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Patterns of Birth and Family Planning Acceptor Rates in Ghana: An Ecological Study

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Abstract

Despite a reported decline in Ghana's birth rate (BR), the pattern of ecological percent decrease in BR as corresponding to the percent increase in family planning acceptor rate (FPAR) in Ghana is not clear. This study explicitly explored and compared the pattern of birth and FPAR in Ghana from 2004-2015. National FPAR and BR data were retrieved from Ghana Health Service and World Bank. A time-trend descriptive analysis was performed via tableau software. Additionally, a segmented regression was applied to inferentially identify where statistically significant log-linear distinct segments exist in the trends. All segmented-related analysis was performed using joinpoint trend analysis software. Whereas, the highest decline in BR was observed from 2013-2015 (-1.4%), the highest increase in FPAR was rather observed from 2004-2008 (7.4%). Unexpectedly, from 2008-2013, a much higher decrease in FPAR (-5.8%) also yielded a moderate decline in BR (-0.7%). FPAR over the eleven years (2004-2015) increased by 1.1% whereas BR declined by -0.7%. BR in Ghana continues to be on a moderate declining trend. However, the decline was uninterrupted by an increase or decrease in FPAR. For a further decrease in Ghana's birth rate, a multifaceted approach is needed, not only focusing on increasing FPAR but also targeting adherence to FP control methods. *(Afr J Reprod Health 2020; 24[2]:64-69).*

Keywords: Birth rate, family planning, fertility rate, segmented regression

Résumé

Malgré une baisse signalée du taux de natalité (BR) du Ghana, le schéma de la baisse écologique en pourcentage du BR correspondant à l'augmentation en pourcentage du taux d'accepteurs de la planification familiale (FPAR) au Ghana n'est pas clair. Cette étude a explicitement exploré et comparé le modèle de naissance et le FPAR au Ghana de 2004 à 2015. Les données nationales FPAR et BR ont été récupérées auprès du Ghana Health Service et de la Banque mondiale. Une analyse descriptive des tendances temporelles a été réalisée via le logiciel de tableau. De plus, une régression segmentée a été appliquée pour identifier par inférence où des segments distincts log-linéaires statistiquement significatifs existent dans les tendances. Toutes les analyses liées aux segments ont été effectuées à l'aide du logiciel d'analyse des tendances Joinpoint. Alors que la plus forte baisse du BR a été observée de 2013 à 2015 (-1,4%), la plus forte augmentation du FPAR a plutôt été observée de 2004 à 2008 (7,4%). De façon inattendue, de 2008 à 2013, une baisse beaucoup plus élevée du FPAR (-5,8%) a également entraîné une baisse modérée du BR (-0,7%). Le FPAR sur les onze années (2004-2015) a augmenté de 1,1% tandis que le BR a diminué de -0,7%. BR au Ghana continue d'être sur une tendance à la baisse modérée. Cependant, la baisse n'a pas été interrompue par une augmentation ou une diminution du FPAR. Pour une nouvelle baisse du taux de natalité au Ghana, une approche à multiples facettes est nécessaire, non seulement en se concentrant sur l'augmentation du FPAR, mais aussi en ciblant l'adhésion aux méthodes de contrôle de la FP. *(Afr J Reprod Health 2020; 24[2]: 64-69).*

Mots-clés: Taux de natalité, planification familiale, taux de fécondité, régression segmentée

Introduction

Promoting the practice of family planning, particularly in developing countries has proven to reduce maternal and child mortality[1-5], and it is pivotal for the attainment of the Sustainable Development Goals (SDG 3.7 and 5.6) which aims at achieving universal access to sexual and reproductive health[6]. For many years family planning has been a major concern for the Government of Ghana and it is outlined in the Ghana Shared Growth and Development Agenda II: 2014-2017 as a significant element in controlling population explosion and national development[7]. Besides its soaring popularity in timing, spacing and limiting of pregnancy[8], it is also considered an important means for poverty reduction[9], reduce burden on education[10], health care system[11] and employment[12].

