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Editor: Friday Okonofua

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CONTENTS

Editorial

Preventing and Controlling Cervical Cancer in Africa: A Call for Action
Friday Okonofua

9-13

Articles

Community Factors Influencing Birth Spacing among Married Women in Uganda and Zimbabwe
Courtney McGuire and Rob Stephenson

14-24

Skilled Birth Attendance in Nigeria: A Function of Frequency and Content of Antenatal Care
Chinelo C. Okigboa and Ahizechukwu C. Ekeb

25-33

Social Networks and Decision Making for Clandestine Unsafe Abortions: Evidence from Kenya
Joachim Osur, Alloys Orago, Isaac Mwanzo and Elizabeth Bukusi

34-43

Factors Influencing Prevention and Control of Malaria among Pregnant Women Resident in Urban Slums, Southern Ghana
Mavis Dako-Gyeke and Humphrey Kofie

44-53

Human Resource Challenges to Integrating HIV Pre-Exposure Prophylaxis (PrEP) into the Public Health System in Kenya: A Qualitative Study
Natasha Mack, Christina Wong, Kevin McKenna, Ansley Lemons, Jacob Odhiambo and Kawango Agot

54-62

“Over my Dead Body”: Knowledge and Attitude of Children Towards HIV and AIDS in the Cape Coast Metropolis of Ghana
Samuel Asiedu Owusu

63-72

Accessing Sexual and Reproductive Health Information and Services: A Mixed Methods Study of Young Women’s Needs and Experiences in Soweto, South Africa
Naomi Lince-Deroche, Adila Hargey, Kelsey Holt and Tara Shochet

73-81

Prevalence and Correlates of Sexual abuse among Female Out-of-School Adolescents in Iwaya Community, Lagos State, Nigeria
Kunnuji Michael and Esiet Adenike

82-90
Prevalence and Factors Associated with Intimate Partner Violence among Married Women in an Urban Community in Lagos State, Nigeria.
Modupe O. Onigbogi, Kofoworola A. Odeyemi and Olanrewaju O. Onigbogi

Adolescent Sexuality and Life Skills Education in Nigeria: To What Extent Have Out-of-School Adolescents Been Reached?
Uche Isiugo-Abanihe, Rasak Olajide, Eze Nwokocha, Funke Fayehun, Rasheed Okunola and Retta Akingbade

Obstetric Fistula ‘Disease’ and Ensuing Care: Patients’ Views in West Africa
Maulet Nathalie, Berthè Abdramane, Traoré Salamatou and Macq Jean

Perceived Health System Causes of Obstetric Fistula from Accounts of Affected Women in Rural Tanzania: A Qualitative Study
Lilian T. Mselle and Thecla W. Kohi

The Epidemiology of Cervical Squamous Intraepithelial Lesions in HIV Infected Women in Kenya
Peter Memiah, Wangeci Mbuthia, Grace Kiiru, Solomon Agbor, Francesca Odhiambo, Sylvia Ojoo, Justice Mbizo, Samuel Muhula, Andrew Owour and Sibhatu Biadgilign

Cervical Cancer and Human Papilloma virus Knowledge and Acceptance of Vaccination among Medical Students in Southwest Nigeria.
F.F. Adejuyigbe, M.R. Balogun, A.O. Sekoni and A.A. Adegbola

Information for Authors

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ABOUT AJRH

_African Journal of Reproductive Health (AJRH)_ is published by the Women’s Health and Action Research Centre (WHARC). It is a multidisciplinary and international journal that publishes original research, comprehensive review articles, short reports and commentaries on reproductive health in Africa. The journal strives to provide a forum for African authors, as well as others working in Africa, to share findings on all aspects of reproductive health, and to disseminate innovative, relevant and useful information on reproductive health throughout the continent.

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The Women’s Health and Action Research Centre (WHARC) is a registered non-profit organization, committed to the promotion of women’s reproductive health in sub-Saharan Africa. Founded in 1995, the centre’s primary mission is to conduct multidisciplinary and collaborative research, advocacy and training on issues relating to the reproductive health of women. The centre pursues its work principally through multidisciplinary groups of national and international medical and social science researchers and advocates in reproductive health.

WHARC receives core funding and support from the Ford Foundation and technical cooperation and mentorship from International Perspectives on Sexual and Reproductive Health and Studies in Family Planning. Principal funding for the journal comes from the Consortium on Unsafe Abortion in Africa. The goal of the centre is to improve the knowledge of women’s reproductive health in Nigeria and other parts of Africa through collaborative research, advocacy, workshops and seminars and through its series of publications – the _African Journal of Reproductive Health_, the _Women’s Health Forum_ and occasional working papers.

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Résumé

Prévention et contrôle du cancer du col en Afrique: Appel à l'action
Friday Okonofua

Articles

Facteurs communautaires qui influencent l’espacement des naissances chez les femmes mariées en Ouganda et au Zimbabwe
Courtney McGuire et Rob Stephenson

Services des Accoucheuses qualifiées au Nigeria: une fonction de la fréquence et du contenu des soins prénataux
Chinelo C. Okigbo et Ahizechukwu C. Ekeb

Réseaux sociaux et prise de décision pour les avortements clandestins dangereux : Evidence venant du Kenya
Joachim Osur, Alliages Orago, Isaac Mwanzo et Elizabeth Bukusi

Facteurs qui influent sur la prévention et le contrôle du paludisme chez les femmes enceintes qui habitent dans les bidonvilles urbains, sud du Ghana
Mavis Dako-Gyeke et Humphrey Kofie

Défi des ressources humaines pour l'intégration de la prophylaxie de la pré-exposition du VIH (PPrE) dans le système de santé publique au Kenya: Une étude qualitative
Natasha Mack, Christina Wong, Kevin McKenna, Ansley Citrons, Jacob Odhiambo et Kawango Agot

«Au cours de mon cadavre”: connaissances et les attitudes des enfants envers le VIH et le SIDA dans le Cape Coast du Ghana Metropolis
Samuel Asiedu Owusu

Accéder aux informations et aux services concernant la santé sexuelle et de la reproduction: Un Étude à des méthodes mixtes sur les besoins et les expériences des jeunes femmes dans Soweto, Afrique du Sud
Naomi Lince-Deroche, Adila Hargey, Kelsey Holt et Tara cho’het

Prévalence et corrélats des sévices sexuels chez les adolescentes qui ne fréquentent pas l’école dans la communauté d’Iwaya, Etat de Lagos, Nigeria
Kunnuji Michael et Esiet Adenike

Prévalence et facteurs associés à la violence conjugale chez les femmes mariées dans une communauté urbaine dans l'État de Lagos, au Nigeria.
Modupe O. Onigbogi, Kofoworola A. Odeyemi et Olanrewaju O. Onigbogi

