is assumed to represent 5/60 of children, etc.).

When the "single indicator" option is selected, the first (baseline) year of the single indicator will be grayed out and the rest of the years will be active. In the detailed display, the first year will be active (allowing users to edit baseline data here if necessary), but the following years will be grayed out. When the "detailed display" option is selected, the single indicator will remain visible but will be entirely grayed out, and the detailed display will be fully active.

Please note that in a healthy population (assumed to have a normal distribution of height for age), approximately 2.275% of the population will fall below -2 z-scores (i.e., more than 2 standard deviations below the median). As a result, we do not recommend setting the single indicator for wasting at a rate below 2.275%, as this is below what is considered normal for a healthy population.

### Wasting distributions

- **Definition:** Distribution of the percent of children falling into one of four Z-score categories for weight for height: <-3Z (severe wasting), -3 to -2Z (moderate wasting), -2 to -1Z (mild wasting), and >-1Z (not wasted). Wasting reflects acute undernutrition.
  - **Default data source:** Data have been recalculated for consistency across countries, using DHS and MICS datasets. This also ensures that the values reflect the exact age groups of interest.
  - **Notes:** Disaggregated data are not available for 0-1 and 1-5 months. As a proxy, the 0-6 month values are applied to both age groups.
-

## Fertility risks

[Maternal age and birth order](#) [Birth intervals](#)

### Maternal age and birth order

- **Definition:** Distribution of all births, categorized by the maternal age and the parity of the birth.
- **Default data source:** Data are drawn from DHS, MICS, and other nationally representative household surveys; the sum of all categories must add to 100%.
- **Notes:**
- **Effect size reference:** Kozuki N, Lee ACC, Silveira MF, et al. The associations of parity and maternal age with small-for-gestational-age, preterm, and neonatal and infant mortality: a meta-analysis. *BMC Public Health* 2013; 13(Suppl 3): S2. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847520/>. (Relative risks are from unpublished calculations associated with the paper.)

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### Birth intervals

- **Definition:** Distribution of all births, categorized by the number of months between births.
- **Default data source:** Data are drawn from DHS, MICS, and other nationally representative household surveys; the sum of all categories must add to 100%.
- **Notes:**
- **Effect size reference:** Kozuki N, Lee ACC, Silveira MF, et al. The associations of birth intervals with small-for-gestational-age, preterm, and neonatal and infant mortality: a meta-analysis. *BMC Public Health* 2013; 13(Suppl 3): S3. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847557/>. (Relative risks are from unpublished calculations associated with the paper.)

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#### 1.1.3.5 Effectiveness

1. The effectiveness editor groupings show the default values for the effectiveness (the percent of deaths due to a specific cause that are reduced by the intervention) and affected fraction (the percent of deaths due to a specific cause which are potentially able to be impacted by a specific intervention) for each maternal or child health intervention. References for effectiveness data are included under each intervention in the "[Coverage](#)" section of the Help manual.
2. The first four editor groupings (maternal, stillbirth, <1, and 1-59 months) have editor screens organized by cause of death, which display the default values by intervention and age grouping if applicable.

3. You may view only the interventions that affect the relevant cause of death (on the selected tab), which is the default presentation; or you may choose to display the full list of interventions (including those with no default effect on the relevant cause of death) by checking the box "Show all items."
4. If you would like to alter the default values for effectiveness or affected fraction, click anywhere inside the editor to make it active and enter the data. Because the default values are based on rigorous scientific study and are unlikely to need alteration, the cell for any default value that you change will be highlighted in **red** to show that the value has been changed from the default value.
5. Click the "Display default" button if you would like to view the value for a cell that was entered in comparison to the default value. If at any time you decide that you would prefer to revert to the default values over the data that you have entered, click the "Restore defaults" button, and the default values for all indicators in the editor will be restored. The "Restore defaults" button works separately for each editor and will only restore the values in the editor you are working on.

#### **Effectiveness of interventions (maternal)**

The effectiveness editor for interventions related to maternal deaths shows the default values for the effectiveness (the percent of deaths due to a specific cause that are reduced by the intervention) and affected fraction (the percent of deaths due to a specific cause which are potentially able to be impacted by a specific intervention) for each maternal or child health intervention. Please see the ["Effectiveness"](#) help page for more information.

The tabs in this editor are organized by cause of death and display the default values by intervention. Please note that each tab contains a table for "effectiveness of interventions (maternal)," which includes interventions prior to delivery/birth (periconceptual and pregnancy periods) and after delivery/birth, and a table for "maternal delivery effectiveness," which includes interventions given during delivery/birth.

***See help pages on Coverage for information on effect size references.***

#### **Effectiveness of interventions (stillbirths)**

The effectiveness editor for interventions related to stillbirths shows the default values for the effectiveness (the percent of deaths due to a specific cause that are reduced by the intervention) and affected fraction (the percent of deaths due to a specific cause which are potentially able to be impacted by a specific intervention) for each maternal or child health intervention. Please see the ["Effectiveness"](#) help page for more information.

The tabs in this editor are organized by cause of death and display the default values by intervention.

***See help pages on Coverage for information on effect size references.***

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### **Effectiveness of interventions (<1 month)**

The effectiveness editor for interventions related to neonatal deaths shows the default values for the effectiveness (the percent of deaths due to a specific cause that are reduced by the intervention) and affected fraction (the percent of deaths due to a specific cause which are potentially able to be impacted by a specific intervention) for each maternal or child health intervention. Please see the "[Effectiveness](#)" help page for more information.

The tabs in this editor are organized by cause of death and display the default values by intervention. Please note that each tab contains a table for "effectiveness of interventions (<1 month)," which includes interventions prior to delivery/birth (periconceptual and pregnancy periods) and after delivery/birth, and a table for "neonatal delivery effectiveness," which includes interventions given during delivery/birth.

***See help pages on Coverage for information on effect size references.***

### **Effectiveness of interventions (1-59 months)**

The effectiveness editor for interventions related to post-neonatal child deaths shows the default values for the effectiveness (the percent of deaths due to a specific cause that are reduced by the intervention) and affected fraction (the percent of deaths due to a specific cause which are potentially able to be impacted by a specific intervention) for each maternal or child health intervention. Please see the "[Effectiveness](#)" help page for more information.

The tabs in this editor are organized by cause of death and display the default values by intervention and by age grouping (1-5 months, 6-11 months, 12-23 months, and 24-59 months).

***See help pages on Coverage for information on effect size references.***

### **Effectiveness of interventions on incidence**

The effectiveness editor for interventions on disease incidence shows the default values for the effectiveness (the percent of deaths due to a specific cause that are reduced by the intervention) and affected fraction (the percent of deaths due to a specific cause which are potentially able to be impacted by a specific intervention) for each maternal or child health intervention. Please see the "[Effectiveness](#)" help page for more information.

The tabs in this editor are organized by disease incidence and age grouping, and display the default values by intervention.

***See help pages on Coverage for information on effect size references.***

### **Effectiveness of vaccines (cohort approach)**

The effectiveness editor for vaccines (cohort approach) shows the default values for the effectiveness (the percent of deaths due to a specific cause that are reduced by the intervention) and affected fraction (the percent of deaths due to a specific cause which are potentially able to be impacted by a specific intervention) for each vaccine intervention. Please see the "[Effectiveness](#)" help page for more information.