In 1969 Ghana adopted an all-inclusive population policy[13]. Following this, the Ghana

national family planning was launched in May 1970 targeted at managing the country's population and to facilitate economic growth. However, the program achieved poor success[14]. This necessitated a revision of the policy in 1994 to specifically target the reduction of total fertility rate in Ghana through increase in contraceptive use[7].

Despite a declining trend in Ghana's birth rate reported by previous studies[15,16], the per cent decrease in birth rate as corresponding to the per cent increase in family planning acceptor rate in Ghana is not clear. Considering this background, no study has been published to explicitly investigate the ecological pattern of birth and family planning acceptor rates in Ghana. The exploration of the pattern will not only deepen the understanding of birth rate and family planning coverage in Ghana but will help inform other targeted intervention strategies. This study hypothesized that a proportion increase in family planning acceptor rate should be like the proportion decline in birth rate. Therefore, the objective of the study was to explore and compare the pattern of birth and family planning acceptor rates in Ghana from 2004-2015.

Methods

Data

This study used the annual family planning acceptor rate data from 2004-2015 retrieved from Ghana Health Service (GHS) annual reports[17]. Family planning acceptor rate is a measure of the rate of new contraceptives users each year[18]. Additionally, data on Ghana's birth rate expressed in per 1,000 population were retrieved from Index Mundi[19], which is consistent with data reported by the World Bank[20]. To further assess the impact of education, data on contraceptive usage among married women by education in Ghana for the year 2003, 2008 and 2014 were retrieved[21]. The present study used formal education categories or levels as a proxy for socioeconomic status[22].

Data analysis

A time-trend descriptive analysis from 2004-2015 via tableau software was performed to compare between birth and family planning acceptor rates in Ghana and as well birth rate and contraceptive usage among married women by education for the year 2003, 2008 and 2014. Additionally, a segmented regression was performed to inferentially identify where statistically significant log-linear distinct segments exist in the trends[23]. The number of unique segments or reakpoints was identified through a permutation test procedure[24]. Birth and family planning acceptor rates were considered the outcome variables and incidence years as the independent variable. This regression approach has successfully been applied in several different research fields including fertility patterns[25], cancer[26] and cardiovascular diseases[27]. The average annual per cent change (AAPC), annual per cent change (APC) with 95% confidence intervals (CIs) were estimated from the models. A p-value less than the significance level of 0.05 was considered a statistically significant breakpoint.

Results

Figure 1 shows that the highest family planning acceptor rate over the interval investigated (2004-2015) was observed in 2008 (33.8%) and the lowest rate in 2005 (22.6%). In contrast, the highest birth rate was observed in 2004 (34.0 per 1,000 population) while the lowest was observed in 2015 (31.6 per 1,000 population). In 2008, similar rates were observed for both birth and acceptors of family planning. In a whole, increasing or decreasing pattern of family planning acceptor rate did not change the pattern of the birth rate.

Figure 2 shows that from 2003 to 2008, contraceptive usage among married women with no education decreased by 11% and increased by 36.8% from 2008 to 2014. From 2003 to 2008 and 2008 to 2014, contraceptive use increased by 1.92% and 8.65% respectively among women with primary education. A decline of 15.4% from 2003 to 2008 and an increase of 4.02% from 2008 to 2014 in contraceptive use were observed in women with Middle/JSS/JHS education. As well, among those with secondary education, from 2003 to 2008, the use of contraceptive decreased by 23.6% and increased by 12.8% from 2008 to 2014.

Table 1 and Figure 3 show that from 2004-2008, family planning acceptor rate increased by 7.4% while the birth rate decrease by -0.5%. Also, from 2008-2013, family planning rate declined by -5.8% which yielded a corresponding decrease in birth rate by -0.7%. Additionally, from 2013-2015, family planning acceptor rate increased by 5.5% and the birth rate at the same time interval decreased by -1.4%.

