RESULTS

# Introduction

This chapter presents the results of the univariate analysis of data for this study.

Characteristics of respondents

This section presents the distribution of the sociodemographic and socioeconomics attribute of the mothers with stunted children under-five years of age as shown in table 4.1. It could be inferred that majority of were in the maternal age less than 20 years (59.06) and this followed in order by those aged 20-20 years (38.36%), 30-39 years (2.55%), and those in age 40 years and above (0.03%). The distribution of birth interval given to their children showed that over half of them (59.65%) allowed a preceding birth interval of 24-47 months, 21.08% allowed 12-23 months, 18.58% allowed 48 months and above, and 0.69% allowed months that are less than 12. Also, it could be seen that families with at most two numbers of children under-five years represent 65.83% of the sample, while those with 3 to 6 numbers of under-five children represent 33.57%, and those with at least 4 number of under-five children represent 0.60%.

The table also showed that (48.52%) of the mothers have no education, 19.11% have primary education, 26.39% have secondary education and 5.98% have higher education. The distribution of their wealth index informed that 23.05% are in the poorest category, 22.37% are in the poorer category, 18.97% are in the middle category, while 18.11% and 17.50% are in the richer and richest categories respectively. Additionally, it can be seen that 46.91% of the representative sample have a large family size with 7 and above, followed medium family size (43.88%) which are 4 to 6 in number, and small family size of 3 and below (9.21%). From the distribution of the respondents based on region showed that 13.65%, 17.29% and 36.85% are from North central, North east and North west respectively, while 8.87%, 9.30%, and 14.04% are from South east, South south, and South west respectively. The proportion of the respondents residing in the rural area are 63.95%, while 36.05% reside in urban area.

Table 4.1: Mothers’ Sociodemographic and Socioeconomics Characteristics

|  |  |  |
| --- | --- | --- |
| Variables | Weighted (*n*) | Weighted (*%*) |
| **Maternal age** |  |  |
| < 20 yrs | 16,300.429 | 59.06 |
| 20-29 yrs | 10,588.271 | 38.36 |
| 30-39 yrs | 702.941298 | 2.55 |
| 40 yrs+ | 7.3587177 | 0.03 |
| **Birth interval** |  |  |
| <12 months | 153.790304 | 0.69 |
| 12-23 months | 4,711.91219 | 21.08 |
| 24-47 months | 13,330.666 | 59.65 |
| 48 months+ | 4,152.6313 | 18.58 |
| **No\_under\_5** |  |  |
| <=2 (small size) | 18,168.258 | 65.83 |
| 3-6(average size) | 9,264.6197 | 33.57 |
| >=4(large) | 166.122051 | 0.60 |
| **Highest educational level** |  |  |
| No education | 13,390.277 | 48.52 |
| Primary | 5,272.8728 | 19.11 |
| Secondary | 7,284.7095 | 26.39 |
| Higher | 1,651.14059 | 5.98 |
| **Wealth index** |  |  |
| Poorest | 6,360.3927 | 23.05 |
| Poorer | 6,173.8034 | 22.37 |
| Middle | 5,234.9186 | 18.97 |
| Richer | 4,998.8303 | 18.11 |
| Richest | 4,831.0551 | 17.50 |
| **Family size** |  |  |
| <=3(small size) | 2,541.5394 | 9.21 |
| 4-6(medium size) | 12,110.992 | 43.88 |
| >=7(large size) | 12,946.469 | 46.91 |
| **Region** |  |  |
| North Central | 3,767.4437 | 13.65 |
| North East | 4,771.7477 | 17.29 |
| North West | 10,171.547 | 36.85 |
| South East | 2,447.545 | 8.87 |
| South South | 2,566.0883 | 9.30 |
| South West | 3,874.6284 | 14.04 |
| **Place of residence** |  |  |
| Urban | 9,948.8731 | 36.05 |
| Rural | 17,650.127 | 63.95 |

This section presents the distribution of the child characteristics as presented in table 4.2. It could be seen that majority (56.93%) of the child’s age in the category of 24-59 months. 20.80% of them are in the age category of 12-23 months, and 22.28% are in the age category of 12 months or less. Also, male child and female child were almost equally distributed in the sample. The children with very large size at birth represent 14.10% of the sample, larger than average size at birth represent 30.07%, average size at birth represent 41.32%, smaller than average size at birth represent 10.32%, and very small size at birth represent 4.19%.

