Factors influencing the survival of under-five children among women visiting government health care facility in semi-urban communities in Nigeria

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Abstract: Background: Child survival is low in Nigeria and often related to the poor health practices of mothers and other exogenous factors. The various factors affecting survival chance of under five children have not fully been studied. So there is need to enhance child survival in order to achieve the SDG 3. Objective: The study seeks to examine factors that have promoted child survival among mothers using institutional health facilities in Ado-Odo/Ota, Ogun State Nigeria. Methods: Study was based on a 2017 cross-sectional survey on determinants of child morbidity and survival in Ogun State by Covenant University Public Health and Wellbeing Research Cluster. Descriptive statistics and regression analyses were applied on 1350 respondents that constituted the sample size. All analysis was done on STATA Version 12. Results: Knowledge of child preventable diseases ($X^2 = 8.9978; P = 0.003$); birth spacing ($X^2 = 31.7293; P = 0.000$); duration of breast feeding ($X^2 = 14.3756; P = 0.002$) and immunization status ($X^2 = 18.8541; P = 0.000$) showed significant influence on child survival. Conclusion and Recommendation: Mothers'

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PUBLIC INTEREST STATEMENT

A Nation's healthcare services are crucial for the well-being of the citizens, including children. Incidentally, Nigeria is a country with a high U-5 mortality rate, poor health status, high poverty level, low literacy rate, lack of potable water supply, poor sanitation, inadequate housing, traditional behaviors and harmful cultural practices. Numerous factors influence the survival of under five children in Nigeria and understanding the drivers of survival among children will lead to better insights and informed policy interventions that will improve their well-being and accelerate the achievement of SDG 3. The study was semi-urban based and examined the factors influencing child survival among 1350 women using public health facilities. The study unveiled that knowledge of child preventable diseases and maternal-child care practices (birth spacing, duration of breast feeding, and immunization) as the drivers of child survival and offer recommendations that will improve the survival rate of U-5 children.
knowledge of child preventable diseases and factors related to maternal child care practices were found to influence child survival. From the findings the study recommends women empowerment and health education for both mothers and their spouses.

Subjects: Cultural Studies; Sociology; Gender Studies - Soc Sci
Keywords: Child survival; government healthcare facility; under-five children; Nigeria; SDGs

1. Introduction
The increase knowledge and practice of mothers on child survival strategies will lead to improvement on child survival and realization of SDG 3 targets by 2030. Under 5 year Children have little or no resistance to sickness and diseases due to their low level of immunity (Adepoju, 1984; Adepoju, Akanni, & Falusi, 2012). Although, childhood diseases are reported to be preventable, if timely and adequate measures are taken, the rate of mortality among these groups is extremely high in most developing countries (UNICEF, 2015; USAID 2014). The health status of any nation to a great extent is directly related to the care given to both women and children, leading to their high level of survival. Globally 5.9 million children under the age 5 died in 2015 and most of these deaths were from preventable causes (UN Inter Agency Group for Child Mortality Estimation Report [UNIGME], 2017, 2018). Studies have shown that at least a child dies out of every 12 births before reaching age 5 years in sub-Saharan Africa countries unlike the loss of one child out of every 147 births in developed countries (United Nations [UN], 2015; UNICEF, 2017; UNIGME, 2018; United Nations Population Fund. According to NDHS 2013, the child mortality in Nigeria is 128 per 1,000 live births (National Population Commission [NPC], 2014), which is equally deplorable, despite health interventions that have been put in place. In addition, one out of the several Sustainable Development Goals (UN-SDG)—i.e., Goal 3—is to make sure that citizens of the member state countries are healthy and people of all ages are in good health (Samuel, 2017; UN, 2015). Incidentally, child survival in Nigeria is very low, perhaps due to poor use of government health facility. According to NPC (2014) the use of government health facility in Nigeria is low as 36% of women had their children delivered in government health facility.

