**Table 1: Baseline characteristics of the study participants by region within the area of the Farafenni Health and Demographic Surveillance System from 2011 to 2014 (N=5994)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Category | Total | West-rural | East-rural | Peri-urban | Urban |
|  |  | N=5994 | N=767 | N=1882 | N=795 | N=2550 |
| Sex | Male | 3114 (52.0) | 401 (52.3) | 1015 (53.9) | 394 (49.6) | 1304 (51.2) |
| Female | 2880 (48.0) | 366 (47.7) | 867 (46.1) | 401 (50.4) | 1246 (48.8) |
| Ethnicity | Wollof | 2807 (46.8) | 57 (7.4) | 1089 (57.9) | 531 (66.8) | 1130 (44.3) |
| Mandinka | 1710 (28.5) | 561 (73.1) | 300 (15.9) | 66 (8.3) | 783 (30.7) |
| Fula | 1241 (20.7) | 117 (15.3) | 483 (25.7) | 187 (23.5) | 454 (17.8) |
| Others | 236 (3.9) | 32 (4.2) | 10 (0.5) | 11 (1.4) | 183 (7.2) |
| Season of birth | Wet (June-October) | 2933 (48.9) | 393 (51.2) | 932 (49.5) | 367 (46.2) | 1241 (48.6) |
| Dry (November-May) | 3061 (51.1) | 374 (48.8) | 950 (50.5) | 428 (53.8) | 1309 (51.4) |
| Maternal age (years) | ≦19 | 728 (12.1) | 80 (10.4) | 246 (13.1) | 81 (10.2) | 321 (12.6) |
| 20-29 | 3035 (50.6) | 341 (44.5) | 903 (48.0) | 407 (51.2) | 1384 (54.3) |
| ≧30- | 2232 (37.2) | 346 (45.1) | 733 (38.9) | 307 (38.6) | 845 (33.2) |
| Year of birth | 2011 | 1334 (22.3) | 176 (22.9) | 424 (22.5) | 164 (20.6) | 570 (22.4) |
| 2012 | 1649 (27.5) | 225 (29.3) | 519 (27.6) | 221 (27.8) | 684 (26.8) |
| 2013 | 1519 (25.3) | 183 (23.9) | 475 (25.2) | 188 (23.6) | 673 (26.4) |
| 2014 | 1491 (24.9) | 183 (23.9) | 464 (24.7) | 222 (27.9) | 622 (24.4) |
| Birth spacing | Less than 2 years | 644 (10.7) | 85 (11.1) | 215 (11.4) | 82 (10.3) | 263 (10.3) |
| Over 2 years | 5348 (89.2) | 682 (88.9) | 1666 (88.5) | 713 (89.7) | 2287 (89.7) |
| Siblings  (N=5943) | No | 1629 (27.4) | 164 (21.6) | 346 (18.4) | 188 (23.7) | 931 (36.9) |
| Yes | 4315 (72.6) | 597 (78.4) | 1521 (81.1) | 604 (76.3) | 1593 (63.1) |
| Distance to vaccine delivery point | <1km | 2940 (49.1) | 380 (49.5) | 1232 (65.5) | 256 (32.2) | 1072 (42.1) |
| 1-2km | 2462 (41.1) | 228 (29.7) | 490 (26.0) | 268 (33.7) | 1476 (57.9) |
| >2km | 592 (9.9) | 159 (20.7) | 160 (8.5) | 271 (34.1) | 2 (0.1) |
| Maternal education  (N=5013) | No | 790 (15.8) | 53 (8.1) | 86 (5.3) | 122 (19.1) | 529 (25.3) |
| Koranic | 3362 (67.1) | 536 (82.2) | 1390 (85.3) | 443 (69.2) | 993 (47.5) |
| Basic | 527 (10.5) | 49 (7.5) | 125 (7.7) | 44 (6.9) | 309 (14.8) |
| Senior | 334 (6.7) | 14 (2.2) | 29 (1.8) | 31 (4.8) | 260 (12.4) |
| SES index  (N=5463) | 1st Poor | 1080 (19.8) | 183 (26.0) | 631 (35.9) | 230 (31.5) | 36 (1.6) |
| 2nd | 966 (17.7) | 284 (40.4) | 465 (26.5) | 174 (23.8) | 43 (1.9) |
| 3rd | 1058 (19.4) | 131 (18.6) | 482 (27.4) | 215 (29.5) | 230 (10.1) |
| 4th | 1118 (20.5) | 84 (11.9) | 171 (9.7) | 99 (13.6) | 764 (33.6) |
| 5th Wealthy | 1241 (22.7) | 21 (3.0) | 7 (0.4) | 12 (1.6) | 1201 (52.8) |
| Place of birth(2014)  (N=1490) | Own/Relative’s home | 600 (40.3) | 97 (53.0) | 251 (54.1) | 100 (45.1) | 152 (24.5) |
| Health centers | 268 (18.0) | 68 (37.2) | 191 (41.2) | 3 (1.4) | 6 (1.0) |
| Hospital | 622 (41.7) | 18 (9.8) | 22 (4.7) | 119 (53.6) | 463 (74.6) |
| Delivery assistant (2014)  (N=1490) | Midwife | 444 (32.4) | 58 (31.7) | 140 (30.2) | 61 (27.5) | 223 (35.9) |
| TBA | 444 (29.8) | 89 (48.6) | 204 (44.0) | 80 (36.0) | 71 (11.4) |
| Doctor | 74 (5.0) | 7 (3.8) | 10 (2.2) | 10 (4.5) | 47 (7.6) |
| Other | 470 (31.5) | 28 (15.3) | 104 (22.4) | 68 (30.6) | 270 (43.5) |
| None | 20 (1.3) | 1 (0.6) | 6 (1.3) | 3 (1.4) | 10 (1.6) |

