

## Supplement to: Travel of pregnant women in emergency situations to hospital and maternal mortality in Lagos, Nigeria: a retrospective cohort study

### Definitions

**Table S1:** Definitions of terms used in the study

| Terminology                               | Definition and source  |
|---|--|
| Maternal death                            | <p>the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes</p> <p>World Health Organization<br/> <a href="https://www.who.int/classifications/icd/ICD10Volume2_en_2010.pdf">https://www.who.int/classifications/icd/ICD10Volume2_en_2010.pdf</a></p>   |
| Emergency obstetric care (EmOC)           | <p>These are services rendered for the treatment of complications that arise during pregnancy and childbirth.</p>  |
| Maternal complications                    |  |
| No maternal complication                  | <p>Women who had no complication of their own but complications with their fetus(es) was the reason they presented with an obstetric emergency</p>   |
| Obstructed labour                         | <p>Prolonged or obstructed labour (dystocia, abnormal labour) (any of the following)</p> <ul style="list-style-type: none"> <li>• prolonged established first stage of labour (&gt; 12 h)</li> <li>• prolonged second stage of labour (&gt;1h)</li> <li>• cephalo-pelvic disproportion, including scarred uterus</li> <li>• malpresentation: transverse, brow or face presentation</li> </ul> <p>WHO, UNFPA, UNICEF<br/> <a href="https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&amp;isAllowed=y">https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&amp;isAllowed=y</a></p>   |
| Haemorrhage (ante-partum and post-partum) | <p>Antepartum: severe bleeding before and during labour: placenta praevia, placental abruption</p> <p>Postpartum: (any of the following)</p> <ul style="list-style-type: none"> <li>• bleeding that requires treatment (e.g., provision of intravenous fluids, uterotonic drugs or blood)</li> <li>• retained placenta</li> <li>• severe bleeding from lacerations (vaginal or cervical)</li> <li>• vaginal bleeding more than 500 ml after childbirth</li> <li>• more than one pad soaked in blood in 5 minutes</li> </ul> <p>WHO, UNFPA, UNICEF<br/> <a href="https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&amp;isAllowed=y">https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&amp;isAllowed=y</a></p> |
| Pre-eclampsia/eclampsia                   | <p>Severe pre-eclampsia: Diastolic blood pressure <math>\geq</math> 110 mm Hg or proteinuria <math>\geq</math> 3 after 20 weeks' gestation. Various signs and symptoms: headache, hyperreflexia, blurred vision, oliguria, epigastric pain, pulmonary oedema</p> <p>Eclampsia: Convulsions; diastolic blood pressure <math>\geq</math> 90 mm Hg after 20 weeks' gestation or proteinuria <math>\geq</math> 2. Signs and symptoms of severe pre-eclampsia may be present</p> <p>WHO, UNFPA, UNICEF<br/> <a href="https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&amp;isAllowed=y">https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&amp;isAllowed=y</a></p>   |