The tabs in this editor are organized by vaccine type and display the default values by cause of death, number of doses, and affected age, if applicable.

**See help pages on Coverage for information on effect size references.**

### **Herd effectiveness of vaccines**

The tabs in this editor are organized by vaccine type (this editor also includes bednets) and display the herd effect by age cohort, coverage rate of the vaccine, and affected disease (tabs at the bottom of the table).

Declines in mortality from vaccines are modeled based on vaccine effectiveness specific to the child receiving the immunization and a herd effect. The herd effect is modeled as the percent of unprotected children (the sum of unvaccinated population and the vaccine failures) who are protected by the reduced transmission of the disease resulting from increased immunization rates. The parameters for herd effect are entered as the percent of the unprotected population which is protected for five-percentage-point bands beginning at 0 percent coverage. Currently, the defaults for herd effect are zero for all vaccines except measles, where the herd effect is assumed to be 1.00 when coverage reaches 95 percent, eliminating local transmission of the disease.

Please note that currently, due to the structure of the LiST program, the herd effect is not being properly calculated when coverage is declining. Thus it is turned off when the specific vaccine coverage decreases.

### **Effectiveness of nutrition interventions**

This editor shows the effectiveness of nutrition interventions, not directly on mortality, but rather on the intermediate variables of birth outcomes (SGA/preterm), stunting rates, severe wasting rates, maternal anemia, and breastfeeding promotion.

Please note that effectiveness information may be displayed as relative risks, odds ratios, or recovery rates within the various tabs.

## **Low Birth Weight Conversion Factors**

- **Definition:** Calculation of percentage of total births that are low birth weight (LBW) based on region-specific pooled proportions of LBW births in each birth outcome category.
- **Notes:**
- **Effect size reference:** Kozuki N, Katz J, Clermont A, Walker N and the Child Health Epidemiology Reference Group SGA-Preterm Birth Working Group. New Option in the Lives Saved Tool (LiST) Allows for the Conversion of Prevalence of Small-for-Gestational-Age and Preterm Births to Prevalence of Low Birth Weight: A Delphi approach. *BMC Public Health* 2013; 13(Suppl 3): S12. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847442/>.

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**See help pages on Coverage for information on other effect size references.**

### **Impact of undernutrition on mortality**

[Impact of stunting on mortality](#) [Impact of wasting on mortality](#) [Impact of birth outcomes on mortality](#) [Impact of breastfeeding on mortality](#)  
[Impact of anemia on maternal mortality](#)

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Building on the information in the "Effectiveness of nutrition interventions," this editor calculates the impact of stunting rates, wasting rates, birth outcomes (SGA/preterm), and breastfeeding rates on child mortality. The tabs in this editor are organized by cause of death and age cohort or birth outcome group. Please note that effectiveness information is displayed as relative risks.

### Impact of stunting on mortality

- **Effect size reference:** Olofin I, McDonald CM, Ezzati M, et al. Associations of Suboptimal Growth with All-Cause and Cause-Specific Mortality in Children under Five Years: A Pooled Analysis of Ten Prospective Studies. *PLOS One* 2013; 8(5): e64636. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3667136/>.

- **Notes:**

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### Impact of wasting on mortality

- **Effect size reference:** Olofin I, McDonald CM, Ezzati M, et al. Associations of Suboptimal Growth with All-Cause and Cause-Specific Mortality in Children under Five Years: A Pooled Analysis of Ten Prospective Studies. *PLOS One* 2013; 8(5): e64636. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3667136/>.

- **Notes:**

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### Impact of birth outcomes on mortality

- **Effect size reference:** Katz J, Lee AC, Kozuki N, et al. Mortality risk in preterm and small-for-gestational-age infants in low-income and middle-income countries: A pooled country analysis. *Lancet* 2013; 382(9890): 417–25. <http://www.ncbi.nlm.nih.gov/pubmed/23746775>.

- **Notes:** This paper indicates the overall effect on neonatal mortality. Through discussion with the authors, we made some assumptions about which causes of death are likely to be associated with the term and gestational-age status of the children. Since the overall effect is applied to only a subset of births, this will underestimate the total impact. The relative risk associated with prematurity is calculated based on the strong assumption that there is no selection in which premature births are prevented.

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### Impact of breastfeeding on mortality

- **Effect size reference:** Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013; 382(9890): 427-51. <http://www.ncbi.nlm.nih.gov/pubmed/23746772>. (Supplementary material - Web Table 17.)

NEOVITA Study Group. Timing of initiation, patterns of breastfeeding, and infant survival: prospective analysis of pooled data from three randomised trials. *Lancet Global Health* 2016; 4(4): e266-75. <https://www.ncbi.nlm.nih.gov/pubmed/27013313>.

- **Notes:**

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### Impact of anemia on maternal mortality

- **Effect size reference:** Murray-Kolb, L. Maternal Mortality, Child Mortality, Perinatal Mortality, Child Cognition, and Estimates of Prevalence of Anemia due to Iron Deficiency. CHERG.org 2010. <http://cherg.org/publications/iron-report.pdf>

**Affected fraction:** % of women with severe anemia. Source: Stevens GA, Finucane MM, De-Regil LM, et al. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995-2011: a systematic analysis of population-representative data. *Lancet Global Health* 2013; 1(1): e16-25.

- **Notes:** The relationship between anemia and maternal mortality in LiST is explained in this Technical Note. [http://www.livessavedtool.org/images/documents/Technical\\_Notes/Anemia-and-Maternal-Mortality-in-LiST.pdf](http://www.livessavedtool.org/images/documents/Technical_Notes/Anemia-and-Maternal-Mortality-in-LiST.pdf)

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#### 1.1.3.6 Costing inputs

##### Introduction

LiST Costing provides a means to estimate the financial and human resources required to deliver a package of services.

Questions can be explored such as: How much funding is required to achieve the goals of the strategic plan? What goals can be achieved with the current resources? What is the impact of alternative patterns of resource allocation in terms of both the associated costs and achieved goals of the strategic plan?

By using LiST Costing in conjunction with the standard LiST module, scenarios can be developed by varying parameters such as costs inputs, coverage rates of interventions, and/or other inputs, and can then be evaluated based on the impact on maternal and child mortality and morbidity and cost associated with delivering the package of services.

##### Configuration

If LiST costing is activated, the user has access to an additional tab in LiST configuration called Currency and Inflation. On this tab the user can set the exchange rate, designate what currency they wish to enter costs in, and enter an inflation rate.

If the user wishes to enter costs in dollars, they need to check the box to say that they wish to enter costs in US dollars instead of local currency. Results can be produced in either currency,

based on the selection in the results editor. They will be calculated between currencies based on the exchange rate entered in the currency and inflation editor.

Configuration **Currency and inflation**

### Currency and exchange rate

Enter name of currency and exchange rate relative to the US Dollar. The default exchange rate is the ratio of the GDP of your country or region evaluated at current prices divided by the US dollar country's or region's GDP. The values of GDP are from the World Economic Outlook.

