

Full Length Research Paper

Challenges to vital registration in Nigeria

**Chiemezie Atama, Ijeoma Igwe, Aloysius Odii, Emmanuel Igbo, Nkoli Ezumah,
Veronica Okeke, Uche Okonwko and Chidi Ugwu***

Department of Sociology and Anthropology, Faculty of Social Sciences, University of Nigeria, Nsukka, Nigeria.

Received 23 January, 2020; Accepted 21 May, 2020

The objective of this study was to investigate and reveal the socio-demographic factors affecting civil registration in Nigeria. The study employed the cross-sectional survey design. Instruments were administered to 600 participants sampled through a systematic random technique. SPSS (version 22) was used to analyze the data. Local importance attached to civil registration was different towards birth, death and marriage respectively. The multivariate Logistic Regression analyses showed that residential location (rural or urban), income and education were important factors affecting attitudes to civil registration; and these factors correlated with birth, death and marriage to different degrees. We conclude that, in addition to availability of institutional provisions, moderating variables peculiar to each cultural area should be factored into efforts to improve civil registration.

Key words: Civil registration, death registration, marriage registration, Nigeria, vital statistics.

INTRODUCTION

Vital registration (also known as civil registration) is the continuous collection, recording, collation, analysis, presentation and distribution of data on the occurrences and characteristics of vital events, such as live birth, death, fetal death, marriage, divorce, adoption, legitimization of birth, recognition of parenthood, annulment of marriage, or legal separation. Records from these events are called vital statistics (Brolan and Gouda, 2017; Mikkelsen et al., 2015). Vital statistics are necessary for countries to compile accurate, complete and timely vital statistics about birth, death and marriage, which, along with population census, are central to estimating population size and demographic dynamics. The cause of death data from civil registration systems, for instance, is vital for pinpointing diseases and injuries that have become common in a population (UNICEF, 2018).

Given the huge importance of vital statistics to the public and the policy-makers, it is worrisome that this issue has received so little attention in literature focusing on post-colonial states such as Nigeria, especially in terms of the contextual factors that challenge this crucial practice. In part, this is because vital statistics are taken for granted in the global centers of research where all births, deaths and marriages are routinely registered. In these countries, vital statistics are readily available for governments to monitor and to use for social and economic planning in key sectors such as health, education, employment and housing (Williams, 2014). However, governments in low and middle-income countries like Nigeria have the same need for data for planning development and for ensuring the effective use of limited resources.

As a result, there is now a momentum-building within

*Corresponding author. E-mail: chidi.ugwu@unn.edu.ng.

these countries and within the global development community towards the strengthening of civil registration and vital statistics (CRVS) systems (Makinde et al., 2016).

There are cultural and contextual constraints to proper civil registration and vital statistics that need to be checked in order for vital statistics to be readily available to the government for planning purposes. These are financial constraints; lacunae in the legal basis; organizational problems affecting supervision and control arising out of the uncoordinated involvement of several agencies in the registration system; low priority assigned to registration work by administrators and policy makers, resulting in indifferent performance of the registration hierarchy; public apathy for lack of effective incentives; and lack of trained manpower. The time lag in the compilation and presentation of data remains a common problem as well. This can manifest in one or more of the following ways: delays in transmission of sub-national compilations; delays in receipt of registration records from sub-national areas at the central office; delayed registration, causing bottle-necks in tabulation by date of occurrence; absence or incompleteness of information in the basic record etc. (Isara and Atimati, 2015; United Nations, 2017).

Lack of awareness of vital registration is a major development problem in Nigeria. Tobin et al. (2013), in their study done in Edo State, Southern Nigeria, found that as much as 40% of respondents had not heard of death registration, and 15% did not know the relevance. An earlier study by Akande and Sekoni (2005) in Kwara State, North-central Nigeria, had as well revealed low awareness of the importance of vital registration. It was confirmed in another study by UNICEF around the same period that about 70% of the over five million annual births in Nigeria went unregistered (UNICEF, Nigeria, 2007). Interestingly, there is as yet no national average for death and marriage registration in Nigeria. In view of the above, Makinde et al. (2016) contend that there is a need for adequate demographic parameters and data especially in developing countries where there is a huge research gap. Dake and Fuseini (2018) therefore saw a need for a vibrant vital registration system which would allow the monitoring of trends and tracing of progress in the population.