In developing countries pregnancy-related complications (PRCs) cause great havoc with respect to the deaths of pregnant mothers and their babies. And most of these deaths could be prevented with access to institutional care before, during and after pregnancy or child birth. Countries in sub-Saharan Africa including Nigeria, have high child morbidity and mortality and consequentially the health care delivery services also poor, particularly in rural areas (Chol, Negin, Agho, & Cumming, 2019; Ghimire et al., 2019). Using government health facility by women during pregnancy and child birth ensures healthy mother and healthy child. It also promotes, protect and maintain the health of the mother during pregnancy, reduce maternal and child complications, morbidity, increases knowledge of personal hygiene, environmental sanitation, child care and mother craft education (Ghimire et al., 2019).

However, women’s access to health care services is constrained by several factors ranging from time spent on child care, domestic chores, job responsibilities, cultural tenets, behavior of health personnel, and quality of care, distance and cost of service. Despite many interventions on child mortality such as World Summit for Children 2000, Sustainable Development Goals 2015 among others, the level of child survival is still at undesirable rate and millions under five children die mostly from vaccine preventable diseases every year. While it is important to identify the medical or health factors that can lead to poor child survival, it is equally significant to identify those non-medical and behavioral factors that are associated with the survival chances of children. According to UNFPA (2018), despite major gains in child survival rates over the past two decades, child mortality persists. The objective of the study, therefore, was to examine the factors influencing
child survival in the study area. Thus, the study is imperative for designing health policies and breakthroughs on the health and wellbeing of under-five children.

2. Review of literature

The low rates of child survival are related to poor subscription of health facilities by nursing mothers, particularly the ones owned by the government, lack of access to health care services and inadequate knowledge about health services by mothers. The past few decades have witnessed increasing concern among developing countries including Nigeria with poor state of health and abysmal under-five mortality of children. A very important factor contributing to morbidity and mortality of the vulnerable groups in developing countries is restricted access to correct and appropriate utilization of institutional care services even when they are available. Some of the causes of deaths that claim the lives of mothers during pregnancy or delivery are avoidable (Ozumba & Nwogu-Ikojo, 2008). Some scholars have found that wide spread poverty, low level of education, inaccessibility of health care services, un-booked emergencies were among non-medical factors retarding maternal health and child survival in Nigeria apart from medical factors (Akokuwebe & Okafor, 2015; Azuh et al., 2017).

Furthermore it has been confirmed that low patronage of health facilities by pregnant women for antenatal and for delivery led to the high number of maternal deaths in Nigeria (Ayutunde, Martin, & Olusola, 2015) with ripple effects on child survival (Azuh, 1994). Findings from the 2013 Nigeria Demographic and health survey showed that, about 61% of pregnant women in Nigeria were attended to by professional and skilled healthcare providers during pregnancy, with close to 51% out of the number who reported that they were able to make at least four visits. It is therefore surprising to know that only 36% eventually delivered at these facilities, while 64% reported that they at home (Azuh & Azuh, 2015; NPC, Nigeria and ICF, 2014; World Health Organization [WHO], 2015).

According to Disu (2010), most births in Nigeria still occur in unorthodox facilities, because of low investment of government in public health care among other factors. Socio-economic and medical factors such as low maternal educational level, low proportion of deliveries attended by skilled personnel, poverty, lack of antenatal care, and delays in treatment of complications of pregnancy and adverse cultural practices were identified as factors influencing mortality among children in Nigeria (Awunyo, 2010; Disu, 2010).

Adejumo, Suleiman, Okagbue, Oguntunde and Odetunmibi (2017) recently revealed a scary statistics on still births and caesarean situation in Nigeria, reflecting low utilization of modern medical care among most households in the nation (Azuh et al., 2017). The situation is very poor in rural areas where poverty and lack of functional health care facilities exacerbate the already worse condition. Providing women with antenatal care (ANC) can improve prospects for safer pregnancy and child survival. It has been noted that ANC offers pregnant women access to relevant information about their health and that of their baby including a cordial relationship between them and the healthcare providers (Adedini, Odimegwu, Bamiwuye, Fadeyibi, & De Wet, 2014; Magoma, Requejo, Campbell, Cousens, & Filippi, 2010; Nikiema, Beninguisse, & Haggerty, 2009; Wablembo & Doctor, 2013). Studies have shown that, women with poor socio-economic status limit the achievements of the health and population intervention programs at the national level, hence, women in such category are unable to seek health care from qualified professionals (Furuta & Salway, 2006; Igbodekwe et al., 2014; Odewale, Oladosun, & Amoo, 2016; Unumeri, Babatunde, & Oginni, 2015). While a report by UNICEF (2017) showed that SSA countries have the highest rates of child mortality in the world, it has equally been estimated that by 2050, 60% of under-five deaths will take place in SSA (UNIGME, 2018).

