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## Effect of maternal exposure to intimate partner violence on under-five mortality in Nigeria

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**Abstract:** *Background:* The under-5 mortality rate in many developing countries has shown little or no improvement over the years. Ravaged by war and poverty, violence which is now a norm in most African countries (including Nigeria) is on the increase and has condensed into most families with women and children bearing the major brunt of this violence.

*Aim:* Effect of maternal exposure to intimate partner violence on under-5 mortality in Nigeria.

*Methods:* Data from nationally representative sample of mothers (aged 15-49 years) was obtained from the 2008 Nigeria Demographic and Health Survey. Cox regression and multiple logistic regressions were used to identify and examine the association between maternal exposure to intimate partner violence and under-5 death and use of maternal and child health services after controlling for potential confounding factors.

*Results:* The prevalence of intimate partner violence (IPV) in Nigeria is 34.9%. This may be lower than the actual prevalence due to under reporting of cases of IPV in most developing countries. Women not exposed to intimate partner

violence were 0.77 times less likely to lose a child under-5 compared to women exposed to intimate partner violence (HR=0.77 95%CI 0.64-0.81). Decision making autonomy in family activities significantly affected loss of a child under-5 in the face of IPV. Similarly women not exposed to IPV were 1.74 times more likely to use maternal and child health services compared to exposed mothers (OR=1.74 95% CI 1.65-1.83). Age of mother, educational status of mothers, social class, occupation, marital status, access to media and decision making autonomy were retained as important maternal predictors of use of maternal and child health services when exposed to IPV in multivariate analysis ( $p < 0.05$ ).

*Conclusion:* Intimate Partner Violence has a significant effect on under-5 mortality. Therefore tackling this social menace will not only reduce the effect on child mortality but also address the ill societal effect that results from family collapse following IPV.

**Key words:** Intimate partner violence, under-5 mortality, use of maternal and child health services, Nigeria

### Introduction

Despite decline in child mortality rate globally the under-five mortality rate is still an issue in most African countries<sup>1</sup>. While the major killers of children in Africa have been identified<sup>2</sup>, the effect of social determinants of health on this increasing mortality rate remains under studied especially in the African setting. Intimate partner violence (IPV) is one of these social determinants which adversely affect the capacity of the mother to care for the child. This is particularly true in Africa where male dominance in relationships and family is an unquestionable norm.

Intimate partner violence is defined as any act of physical, sexual and emotional abuse by a current or former partner whether cohabitating or not.<sup>3</sup> The Centre for Disease Control prevention (CDC) also defined it as a serious, preventable public health problem characterised by physical, sexual or psychological harm by a current or former spouse or partner<sup>4</sup>. According to CDC, three main types of intimate partner violence exists and they include - physical abuse when a person hurts or tries to hurt a partner by hitting, kicking, burning or other physical force. Sexual abuse forcing a partner to take part in a sexual act when the partner does not consent and emo-

tional abuse is threatening a partner or his /her possession or loved ones or harming a partner's sense of worth e.g. stalking, name calling, intimidation or not allowing a partner see friends or family.

Intimate partner violence is the third highest cause of death among people 15-44 years of age,<sup>5</sup> and the most common form of violence against women. Its negative effects on women's health are serious enough to be recognized as a public health crisis with extensive effects on children.<sup>6-8</sup> In most cases of IPV these several types occur together usually starting from emotional abuse then progressing to physical or sexual assault<sup>4</sup>. Although women can be violent in a relationship, bulk of the global burden of IPV are borne by women, this is particularly true in Africa where women are emotionally and economically dependent on men<sup>9</sup>. Owing to cross-cultural differences in expected gender roles, IPV varies between geographical locations.