The few studies exploring the reasons for poor vital statistics in Nigeria show that a large percentage of the populace are aware of vital registration, particularly of birth, but practice remains scant (Makinde et al., 2016). It remains to be investigated whether gaps in awareness, lack of clarity about the registration process, individual perceptions, and other socio-cultural impediments may be contributory to this observed pattern. This study, therefore, aims to investigate the contextual (that is structural and public perception) factors that pose challenges to vital statistics in Nigeria. The study feeds into the need for indigenous researchers to conduct

baseline studies to come to terms with contextual challenges to vital statistics in sub-Saharan Africa. This study will uncover the extant situation of CRVS in the sample states, and will reflect the condition in Nigeria since CRVS is driven and coordinated nationally. Although some studies suggest that these factors can be local and peculiar, the findings of this research might suggest whether some general approach can be used to address the poor state of the CRVS in Nigeria, or whether studies should be commissioned to generate more locally situated suggestions across the states. We hold firmly that the pathway(s) to a workable and sustainable vital registration system in Nigeria can be articulated using the lessons that issue from the findings of this study.

Theoretical orientation

The Social Ecological Theory (SET) provides the conceptual framework for this study. SET was first introduced as a conceptual model for understanding human development by Urie Bronfenbrenner in the 1970s and later formalized as a theory in the 1980s (Bronfenbrenner, 1977). The theory tries to understand the multifaceted levels of human development within a society and how individuals and the environment interact within a social system. It describes five levels of influence on behavior; individual, interpersonal, organization, community and public policy (Newes-Adeyi et al., 2000). The individual level is concerned with an individual's level of awareness and knowledge of civil registration. The interpersonal level has to do with a person's relationships with other people like family, friends, and so on and how this helps to inform the individual's attitude about civil registration. At the organizational level, the theory explains how organizations like schools, hospitals and others can galvanize to ensure complete and comprehensive civil registration systems. The community level has to do with the culmination of the various organizations in an area to promote civil registration system. For instance, adequate information about civil registration can enhance its efficiency at the community level. Thus, effort targeted efforts at stressing the importance of civil registration at community level can help to change people's attitude about civil registration. The final level which is the policy level stresses the need for policy support to strengthen civil registration system. The existence of civil registration system in Nigeria requires some strategic actions to encourage the registration of vital events. Socio-ecological model has been used to analyze a wide range of issues including public health promotion, violence prevention, safety in agricultural environment, government programs etc. (Kilanowski, 2017; Golden and Earp, 2012; Hong et al., 2012). The theory is considered most appropriate for this study because it offers explanation to how reciprocal

interactions affect civil registration systems in Nigeria.

MATERIALS AND METHODS

Study design and setting

The study adopted the cross-sectional survey research design in generating data to answer the research questions and test the hypotheses. The study location was southeastern Nigeria, one of the six geo-political zones of the country. The area comprises five states: Abia, Anambra, Ebonyi, Enugu and Imo. Each of these states has three senatorial zones and a number of local government areas (LGAs), with each having at least one vital registration centre. The 2006 population census estimated the combined population of these states at 16, 395, 555. Most of their populations are Igbo and predominantly Christian. We purposively selected the southeastern region for convenience of language, distance and spatial familiarity. We used urban and rural indices to stratify the five states into two and purposively selected Ebonyi to represent the more rural states and Enugu to represent the more urbanized states. Enugu State is chosen because, being the administrative headquarters of the old Eastern Region, it is likely to be bureaucratically and administrative mature, in contradistinction with Ebonyi which is a relatively young state and ordinarily likely to be less administratively advanced than Enugu. Thus, placing the results from both states side-by-side will provide useful comparative insights. Ebonyi and Enugu states have 2019 projected populations of 3,025,956 and 4,542,446 respectively.