Hence, to achieve the SDG Goal 3, in the fast approaching period of 2030, mothers’ utilization of health care services at this stage is very crucial and such services which are often obtained in healthcare facilities include; timely child immunization, adequate knowledge and use of family planning, received adequate information on the right proportion and type of nutrition for their
children, and appropriate timing of antenatal and postnatal visits (Samuel, 2017; NPC [Nigeria] and ICF, 2014). This study, therefore identify and evaluate those factors that has promoted child survival in Ado-odo/Ota local government area among nursing mothers utilizing government or public healthcare facility for the purpose of emphasis and policy implementation such that will help to achieve the target of reduction to 25 deaths per 1,000 live births.

3. Materials and methods
The study used a cross-sectional data from the 2017 Covenant University Public Health and Wellbeing Research Cluster survey on determinants of child morbidity and survival in Ogun State, Nigeria. The targeted audience was pregnant women who attended antenatal care and had at least one child in the last 3 years preceding the survey was included.

3.1. Study participants
The study was a cross-sectional study and multi-stage sampling technique was employed to select respondents from the study area. Ado-odo/Ota local government area was the study area and the selection of this LGA was purposively out other 20 LGAs in Ogun State. This was the first round of selection. In the second round of selection, all the 16 political wards were listed and 12 political wards (75%) were selected at random (Azuh et al., 2017). And from the selected political wards, again all the health facilities were listed and at random, 12 health facilities were selected at random, eventually one primary health care center was selected randomly through lottery method. Overall, 1350 respondents constituted the sample size, which is women who have met the inclusion criteria were interviewed through the instrumenta- tion of the questionnaire. From the total sample of 1350 respondents, we re-selected a smaller sample of 545 pregnant women/nursing mothers who delivered their last child in a government healthcare facility.

3.2. Data measurements
The data collection instrument was pretested and questions modified to perfect its reliability, in addition to Cronbach Alpha index which yielded 0.65. The data collection instrument was pretested and questions modified to perfect its reliability, in addition to Cronbach Alpha index which yielded 0.75. The research instrument was validated by two experts, a demographer and healthcare personnel. The nominal, ordinal and ratio data measurements were adopted in the questionnaire design. Cross tabulation method was used to explain associations between the explanatory variables and child survival while binary logistic regression analysis was employed at the multi- variate stage. The significance of the variables in the analyses was set at 0.05 or 5%. All analysis was done on STATA Version 12.

3.3. Data collection
Structured questionnaires were used to obtained information on socio-economic characteristics of mothers as well as health care and behavioral practice of respondents with respect to child care practices.

3.4. Ethical consideration
This study was conducted under the permission and guidance of the Covenant University Center for Innovation and Development (CUCRID). All information obtained were only for research purpose and does not have any negative implications on the population being studied. The study has no bearing with animal, human or related tissues. Informed consent of participants was properly obtained. Respondents were educated on the importance and relevance of the research before information were elicited. Participants were not only informed that they could withdraw at any point of their choice, they were also guaranteed of their anonymity, privacy and confidentiality of information supplied.
4. Results

4.1. Description of respondents socio-economic and community characteristics

Table 1 shows the percentage distribution of the socio-economic and community characteristics of the respondents, i.e., nursing mothers who had children below the age of 5 years as at the period of the survey. From the table, a larger representation of the mothers in the study had secondary (35.1%) and post-secondary education (25.5%). Also, about 28.8% of the mothers had primary education which implied that most the women are literate.