Table 4.2: Childs’ Characteristics

|  |  |  |
| --- | --- | --- |
| Variables | Weighted (*n*) | Weighted (*%*) |
| **Child’s Age** |  |  |
| <12 months | 6,132.7023 | 22.28 |
| 12-23 months | 5,725.3297 | 20.80 |
| 24-59 months | 15,670.968 | 56.93 |
| **Sex of child** |  |  |
| Male | 13,859.422 | 50.22 |
| Female | 13,739.578 | 49.78 |
| **Size of child at birth** |  |  |
| Very large | 3,836.2925 | 14.10 |
| Larger than average | 8,178.0925 | 30.07 |
| Average | 11,238.309 | 41.32 |
| Smaller than average | 2,806.9956 | 10.32 |
| Very small | 1,140.3099 | 4.19 |

The table 4.3 below presents the result of the cross tabulation of stunting by child’s characteristics. From the table p-value of all the observed child characteristics are found to be less than 0.0500, indicating that all the selected child characteristics are significantly associated with stunting.

This finding further shows that, stunting is high in children aged 24-59 months (42.22%), followed by 12-23 months (37.93%), and less than 12 months (20.87%).

The male children were more likely to be stunted (52.24%), compared to the female (47.76%). By size of child at birth, stunting was more reported among children with very small size at birth (45.55%) and this followed by children at their birth size smaller than average (44.33%), average size at birth (38.15%), larger than average size at birth (33.32%), very large size (31.77%).

Bivariate Analysis

Table 4.3: Cross tabulation of stunting by child’s characteristics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Stunted | |  |  |
|  | Yes No | |  |  |
| Variables | *n (%)* | *n (%)* | *χ2* | P-Value |
| **Child’s Age** |  |  | 756.0430 | 0.0000 |
| <12 months | 1043(20.87) | 4272(79.13) |  |  |
| 12-23 months | 1871(37.93) | 3168(62.07) |  |  |
| 24-59 months | 5917(42.22) | 8207(57.78) |  |  |
| **Sex of Child**  Male  Female  **Size of child at birth**  Very large  Larger than average  Average  Smaller than average  Very small | 4636(52.24)  4195(47.76)  1031(31.77)  2528(33.32)  3663(38.15)  1064(44.33)  400(45.55) | 7608(48.19)  8039(51.81)  2286(68.23)  4947(66.68)  6321(61.85)  1392(55.67)  496(54.45) | 37.4496  173.6974 | 0.0000  0.0000 |

P<=0.0500, indicate significant

*Figure 1: Pie chart showing the percentage of stunting by child’s sex*

Table 4.4 aimed to determine the association between stunting and maternal, and household characteristics. The selected maternal and household characteristics are maternal age, birth interval, numbers of under-five children in a household, highest educational level, wealth index, family size. From the result of the chi2 it’s shown that all the selected maternal and household characteristics were strongly associated with stunting of children under-five years old in Nigeria (p≤0.001).

Mothers’ whose age are less than 20 years have the highest proportion of stunted children (43.00%), those in the age category of 20 to 29 years have 28.62% stunted children, and those in the age category of 30 to 39 years have 19.35% stunted children, while those in the age category of 40 years and above were reported with 6.66% stunted children.

Also, the distribution of stunted children was receding based with the increasing interval of birth mothers allowed. While about 46% children of mothers’ who allowed less 12 moths interval of birth are stunted, 41% with birth interval of 12 to 23 months were stunted, about 38% with birth interval of 24 to 47 months were stunted, and 32% with birth interval of 48 months and above were stunted.

Stunted children by mothers’ level of education shows that those mothers with no formal education have the highest proportion of stunted children with about 50%, those with primary education had 33%, while those with secondary had about 23%, and those with higher educational level had 13% stunted children. Invariably, the distribution of stunted children based on wealth index informed that, those mothers on the poorest and poorer side of the category had about 54% and 46% stunted children, the ones on the middle category had 35% stunted children, while those categorise as the richer, and richest had 26% and 18% stunted children.

Also, 32.28% of children from small family size were stunted, 32.39% from medium family size were stunted, about 42% from large family size were stunted as shown in figure2.