A global lifetime prevalence of 10-70% has been stated for women in marriage or current relationship<sup>10</sup> while in sub-Saharan Africa a life time prevalence of IPV is between 20-71%<sup>11</sup>. This has been argued to be non representative due to the low reporting trends of IPV in many sub-Saharan African countries. According to W.H.O<sup>12</sup> almost 50% of women who die of homicide are killed by either their current or former partners, while in some countries it can be as high as 70%. Also 25% of women will experience violence by intimate partner in their life time.<sup>12</sup> While domestic violence is a universal problem; it is a problem of extreme magnitude in less developed countries. A recent survey in Uganda and Bangladesh reported that more than 80% and 94% of women surveyed respectively had experienced physical, sexual or psychological violence at some point in their marriage or intimate relationship.<sup>13</sup> In many parts of Africa, IPV is a justifiable punishment accepted as a societal norm.<sup>14</sup> This acceptance is enhanced by the increasingly armed conflicts in most African countries, lawlessness and almost absent interference of police in intra marital affairs.<sup>14</sup> A study in Nigeria revealed that 47% and 42% of women in Niger-delta (South-south) and the rest of the country respectively justified IPV for one reason or the other. It also showed that 81% and 83% of these women had no autonomy over their own health or that of their children.<sup>15</sup>

Due to the damaging effect of IPV on the society it is now viewed by international organisations not only as a

human right issue but as a public health issue.<sup>16</sup> This is because IPV not only affects the health of the assaulted woman but also affects the health and psychological stability of her child leading to a vicious cycle of domestic violence that accounts for most of the ills of the society today.<sup>17</sup> Several studies outside Africa have documented the existence of a strong link between IPV and childhood morbidity and mortality.<sup>18,19</sup>

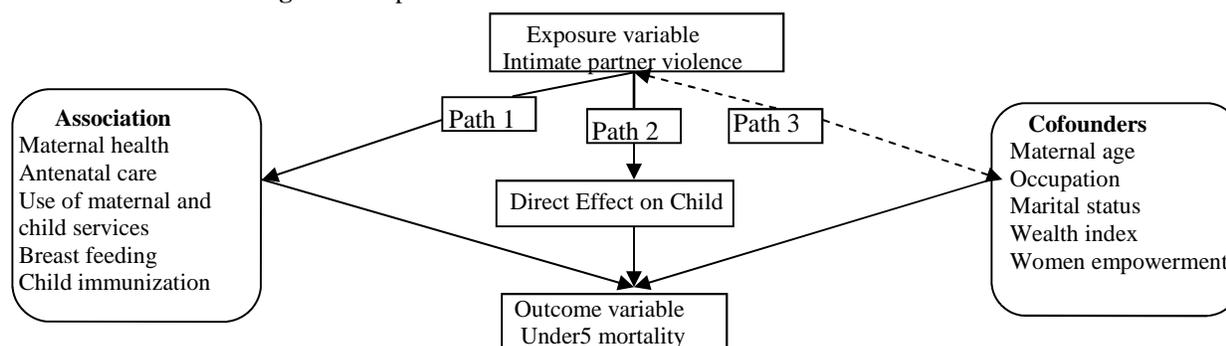
Children who witness such violence are at greater risk of being affected in various aspects of their life including physical, behavioural, cognitive development and social adjustment which are all necessary determinants for the survival of a child.<sup>20</sup> In a study done in the North of India it was found that the risk of child death during perinatal and neonatal period is twice higher in women who experienced domestic violence during pregnancy compared to those who did not.<sup>21</sup> Another study in Uganda<sup>22</sup> associated IPV with childhood diseases like fever, cough and fast breathing.

Several studies have proved that a major link between maternal exposure to IPV and child mortality is poor care from mothers who are mentally stressed.<sup>23,24</sup> The pathway between IPV and child mortality is multifaceted and complex. Some linkages between IPV and child mortality have been proposed, some of which included maternal depression and direct physical injury assault on the child. This study probes further other possible relationship between IPV and child mortality using 2008 Nigeria DHS data.