Similarly, most of the fathers of the under-five children were reported to be more educated as 29.4%, 26.4% and 29.4% had secondary, post-secondary and professional educational attainments, respectively. A larger percent of the mothers were reported to be within ages 25–30 years (39.8%) and 31–40 years (40.6%).

Further, 59.6% of the women mentioned that their main source of drinking water was from a borehole while 14.3% and 11.9% reported that their main source of drinking was tanker-truck and covered well, respectively. Similarly, 84.2% used flush toilet for their sanitation, while 9.9% used pit latrine and 4.6% used bucket toilet. Forty-five percent of the respondents reported that they were self-employed as at the time of the survey, 16.7%, 15.1% and 10.8% were civil servants, private sector employees and traders, respectively. In the same vein with the occupation of the mothers, the fathers’ occupation was mainly self-employment (35.6%), private sector employees (21.5%) and trading (13.9%).

Fifty percent of the respondents reported that they have a family size of 3–4 persons, 23.9% and 16.2% have a family size of 5–6 persons and 1–2 persons, respectively. An appreciable number of the women delivered their last child under the care and supervision of a trained healthcare professional, i.e., 65% were assisted by nurses/midwives and 32.3% were assisted by a doctor. More than half of the women reported that they have a cordial relationship with their healthcare provider and that the cost of treatment at their center was moderate or cheap. Lastly, 84.6% reported that all the children they have ever had were alive as at the time of the survey, while 15.4 mentioned they have lost at least one child before the survey.

4.2. Association between respondents and community characteristics by the survival status of the child

Table 2 shows the bivariate result of the socioeconomic and health characteristics of mothers using government healthcare centers. The result revealed that out the total percent of mothers who had knowledge of child preventable diseases only 12% reported cases of child mortality unlike 22.6% cases reported by women who had no knowledge about child preventable diseases. There is a strong association between the knowledge about child preventable and experience of child mortality (Chi-square value = 8.998; P = 0.003). The proportion of deaths of under-age-five children was higher among those who had never received immunization (36.7%) at any point in time compared to their counterparts who had completed the required vaccines (13.0%) or at least received part of it (14.0%). Therefore, there is a strong relationship between the immunization status of a child and the chances of celebrating age 5 years (Chi-square value = 18.854; P = 0.000).

The duration of breastfeeding also showed a significant relationship with mortality experience. The result showed that children whose mothers breastfed for 6 months and above died less than children whose mothers breastfed for a period below 6 months (Chi-square value = 14.376; P = 0.002). Lastly, the number of years of birth spacing between the births of mothers had significant relationship with their chances of seeing their children celebrating fifth year birthday (Chi-square value = 31.729; P = 0.000).

The result further revealed that background variables such as the educational status of the father, the educational attainment of the mother, her occupation, marital status, religious
Table 1. Percent distribution of respondents’ socioeconomic and community characteristics

| Variables                        | n = 545 | %    | Variables                        | n = 545 | %    |
|----------------------------------|---------|------|----------------------------------|---------|------|
| **Mother's Educational Attainment** |         |      | **Type of Dwelling**             |         |      |
| No education                     | 6       | 1.1  | Mud/Grass/Hut                    | 10      | 1.8  |
| Primary                          | 157     | 28.8 | One room                         | 99      | 18.2 |
| Secondary                        | 191     | 35.1 | Room and Parlor                  | 157     | 28.8 |
| Post-secondary                   | 139     | 25.5 | 2/3-bedroom flat                 | 258     | 47.3 |
| Professional                     | 52      | 9.54 | Detached house/Mansion           | 21      | 3.9  |
| **Father's Educational Attainment** |         |      | **No. of Persons living in the house** |         |      |
| No education                     | 33      | 6.1  | 1-2                              | 88      | 16.2 |
| Primary                          | 48      | 8.8  | 3-4                              | 273     | 50.1 |
| Secondary                        | 160     | 29.4 | 5-6                              | 130     | 23.9 |
| Post-secondary                   | 144     | 26.4 | 7 and above                      | 54      | 9.9  |
| Professional                     | 160     | 29.4 | **Toilet facility**              |         |      |
| Mother's current age             |         |      | **Source of Water Supply**       |         |      |
| 20-24 years                      | 83      | 15.2 | Field/bush                       | 7       | 1.3  |
| 25-30 years                      | 217     | 39.8 | Bucket toilet                    | 25      | 4.6  |
| 31-40 years                      | 221     | 40.6 | Pit latrine                      | 54      | 9.9  |
| 41-44 years                      | 18      | 3.3  | Flush toilet                     | 459     | 84.2 |
| 45 and above years               | 6       | 1.1  | **Religious Affiliation**        |         |      |
|                                 |         |      | Tap                              | 49      | 9.0  |
|                                 |         |      | Borehole                         | 325     | 59.6 |
| Christianity                     | 375     | 68.8 | Covered-well                     | 65      | 11.9 |
| Islam                            | 158     | 28.9 | River/Stream                     | 28      | 5.1  |
| Traditional worshippers          | 12      | 2.2  | Tanker-truck                     | 78      | 14.3 |
| **Marital Status**               |         |      | **Distance to Healthcare facility** |         |      |