Table 4.4: Cross tabulation of stunting by maternal and household characteristics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Stunted | |  |  |
|  | Yes | No |  |  |
| Variables | *n* (*%*) | *n* (*%*) | *χ2* | P-Value |
| **Maternal age** |  |  |  |  |
| < 20 yrs | 6014(43.00) | 8129(57) | 594.7063 | 0.0000 |
| 20-29 yrs | 2695(28.62) | 7003(71.38) |  |  |
| 30-39 yrs | 121(19.35) | 506(80.65) |  |  |
| 40 yrs+ | 1(6.66) | 9(93.34) |  |  |
| **Birth interval** |  |  | 81.0294 | 0.0000 |
| <12 months | 51(46.15) | 60(53.85) |  |  |
| 12-23 months | 1718(41.22) | 2449(53.85) |  |  |
| 24-47 months | 4419(37.99) | 7417(53.85) |  |  |
| 48 months+ | 1123(31.8) | 2582(53.85) |  |  |
| **No\_under\_5** |  |  | 133.5979 | 0.0000 |
| <=2 (small size) | 5435(34.2) | 1.1000(65.8) |  |  |
| 3-6(average size) | 3342(41.66) | 4862(58.34) |  |  |
| >=4(large) | 54(44.14) | 76(55.86) |  |  |
| **Highest educational level** |  |  | 1791.4731 | 0.0000 |
| No formal | 5424(49.78) | 5410(50.22) |  |  |
| Primary | 1724(33.06) | 3452(66.94) |  |  |
| Secondary | 1483(22.58) | 5375(77.42) |  |  |
| Higher | 200(13.31) | 1410(86.69) |  |  |
| **Wealth index** |  |  | 1771.4694 | 0.0000 |
| Poorest | 2763(53.89) | 2347(46.11) |  |  |
| Poorer | 2481(45.81) | 2992(54.19) |  |  |
| Middle | 1733(35.08) | 3230(64.92) |  |  |
| Richer | 1169(26.00) | 3580(74.00) |  |  |
| Richest | 685(18.06) | 3498(81.94) |  |  |
| **Family size** |  |  | 231.6942 | 0.0000 |
| <=3(small size) | 690(32.28) | 1494(67.72) |  |  |
| 4-6(medium size) | 3413(32.39) | 7288(67.61) |  |  |
| >=7(large size) | 4728(41.77) | 6865(58.23) |  |  |

***Figure 2: Bar chart showing the distribution of stunting by family size***

Table 4.5 targeted to determine the association between stunting and community characteristics of the children. Those characteristics are region and place of residence. The result of the chi2test indicate that all the selected community factors were strongly associated with stunting (p≤0.001).

The prevalence of stunting was high in the northern part with the highest in the north west (54.88%), while there is a low prevalence in the southern part with the highest in the south west (21.74%). The distribution of stunted children in the rural area was higher (43.08%), compare to the urban area (25.97%) as presented in figure 3.

Table 4.5: Cross tabulation of stunting by community characteristics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Stunted | |  |  |
|  | Yes | No |  |  |
| Variables | n (%) | n (%) | *χ2* | P-Value |
| **Region** |  |  | 2527.2965 | 0.0000 |
| North Central | 1095(28.82) | 2718(71.18) |  |  |
| North East | 2143(42.06) | 2752(57.94) |  |  |
| North West | 3940(54.88) | 3190(45.12) |  |  |
| South East | 334(15.25) | 1952(84.75) |  |  |
| South South | 610(17.87) | 2430(2430) |  |  |
| South West | 709(21.74) | 2605(78.26) |  |  |
| **Place of residence** |  |  | 717.7257 | 0.0000 |
| Urban | 2131(25.97) | 6380(74.03) |  |  |
| Rural | 6700(43.08) | 9267(56.92) |  |  |

***Figure 3: Bar chart showing the distribution of stunting by region***

Multivariate Analysis

Binary logistic regression

The logistics regression model for individual characteristics and stunting is summarized in table 4.6, where children aged 24-59 months were about 3 times more likely to be stunted compared to those aged <12 months (OR=2.82, P≤0.001, CI: 2.58-3.08) and those aged 12-23 months were about 2 times likely to be stunted than those aged <12 months (OR=2.35, P≤0.001, C.I: 2.12-2.60). The female children have protective effect from stunting compared to their counterpart (OR=0.84, CI: 0.78-0.89). Comparing the various size of children had at birth to very large size of children at birth, children that are very small at birth had the highest chances of stunting (OR=1.99, P≤0.001, CI:1.63-2.42), followed by smaller than average size at birth (OR=1.82, CI: 1.59-2.09), average (OR=1.36, P≤0.001, CI: 1.22-1.51), and larger than average (OR=1.09, P≤0.107, CI: 0.98-1.22).