|                            |   |
|----------------------------|---|
| Sepsis                     | <p>A temperature of 38°C or higher more than 24h after delivery (with at least two readings, as labour alone can cause some fever) and any one of the following signs and symptoms: lower abdominal pain, purulent, offensive vaginal discharge (lochia), tender uterus, uterus not well contracted, history of heavy vaginal bleeding. (Rule out malaria)</p> <p>WHO, UNFPA, UNICEF<br/> <a href="https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&amp;isAllowed=y">https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&amp;isAllowed=y</a></p>   |
| Abortion                   | <p>Abortion in our study include voluntary and spontaneous abortions of all forms (missed abortions, inevitable miscarriage and incomplete miscarriage).</p> <p>Voluntary abortion refers to an intervention to terminate an unwanted, mistimed, or unplanned pregnancy. The persons, skills and medical standards considered safe in the provision of abortion are different for medical and surgical abortion and depend on the duration of the pregnancy.</p> <p><a href="https://www.gfmer.ch/SRH-Course-2018/adolescent-health/pdf/WHO-compilation-tool-abortion-section-2018.pdf">https://www.gfmer.ch/SRH-Course-2018/adolescent-health/pdf/WHO-compilation-tool-abortion-section-2018.pdf</a></p> |
| Ectopic pregnancy          | <p>Internal bleeding from a pregnancy outside the uterus; lower abdominal pain and shock possible from internal bleeding; delayed menses or positive pregnancy test</p> <p>WHO, UNFPA, UNICEF<br/> <a href="https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&amp;isAllowed=y">https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&amp;isAllowed=y</a></p>  |
| Ruptured Uterus            | <p>Uterine rupture with a history of prolonged or obstructed labour when uterine contractions suddenly stopped. Painful abdomen (pain may decrease after rupture of uterus). Patient may be in shock from internal or vaginal bleeding</p> <p>WHO, UNFPA, UNICEF<br/> <a href="https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&amp;isAllowed=y">https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&amp;isAllowed=y</a></p>   |
| Others                     | <p>This includes premature rupture of membranes, oligohydramnios, retained placenta, malpresentation and malposition at term, previous caesarean section, post-dated pregnancies, anaemia in pregnancy and non-obstetric complications (cardiomyopathy in pregnancy, gestational diabetes, asthma in pregnancy) and any other recorded complication that did not fit into the categorized complications above.</p>  |
| <b>Other variables</b>     |   |
| Booked at hospital of care | <p>Clinical records indicating that patient was booked for antenatal care at facility where patient gave birth and records were retrieved on travel to delivery care.</p>   |
| Referral                   | <p>a process in which a health worker at a level of the health system (initiating facility), having insufficient resources (drugs, equipment, skills) to manage a clinical condition, seeks the assistance of a better or differently resourced facility at the same or higher level (receiving facility) to assist in, or take over the management of, the client's case.</p> <p>WHO<br/> <a href="https://www.who.int/management/Referralnotes.doc">https://www.who.int/management/Referralnotes.doc</a></p>  |
| Initial point of care      | <p>This is the initial provider of care, which could have been another hospital (public), another hospital (private), clinic (public or private), primary health centre, traditional birth attendant, nursing/maternity home or some non-formal referral</p>  |

**Table S2a:** Components/Signal Functions of Comprehensive Emergency Obstetric Care

| S/No. | Signal function   |
|-------|---|
| 1.    | Administer parenteral antibiotics   |
| 2.    | Administer parenteral uterotonic drugs (i.e., parenteral oxytocin)                      |
| 3.    | Administer anticonvulsants (i.e., magnesium sulphate)                                   |
| 4.    | Manual removal of placenta  |
| 5.    | Removal of retained products (e.g., manual vacuum extraction or dilation and curettage) |
| 6.    | Perform assisted vaginal delivery (e.g., vacuum extraction or forceps delivery)         |
| 7.    | Perform basic neonatal resuscitation (e.g., with bag and mask)                          |
| 8.    | Perform surgery (e.g., caesarean section)   |
| 9.    | Perform blood transfusion   |

Note: 1-7 are basic services, 8-9 are comprehensive services. A Comprehensive Emergency Obstetric Care facility is one that performs all nine signal functions.

**Table S2b:** Components/Signal Functions and related obstetric complications

| Major obstetric complication        | Signal Function  |
|-------------------------------------|--|
| Haemorrhage                         | <i>Antepartum:</i>                                     |
|                                     | Perform blood transfusion                              |
|                                     | Perform surgery (e.g., caesarean for placenta praevia) |
|                                     | <i>Postpartum:</i>                                     |
|                                     | Administer uterotonic drugs                            |
|                                     | Perform blood transfusion                              |
|                                     | Perform manual removal of placenta                     |
|                                     | Perform removal of retained products                   |
|                                     | Perform surgery (hysterectomy) for uterine rupture     |
|                                     | Perform assisted vaginal delivery                      |
| Prolonged or obstructed labour      | Perform surgery (caesarean section)                    |
|                                     | Administer uterotonic drugs                            |
|                                     | Perform neonatal resuscitation                         |
| Postpartum sepsis                   | Administer parenteral antibiotics                      |
|                                     | Remove retained products                               |
|                                     | Perform surgery for pelvic abscess                     |
| Complications of abortion           | <i>For haemorrhage:</i>                                |
|                                     | Perform blood transfusion                              |
|                                     | Remove retained products                               |
|                                     | <i>For sepsis:</i>                                     |
|                                     | Administer parenteral antibiotics                      |
|                                     | Remove retained products                               |
|                                     | For intra-abdominal injury:                            |
|                                     | Administer parenteral antibiotics                      |
|                                     | Perform blood transfusion                              |
|                                     | Pre-eclampsia or eclampsia                             |
| Perform neonatal resuscitation      |  |
| Perform surgery (caesarean section) |  |
| Ectopic pregnancy                   | Perform surgery  |
|                                     | Perform blood transfusion                              |
| Ruptured uterus                     | Perform surgery  |
|                                     | Perform blood transfusion                              |
|                                     | Administer parenteral antibiotics                      |
| Newborn distress (intrapartum)      | Perform newborn resuscitation                          |
|                                     | Perform surgery (caesarean)                            |

