Supplementary Table 3. Associations of key risk factors with ER status by hospitals (N=838)

|  |  |
| --- | --- |
|   | **Hospitals** |
|  | **AKU (n=350, 42%)** |  | **Kijabe (n=105, 13%)** |  | **Nyeri (n=110, 13%)** |  | **St Mary's (n=122, 15%)** |  | **Others (n=151, 18%)** |
|  | **ER+** | **ER-** | **ER- vs. ER+** |  | **ER+** | **ER-** | **ER- vs. ER+** |  | **ER+** | **ER-** | **ER- vs. ER+** |  | **ER+** | **ER-** | **ER- vs. ER+** |  | **ER+** | **ER-** | **ER- vs. ER+** |
| **Key risk factors** | **N** | **%** | **N** | **%** | **OR (95% CI)†** | **P†** |  | **N** | % | **N** | % | **OR (95% CI)†** | **P†** |  | **N** | % | **N** | % | **OR (95% CI)†** | **P†** |   | **N** | % | **N** | % | **OR (95% CI)†** | **P†** |  | **N** | % | **N** | % | **OR (95% CI)†** | **P†** |
| **BMI** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Normal (<25.0) | 42 | 18.9 | 25 | 26.9 | 1.00 (Ref) |  |  | 27 | 40.9 | 8 | 38.1 | 1.00 (Ref) |  |  | 12 | 36.4 | 13 | 43.3 | 1.00 (Ref) |  |  | 28 | 43.1 | 8 | 33.3 | 1.00 (Ref) |  |  | 27 | 38.0 | 20 | 43.5 | 1.00 (Ref) |  |
| Overweight (25.0 - 29.9) | 96 | 43.2 | 30 | 32.3 | **0.47 (0.25, 0.91)** | **0.026** |  | 25 | 37.9 | 8 | 38.1 | 1.20 (0.38, 3.82) | 0.75 |  | 15 | 45.5 | 13 | 43.3 | 0.86 (0.27, 2.68) | 0.79 |  | 25 | 38.5 | 12 | 50.0 | 1.74 (0.61, 5.00) | 0.30 |  | 24 | 33.8 | 16 | 34.8 | 0.91 (0.37, 2.24) | 0.84 |
| Obese (≥30.0) | 84 | 37.8 | 38 | 40.9 | 0.67 (0.35, 1.27) | 0.22 |  | 14 | 21.2 | 5 | 23.8 | 1.07 (0.28, 4.02) | 0.92 |  | 6 | 18.2 | 4 | 13.3 | 0.71 (0.15, 3.40) | 0.67 |  | 12 | 18.5 | 4 | 16.7 | 1.16 (0.29, 4.68) | 0.84 |  | 20 | 28.2 | 10 | 21.7 | 0.68 (0.26, 1.82) | 0.44 |
| Trend‡ |  |  |  |  | 0.87 (0.63, 1.20) | 0.40 |  |  |  |  |  | 1.05 (0.55, 2.00) | 0.88 |  |  |  |  |  | 0.85 (0.40, 1.78) | 0.66 |  |  |  |  |  | 1.16 (0.61, 2.21) | 0.65 |  |  |  |  |  | 0.83 (0.51, 1.35) | 0.45 |
| **Age at menarche/year** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ≤14 (9-14) | 125 | 50.2 | 55 | 54.5 | 1.00 (Ref) |  |  | 29 | 42.0 | 12 | 57.1 | 1.00 (Ref) |  |  | 27 | 45.0 | 19 | 45.2 | 1.00 (Ref) |  |  | 52 | 59.1 | 16 | 50.0 | 1.00 (Ref) |  |  | 47 | 52.2 | 26 | 52.0 | 1.00 (Ref) |  |
| ≥15 (15-20) | 124 | 49.8 | 46 | 45.5 | 0.90 (0.55, 1.49) | 0.69 |  | 40 | 58.0 | 9 | 42.9 | 0.47 (0.15, 1.50) | 0.21 |  | 33 | 55.0 | 23 | 54.8 | 2.68 (0.75, 9.59) | 0.13 |  | 36 | 40.9 | 16 | 50.0 | **2.96 (1.08, 8.12)** | **0.036** |  | 43 | 47.8 | 24 | 48.0 | 1.02 (0.47, 2.22) | 0.96 |