Sexualité de l’adolescent et éducation pour des compétences de vie au Nigeria : Jusqu’à quel point a-t-on atteint les adolescents qui ne fréquentent pas l’école?
Uche Isiugo-Abanihe, Rasak Olajide, Eze Nwokocha, Funke Fayehun, Rasheed Okunola et Retta Akingbade

« Maladie » de la fistule obstétricale et les soins qui suivent: les points de vue des patientes en Afrique de l'Ouest
Nathalie Maulet, Berthé Abdramane, Traoré Salamatou et Jean Macq

Causes perçues de la fistule obstétricale dues au système de santé selon ce que disent les femmes touchées en Tanzanie rurale: Une étude qualitative
Lilian T. Mselle et Thecla W. Kohi

Épidémiologie des lésions intra-épithéliales squameuses du col utérin chez les femmes séropositives au Kenya
Peter Memiah, Wangeci Mbuthia, Grace Kiiru, Solomon Agbor, Francesca Odhiambo, Sylvia Ojoo, Justice Mbizo, Samuel Muhula, Andrew Owour et Sibhatu Biadgilign

Connaissance sur le Cancer du col utérin et sur le virus du papillome humain et l'acceptation de la vaccination chez les étudiants en médecine sud-ouest du Nigeria.
F.F. Adejuyigbe, M R. Balogun, A.O. Sekoni et A.A. Adegbola

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APROPOS AJRH

La Revue Africaine de santé de la Reproduction (RASR) est publiée par le Women’s Health and Action Research Centre (WHARC). C’est une revue à la fois pluridisciplinaire et internationale qui publie des articles de recherche originaux, des articles de revue détaillés, de brefs rapports et des commentaires sur la santé de la reproduction en Afrique. La Revue s’efforce de fournir un forum aussi bien à des auteurs africains qu'à des professionnels qui travaillent en Afrique, afin qu'ils puissent partager leurs découvertes dans tous les aspects de la santé de reproduction et diffuser à travers le continent, des informations innovatrices, pertinentes et utiles dans ce domaine de santé de la reproduction.


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Le WHARC est une organization non gouvernementale à but non-lucratif s’engagez dans la promotion de santé de la reproduction chez la femme en Afrique subsaharienne. Fondé en 1995, le Centre a pour objectif principal de mener des recherches pluridisciplinaires et en collaboration, de promouvoir et de former des cadres en matières relatives à la santé de la reproduction chez la femme. Le Centre travaille surtout à travers des groupes multidisciplinaires de chercheurs aussi bien nationaux qu’internationaux en sciences médicales et en sciences économiques dans le domaine de santé de la reproduction.

Le WHARC recoit une aide financière principale de la Fondation Ford et bénéficie de la coopération technique de l’International Perspectives on Sexual and Reproductive Health et de Studies in Family Planning. Le financemement principale pour la revue vient de la part du Consortium on Unsafe Abortion in Africa. L’objectif du Centre est d’améliorer la connaissance en matière de santé de la reproduction chez la femme au Nigeria et dans d’autres régions d’Afrique à travers la recherche en collaboration, le paydoyer, des ateliers et des séminaires à travers des série de publication - La Revue africaine de santé de la reproduction, Le Women’s Health Forum et des rapports des recherches de circonstance.

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EDITORIAL

Preventing and Controlling Cervical Cancer in Africa: A Call for Action

Friday Okonofua

Editor, African Journal of Reproductive Health

Cancer of the cervix is one of the most deadly cancers in women, accounting for over 270,000 annual deaths globally. About 85% of these deaths occur in developing countries, with Africa topping the list of countries with the highest prevalence and death rates from the disease. In 2010, the World Health Organization estimated that about 75,000 women were diagnosed with cervical cancer in the African region, with more than 50,000 dying from the disease. Despite this high burden of the disease in Africa, it is worrisome that very little public health measures have been put in place to tackle the disease in a purposeful and action-oriented manner.

It is now known that cervical cancer is caused by the Human Papilloma Virus (HPV), which is largely acquired through sexual intercourse. The risk factors for HPV and therefore cervical cancer include early age of first sexual intercourse, having multiple sexual partners and having experienced a weakened immunity system. Data from the WHO indicate that the prevalence of HPV in Africa is 21.3% - ranging from 21% in Southern Africa, to 21.5% in West Africa, and 33.6% in East Africa. Fortunately, HPV does not immediately cause cervical cancer, but produces a series of pre-malignant lesions called “cervical intra-epithelial neoplasia (CIN)” over a long period of time before invasive cancer develops. This long period of pre-malignant lesions offers an opportunity for early recognition, and the application of complete and effective treatment of the disease.

Apart from promotion of health sexual lifestyles, the advent of effective vaccines against HPV that causes cervical cancer are effective approaches for the primary prevention of cervical cancer. Two types of HPV vaccines are now available: quadrivalent vaccine active against HPV genotype 6, 11, 16 and 18, and bivalent vaccine that is active against HPV types 16 and 18. Both are now widely available in African markets. Secondary prevention of cervical cancer is by screening for pre-cancerous lesions and early diagnosis followed by effective treatment, while tertiary prevention involves the diagnosis and treatment of confirmed cases of cancer.

The best approach for dealing with this disease is to get women to seek primary or secondary prevention since tertiary prevention has little effectiveness even in the best health systems. Indeed, the incidence and mortality associated with cervical cancer has declined in high income countries largely due to the wider use of primary or secondary prevention. By contrast, the prevalence and case-fatality from cervical cancer remains high in many African countries as a result of the inadequate use of primary and secondary prevention methods. Most women in these countries wait until the terminal stages of the disease before they seek treatment, while primary and secondary prevention methods remain poorly integrated into Africa’s health care delivery systems.

The paper by Peter Memlah and colleagues in this edition of the journal demonstrate the higher susceptibility of HIV positive women in Kenya to HPV infection and more severe forms of cervical cancer. This is due to the immunosuppression that is associated with HIV. Thus, it is possible that the higher prevalence of HIV/AIDS in sub-Saharan Africa accounts for the persistence of severe forms of cervical cancer in the region. The paper by Adejuyigbe and others in the journal report the low knowledge of HPV vaccine among a cohort of youth in Nigeria, an important problem that needs to be overcome in efforts to promote primary prevention of cervical cancer in the
region.

In dealing with cervical cancer in Africa, some of the challenges that need to be overcome include: the lack of cervical control policies, strategies and programs; inadequate information and skills to manage the disease; lack of recent and accurate data; high cost of HPV vaccines and unavailability of secondary prevention methods; and the geographical inaccessibility and limited tertiary prevention methods. The delay in seeking primary prevention and treatment of early cases of cervical cancer is a major challenge that needs to be overcome in Africa. Delay in treatment also brings huge economic losses to the region. The World Bank has estimated that the cost of screening for cervical cancer every five years is US$ 100 per disability-adjusted year (DALY) gained, compared with $2,600 per DALY for treatment and palliative care for invasive cancer. Thus, primary prevention and prompt secondary prevention makes sense and should be the major focus of any attempt to deal with the disease in the African region.