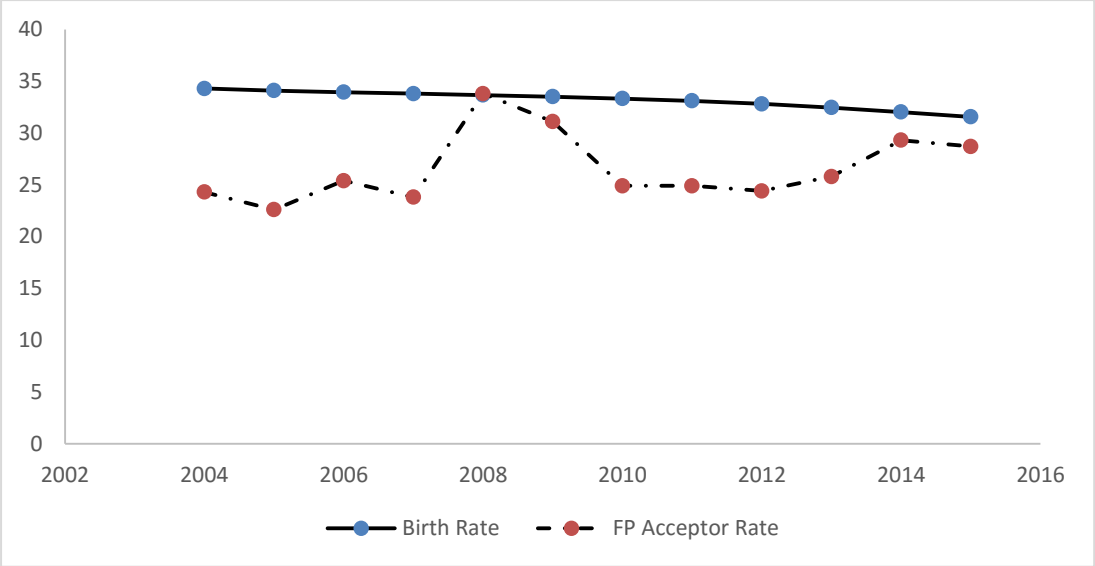

Figure 1: Birth and Family Planning Acceptor rates in Ghana from 2004-2015

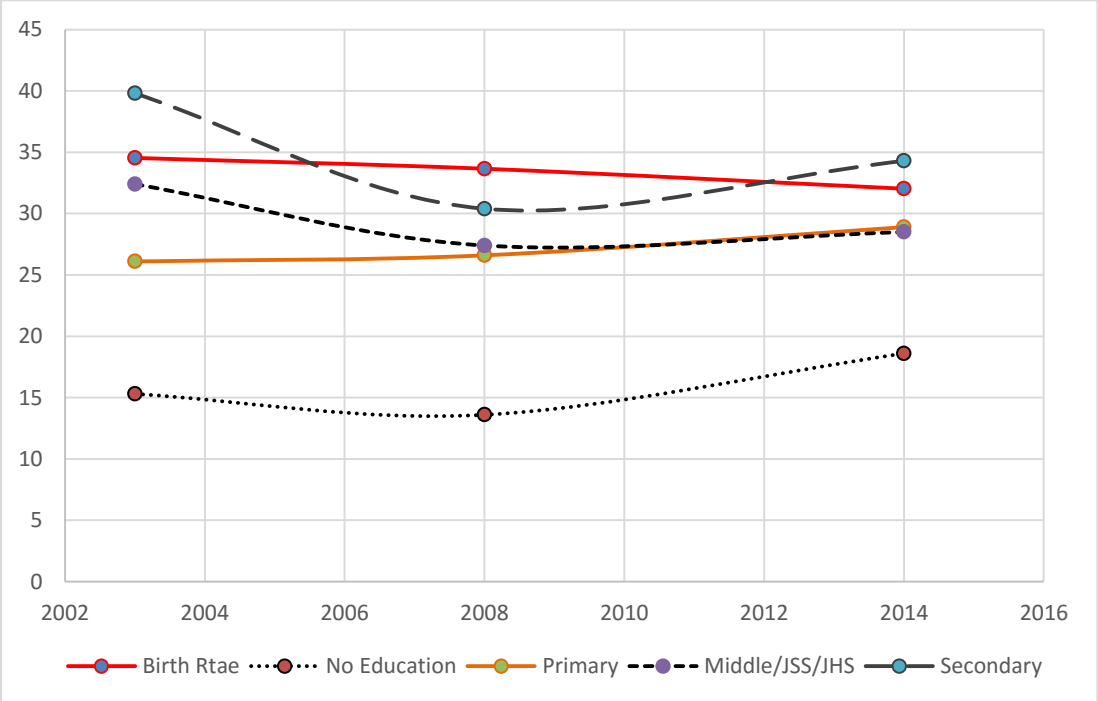

Figure 2: Birth Rate and Contraceptive Usage among Married Women by Education in Ghana for the Year 2003, 2008 and 2014

Table 1: Annual Percent Change in Family Planning Acceptor and Birth Rates in Ghana from, 2004-2015

Break Point	Family Planning Acceptor Rate		Birth Rate	