Participants

The population for this study comprises adult males and females of 18 years and above who have had at least one child. The justification for working with this category of the population is that they are the set of people most likely to have relevant experiences on the subject matter. A sample of 600 adult males and females, which was considered representative enough for the nature of the study, was engaged. A multistage sampling procedure – which entailed successive selection of LGAs, wards, housing units and respondents – was employed. We stratified the LGAs in each sample state according to urban and rural indices and randomly selected one from each of the two strata. Simple random sampling was used to select two wards from each of the selected LGAs, giving us eight wards in all. In each of the eight selected wards across the two sample states, we visited households using the systematic random sampling technique until we arrived at 75 respondents. Doing this across the eight wards gave us a total of 600. (We ignored village boundaries in our sample selection since villages within the wards are not far from each other and do not differ in any significant ways, especially with regards to the subject matter of this study.)

Data collection

To explore the research questions, we employed an interviewer-based questionnaire designed to provide information on the socio-demographic characteristics of the respondents as well as their views and practices on vital registration. The questionnaire items were translated into Igbo, the local language spoken in the sample states. Each fieldworker was given equal numbers of English and Igbo versions of the instrument. This was to ensure that translations would not vary should the fieldworker face situations that would warrant any translations. This helps to smoothen the data collection

process. Other-administered technique was adopted for administering the questionnaire; this was to avoid possible misunderstanding of any questions by the respondent, which would have led them to supply unintended responses. This method of administration also ensured that all 600 copies of the questionnaire were filled and returned, avoiding loss and damage that sometimes happen with the self-administered approach.

Data management

All collected data were double-checked by the field supervisors before entry into the computer. Statistical Packages for the Social Science (SPSS) was used to analyze the data. A univariate analysis was done to highlight the distribution of respondents by key variables including birth, death and marriage registration. Multivariate Logistic regression was used to respectively examine the relationship between each of the sociodemographic and socioeconomic variables on the registration of birth, death and marriage.

RESULTS

Participants' profiles

A total of 600 respondents, aged between 18-88 years old with a mean age of 40.8, were sampled for the study. As shown in Table 1, the average age was 41 years with a standard deviation of 13.74. Most of the respondents were females (60.7%) with up to 81.7% married. Civil/public service (37%) and trading (34%) were the occupations that most of the respondents engaged in.

Most of the respondents seemed highly educated with as many as 43% having completed tertiary education. About half (49%) of the respondents were Catholics. Birth registration appeared to be quite common among the respondents with as many as 73.5% reporting that they had registered someone's birth. Registration of the death of one's relatives however was quite an uncommon practice with only 33.8% reporting that they did. Finally, 66.8% of those who had at some point married in their lives reported that they registered their marriage.

Birth registration

The multivariate analyses for registration of birth show that state of residence, sex, marital status, number of children born and number of children living were significant predictors of birth registration. Compared to people who resided in Ebonyi, people who resided in Enugu were less likely to register birth (OR 0.046; CI 0.005-0.440). Compared to females, males were less likely to register the birth of their child (OR 0.247; CI 0.101-0.607). Those who had ever married were more likely to register for birth than those who had never married (OR 3.272; CI 1.014-10.558). The likelihood to register for birth decreased with the number of children born (OR 0.509; CI 0.257-1.007); while it increased with

Table 1. Description of respondents by sociodemographic characteristics; N = 600.