Surely, the time to act is now. Estimates indicate that if nothing is done the number of deaths from cervical cancer could rise by up to 25% in the African region in the next 10 years. Three concrete actions are urgently needed to deal with the high burden of cervical cancer in Africa. The first is for African countries to work towards integrating policies and programs for the prevention and treatment of cervical cancer into their health care systems. Many African countries currently do not have such a plan, and many are oblivious of the consequences of inaction on this front. This includes making HPV vaccines affordable and accessible, providing facilities for secondary and tertiary care, and training care providers to offer high quality treatment and palliative care. The second is to address the current inequality in access that increases the likelihood of death from cervical cancer for poor women, especially illiterate women who live in rural areas. Targeted information as well as social safety nets need to be provided to these women to enable them access preventative and curative care for cervical cancer.

Thirdly and most importantly, accurate comprehensive research and service delivery data are sorely needed to better manage the disease in Africa. Current data on cervical cancer from many parts of Africa are largely based on retrospective data or case reports from single hospitals. More expansive data based on systematically collected prospective data are needed to guide future policymaking and programming. Attempts to establish cancer registries that provide accurate prospective multicentre data to track the incidence and patterns of various forms of cancer, including cervical cancer have largely been unsuccessful in Africa. A properly organized effort based on integration of data collection into health care systems may likely address this problem. Furthermore, community based data are needed to establish the actual prevalence and incidence of the disease and to determine why women use or do not use primary or secondary prevention methods. Intervention research that provides information on ways to increase women’s access to services such as HPV vaccines and simple screening methods for CIN are also urgently needed.

In conclusion, we posit that the prevention of cervical cancer is one of the most important issues and yet unmet need for promoting the sexual and reproductive health of African women. We challenge African countries to take steps to improve access to modern technology for prevention and treatment in efforts to reduce the burden and consequences of cervical cancer in the continent.

Conflict of Interest

None

References

EDITORIAUX

Prévention et contrôle du cancer du col en Afrique: Appel à l'action

Friday Okonofua

Rédacteur, Revue africaine de santé de la reproduction

Le cancer du col de l'utérus est l'un des cancers les plus mortels chez les femmes, ce qui est responsable de plus de 270 000 décès annuels à l'échelle mondiale. Environ 85% de ces décès surviennent dans les pays en développement, l'Afrique étant en tête de la liste des pays qui ont les taux de prévalence et de mortalité les plus élevés de la maladie. En 2010, l'Organisation mondiale de la Santé a estimé que près de 75 000 femmes ont été diagnostiquées avec un cancer du col utérin dans la région de l'Afrique, avec plus de 50 000 qui sont mortes de la maladie. Malgré ce lourd fardeau de la maladie en Afrique, il est inquiétant de constater que très peu de mesures de santé publique ont été mises en place pour lutter contre la maladie d'une manière résolue et orientée vers l'action.

On sait maintenant que le cancer du col utérin est causé par le virus du papillome humain (VPH), qui est en grande partie acquis par voie sexuelle. Les facteurs de risque pour le VPH et le cancer du col utérin comprennent donc le fait d'avoir un très jeune âge lors du premier rapport sexuel, ayant des partenaires sexuels multiples et ayant connu un système immunitaire affaibli. Les données de l'OMS indiquent que la prévalence du VPH en Afrique est de 21,3% - allant de 21% en Afrique australe, à 21,5% en Afrique de l'Ouest, et 33,6% en Afrique de l'Est. Heureusement, le VPH n'entraîne pas immédiatement le cancer du col, mais produit une série de lésions pré-malignes appelées «néoplasie intra-épithéliale cervicale (NIC)" au cours d'une longue période de temps avant que le cancer invasif se développe. Cette longue période de lésions pré-malignes offre une opportunité pour la détection précoce, avec l'application d'un traitement complet et efficace de la maladie.

Outre la promotion des modes de vie de santé sexuelle, l'avènement de vaccins efficaces contre le VPH qui cause le cancer du col utérin est une des approches efficaces pour la prévention primaire du cancer du col. Deux types de vaccins contre le VPH sont maintenant disponibles: le vaccin quadrivalent qui est actif contre le VPH du génotype 6, 11, 16 et 18, et le vaccin bivalent qui est actif contre le VPH des types 16 et 18. Les deux sont maintenant largement disponibles dans la plupart des marchés africains. La prévention secondaire du cancer du col est par le dépistage des lésions précancéreuses et le diagnostic précoce suivi d'un traitement efficace, alors que la prévention tertiaire implique le diagnostic et le traitement des cas confirmés de cancer.

La meilleure approche pour faire face à cette maladie est de le rendre possible pour les femmes de rechercher la prévention primaire ou secondaire puisque la prévention tertiaire a peu d’efficacité même dans les meilleurs systèmes de santé. En effet, l'incidence et la mortalité associées au cancer du col utérin ont diminué dans les pays à revenu élevé en grande partie en raison de l'utilisation plus large de la prévention primaire ou secondaire. En revanche, la prévalence et la létalité du cancer du col restent élevées dans de nombreux pays africains en raison de la mauvaise utilisation des méthodes de prévention primaire et secondaire. La plupart des femmes dans ces pays attendent jusqu'à la phase terminale de la maladie avant de rechercher un traitement, alors que les méthodes de prévention primaire et secondaire restent mal intégrées dans les systèmes de prestation de soins de santé de l'Afrique.

L'article de Peter Memlah et ses collègues dans cette édition de la revue démontrent la plus grande sensibilité des femmes séropositives au Kenya à l'infection par le VPH et des formes plus graves de cancer du col utérin. Cela est dû à l'immunosuppression associée au VIH. Ainsi, il est possible que la prévalence élevée du VIH / SIDA en Afrique sub-saharienne représente la persistance des formes graves de cancer du col.

utérin dans la région.

En traitant le cancer du col en Afrique, quelques-uns des défis qui doivent être surmontés comprennent: absence de politiques de contrôle cervical, stratégies et programmes; informations et des compétences insuffisantes pour gérer la maladie; manque de données récentes et précises; coût élevé des vaccins contre le VPH et l'absence des moyens de prévention secondaire; et l'inaccessibilité géographique et les méthodes de prévention tertiaire limitées. Le retard à chercher la prévention et le traitement des premiers cas de cancer du col utérin primaire est un défi majeur qui doit être surmonté en Afrique. Le retard dans le traitement apporte également d'énormes pertes économiques à la région. La Banque mondiale a estimé que le coût du dépistage du cancer du col de l'utérus tous les cinq ans est de 100 $ par année – de handicap ajusté (AHA) gagnée, par rapport à $ 2,600 par AHA pour le traitement et les soins palliatifs pour le cancer3 invasif. Ainsi, la prévention primaire et la prévention secondaire du sens et devraient être le principal objectif de toute tentative pour faire face à la maladie dans la région africaine.