	APC (%)	P-value	APC (%)	P-value
2004-2008	7.4	0.180	-0.5	<0.001
2008-2013	-5.8	0.054	-0.7	<0.001
2013-2015	5.5	0.430	-1.4	0.023
	AAPC (%)		AAPC (%)	
2004-2015	1.1	0.282	-0.7	<0.001

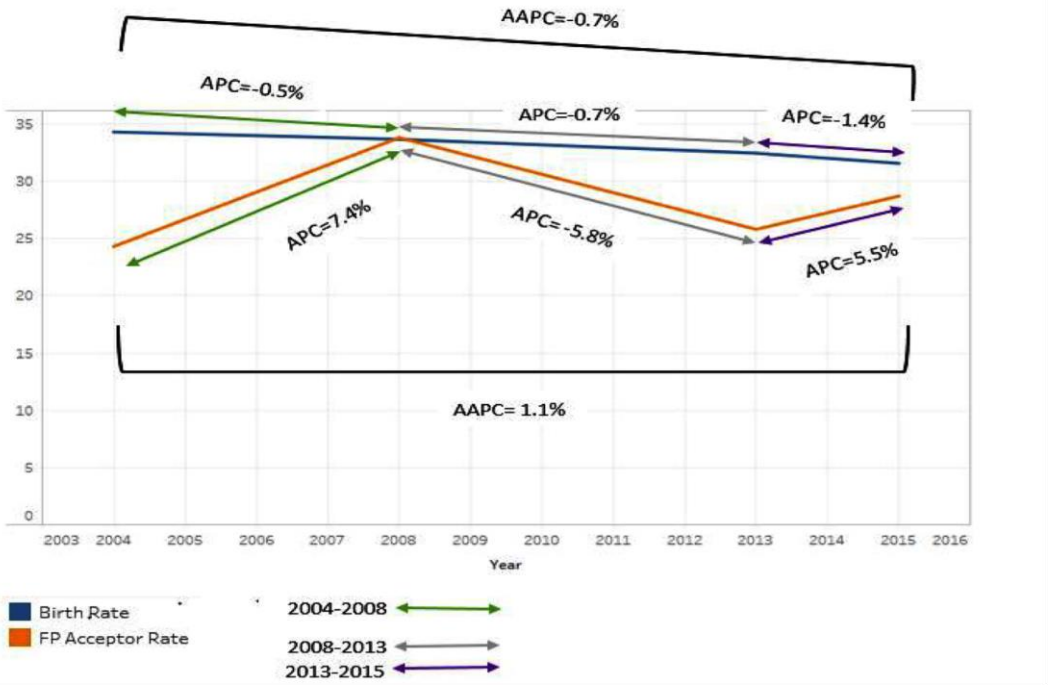

Figure 3: Comparing Birth and Family Planning Acceptor Rates in Ghana

In a whole, over the eleven-years interval investigated (2004-2015), family planning acceptor rate increased by 1.1% whereas birth rate decreased by -0.7%.