Table 4.6: Individual factors (child’s age, child’s sex, birth size) predictor of stunting.

|  |  |  |  |
| --- | --- | --- | --- |
| Risk factors | OR | 95% CI | P-value |
| **Child age** |  |  |  | |
| <12 months | 1 |  |  | |
| 12-23 months | 2.35 | (2.12, 2.60) | 0.000 | |
| 24-59 months | 2.82 | (2.58, 3.08) | 0.000 | |
| **Child sex** |  |  |  | |
| Male | 1 |  |  | |
| Female | 0.84 | (0.78, 0.89) | 0.000 | |
| **Birth size** |  |  |  | |
| Very large | 1 |  |  | |
| Larger than average | 1.09 | (0.98,1.22) | 0.107 | |
| Average | 1.36 | (1.22, 1.51) | 0.000 | |
| Smaller than average | 1.82 | (1.59, 2.09) | 0.000 | |
| Very small | 1.99 | (1.63, 2.42) | 0.000 | |

P≤0.001 indicate significant

From table 4.7, it can be inferred that the odds of stunting for children with mothers aged 40 years and above is exactly the same for mothers with age less than 20 years, also children given birth to mothers at 30-39 are 0.36 times less likely to be stunted compared to those given birth to by mothers <20 years of age (OR=0.36, P≤0.001, CI: 0.27-0.49), while children given birth to by mothers in age category of 20-29 years had 0.57 times less likely to be stunted compared to mothers in age category less than 20 years (0R=0.57, P≤0.001, CI: 0.52-0.61).

Additionally, mothers who allowed 12-23 birth interval had less odds of 0.81 stunted children compared to those who allowed less than 12 months (OR=0.81, P≤0.385, CI: 0.49-1.31), those who allowed 24-47 months birth interval had a less odd of 0.69 stunted children compared to those who allowed less than 12 months birth interval (OR=0.69, P≤0.001, CI: 0.42-1.12), and those who allowed an interval of 48 months and above had a less odd of 0.52 stunted children compared to those who allowed birth interval less than 12 months (OR=0.52, P≤0.001, CI: 0.32-0.86).

Table 4.7: Maternal factors (maternal age, birth interval) predictor of stunting

|  |  |  |  |
| --- | --- | --- | --- |
| Risk factors | OR | 95% | P-value |
| **Maternal age** |  |  |  |
| < 20 yrs | 1 |  |  |
| 20 – 29 yrs | 0.57 | (0.52, 0.61) | (0.000) |
| 30 – 39 yrs | 0.36 | (0.27, 0.49) | (0.000) |
| 40 yrs+ | 1 |  |  |
| **Birth interval** |  |  |  |
| < 12 months | 1 |  |  |
| 12 – 23 months | 0.81 | (0.49, 1.31) | (0.385) |
| 24 – 47 months | 0.69 | (0.42, 1.12) | (0.130) |
| 48 months+ | 0.52 | (0.32, 0.86) | (0.010) |

P≤0.001 indicate significant

The result in table 4.8 indicate that the odds of stunting for children with number of under-five children in a household ≥4 is 0.20 times higher than children with number of under-five children in a household ≤ 2 (OR=1.20, P=0.376, CI: 0.80-1.81), while the odds of stunting for children with number of under-five children in a household as 3-6 is 0.04 times higher than children with number of under-five children in a household ≤ 2 (OR=1.04, P=0.298, CI: 0.96-1.13).

From the mothers’ educational level and stunting, it can be seen that the chances of having a child to be stunted decline as mothers increases the level of their educational attainment. The mothers with primary educational attainment had 0.65 times less chances of having stunted children compared with those who had no formal educational attainment, those with secondary education had 0.48 less chances of having stunted children compared with those who had no formal education (OR=0.48, P=0.000, CI: 0.96-1.13), and those with tertiary educational attainment had 0.31 times less chances of having stunted children compared with those who had no formal educational attainment (OR=0.31, P=0.000, CI=0.25-0.39).

As for children stunting status based of family wealth index categories, the children who are in the poorer category had 0.82 times less chances of stunted children compared to those in the poorest category (OR=0.82, P=0.000, CI: 0.59-0.71), those in the middle category had 0.62 times less chances of stunted children compared to those in poorest category (OR=0.62, P=0.000, CI: 0.000), those in the richer category had 0.48 times less chances of stunted children compared to those in the poorest category (OR=0.48, P=0.000, CI: 0.44-0.54), and those in the richest category had 0.39 times less chances of stunted children compared to those in the poorest category (OR=0.39, P=0.000, CI: 0.33, 0.45). The odds of stunting for children from large family size (≥7) was 0.03 times higher than children from small family size (≥3), however the odds for children from medium family size (4-6) were 0.94 times lesser than children from small family size (≥3).

