
SEASONAL VARIATION AND SOCIO-DEMOGRAPHIC FACTORS AFFECTING CHILD- BIRTH IN ZARIA, NORTH-WESTERN NIGERIA

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ABSTRACT

BACKGROUND

The high maternal morbidity and mortality in developing countries can be linked to the skewed manpower distribution and inadequate planning and provision of maternal health services. An understanding of the seasonal variation and effect of social as well as demographic factors on monthly birth rates will help decision makers in the allocation of scarce human and material resources to coincide with periods of high childbirth rates.

OBJECTIVES

This study was carried out to determine the frequency of monthly childbirth and factors that affect such variations.

METHODS

It was a cross sectional retrospective study of delivery records at Ahmadu Bello University Teaching hospital, Zaria from January 2009 to December 2011. Data was collected manually and analysed using SPSS version 20.0

RESULTS

There were a total of 5015 deliveries over the study period with a yearly average of 1670. Forty five percent (45%) of parturient were aged between 25 – 30 years while 46.3% of them were primiparous. A bimodal distribution of peak birth rate was observed in months of March to May, and September to October respectively. There was a significant association between parity and monthly variation of childbirth which was

more for primiparous women ($r_s = 0.01$, $\alpha < 0.05$).

CONCLUSION

There was an observed increase in the birth rate around the rainy and harmattan seasons. This knowledge can aid planning of health manpower distribution in order to ensure adequate coverage around these periods.

KEYWORDS: Age, Parity, Seasonality, Child-Birth, Manpower, Mortality

INTRODUCTION

Seasonality of human birth has been a subject of study for decades with several hypotheses proposed for this phenomenon. It has variously been linked to environmental factors like temperature, rainfall and humidity, seasonal foetal loss as well as socio-cultural factors like timing of marriages, public holidays, seasonal labour migration and social class.¹ In addition, it was also observed that there still exists baseline variability in human birth irrespective of the influence of extrinsic factors like contraceptive use, physical environment and cultural factors.²

The culmination of activities above, which is human reproduction and pregnancy, ends in the process of childbirth. This is viewed with high premium in our local environment but sometimes causes emotional distress when mother, baby or both die in the process. The Maternal Mortality Ratio(MMR) of 560 per 100,000 livebirths and skilled birth attendant at birth of 35% puts the national problem into perspective.³ Furthermore, a dearth of skilled health manpower, including material resources, necessitates a multipronged approach to tackling this problem. Several possible area of intervention includes

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determining periods associated with high rates of childbirth and subsequent judicious allocation of material and human resources along these lines.

While most studies on seasonality of childbirth among humans were carried out in the developed world, only a few are available in our sub-region despite having high fertility rates. The observed trend of births in the North America showed a peak in autumn, signifying more conceptions in winter, with greatest dip in spring⁴ while in Northern Europe, their births peaked in spring and dipped in autumn.^{1,4}

This study sets out to improve the understanding of conception, delivery rates and pattern in our sub region. This is of immense value in time-assisted reproductive procedures, timing of contraception intervention programs and other issues related to care of the pregnant woman for a more efficient service delivery and reduction of maternal morbidity and mortality.⁵

MATERIALS AND METHODS:

STUDY DESIGN

The study is a cross-sectional hospital based study with patient data retrieved over a three

year study period from January 2009-December 2011. It was carried out at Ahmadu Bello University Teaching Hospital, Zaria Kaduna State.

STUDY AREA

The study area is located in Zaria, Kaduna State of North-western Nigeria, which is one of the six geo-political zones in Nigeria. The others are North-central, North-east, South-west, South-east and South-south spanning the Sahel, Savannah and Guinea savannah vegetative belts. Zaria has an estimated population of 408,198 and lies within the longitude 7° 39'E and latitude 11° 10'N in the Savannah belt. There is a rainy season between April and October, and a dry season between November and March. The area experiences an average annual rainfall of 1099mm and average daily temperature of 28°C.⁶

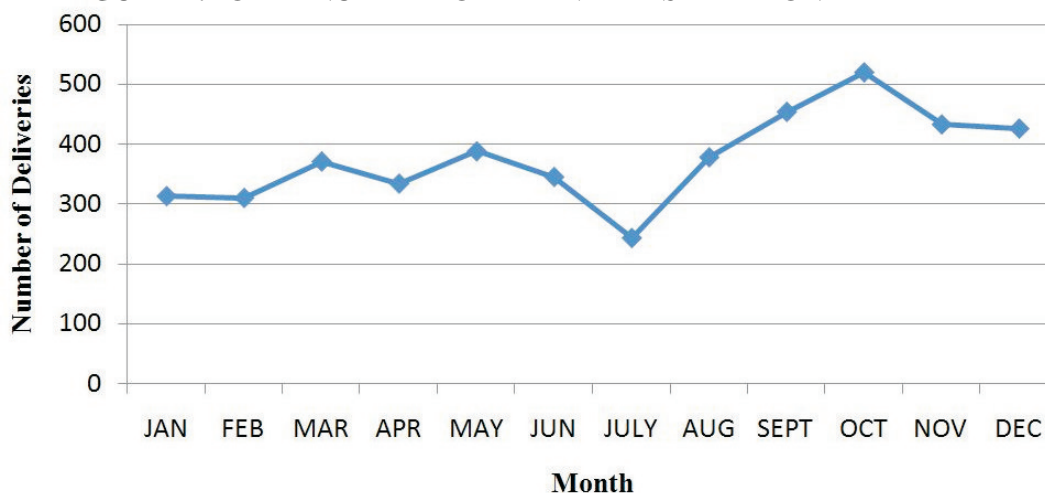
DATA COLLECTION

Data was collected manually by retrieval of patient record using a proforma containing socio-demographic information and route of delivery. This was entered into computer software.