| **Age at first pregnancy/year** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Nulliparousᵃ or ≥30 | 44 | 17.7 | 12 | 11.9 | 0.53 (0.25, 1.13) | 0.10 |  | 7 | 8.9 | 4 | 17.4 | 1.57 (0.33, 7.53) | 0.57 |  | 4 | 6.5 | 1 | 2.2 | 1.43 (0.07, 28.47) | 0.82 |  | 4 | 4.9 | 3 | 10.0 | 2.75 (0.46, 16.55) | 0.27 |  | 11 | 11.3 | 3 | 5.7 | 0.42 (0.11, 1.63) | 0.21 |
| <25 | 138 | 55.4 | 66 | 65.3 | 1.00 (Ref) |  |  | 53 | 67.1 | 17 | 73.9 | 1.00 (Ref) |  |  | 50 | 80.6 | 38 | 84.4 | 1.00 (Ref) |  |  | 64 | 79.0 | 26 | 86.7 | 1.00 (Ref) |  |  | 78 | 80.4 | 47 | 88.7 | 1.00 (Ref) |  |
| ≥25-29 | 67 | 26.9 | 23 | 22.8 | 0.60 (0.33, 1.08) | 0.09 |  | 19 | 24.1 | 2 | 8.7 | 0.54 (0.11, 2.80) | 0.46 |  | 8 | 12.9 | 6 | 13.3 | 5.51 (0.50, 60.64) | 0.16 |  | 13 | 16.0 | 1 | 3.3 | 0.32 (0.04, 2.80) | 0.30 |  | 8 | 8.2 | 3 | 5.7 | 0.87 (0.19, 3.90) | 0.85 |
| Trend‡ |  |  |  |  | 0.96 (0.65, 1.41) | 0.84 |  |  |  |  |  | 0.59 (0.21, 1.65) | 0.31 |  |  |  |  |  | 2.72 (0.45, 16.34) | 0.27 |  |  |  |  |  | 0.34 (0.091, 1.30) | 0.12 |  |  |  |  |  | 1.53 (0.61, 3.81) | 0.37 |
| **Parity** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Nulliparousᵃ | 23 | 9.2 | 3 | 3.0 | *N* |  | 4 | 5.0 | 2 | 8.0 | *N* |  | 2 | 3.1 | 0 | 0.0 | *N* |  | 1 | 1.1 | 1 | 3.1 | *N* |  | 7 | 7.1 | 1 | 1.9 | *N* |
| Parous | 226 | 90.8 | 98 | 97.0 | 1.00 (Ref) |  |  | 76 | 95.0 | 23 | 92.0 | 1.00 (Ref) |  |  | 63 | 96.9 | 45 | 100.0 | 1.00 (Ref) |  |  | 89 | 98.9 | 31 | 96.9 | 1.00 (Ref) |  |  | 91 | 92.9 | 52 | 98.1 | 1.00 (Ref) |  |
|  **Number of children** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  1-3 | 145 | 64.2 | 54 | 55.1 | 1.00 (Ref) |  |  | 38 | 50.0 | 6 | 26.1 | 1.00 (Ref) |  |  | 30 | 47.6 | 23 | 51.1 | 1.00 (Ref) |  |  | 41 | 46.1 | 9 | 29.0 | 1.00 (Ref) |  |  | 39 | 42.9 | 16 | 30.8 | 1.00 (Ref) |  |
|  4 or 5 | 81 | 35.8 | 44 | 44.9 | 1.55 (0.90, 2.67) | 0.11 |  | 38 | 50.0 | 17 | 73.9 | 3.30 (0.93, 11.76) | 0.07 |  | 33 | 52.4 | 22 | 48.9 | 0.82 (0.28, 2.43) | 0.72 |  | 48 | 53.9 | 22 | 71.0 | 2.88 (0.86, 9.64) | 0.09 |  | 52 | 57.1 | 36 | 69.2 | 1.59 (0.69, 3.67) | 0.28 |
|  **Cumulative breastfeeding**  **duration /month** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  T1: 1 - <48 | 81 | 36.3 | 22 | 22.7 | 1.00 (Ref) |  |  | 32 | 43.2 | 4 | 20.0 | 1.00 (Ref) |  |  | 16 | 26.2 | 13 | 28.9 | 1.00 (Ref) |  |  | 31 | 37.8 | 6 | 19.4 | 1.00 (Ref) |  |  | 27 | 31.0 | 8 | 16.7 | 1.00 (Ref) |  |
|  T2: 48 - <81 | 95 | 42.6 | 47 | 48.5 | 1.77 (0.95, 3.31) | 0.07 |  | 26 | 35.1 | 6 | 30.0 | 1.66 (0.34, 8.00) | 0.53 |  | 20 | 32.8 | 16 | 35.6 | 1.32 (0.34, 5.18) | 0.69 |  | 19 | 23.2 | 7 | 22.6 | 1.80 (0.43, 7.63) | 0.42 |  | 25 | 28.7 | 12 | 25.0 | 1.35 (0.41, 4.40) | 0.62 |