(Continued)
| Variables          | n = 545 | %   | Variables          | n = 545 | %   |
|-------------------|---------|-----|-------------------|---------|-----|
| Single            | 16      | 2.9 | Not far/Trekable  | 151     | 27.7|
| Married           | 507     | 93.0| For but trekable  | 152     | 27.9|
| Divorced/Separated| 11      | 2.0 | Very far          | 226     | 41.5|
| Widow             | 11      | 2.0 | Don’t know        | 16      | 2.9 |
| Mother’s Occupation|       |     | Assistance during the last birth |        |     |
| Not working       | 54      | 9.9 | Doctor            | 176     | 32.3|
| Self employed     | 247     | 45.3| Nurses/Midwives   | 354     | 65.0|
| Civil/Public Servant | 91    | 16.7| Traditional birth attendants | 8     | 1.5 |
| Private sector employee | 82  | 15.1| Relatives         | 6       | 1.1 |
| Farming           | 4       | 0.7 | Other             | 1       | 0.2 |
| Trading           | 59      | 10.8| Cost of treatment at HC facility |        |     |
| Artisan           | 8       | 1.5 | Very expensive    | 77      | 14.1|
| Father’s Occupation|       |     | Expensive         | 164     | 30.1|
| Not working       | 25      | 4.6 | Moderate          | 219     | 40.2|
| Self employed     | 194     | 35.6| Cheap             | 48      | 8.8 |
| Civil/Public Servant | 117  | 21.5| Very cheap        | 37      | 6.8 |
| Private sector employee | 120 | 22.0| Behavior of workers at the HCF |        |     |
| Farming           | 5       | 0.9 | Very cordial      | 158     | 29.0|
| Trading           | 76      | 13.9| Cordial           | 209     | 38.4|
| Artisan           | 8       | 1.5 | Indifferent       | 55      | 10.1|
| Child is alive    |         |     | Not cordial       | 85      | 15.6|
| Yes               | 461     | 84.6| Not very cordial  | 38      | 7.0 |

(Continued)
| Variables                  | n = 545 | %  | Variables                  | n = 545 | %  |
|----------------------------|---------|----|----------------------------|---------|----|
| No                         | 84      | 15.4| Immunization Status        |         |    |
| Duration of Breastfeeding  |         |    | Complete                   | 346     | 63.5|
| Below 6 months             | 132     | 24.2| Not complete               | 150     | 27.5|
| 6-9 months                 | 245     | 45.0| No immunization            | 49      | 9.0 |
| 10-12 months               | 74      | 13.6|                            |         |    |
| Above 12 months            | 94      | 17.3|                            |         |    |