Certes, le temps est venu d'agir. Les estimations indiquent que si aucune mesure n’est prise, le nombre de décès par le cancer du col utérin pourrait augmenter de jusqu’à 25% dans la région de l'Afrique dans les 10 prochaines années. Pour faire face à la lourde charge du cancer du col en Afrique il faut d’urgence trois actions concrètes. La première est que les pays africains doivent assurer l'intégration des politiques et des programmes pour la prévention et le traitement du cancer du col dans leurs systèmes de soins de santé. Beaucoup de pays africains n’ont pas actuellement d’un tel plan, et beaucoup ne sont pas conscients des conséquences de l’inaction sur ce front. Cela comprend de rendre des vaccins contre le VPH abordable et accessible, tout en assurant des matériels pour les soins secondaires et tertiaires, et la formation des fournisseurs de soins à offrir un traitement de haute qualité et des soins palliatifs. La deuxième est d'aborder l'inégalité actuelle d'accès qui augmente la probabilité de décès par le cancer du col utérin pour les femmes pauvres, en particulier les femmes analphabètes qui habitent dans les zones rurales. Des informations ciblées ainsi que des filets de sécurité sociale doivent être mis à la disposition de ces femmes pour leur permettre un accès aux soins préventifs et curatifs du cancer du col.

Troisièmement et plus important encore, des données précises de recherche et de prestation de services complets sont nécessaires de toute urgence pour mieux gérer la maladie en Afrique. Les données actuelles sur le cancer du col de nombreuses régions d'Afrique sont largement fondées sur des données rétrospectives ou des rapports de cas des hôpitaux individuels. Des données plus vastes qui sont basées sur la collecte systématique de données prospectives sont nécessaires pour guider l'élaboration des politiques et la programmation futurs. Les tentatives visant à établir des registres du cancer qui fournissent des données prospectives précises pour suivre l'incidence et les caractéristiques de diverses formes du cancer, notamment le cancer du col utérin ont été largement infructueuses en Afrique. Un effort bien organisé sur la base de l'intégration de la collecte de données dans les systèmes de soins de santé pourrait tenter de résoudre ce problème. En outre, les données à la base communautaire sont nécessaires pour établir la prévalence et l'incidence réelles de la maladie et pour déterminer pourquoi les femmes utilisent ou n’utilisent pas les méthodes de prévention primaire ou secondaire. La recherche d'intervention qui fournit des informations sur les moyens d'accroître l'accès des femmes à des services tels que les vaccins contre le VPH et les méthodes de dépistages simples pour la NIC sont également nécessaires de toute urgence. En conclusion, nous postulons que la prévention du cancer du col utérin est l'une des questions les plus importantes et pourtant les besoins non satisfaits pour promouvoir la santé sexuelle et de la reproduction des femmes africaines. Nous définissons les pays africains de prendre des mesures pour améliorer l'accès à la technologie moderne pour la prévention et le traitement précoces dans les efforts pour réduire le fardeau et les conséquences de col de l'utérus dans le continent.
Références

ORIGINAL RESEARCH ARTICLE

Community Factors Influencing Birth Spacing among Married Women in Uganda and Zimbabwe

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Abstract

Short birth spacing continues to be a problem in Uganda and Zimbabwe, resulting in negative infant, child, and maternal health outcomes. This study investigates community-level influences on birth spacing outcomes among women aged 15-49 in Uganda and Zimbabwe, using Demographic and Health Surveys conducted in 2011 (Uganda) and 2010-2011 (Zimbabwe). Women living in communities with higher mean maternal age, mean age at marriage, and mean parity were significantly more likely to have longer birth spacing. Women living in communities with higher levels of contraceptive use and low levels of unmet contraceptive need were more likely to have short birth spacing. The significance of community-level demographic and fertility norms, gender norms, economic prosperity, and family planning behaviors demonstrate the broad influence of community variables on birth spacing outcomes. This analysis highlights the importance of moving beyond individual and household-level interventions in order to harness the power of contextual influences on birth spacing.

Keywords: birth spacing, community, gender, social epidemiology

Introduction

Increasing the proportion of women who are able to adequately space their births is an integral part of reducing under-five mortality rates1-6. A 2002 global study of 456,889 pregnancies from low and middle income countries found that the neonatal death rate was 102% higher among children with birth intervals of 9-14 months and 27% higher among children with 15-20 months birth intervals compared to children born 27-32 months after the previous birth7. Short birth intervals (<24 months) have been linked to health effects including low birth weight, pre-term birth, small-for-gestational age1-8, and childhood stunting9, and maternal morbidities, including uterine rupture and utero-placental bleeding disorders10. A 2011 study of Demographic and Health Surveys (DHS) from 72 countries representing 371,768 birth intervals, showed that an average of only 31% of births
occur in the lowest risk birth interval of 36-59 months\textsuperscript{11}. More than half (57\%) of all births occur within an interval of less than 36 months with an additional 12\% of births occurring more than 60 months\textsuperscript{11}.

There is increasing recognition of the importance of contextual influences on reproductive health outcomes\textsuperscript{12-19}. Studies have shown residence in a community with higher levels of education is associated with higher likelihood of premarital sex\textsuperscript{12} but a lower likelihood of risky sexual behaviors\textsuperscript{17}. Community higher levels of education are also associated with lower demand for large families\textsuperscript{13}, lower birth rates\textsuperscript{16}, and greater contraceptive use\textsuperscript{18}. This is perhaps due to increased access to reproductive health information in more educated communities, or the creation of alternative pathways to achieving social capital through education and employment that override the desire and expectation for large families. Studies have demonstrated that women who live in wealthier communities are more likely to use modern contraceptives\textsuperscript{18}, have lowered demand for large families\textsuperscript{13}, and are less likely to engage in premarital sex\textsuperscript{12}. While there are many studies of contextual influences on reproductive health outcomes, there are very few that have specifically examined community-level influences on birth intervals. Hung, et al analyzed DHS data from 11 sub-Saharan countries and found that community prevalence of intimate partner violence and sexual violence had a significant association with shorter birth intervals\textsuperscript{21}. Women living in communities with high levels of intimate partner violence (IPV) have experienced pervasive “everyday violence” that contributes to acceptance of unequal power dynamics. This may contribute to an erosion of women’s self-efficacy and ability to control reproductive health outcomes. The limited number of studies on community-influences on birth intervals represents an important gap in the existing literature on birth spacing behaviours. This paper examines the influence of community-level factors on birth spacing behaviour in Uganda and Zimbabwe, to inform the ways through which interventions aimed at improving birth spacing can best target women within community environments.