Variable	Frequency	Percentage
State		
Ebonyi	300	50.0
Enugu	300	50.0
Place of residence		
Rural	300	50.0
Urban	300	50.0
Sex		
Female	364	60.7
Male	236	39.3
Marital status		
Married	490	81.7
Single	66	11.0
Separated	6	1.0
Divorced	3	.5
Widowed	35	5.8
Occupation		
Farming	99	16.5
Trading	204	34.0
civil/public servant	222	37.0
Artisan	75	12.5
Education		
no formal education	63	10.5
primary education	71	11.8
secondary education	208	34.7
tertiary education	258	43.0
Religion		
Catholic	299	49.8
Anglican	95	15.8
Pentecostal	167	27.8
Birth registration		
Yes	441	73.5
No	159	26.5
Death registration		
Yes	203	33.8
No	397	66.2
Marriage registration		
Yes	357	66.8
No	177	33.2

the number of children living (OR 2.288; CI 1.069-4.899).

Death registration

The multivariate analysis show that state of residence, place of residence, and Level of education were

significant predictors of death registration. People residing in Enugu were less likely to register death of their relatives than people who resided in Ebonyi (OR 0.433; CI 0.209-0.897). Compared to residents in rural areas, residents in urban areas were more likely to register death of their relatives (OR 6.829; CI 2.816-16.561). People with high formal education (secondary

and tertiary) were more likely to register the death of their relatives than people with no formal education (OR 5.861; CI 1.216-28.243 and OR 6.241; CI 1.272-30.623).

Marriage registration

The multivariate analysis for marriage registration shows that place of residence, age, occupation, education, and number of children born were significant predictors of marriage registration. Urban residents were less likely to register marriage compared to rural residents (OR 0.251; CI .092-0.684). The likelihood of registering for marriage increased with age (OR 1.041; CI 1.004-1.078). Compared to farmers, traders and civil servants were more likely to register for marriage (OR 3.064; 1.181-7.952 and OR 5.036 CI 1.597-15.882). Those educated at primary level (OR 4.105; CI 1.127-14.958), those educated up to secondary level (OR 5.592; CI 1.591-19.657) and those that completed tertiary education (OR 6.959; CI 1.914-25.297) were more likely to register marriage than those with no formal education. The likelihood to register marriage decreased with the number of children one had (OR 666; CI 0.441-1.006).

DISCUSSION

The study was conducted to assess the contextual factors affecting the practice of vital registration in the study area with emphases on the registration of birth, death and marriage. Our findings showed that 73.5% of the respondents registered a child in their household in a birth and death registry or any other agency. This is an indication that birth registration is continuing the trend of increase from 31.5% in 2007 to 41.5% in 2011 as revealed by Makinde et al. (2016). Williams (2014) reported a higher figure of 84.8% having taken into consideration the certificate cited and affirmation from parents. Increase in birth registration may not be unconnected with an improved awareness of birth registration reported in many parts of Nigeria (Akande and Sekoni, 2005; Tobin et al., 2013). Despite the fact that the rate of birth registration in our study is higher than the national rate of 33.09% for under 1 age, 31.19% for 1-5% 35.72% for above 5 years (NBS, 2018), it is still considered suboptimal when compared with industrialized nations that register nearly all their births.

The multivariate logistic regression (Table 2) suggests that contextual (or social location) factors affect the registration of all births in Nigeria. Our comparison of two states (Ebonyi and Enugu) in south-eastern region of Nigeria showed marked differences in the practice of birth registration. People from Ebonyi were more inclined to registering for birth than people from Enugu, the more urbanized of the two sample states. Though NPC and ICF (2014) had earlier shown that Enugu had a birth

registration rate of 46.1% in 2013 compared to Ebonyi State that had 36.8%, higher percentage of people in Enugu that registered for birth does not however suggest any relationship. Our study also showed that sex is one of the factors influencing the registration of birth. Males were less likely to register the birth of a child in their household than females. The reason for this might not be unconnected to the fact that men are not major users of health facilities compared to women. Utilisation of health facilities improves chances of contact with health administrators who have been known to influence birth registration. In that light, Makinde et al. (2016) have shown that women that received Antenatal Care (ANC) had greater odd of registering the birth of their child.