HC: Healthcare; HCF: Healthcare facility
| Variables                              | Child is Alive |  | Chi-square/P-value |
|---------------------------------------|----------------|---|-------------------|
| Knowledge about child preventable diseases |                |   |                   |
| Yes                                   | 338 (87.6%)   | 48 (12.4%) | 8.998; P = 0.003 |
| No                                    | 123 (77.4%)   | 36 (22.6%) |                   |
| Distance to Healthcare Facility       |                |   |                   |
| Not far/trekable                      | 124 (82.1%)   | 27 (17.9%) | 2.403; P = 0.493  |
| Far but trekable                      | 131 (86.2%)   | 21 (13.8%) |                   |
| Very far                              | 194 (85.8%)   | 32 (14.2%) |                   |
| I don’t know                          | 12 (75.0%)    | 4 (25.0%)  |                   |
| Mother’s Educational Attainment       |                |   |                   |
| No education                          | 6 (100%)      | 0 (0%)     | 6.094; P = 0.192  |
| Primary                               | 136 (86.6%)   | 21 (13.4%) |                   |
| Secondary                             | 154 (80.6%)   | 37 (19.4%) |                   |
| Post-secondary                        | 123 (88.5%)   | 16 (11.5%) |                   |
| Professional                          | 42 (80.8%)    | 10 (19.2%) |                   |
| Mother’s Occupation                   |                |   |                   |
| Not working                           | 44 (81.5%)    | 10 (18.5%) | 9.702; P = 0.138  |
| Self employed                         | 204 (82.6%)   | 43 (17.4%) |                   |
| Civil/Public Servant                  | 80 (87.9%)    | 11 (12.1%) |                   |
| Private Sector employee               | 77 (93.9%)    | 5 (6.1%)   |                   |
| Farming                               | 3 (75.0%)     | 1 (25.0%)  |                   |
| Trading                               | 46 (78.0%)    | 13 (22.0%) |                   |
| Artisan                               | 7 (87.5%)     | 1 (12.5%)  |                   |
| Religious Affiliation                 |                |   |                   |
| Christianity                          | 326 (86.9%)   | 49 (13.1%) | 6.563; P = 0.038  |
| Islam                                 | 124 (78.5%)   | 34 (21.5%) |                   |
| Traditional worshippers               | 11 (91.7%)    | 1 (8.3%)   |                   |
| Father’s Educational Attainments      |                |   |                   |
| No education                          | 24 (72.7%)    | 9 (27.3%)  | 7.783; P = 0.100  |
| Primary                               | 40 (83.3%)    | 8 (16.7%)  |                   |
| Secondary                             | 132 (82.5%)   | 28 (17.5%) |                   |
| Post-secondary                        | 121 (84.0%)   | 23 (16.0%) |                   |
| Professional                          | 144 (90.0%)   | 16 (10.0%) |                   |
| Mother’s Marital Status               |                |   |                   |
| Single                                | 15 (93.8%)    | 1 (6.3%)   | 5.990; P = 0.112  |
| Married                               | 431 (85.0%)   | 76 (15.0%) |                   |
| Divorced/Separated                    | 8 (72.7%)     | 3 (27.3%)  |                   |
| Widowed                               | 7 (63.6%)     | 4 (36.4%)  |                   |
| Current Age of Mother                 |                |   |                   |
| 20–24                                 | 69 (83.1%)    | 14 (16.9%) | 2.789; P = 0.594  |
| 25–30                                 | 179 (82.49%)  | 38 (17.5%) |                   |
| 31–40                                 | 191 (86.4%)   | 30 (13.6%) |                   |
affiliation and her current age as at the time of the survey had no significant association with the survival of the under-five children in the study area. Hence, only the independent variables that have significant association with the dependent variable at the bivariate stage as presented in the cross tabulation Table 2 above was included in the binary logistic regression analysis in Table 3.

4.3. Factors determining the survival status of under-five children in Ado-Odo/Ota

Table 3 presents the binary logistic regression analysis results of the independent variables that hold significant association with the survival status of under-five children at the bivariate stage. Findings from the table shows that the immunization status of the child is a strong determinants of his/her survival status ($P$-value = 0.006). The result showed that children who were not immunized as at the time of the survey were 0.34 times less likely to survive when compared with their counterparts who had complete immunization and had the odds ratio of 1.00 to survive.