Currency

	2017	2018	2019	2020	2021
Exchange rate	24.52	24.52	24.52	24.52	24.52

Enter costs in USD instead of the currency specified above


### Inflation rates

Inflation  GDP deflator

Enter inflation rates (percent per year)

	2017	2018	2019	2020	2021
Domestic inflation rate		0.0	0.0	0.0	
USD inflation rate		0.0	0.0	0.0	

Costing outputs can be accessed either as nominal values or values adjusted for inflation via the output.

Ok Cancel  Help

### Staff baseline data

Staff baseline data is pre-populated with assumptions for salaries, benefits, and time utilization drawn from [WHO CHOICE](#). These data points are used to estimate a cost per minute, which is combined with information from Treatment Inputs editors to estimate the labor costs for delivering the various interventions. Users are encouraged to revise these assumptions if more accurate local information is available.

Salaries are assumed to be an annual salary for a full time staff person, denoted in local currency or US dollars, depending on the user's selection in LiST Configuration. Benefits are calculated as a percentage of those salary costs, and entries for days per year and time worked per day are used to convert the assumptions for what a full-time staff person can do into a cost per minute.

**Intervention costing (target population, population in need, coverage, and delivery channels)**

The determinants for intervention costs are the **number of people** receiving the intervention and the **quantity of resources** required to deliver the intervention per person.

In order to calculate the number of people receiving the services, LiST costing includes data entry fields for the following:

- Target population
- Population in need

Coverage is drawn from the [coverage menu in LiST](#).

All three of the above must have data entered into them in order for the tool to be able to estimate the number of people receiving the intervention each year. The calculation pattern is as follows:

$$\text{Target population} * \text{population in need} * \text{coverage} = \text{number of services}$$

**Target population:** This is defined as the population that could possibly receive the intervention. There are global defaults available for each intervention.

Examples of target populations include:

- Pregnant women
- Children aged <1 month
- Children aged 0-59 months
- Children aged 1-59 months
- Total population

Target populations, which represent age-determined groups, are drawn from the DemProj module, as are demographic events such as pregnancies or births. The user can select from a drop-down list of default populations or specify the target population of each intervention as shown below:

---

Select a target population for each intervention

Intervention	Target population	Sex	Starting age	Ending age
Safe abortion services	Abortions	▼		
Post abortion case management	Abortions	▼		
Ectopic pregnancy case management	Pregnant women	▼		
Blanket iron supplementation/fortification	Total population	▼		
<b>Pregnancy</b>				
<b>Routine</b>				
TT - Tetanus toxoid vaccination	Pregnant women	▼		
IPTp - Intermittent preventive treatment of malaria during pregnancy	Pregnant women	▼		
Syphilis detection and treatment	Live births and stillbirths	▼		
<b>Nutritional</b>				
Calcium supplementation	Children < 1	▼		
Micronutrient supplementation (iron and multiple micronutrients)	Children 0-59 months	▼		
Iron supplementation in pregnancy	Children 1-59 months	▼		
	Children 6-59 months	▼		
	Pregnant women	▼		

Enable searching

The second option is to select a target population based on age and sex. In order to do this, select Custom Target population from the drop-down menu, and enter the characteristics needed (age range and sex).

Intervention	Target population	Sex	Starting age	Ending age
Case management of premature babies				
Thermal care	Live births	▼		
KMC - Kangaroo mother care	Live births	▼		
Full supportive care for prematurity	Live births	▼		
Case management of neonatal sepsis/pneumonia				
Oral antibiotics for neonatal sepsis/pneumonia	Live births	▼		
Injectable antibiotics for neonatal sepsis/pneumonia	Live births	▼		
Full supportive care for neonatal sepsis/pneumonia	Live births	▼		
<b>Diarrhea</b>				
ORS - oral rehydration solution	Custom target population	Both sexes	0	80+
Antibiotics for treatment of dysentery	Children 0-59 months	▼		
Zinc for treatment of diarrhea	Children 0-59 months	▼		
<b>Other infectious diseases</b>				

The third option is to enter the target population directly, but selecting "Direct entry" from the drop-down menu. When a user does this, they will have the opportunity to enter a numeric target population of their choice by double clicking on the name of the intervention.

Select a target population for each intervention

Intervention	Target population	Sex	Starting age	Ending age
Case management of premature babies				
Thermal care	Live births			
KMC - Kangaroo mother care	Live births			
Full supportive care for prematurity	Live births			
Case management of neonatal sepsis/pneumonia				
Oral antibiotics for neonatal sepsis/pneumonia	Live births			
Injectable antibiotics for neonatal sepsis/pneumonia	Live births			
Full supportive care for neonatal sepsis/pneumonia	Live births			
<b>Diarrhea</b>				
ORS - oral rehydration solution	Direct entry			
Antibiotics for treatment of dysentery	Children 0-59 months			
Zinc for treatment of diarrhea				
<b>Other infectious diseases</b>				

Note: Double-click on the intervention name to enter target population data by year.

Select direct entry then double click on intervention name

**Population in need:** This section is used to identify what share of the target population requires the intervention, per year. For most preventive care interventions, the share will be 100%. For example, antenatal care will be required for all pregnant women. Population in need is determined by incidence and prevalence of conditions, as well as by treatment guidelines.

In some instances, the population in need may be > 100%. For example, consider management of diarrhea with ORS. The target population is children aged 0-59 months. If we put 100% population in need, this means that each child will on average receive the intervention once per year. However, in many settings, the incidence of diarrhea may be greater than 1.0. For example, if the incidence of diarrhea in children is estimated at 3.5 episodes per year, the population in need will be 350%. If 1% of all diarrhea cases are estimated to be severe, then the population in need for treatment of severe diarrhea will be 3.5% (calculated as 350% x 1%).

For another example, take treatment of malaria in pregnant women. Here the target population is pregnant women, and the population in need is the percentage of pregnant women who will need treatment of malaria, per year.

Detailed information about the sources for each of the default assumptions is found in the Intervention Assumptions Manual (pending).

### Treatment inputs

Treatment inputs for each intervention specify the required drugs and consumable supplies (e.g., gloves, syringes), provider time, and number of inpatient days and outpatient visits needed for the effective provision of an intervention. These are drawn from intervention assumptions developed for the OneHealth Tool (<http://www.who.int/choice/onehealthtool/en/>) and documented in the Intervention Assumptions Manual (pending). These inputs were developed based on WHO norms and guidelines where available, with expert input where explicit guidance was not available. Drugs and consumable supply prices are extracted from international sources such as the [MSH Drug Price Indicator Guide](#), [UNICEF supply catalog](#), and the [Global Price Reporting Mechanism](#).



Default treatment inputs and prices are provided at a global level, with no variation for different countries, but these inputs can be adjusted to fit the country context. Users can change the assumed quantities of drugs and supplies used, amount of provider time and number of visits, as well as the unit price for any input. In a typical country application, country teams review all data assumptions thoroughly, particularly country-specific input prices, and change the default data to reflect the specific country context and their norms or practices.

See the examples below for tetanus toxoid vaccination. For each intervention, similar to this example, users can review the existing inputs for drugs and supplies, provider time by type, and inpatient and outpatient visits. Each element can be edited, including adding other drugs and supplies, and changing the unit cost (by double-clicking on the unit cost cell).

