

## **IS THERE SEASONALITY IN DELIVERIES ON THE PLATEAU?**

*Daru, PH, Mohammed, C, and Madziga, IG.*

*Department of Obstetrics and Gynaecology, Faculty of Medical Sciences, University of Jos/Jos University Teaching Hospital, Jos, Plateau state, Nigeria*

### **ABSTRACT**

**Objective-** To determine if there are seasonal variations in delivery rates in JUTH, Jos, Plateau state, Nigeria

**Material and Methods-** This is a retrospective descriptive study carried out in JUTH, Jos, Nigeria. The monthly delivery records from 1985-2011 (26 years) were extracted from the labour ward delivery record. The figures were analyzed for monthly variation in delivery rates.

**Results-** The total number of deliveries during the study period was 65,086. The monthly distribution showed a sinusoidal pattern with peak rates in Sept- Oct. and lowest in Feb-March.

**Conclusion-** There is a seasonal variation in delivery rate on the Plateau. This information will help in health system planning.

**Keywords-** seasonal variation, delivery rate, Jos Plateau

### **INTRODUCTION**

Time-of-year cyclic changes have been shown to affect human reproduction<sup>1</sup>. Almost all human populations exhibit seasonal variation in births, owing mostly to seasonal variation in the frequency of conception<sup>2,3,4</sup>.

A fertile woman can get pregnant following unprotected sexual intercourse at the time of ovulation if there are no inhibitions to the process<sup>5</sup>. Seasonal variation in sexual behavior is more likely to be associated with environmental stimulus than physiological response, yet little attention has been paid to the coincidence between calendar events and sexual activity in the context of sexual health promotion and service provision<sup>4</sup>.

The seasonality of birth is not identical in all populations. Although a number of explanations have been put forward, the causes of the seasonal variations are not fully understood, though attention is given to physical and environmental factors such as temperature and light<sup>6</sup>. It has been suggested that temperature and light, possibly via hormonal changes, may affect the quality, frequency of coitus, or length of menstrual cycle, and thus the ability to conceive. It has also been proposed that fetal loss, if seasonally dependent, may underlie the seasonality of births<sup>6</sup>.

This study is aimed at reviewing the monthly distribution of deliveries. This approximately reflects the monthly distribution of conception, as each term delivery reflects a conception that occurred about nine months earlier. The knowledge gained of seasonal variation in conception and delivery will be important in various aspects of health system planning, especially those

concerning reproductive health issues. Among cultural factors, seasonal changes in the rate at which women enter (or leave) the population at risk may play a role. For example, seasonality in marriages would affect the number of women at risk of conception, and thus result in seasonal changes in birth rates<sup>6</sup>.

### **MATERIALS AND METHOD**

This is a retrospective descriptive study carried out in the department of Obstetrics and Gynaecology of the Jos University Teaching Hospital (JUTH), Nigeria. The delivery records from 1985-2011 (26 years) were extracted and analyzed using the SPSS version 16 statistical software.

### **RESULTS**

The total number of deliveries recorded in the study period was 65,086 with the average monthly delivery of 209 for the period under study.

The highest deliveries occurred in the months of October, followed by September.

The next peaks of deliveries occurred in the Months of April and May. The months with the least deliveries were in January and March. Figure 1.

### **DISCUSSION**

This study found that the monthly distribution of total deliveries showed a sinusoidal pattern with two peaks. The major peaks spanning two months; April-May and September-October. The highest peak occurring in the September- October,, which are

---

Correspondence: phdaru@yahoo.com

summer, and autumn respectively. This by implication infers the highest months of conception to be in December to January (i.e. 9 months earlier). This period corresponds to the peak of the cold harmattan season on the Plateau, which tends to keep couples at home and possibly increase the frequency of coitus that may result to pregnancies. In addition, December- January is the period when many marriages occur on the Plateau

In the same manner, conceptions that occurred in July-August which resulted in deliveries in April-May may be due to the peak of the rains on the Plateau, which confines couples in-doors, and hence facilitating increased coitus. This agrees with a study of seasonal variation in births in Southwestern Nigeria, which showed a significant seasonal pattern with a peak in May, which was adduced to climatic factors<sup>7</sup>. Studies in Greece, Norway, and Australia also observed a seasonal variation with peaks in January and February<sup>8,9,10</sup>. This could be explained as an effect of sociocultural (religious) factors on the rate of conception<sup>8</sup>. Yadava et al, working in India, reported the maximum indices of deliveries occur in the months of August to October., extrapolating this to indicate the maximum conception rates taking place in the winter season<sup>11,12</sup>.