### Conceptual framework

A conceptual framework adapted from Emily Rico<sup>25</sup> et al was modified ( figure 1) and used to hypothesize the assumed association between IPV and under-five mortality. It outlines how IPV could lead to child mortality and how other confounding variables could possibly play a role in enhancing or reducing these associations. Pathway1 shows how IPV through maternal factors lead to under- five mortality. These health problems include mainly the physical health effect and the psychosocial/mental effect.<sup>23</sup> The poor mental state leads to poor breast feeding, substances abuse, poor use of maternal and child health services, etc. All these problems tend to reduce the IPV-exposed mothers ability to carter for herself and for the child leading to poor child attention, child malnutrition and increased morbidity.

**Fig 1:** Conceptual framework between association of IPV and under-5 death



Pathway 2 shows IPV can also be related to under-five mortality via direct effect on the child. These could occur prenatally leading to poor pregnancy outcome like ante-partum haemorrhage, spontaneous abortion, prematurity, and still births due to combined effect of trauma on the abdomen or activity of stress hormone on the pregnancy. Postnatally, children are advertently victim of domestic violence either accidentally by being used as a shield or when they try to intervene due to fear, or non-accidentally due to battering by one of the spouse out of retaliation or reaction for the domestic violence. It was noted in the USA that 40-60% of men who abuse women also abuse their children and 27% of violent homicide victims were children.<sup>26</sup>

In Pathway 3 social and demographic factors which in themselves do not cause under-five mortality directly but mediates the association between IPV and child mortality. Thus the presence or absence of these factors enhance or reduce the effect of IPV on under-five mortality. In this study these factors will be treated as co-founders.

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## Methods

### *Study area*

Nigeria is in the West African sub-region, lying between Niger in the North, Chad to the North-East, Cameroun in the East and Benin to the West. The 2006 population and housing census puts Nigeria's population at 140,431,790 making it the most populous nation in Africa and 14<sup>th</sup> in the world.<sup>27</sup> Nigeria is made up of 36 states and a federal capital territory, grouped into six geopolitical regions. There are 774 constitutionally recognised local governments and about 374 identifiable ethnic groups.<sup>28</sup> This survey was conducted in all states (including the Federal Capital Territory) within the six regions of Nigeria.

### *Study design*

This is a cross-sectional descriptive-analytical study. The study was conducted between July 2011 and December 2011 using data from the 2008 edition of DHS survey, which is a nationally-representative probability sample, using a stratified two-stage cluster sampling design consisting of 888 clusters, 286 urban and 602 rural areas. In all, a nationally representative sample of 36,298 household was selected for the 2008 NDHS survey. From these household 34,596 women were eligible for interview out of which 33,385 were successfully interviewed yielding a response rate of 96.5%.<sup>29</sup> Data collection was by 368 trained people (37 supervisors, 37 editors, 37 quality control interviewers, 152 female interviewers, and 74 male interviewer, reserve interviewers, etc). Training for the field staff who conducted the state interviews was done during a three week period in May-June 2008. The training consisted of instruction regarding interviewing techniques and field procedures, a detailed review of item on the questionnaire, mock

interview between participant in the classroom, and practice interviews with real respondents in area outside NDHS sample point<sup>29</sup>.

### *Exposure variable*

The logistic regression analysis included the two broad predictor variables namely-

- Exposure to IPV was assessed using the DHS intimate partner module which is based on a modified previous version of the conflict tactics scale (CTS).<sup>29</sup> Based on this scale respondent will be classified as "exposed" and "non-exposed". IPV referred to any exposure to one or several of the types of IPV i.e. physical, sexual or emotional acts of violence against women by a current, former husband or intimate partner.<sup>29</sup>
- Social and Demographic Variables- These characteristics were chosen as they were found to be important predictors of child immunization in previous studies.<sup>15,22,25</sup> This variable include age of mothers, marital status, educational status, occupation, wealth class, decision autonomy, access to media, literacy level and number of living children. These variables were re-coded into categories using DHS primary data.<sup>29</sup>

