Cost-Effectiveness of Interventions to Improve Maternal, Newborn and Child Health Outcomes: A WHO-CHOICE Analysis for Eastern Sub-Saharan Africa and South-East Asia
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Supplementary file 1. Effect Sizes Used Within Analysis

No	Single Interventions	Target For Impact	Impact Size	Impact Reference
1	Family planning	Maternal mortality	Family planning increases the age at first birth, and subsequent birth intervals. Effectiveness is measured as the proportion of users who do not become pregnant during a year of method use. Within the tool they range from 81-100%. Impact is calculated as the difference in all cause maternal deaths between the scale-up scenario and the Null scenario (both scenarios with the same baseline MMR).	Stover, John, Jane T. Bertrand, Susan Smith, Naomi Rutenberg and Kimberly Meyer-Ramirez. 1997 Empirically Based Conversion Factors for Calculating Couple-Years of Protection . ChapelHill,NC: The EVALUATION Project.
2	Folic acid supplementation	Newborn (0-1 month)	Effect size 0.62. Affected Fraction 0.29.	Blencowe H, Cousens S, Modell B, Lawn J. Folic acid to reduce neonatal mortality from neural tube disorders. International Journal of Epidemiology. 2010;39(Suppl 1):i110-i121. doi:10.1093/ije/dyq028.
		Stillbirths	Effect size 0.41. Affected Fraction 0.02.	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.
3	Safe abortion services	Maternal mortality	Effect on maternal mortality due to abortion. Effectiveness: 0.95 Affected Fraction: 0.905	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. doi:10.1186/1471-2458-13-S3-S12.
4	Post abortion case management	Maternal mortality	Effect on maternal mortality due to abortion. Effectiveness: 0.8 Affected Fraction: 0.905	Pollard SL, et al (as above).

5	Calcium supplementation in pregnant women for the prevention and management of pre-eclampsia/eclampsia	Maternal mortality	Effect on maternal mortality due to hypertensive disorders. Effectiveness: 0.2 Affected Fraction: 1.0	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/.
6	Daily iron and folic acid supplementation in pregnant women	Newborn (0-1 month)	Effect on newborn mortality due to congenital anomalies. Effectiveness 0.46. Affected Fraction 0.20	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/.
7	Balanced energy-protein supplementation to pregnant women with insecure food availability	Newborn (0-1 month)	Effect on antepartum and intrapartum stillbirths: Effectiveness: 0.4. Affected Fraction: country-specific	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. 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
8	Tetanus toxoid vaccination	Maternal mortality	Effect on indirect causes: Effectiveness 0.98. Affected fraction 0.005	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/.
		Newborn (0-1 month)	Effect on indirect causes: Effectiveness 0.98. Affected fraction 1.0	
9	Intermittent presumptive treatment of malaria in pregnancy	Maternal mortality	Effect on indirect causes: Effectiveness 0.725. Affected fraction 0.045	Eisele TP, Larsen D, Steketee RW. Protective efficacy of interventions for preventing malaria mortality in children in Plasmodium falciparum endemic areaIsn.ternational 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 approacBhM. C 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 reviewBM. C 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 treatmenCt.ochrane Database Syst Rev 2014. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4498495/.
		Stillbirths	Effectiveness 0.33. Affected fraction: country specific	

10	Syphilis detection and treatment in pregnancy	Newborn (0-1 month)	Effect on newborn mortality due to sepsis: Effectiveness: 0.97. Affected Fraction: 0.006	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.
		Stillbirths	Effect on antepartum stillbirths: Effectiveness: 0.82. Affected Fraction: 0.002	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.
11	Hypertensive disease case management in pregnancy	Maternal mortality	Effect on maternal mortality due to hypertensive disorders. Effectiveness: 0.5 Affected Fraction: 1.0	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/.
12	Management of pre-eclampsia (mild and severe)	Maternal mortality	Effect on maternal mortality due to hypertensive disorders. Effectiveness: 0.59 Affected Fraction: 1.0	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/.
13	Ectopic pregnancy case management	Maternal mortality	Effect on maternal mortality due to abortion. Effectiveness: 0.900 Affected Fraction: 0.184	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/.
14	Neonatal resuscitation	Newborn (0-1 month)	Effect on newborn mortality due to asphyxia: Effectiveness: 0.3 at CEmOC*. Affected Fraction: 1.0. Effect on newborn mortality due to prematurity: Effectiveness: 0.1 at CEmOC*. Affected Fraction: 1.0	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

