**Supplement to:**

**Background rates of adverse pregnancy outcomes for assessing the safety of maternal vaccine trials in Sub-Saharan Africa**

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**Table S2:** The incidence of low birth weight and prematurity in 104 studies in Sub-Saharan Africa published between 1992 and 2011.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **sdf Study** | **Country** | **Years** | **Design†** | **Setting** | **N\*** | **Mean Birth Weight (SD)** | **<2.5 kg (%)** | **<37 wks (%)** | **SGA (%)** | **Method of GA Estimation** | **SGA Definition** |
| *Central* | | | | | | | | | | | |
| Pambou [1] | Congo (Brazza) | 1994 | Record review | Urban hospital | 5109 TB† | --- | --- | 16.7 | --- | LMP, US, or Ballard/Farr exam | --- |
| Mabiala-Babela [2] | Congo (Brazza) | 2005 | Record review | Urban hospitals | 3944 LB | --- | 12.4 | --- | --- | --- | --- |
| Mugisho [3] | DR Congo | 1980-1998 | Record review | Rural hospital | 13042 TB† | --- | 18.0 | --- | --- | --- | --- |
| Newby [4] | DR Congo | 1989-1994 | Record review | Rural hospital | 4942 TB† | 2669.0 (---) | 34.2 | --- | --- | --- | --- |
| Kyamusugulwa [5] | DR Congo | 2003-2004 | Perinatal survey | Rural hospitals | 938 TB† | --- | 22.0 | --- | --- | --- | --- |
| Engmann [6] | DR Congo | 2005-2007 | Prospective cohort | Rural clinics | 7932 LB† | 3071.0 (537.8) | 10.5 | 2.3 | --- | LMP | --- |
| Ramharter [7] | Gabon | 2003-2006 | Perinatal survey | Urban and semi-urban hospitals | 1173 TB | 3055.6 (507.7) | 10.7 | 21.3 | --- | LMP | --- |
| Kurth [8] | Gabon | 2005-2006 | Perinatal survey | Urban hospitals | 775 LB | 3076.6 (500.2) | 10.3 | 19.1 | 4.7 | LMP | Term LBW |
| *East* | | | | | | | | | | | |
| Gessessew [9] | Ethiopia | 1993-2003 | Record review | Semi-urban hospital | 7150 TB | 3108.6 (915.1) | 11.2 | --- | --- | --- | --- |
| Teshome [10] | Ethiopia | 1995-1996 | Perinatal survey | Urban hospital | 804 TB† | 2978 (---) | 15.4 | 15.3 | --- | LMP | --- |
| Feleke [11] | Ethiopia | 1996-1997 | Perinatal survey | Urban hospitals | 4010 LB | 3065 (465) | 9.1 | 11.6 | 6.4 | LMP | Term LBW |
| Gebremariam [12] | Ethiopia | 1999-2000 | Perinatal survey | Urban hospital | 1441 LB† | --- | 10.2 | --- | --- | --- | --- |
| Tema [13] | Ethiopia | 2002-2003 | Perinatal survey | Urban/rural clinics and hospital | 595 LB | --- | 20.3 | --- | --- | --- | --- |
| Nekatibeb [14] | Ethiopia | 2003-2005 | Record review | Semi-urban hospital | 1832 LB | 3147 (---) | 8.6 | --- | --- | --- | --- |
| Belete [15] | Ethiopia | 2004 | Perinatal survey | Urban hospitals | 320 TB | 3152 (494) | 6.3 | --- | --- | --- | --- |
| Hanlon [16] | Ethiopia | 2005-2006 | Prospective cohort | Rural community | 521 LB | 3005.9 (382.7) | 7.3 | --- | --- | --- | --- |
| Allen [17] | Kenya | 1981-1992 | Prospective cohort | Rural community | 140 LB† | 3150 (400) | 10.0 | --- | --- | --- | --- |
| Aidoo [18] | Kenya | 1992-1994 | Prospective cohort | Rural communities | 990 LB | 3082.6 (457.9) | 8.6 | 3.4 | 20.1 | Dubowitz exam | Not defined |
| Shulman [19] | Kenya | 1996-1997 | Perinatal survey | Rural hospital | 820 LB | 2900 (510) | 18.0 | --- | --- | --- | --- |