Source: WHO, UNFPA, UNICEF

[https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734\\_eng.pdf?sequence=1&isAllowed=y](https://apps.who.int/iris/bitstream/handle/10665/44121/9789241547734_eng.pdf?sequence=1&isAllowed=y)

**Table S3:** Geographical characteristics of area principally served by public hospitals offering comprehensive EmOC in Lagos State

| S/N | Facility name  | Local Government Area | Population density | Water body | Settlement type | Slum population | Access to facility |
|-----|--|-----------------------|--------------------|------------|-----------------|-----------------|--------------------|
| 1   | Agbowo General Hospital                                | Epe                   | Sparse             | No         | Town            | Non-slum        | Easy               |
| 2   | Ajeromi Ifelodun General Hospital                      | Ajeromi-Ifelodun      | Dense              | No         | Suburb          | Slum            | Difficult          |
| 3   | Alimosho General Hospital                              | Alimosho              | Dense              | No         | Suburb          | Non-slum        | Difficult          |
| 4   | Amuwo-Odofin MCC                                       | Amuwo-odofin          | Dense              | Yes        | Suburb          | Non-slum        | Easy               |
| 5   | Apapa General Hospital                                 | Apapa                 | Sparse             | No         | Suburb          | Non-slum        | Difficult          |
| 6   | Badagry General Hospital                               | Badagry               | Sparse             | Yes        | Town            | Non-slum        | Easy               |
| 7   | Epe General Hospital                                   | Epe                   | Sparse             | Yes        | Town            | Non-slum        | Easy               |
| 8   | Eti-Osa MCC*   | Eti-Osa               | Sparse             | Yes        | Suburb          | Non-slum        | Easy               |
| 9   | FMC Ebute-Metta  | Lagos Mainland        | Dense              | No         | Suburb          | Non-slum        | Difficult          |
| 10  | Gbagada General Hospital                               | Somolu                | Dense              | No         | Suburb          | Non-slum        | Easy               |
| 11  | Harvey Road Health Centre                              | Mainland              | Dense              | No         | Suburb          | Non-slum        | Easy               |
| 12  | Ibeju-Lekki General Hospital                           | Ibeju-Lekki           | Sparse             | Yes        | Town            | Non-slum        | Easy               |
| 13  | Ifako-Ijaiye MCC                                       | Ifako-Ijaiye          | Dense              | No         | Suburb          | Non-slum        | Easy               |
| 14  | Ijede Health Care Centre                               | Ikorodu               | Sparse             | No         | Town            | Non-slum        | Easy               |
| 15  | Ikorodu MCC  | Ikorodu               | Sparse             | Yes        | Town            | Non-slum        | Easy               |
| 16  | Institute of Maternal and Child Health - Àyinkẹ House* | Ikeja                 | Dense              | No         | Suburb          | Non-slum        | Easy               |
| 17  | Isolo MCC  | Oshodi-Isolo          | Sparse             | No         | Suburb          | Non-slum        | Easy               |
| 18  | Lagos Island Maternity Hospital                        | Lagos Island          | Very dense         | No         | City            | Non-slum        | Easy               |
| 19  | Lagos University Teaching Hospital                     | Mushin                | Very dense         | No         | City            | Non-slum        | Easy               |
| 20  | Mushin General Hospital                                | Mushin                | Very dense         | No         | Suburb          | Slum            | Easy               |
| 21  | Onikan Health Care Centre                              | Lagos Island          | Very dense         | No         | Suburb          | Slum            | Easy               |
| 22  | Orile Agege General Hospital                           | Agege                 | Dense              | No         | City            | Non-slum        | Easy               |
| 23  | Randle General Hospital (Gbaja-Surulere MCC)           | Surulere              | Dense              | No         | Suburb          | Slum            | Easy               |
| 24  | Somolu General Hospital                                | Somolu                | Dense              | No         | Suburb          | Non-slum        | Easy               |

Note: Facilities in towns are in the rural parts of Lagos. Those situated in suburbs and the city are in the urban parts of Lagos (Lagos metropolis).