Methods

Data for this analysis was taken from the most recent Demographic and Health Survey (DHS) for Uganda (2011) and Zimbabwe (2010-2011), available publicly from www.measuredhs.com. Data was downloaded in STATA format. In a 2011 analysis of the most recent DHS data for 70 countries, Zimbabwe was among the countries with the largest proportion of women (42.9\%) reporting a birth space of 36-59 months between their most recent two births. Conversely, only 24.6\% of women in Uganda reported a birth space of 36-59 months between their last two births\textsuperscript{10}. Uganda and Zimbabwe were thus selected to represent two very different contexts of birth spacing.

The DHS collect data from women 15-49 and men 15-54 years. DHS employ a two-stage sampling strategy, with households randomly selected within Primary Sampling Units (PSUs). Primary Sampling Units typically comprise 20-30 households. For Uganda, a representative sample of 404 PSU, 10,086 households and 9,247 women aged 15-49 was surveyed. For Zimbabwe, a representative sample of 406 PSU, 10,828 households and 9,831 women aged 15-49 was surveyed. The original samples were 9,171 women in Zimbabwe and 8,674 women in Uganda. To identify community-level factors that influenced birth spacing, the samples were restricted to married women or women reported being in a union with a man, regardless of cohabitation status (to allow the inclusion of partner characteristics). This excluded 3,593 women in Zimbabwe and 3,183 women in Uganda. A further 1,586 women in Zimbabwe and 1,076 women in Uganda were excluded because they did not have two or more children. The final sample included 3,992 women from Zimbabwe and 4,415 women from Uganda.

DHS do not collect community-level data, and we approximate community-level factors by aggregating individual level data to the PSU level. This method has been used extensively in the analysis of community effects on sexual and reproductive health outcomes and behaviors\textsuperscript{12-14}. We examine the following domains of community environments as potential influences on birth spacing behaviour.
Community Demographics and Fertility Norms

Previous studies have shown that living in communities with low mean age at marriage and low mean age at first childbirth may reduce a woman’s use of contraception and uptake of maternal health services. A young age at marriage or child birth may suggest that women’s progress to womanhood is marked by expectations of early marriage and childbearing, and that there are fewer alternative opportunities – for example education or employment – available to women. Similarly, community demographic profiles indicative of fewer opportunities for women may also lead women towards short birth spacing by reducing their ability to seek care and access to family planning services or by encouraging women to high fertility as a means of achieving social expectations. To measure demographic context we use the community mean age at marriage, the mean age at first sex, the mean age at childbearing, and the mean ideal number of children.

Community Economic Prosperity

Previous studies have demonstrated that higher socioeconomic status is associated with delayed onset of first marriage, sex, and childbirth and with increased use of modern contraceptives. Residing in a wealthier community may result in greater access to health knowledge, family planning and maternal health care services. We measure community economic prosperity with the community mean wealth index factor score, a household level indicator of the ownership of household goods.

Community Gender Norms

Previous students have shown that living in communities with higher education influence a woman’s use of modern birth control and have lower levels of fertility. Higher community levels of female employment and education may contribute to greater autonomy and its positive effect on reproductive health outcomes. These may be communities in which the rights to education and employment for women are viewed as the same for men, and therefore have more progressive gender norms that more freely allow women to make reproductive health decisions. To measure community gender norms, we used ratio of women to men in the community with at least primary school education, the percentage of women in each community who were employed in the previous 12 months, and the community mean violence justification score. The violence justification index included questions of whether women felt a husband was justified in beating his wife in five situations, such as if she burns the food or neglects the children. Women who scored 5 on the index believed that husbands were justified in beating their wives in each scenario.

Community Family Planning Behaviour

Previous studies have shown that women who live in communities with family planning messaging, a marker of a successful reproductive health program, are four times as likely to be using a modern contraceptive method than those who are not exposed to family planning messages. To measure community family planning behaviours, we use the percentage of women in the community with unmet need for spacing or limiting of births, the mean ideal birth space reported by women in the community, and the percentage of women in the community who are using modern contraceptive methods.

Individual and Household Measures

In addition to the community level variables, the analysis controlled for individual and household factors shown by previous studies to be associated with birth spacing behaviour. For individual variables we controlled for maternal age (15-24, 25-29, 30-34, 35-39, 40-49), parity (2, 3-4, 5-6, 7+ children), age at marriage (less than 14, 15-19, 20-39), and spousal age difference (20 years younger to 5 years older, 6 years older and above). We also controlled for current use of birth control (modern, no method/folkloric/traditional), women’s and husband education (no education/primary, secondary/higher education). Individual variables relating to the index child included the sex of the index child and if it was alive. At the household level we controlled for household wealth, measured by the wealth quintile.
Analysis was conducted in STATA 12. Data were first cleaned, including checks for missing data and re-categorization of variables to create either categorical variables (transfer of continuous age at marriage into categories) or to reduce the number of categories (e.g. combining secondary and higher education into one category). The analysis considers two outcomes. The first is a continuous variable measuring the self-reported length of time in months between the most recent birth (index birth) and the previous birth. The second outcome is a categorical variable measuring the number of months between the index birth and the previous birth, categorized as: <24 months, 25-38 months, 39-59 months, and >60 months). The reference category was taken as 25-38 months. The second stage of analysis involved bivariate analysis to test for significant associations between the measures of birth spacing and the individual, household and community variables. T-tests for variations in means were conducted to examine variations in birth spacing length across the variables. The third stage of analysis involved multivariate models. Two regression models were fitted. A linear regression model was fitted to the first outcome, the continuous measure of self-reported birth spacing.

## Results

Community characteristics were only significantly associated with the length of the preceding birth interval in Uganda (Table 1). In Uganda, living in a community with a higher mean age at first birth was significantly negatively associated with the length of the preceding birth interval (beta -1.26, SE 0.39, p=0.001). Living in a community with a higher mean age at first cohabitation in years was significantly positively associated with the length of the preceding birth interval (beta 1.13, SE 0.36, p=0.002). Community wealth index score was associated with birth intervals in Uganda (beta 0.00, SE 0.00, p=0.004).