| Temmerman [20] | Kenya | 1997-1998 | Perinatal survey | Urban hospital | 12414 TB† | --- | 8.8 | --- | --- | --- | --- |
| Andriamady [21] | Madagascar | 1997 | Record review | Urban hospital | 7717 TB | --- | --- | 18.1 | --- | Dubowitz exam | --- |
| Mwanyumba [22] | Kenya | 1999 | Perinatal survey | Urban hospital | 627 LB | 2968.6 (535.5) | 12.4 | --- | 6.5 | Dubowitz exam | Term LBW |
| van Eijk [23] | Kenya | 1999-2000 | Perinatal survey | Urban hospital | 2114 LB | 3091.9 (484.4) | 9.4 | --- | --- | --- | --- |
| English [24] | Kenya | 1999-2001 | Perinatal survey | Rural hospital | 2857 LB | 2949.1 (507.4) | 16.5 | --- | --- | --- | --- |
| Brown [25] | Kenya | 2004-2005 | Prospective cohort | Rural communities | 1340 LB† | --- | 7.9 | --- | --- | --- | --- |
| Alusala [26] | Kenya | --- | Prospective cohort | Urban and rural clinic | 578 TB | 3107 (480.8) | 8.5 | --- | --- | --- | --- |
| Kavoo-Linge [27] | Kenya | --- | Perinatal survey | Semi-urban hospital | 1876 TB† | --- | 12.4 | 19.1‡ | --- | --- | --- |
| Kalanda [28] | Malawi | 1993-1994 | Prospective cohort | Rural hospitals | 1414 LB | 2938.6 (449.3) | 14.9 | 17.3 | 20.3 | Modified Ballard [29] | <10th percentile [30] |
| Kulmala [31] | Malawi | 1995-1996 | Prospective cohort | Rural clinic | 476 LB | 3099.5 (505.9) | 15.1 | --- | --- | --- | --- |
| Vaahtera [32] | Malawi | 1995-1996 | Prospective cohort | Rural clinic | 480 LB† | 3069 (523) | 18.3 | --- | --- | --- | --- |
| Rogerson [33] | Malawi | 1997-1999 | Perinatal survey | Urban hospital | 1044 LB | --- | 15.2 | --- | --- | --- | --- |
| van den Broek [34] | Malawi | --- | Prospective cohort | Rural clinic and hospital | 218 TB† | --- | 13.3 | 17.6‡ | --- | US <24 wks | --- |
| Osman [35] | Mozambique | 1993-1995 | Prospective cohort | Semi-urban clinics | 821 TB | 2910 (---) | 16.2 | 15.4 | 9.7 | US < 21 wks | Not defined |
| Adam [36] | Sudan | 2006-2007 | Perinatal survey | Rural hospital | 524 TB | 3053.6 (559.3) | 15.3 | --- | --- | --- | --- |
| Haggaz [37] | Sudan | 2008 | Perinatal survey | Urban hospital | 430 LB | 2985.9 (574.8) | 14.9 | --- | --- | --- | --- |
| Hassan [38] | Sudan | 2008 | Perinatal survey | Urban hospital | 2076 TB | 3040.6 (573.3) | 12.5 | --- | --- | --- | --- |
| Aziz [39] | Sudan | --- | Perinatal survey | Rural community | 1794 LB† | --- | 18.0 | --- | --- | --- | --- |
| Elshibly [40] | Sudan | --- | Perinatal survey | Urban hospital | 1000 LB | 3131.7 (538.9) | 8.3 | 5.7 | --- | LMP | --- |
| Wort [41] | Tanzania | 1990-1999 | Record review | Rural hospital | 11903 LB | 2997.2 (944.9) | 10.6 | --- | --- | --- | -- |
| Menendez [42] | Tanzania | 1994-1995 | Perinatal survey | Semi-urban hospital | 1177 LB | 2818.7 (429.0) | 17.6 | 7.9 | 13.4 | Dubowitz exam | Term LBW |
| Hinderaker [43] | Tanzania | 1995-1996 | Perinatal survey | Rural hospital | 774 TB† | --- | 9.7 | --- | --- | --- | --- |
| Jamieson [44] | Tanzania | 1997-1998 | Record review | Refugee camp | 617 LB† | --- | 22.4 | --- | --- | --- | --- |