TABLE: DISTRIBUTION OF PATRIURIENTS

Age	Total	%
<20	185	4.1
20-24	854	19
25-30	2033	45.1
>30	1434	31.8
Parity		
Primipara	2321	46.3
Multipara	2088	41.6
Grandmultipara	606	12.1
Route of Delivery		
Vaginal	3499	77.4
Caesarean section	1019	22.6

FIGURE 1: TOTAL NUMBER OF DELIVERIES PER MONTH



DATA ANALYSIS

The information retrieved was analysed using SPSS version 20.0 for distribution expressed as percentages and association between variables analysed using the Spearman's rank correlation (r_s) at 95% confidence interval and level of significance (α) of <0.05 .

RESULTS:

The total deliveries within the study period were 5015 with an average of 1670 deliveries per year. The distribution of birth by age showed that majority (45.1%) of parturient were aged 25-30 years while 4.1% were teenagers.

About 46.3% of parturient were primiparous, 41.6% multiparous and 12.1% had 5 or more deliveries.

A total of 1019 (22.6%) of babies were delivered by caesarean section.

Figure 1 shows the distribution of total monthly births over the study period. A bimodal trend was observed with peaks in the months of March-May and also months of September-October. This indicates that most conceptions occurred 9 months earlier in the months of June-August, then December-January respectively.

There was significant association between parity and seasonal variation of birth, both for primiparity, multiparity and grandmultiparity (r_s 0.01, 0.024 and 0.014 respectively).

DISCUSSION

The majority of parturient were aged between 25- 30 years at 45.1% and only 4.1% of live-births were in women less than 20 years old. This figure falls within the teenage pregnancy rate for Nigeria of 1.7 - 11 %.^{5,7,8} Primiparous women accounted for 46.3% of parturient while 41.6% were multiparous and 12.1% had five or more deliveries. The prevalence of grandmultiparity, which is associated with adverse delivery outcome, was within the range of most national studies of 11-16%.^{9,10} This study established a bimodal pattern of births with most live births occurring between March to May and September to October. These periods lie within the peak of the rainy season usually between April to November. A study in Jos, North-Central Nigeria, having parallel climatic and environmental conditions found a sinusoidal pattern with peaks in the months of September and October, then April through May while having a trough in January and March.¹¹ Though the study period was longer and sample size was larger, findings were consistent and similar. Another study in South-western Nigeria established a similar pattern with highest number of births in May while having the least in November.¹² Additional studies also established high number of childbirths in April through May and October in Benin, South-south Nigeria.¹³ The increased rates of conception around the

rainy season and cold harmattan months might partly be explained by the adverse effect of temperature on sperm quality and ovarian function.⁴ High temperatures are also thought to account for decreased frequency of mating, decreased fecundability and also seasonal fetal loss.¹⁴ Though seasonal effect of weather on conception and timing of childbirth was observed in African studies, probably due to increased indoor time between couples, this was not observed in studies from western countries. Holidays and festivities exerted greater influence thereby attenuating the supposed seasonal effect of temperature on sperm quality.⁴ The comparisons between seasonal variations of birth across climatic and cultural boundaries should be approached with caution. Some socio-demographic factors analysed in relation to variations in rate of monthly births showed that age above 25 years had an effect on seasonal variations probably due to the fact that 76.9% of the parturient fall within that age group with most of them having their second or third babies.

Women who were giving birth for the first time and also grand multiparous women had a more significant variation of monthly deliveries as opposed to those having their second to fourth babies. This might be because first pregnancies are more likely to be planned around seasons of festivities when marriages are conducted in African societies. The assumption above was countered in other studies that showed seasonality is associated more with second and third birth orders but less with first or higher order births.^{15,16}

A study in Calabar, Nigeria reported a link between increased maternal mortality and manpower shortage, with 32.1% of such maternal deaths attributed to the absence of an adequately qualified health worker at the time of delivery.¹⁷ The implication of findings of variation in the number of childbirth according to seasons is to allow for health managers, by implicit rationing of scarce human and material resources, improve health indices as this has been shown to be beneficial.¹⁸

CONCLUSION

The study was able to establish the presence of a bimodal distribution of childbirth with more deliveries occurring in the mid and late rainy seasons. Parity was found to have an association with seasonal child birth rates. It is recommended that the planning of delivery services to be more efficient and effective should involve provision of adequate manpower to cover such periods of high child birth rates which might likely impact on reducing maternal morbidity and mortality.

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