## Table 1: Linear Regression for Length of Preceding Birth Interval in Months

<table>
<thead>
<tr>
<th></th>
<th>Zimbabwe</th>
<th>Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta coefficient (SE)</td>
<td>P value</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-24 (ref)</td>
<td>13.69 (2.02)*</td>
<td>0.000</td>
</tr>
<tr>
<td>25-29</td>
<td>25.51 (2.20)*</td>
<td>0.000</td>
</tr>
<tr>
<td>30-34</td>
<td>39.35 (2.43)*</td>
<td>0.000</td>
</tr>
<tr>
<td>35-39</td>
<td>40.06 (2.51)*</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Women’s Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No education/Primary (ref)</td>
<td>-2.76 (1.38)*</td>
<td>0.046</td>
</tr>
<tr>
<td>Secondary/Higher</td>
<td>-1.98 (1.43)</td>
<td>0.166</td>
</tr>
<tr>
<td><strong>Husband’s Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No education/Primary (ref)</td>
<td>-0.66 (2.24)</td>
<td>0.768</td>
</tr>
<tr>
<td>Secondary/Higher</td>
<td>-5.35 (2.41)*</td>
<td>0.026</td>
</tr>
<tr>
<td><strong>Age at Marriage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-14 (ref)</td>
<td>-0.37 (1.17)</td>
<td>0.753</td>
</tr>
<tr>
<td>15-19</td>
<td>-0.37 (1.17)</td>
<td>0.753</td>
</tr>
<tr>
<td>20-39</td>
<td>-0.37 (1.17)</td>
<td>0.753</td>
</tr>
<tr>
<td><strong>Spousal Age Difference</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 years younger to 5 years older (ref)</td>
<td>-0.37 (1.17)</td>
<td>0.753</td>
</tr>
<tr>
<td>6 years older and above</td>
<td>-0.37 (1.17)</td>
<td>0.753</td>
</tr>
<tr>
<td><strong>Parity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 children (ref)</td>
<td>-0.37 (1.17)</td>
<td>0.753</td>
</tr>
</tbody>
</table>
In Uganda only, women residing in wealthier communities were more likely to report all birth intervals relative to birth intervals of 25-38 months (Table 2). Zimbabwean women who resided in a community with greater justification for violence against women were more likely to report birth intervals of 39-59 months than 25-38 months (Relative Risk Ratio (RRR) 1.40, 95% CI 1.10-1.78, p=0.007). Women living in communities in Uganda in which women reported wanting longer birth spaces, measured in months, were more likely to report birth intervals of 39-59 months than 25-38 months (RRR 0.99, 95% CI 0.98-1.00, p=0.016). Women living in communities in Zimbabwe in which there was a reported higher mean age at first birth in years were significantly more likely to report birth intervals of less than 24 months than 25-38 months (RRR 1.24, 95% CI 1.01-1.51, p=0.037). Ugandan women living in communities in which there was a higher reported mean age at first birth in years were significantly less likely to report a birth of greater than 60 months relative to 25-38 months (RRR 0.80, 95% CI 0.70-0.91, p=0.001). Ugandan women in communities with lower levels of reported unmet need were significantly less likely to report birth intervals of less than 24 months than 25-38 months (RRR 0.32, 95% CI 0.18-0.55, p=0.000). Zimbabwean women residing in communities with higher levels of reported contraceptive use were significantly less likely to report birth intervals of less than 24 months than 25-38 months (RRR 0.28, 95% CI 0.08-0.94, p=0.039). Community-level characteristics of education, age at first cohabitation and sex, women working, and ideal number of children were not significantly associated with birth intervals in Uganda or Zimbabwe.

Individual and household factors found to be significantly associated with birth spacing behavior were generally in line with those identified in previous studies. Age had a significant positive association with the length of the preceding birth interval in both countries and among all ages. Relative to women who married at less than 14, older age at marriage (20-39) was

| 3-4 children | -7.11 (1.48)* | 0.000 | -5.23 (1.01)* | 0.000 |
| 5-6 children | -20.00 (2.15)* | 0.000 | -10.44 (1.25)* | 0.000 |
| 7+ children  | -30.33 (2.89)* | 0.000 | -19.07 (1.40)* | 0.000 |

**Current use of birth control by method type**

<table>
<thead>
<tr>
<th>No method/Folkloric/Traditional (ref)</th>
<th>Modern Method</th>
<th>Sex of First Child</th>
<th>Alive first child</th>
<th>Wealth Quintiles</th>
<th>Community Level Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male (ref)</td>
<td>Yes (ref)</td>
<td>Poorest (ref)</td>
<td>Wealth Index</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>No</td>
<td>Poorer</td>
<td>Violence Justification Index</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Middle</td>
<td>Women working</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Richer</td>
<td>Ideal birth spacing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Richest</td>
<td>Ideal number of children</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Age at first birth</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Age at first sex</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Age at first cohabitation</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Unmet need</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Birth control</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ratio of education (women to men)</td>
</tr>
</tbody>
</table>

* indicates significance at p<0.05.

negatively associated with the length of the preceding birth interval (Uganda: beta -7.55, SE 1.12, p=0.000; Zimbabwe: beta -5.35, SE 2.41, p=0.026). Parity was significantly associated with the length of the preceding birth interval in both Uganda and Zimbabwe. Relative to women whose first child was alive, women whose index child had died were more likely to have shorter birth intervals. There was evidence of an association between contraceptive use and birth spacing: In Zimbabwe, compared to women who utilized no method, folkloric or traditional methods, women who utilized modern contraceptive methods were significantly more likely to have a birth interval greater than 60 months than a birth interval of 25-38 months (RRR2.00, 95% CI 1.50-2.66, p=0.000). Women’s education was significantly associated with the length of the preceding birth interval in Zimbabwe, with women reporting secondary or higher education reporting shorter birth intervals (beta -2.76, SE 1.38, p=0.046). Wealth was only significantly associated with the length of the preceding birth interval in Zimbabwe. Relative to the poorest quintile, the middle quintile had a significant positive association with the length of the preceding birth interval.

Discussion

The results point to the different pathways through which the community environment may influence birth spacing behavior. Interestingly, the analysis found more significant community-level factors associated with birth spacing in Uganda than in Zimbabwe.

Several of the results found here suggest the role of community-level gender norms in shaping birth spacing behavior. Women living in communities with higher age at marriage and higher age at first birth had shorter birth intervals, indicating that demographic patterns in which women marry and begin childbearing later do not necessarily result in healthy child spacing behaviors. Delayed marriage and childbirth may be indicative of more liberal community norms but subsequent short birth intervals are reflective of gender inequities that emphasize the importance of large family sizes. Upadhyay found that women in Cebu, Philippines reported that they had short birth intervals after delaying childbearing in order to “catch up” with their peers who had longer periods to plan their birth intervals. This community emphasis on achieving fertility expectations in a shorter amount of time may be the pathway to short birth intervals.