| Wort [45] | Tanzania | 1997-2001 | Record review | Rural hospitals and clinics | 9839 LB | 2935.7 (491.0) | 12.2 | --- | --- | --- | --- |
| Kidanto [46] | Tanzania | 1999-2003 | Perinatal survey | Urban hospital | 67972 LB | --- | 19.0 | --- | --- | --- | --- |
| Muganyizi [47] | Tanzania | 1999-2005 | Record review | Urban hospital | 91699 TB | --- | 16.2 | --- | --- | --- | --- |
| Habib [48] | Tanzania | 1999-2006 | Record review | Urban hospital | 14444 TB | 3191 (453) | --- | 10.0 | --- | LMP | --- |
| Mmbaga [49] | Tanzania | 2000-2008 | Perinatal survey | Urban hospital | 21146 LB | 3090 (544) | 8.6 | --- | --- | --- | --- |
| Siza [50] | Tanzania | 2001 | Record review | Semi-urban hospital | 3464 TB† | --- | 13.6 | --- | --- | --- | --- |
| Wort [51] | Tanzania | 2001-2002 | Perinatal survey | Rural hospital | 1684 LB | 2892.3 (464.6) | 15.7 | --- | --- | --- | --- |
| Mmbando [52] | Tanzania | 2004-2005 | Record review | Rural/semi-urban clinics | 1458 TB | 3010 (572.8) | 9.9 | --- | --- | --- | --- |
| Marchant [53] | Tanzania | 2009 | Perinatal survey | Rural hospital | 529 LB† | 2900 (400) | 14.7 | 8.3 | --- | Eregie exam [54] | --- |
| Azayo [55] | Tanzania | --- | Perinatal survey | Urban tertiary care hospital | 150 LB† | 3200 (---) | 12.0 | --- | --- | --- | --- |
| Ndyomugyenyi [56] | Uganda | 1997-1998 | Record review | Rural hospitals | 5729 LB | 3072.0 (470.1) | 9.9 | --- | --- | --- | --- |
| Kasumba [57] | Uganda | 1998 | Perinatal survey | Urban hospital | 514 LB† | 3059.0 (548.3) | 9.3 | --- | --- | --- | --- |
| Kaye [58] | Uganda | 2004-2005 | Prospective cohort | Urban hospital | 612 LB | 2782.5 (626.0) | 37.1 | 20.3 | 18.8 | LMP, US, or exam | Not defined |
| Byaruhanga [59] | Uganda | --- | Perinatal survey | Urban hospital | 300 LB† | 3218 (496) | 6.4 | --- | --- | --- | --- |
| *Southern* | | | | | | | | | | | |
| Letamo [60] | Botswana | 1990-1995 | Record review | Urban and rural hospitals | 6735 TB† | 3055.0 (563.4) | 13.0 | --- | --- | --- | --- |
| Parekh [61] | Botswana | 2007-2010 | Record review | Urban/semi-urban/rural hospitals | 16219 LB† | --- | --- | 20.1 | 11.3 | LMP | Botswana [90] |
| Louw [62] | South Africa | 1989-1991 | Record review | Urban/semi-urban hospitals/clinics | 367092 LB† | --- | 14.7 | --- | --- | --- | --- |
| Woods [63] | South Africa | 1993 | Record review | Regional database | 20668 TB¥ | --- | 17.2 | --- | --- | --- | --- |
| Pattinson [64] | South Africa | 1999-2002 | Record review | Nationwide database | 227504 LB† | --- | 16.3 | --- | --- | --- | --- |
| Hoque [65] | South Africa | 2005 | Record review | Rural hospital | 7836 TB† | 2985.4 | 13.8 | --- | --- | --- | --- |
| Le Bacq [66] | Zimbabwe | 1990-1991 | Perinatal survey | Urban hospital and rural communities | 684 TB† | --- | 9.4 | --- | --- | --- | --- |
| Kambarami [67] | Zimbabwe | 1994 | Record review | Rural communities | 419 LB† | --- | 14.3 | --- | --- | --- | --- |
| Majoko [68] | Zimbabwe | 1995-1998 | Prospective cohort | Rural clinics | 10497 TB† | 3154.6 (490.8) | 6.0 | --- | --- | --- | --- |
| Galvan [69] | Zimbabwe | 1996-1998 | Perinatal survey | Urban hospital | 3855 TB | 2961.1 (573.3) | 15.6 | --- | --- | --- | --- |