### *Outcome variable*

- The outcome variable was under-5 mortality defined as a child dying between birth and the fifth birthday. Under-5 mortality was estimated for the 5 years preceding the survey. All deaths among children  $\leq 60$  months were regarded as cases while those  $>60$  month were regarded as non cases. The under-5 mortality was chosen because it reflects the impact of social, economic and environmental circumstances as well as other causes of death on infants, toddler and children and more so 90% of death among children  $< 18$  years occurs in the first 5 years of life.<sup>30</sup>
- The use of maternal and child health services (MCHS) such as antenatal care, place of delivery and postnatal care like immunisation and child follow-up clinics were outcomes that were measured in women whether or not they were exposed to IPV. The variable was created from DHS data on antenatal care visit, place of delivery and child having ever been immunized. The MCHS variable was then computed by summing up of the variable. Two groups were formed, 0 for those who had never used MCHS and 1 for people that have used MCHS at least once or more.

### *Ethical Consideration*

The survey procedure and instruments for DHS for Nigeria was ethically approved by the Ethics Committee of the Opinion Research Corporation (ORC) Macro International Inc, Calverton, USA, and by the National

Ethics Committee in the Federal Ministry of Health of Nigeria. Informed consent was obtained from all participants prior to participation in the survey, and collection of information was confidential.<sup>29</sup>

### Analysis

The Predictive Analytics Software (PASW) statistical package version 19.0 (formerly called SPSS) was used for data analysis. The Pearson chi-square ( $\chi^2$ ) test was used to study the differences in proportion between the independent variables and immunization practice. The largest category in each predictor variable was used as the reference category. For all statistical tests performed, it was ensured that the assumptions for carrying out these specific tests were met. Statistical significance was set at  $p$ -value  $< 0.05$ . Results are presented using percentages, Odds Ratios and 95% CIs where appropriate.

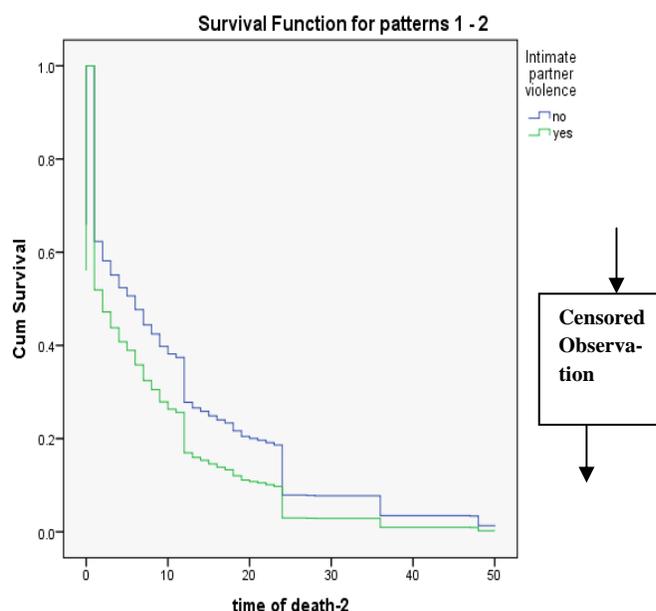
## Results

The mean age of mothers surveyed in this study was 28.7 years with an average of 2.54 children per woman. The overall prevalence of IPV for women from age of 15 in this study was 34.9%. Cross tabulation shows that women with no education had the highest rate of death of a child under-5 though this was not statistically significant ( $p=0.1025$ ) while those 20-29 had a significantly higher proportion of child death under-5 years ( $p=0.001$ ) compared to women in other age category. Expectedly women in the poor wealth category had the most under-5 death ( $p=0.034$ ) while women who are employed and skilled had most child death in the occupation category; this proportion was however not significantly different from other occupational category ( $p=0.889$ ). Respondents who were not married, those with no access to media and respondent with no decision making autonomy had higher rate of under-5 death  $p = 0.3688, 0.0951$  and  $0.0870$  respectively. These were however not statistically significant. Finally under-5 death was not significantly different in women with more than 4 children compared to those with less number of children ( $p=0.0977$ ).