Similarly, children raised by mothers who had no knowledge of preventable diseases were less likely to live to see fifth year birthday unlike those raised by mothers who had knowledge about child preventable diseases (OR = 0.58; $P$-value = 0.048). Further, Children who were breastfed up till 6–9 months lived to celebrate their fifth year birthday than their counterparts who were breastfed for a duration of period that was less than 6 months (OR = 2.03; $P$-value = 0.031).

| Table 2. (Continued) | Child is Alive |
|----------------------|----------------|
| 41–44                | 16 (88.9%)     | 2 (11.1%) |
| 45 and above         | 6 (100.0%)     | 0 (0.0%)  |
| Immunization status of the last child |                |           |
| Complete             | 301 (87.0%)    | 45 (13.0%) |
| Not complete         | 129 (86.0%)    | 21 (14.0%) |
| No immunization      | 31 (63.3%)     | 18 (36.7%) |
| Duration of breastfeeding |          |           |
| Below 6 months       | 106 (80.3%)    | 26 (19.7%) |
| 6 – 9 months         | 216 (88.2%)    | 29 (11.8%) |
| 10 – 12 months       | 54 (73.0%)     | 20 (27.0%) |
| Above 12 months      | 85 (90.4%)     | 9 (9.6%)  |
| Cost of treatment at the health facility |                |           |
| Very expensive       | 67 (87.0%)     | 10 (13.0%) |
| Expensive            | 135 (82.3%)    | 29 (17.7%) |
| Moderate             | 191 (87.2%)    | 28 (12.8%) |
| Cheap                | 39 (81.3%)     | 9 (18.8%)  |
| Very cheap           | 29 (78.4%)     | 8 (21.6%)  |
| Birth spacing between the previous and last child |                |           |
| Below 6 months       | 183 (88.0%)    | 25 (12.0%) |
| 6 – 12 months        | 57 (64.8%)     | 31 (35.2%) |
| 13 – 18 months       | 81 (88.0%)     | 11 (12.0%) |
| 19–24 months         | 55 (88.7%)     | 7 (11.3%)  |
| 25 months and above  | 85 (89.5%)     | 10 (10.5%) |
Children of mothers who practiced shorter birth spacing of 6–12 months reported to had lesser chances of survival status compared to children who mothers waited for 25 months or more before getting pregnant of them (OR = 0.26; \( P \)-value = 0.001). Lastly, the affiliation of the respondents was found to be a strong determinant of the survival status of their children (OR = 0.40; \( P \)-value = 0.001).

### 5. Discussion

The findings of the study will accelerate the knowledge base of mothers on the importance of health care practices which holds great potential for improvement of child survival leading to the achievement of SDG 3 by 2030. It can be established from the study that factors such as immunization status of the child, the duration of period in which the child was breastfed, the birth spacing between the previous child and the current child, the knowledge of the mother about preventable diseases and her religious affiliation were found to be strong determinants of the survival status of children under-age-five whose mothers uses government healthcare facilities in Ado-odo/Ota. The findings from this study revealed that socio-economic factors such as; father’s educational attainments, his occupation, maternal education status, her occupation, marital status and her current age have little or no effects on the survival status of under-five children in Ado-odo/Ota.

From the frequency table a tangible number of the mothers (i.e., 461 out of 545 women—84.6%) reported that they have never lost any child before the time of the survey. This can be linked to the high percentage of women (63.5%) who mentioned that their children had completed the

| Variables                                      | Odds ratio | \( P \)-value |
|------------------------------------------------|------------|--------------|
| **Duration of breastfeeding**                  |            |              |
| Below 6 months                                | RC         |              |
| 6 – 9 months                                   | 2.03       | 0.031        |
| 10 – 12 months                                 | 0.91       | 0.795        |
| Above 12 months                                | 2.08       | 0.094        |
| **Immunization of the last child**             |            |              |
| Complete                                       | RC         |              |
| Not complete                                   | 1.02       | 0.939        |
| No immunization                                | 0.34       | 0.006        |
| **Knowledge about child preventable diseases** |            |              |
| Yes                                            | RC         |              |
| No                                             | 0.58       | 0.048        |
| **Birth spacing between the previous and last child** |      |          |
| Below 6 months                                 | 1.12       | 0.779        |
| 6 – 12 months                                  | 0.26       | 0.001        |
| 13 – 18 months                                 | 0.92       | 0.858        |
| 19–24 months                                   | 0.85       | 0.757        |
| 25 months and above                            | RC         |              |
| **Religious Affiliation**                      |            |              |
| Christianity                                   | RC         |              |
| Islam                                          | 0.40       | 0.001        |
| Traditional worshippers                         | 3.00       | 0.350        |
| Constant                                       | 10.48      | 0.000        |
immunization procedures as at the time of the survey. Hence, it can be established here that, mothers in Ado-odo/Ota usually ensures that their children take all the complete immunization doses and injections as recommended for children within ages 0–4 years by WHO.