Table 2: Factors associated with vaccination at day 7 after birth in the Farafenni Health and Demographic Surveillance System, 2011-2014 (N=5994)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Variables | | | |  | Day 7 after birth | | | | | | | |
|  | |  | | Total | No. (%) | | Crude OR 1  (95%CI3) | | *P* 4 | | Adjusted OR 2  (95%CI3) | *P* 4 |
| Area | | | |  |  | |  | |  | |  |  |
|  | | Urban | | 2,550 | 43 (1.7) | | 1 (reference) | | <0.001 | | 1 (reference) | <0.001 |
|  | | Peri-urban | | 795 | 14 (1.8) | | 1.04 (0.57-1.92) | | 1.59 (0.69-3.64) |
|  | | West-rural | | 767 | 66 (8.6) | | 5.49 (3.70-8.13) | | 6.13 (3.20-11.75) |
|  | | East-rural | | 1,882 | 190 (10.1) | | 6.54 (4.67-9.16) | | 6.72 (3.66-12.33) |
| Distance to vaccine delivery point | | | | | |  | |  | |  | |  |
|  | | | <1km | 2,940 | 218 (7.4) | | 1 (reference) | | <0.001 | | 1 (reference) | <0.001 |
|  | | | 1-2km | 2,462 | 72 (2.9) | | 0.38 (0.29-0.49) | | 0.50 (0.35-0.70) |
|  | | | >2km | 592 | 23 (3.9) | | 0.50 (0.33-0.78) | | 0.41 (0.24-0.70) |
| Sex | | | |  |  | |  | |  | |  |  |
|  | | | Boys | 3,114 | 162 (5.2) | | 1 (reference) | | 0.94 | |  |  |
|  | | | Girls | 2,880 | 151 (5.2) | | 1.01 (0.80-1.27) | |  |
| Ethnicity | | | |  |  | |  | |  | |  |  |
|  | | | Wollof | 2,807 | 140 (5.0) | | 1 (reference) | | <0.001 | | 1 (reference) | 0.014 |
|  | | | Mandinka | 1,710 | 117 (6.8) | | 1.40 (1.09-1.80) | | 1.18 (0.83-1.70) |
|  | | | Fula | 1,241 | 52 (4.2) | | 0.83 (0.60-1.15) | | 0.60 (0.40-0.91) |
|  | | | Others | 236 | 4 (1.7) | | 0.33 (0.12-0.9) | | 0.67 (0.23-1.96) |
| Year of birth | | | |  |  | |  | |  | |  |  |
|  | | | 2011 | 1334 | 69 (5.2) | | 1 (reference) | | 0.08 | | 1 (reference) | 0.06 |
|  | | | 2012 | 1649 | 83 (5.0) | | 0.97 (0.70-1.35) | | 1.19 (0.81-1.73) |