Respondent not exposed to IPV had a total of 867 under-5 death compared to 499 under-5 deaths recorded by those exposed to IPV, with an average age at death of  $2.01 \pm 0.85$  years and  $1.67 \pm 0.87$  years respectively. 31.7% of the under-5 death occurred in the neonatal period for those not exposed to IPV compared to 55.9% in those exposed to IPV. Similarly 26.2% and 42.1% of under-5 death occurred in the infant and early childhood period in respondents not exposed to IPV compared to 21.2% and 22.8% respectively in those exposed to IPV. The proportion of deaths within these categories were statistically significant ( $p < 0.001$ ). Even though respondent not exposed to IPV proportionately had higher under-5 death compared to those exposed, this proportion was not statistically significant ( $p=0.112$ ). Bivariate Cox

regression (model 1) showed that mothers not exposed to IPV were 0.69 times less likely to lose a child under-5 than those exposed to IPV (HR 0.69 CI 0.62-0.78). In other words those exposed to IPV were about 1.5 times more likely to lose a child under-5 compared to mothers not exposed to IPV. In model 2, after correcting for confounders using multivariate Cox regression, the likelihood of losing a child when mother is not exposed to IPV remained significant (HR 0.77 CI 0.64-0.81) compared to when she is exposed to IPV. Stratified analysis showed that women with no decision making autonomy were 1.36 times more likely to lose a child under-5 compared to those with decision making autonomy in events of IPV. See figure 2

**Fig 2:** Survival plot from Kaplan-Meier survival analysis and number of censored observation for women exposed and those not exposed to IPV.



Respondents with no education used MCHS the least ( $p < 0.001$ ) while similarly mothers more than 40 years old used MCHS the least ( $p < 0.001$ ). Women in the poor wealth category, women with no form of employment and those not literate used MCHS less often compared to others in their respective category ( $p < 0.001$ ). Lastly women with access to media and decision making autonomy used MCHS more than those with no access to media and no decision making autonomy ( $p < 0.001$ ).

The use of MCHS was significantly better in women not exposed than those exposed to IPV ( $p < 0.001$ ). Logistic regression in model 1 showed that women not exposed to IPV had 1.65 times more likelihood than those exposed to use MCHS (OR 1.65, CI 1.58-1.72). Correcting for confounders in model 2 showed that the association still remained significant with likelihood increasing to 1.74 (OR 1.74, CI 1.65-1.83). Women who were 40 years and older were 1.71 more likely to use MCHS when exposed to IPV than those 15-19 years (OR 1.71 CI 1.28-2.28) while those between 20-29 and 30-39

were 1.37 times more probable to use these services than the reference category (OR 1.37, CI 1.06-1.63). Respondents in the rich and middle wealth category were 4 and 2 times respectively more likely to use MCHS than respondents in the poor wealth class [(OR 4.78, CI 3.38-5.47) and (OR 2.66, CI 2.24- 3.15)]. Employed women had more likelihood to use MCHS compared to those unemployed. Women within the unskilled and skilled employed category being 1.57 and 1.37 times

respectively more likely to use MCHS compared to the unemployed women [(OR 1.57, CI 1.34- 1.84) and OR 1.37, CI 1.21- 1.55)]. Similarly respondent who had no access to media and those without decision making autonomy were 0.8 and 0.65 times less likely to use MCHS than those with access to media (OR 0.81, CI 0.72- 0.92) and decision making autonomy (OR 0.65, CI 0.58- 0.73) respectively. Finally women who were not married were 0.66 times less likely to use MCHS compared to those who are married (OR 0.66, CI 0.41- 0.93). See table 1.