TT - Tetanus toxoid vaccination, clinic level

Drugs and supplies									
Drug/Supply	Percent receiving this aspect of the treatment	Note	Number of units	Times per day	Days per case	Units per case	Unit cost (USD) (2017)	Cost per average case (USD) (2017)	
Tetanus toxoid, injection	100.0		1.0	1	2	2	0.06	0.12	
Syringe, needle + swab	100.0		1.0	1	2	2	0.05	0.10	
<b>Total cost</b>								<b>0.22</b>	

TT - Tetanus toxoid vaccination, clinic level

Medical personnel					
Staff type	Percent treated by	Note	Minutes	Number of days/visits	Total minutes
Midwives	100.0			3	5.00
<b>Total minutes</b>					<b>5.00</b>

TT - Tetanus toxoid vaccination, clinic level

Outpatient visits and inpatient days				
	Percent receiving	Note	Units per case	Total visits
Outpatient visits	100.0		2	2.0
<b>Total visits</b>				<b>2.0</b>

### Other - recurrent and capital costs

The costs per outpatient visit and inpatient day (OPVs/IPDs) have been calculated by the World Health Organization at the country level and are available from the [WHO-CHOICE website](#). Note that the costs that are available on their website are defined by the World Health Organization to be the "hotel" cost portion of both OPVs and IPDs, that is, all costs except drugs and laboratory costs. In other words, the OPV and IPD costs contain both other direct costs (ODCs) and indirect costs, as well as personnel costs and the cost of consumables.

By estimating the proportion of the WHO-CHOICE OPV/IPD cost that is associated with ODCs and indirect costs, those proportions can then be applied to adjust the cost of the OPV/IPD for each intervention in LiST. To calculate the costs associated with ODCs and indirect costs for each intervention, we can use the number of OPV/IPD for each intervention, already available in LiST, and multiply those quantities by the proportion of the country-specific cost of one OPV/IPD that is attributable to ODCs and indirect costs.

These costs are then multiplied by the number of OPVs/IPDs associated with each service to give a total cost for other recurrent and capital costs.

### Delivery channels

LiST costing provides the option to differentiate the delivery of services by delivery channel or level of service delivery – that is, via community, outreach, clinic, and hospital-level care. Users can specify different treatment inputs (drugs and supplies, personnel time, and outpatient visits/inpatient days for each level), based on the different access to resources at different levels in the country. Results can also be produced by level, allowing analysis of the cost implications in a shift of services between levels, as well as the amount of resources required to expand services.

The delivery channels editor allows users to enter base and target distributions of services (i.e. what proportion of each intervention is delivered at each level in the first and final years of the projection). A linear interpolation takes place between these points to fill in the interim years.

A default distribution is provided, based on expert consultation by WHO experts.

### Program costs

Program cost categories can be configured or changed using the Add/Edit/Delete buttons. These costs are intended to capture the above service delivery costs associated with the delivery of the RMNCH package of services found in LiST and LiST costing. Users have the option of entering costs either as a percentage of direct costs, or as an absolute number (each program cost can be configured as percentage or absolute number using the drop down selection).

Default program cost categories and percentages have been provided, based on [SUN nutrition plan costing exercises](#), the [EPIC immunization studies](#), and [National AIDS Spending Assessments](#) (see detailed table below). Users are encouraged to adapt these cost categories and the assumed level of costs based on recent country-specific data if available.

Category	Option	Source
Programme-specific human resources	Percentage	1%
Training	Percentage	1% EPIC studies
Supervision	Percentage	2% EPIC studies
Monitoring and evaluation	Percentage	2% EPIC studies
Infrastructure	Percentage	2% NASA

Transport	Percentage	2%	Comprehensive vaccine planning (WHO)
Communication, media, and outreach	Percentage	1%	SUN costed nutrition plans
Advocacy	Percentage	1%	EPIC studies
General programme management	Percentage	2%	EPIC studies
Community health worker training	Percentage	1%	Expert estimates (no data)
Other	Percentage	0%	
Total		15%	

#### 1.1.4 Methodology

Choosing an optimum set of child health interventions for maximum mortality impact is important within resource-poor policy environments. The Lives Saved Tool (LiST) is a computer model that estimates the mortality and stillbirth impact of scaling up proven maternal and child health interventions. To model the impacts on child health, LiST uses the demographic engine of Spectrum (DemProj), which calculates the numbers of deaths disaggregated by age band, while using neonatal, infant, and under-five mortality rates from LiST. It then overlays the AIDS mortality directly related to children from the AIDS Impact Module (AIM), based upon the prevalence of AIDS among the entire population to calculate the total number of deaths due to AIDS. The non-AIDS individual causes of death are then overlaid on all of the non-AIDS deaths in children in the neonatal period and the 1-59 month period.

LiST estimates the mortality impact via five age bands: 0 months, 1-5 months, 6-11 months, 12-23 months, and 24-59 months. For each of these age bands, reductions in cause-specific mortality are estimated by applying intervention effectivenesses and affected fractions to intervention coverage changes. The impacts of interventions are calculated separately for eight causes of death in the neonatal period, and nine causes of death in the 1-59 month period. Corrections are then made to this simple equation to correct for the impact of coverage achieved prior to the projection period. The impact of interventions are calculated in groups such that periconceptual, antenatal, and childbirth interventions, sequentially, have the first "opportunity" to prevent mortality, with preventive interventions impacting mortality next and leaving those that are more curative in nature to reduce the remaining mortality that is not reduced. Then each child who is "saved" is then capable of dying of other causes during the subsequent age period.

Simultaneously, nutrition interventions can impact either nutritional status or directly impact mortality. In the former case, LiST acts as a cohort model where current nutritional statuses such as stunting or intrauterine growth restriction impact the probability of stunting as the cohort ages. LiST links with DemProj to estimate the deaths and deaths averted due to the reductions in mortality rates.

In addition, AIM calculates the impact of PMTCT, Cotrimoxazole, and ART for children and then feeds these directly back into the LiST model as deaths averted by these interventions. The Family Planning (FamPlan) and DemProj modules can also feed into the LiST model via changes in

the number of births, resulting in varying numbers of child deaths upon which to apply the intervention impacts.

LiST also estimates the impact of interventions on maternal mortality. The calculations are very similar to those for child mortality. One difference is that all women aged 15-49 are treated as a single group in the calculations, and interventions act directly on one or more of the nine causes of death (i.e., none affect an intermediate nutrition status). Family planning, although not an intervention in LiST, may also impact maternal mortality by reducing the incidence of abortion, which is a maternal cause of death in the LiST model. The reductions in maternal mortality are translated into maternal mortality ratios, which are then translated into maternal deaths and maternal deaths averted via live births calculated in DemProj.

Finally, LiST estimates the impact of interventions on stillbirths. Different from the other outputs, the reductions are analyzed by when the stillbirth occurs in pregnancy – either antepartum or intrapartum. As with maternal mortality, stillbirth reductions are translated into stillbirth rates, and stillbirths via pregnancies in DemProj.

For more information on the general methodology of LiST please see Walker N, Tam Y, Friberg I. Overview of the Lives Saved Tool (LiST). *BMC Public Health* 2013; 13(Suppl 3): S1. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3847271/>.

For more information on the calculations within LiST, please see Winfrey W, McKinnon R, Stover J. Methods used in the Lives Saved Tool (LiST). *BMC Public Health* 2011, 11(Suppl 3): S32. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3231906/>.