Ever been married was found to be a predictor of birth registration. Similar finding has been reported by Isara and Atimati (2015) as well as well Tobin et al. (2013). Marriage facilitates information sharing, and as such, unmarried people may not always have someone close to enlighten and motivate them to register their birth. We also found that the likelihood to register birth decreased with the number of children one had while it increased with number of children alive. Again, this may equally be connected to the importance attached to children.

As the study revealed, the number of people who registered the death of a relative is quite low (33.8%). Tobin et al. (2013) reported similarly low figure of 39.7% in a study in Southern Nigeria. Low registration of death may be because of the circumstances surrounding death. To illustrate, birth occurs mostly in health facilities where health professionals can influence the registration process (Dake and Fuseini, 2018), most deaths, however, occur outside health facilities where health workers cannot influence the registration process. Also, people have been known to purposely underreport deaths for social and cultural reasons (Williams, 2014); and this would limit the willingness to register the death of a relation.

Unlike birth registration, place of residence and educational status are significantly associated with death registration. Specifically, urbanites and people with secondary and tertiary education predicted the likelihood of death registration. These two factors have something in common – exposure to more information and awareness of the importance of civil registration. As such, it is suggestive that the reason for the registration of deaths by people in these two categories has to do with awareness and knowledge of its importance. Similar findings on high educational status being a determining factor on the registration of birth and death have as well been reported by Isara and Atimati (2015).

In our study, only 66.8% of the ever-married respondents indicated that their union was registered. Again, the challenges associated with both birth and death registration may also extend to marriage registration. Moreover, unavailable law on compulsory registration of marriage may be blamed. But the

Table 2. Multivariate Logistic regression analyses of some sociodemographic and socioeconomic characteristics by vital registration of birth, death and marriage.

Variables	Birth		Death		Marriage	
	OR	CI	OR	CI	OR	CI
State						
Ebonyi	1	-	1	-	1	-
Enugu	0.046*	0.005 - 0.440	0.433*	0.209 - 0.897	1.293	0.512 - 3.266
Place of residence						
Rural	1	-	1	-	1	-
Urban	0.390	0.121 - 1.256	6.829**	2.816 - 16.561	0.251*	0.092 - 0.684
Sex						
Female	1	-	1	-	1	-
Male	0.247*	0.101 - 0.607	1.230	0.662 - 2.288	0.964	0.491 - 1.893
Age						
	0.987	0.940 - 1.037	0.977	0.946 - 1.009	1.041*	1.004 - 1.078
Marital status						
Never married	1	-	1	-	n/a	n/a
Ever married	3.272*	1.014 - 10.558	1.056	0.423 - 2.638	n/a	n/a
Occupation						
Farming	1	-	1	-	1	-
Trading	0.880	0.162 - 4.779	0.843	0.280 - 2.538	3.064*	1.181 - 7.952
Civil/public servant	1.844	0.275 - 12.365	0.634	0.183 - 2.199	5.036*	1.597 - 15.882
Artisan	0.380	0.053 - 2.741	0.618	0.168 - 2.274	1.037	0.275 - 3.911
Education						
No formal education	1	-	1	-	1	-
Primary education	3.121	0.362 - 26.908	3.320	.640 - 17.228	4.105*	1.127 - 14.958
Secondary education	1.970	0.357 - 10.873	5.861*	1.216 - 28.243	5.592*	1.591 - 19.657
Tertiary Education	2.602	0.459 - 14.750	6.241*	1.272 - 30.623	6.959*	1.914 - 25.297
Religion						
Catholic	1	-				
Anglican	2.051	0.600 - 7.008	1.509	0.662 - 3.439	1.145	0.494 - 2.653
Pentecostal	0.679	0.261 - 1.768	1.498	0.777 - 2.887	0.699	0.360 - 1.357
Monthly income	1.000	1.000 - 1.000	1.000	1.000 - 1.000	1.000	1.000 - 1.000
Number of children	0.509*	0.257 - 1.007	1.551	.929 - 2.590	0.666*	0.441 - 1.006
Number of living chi.	2.288*	1.069 - 4.899	0.736	.419 - 1.292	1.442	0.910 - 2.286
Number of adopted	0.565	0.246 - 1.299	0.517	.238 - 1.124	2.412	0.750 - 7.757
Constant	39.442		0.243		0.093	