|  | | | 2013 | 1520 | 97 (6.4) | | 1.25 (0.91-1.72) | | 1.36 (0.93-1.99) |
|  | | | 2014 | 1491 | 64 (4.3) | | 0.82 (0.58-1.17) | | 0.81 (0.53-1.23) |
| Season of birth | | | |  |  | |  | |  | |  |  |
|  | | | Wet | 2,933 | 160 (5.5) | | 1 (reference) | | 0.45 | |  |  |
|  | | | Dry | 3,061 | 153 (5.0) | | 0.91 (0.73-1.14) | |  |  |
| Mother age | | | |  |  | |  | |  | |  |  |
|  | | | ≦19 | 728 | 32 (4.4) | | 1 (reference) | | 0.22 | |  |  |
|  | | | 20-29 | 3,034 | 151 (5.0) | | 1.14 (0.77-1.68) | |  |  |
|  | | | ≧30 | 2,231 | 130 (5.8) | | 1.35 (0.91-2.00) | |  |  |
| Birth spacing | | | |  |  | |  | |  | |  |  |
|  | Less than 2 years | | | 645 | 45 (7.0) | | 1 (reference) | | 0.041 | | 1 (reference) | 0.056 |
|  | Over 2 years | | | 5,348 | 268 (5.0) | | 0.7 (0.51-0.97) | | 0.67 (0.45-1.00) |
| Sibling | | | |  |  | |  | |  | |  |  |
|  | | | No | 1,629 | 75 (4.6) | | 1 (reference) | | 0.165 | | 1 (reference) | 0.75 |
|  | | | Yes | 4,315 | 237 (5.5) | | 1.2 (0.92-1.57) | | 0.93 (0.64-1.35) |
| Maternal education level | | | | | |  | |  | |  | |  |
|  | | | No | 790 | 23 (2.9) | | 1 (reference) | | 0.005 | | 1 (reference) | 0.027 |
|  | | | Koranic | 3,362 | 198 (5.9) | | 2.09 (1.35-3.24) | | 0.97 (0.57-1.64) |
|  | | | Basic | 527 | 28 (5.3) | | 1.87 (1.07-3.29) | | 1.46 (0.77-2.77) |
|  | | | Senior | 334 | 16 (4.8) | | 1.68 (0.87-3.22) | | 2.43 (1.17-5.06) |
| SES index | | | |  |  | |  | |  | |  |  |
|  | | | 1st Poor | 1,080 | 71 (6.6) | | 1 (reference) | | <0.001 | | 1 (reference) | 0.50 |
|  | | | 2nd | 966 | 88 (9.1) | | 1.42 (1.03-1.97) | | 1.24 (0.85-1.80) |
|  | | | 3rd | 1,058 | 61 (5.8) | | 0.87 (0.61-1.24) | | 0.95 (0.64-1.43) |
|  | | | 4th | 1,118 | 39 (3.5) | | 0.51 (0.34-0.77) | | 1.19 (0.73-1.93) |
|  | | | 5th Wealthy | 1,241 | 20 (1.6) | | 0.23 (0.14-0.38) | | 0.83 (0.39-1.75) |