Please visit [www.livessavedtool.org](http://www.livessavedtool.org) for a complete list of papers using LiST and other resources.

### 1.1.5 AIM-LiST analysis

#### **Open Spectrum then open the country projection of interest**

- Go to the modules tab of the Spectrum menu and select LiST.
- Click the [Configuration](#) tab.
- Do NOT change the "base year of coverage" unless you have new cause-of-death data. The "First year of intervention program" is the baseline year from which you want to calculate your scale-up. Click "OK" when finished.
- Click "Close." Under the "home" tab of the Spectrum menu, select "Save Projection As" and rename the file.

#### **Choose the new file that you just saved**

- Under the home tab of the Spectrum menu select "Open projection" and choose the new file that you have just saved.
  - Choose "Load and rename" when a window pops up that asks "Projection is already loaded, what would you like to do?"
  - Rename the file to indicate that you are doing an AIM analysis.
-

- When you are finished you should have two projections, with different names, but with identical data. You will see the projection names at the bottom right corner of the screen.

### **Begin work in AIM**

- From the modules tab of the Spectrum menu, select AIM.
- Choose the projection in which you want to change the coverage of the AIDS interventions.
- Eight tabs will appear: Eligibility for treatment, Program statistics, Advanced options, Incidence, Sex/Age pattern, Results, Validation, and Changes. Default data will be provided. You will likely not want to change the default data, unless you have more recent treatment or incidence data through the EPP file prepared by the statistics division of the National AIDS commission, or you are working on a sub-national projection with significantly different estimates. Adult ART does not affect child mortality estimates.
- To change the "Maternal-to-Child Transmission" values, click the "Program statistics" tab and then "PMTCT."
- Enter the yearly values for the prophylaxis/treatment options. For any given year, choose either the number or percent option. If you select number, then percent should equal 0; if you select percent, then number should equal 0. The No Prophylaxis percent and Total Number change automatically. If you prefer, you can convert the default number of users to a percent of users by clicking on the bottom right of the screen.
- Then, in the "Child treatment" tab edit the number/percent receiving cotrimoxazole and ART as needed. Then click "OK."
- Review the CD4 count threshold for eligibility for treatment by age, under "Child" in the "Eligibility for treatment tab." Then click "OK."
- To input incidence, you may do so through the "Configuration" choice in the drop-down menu under Incidence or through the "Direct incidence option" in the same menu. The user may choose instead to enter prevalence by choosing "Validation" - "Prevalence" - "Enter/edit data."
- The "Sex/Age pattern" and "Advance options" default values should also be reviewed, but it is unlikely that the user will want to deviate from the default values provided by research experts. When finished, click "OK." Under the "Home" tab of the spectrum menu select "Save projection" and choose the projection you have just altered (i.e. Senegal-AIM).

### **Display results**

- From the modules tab of the Spectrum menu, select LiST.

- Choose the display of interest under the "Results" menu. Typically one will want to look at "Additional Deaths prevented in children under 5 years of age relative to impact year."
- The lives saved by each intervention is the difference between the baseline and the AIM projection. In the example below, PMTCT saved  $3,109 - 2,051 = 1,058$  lives.

Additional deaths prevented in children under-five years of age by intervention relative to impact year (Total (0-60 months))						
	2015	2016	2017	2018	2019	2020
<b>Test1</b>						
<b>Pregnancy</b>						
PMTCT - Prevention of mother to child transmission ...	1,004	1,800	1,988	2,036	2,057	2,051
<b>Curative after birth</b>						
Cotrimoxazole	149	187	231	275	319	362
ART	195	233	256	282	309	338
<b>test1-AIM</b>						
<b>Pregnancy</b>						
PMTCT - Prevention of mother to child transmission ...	2,660	4,530	4,713	4,437	3,690	3,109
<b>Curative after birth</b>						
Cotrimoxazole	326	326	427	567	724	850
ART	442	448	560	772	1,156	1,748

### 1.1.6 FamPlan-LiST analysis

#### Open Spectrum and then open the country projection of interest

- Go to the modules tab of the Spectrum menu and select LiST.
- Click the [Configuration](#) tab.
- Do NOT change the "base year of coverage" unless you have new cause-of-death data. The "First year of intervention program" is the baseline year from which you want to calculate your scale-up from. Click "OK" when finished.
- Click "Close." Under the "Home" tab of the Spectrum menu, select "Save Projection As" and rename the file.

#### Choose the new file that you just saved

- Under the home tab of the Spectrum menu select "Open projection" and choose the new file that you have just saved.
- Choose "Load and rename" when a window pops up that asks "Projection is already loaded, what would you like to do?"
- Rename the file to indicate that you are doing an FamPlan analysis.
- When you are finished you should have two projections, with different names, but with identical data. You will see the projection names at the bottom right corner of the screen.

## Begin work in FamPlan

- From the modules tab of the Spectrum menu, select FamPlan.
- Choose the projection in which you want to change the family planning information.
- If you plan on altering the Contraceptive Prevalence Rate (CPR) in your population, click on the "Goal" tab.
- By default, the CPR is set to match the values in the most recent survey and then extrapolated to the end of the projection to maintain the UN Population division TFR estimates. Change the values in the target year and use the interpolate and duplicate functions as needed. Click "OK."
- If you want to change the proportion of women using different methods for contraception, click on the "Family Planning" tab.
- Choose the "Method Mix" tab under the "Family planning" menu item. Adjust the proportions of women using different contraceptive methods. The total must equal to 100%. Use the duplicate, interpolate and normalize functions as needed. When finished, click "OK."

NOTE: If you have a different goal, i.e. TFR, or unmet need, you will need to visit the "Configuration" button first and read the FamPlan help manual.

## Display results

- From the modules tab of the Spectrum menu, select LiST.
- Choose the display of interest under the "Results" menu. Typically one will want to look at "Additional Deaths prevented in children under 5 years of age relative to impact year."
- As you can see below, there are fewer deaths in the population in which the contraceptive prevalence was increased. This occurs due to the reduction in the number of pregnancies and births. There is no impact on mortality rates.

Deaths in children under-five years of age (Total (0-60 months))						
	2015	2016	2017	2018	2019	2020
<b>Test1</b>						
Total (0-60 months)	55,606	56,048	56,980	58,060	59,177	60,328
<1 month	17,404	17,841	18,282	18,730	19,180	19,635
1-59 months	38,202	38,207	38,698	39,330	39,997	40,694
<b>test1-FP</b>						
Total (0-60 months)	61,044	61,320	62,129	63,090	64,078	62,243
<1 month	19,112	19,532	19,942	20,355	20,767	19,263
1-59 months	41,932	41,788	42,187	42,735	43,311	42,980