15	Clean cord care (clean birth practices)	Newborn (0-1 month)	Effect on newborn mortality due to sepsis: Effectiveness: 0.23. Affected Fraction: 1.0.	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/. Top
16	Antibiotics for preterm premature rupture of membranes.	Maternal mortality	Effect on maternal mortality due to Sepsis. Effectiveness: 0.80 at CEmOC*. Affected Fraction: 0.33	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.
17	Management of eclampsia with Magnesium-Sulphate	Maternal mortality	Effect on maternal mortality due to hypertensive disorders. Effectiveness: 0.60 at CEmOC*. Affected Fraction: 1.0.	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.
18	Management of maternal sepsis	Maternal mortality	Effect on maternal mortality due to Sepsis. Effectiveness: 0.80. Affected Fraction: 1.0.	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/.
19	Promotion of breastfeeding	Newborn (0-1 month) and	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):	Relative Risk varies by mode of breastfeeding, for different causes of post-neonatal death (diarrhea, pneumonia, meningitis, measles, pertussis), and by age group 1-5 months, 6-11 months, 12-23 months, and 24-59 months.

		child (1-59 months)	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.	
20	Home visits for clean postnatal practices	Newborn (0-1 month)	Effect on newborn mortality due to tetanus. Effectiveness: 0.4. Affected Fraction: 1.0.	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/.
21	Vitamin A supplementation (0-4 years)	Child (1-59 months)	Effect on child mortality >6 months due to Diarrhea. Effectiveness: 0.53. Affected Fraction: 0.335.	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.
22	Promotion of complementary feeding	Child (1-59 months)	Odds ratio for stunting: food secure with promotion 1.00 whereas food secure without promotion 1.30. The stunting prevalence further determines relative risk for mortality due to diarrhea, pneumonia, meningitis, measles, and deaths due to Other causes in the LiST model.	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. 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/.

23	DPT vaccine	Child (1-59 months)	Effect on newborn mortality due to pertussis: effectiveness 0.84, affected fraction: 1.0	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
24	H. influenzae b vaccine	Child (1-59 months)	Effect on newborn mortality due to pneumonia Effectiveness: 0.93 Affected Fraction: 0.213 Effect on newborn mortality due to meningitis: Effectiveness: 0.93 Affected Fraction: 0.46	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/
25	Pneumococcal vaccine	Child (1-59 months)	Effect on newborn mortality due to pneumonia. Effectiveness: 0.58. Affected Fraction: 0.328. Effect on newborn mortality due to meningitis: Effectiveness: 0.58. Affected Fraction: 0.52. Effect on newborn mortality due to other causes: Effectiveness: 0.58. Affected Fraction: 0.024.	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/
26	Rotavirus vaccine	Child (1-59 months)	Effect on newborn mortality due to diarrhea. Effectiveness varies by region: (East Asia 0.427), affected fraction: 0.255	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/
27	Pentavalent vaccine (DPT + Hep B + Hib)	Child (1-59 months)	See the individual vaccines DPT, Hib, and HepB for effect information	
28	Measles vaccine	Child (1-59 months)	Effect on newborn mortality due to measles: effectiveness 0.85, affected fraction: 0.255	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.
29	Kangaroo mother care (KMC)	Newborn (0-1 month)	Effect on newborn mortality due to prematurity: effectiveness 0.51, affected fraction: 0.58 (the affected fraction is the average percent of premature births that survive to day 3).	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.