**Table S4:** Location and service characteristics of public hospitals offering comprehensive EmOC in Lagos State

| S/N | Facility name  | Latitude (x) | Longitude (y) | Facility type                 | Type of referral facility | Year of establishment | Number of deliveries in 2018 |
|-----|--|--------------|---------------|-------------------------------|---------------------------|-----------------------|------------------------------|
| 1   | Agbowa General Hospital                                | 6.645643     | 3.712914      | General Hospital              | Non-apex referral         | 2003                  | 157                          |
| 2   | Ajeromi Ifelodun General Hospital                      | 6.455283     | 3.33362       | Maternal and Childcare Centre | Non-apex referral         | 1983                  | 825                          |
| 3   | Alimosho General Hospital                              | 6.561196     | 3.250662      | Maternal and Childcare Centre | Non-apex referral         | 2006                  | 2,484                        |
| 4   | Amuwo-Odofin MCC                                       | 6.461779     | 3.301963      | Maternal and Childcare Centre | Non-apex referral         | 2014                  | 2,484                        |
| 5   | Apapa General Hospital                                 | 6.441943     | 3.368962      | General Hospital              | Non-apex referral         | 1964                  | 120                          |
| 6   | Badagry General Hospital                               | 6.413752     | 2.900374      | General Hospital              | Non-apex referral         | 1957                  | 973                          |
| 7   | Epe General Hospital                                   | 6.586945     | 3.971665      | General Hospital              | Non-apex referral         | 1954                  | 883                          |
| 8   | Eti-Osa MCC*   | 6.465421     | 3.585173      | Maternal and Childcare Centre | Non-apex referral         | 2019                  | -                            |
| 9   | FMC Ebute-Metta  | 6.484271     | 3.380194      | Tertiary Hospital             | Apex Referral             | 1964                  | 890                          |
| 10  | Gbagada General Hospital                               | 6.551919     | 3.387304      | General Hospital              | Non-apex referral         | 1983                  | 1,729                        |
| 11  | Harvey Road Health Centre                              | 6.50935      | 3.372629      | General Hospital              | Non-apex referral         | 1962                  | 717                          |
| 12  | Ibeju-Lekki General Hospital                           | 6.439312     | 3.934335      | General Hospital              | Non-apex referral         | 2006                  | 982                          |
| 13  | Ifako-Ijaiye MCC                                       | 6.680364     | 3.291382      | Maternal and Childcare Centre | Non-apex referral         | 2006                  | 2,916                        |
| 14  | Ijede Health Care Centre                               | 6.564649     | 3.596596      | General Hospital              | Non-apex referral         | 1983                  | 869                          |
| 15  | Ikorodu MCC  | 6.608265     | 3.499394      | Maternal and Childcare Centre | Non-apex referral         | 1983                  | 2,820                        |
| 16  | Institute of Maternal and Child Health - Àyinkę House* | 6.590868     | 3.34092       | Tertiary Hospital             | Apex Referral             | 1955                  | -                            |
| 17  | Isolo MCC  | 6.527787     | 3.318979      | Maternal and Childcare Centre | Non-apex referral         | 1975                  | 2,147                        |
| 18  | Lagos Island Maternity Hospital                        | 6.448543     | 3.397417      | Tertiary Hospital             | Apex Referral             | 1960                  | 3,681                        |
| 19  | Lagos University Teaching Hospital                     | 6.517803     | 3.353786      | Tertiary Hospital             | Apex Referral             | 1962                  | 2,011                        |
| 20  | Mushin General Hospital                                | 6.531566     | 3.348531      | General Hospital              | Non-apex referral         | 1954                  | 524                          |
| 21  | Onikan Health Care Centre                              | 6.444656     | 3.405436      | General Hospital              | Non-apex referral         | 1971                  | 544                          |
| 22  | Orile Agege General Hospital                           | 6.635353     | 3.303379      | General Hospital              | Non-apex referral         | 1982                  | 1,677                        |
| 23  | Randle General Hospital (Gbaja-Surulere MCC)           | 6.50433      | 3.359574      | Maternal and Childcare Centre | Non-apex referral         | 1960                  | 2,056                        |
| 24  | Somolu General Hospital                                | 6.536461     | 3.372251      | General Hospital              | Non-apex referral         | 2006                  | 619                          |

\*Facilities not running in 2018. As such no details available on number of deliveries.