1. Odd Ratio

2. Odds Ratio adjusted for area, distance from vaccine location, ethnicity, year of birth, birth spacing, sibling, maternal education and SES index

3. 95% confidence interval

4. p-value tested by likelihood ratio test

**Table 3. Vaccine coverage at birth (day 1) and day 7 after birth by location of birth and by the nature of assistance at delivery in 2014 (N=1490)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Number (%) | Day 0-1 (at birth)  No. (%) | aOR1 (95%CI3) | P4 | Day 7 after birth No. (%) | aOR2 (95%CI3) | P4 |
|  | N=1,490 | 13 (0.87) |  |  |  |  |  |
| Place of birth | | | |  |  |  |  |
| Home | 600 (40.3) | 8 (1.3) | 1 (reference) | 0.29 | 32 (5.2) | 1 (reference) | 0.34 |
| Health center | 268 (18.0) | 2 (0.8) | 0.32 (0.06-1.59) | 24 (8.5) | 1.49 (0.72-3.07) |
| Hospital | 622 (41.7) | 3 (0.5) | 1.19 (0.21-6.76) | 10 (1.6) | 0.63 (0.20-2.03) |
| Delivery assistant | | | |  |  |  |  |
| Midwife | 482 (32.3) | 4 (1.6) | 1 (reference) | 0.45 | 29 (6.4) | 1 (reference) | 0.90 |
| TBA | 444 (29.8) | 7 (0.8) | 1.58 (0.43-5.68) | 23 (4.6) | 0.93 (0.44-2.01) |
| Doctor | 74 (5.0) | 0 (0) | - | 2 (2.7) | 0.50 (0.06-4.22) |
| Other | 470 (31.5) | 2 (0.4) | 0.59 (0.11-3.27) | 12 (2.5) | 0.83(0.34-2.00) |
| None | 20 (1.3) | 0 (0) | - | 0 (0) | -- |

1. Odds ratio adjusted for living areas, distance to vaccine delivery point and ethnicity

2. Odds ratio adjusted for area, distance from vaccine delivery point, ethnicity, birth spacing, sibling, maternal education and SES index

3. 95% confidence interval

4. p-value tested by likelihood ratio test.

