

# **Spatial heterogeneity and factors influencing stunting and severe stunting among under-5 children in Ethiopia: Spatial and Multilevel Analysis**

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**Supplementary Table S1. Individual and household level factors and multilevel logistic regression analysis for stunting and severe stunting of under-5 children in Ethiopia, 2016.**

| Characteristics                                | Weighted sample size (%) | Weighted Prevalence(No) |                  | Odds Ratio(95%CI) |                  |                    |                     |
|------------------------------------------------|--------------------------|-------------------------|------------------|-------------------|------------------|--------------------|---------------------|
|                                                |                          | Stunted                 | Severely stunted | Crude             |                  | Adjusted           |                     |
| All                                            | 9588(100)                | 38.4(3681)              | 17.4(1669)       | Stunted           | Severely Stunted | Stunted            | Severely Stunted    |
| <b>Individual(Lower Level) Characteristics</b> |                          |                         |                  |                   |                  |                    |                     |
| Child age                                      | 9588(100)                | 38.4(3681)              | 17.4(1669)       | 1.05(1.04,1.05)   | 1.05(1.04,1.05)  | 1.04(1.03,1.05)**  | 1.04(1.01,1.05)**   |
| <b>Type of birth</b>                           |                          |                         |                  |                   |                  |                    |                     |
| Single                                         | 9363(97.6)               | 38(3556)                | 17(1601)         | 1                 | 1                | 1                  | 1                   |
| Twin                                           | 225(2.4)                 | 55.5(125)               | 30(68)           | 13.8(7,27)        | 10.5(4.9,22.7)   | 25.2(11.1,57.5)**  | 27.6(10.73,71.18)** |
| <b>Child sex</b>                               |                          |                         |                  |                   |                  |                    |                     |
| Female                                         | 4695(49)                 | 35.4(1664)              | 16(739)          | 1                 | 1                | 1                  | 1                   |
| Male                                           | 4893(51)                 | 41(2017)                | 19(929)          | 1.81(1.52,2.16)   | 1.48(1.2,1.8)    | 1.89(1.53,2.33)**  | 1.51(1.16,1.96)**   |
| <b>Place of delivery</b>                       |                          |                         |                  |                   |                  |                    |                     |
| Health center                                  | 2573(26.8)               | 30.5(786)               | 11(290)          | 1                 | 1                | 1                  | 1                   |
| Not health center                              | 7015(73.2)               | 41.3(2895)              | 20(1355)         | 2.6(2.08,3.25)    | 3.6(2.7,4.9)     | 0.91(0.68,1.23)    | 1.39(0.95,2.03)     |
| <b>Have diarrhea</b>                           |                          |                         |                  |                   |                  |                    |                     |
| No                                             | 8419(88)                 | 38.1(3209)              | 17(1454)         | 1                 | 1                |                    |                     |
| Yes                                            | 1151(12)                 | 40.8(469)               | 19(215)          | 1.17(0.88,1.56)   | 1.18(0.84,1.65)  |                    |                     |
| <b>Have fever</b>                              |                          |                         |                  |                   |                  |                    |                     |
| No                                             | 8167(85.3)               | 37.9(3096)              | 17(1427)         | 1                 | 1                | 1                  |                     |
| Yes                                            | 1411(14.7)               | 41.5(585)               | 17(242)          | 1.32(1.02,1.71)   | 0.91(0.7,1.2)    | 1.66(1.21,2.26)**  |                     |
| <b>Anemia status</b>                           |                          |                         |                  |                   |                  |                    |                     |
| Not anemic                                     | 3565(43)                 | 37(1330)                | 15(542)          | 1                 | 1                | 1                  | 1                   |
| Mild                                           | 2090(25)                 | 44(917)                 | 20(427)          | 1.7(1.4,2.2)      | 2.2(1.6,2.79)    | 2.2(1.68,2.88)**   | 3.21(2.3,4.49)**    |
| Moderate                                       | 2439(29)                 | 44(1074)                | 22(535)          | 2.1(1.6,2.7)      | 2.1(1.6,2.8)     | 3.18(2.42,4.18)**  | 3.55(2.54,4.96)**   |
| Severe                                         | 252(3)                   | 53(133)                 | 31(78)           | 3.8(2.1,6.62)     | 6.7(3.4,13.1)    | 5.49(3.01,10.01)** | 10.79(5.23,22.26)** |