**Table S5:** Full description of models

| <b>Model</b>  | <b>Description</b>   |
|---|--|
| Model 1   | This model includes socio-demographic factors, pregnancy related factors, distance and time variables, and variables describing characteristics of facility of birth. Each variable in the model was adjusted for by all other variables in the same model.  |
| Model 2 A (Sub-group analysis of women who travelled from home directly to a health facility) | This model is restricted to all women who travelled directly from home to a health facility and includes socio-demographic factors, pregnancy related factors, distance and time variables, and variables describing characteristics of facility of birth. Each variable in the model was adjusted for by all other variables in the same model.             |
| Model 2 B (Sub-group analysis of women who were referred to a health facility)                | This model is restricted to all women who were referred in their journey from home to a health facility and includes socio-demographic factors, pregnancy related factors, distance and time variables, and variables describing characteristics of facility of birth. Each variable in the model was adjusted for by all other variables in the same model. |

**Table S6a:** Distance in kilometres by maternal outcome and obstetric complication for mothers with traceable journeys

| Variable                            | N     | Total (N=3,590) |      | Mother alive (n=3,430) |      | Mother dead (n=160) |      |
|-------------------------------------|-------|-----------------|------|------------------------|------|---------------------|------|
| Obstetric complication              |       | Median (IQR)    | Mean | Median (IQR)           | Mean | Median (IQR)        | Mean |
| All women                           | 3,590 |                 |      | 7.6 (3.4, 18)          | 13.7 | 8.3 (5.0, 16.6)     | 13.9 |
| No maternal complications           | 122   | 7.2 (3.5, 20.7) | 15.7 | 7.0 (3.2, 20.7)        | 15.3 | 16.2 (6.8, 33.7)    | 23.3 |
| Prolonged/obstructed labour         | 883   | 6.0 (2.9, 15.0) | 12.0 | 6.0 (2.9, 15.0)        | 12.0 | 10.2 (2.6, 22.4)    | 11.9 |
| Ante-partum/post-partum haemorrhage | 604   | 8.5 (4.1, 18.5) | 14.2 | 8.5 (4.1, 19.0)        | 14.4 | 8.4 (4.3, 14.1)     | 10.5 |
| Pre-eclampsia/Eclampsia             | 802   | 8.4 (3.9, 20.4) | 15.3 | 8.5 (3.8, 20.6)        | 15.4 | 7.7 (4.9, 14.8)     | 12.9 |
| Sepsis                              | 145   | 5.8 (2.5, 13.4) | 11.1 | 5.5 (2.4, 13.3)        | 10.8 | 7.8 (7.3, 22.1)     | 19.2 |
| Abortion                            | 535   | 7.4 (3.4, 16.0) | 12.2 | 7.4 (3.2, 16.0)        | 12.0 | 7.7 (4.8, 18.9)     | 14.4 |
| Ectopic pregnancy                   | 209   | 9.3 (4.7, 21.0) | 15.1 | 8.9 (4.7, 20.7)        | 14.9 | 12.1 (6.2, 23.9)    | 16.1 |
| Others                              | 290   | 8.7 (3.9, 21.4) | 15.4 | 8.7 (3.8, 21.7)        | 15.5 | 6.9 (5.6, 11.5)     | 9.3  |

