



## Lives Saved Tool Technical Note

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For more information, please contact [info@livesavedtool.org](mailto:info@livesavedtool.org)

### **Default estimates of coverage of antenatal care interventions in the Lives Saved Tool**

This technical note provides rationale for default estimates of intervention coverage in the Lives Saved Tool (LiST), discusses the availability of coverage data for several interventions, and presents a detailed description of the predictive models used to estimate coverage of five antenatal care (ANC) interventions in the LiST.

Estimating the impact of changes in the coverage of interventions on cause-specific maternal, neonatal, and child mortality is important for monitoring and evaluation, strategic program planning, and advocacy in low and middle income countries. Modelling the impact of intervention scale-up using LiST depends on three inputs: intervention effectiveness, health and mortality status, and intervention coverage. While default values for coverage for most of the 70+ interventions currently modeled in LiST are derived from large-scale, nationally representative household surveys such as the Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS); coverage estimates for several interventions, particularly those in and around the time of birth are not routinely available for most low and middle income countries.

Recent methodological advances in linking household and health facility surveys hold considerable potential to improve the estimation of coverage of maternal, neonatal and child health interventions [1,2]. For instance, a recent study estimated population level coverage for syphilis detection and treatment, case management of diabetes, malaria infection, hypertensive disorders, and pre-eclampsia in 13 sub-Saharan African countries [3]. While several other studies have attempted to estimate population level coverage of interventions along the continuum of care, few low and middle income countries have temporally matched nationally representative household and health facility surveys available to facilitate the linking approach to coverage estimation. In the absence of reliable and routine coverage data for syphilis detection and treatment, case management of diabetes, malaria infection, hypertensive disorders, and pre-eclampsia, we developed predictive models to estimate population level coverage of these ANC interventions based on available household survey data [4]. The predictive models are based on a five-step process using the linking methodology and information available from the DHS and MICS on characteristics of antenatal care sought. For a full elaboration of the analytical method and rationale, see Kanyangarara and Chou (2017).

Below, we present the formulas used to estimate baseline coverage for syphilis detection and treatment, case management of diabetes, malaria infection, hypertensive disorders, and pre-eclampsia during pregnancy in LiST.

$$\text{Coverage of syphilis detection and treatment} = \frac{1}{1 + e^{1.22 - 3.36(\text{blood}) + 5.23(\text{anctime})}}$$

$$\text{Coverage of diabetes case management} = \frac{1}{1 + e^{3.21 - 2.61(\text{blood})}}$$

$$\text{Coverage of malaria case management} = \frac{1}{1 + e^{1.64 - 2.92(\text{blood})}}$$

$$\text{Coverage of hypertensive disorder case management} = \frac{1}{1 + e^{1.62 - 2.50(\text{urine})}}$$

$$\text{Coverage of MgSO}_4 \text{ management of pre – eclampsia} = \frac{1}{1 + e^{6.44 - 4.91(\text{blood}) - 2.56(\text{anc4})}}$$

Where:

**anc4**= proportion of women who had a live birth in the three years preceding the survey who had 4+ antenatal care visits

**anctime**= proportion of women who had a live birth in the three years preceding the survey whose first antenatal care visit was at less than 4 months

**blood**=proportion of women with a live birth in the three years preceding the survey who received antenatal care for the most recent birth with blood sample taken

**urine**= proportion of women with a live birth in the three years preceding the survey who received antenatal care for the most recent birth with urine sample taken

### Worked example: Ghana 2014

Predictors	Value	Source
anc4	86.2%	Ghana DHS 2014
anctime	62.1%	Ghana DHS 2014
blood	97.9%	Ghana DHS 2014
urine	97.2%	Ghana DHS 2014
<b>Default coverage value in LiST</b>		
Coverage of syphilis detection and treatment		
$= \frac{1}{1 + e^{1.22 - 3.36(\text{blood}) + 5.23(\text{anctime})}} = \frac{1}{1 + e^{1.22 - 3.36(0.979) + 5.23(0.621)}} = 23.5\%$		
Coverage of diabetes case management		
$= \frac{1}{1 + e^{3.21 - 2.61(\text{blood})}} = \frac{1}{1 + e^{3.21 - 2.61(0.979)}} = 34.2\%$		
Coverage of malaria case management		
$= \frac{1}{1 + e^{1.64 - 2.92(\text{blood})}} = \frac{1}{1 + e^{1.64 - 2.92(0.979)}} = 77.2\%$		
Coverage of hypertensive disorder case management		
$= \frac{1}{1 + e^{1.62 - 2.50(\text{urine})}} = \frac{1}{1 + e^{1.62 - 2.50(0.972)}} = 69.2\%$		
Coverage of MgSO <sub>4</sub> management of pre – eclampsia		
$= \frac{1}{1 + e^{6.44 - 4.91(\text{blood}) - 2.56(\text{anc4})}} = \frac{1}{1 + e^{6.44 - 4.91(0.979) - 2.56(0.862)}} = 64.0\%$		

### References

1. Do M, Micah A, Brondi L, Campbell H, Marchant T, Eisele T, et al. Linking household and facility data for better coverage measures in reproductive, maternal, newborn, and child health care: systematic review. *J Glob Health*. 2016 Dec 3;6(2):20501.
2. Munos MK, Stanton CK, Bryce J. Improving coverage measurement for reproductive, maternal, neonatal and child health: gaps and opportunities. *J Glob Health*. 2017 Jun;7(1):10801.
3. Kanyangarara M, Walker N, Munos M. Quality of Antenatal Care Service Provision in Health Facilities across Sub-Saharan Africa: Evidence from Nationally Representative Health Facility Assessments. *J Glob Health*. 2017 Dec;7(2): 021101.

4. Kanyangarara M, Chou VB. Linking household surveys and health facility assessments to estimate intervention coverage for the Lives Saved Tool (LiST). BMC Public Health. 2017 Nov; 17(Suppl 4):780