|                                                 |            |            |            |                   |                 |                    |                   |
|-------------------------------------------------|------------|------------|------------|-------------------|-----------------|--------------------|-------------------|
| <b>Household (Higher Level) Characteristics</b> |            |            |            |                   |                 |                    |                   |
| <b>Mother age</b>                               | 9588(100)  | 38.4(3681) | 17.4(1669) | 1.03(1.01,1.04)   | 1.02(0.99,1.04) | 0.99(0.97,1.02)    |                   |
| <b>Maternal occupation</b>                      |            |            |            |                   |                 |                    |                   |
| No                                              | 6994(73)   | 38.3(2675) | 18(1224)   | 1                 | 1               |                    |                   |
| Yes                                             | 2594(27)   | 38.8(1006) | 17(445)    | 1.05(0.81,1.36)   | 0.9(0.7,1.2)    |                    |                   |
| <b>Mother Marital status</b>                    |            |            |            |                   |                 |                    |                   |
| Married                                         | 9011(94)   | 38.3(3447) | 17(1569)   | 1                 | 1               |                    |                   |
| Not married                                     | 577(6)     | 40.5(234)  | 17(100)    | 1.08(0.68,1.72)   | 0.7(0.4,1.2)    |                    |                   |
| <b>Mother education</b>                         |            |            |            |                   |                 |                    |                   |
| Secondary and above                             | 679(7.1)   | 20.1(137)  | 6(39)      | 1                 | 1               | 1                  | 1                 |
| Primary                                         | 2615(27.3) | 35.3(924)  | 15(388)    | 4.94(3.09,7.91)   | 8(3,21)         | 0.77(0.56,1.08)    | 0.85(0.57,1.25)   |
| No education                                    | 6294(65.6) | 41.6(620)  | 20(1669)   | 10.35(6.61,16.23) | 18.4(7,47)      | 0.41(0.21,0.81)**  | 0.18(0.05,0.71)** |
| <b>Mother's stunting status</b>                 |            |            |            |                   |                 |                    |                   |
| Normal                                          | 7765(82)   | 35(2738)   | 15(1202)   | 1                 | 1               | 1                  | 1                 |
| Stunted                                         | 1443(15)   | 52(746)    | 26(378)    | 5(3.7,7.2)        | 4(2.8,5.9)      | 6.94(4.64,10.36)** | 5.35(3.45,8.32)** |
| Severely stunted                                | 269(3)     | 57(154)    | 27(73)     | 8(4.1,17.1)       | 5.8(2.6,13)     | 12.11(5.1,28.71)** | 3.15(0.77,12.83)  |
| <b>Mother's wasting status</b>                  |            |            |            |                   |                 |                    |                   |
| Normal                                          | 7796(82)   | 37(2870)   | 16(1287)   | 1                 | 1               | 1                  | 1                 |
| Wasted                                          | 1571(17)   | 45(712)    | 22(342)    | 2.4(1.8,3.3)      | 2.3(1.6,3.2)    | 1.76(1.07,2.88)**  | 1.7(0.96,2.99)    |
| Severely wasted                                 | 91(1)      | 43(39)     | 24(22)     | 1.9(0.69,5.4)     | 4(1.3,13)       | 1.35(0.39,4.67)    | 3.15(0.77,12.83)  |
| <b>Mother's Body Mass Index</b>                 |            |            |            |                   |                 |                    |                   |
| Not under weight                                | 7627(80)   | 38(2878)   | 17(1301)   | 1                 | 1               | 1                  | 1                 |
| Underweight                                     | 1866(20)   | 41(767)    | 19(354)    | 1.6(1.2,2.1)      | 1.5(1.1,2.10)   | 0.91(0.57,1.45)    | 0.84(0.48,1.47)   |
| <b>Household wealth index</b>                   |            |            |            |                   |                 |                    |                   |
| Richest                                         | 1367(14.3) | 25.5(349)  | 10(132)    | 1                 | 1               | 1                  | 1                 |
| Richer                                          | 1742(18.2) | 34.7(605)  | 14(244)    | 3.09(2.06,4.62)   | 3.3(1.8,5.9)    | 2.24(1.21,4.13)**  | 2.02(0.85,4.77)   |
| Middle                                          | 2018(21)   | 37.7(761)  | 16(320)    | 4.26(2.87,6.33)   | 4.4(2.5,7.7)    | 3.21(1.74,5.93)**  | 3.25(1.39,7.62)** |

|                              |            |            |            |                  |                 |                   |                    |
|------------------------------|------------|------------|------------|------------------|-----------------|-------------------|--------------------|
| Poorer                       | 2249(23.5) | 43.1(969)  | 20(461)    | 7.17(4.83,10.65) | 8.7(5,15)       | 5.75(3.1,10.67)** | 6.19(2.67,14.35)** |
| Poorest                      | 2211(23)   | 45.1(997)  | 23(506)    | 6.62(4.53,9.67)  | 10.4(6.1,17.8)  | 4.48(2.43,8.24)** | 5.95(2.58,13.69)** |
| <b>Sex of household head</b> |            |            |            |                  |                 |                   |                    |
| Male                         | 8304(86.6) | 38.2(3174) | 17(1425)   | 1                | 1               |                   |                    |
| Female                       | 1284(13.4) | 39.5(507)  | 19(244)    | 0.9(0.65,1.23)   | 0.96(0.7,1.4)   |                   |                    |
| <b>Residence</b>             |            |            |            |                  |                 |                   |                    |
| Urban                        | 1048(11)   | 26.2(274)  | 11(115)    | 1                | 1               | 1                 | 1                  |
| Rural                        | 8540(89)   | 39.9(3407) | 18(1554)   | 4.78(3.37,6.77)  | 5.4(3.2,8.9)    | 1.5(0.82,2.74)    | 1.37(0.58,3.22)    |
| <b>Household Size</b>        | 9588(100)  | 38.4(3681) | 17.4(1669) | 1.05(0.99,1.11)  | 1.05(0.99,1.13) |                   |                    |

Note: \*\* statistically significant at p<0.05