Note: Significant at *p>0.05; **p> 0.000
n/a = not applicable; OR = odds ratio; CI, confidence interval.

registration of marriage is very important as it stamps legality on the union especially during official matters and divorce (Mian and Hossain, 2013). Among the factors investigated, our study showed that place of residence was significantly associated with marriage registration: urban dwellers were more likely to register their marriage than rural dwellers. Again, urban dwellers are better

exposed to the knowledge and importance of marriage registration. Besides, considering the financial commitment involved, rural dwellers are likely to find it rather challenging because of higher rate of poverty in rural areas. Bennouna et al. (2016) found in their study in Indonesia that financial constraints and bureaucratic bottlenecks were major barriers to the registration of

marriage.

Our results also showed that the likelihood of marriage registration increases with age. This may be because older couples have the need for it than younger couples. Occupation, especially with regards to traders and civil/public servants, acted as a predictor of marriage registration. These occupations offer room for more income than farming, and as earlier presented, finance is an important factor in marriage registration. Moreover, there are added benefits in one's marital status for those working in government parastatals. These benefits could influence the registration of marriages by civil/public servants. Although not much is written on marriage, the report by NBS (2018) indicates that the number of people who reported registering their marriage is falling. With the current poor socioeconomic situation in Nigeria, many may not afford the cost of marriage registration. As shown in our study, completing any educational level is a predictor for the registration of marriage. The role that education plays in all vital registration has been clearly acknowledged in this study. Education helps people appreciate the importance of civic registration. In addition, number of children is a significant predictor of marriage and as our study shows, the number of children one has decreased the odds to register.

Conclusion

Our results revealed that the challenges of civil registration were tied to its perceived relevance in the society and its interception with one's sociodemographic. For instance, registration of birth was highest because since it had something to do with one's legal identity and serves as requirements for inclusion in various government institutions, social and private establishments. For death registration, however, the low rate of practice may serve as an indication of unrecognized relevance. As such, the importance of sensitization cannot be downplayed. Further, birth certificate is prerequisite for school enrolment and employment into most formal organizations. All these are in line with the SET put forward by Bronfenbrenner (1977), that what affects vital registration are at the individual, interpersonal, organizational, community and public policy level. Since the Nigerian National Population Commission (NPC) (2008) had earlier noted that one of the main challenges of vital registration was publicity, persuasive programmes on media outlets should therefore be used to create awareness, to highlight availability of civil registration centres as well as the individual and national benefits of complying. Some compulsive measures could also be employed to improve compliance should persuasion alone not produce desired results.

In addition to the factors of awareness, availability and robustness of institutional provisions, moderating variables peculiar to each cultural area should be factored

into efforts to improve civil registration. Despite the fact that our study is limited by the non-addition of qualitative data, we nonetheless succeeded in raising a fresh perspective as to how contextual (cultural/social) factors could influence people's attitudes to civil registration, and therefore affect rates of its success in different places, no matter the extent of institutional arrangements for the purpose. In addition to the factors of awareness, availability and robustness of institutional provisions, moderating variables peculiar to each cultural area should be factored into efforts to improve civil registration.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