|  T3: ≥81 | 47 | 21.1 | 28 | 28.9 | 2.00 (0.96, 4.18) | 0.06 |  | 16 | 21.6 | 10 | 50.0 | 4.54 (0.97, 21.21) | 0.055 |  | 25 | 41.0 | 16 | 35.6 | 1.17 (0.28, 4.93) | 0.83 |  | 32 | 39.0 | 18 | 58.1 | 2.60 (0.73, 9.35) | 0.14 |  | 35 | 40.2 | 28 | 58.3 | 2.93 (0.97, 8.83) | 0.056 |
|  Trend‡ |  |  |  |  | 1.42 (0.99, 2.05) | 0.056 |  |  |  |  |  | **2.19 (1.00, 4.78)** | **0.049** |  |  |  |  |  | 1.08 (0.53, 2.21) | 0.84 |  |  |  |  |  | 1.60 (0.85, 3.00) | 0.14 |  |  |  |  |  | **1.76 (1.01, 3.04)** | **0.044** |
|  **Mean breastfeeding**  **duration per child/month** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <12 | 39 | 17.5 | 14 | 14.4 | 1.00 (Ref) |  |  | 19 | 25.7 | 4 | 20.0 | 1.00 (Ref) |  |  | 3 | 4.9 | 5 | 11.1 | 1.00 (Ref) |  |  | 12 | 14.6 | 6 | 19.4 | 1.00 (Ref) |  |  | 11 | 12.6 | 7 | 14.6 | 1.00 (Ref) |  |
| 12-23 | 103 | 46.2 | 50 | 51.5 | 1.32 (0.63, 2.78) | 0.46 |  | 36 | 48.6 | 10 | 50.0 | 0.93 (0.23, 3.77) | 0.92 |  | 42 | 68.9 | 29 | 64.4 | 1.18 (0.19, 7.39) | 0.86 |  | 48 | 58.5 | 16 | 51.6 | 0.55 (0.15, 2.07) | 0.38 |  | 48 | 55.2 | 25 | 52.1 | 1.03 (0.29, 3.66) | 0.97 |
| ≥24 | 81 | 36.3 | 33 | 34.0 | 1.27 (0.58, 2.79) | 0.55 |  | 19 | 25.7 | 6 | 30.0 | 0.86 (0.17, 4.27) | 0.86 |  | 16 | 26.2 | 11 | 24.4 | 1.93 (0.22, 17.02) | 0.55 |  | 22 | 26.8 | 9 | 29.0 | 0.56 (0.11, 2.91) | 0.49 |  | 29 | 32.2 | 16 | 33.3 | 1.27 (0.34, 4.79) | 0.72 |
| Trend‡ |  |  |  |  | 1.31 (0.97, 1.77) | 0.08 |  |  |  |  |  | 0.86 (0.47, 1.59) | 0.63 |  |  |  |  |  | 1.60 (0.60, 4.27) | 0.35 |  |  |  |  |  | 0.63 (0.29, 1.36) | 0.24 |  |  |  |  |  | 1.34 (0.80, 2.25) | 0.26 |
|  **Age at first pregnancy &**  **Number of children** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Age 25+ yr, 1-3 births | 74 | 32.7 | 24 | 24.5 | 1.00 (Ref) |  |  | 14 | 18.7 | 2 | 9.1 | 1.00 (Ref) |  |  | 8 | 13.3 | 5 | 11.1 | 1.00 (Ref) |  |  | 12 | 15.0 | 1 | 3.4 | 1.00 (Ref) |  |  | 9 | 10.0 | 5 | 9.6 | 1.00 (Ref) |  |
|  Age <25 yr, 1-3 births | 71 | 31.4 | 30 | 30.6 | 1.50 (0.77, 2.96) | 0.24 |  | 23 | 30.7 | 4 | 18.2 | 0.46 (0.06, 3.86) | 0.48 |  | 20 | 33.3 | 18 | 40.0 | 0.27 (0.02, 3.05) | 0.29 |  | 29 | 36.3 | 8 | 27.6 | 2.38 (0.24, 23.83) | 0.46 |  | 30 | 33.3 | 11 | 21.2 | 0.63 (0.15, 2.56) | 0.52 |
|  Age 25+ yr, 4+ births | 15 | 6.6 | 8 | 8.2 | 1.78 (0.65, 4.92) | 0.27 |  | 9 | 12.0 | 3 | 13.6 | 1.35 (0.15, 12.46) | 0.79 |  | 2 | 3.3 | 2 | 4.4 |  *N* |  |  | 4 | 5.0 | 2 | 6.9 | 12.02 (0.64, 226.73) | 0.10 |  | 4 | 4.4 | 0 | 0 | *N* |