| <b>Table 1: Crude and adjusted hazard/odd ratio for under-5 death/use of MCHS and IPV variables</b> |                               |                                |                               |                               |
|---|-------------------------------|--------------------------------|-------------------------------|-------------------------------|
| Variable  | Death of under-5 child        |                                | Use of MCHS                   |                               |
|   | Model 1*<br>HR (95% CI)       | Model 2**<br>HR (95% CI)       | Model 1*<br>OR (95% CI)       | Model 2**<br>OR (95% CI)      |
| <i>Exposure IPV</i>   |                               |                                |                               |                               |
| No  | 0.69(0.62, 0.78) <sup>+</sup> | 0.77(0.64, 0.81) <sup>+</sup>  | 1.65(1.58, 1.72) <sup>+</sup> | 1.74(1.65, 1.83) <sup>+</sup> |
| Yes   | 1                             | 1                              | 1                             | 1                             |
| <i>Age of mother</i>  |                               |                                |                               |                               |
| <19yr   |                               | 1.13(0.87, 1.46)               |                               | 1                             |
| 20-29   |                               | 1.08(0.92, 1.28)               |                               | 1.37(1.06, 1.63) <sup>+</sup> |
| 30-39   |                               | 1.12(0.95, 1.33)               |                               | 1.37(1.07, 1.63) <sup>+</sup> |
| >40   |                               | 1                              |                               | 1.71(1.28, 2.28) <sup>+</sup> |
| <i>Education</i>  |                               |                                |                               |                               |
| None  |                               | 1                              |                               | 1                             |
| Primary   |                               | 1.05(0.80, 1.38)               |                               | 2.66(2.24, 3.15) <sup>+</sup> |
| Higher  |                               | 0.66(0.36, 1.22)               |                               | 4.78(2.24, 8.90) <sup>+</sup> |
| <i>Wealth index</i>   |                               |                                |                               |                               |
| Poor  |                               | 1                              |                               | 1                             |
| Middle  |                               | 0.76(0.63, 1.37)               |                               | 2.36(2.01, 2.78) <sup>+</sup> |
| Rich  |                               | 0.87(0.70, 1.09)               |                               | 4.30(3.38, 5.47) <sup>+</sup> |
| <i>Occupation</i>   |                               |                                |                               |                               |
| None  |                               | 1                              |                               | 1                             |
| Unskilled   |                               | 0.73(0.43, 1.25)               |                               | 1.57(1.34, 1.84) <sup>+</sup> |
| Skilled   |                               | 1.06(0.94, 1.19)               |                               | 1.37(1.21, 1.55) <sup>+</sup> |
| <i>Literacy</i>   |                               |                                |                               |                               |
| No  |                               | 1                              |                               | 1                             |
| Yes   |                               | 1.56(0.89, 2.74)               |                               | 1.25(0.71, 2.19)              |
| <i>Marital status</i>   |                               |                                |                               |                               |
| No  |                               | 0.67(0.40, 1.18)               |                               | 0.66(0.41, 0.93) <sup>+</sup> |
| Yes   |                               | 1                              |                               | 1                             |
| <i>Media access</i>   |                               |                                |                               |                               |
| No  |                               | 0.90(0.80, 1.01)               |                               | 0.81(0.72, 0.92) <sup>+</sup> |
| Yes   |                               | 1                              |                               | 1                             |
| <i>Decision autonomy</i>  |                               |                                |                               |                               |
| No  |                               | 1.36(0.121, 1.54) <sup>+</sup> |                               | 0.65(0.58, 0.73) <sup>+</sup> |
| Yes   |                               | 1                              |                               | 1                             |
| <i>No of children</i>   |                               |                                |                               |                               |
| 0   |                               | 1.21(0.90, 1.63)               |                               | 0(0.00, 0.00) <sup>β</sup>    |
| 1   |                               | 1.03(0.84, 1.26)               |                               | 0.91(0.80, 1.04)              |
| 2-3   |                               | 1.08 (0.925, 1.26)             |                               | 1.03(0.93, 1.15)              |
| 4   |                               | 1                              |                               | 1                             |

(\* ) Crude Hazard ratio/odd ratio (\*\*) Adjusted Hazard ratio/odd ratio (+) statistically significant (β) Not computable

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## Discussion

The finding of the survey puts the prevalence rate of IPV in Nigeria at 34.9%. This falls within the life time prevalence of IPV in Africa<sup>11</sup> put at 20-71%. A study done in Kenya by Rico et al<sup>25</sup> found a prevalence rate of 42.6%. The prevalence rate found by this study is believed to be lower than the actual prevalence in Nigeria. This is because in Nigeria like in many developing countries, IPV which is regarded as a justifiable punishment<sup>14</sup> is not or under reported in most cases and regarded as a family issue.