Supplementary Table 1: Factors associated with timely vaccination at birth (day 0-1) in Farafenni Health and Demographic Surveillance System, 2011-2014 (N=5994)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Variables | |  | Day 0-1 (at birth) | | | | |
|  |  | Total | No. (%) | Crude OR  (95%CI3) | *P* | Adjusted OR 1  (95%CI3) | *P* |
| Area | |  |  |  |  |  |  |
|  | Urban | 2,550 | 12 (0.5) | 1 (reference) | <0.001 | 1 (reference) | <0.001 |
|  | Peri-urban | 795 | 1 (0.1) | 0.27 (0.03-2.05) | 0.28 (0.03-2.26) |
|  | West-rural | 767 | 7 (0.9) | 1.95 (0.76-4.96) | 1.51 (0.55-4.11) |
|  | East-rural | 1,882 | 39 (2.1) | 4.47 (2.34-8.57) | 4.61 (2.27-9.36) |
| Distance to vaccine location | | | | |  |  |  |
|  | <1km | 2,940 | 38 (1.3) | 1 (reference) | 0.035 | 1 (reference) | 0.57 |
|  | 1-2km | 2,462 | 15 (0.6) | 0.47 (0.26-0.85) | 0.74 (0.39-1.39) |
|  | >2km | 592 | 6 (1.0) | 0.78 (0.33-1.86) | 1.13 (0.46-2.82) |
| Sex | |  |  |  |  |  |  |
|  | Boys | 3,114 | 30 (1.0) | 1 (reference) | 0.86 |  |  |
|  | Girls | 2,880 | 29 (1.0) | 1.05 (0.63-1.75) |  |
| Ethnicity | |  |  |  |  |  |  |
|  | Wollof | 2,807 | 28 (1.0) | 1 (reference) | 0.67 | 1 (reference) | 0.36 |
|  | Mandinka | 1,710 | 20 (1.2) | 1.17 (0.66-2.09) | 1.50 (0.78-2.87) |
|  | Fula | 1,241 | 9 (0.7) | 0.72 (0.34-1.54) | 0.74 (0.35-1.59) |
|  | Others | 236 | 2 (0.8) | 0.85 (0.2-3.58) | 1.71 (0.38-7.68) |
| Year of birth | |  |  |  |  |  |  |
|  | 2011 | 1334 | 15 (1.1) | 1 (reference) | 0.89 | 1 (reference) | 0.88 |
|  | 2012 | 1649 | 15 (0.9) | 0.81 (0.39-1.66) | 0.81 (0.39-1.67) |
|  | 2013 | 1520 | 16 (1.1) | 0.94 (0.46-1.90) | 0.93 (0.46-1.89) |
|  | 2014 | 1491 | 13 (0.9) | 0.77 (0.37-1.63) | 0.76 (0.36-1.60) |
| Season of birth | |  |  |  |  |  |  |
|  | Wet | 2,933 | 27 (0.9) | 1 (reference) | 0.63 |  |  |
|  | Dry | 3,061 | 32 (1.0) | 1.14 (0.68-1.90) |  |  |
| Mother age | |  |  |  |  |  |  |
|  | ≦19 | 728 | 6 (0.8) | 1 (reference) | 0.40 |  |  |
|  | 20-29 | 3,034 | 26 (0.9) | 1.04 (0.43-2.54) |  |  |
|  | ≧30 | 2,231 | 27 (1.2) | 1.47 (0.61-3.58) |  |  |
| Birth spacing | |  |  |  |  |  |  |
|  | Less than 2 years | 645 | 10 (1.6) | 1 (reference) | 0.15 | 1 (reference) | 0.19 |
|  | Over 2 years | 5,348 | 49 (0.9) | 0.59 (0.30-1.16) | 0.61 (0.31-1.22) |
| Sibling | |  |  |  |  |  |  |
|  | No | 1,629 | 15 (0.9) | 1 (reference) | 0.73 |  |  |
|  | Yes | 4,315 | 44 (1.0) | 1.11 (0.62-2.00) |  |  |
| Maternal education level | | | |  |  |  |  |
|  | No | 790 | 3 (0.4) | 1 (reference) | 0.26 |  |  |
|  | Koranic | 3,362 | 36 (1.1) | 2.84 (0.87-9.24) |  |  |
|  | Basic | 527 | 5 (0.9) | 2.51 (0.60-10.56) |  |  |
|  | Senior | 334 | 3 (0.9) | 2.38 (0.48-11.84) |  |  |
| SES index | |  |  |  |  |  |  |
|  | 1st Poor | 1,080 | 11 (1.0) | 1 (reference) | 0.16 |  |  |
|  | 2nd | 966 | 13 (1.3) | 1.33 (0.59-2.97) |  |  |
|  | 3rd | 1,058 | 11 (1.0) | 1.02 (0.44-2.37) |  |  |
|  | 4th | 1,118 | 11 (1.0) | 0.97 (0.42-2.24) |  |  |
|  | 5th Wealthy | 1,241 | 5 (0.4) | 0.39 (0.14-1.14) |  |  |

1. Odds ratio adjusted for living areas, distance to vaccine delivery point, ethnicity, year of birth and birth spacing

2. Odds ratio adjusted for living areas, distance to vaccine delivery point, ethnicity, year of birth, mother's age, sibling, maternal education and SES index

3. 95% confidence interval

Figure 1: Map of Farafenni

Figure 2: BCG and HBV cumulative vaccine coverage within different ages of birth from 2005 to 2014, in Farafenni HDSS.