Table 4.8: Household factors (number of under-fives in a household, mothers’ level of ≤ 2 under-five children in a household education, household wealth index and family size) predictor of stunting.

|  |  |  |  |
| --- | --- | --- | --- |
| Risk factors | OR | 95% | P-value |
| **Num\_under\_5** |  |  |  |
| ≤2(small size) | 1 |  |  |
| 3-6(average size) | 1.04 | (0.96, 1.13) | 0.298 |
| ≥4(large size) | 1.20 | (0.80, 1.81) | 0.376 |
| **Level of education** |  |  |  |
| No formal | 1 |  |  |
| Primary | 0.65 | (0.59, 0.71) | 0.000 |
| Secondary | 0.48 | (0.44, 0.54) | 0.000 |
| Tertiary | 0.31 | (0.25, 0.39) | 0.000 |
| **Wealth index** |  |  |  |
| Poorest | 1 |  |  |
| Poorer | 0.82 | (0.75, 0.91) | 0.000 |
| Middle | 0.62 | (0.55, 0.69) | 0.000 |
| Richer | 0.48 | (0.42, 0.54) | 0.000 |
| Richest | 0.39 | (0.33, 0.45) | 0.000 |
| **Family size** |  |  |  |
| ≤3(small) | 1 |  |  |
| 4-6(medium size) | 0.94 | (0.83, 1.07) | 0.353 |
| ≥7(large size) | 1.03 | (0.91, 1.18) | 0.621 |

P≤0.001 indicate significant

The results of the prediction of stunting by the selected community factors is presented in table 4.9. It indicates chances of suffering from stunting among under-five children in the north east increased by 0.82 times compares to those in the north central (OR=1.82, P=0.000, CI: 1.63-2.05), in the north west the chances increased by 2.05 times compares to those in the north central (OR=3.05, P=0.000, C: 2.74, 3.39), while for children in the south east the chances decreased by 0.55 times compared to those in the north central (OR=0.55, P=0.000, C: 0.46-0.66), in the south south it decreased by 0.56 times compared to those in the north central (OR=0.56, P=0.000, C: 0.49-0.65), and in the south west it decreased by 0.86 times compares to those in the north central (OR=0.86, P=0.000, CI: 0.74-0.99). Children from rural areas are 0.58 times more likely to be stunted compared with children from urban areas.

Table 4.9: Community factors (region, residence) predictor of stunting.

|  |  |  |  |
| --- | --- | --- | --- |
| Risk factors | OR | 95% | P-value |
| **Region** |  |  |  |
| North central | 1 |  |  |
| North east | 1.82 | (1.63, 2.05) | 0.000 |
| North west | 3.05 | (2.74, 3.39) | 0.000 |
| South east | 0.55 | (0.46, 0.66) | 0.000 |
| South south | 0.56 | (0.49, 0.65) | 0.000 |
| South west | 0.86 | (0.74, 0.99) | 0.000 |
| **Residence** |  |  |  |
| Urban | 1 |  |  |
| Rural | 1.58 | (1.46, 1.72) | 0.000 |

P≤0.001 indicate significant

Table 5.0 reported that mothers with low exposure to media had 0.71 times of having stunted children compared to those with no exposure to media (OR=0.71, P=0.000, CI: 0.65, 0.77), also those with high exposure to media had 0.41 times of having stunted children compared to with no media exposure (OR=0.47, P=0.000, CI: 0.43, 0.50). Mothers who find distance to health facility during the period of carrying their pregnancy as not a big problem have a less chances of 0.78 times stunted children compared to those who find it as a big problem.

Table 5.0: Intervening factors (media exposure, distance to health facility) predictors of stunting.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Risk factors | OR | | 95% | P-value |
| **Media exposure** |  | |  |  |
| No exposure | 1 | |  |  |
| Low exposure | 0.71 | | (0.65, 0.77) | 0.000 |
| High exposure | 0.47 | | (0.43, 0.50) | 0.000 |
| **Distance to health facility** | |  |  |  |
| Big problem | 1 | |  |  |
| Not a big problem | 0.78 | | (0.72, 0.84) | 0.000 |

P≤0.001 indicate significant