**Table S6b:** Time in minutes by maternal outcome and obstetric complication for mothers with traceable journeys

| Variable                            | N     | Total (N=3,590) |      | Mother alive (n=3,430) |      | Mother dead (n=160) |      |
|-------------------------------------|-------|-----------------|------|------------------------|------|---------------------|------|
|                                     |       | Median (IQR)    | Mean | Median (IQR)           | Mean | Median (IQR)        | Mean |
| All women                           | 3,590 |                 |      | 26 (12, 51)            | 38.6 | 28 (17, 43)         | 37.5 |
| No maternal complication            | 122   | 30 (12, 65)     | 47.5 | 30 (12, 65)            | 46.5 | 44 (28, 67)         | 66.2 |
| Prolonged/obstructed labour         | 883   | 20 (10, 45)     | 33.0 | 20 (10, 45)            | 33.0 | 30 (9, 61)          | 36.8 |
| Ante-partum/post-partum haemorrhage | 604   | 27 (14, 55)     | 39.3 | 27 (14, 55)            | 39.6 | 28 (18, 46)         | 32.9 |
| Pre-eclampsia/Eclampsia             | 802   | 30 (14, 58)     | 43.7 | 30 (14, 60)            | 44.0 | 24 (16, 38)         | 34.6 |
| Sepsis                              | 145   | 20 (9, 45)      | 31.7 | 19 (8, 45)             | 31.2 | 28 (26, 45)         | 40.4 |
| Abortion                            | 535   | 24 (12, 45)     | 34.3 | 23 (11, 45)            | 33.8 | 28 (16, 43)         | 37.8 |
| Ectopic pregnancy                   | 209   | 30 (16, 55)     | 43.3 | 30 (16, 55)            | 43.6 | 29 (18, 53)         | 40.9 |
| Others                              | 290   | 30 (14, 58)     | 43.6 | 30 (14, 60)            | 44.2 | 21 (17, 30)         | 23.5 |

**Table S6c:** Distance in kilometres and time of travel in min to facility of care by facility of referral for all mothers with traceable journeys

| Variable                    | N   | Distance travelled |      | Time of travel |       |
|-----------------------------|-----|--------------------|------|----------------|-------|
| Facility type               |     | Median (IQR)       | Mean | Median (IQR)   | Mean  |
| All women referred          | 612 | 15.6 (7.6 – 29.7)  | 23.1 | 54 (28 – 91)   | 68.0  |
| Another hospital (public)   | 143 | 23.4 (9.7 – 40.6)  | 31.7 | 80 (51 – 128)  | 95.0  |
| Another hospital (private)  | 99  | 15.5 (8.9 – 27.7)  | 21.1 | 52 (30 – 95)   | 70.0  |
| Clinic (public or private)  | 17  | 19.2 (8.3 – 31.1)  | 19.2 | 51 (26 – 93)   | 62.6  |
| Primary health centre       | 337 | 13.2 (6.3 – 23.8)  | 20.1 | 45 (22 – 77)   | 56.3  |
| Traditional birth attendant | 13  | 15 (6.1 – 19)      | 20.2 | 41 (28 – 58)   | 50.9  |
| Nursing/maternity home      | 2   | 36.1 (9.3 – 62.8)  | 36.1 | 98 (40 – 155)  | 97.5  |
| Non-formal referral         | 2   | 32.0 (8.5 – 55.4)  | 32.0 | 116 (21 – 210) | 115.5 |