| Feresu [70] | Zimbabwe | 1997-1998 | Record review | Urban hospital | 16164 LB† | 2879 | 20.3 | 17.3 | 9.2 | LMP | Term LBW |
| Ogbonna [71] | Zimbabwe | 1998-1999 | Perinatal survey | Urban hospital | 498 TB | --- | 14.1 | --- | --- | --- | --- |
| Ticconi [72] | Zimbabwe | 2000-2001 | Record review | Rural hospital | 1705 TB† | --- | 12.9 | --- | --- | --- | --- |
| *West* | | | | | | | | | | | |
| Fourn [73] | Benin | 1991 | Prospective cohort | Urban clinics | 4113 LB† | --- | 17.8 | --- | --- | --- | --- |
| Denoeud [74] | Benin | 2004-2005 | Perinatal survey | Semi-urban clinics | 1087 LB | 2850 (491.2) | 15.7 | --- | --- | --- | --- |
| Le Port [75] | Benin | 2007-2008 | Perinatal survey | Rural clinics | 588 LB | 2979.0 (402.2) | 10.0 | --- | --- | --- | --- |
| Sirima [76] | Burkina Faso | 2004 | Prospective cohort | Semi-urban clinics | 1133 LB | 2981 (438) | 12.2 | --- | ---- | --- | --- |
| Tako [77] | Cameroon | 1996-2001 | Perinatal survey | Urban hospital | 1708 TB | 3002.1 (732.0) | 16.4 | 20.3 | --- | LMP, exam at birth | --- |
| Salihu [78] | Cameroon | 1997-1998 | Perinatal survey | Semi-urban hospital | 232 LB† | --- | 20.3 | --- | --- | --- | --- |
| Akum [79] | Cameroon | 1999-2001 | Perinatal survey | Semi-urban clinic | 749 LB | 3140 (480) | 9.6 | --- | --- | --- | --- |
| Wessel [80] | Cape Verde | 1991-1992 | Prospective cohort | Urban and rural clinics | 330 TB | 3169.5 (---) | 8.2 | 13.4 | --- | LMP | --- |
| Vanga-Bosson [81] | Côte d’Ivoire | 2008 | Perinatal survey | Urban and semi-urban clinics | 1945 LB | --- | 10.6 | --- | --- | --- | --- |
| Rayco-Solon [82] | Gambia | 1976-2003 | Retrospective cohort | Rural communities | 2472 LB† | --- | 13.3 | 12.3 | 25.1 | Dubowitz exam | <10th percentile [51] |
| Okoko [83] | Gambia | 1997 | Perinatal survey | Rural hospital | 213 LB | --- | 23.9 | 30.5 | 8.5 | Dubowitz exam | Term LBW |
| Klufio [84] | Ghana | 1994 | Perinatal survey | Urban hospital | 866 LB | 3070 (616) | 13.3 | 14.1 | --- | US <26 wks, LMP | --- |
| Shuaib [85] | Ghana | 2006 | Perinatal survey | Urban hospitals | 755 TB | --- | 20.3 | --- | --- | --- | --- |
| Oduro [86] | Ghana | 2006-2007 | Prospective cohort | Rural communities | 2182 LB | 2884.5 (486.6) | 16.4 | --- | --- | --- | --- |
| Roth [87] | Guinea-Bissau | 1989-1999 | Record review | Semi-urban hospital | 7138 LB† | --- | 11.8 | --- | --- | --- | --- |
| Sodemann [88] | Guinea-Bissau | 1997-2002 | Record review | Semi-urban hospital | 2926 LB† | --- | 14.7 | --- | --- | --- | --- |
| Kayentao [89] | Mali | 1998-1999 | Perinatal survey | Rural clinics | 453 TB | --- | 18.6 | 5.3 | --- | Ballard exam | --- |
| Famanta [90] | Mali | 2009 | Perinatal survey | Urban clinic | 372 TB† | --- | 12.1 | --- | --- | --- | --- |
| Onah [91] | Nigeria | 1991-2000 | Record review | Urban hospital | 496 TB | 3200 (600) | --- | 10.6 | --- | LMP, US | --- |
| Egwunyenga [92] | Nigeria | 1994-1995 | Perinatal survey | Urban and rural hospitals | 1905 TB† | --- | 11.3 | --- | --- | --- | --- |
| Lawoyin [93] | Nigeria | 1996-1998 | Prospective cohort | Rural community | 526 LB† | --- | 24.1 | --- | --- | --- | --- |