# Part II

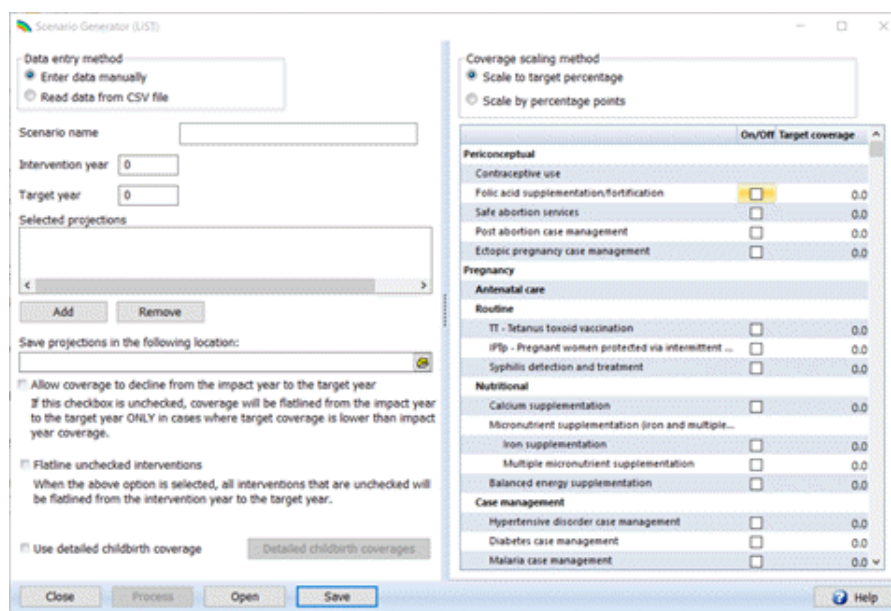
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## 2 Tools

### 2.1 Scenario Generator for LiST

Scenario Generator allows users to create scale-up functions for multiple projections at a single time. The result of a Scenario Generator run will be new projections with new names (each with a prefix added onto the original file name) in a designated location. Each projection will have interventions scaled up in accordance with the options selected in the Scenario Generator menu.



1. After entering Spectrum, go to "Tools" and click on "LiST," then select "Scenario Generator." Note that this can only be selected if there are no projections currently open.
2. Select the "Enter data manually" toggle button in the top left of the page.

**NOTE:** There is also an advanced feature that allows users to automatically upload an Excel file with pre-loaded scale-ups. There are no checks in this method and the developers are not responsible for the results.

3. Choose the "Intervention Year" and "Target Year." The "Intervention Year" should be the year from which you intend the scale-up to begin. No changes will occur in the "Intervention Year"; they will begin in the following year. The "Target Year" is the year in which the full scale-up target will be achieved. A linear scale-up will occur between these years.
4. Choose a "Scenario Name." This is the prefix will be added to the front of the projection name for all projections selected.
5. Under the "Selected Projections" box, click "Add" to browse and add previously saved projection(s). If necessary, you may highlight a projection in the "Selected Projections" box and click "Remove" to remove it.

6. Select where to save the new projection(s) by clicking on the file folder icon beneath "Save projections in the following location" and choosing from the drop-down list.
7. Check the boxes in the "On/off" column next to the indicators you wish to modify in your scale-up scenario.
8. In the Target year column, click on the box in the row for each intervention you want to include and enter in a target coverage. If the "scale to target percentage" option is selected above, then each projection in the scenario will have the intervention scaled up to that target coverage level. (For example, if "Folic acid supplementation/fortification" is checked and a target coverage of 80% is selected, each projection will be scaled up from its current level in the intervention year to reach 80% in the target year.) If the "scale by percentage points" option is selected above, then each projection in the scenario will have the intervention scaled up by the target number of percentage points over the course of the coverage period. (For example, if "Folic acid supplementation/fortification" is checked and a target coverage of 20% is selected, and the period from "Intervention year" to "Target year" is 10 years, each projection will be scaled up from its current level in the intervention year by 2% per year, for a total increase of 20 percentage points over the 10-year scale-up period.)
9. To launch the scenario generation, click the "Process" button.

There are several additional features that can be selected prior to selecting the "Process" button. They are all optional.

- By default, within Scenario Generator, LiST does not allow coverage to drop below the current level in the intervention year. It will maintain current coverage values, rather than scaling coverage down if the target coverage is below current coverage. If you do not want this feature, check the box next to "Allow coverage to decline from the impact year to the target year."
  - Check the "Flatline unchecked interventions" box if you would like the program to keep coverage constant from the intervention year to the target year for all interventions that are unchecked in the "On/off" column. Often, this will be the preferred choice, as it allows you to project the impact of only the intervention(s) that you select in the "On/off" column and set a target coverage for (holding all other interventions constant). However, in some cases users may have previously prepared projection files that have target coverage already entered for a specified set of indicators, and they may wish to keep those coverage settings with the exception of one (or more) indicators for which a new target coverage will be applied through Scenario Generator. In that case, the "Flatline unchecked interventions" box should remain unchecked.
  - In the standard Scenario Generator window, the delivery interventions are packaged and modeled together. If you would like to scale up individual interventions that occur during delivery, check the box "Use detailed childbirth coverage." Note that after using this, there may be complications with modifying coverage. These are intentional. The user is responsible for all post-hoc modifications. You can choose to scale up location/level of delivery or interventions specifically. If you would like to scale up location, uncheck the box next to "Allow LiST to calculate place and level of delivery." If you want to scale up interventions, uncheck the box "Allow LiST to calculate intervention coverages." Within this table, any unchecked boxes will be unaltered; only checked boxes will have their
-

coverage values changed. Click OK to exit this screen. After exiting, if you do not want to include these assumptions, uncheck the box next to "Use detailed childbirth coverage."

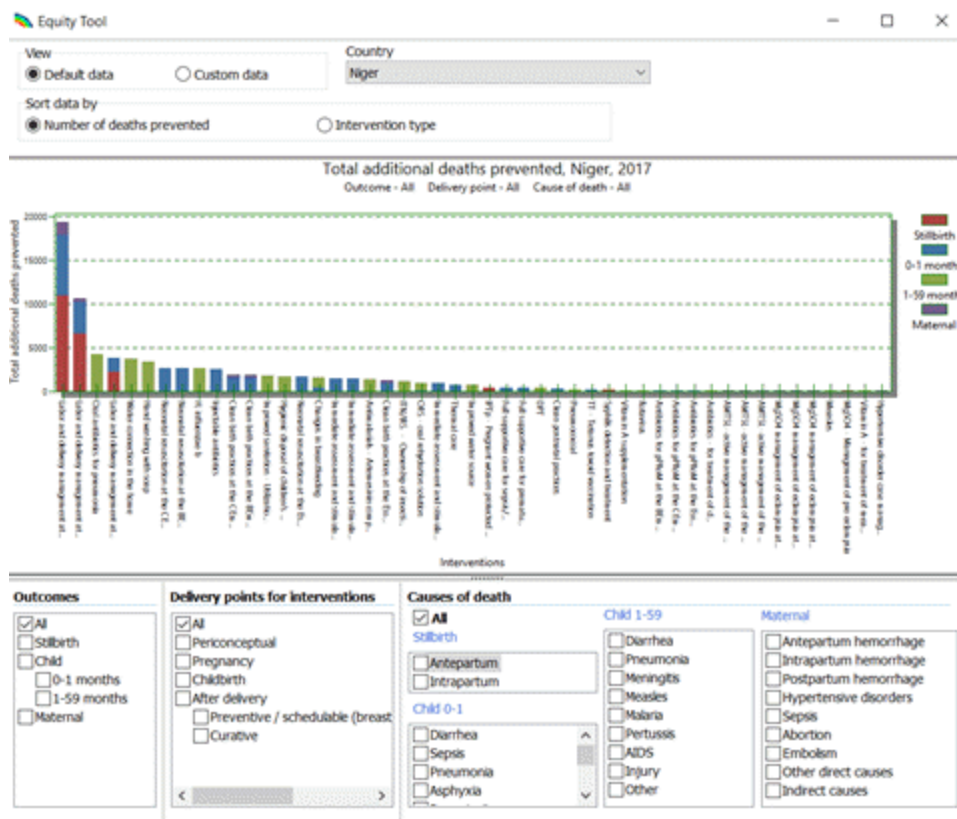
- If you do not wish to process the scenario generation immediately, but would like to save the Scenario Generator parameters you have specified for future use, click the "Save" button. Enter the file name you wish to save the "Scenario Generator (LiST)" window as, and click "Save." It will then be saved as an .SGLIST file. If you have a previous set of parameters saved as an .SGLIST file, you may open it by clicking the "Open" button.