**Table S7:** Logistic regression showing association between maternal death and the selected independent variables

| Factor  | Model 2A (95% CI)      | Model 2B (95% CI)       |
|---|------------------------|-------------------------|
| Age   |                        |                         |
| 12-19   | 1.60 (0.63 – 4.06)     | (empty)                 |
| 20-34   | 1.00                   | 1.00                    |
| 35-60   | 1.27 (0.82 – 1.97)     | 1.47 (0.58 – 3.75)      |
| Marital status  |                        |                         |
| Single  | 0.87 (0.45 – 1.69)     | 1.66 (0.27 – 10.01)     |
| Married   | 1.00                   | 1.00                    |
| Obstetric complications in previous pregnancy   |                        |                         |
| No  | 1.00                   | 1.00                    |
| Yes   | 0.39 (0.19 – 0.80) *   | 0.42 (0.10 – 1.70)      |
| Booking status at hospital of care  |                        |                         |
| Un-booked   | 1.00                   | 1.00                    |
| Booked  | 0.22 (0.11 – 0.43) *** | (empty)                 |
| Maternal complications  |                        |                         |
| No maternal complication  | 1.00                   | 1.00                    |
| Obstructed labour   | 0.18 (0.04 – 0.72) *   | 0.62 (0.04 – 8.74)      |
| Haemorrhage   | 0.62 (0.21 – 1.85)     | 0.95 (0.10 – 9.30)      |
| Hypertension  | 0.77 (0.26 – 2.24)     | 0.85 (0.08 – 9.20)      |
| Sepsis  | 0.74 (0.18 – 3.05)     | 1.56 (0.07 – 36.69)     |
| Abortion  | 1.82 (0.64 – 5.20)     | 2.98 (0.05 – 23.12)     |
| Ectopic pregnancy   | 1.33 (0.43 – 4.10)     | 1.81 (0.12 – 28.43)     |
| Others  | 0.85 (0.25 – 2.95)     | 1.06 (0.12 – 28.43)     |
| Mode of birth   |                        |                         |
| Spontaneous vaginal birth   | 1.00                   | 1.00                    |
| Assisted vaginal birth  | 3.17 (1.52–6.62) **    | 14.58 (2.02–105.29) **  |
| Caesarean birth   | 0.49 (0.24–0.97) *     | 0.27 (0.08–0.88) *      |
| Uterine evacuation  | (omitted)              | (omitted)               |
| Total traceable distance for all women whose journeys were traceable (N=3,590 <sup>††</sup> ) |                        |                         |
| Within 5 Km   | 1.00                   | 1.00                    |
| 5 – 10 Km   | 1.57 (0.90–2.76)       | 1.66 (0.33–8.39)        |
| >10 – 15 Km   | 2.48 (1.18–5.23) *     | 2.12 (0.24–19.08)       |
| >15 – 25 Km   | 1.43 (0.53–3.84)       | 3.28 (0.32–33.31)       |
| >25 – 35 Km   | 0.95 (0.25–3.54)       | 21.40 (1.24–36.72) *    |
| >35 Km  | 0.52 (0.10–2.77)       | 49.63 (2.39–103.05) *   |
| Total traceable time for all women whose journeys were traceable (N=3,590 <sup>††</sup> )     |                        |                         |
| 0 – 9 minutes   | 1.00                   | 1.00                    |
| 10 – 29 minutes   | 1.59 (0.79–3.17)       | 184.23 (5.14–608.51) ** |
| 30 – 59 minutes   | 1.13 (0.45–2.84)       | 74.82 (3.42–163.79) **  |
| 60 – 119 minutes  | 1.15 (0.31–4.25)       | 13.83 (1.11–171.51) *   |
| 120 – 480 minutes   | 7.05 (1.10–45.32) *    |                         |
| Facility type   |                        |                         |
| Non-apex referral   | 0.54 (0.24–1.20)       | 3.33 (0.42–25.91)       |
| Apex referral   | 1.00                   | 1.00                    |
| Principal settlement type served by hospital  |                        |                         |
| Urban   | 1.00                   | 1.00                    |
| Suburban  | 3.07 (1.27–7.44) *     | 7.77 (0.54–112.37)      |
| Rural   | 3.03 (1.13–8.08) *     | 0.34 (0.01–11.59)       |
| Majority population type served in facility catchment area                                    |                        |                         |
| Non-slum  | 1.00                   | 1.00                    |
| Slum  | 1.77 (1.08 – 2.90) *   | 0.79 (0.29 – 2.15)      |

Footnote: \*\*\* $p \leq 0.001$ ; \*\* $p \leq 0.010$ ; \* $p \leq 0.050$ ; OR Odds Ratio, CI Confidence Interval

†: Excludes women whose referral journey could not be traced (n=415)

‡: Excludes women whose journey to hospital could not be determined (n=166)

§: Excludes ten missing values

Footnote: Model description: For Model 2A: sub-group analysis for all women who travelled from home directly to a health facility (Total maternal deaths: 140), Model 2B: sub-group analysis for all women who were referred in their journey from home to a health facility (Total maternal deaths: 42). Number of deaths per distance category for referred women: Within 5 Km (4 deaths), 5 – 10 Km (7), &gt;10 – 15 Km (4), &gt;15 – 25 Km (6), &gt;25 – 35 Km (4), &gt;35 Km (4); Number of deaths per distance category for non-referred women: Within 5 Km (37 deaths), 5 – 10 Km (42), &gt;10 – 15 Km (24), &gt;15 – 25 Km (13), &gt;25 – 35 Km (7), &gt;35 Km (8); Number of deaths per travel time category for referred women: Within 0-9mins (0 death), 10-29mins (9), 30-59mins (11), 60-119mins (8), 120-480mins (1); Number of deaths per travel time category for non-referred women: Within 0-9mins (15 deaths), 10-29mins (66), 30-59mins (32), 60-119mins (12), 120-480mins (6).