**A multilevel Bayesian Markov Chain** **Monte Carlo Poisson modelling of factors associated with components of antenatal care offered to pregnant women in Nigeria**

Omon Stellamaris Fagbamigbea, Olugbenga Sunday Olaseindeb, Oluwasomidoyin O. Belloc, Vincent Setlhared,Jackline Mosinya Nyaberie, Anthony Ike Wegbomf, Ayo Stephen Adebowaleg,h, \*Adeniyi Francis Fagbamigbeg,i,j

aPortsmouth Business School, Faculty of Business and Law, University of Portsmouth, United Kingdom

bDepartment of Sociology, Adekunle Ajasin University, Akungba Akoko, Nigeria

cDepartment of Obstetrics and Gynaecology, College of Medicine, University of Ibadan, Ibadan, Nigeria f dDepartment of Family Medicine and Public Health, Faculty of Medicine, University of Botswana, Gaborone, Botswana.

eDepartment of Environmental Health and Disease Control, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya.

fDepartment of Public Health Sciences, College of Medical Sciences, Rivers State University, Port Harcourt, Nigeria.

gDepartment of Epidemiology and Medical Statistics, College of Medicine, University of Ibadan, Ibadan, Nigeria

hPopulation Health and Research Entity, North-West University, Mafikeng, South Africa

iHealth Data Science Unit, Division of Population and Behavioural Science, School of Medicine, University of St Andrews, St Andrews, United Kingdom

jInstitute of Applied Health Sciences, School of Medicine, Medical Sciences & Nutrition, University of Aberdeen, Aberdeen, United Kingdom

\*Correspondence: [franstel74@yahoo.com; fadeniyi@cartafrica.org](mailto:franstel74@yahoo.com;%20fadeniyi@cartafrica.org); +2348061348165; ORCID: 0000-0001-9184-8258

Omon Stellamaris Fagbamigbe: omonstellamaris@yahoo.com

Olugbenga Olaseinde: [gbengaseinde@gmail.com](mailto:gbengaseinde@gmail.com)

Oluwasomidoyin O. Bello: bellodoyin@yahoo.com

Vincent Setlhare : [setlharev@ub.ac.bw](mailto:setlharev@ub.ac.bw)

Jackline Mosinya Nyaberi: [jnyaberij@gmail.com](mailto:jnyaberij@gmail.com)

Ayo S. Adebowale: adehamilt2008@yahoo.com

Adeniyi Francis Fagbamigbe: [franstel74@yahoo.com; fadeniyi@cartafrica.org](mailto:franstel74@yahoo.com;%20fadeniyi@cartafrica.org)

Supplementary Table A: Distribution of having all ANC component received during the most recent pregnancyby States and regions in Nigeria

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Region** | **State** | **Had ≥1 ANC Contacts (%)** | **n** | **All 9** |
| North Central |  | **72.2** | **1,420** | **4.5** |
|  | Plateau | 75.9 | 203 | 2.6 |
|  | Kogi | 82.2 | 147 | 0.4 |
|  | Niger | 59.2 | 271 | 0.8 |
|  | Nasarawa | 77.6 | 185 | 4.8 |
|  | Benue | 74.6 | 356 | 8.3 |
|  | FCT, Abuja | 87.7 | 91 | 3.4 |
|  | Kwara | 74.6 | 167 | 8.6 |
| North East |  | **71.5** | **2,142** | **3.1** |
|  | Borno | 62.4 | 350 | 0.1 |
|  | Taraba | 79.6 | 280 | 1.3 |
|  | Yobe | 69.8 | 417 | 2.1 |
|  | Bauchi | 66.9 | 493 | 2.4 |
|  | Gombe | 74.5 | 251 | 3.5 |
|  | Adamawa | 84.5 | 351 | 9.3 |
| North West |  | **63.7** | **3,772** | **1.5** |
|  | Kebbi | 52.1 | 281 | 0.3 |
|  | Kano | 83.6 | 1,106 | 0.6 |
|  | Katsina | 53.0 | 635 | 3.2 |
|  | Kaduna | 70.0 | 787 | 1.4 |
|  | Zamfara | 36.3 | 187 | 0.0 |
|  | Sokoto | 46.9 | 176 | 2.7 |
|  | Jigawa | 79.5 | 600 | 2.1 |
| South East |  | **96.2** | **1,479** | **8.3** |
|  | Ebonyi | 94.4 | 349 | 6.4 |
|  | Enugu | 96.2 | 222 | 2.4 |
|  | Imo | 97.5 | 277 | 6.7 |
|  | Anambra | 96.6 | 456 | 4.5 |
|  | Abia | 96.2 | 175 | 31.7 |
| South South |  | **81.1** | **1,111** | **5.8** |
|  | Cross River | 84.0 | 132 | 6.5 |
|  | Edo | 90.0 | 165 | 0.7 |
|  | Bayelsa | 42.3 | 47 | 6.1 |
|  | Rivers | 87.6 | 360 | 4.6 |
|  | Akwa Ibom | 80.7 | 206 | 11.4 |
|  | Delta | 76.7 | 201 | 5.7 |
| South West |  | **94.1** | **1,945** | **12.2** |
|  | Osun | 98.8 | 236 | 3.6 |
|  | Lagos | 95.4 | 691 | 10.4 |
|  | Ekiti | 93.1 | 145 | 5.4 |
|  | Oyo | 87.9 | 402 | 19.6 |
|  | Ondo | 95.4 | 186 | 1.5 |
|  | Ogun | 96.2 | 285 | 23.5 |
| **Total** |  | **75.2** | **11,867** | **5.1** |

Supplementary Table B: The BIC and ICCs of the levels of the different models considered.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Null model | Individual-level alone | Community-level alone | State-level alone | All levels included |
| ICC\* |  |  |  |  |  |
| Individual | 1 | 1 | 1 | 1 | 1 |
| Community | 0.34(0.29-0.44) | 0.34(0.30-0.45) | 0.19(0.13-0.26) | 0.29(0.27-0.36) | 0.10(0.05-0.33) |
| State | 0.14(0.12-0.17) | 0.19(0.12-0.26) | 0.21(0.13-0.28) | 0.06(0.01-0.01) | 0.09(0.05-0.17) |
| BIC | 45898.6 | 43215.9 | 44158.1 | 44211.7 | 41927.3 |
| ICC Intraclass Correlation Coefficient BIC Bayesian Information Criteria \*computed as ratio of the variability in the community and state levels compared with the individual levels | | | | | |