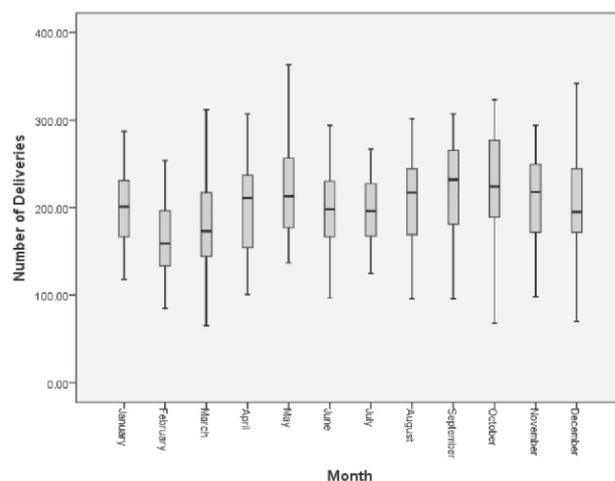
Different geographical locations experience different months of peak in the number of deliveries as a result of differences in the altitude and climatic conditions<sup>14</sup>.

Different reasons have been adduced for the seasonal variations observed in these studies. Seasonal variation in sperm quality and also in ovarian activity has been proposed<sup>13</sup>. Seasonal variation in coital activity among couples is the possible factor influencing the seasonal variation in conception and delivery. Increase in cohabitation is expected in the cold seasons as in the cold harmattan seasons of December-January on the Jos Plateau, Nigeria, which probably accounts for the peak delivery rate in September and October as seen in this study.

The limitations in this study include; it is hospital-based and therefore, failed to capture all births in the community as many deliveries occur at home, and other informal delivery set-ups. Occasional industrial action, religious crisis leading to the closure of the hospital is another limitation..

The study of seasonal variations and delivery rates is of immense value in reproductive care and when planning for a more efficient service delivery.

Figure 1. Deliveries by month.



## REFERENCES

1. Friger M, Shoham-Vardi I, Abu-Saad K. Trends and seasonality in birth frequency: a comparison of Muslim and Jewish populations in Southern Israel: daily time series analysis of 200,009 births, 1985-2005. *Human Reproduction* 2009; 24(6): 1492-1500
2. Bronson F.H. Seasonal Variation in human reproduction: Environmental factors. *The Quarterly Review of Biology* 1995; 70(2): 1-4
3. Richard J.U, Naomi M. M. Seasonality of coitus and seasonality of birth. *Humanities, social science and law Demography* 2008. 4(2): 673-679s
4. Welhings K, Macdowall W, Catchpole M, Goodrich MA. Seasonal variation in sexual activity and their implications for sexual health promotion. *Journal of Royal Society of medicine* 1999; 92:60-65
5. Enabudoso E. J, Ohighe A. C, Gharoro E.P, Okpere E.E. Delivery rate in Benin city, Nigeria: Are there seasonal variations? *Nigeria Journal of Clinical practice* 2011; 14(2): 129-131
6. Martins B, Arjan G. The seasonality of live birth is strongly influenced by socio-demographic factors. *Human Reproduction* 2001, 16(7): 1512-1517
7. Olusola A. Seasonal Variation of Births in Rural Southwest Nigeria. *Int. J. Epidemiol* 1986, 15(1): 91-94
8. Athanassenas, G. A. Seasonal variation of births in Greece: Temporal changes and regional differences over a 24-year period. *Chronobiologia* 1985; 12(4): 351-357
9. Odegard W. Season of birth in the population of Norway, with particular reference to the September birth maximum. *Br J Psychiatry*

- 1977; 131:339-44
10. Mathers C.D, Harris R.S. Seasonal distribution of births in Australia. *Int J Epidemiol* 1983; 12:326-31
  11. Yadava K.N, Dube D, Marwah S. M. A study of seasonal trends in delivery and medical termination of pregnancy. *J Obst Gynaecol India* 1979; 29:256-7
  12. Chatterjee U, Acharya R. Seasonal variation of births in rural West Bengal: magnitude, direction and correlates. *J Biosoc Sci.* 2000; 32(4): 443-58
  13. Levine R.J, Bordson B.L, Brown M.H, Star T.B. Deterioration of semen quality during summer in New Orleans. *Fertil Steril* 1988; 49:900-7
  14. Paonnenberg T, Aschoff J. Annual rhythms of human reproduction and environmental correlations. *J Biol Rhythms* 1990;5: 217-39