30	Full supportive care for premature babies	Newborn (0-1 month)	Effect on newborn mortality due to prematurity effectiveness 0.80, affected fraction: 1.000	Bhutta ZA, Das JK, Bahl R, et al. Can available interventions end preventable deaths in mothers, newborn babies, and stillbirths, and at what cosLt?ancet 2014; 384(9940: 347-70. http://www.ncbi.nlm.nih.gov/pubmed/24853604.
31	Case management of severe neonatal infection (sepsis/pneumonia) with full supportive care	Newborn (0-1 month)	Effect on newborn mortality due to sepsis: effectiveness 0.80, affected fraction: 1.000; Effect on newborn mortality due to pneumonia effectiveness 0.90, affected fraction: 1.000.	Zaidi AK, Ganatra HA, Syed S, et al. Effect of case management on neonatal mortality due to sepsis and pneumoniBaM. C Public Health 2011; 11(Suppl 3): S13. http://www.ncbi.nlm.nih.gov/pubmed/21501430.
32	Facility based management of neonatal infection (sepsis/pneumonia) with injectible (and oral) antibiotics	Newborn (0-1 month)	Effect on newborn mortality due to sepsis: effectiveness 0.65, affected fraction: 1.000; Effect on newborn mortality due to pneumonia effectiveness 0.75, affected fraction: 1.000.	Zaidi AK, Ganatra HA, Syed S, et al. Effect of case management on neonatal mortality due to sepsis and pneumoniBaM. C Public Health 2011; 11(Suppl 3): S13. http://www.ncbi.nlm.nih.gov/pubmed/21501430.
33	Management of diarrhea through Oral Rehydration Solution and Zinc	Child (1-59 months)	Effect on child mortality due to diarrhea: The effectiveness reported for ORS is 0.93, with affected fraction: 0.88. The effectiveness reported for zinc is 0.23, with affected fraction: 1.00	Munos M, Fischer Walker CL, Black RE. The effect of oral rehydration solution and recommended home fluids on diarrhea mortalitIyn.ternational Journal of Epidemiology 2010; 39(Suppl 1): i75-i87. http://www.ncbi.nlm.nih.gov/pubmed/20348131. Fischer Walker CL, Black RE. Zinc for the treatment of diarrhea: Effect on diarrhea morbidity, mortality and incidence of future episodeIsn.ternational Journal of Epidemiology 2010; 39(Suppl 1): i63-i69. http://www.ncbi.nlm.nih.gov/pubmed/20348128.
34	Community based management of pneumonia (oral antibiotics)	Child (1-59 months)	Effect on child mortality due to pneumonia: effectiveness 0.7, affected fraction: 1.000.	Theodoratou E, Al-Jilaihawi S, Woodward F, et al. The effect of case management on childhood pneumonia mortality in developing countrieIsn International Journal of Epidemiology 2010; 39(Suppl 1): i155-i171. http://www.ncbi.nlm.nih.gov/pubmed/20348118.

35	Antibiotics for treatment of dysentery	Child (1-59 months)	Effect on child mortality due to diarrhea: effectiveness 0.82, affected fraction: 0.12	Das JK Ali A, Salam RA, et al. Antibiotics for the treatment of Cholera, Shigella and Cryptosporidium in childreBnM. C Public Health 2013; 13(Suppl 3): S10. http://www.ncbi.nlm.nih.gov/pubmed/24564492.
36	Facility based management of pneumonia (oral antibiotics)	Child (1-59 months)	Effect on child mortality due to pneumonia: effectiveness 0.7, affected fraction: 1.000.	Theodoratou E, Al-Jilaihawi S, Woodward F, et al. The effect of case management on childhood pneumonia mortality in developing countrieIsn International Journal of Epidemiology 2010; 39(Suppl 1): i155-i171. http://www.ncbi.nlm.nih.gov/pubmed/20348118.
37	Management of children with severe acute malnutrition	Child (1-59 months)	Treatment shifts children from the severely wasted category into the moderately (-3 to -2 Z-score) and mildly (-2 to -1 Zscore) wasted categories. The effectiveness is 0.78. The LiST tool includes a range of fifferent mortality rates for diarrhea, pneumonnia, meningitis, measles, malaria, and other causes, depending on the degree of wasting. Thus, treatment for severe malnutrition shifts children into a category where their risk of mortality from these conditions is lower.	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 procesBsM. C 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.)

Note: All of the impact sizes and Impact references are taken from the OneHealth Tool Manual https://avenirhealth.org/Download/Spectrum/Manuals/OneHealthManualE.pdf (Accessed: 1 March 2020)

Impact size within the LiST tool uses the two concepts of Effectiveness and Affected Fraction. The effectiveness measure refers to the percent of deaths due to a specific cause that are reduced by the intervention. The affected fraction refers to the percent of deaths due to a specific cause which are potentially able to be impacted by a specific intervention.