## 2.2 Equity Tool for LiST

The Equity Tool is a visualization tool that explores the effect of individually scaling up interventions from the current national average to the coverage level of the top wealth quintile (richest 20% of the country's population), to see which intervention scale-up would allow for the greatest number of lives saved. This allows users to explore the impact of within-country inequality in intervention coverage on maternal and child mortality.

The methodology and functionality of this tool are similar to [Missed Opportunities](#), except that rather than scaling each intervention up to a target of 90% (as in MO), the scale-up target is the coverage of that intervention for the top wealth quintile in that country.

**Note:** The Equity Tool is only available for countries that have at least one household survey that is disaggregated by wealth quintile.



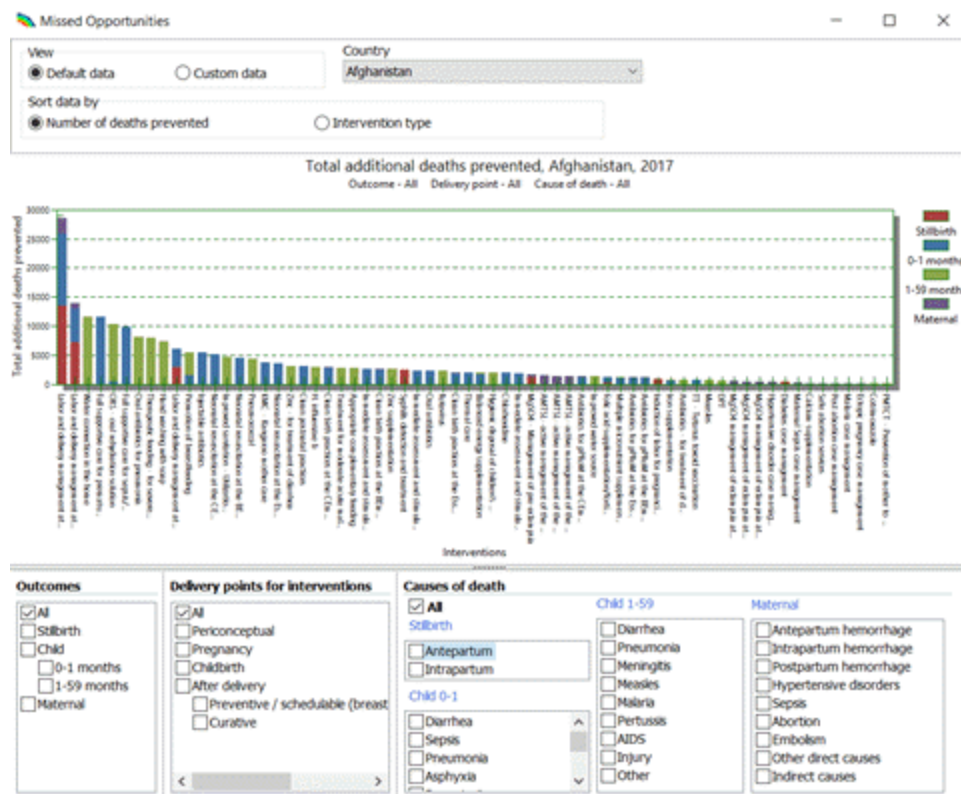
## 2.3 Missed Opportunities for LiST

Missed Opportunities (MO) is a visualization tool for quickly comparing the relative impact of different interventions reaching universal coverage on saving children's and women's lives. The MO tool draws on data from LiST to enable program managers and country health planners to explore intervention effectiveness in a rapid and comparative manner. As its name implies, if these proven interventions do not reach every child and woman in need, the potential deaths averted will become "missed opportunities."

The tool explores the effect of individually scaling up interventions from the current coverage level to 90%, to see which intervention scale-up would allow for the greatest number of lives saved.

**Note:** Missed Opportunities is only available for countries that have an under-five mortality rate of greater than 20 per 1,000 live births and that have at least some household survey data. If you would like to apply MO to another country, you may use the custom data option described below.

**Note:** Contraceptive prevalence is not displayed in the MO results by default, but can be shown by clicking on "Contraceptive prevalence" and checking the box underneath. This shows the impact of *reducing unmet need* for contraception by 90%.



**To run Missed Opportunities:**

1. From the start screen, click the "Missed Opportunities" button. Alternatively, once in Spectrum, go to "Tools" and click on "LiST," then select "Missed Opportunities." Note that this can only be selected if there are no projections currently open.
2. You may use default data, based on the data that is available in the LiST database. This is updated regularly to ensure coverage is up-to-date. Alternatively, you may load custom data by creating a Missed Opportunities file. To do this, click the "Create Missed Opportunities file" button, then click the "Add" button in the pop-up menu window to select the projections you would like to use for custom data. Then click "Process," and a .MO file will be saved in the same folder as your projection. You can then click the "Load Missed Opportunities data" button on the main MO screen to use it.
3. Select the country of interest at the top of the screen. Note that limited intervention data may be available for some countries. You can click on any bar within the graph to see the current coverage level of that intervention (from which it is being scaled up to 90%). Any intervention that is not displayed has a current coverage level of above 90% and thus does not contribute any lives saved.
4. By default, the interventions are ordered in decreasing order of number of deaths prevented (when each intervention is scaled up to 90% coverage). You may choose to instead order them by intervention type (according to the categories as ordered in the "Coverage" tabs).
5. You may use the menus at the bottom of the screen to view results by outcome type (stillbirths, neonatal deaths, child deaths, maternal deaths), by delivery point for interventions, or by cause of death.

## 2.4 Subnational projection for LiST

The Subnational Wizard can be used to model any subnational region or group (province, wealth quintile, rural areas, etc.). Because the mortality, fertility, and disease burden profile of this region/group differs from the national average, additional data are needed to correctly adjust the demographic and other module input data.

**NOTE:** In addition to the documentation below, a [brief video tutorial](#) is available on the [LiST website](#). A repository of pre-created subnational files for several countries is available on our website [here](#).

### **Wizard approach (recommended):**

Click the "Subnational Projection" wizard on the start screen. This wizard will guide you through the process of creating a subnational projection. Listed below are key subnational baseline estimates you will need to gather before you start to input them using the wizard. In cases where you do not have the estimates readily available, the wizard will use LiST to project them based on the difference between national and subnational coverage of interventions.