Women in Zimbabwe living in communities with higher violence justification rates were more likely to have optimal birth spacing intervals (Table 2). This surprising result is consistent with Elfstrom’s (2012) findings that women in Zimbabwe who reported higher levels of violence justification were more likely to use modern contraceptives. Both studies utilized cross-sectional DHS data and thus cannot draw conclusions on causality. This surprising result warrants further research: it is possible that higher levels of violence justification may be discouraging women from childbearing.

The study’s results point to the impact of living in a community with limited access to reproductive health services on achieving optimal birth intervals. Women living in communities with greater levels of unmet need for modern contraception and lower rates of contraceptive use are more likely to have shorter birth intervals (Table 2), demonstrating an important synergy in reproductive health outcomes. Kaggwa et al. showed that women living in Malian communities with high levels of exposure to family planning messaging were more likely to adopt modern contraceptives. Communities without physical or financial access to reproductive health services are left without a crucial source of reproductive knowledge and care, hence limiting options for family planning and increasing the likelihood of short birth spaces.

There are a number of limitations to the current study. DHS does not collect community-level data. For this analysis, we aggregated individual data to create proxies for community-level variables. Many other studies have utilized similar methodology to establish associations between community level proxies and sexual and reproductive health outcomes. Since the data used were cross-sectional, it is not possible to draw conclusions regarding causality of the associations identified. Another limitation is the absence of data on the presence of reproductive health...
services within the community. The results do not consider the availability or quality of sexual and reproductive health services in the community, although we use two proxies (mean unmet need for contraception and mean contraceptive use) as measures of likely exposure to sexual and reproductive health services.
Table 2: Ordinal Regression Model for Length of Preceding Birth Interval.

Outcome variable is: <24 months, 25-38 months (reference), 39-59 months, and >60 months. Figures presented are Relative Risk Ratio of birth interval category relative to 25-38 months, associated 95% Confidence Intervals, and P-values.

<table>
<thead>
<tr>
<th>Zimbabwe</th>
<th>Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>15-24 (ref)</td>
<td>0.62 (0.37-1.03)</td>
</tr>
<tr>
<td>25-29</td>
<td>0.62 (0.33-1.14)</td>
</tr>
<tr>
<td>30-34</td>
<td>0.60 (0.09-1.22)</td>
</tr>
<tr>
<td>35-39</td>
<td>0.57 (0.07-2.01)</td>
</tr>
<tr>
<td>40-49</td>
<td>0.59 (0.24-0.79)*</td>
</tr>
<tr>
<td><strong>Women's Education</strong></td>
<td></td>
</tr>
<tr>
<td>No education/Primary (ref)</td>
<td>1.07 (0.72-1.59)</td>
</tr>
<tr>
<td>Secondary/Higher</td>
<td>0.30 (0.18-0.51)</td>
</tr>
<tr>
<td><strong>Husband's Education</strong></td>
<td></td>
</tr>
<tr>
<td>No education/Primary (ref)</td>
<td>1.23 (0.81-1.87)</td>
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<tr>
<td>Secondary/Higher</td>
<td>0.40 (0.23-0.70)</td>
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<tr>
<td><strong>Age at Marriage</strong></td>
<td></td>
</tr>
<tr>
<td>5-14 (ref)</td>
<td>1.07 (0.72-1.59)</td>
</tr>
<tr>
<td>15-19</td>
<td>0.40 (0.23-0.70)</td>
</tr>
<tr>
<td>20-39</td>
<td>0.40 (0.23-0.70)</td>
</tr>
<tr>
<td><strong>Spousal Age Difference</strong></td>
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</tr>
<tr>
<td>0-5 years older (ref)</td>
<td>1.18 (0.78-1.87)</td>
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<tr>
<td>6 years older and above</td>
<td>0.74 (0.53-1.05)</td>
</tr>
<tr>
<td>5-15 years older</td>
<td>0.74 (0.53-1.05)</td>
</tr>
<tr>
<td>20 years older and above</td>
<td>0.74 (0.53-1.05)</td>
</tr>
<tr>
<td><strong>Parity</strong></td>
<td></td>
</tr>
<tr>
<td>1-2 (ref)</td>
<td>1.18 (0.78-1.87)</td>
</tr>
<tr>
<td>3+</td>
<td>0.74 (0.53-1.05)</td>
</tr>
<tr>
<td>Children</td>
<td>Current use of birth control by method type</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>No method/Folkloric/Traditional (ref)</td>
</tr>
<tr>
<td></td>
<td>Modern Method</td>
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<tr>
<td></td>
<td>Sex of First Child</td>
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<tr>
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<tr>
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<td>Female</td>
</tr>
<tr>
<td></td>
<td>Alive first child</td>
</tr>
<tr>
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<td>Yes (ref)</td>
</tr>
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<table>
<thead>
<tr>
<th>Wealth Quintiles</th>
<th>Community Level Variables</th>
<th>Age at first birth</th>
<th>Age at first sex</th>
<th>Age at first cohabitation</th>
<th>Unmet need</th>
<th>Birth control</th>
<th>Ratio of education (women to men)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poorest</td>
<td>Wealh Index</td>
<td>1.00 (1.00-1.00)</td>
<td>0.987 (1.00-1.00)</td>
<td>0.289 (1.00-1.00)</td>
<td>0.959 (1.00-1.00)</td>
<td>0.007 (1.00-1.00)</td>
<td>0.016 (1.00-1.00)</td>
</tr>
<tr>
<td>Poorer</td>
<td>Violence Justification Index</td>
<td>0.91 (0.65-1.28)</td>
<td>0.600 (1.40-1.10-1.78)</td>
<td>0.007 (1.07-0.83-1.38)</td>
<td>0.622 (0.99-0.89-1.10)</td>
<td>0.865 (0.95-0.84-1.07)</td>
<td>0.364 (0.91-0.78-1.06)</td>
</tr>
<tr>
<td>Middle</td>
<td>Women working</td>
<td>1.29 (0.59-2.82)</td>
<td>0.527 (0.81-0.86-1.43)</td>
<td>0.471 (1.00-0.56-1.79)</td>
<td>0.995 (0.85-0.55-1.32)</td>
<td>0.468 (0.73-0.45-1.18)</td>
<td>0.201 (0.66-0.35-1.25)</td>
</tr>
<tr>
<td>Richer</td>
<td>Ideal birth spacing</td>
<td>0.99 (0.98-1.00)</td>
<td>0.213 (1.01-1.00-1.02)</td>
<td>0.120 (1.00-0.99-1.01)</td>
<td>0.688 (1.00-0.99-1.01)</td>
<td>0.827 (0.99-0.98-1.00)*</td>
<td>0.016 (0.99-0.99-1.00)</td>
</tr>
<tr>
<td>Richest</td>
<td>Ideal number of children</td>
<td>0.91 (0.73-1.14)</td>
<td>0.407 (0.86-0.87-1.16)</td>
<td>0.943 (0.91-0.77-1.07)</td>
<td>0.242 (1.02-0.93-1.12)</td>
<td>0.960 (0.95-0.86-1.05)</td>
<td>0.350 (0.97-0.84-1.12)</td>
</tr>
<tr>
<td></td>
<td>Age at first birth</td>
<td>1.24 (1.01-1.51)*</td>
<td>0.037 (1.01-0.87-1.16)</td>
<td>0.943 (0.98-0.93-1.26)</td>
<td>0.301 (0.94-0.85-0.3)</td>
<td>0.181 (0.93-0.83-1.02)</td>
<td>0.160 (0.80-0.70-0.91)*</td>
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<tr>
<td></td>
<td>Age at first sex</td>
<td>0.96 (0.88-1.05)</td>
<td>0.402 (0.98-0.91-1.04)</td>
<td>0.469 (0.94-0.88-1.01)</td>
<td>0.119 (0.97-0.90-1.05)</td>
<td>0.469 (1.01-0.93-1.09)</td>
<td>0.837 (1.02-0.91-1.13)</td>
</tr>
<tr>
<td></td>
<td>Age at first cohabitation</td>
<td>0.88 (0.83-1.06)</td>
<td>0.165 (1.09-0.96-1.25)</td>
<td>0.174 (0.96-0.84-1.10)</td>
<td>0.604 (1.02-0.92-1.10)</td>
<td>0.996 (1.02-0.93-1.13)</td>
<td>0.682 (1.06-0.94-1.19)</td>
</tr>
<tr>
<td></td>
<td>Unmet need</td>
<td>0.42 (0.09-2.46)</td>
<td>0.368 (0.87-0.24-3.12)</td>
<td>0.851 (0.84-0.23-3.07)</td>
<td>0.787 (0.32-0.18-0.55)*</td>
<td>0.000 (0.69-0.37-1.28)</td>
<td>0.236 (0.88-0.39-2.00)</td>
</tr>
<tr>
<td></td>
<td>Birth control</td>
<td>0.28 (0.08-0.94)*</td>
<td>0.039 (1.12-0.44-2.84)</td>
<td>0.814 (0.86-0.33-2.22)</td>
<td>0.752 (0.85-0.45-1.58)</td>
<td>0.600 (0.88-0.45-1.74)</td>
<td>0.718 (0.85-0.36-2.03)</td>
</tr>
<tr>
<td></td>
<td>Ratio of education (women to men)</td>
<td>2.65 (0.46-15.41)</td>
<td>0.277 (0.65-0.17-2.51)</td>
<td>0.530 (0.82-0.19-3.50)</td>
<td>0.794 (0.78-0.36-1.10)</td>
<td>0.157 (0.98-0.66-1.46)</td>
<td>0.936 (1.65-0.90-3.00)</td>
</tr>
</tbody>
</table>
Conclusion