Also, the authors of this paper assumed that since about 64% of the women reported complete immunization of their children and thereby must have been privy to listen to health talks by the matrons, nurses, community health workers, etc., on immunization days, so therefore they are at advantage to have knowledge of preventable diseases of under-five children.

Similarly, as shown in Table 1, more than 80% of the women reported that they delivered their last child under the supervision of a trained medical doctor, nurses or midwives. This implied that they must have had a regular antenatal classes or visits during pregnancy and hence, must have been informed about the benefits of breastfeeding their babies. The impact of this was observed in the results all through the stages of analyses, as about 45% of the women in Table 1, reported that they breastfed their children for a period of 6–9 months, also at the bivariate and multivariate stages it was found that children who were breastfed for minimum of 6 months had higher chances of survival than their counterparts who were breastfed for a period that was less than 6 months. Further, among other variables that had significant impact on under-five survival in the study area was birth spacing. Most of the women got pregnant to their current child within a period of less than a year after the delivery of their previous child, which put both the child and the mother at high risk of morbidity or mortality. Hence, this contributed to the current rate of low survival of children in Ado-odo/Ota.

Although, results from this study established some of the findings from other researchers such as Adedini (2013), Antai (2011), Samuel (2017), Oni (1996), Uddin, Hassain, and Ullah (2009), Ojewunmi and Ojewunmi (2012), Ogunjuyigbe (2004), Samuel and Oni (2018), Black and Liu (2012), Caldwell, (1979), Mondal, Hassain, and Ali (2009), Adetoro and Amoo (2014), Akombi, Agho, Renzaho, Hall, and Merom (2019), Agho et al. (2018), Omuemu and Adamu (2019), on the significance of immunization, duration of breastfeeding, birth spacing, etc., on the survival of under-five children, the authors will therefore, like to submit here that the factors identified as significant in the results of the analyses can be leverage upon by the government of Ogun State and the Local Government Management for more improvement in the survival status of children in Ado-odo/Ota Local Government Area. Hence, the general goal of reducing under-five mortality to 25 deaths per 1000 per live births by 2030 which is fast approaching for the country of Nigeria has a whole is gradually been achieved as policy makers in this area focus attention or intensify more efforts on these factors.

6. Conclusions and recommendations
The findings from this study may help government and stakeholders to design comprehensive and integrated interventions towards improving the level of child survival in the study area and by extension the entire country. The authors hereby conclude that attention should be placed on factors that have been found to have contributed to the increase in the survival status of under-five children as observed in the results. Government should subsidize the cost of health care services at the grassroots to increase patronage, create more awareness on the benefits of immunization, encourage longer period of breastfeeding and birth spacing, sensitize women more on the safety and importance of delivering their babies under the supervision of a trained healthcare professional, particularly for nursing mothers. The authors are of the opinion that if government can look at that direction, this will aid the achievement of the SDG Goal 3 in no time in the study area, in Ogun State and Nigeria at large.

7. Limitations of the study
Mothers do not like to talk about negative things about their children either dead or alive because their culture or religion discourage it. Since the study drew on primary data, as a result, there might be a tendency for underreported cases of morbidity or even death which might affect quality of the data.
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Citation information
Cite this article as: Factors influencing the survival of under-five children among women visiting government health care facility in semi-urban communities in Nigeria, Dominic E. Azuh, Shalom Chinedu, Olugbemisola W. Samuel, Akunna Azuh, Grace Joshua & Emmanuel O. Amoo. Demography and Social Statistics (2019), 6: 1686800.

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