|  Age <25 yr, 4+ births | 66 | 29.2 | 36 | 36.7 | 1.93 (0.99, 3.80) | 0.06 |  | 29 | 38.7 | 13 | 59.1 | 2.17 (0.37, 12.56) | 0.39 |  | 30 | 50.0 | 20 | 44.4 | 0.23 (0.02, 2.59) | 0.23 |  | 35 | 43.8 | 18 | 62.1 | 5.18 (0.55, 48.72) | 0.15 |  | 47 | 52.2 | 36 | 69.2 | 1.22 (0.35, 4.26) | 0.76 |
|  Trend‡ |  |  |  |  | 1.23 (0.99, 1.53) | 0.06 |  |  |  |  |  | 1.58 (0.91, 2.74) | 0.10 |  |  |  |  |  | 0.79 (0.48, 1.31) | 0.99 |  |  |  |  |  | 1.55 (0.92, 2.61) | 0.10 |  |  |  |  |  | 1.21 (0.85, 1.73) | 0.29 |
| **Number of children & Cumulative breastfeeding duration** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Nulliparous or ≤3 children & <62 months | 134 | 54.5 | 45 | 45.0 | 1.00 (Ref) |  |  | 37 | 47.4 | 7 | 31.8 | 1.00 (Ref) |  |  | 23 | 36.5 | 20 | 44.4 | 1.00 (Ref) |  |  | 36 | 43.4 | 8 | 25.0 | 1.00 (Ref) |  |  | 35 | 37.2 | 9 | 18.4 | 1.00 (Ref) |  |
| ≤3 children & ≥62 months | 31 | 12.6 | 12 | 12.0 | 1.04 (0.45, 2.39) | 0.93 |  | 4 | 5.1 | 1 | 4.5 | 1.63 (0.13, 20.05) | 0.70 |  | 7 | 11.1 | 3 | 6.7 | 0.59 (0.10, 3.63) | 0.57 |  | 6 | 7.2 | 2 | 6.3 | 1.26 (0.11, 14.74) | 0.85 |  | 8 | 8.5 | 5 | 10.2 | 1.65 (0.37, 7.41) | 0.51 |
| ≥4 children & <62 months | 20 | 8.1 | 9 | 9.0 | 1.74 (0.69, 4.42) | 0.24 |  | 15 | 19.2 | 2 | 9.1 | 0.92 (0.14, 6.16) | 0.93 |  | 2 | 3.2 | 4 | 8.9 | 0.57 (0.06, 5.54) | 0.63 |  | 4 | 4.8 | 2 | 6.3 | 6.93 (0.69, 69.10) | 0.10 |  | 10 | 10.6 | 5 | 10.2 | 1.82 (0.45, 7.44) | 0.40 |
| ≥4 children & ≥62 months | 61 | 24.8 | 34 | 34.0 | 1.62 (0.87, 3.02) | 0.13 |  | 22 | 28.2 | 12 | 54.5 | 3.00 (0.86, 10.50) | 0.09 |  | 31 | 49.2 | 18 | 40.0 | 0.69 (0.20, 2.36) | 0.55 |  | 37 | 44.6 | 20 | 62.5 | 2.74 (0.79, 9.50) | 0.11 |  | 41 | 43.6 | 30 | 61.2 | 2.79 (0.98, 7.89) | 0.054 |
| Trend‡ |  |  |  |  | 1.19 (0.97, 1.46) | 0.092 |  |  |  |  |  | 1.42 (0.93, 2.16) | 0.10 |  |  |  |  |  | 0.88 (0.59, 1.33) | 0.55 |  |  |  |  |  | 1.39 (0.93, 2.09) | 0.11 |  |  |  |  |  | 1.39 (0.996, 1.95) | 0.053 |

† Point estimates and 95% confidence intervals were from multivariable models, adjusting for categorized age at diagnosis and BMI, except where noticed. Estimates of numbers of children, cumulative and averaged breastfeeding duration, and combined age at first pregnancy and number of children were computed among parous women. ‡ Results were from the trend analysis using the categorical risk factor as a trend. ᵃ Nulliparous cases were women who reported never pregnant, never given birth, and had no children (N=37, 4.4%). AKU, Aga Khan University; BMI, body mass index; CI, confidence interval; ER, estrogen receptor; *N*, results not shown due to limited sample sizes; OR, odds ratio; T, tertile.