This study is the first of its kind to investigate multiple community-level influences on birth spacing in two different resource-poor settings. The results add to a growing body of literature on the importance of moving beyond individual and household-level variables and exploring contextual influences on reproductive health. The findings highlight the importance of the community demographic profile and related prevailing gender norms and expectations in shaping birth spacing behaviour. The results indicate the need to move beyond traditional individual and household level factors when designing interventions to improve birth spacing behaviour, and to consider the importance of the community environment as a target for intervention.

Contribution of Authors

CM and RS conceptualized and designed the study. CM conducted the data analysis, with supervision from RS. CM and RS both contributed to the writing of the manuscript. CM and RS both approved the final content of the manuscript.

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ORIGINAL RESEARCH ARTICLE

Skilled Birth Attendance in Nigeria: A Function of Frequency and Content of Antenatal Care

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Abstract

The utilization rate of maternal services remains low in sub-Saharan Africa and may be contributing to the region’s high maternal mortality rate. This study examines the influence of antenatal care (ANC) on skilled birth attendance (SBA) in Nigeria. The data used were collected from a nationally representative sample of women (aged 15-49) in 2011. The sample is restricted to women who were within two years postpartum (weighted n=9879). Multivariate logistic regression was used to assess the association between ANC (number of visits attended and services received during last pregnancy) and SBA. Despite 70% of the women receiving any ANC, only 49% had SBA during their last childbirth. The number of ANC services received, rather than the number of ANC visits attended, was positively associated with having SBA during last childbirth after controlling for relevant covariates (p<0.05). The focus, therefore, should be on increasing the number of services received during ANC.

Keywords: Antenatal care, skilled birth attendance, pregnancy, Nigeria

Résumé

Le taux d’utilisation des services de santé maternelle reste faible en Afrique sub-saharienne et peut contribuer au taux élevé de mortalité maternelle de la région. Cette étude examine l’influence des soins prénatals (SPN) sur les accoucheuses qualifiées (AQ) au Nigeria. Les données utilisées ont été recueillies auprès d'un échantillon national représentatif de femmes (15-49 ans) en 2011. L'échantillon est limité aux femmes qui étaient dans les deux ans après l'accouchement (n = 9879 pondérée). La régression logistique multivariée a été utilisée pour évaluer l'association entre l'ISP (nombre de consultations et les services reçus pendant la dernière grossesse) et les AQ. Malgré le fait que 70% des femmes profitaient des SPN, seulement 49% avaient des AQ lors de leur dernier accouchement. Le nombre de services de soins prénatals reçu, plutôt que le nombre de visites prénatales assisté, était positivement associé au fait d’avoir une AQ lors du dernier accouchement après avoir contrôlé pour vérifier des variables pertinentes (p<0,05). L’accent doit donc être mis sur l’augmentation du nombre de services reçus pendant les SPN. (Afr J Reprod Health 2015; 19[1]: 25-33).

Mots clé : Soins prénatals, services des accoucheuses qualifiées, grossesse, Nigeria

Introduction

antenatal care (ANC) is relevant to the prevention of maternal mortality especially in developing countries where the rates of maternal deaths continue to be high. According to the World Health Organization (WHO), an estimated 289,000 women died during pregnancy/childbirth in 2013; a majority of these deaths were among women with limited access to skilled ANC and delivery. ANC has both direct and indirect effects on maternal health. The direct effect includes early detection and treatment of conditions that lead to poor health outcomes during pregnancy such as hypertension and diabetes; while the indirect effects are through skilled birth attendance (SBA), which can prevent morbidity/mortality due to emergency conditions that arise during childbirth such as obstructed labor and bleeding. Despite the progress made by many countries in the achievement of the Millennium Development Goals (MDGs), the progress of the fifth MDG, which is to improve maternal health, is lagging behind that of the other goals. The United Nations monitor the progress of this MDG by measuring the proportion of births attended by a