- Population
  - Total fertility rate
  - Contraceptive prevalence rate
  - HIV incidence
  - Intervention coverage
  - Stunting and wasting distributions
-

- Causes of death and mortality rates for neonates, children 1-59 months, maternal, and stillbirths

**Before you begin**

**Gathering information for your LIST subnational projection**

This wizard will guide you through the process of creating a subnational projection. You will be asked for key subnational baseline estimates as you progress. In cases where you do not have the estimates readily available, the wizard will use LIST to project them based on the difference between national and subnational coverage of interventions. In the next screen you will be prompted to enter basic projection information in the Projection manager.

Listed below are the estimates used to create your subnational projection. You can check off the ones you have now or you can do it later as you work through the wizard.

**Select the estimates you have for your subnational projection**

DemProj estimates	AIM estimates	FamPlan estimates
<input type="checkbox"/> First year population	<input type="checkbox"/> HIV incidence	<input type="checkbox"/> Contraceptive prevalence rate
<input type="checkbox"/> Total fertility rate (TFR)	<input type="checkbox"/> PMTCT	
	<input type="checkbox"/> Cotrimoxazole	
	<input type="checkbox"/> Adult ART	

**LIST estimates**

Child health status	Nutrition status distributions	Child mortality
<input type="checkbox"/> Percent vitamin A deficient	<input type="checkbox"/> Stunting distributions	<input type="checkbox"/> Neonatal, infant and under 5 mortality rate
<input type="checkbox"/> Percent zinc deficient	<input type="checkbox"/> Wasting distributions	<input type="checkbox"/> Neonatal and post neonatal causes of death

Stillbirth	Maternal mortality	Coverage
<input type="checkbox"/> Stillbirth rate	<input type="checkbox"/> Maternal mortality ratio	<input type="checkbox"/> Intervention coverage
<input type="checkbox"/> Stillbirth causes	<input type="checkbox"/> Maternal causes of death	

Cancel    Help    Move to Projection manager

### **Manual approach (advanced users only):**

#### ***You will need to create 3 projections in total***

- National projection
- "National to subnational" projection
  - The purpose of this intermediate projection is to use the change in coverage from national to subnational to predict subnational estimates not typically found in surveys, e.g. subnational cause of death
- Subnational projection

#### **1. Collect data on:**

- Population of the subnational region and population of the nation in the same year
- TFR of the subnational region and the TFR of the nation in the same year
- CPR of the subnational region and the CPR of the nation in the same year (optional: only needed if you are using the FamPlan module)

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- HIV prevalence and HIV treatment data in the subnational region and HIV prevalence and HIV treatment data in the nation in the same year (optional: only needed if you are using the AIM module **or** if there is a significant HIV epidemic)
  - Subnational region's intervention coverage, mortality rates, stunting and wasting rates, etc. Collect as much subnational information as you can to populate the LiST module
  - Births, population information, and census data (optional: to be used as quality control)

## **2. Create national projection**

- Go to the Home tab of the Spectrum menu, click "New"
- Follow on-screen instructions to set projection name and boundary years, activate modules, select country, and then click "Ok"
- Save the projection
- You now have a national projection with the most recent national estimates in published surveys. You can put in more recent estimates should you have them

## **3. Create "national to subnational" projection**

- Open the national projection you have just created and use it as a base to create your second projection
  - Go to the "File" menu and click "Save projection as," and rename the projection such that you know it is the "national to subnational" projection. Click "Save" after renaming.
  - Open your "national to subnational" projection. Go to the LiST module, and click on the "Coverage" tab. You should already have your national estimates in all the years on display. In the second year of intervention (to check what is the first year of intervention, go to the "Configuration" tab), enter in subnational coverage estimates, and duplicate the estimates until the end year
  - Save the projection
  - Go to the LiST module and click on the "Results" tab to get subnational estimates, e.g. to get at subnational cause of death, go to "Results" – "Child" – "Cause-specific deaths in children under five years of age." To allow for the full benefit of some interventions (e.g. vaccines) to be realized, look at outputs that are 5 years out from the second year of intervention where you have entered subnational estimates
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#### **4. Create subnational projection and edit DemProj data in subnational projection**

- Open the "national to subnational" projection you have just created and use it as a base to create your third projection
- Go to the "File" menu and click "Save projection as," and rename the projection such that you know it is the subnational projection. Click "Save" after renaming.
- Go to the "Modules" tab of the Spectrum menu and select the DemProj module. Go to the "Demographic Data" tab, and then to "First year population." Multiply the "First year population" by the ratio of the subnational region to the national (the ratio value should be between 0 and 1) population
- Go to "International migration." Multiply both male and female total net migrants per year with the same ratio you used to reduce the first year population

*NOTE: If the FamPlan module is active, you must go to the Projection Manager and turn FamPlan off (uncheck the box), as you will not be able to change TFR. You can also choose to adjust CPR in FamPlan, which will in turn impact TFR.*

- Copy the "TFR" trend into Excel and multiply by the ratio of the Subnational TFR to the national TFR (value likely to be 0.6 to 1.4). Replace the old TFR values with these new ones.

#### **5. Enter AIM data to the subnational projection**

- Go to the "Modules" tab of the Spectrum menu and select the AIM module
- Run any result in the AIM module to ensure that this is an active projection.
- For PMTCT, Adult ART, and Child Treatment: All numbers need to be converted into percents to make sure they are applied to the adjusted population. Click on "program statistics" tab, and then look in "PMTCT." First, confirm that there is a non-zero value in the row "Calculated mothers needing PMTCT." If not, run a "result" first
- At the bottom right of the PMTCT tab, click "Convert values." Repeat on each of the "Adult ART" and "Child treatment" tabs.
- If you know that the HIV incidence in your subnational region is different from the national, do the following additional steps:
  - Under the incidence tab, select "Direct incidence input"
  - Copy the "HIV incidence" trend into Excel. Multiply by the ratio of the subnational region to the national. Paste these new values back into the HIV incidence row



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*NOTE: If you have subnational treatment data in numbers, you should enter of the values directly, but do this AFTER making the population changes. You must use a projection starting prior to the HIV epidemic or assume that the HIV incidence is 0.*

**6. Enter remaining LiST estimates in "Health status..." tab and "Coverage" tab**

- Go to the LiST module, and click on the "Health status, mortality, and economic status" tab. Populate the tab with all the subnational data you have, including the subnational cause of death estimates you have generated from your "national to subnational" projection
- Go to the LiST module, and click on the "Coverage" tab. You should already have your national estimates in the first year of intervention, and subnational estimates in the second year of intervention to end year on display. Copy and paste the subnational estimates to all years on display

**7. Edit FamPlan data in the subnational projection (if needed)**

- If the CPR in the subnational region is significantly different than that found in the national area, you should also replace the CPR with the subnational value. If possible, collect data from multiple surveys and calibrate at multiple points. Assume that the time when contraception was first used is the same in the subnational region as in the nation
- Go to the "Modules" tab of the Spectrum menu and select the FamPlan module
- Go to the "Goal" tab, and put in the subnational CPR
- Go to "Results", click "Fertility and FP use," then click "Total Fertility Rate" to make sure TFR do not fall below 2.1 (replacement rate)

*NOTE: If you have census data or other data which confirms the total population or the total births, check that now. If the values are different, then make minor adjustments to the values discussed above. This is a trial and error process. Also, remember to check the number of HIV deaths and compare them to any data you have available.*

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