| Ezeaka [94] | Nigeria | 1997 | Perinatal survey | Urban hospitals | 788 LB | 3046 (656) | 17.3 | --- | --- | --- | --- |
| Ozumba [95] | Nigeria | 1997-1999 | Record review | Urban hospital | 7160 LB† | --- | 5.5 | --- | --- | --- | --- |
| Onah [96] | Nigeria | 1998 | Record review | Urban hospital | 851 LB | 3144 (640) | 10.1 | 10.9 | 6.2 | LMP, US | Not defined |
| Onyiriuka [97] | Nigeria | 1999-2001 | Perinatal survey | Urban hospital | 4075 LB† | --- | 8.1 | --- | --- | --- | --- |
| Ibekwe [98] | Nigeria | 2001-2003 | Record review | Rural hospital | 1684 TB† | --- | 16.1 | --- | --- | --- | --- |
| Ekure [99] | Nigeria | 2002 | Perinatal survey | Urban hospital | 560 LB† | 3100 | 13.0 | --- | --- | --- | --- |
| Falade [100] | Nigeria | 2003-2004 | Perinatal survey | Urban hospital | 980 LB | 3153.6 (490) | 6.5 | --- | --- | --- | --- |
| Fawole [101] | Nigeria | 2004-2005 | Record review | Urban hospitals and clinics | 9208 TB† | --- | 10.1 | --- | --- | --- | --- |
| Aribodor [102] | Nigeria | 2005-2006 | Perinatal survey | Urban and rural communities | 500 TB | 2963.0 (---) | 29.0 | --- | --- | --- | --- |
| Sotimehin [103] | Nigeria | 2004-2005 | Perinatal survey | Urban hospital | 192 LB† | 2910.3 (623.4) | 27.1 | 16.1 | 14.1 | LMP, Dubowitz exam | [104] |
| Tongo [105] | Nigeria | 2007-2008 | Perinatal survey | Urban hospital | 796 TB† | 3020 (560) | 9.0 | 19.4 | --- | LMP, US, Ballard exam | --- |
| Sule-Odu [106] | Nigeria | --- | Perinatal survey | Urban hospital | 564 TB | 3035.2 (414.9) | 15.6 | --- | --- | --- | --- |
| Akanbi [107] | Nigeria | --- | Prospective cohort | Urban clinic | 254 TB† | 2833.5 (730.7) | 17.7 | --- | --- | --- | --- |
| Akpala [108] | Nigeria | --- | Prospective cohort | Rural community | 1479 TB | --- | 8.8 | --- | --- | --- | --- |
| Camara [109] | Senegal | 1992-1993 | Record review | Semi-urban clinic | 7527 LB† | --- | 10.3 | --- | --- | --- | --- |
| Olliaro [110] | Senegal | 2000-2007 | Record review | Rural clinic | 904 TB† | --- | 9.5 | --- | --- | --- | --- |
| Gueye [111] | Senegal | 2006 | Perinatal survey | Urban hospital | 1152 TB | --- | 18.8 | --- | --- | --- | --- |
| Balaka [112] | Togo | --- | Perinatal survey | Urban hospital | 1672 LB† | --- | --- | 11.1 | --- | US<12 wks, LMP, Dubowitz/Farr exam | --- |

**†** We classified studies into three designs: cohort studies in which pregnant women were recruited before delivery and pregnancy outcome was determined regardless of delivery site, perinatal surveys in which pregnant women were recruited in labor or immediately after delivery, and record reviews.  
**\*** When the denominators for LBW and gestational age differed, we only included the denominator used for LBW.  
‡ For Kavoo-Linge et al [27], the denominator for the % <37 wks was 1807 live births; For Van den Broek et al [34], the denominator for prematurity was 409 live births.  
¥ For Woods et al [63], the % <2.5kg is expressed per live births, but the denominator was only given in total births.

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