Finding from this study showed that women exposed to violence lost a child at earlier ages of the child life when compared to those not exposed. This is particularly important in Nigeria and other developing countries where majority of the under-5 death occurs in the first year of life with the highest risk within the first 28 days<sup>31</sup>. During this period care of the mother is critical to survival of the child therefore experience of IPV by mother means higher chances of neonatal and infant death. Analysis also indicates that women who experienced IPV were 1.5 times more likely to lose a child under-5 years than those who were not exposed. This is expected as these women not only suffer physical injury but also social, emotional and psychological trauma which affects their capacity as mothers to cater for their children. Furthermore women exposed to IPV were more likely to separate temporary from their husbands after spousal abuse leaving the care of the child to the man who is usually less skilled in the care of children. For those who stay on after IPV, reduced financial support for them from their partners (especially those who are unemployed and completely dependent on their husbands for finances) will definitely translate to poor use of MCHS and invariably higher chances of death of their under-5 children. The findings of this study are in line with the results of other studies<sup>21, 23</sup> which showed a significant association between IPV and child mortality.

Higher educational level, higher wealth index and better employment status were also seen to significantly affect the use of MCHS. These variables which reflect the socioeconomic class of a woman empowers the woman better in seeking healthcare for herself and her child. Because they are less dependent on the man financially and psychosocially they tend to act more independently from their husbands during spousal crises. This also possibly explains the lower rate of under-5 death experienced by women of higher education level, rich class and employed status found in this study.

The findings that married women uses MCHS more than unmarried women is worthy of note. Apart from the financial and emotional support enjoyed by most married women in seeking health services for themselves and their children, the belief in most African countries that having a child outside marriage is an abomination usually discourages most single mothers from visiting healthcare facilities<sup>32</sup> in Nigeria. Finally the study showed that women who have a say in the running of the family activities and have access to media

had better usage of MCHS than those without decision making autonomy and without media access. The reason for this is not far-fetched. A woman who has say in the decision of her family and has access to media is more likely to be better empowered than one without such privileges. This power puts her in charge of decisions regarding health issue for herself and the child which in turns translates to less mortality for the child.

The findings of this study though collaborated by other studies<sup>18, 19, 21, 23</sup> should be interpreted in the light of some limitations. Firstly, being a cross-sectional study, the temporality in causality could not be ascertained since both intimate partner violence and under-5 mortality could precede one another. Since some of the variables used in this study were re-categorised using DHS primary data, errors in classification might have occurred giving rise to misclassification and interpretation errors. Lastly most confounding variables had skewed distribution in the number of respondents in various categories, which made regression analysis impossible, inconsequential or resulting in incorrect associations.

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## Conclusion and Recommendation

Despite all the short comings, this analysis supports evidence that IPV has an influential role in under-5 mortality and use of maternal and child health services in Nigeria and by extension to developing countries where child mortality is still high. This indicates that violence against women represent an important public health concern not only for women but also for child's survival. Therefore tackling the increasing incidence of intimate partner violence in families of developing countries will go a long way to impact on the ever increasing childhood mortality in many countries in Africa, if the millennium development goal<sup>4</sup> is to be achieved in the continent by 2015. It is recommended that women should be empowered by ways of education and employment in Nigeria as the factors were seen not only to reduce under-5 death in face of IPV and but also encouraged the use of MCHS. Also early marriage should be discouraged by effective legislation as lower maternal age was seen to negatively affect child care and use of MCHS. Further studies to further collaborate these findings, to evaluate other possible pathways not captured in this study and exploration of causality and temporality is also recommended.

### Authors contributions

Osuorah D : Conceptualised the frame work, developed work and data analysis.  
 Antai D: Supervised the work,  
 Ezeudu C : Literature review  
 Chukwujekwu E: Methodology, discussion and Recommendations

Conflict of interest: None  
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