Discussion

The findings from the present study show that the birth rate in Ghana is on a moderate declining trend. However, decreasing or increasing pattern of family planning acceptor rate over the period investigated did not change the overall pattern of birth rate in Ghana. The highest decline in the birth rate was observed from 2013-2015 (-1.4%). In contrast, the highest increase in family planning acceptor rate was rather observed from 2004-2008 (7.4%). Thus, unexpectedly, the period with an observed higher increase in family planning acceptor rate in Ghana rather saw the lowest decline in birth rate. Also, surprisingly, between the period 2008 to 2013, a much higher decrease in family planning acceptor rate (-5.8%) also yielded a moderate decline in birth rate (-0.7%). This contradicts the rationale for the introduction of family planning in Ghana[7] and the study hypothesis that a proportion increase in family planning acceptor rate should be like the proportion decline in birth rate.

The present study findings on declining trends of birth rate in Ghana is consistent with other published studies[15, 16]. For instance, within the interval 1993 to 1998, the fertility rate in Ghana declined by 16.4%[15]. Askew I, Maggwa N and Obare F, also noted a decrease in Ghana's fertility rate by 2.5% from 2008 to 2014[28].

The inconsistent trend between the pattern of family planning acceptor and birth rates suggest that several multiple factors might play a role. Education has been reported as an important factor influencing contraceptive usage in Ghana[21]. Formal education categories or levels was considered as a proxy for socioeconomic status in the current study[22]. Findings revealed that despite an increase of 36.8% of contraceptive use observed among women with no education from 2008-2014, this rise is still lagging compared to women with primary education and beyond.

The impact of education on contraceptive usage may also vary depending on the place of residence in Ghana (rural versus urban)[29]. In Ghana, the rural communities have been reported to have low-level education due to scarce access[30]. Marrone G, Abdul-Rahman L, De Coninck Z and Johansson A, acknowledged the low usage or patronage of contraceptives especially among both the married and adolescents in Ghana's rural areas[29]. The lagging behind of contraceptive use in rural communities in Ghana also reflect the high birth rate in these areas compared to urban Ghana[31]. In 2008, the fertility rate in Ghana's rural areas was reported to be 4.9 per

1000 population compared to 3.1 per 1000 population in the urban areas[31]. Thus, suggesting more residence-specific based interventions is needed.

As well, religious beliefs[32] and access to family planning services[33] might be responsible for pattern difference between family planning acceptor and birth rates. Beson P, Appiah R and Adomah-Afari A, found increased use of modern contraceptive in non-religious believers when compared to religious believers[32]. This in part is attributed to reasons such as contradiction to God's law on procreation[34] and against Islamic teaching[35]. Also, the differing proportion of family planning services /facilities in the urban compared to the rural areas of Ghana hinders the promotion and patronage of family planning methods[36]. Additionally, discontinuity due to side effect has been reported elsewhere as an important factor that may inhibit the patronage of family planning services[37]. However, due to data limitation at the ecologic level, these factors were not considered in the present study analysis.

Strengths and Limitations

The segmented regression approach used enabled the present study to robustly identify any significant changes in the trend. Also, this is the first explicit comparison to shed light upon the impact of an increase or decrease in family planning acceptors on birth rate in Ghana at the ecologic level. As a limitation, the present study could not further assess the potential ecological influence of variables such as access to family planning services[36], side effects[37] and religion[32] on contraceptive usage in Ghana due to data limitations.

Conclusion

Birth rate in Ghana continues to be on a moderate declining trend. However, the decline was uninterrupted by an increase or decrease in family planning acceptor rate. Despite a gradual increase in the usage of family planning methods observed among women with low socioeconomic status, this still lags behind women with moderate to high socioeconomic status. For a further decrease in Ghana's birth rate, a more residence-specific based intervention especially targeting women with low socioeconomic status would be extremely helpful.

Acknowledgement

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Contribution of Authors

PKE, JKE and SKE designed the study. JKE conducted the literature review and prepared the study data for analysis. PKE and SKE conducted the statistical analysis and interpretation of the results as well wrote the manuscript. PKE and JKE edited the manuscript.

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