- Akande T, Sekoni OO (2005). A Survey of birth and death registration in a semi-urban settlement in Middle Belt, Nigeria. *European Journal of Scientific Research* 8:56-60.
- Bennouna C, Feldman B, Usman R, Adiputra R, Kusumaningrum S, Stark L (2016). Using the three delays model to examine civil registration barriers in Indonesia. *PLoS ONE* 11:12.
- Brolan CE, Gouda H (2017). Civil registration and vital statistics, emergencies, and International law: Understanding the intersection. *Medical Law Review* 25(2):314-339. <https://doi.org/10.1093/medlaw/fwx021>
- Bronfenbrenner U (1977). Toward an experimental ecology of human development. *American Psychologist* 32:513-531. doi:10.1037/0003-066X.32.7.513.
- Dake AA, Fuseini K (2018). Registered or unregistered? Levels and differentials in registration and certification of births in Ghana. *BioMed Central International Health and Human Rights* 18:25.
- Golden SD, Earp JAL (2012). Social ecological approaches to individuals and their contexts: twenty years of health promotion interventions. *Health Education and Behavior* 39(3):364-372 DOI: 10.1177/1090198111418634
- Hong JS, Garbarino J (2012). Risk and protective factors for homophobic bullying in schools: an application of the social-ecological framework. *Educational Psychology Review* 24(2):271-285. <https://www.jstor.org/stable/43546789>
- Isara RA, Atimati OA (2015). Socio-demographic determinants of birth registration among mothers in an urban community in Southern Nigeria. *Journal of Medicine in the Tropics* 17(1):16-21.
- Kllanowski JF (2017). Breadth of the Socio-ecological model. *Journal of Agro Medicine* 22(4):295-297.
- Makinde AO, Olapeju B, Ogbuoi O, Babalola S (2016). Trends in the completeness of birth registration in Nigeria: 2002-2010. *Demographic Research* 35(12):315-338.
- Mian N, Hossain R (2013). Modernizing marriage registration law in Bangladesh. *International Journal of Physical and Social Sciences* 3(7):127-146.
- Mikkelsen L, Philips D, AbouZahr C, Setel P, De Savigny D, Lozano R, Lopez AD (2015). A global assessment of civil registration and vital statistics systems: Monitoring data quality and progress. *The Lancet* 386(10001):1395-1406. DOI:10.1016/S0140-6736(15)60171-4
- National Population Commission (2008). Reports on live births, deaths and still births registration in Nigeria (1994-2007). Abuja: NPopC. Available at: http://www.ibenaija.org/uploads/1/0/2/10128027/report_on_birth-death-stillbirth-registration.pdf. [Accessed 15 August, 2019].
- National Bureau of Statistics (NBS) (2018). Demographic statistics bulletin. 2017. National Bureau of Statistics. Available at: <https://nigerianstat.gov.ng/download/775>. [Accessed 10 December, 2018]

- Newes-Adeyi G, Heltizer DL, Caulfield LE, Bronner Y (2000). Theory and practice: Applying the ecological model to formative research for a WIC training program in New York State. *Health Education Research: Theory and Practice* 15(3):283-291. <http://doi.org/10.1093/her/15.3.283>.
- NPC and ICF International (2014). Nigeria demographic and health survey 2013. Abuja, Nigeria and Rockville, Maryland, USA: NPC and ICF International.
- Tobin AE, Obi IA, Isah CE (2013). Status of birth and death registration and associated factors in the south-south region of Nigeria. *Annals of Medicine* 7(1):3-7. Available at: <http://www.anmjournal.com/article.asp?issn=0331131;year=2013;volume=7;issue=1;spage=3;epage=7;aulast=Tobin>. [Accessed 5 March, 2019].
- UNICEF (2018). Strengthening civil registration and vital statistics systems through innovative approaches in the health sector: guiding principles and good practices. Geneva: WHO.
- UNICEF Nigeria (2007). Information sheet on birth registration. Available at: https://www.unicef.org/wcaro/WCARO_Nigeria_Factsheets_BirthRegistration.pdf. [Accessed 24 August, 2019].
- United Nations (2017). Demographic and social statistics. Available at: <https://unstats.un.org/unsd/demographic-social/crvs/>. [Accessed 24 August, 2019].
- Williams OA (2014). Assessment of the completeness of births and deaths registration in an Urban Nigerian community. *African Population Studies* 27(2):263-272. Available at: <http://aps.journals.ac.za/pub/article/view/473>.