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# Determinants of Antenatal Consultation in The Health Districts of Kolda and Sédhiou (Senegal)

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## ABSTRACT

***Introduction:*** **The ANC plays an important role in monitoring the health status of the fetus but also in the monitoring of the mother, by allowing the tracking of several conditions. It makes it possible to retain the woman with the health structure, thus promoting childbirth in ideal conditions. The objective of this study was to identify the determinants of ANC in the Kolda and Sédhiou regions.**

***Method:*** **It was a descriptive and analytical cross-sectional survey. The study focused on women who gave birth between February 2013 and January 2014. Sampling was two-stage random. The data collected during an individual interview focused on the socio-demographic characteristics, knowledge and practices of the women surveyed. The data was analyzed using the R software.**

***Results:*** **A total of 1216 women were surveyed. The results of the study show that 62.3% had no level of education, 48% had no IGA, 57.6% were within 5 km of a health facility and 44.1% were multiparous. Participation in awareness-raising activities involved 53% of women. The percentage of women who had completed their ANC was 24% while 34% had completed $ANC_1$ on time. The results of the multivariate analysis showed that timely $ANC_1$ practice was related to proximity to the health facility (1.7 [1.31-2.2)], simple multiparity (1.46 [1.14-1.89]) and participation in the awareness programme (1.4 [1.08-1.81]). Completion of all ANCs was associated with schooling (79 [1.34-2.39]), knowledge of the number and importance of ANC and the fact that the woman lived within 15 minutes of the structure (1.52 [1.14-2.04]).**

***Conclusion:*** **The results of the study show that the useof reproductive health services for ANC was linked to environmental, economic, cultural and structural factors. Improving the accessibility of these services requires joint actions by the government, NGOs, community actors and the involvement of the population.**

**Keywords:** Antenatal consultation, determinants, health district, maternal health.

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## I. Introduction

Mother/child health is a major priority in low-income countries. This concern is justified by the interest devoted to the fight to reduce maternal and infant and child mortality in these countries. It is at the level of these two targets that the greatest disparities between the countries of the North and those of the South are noted in the indicators that are monitored by WHO. According to the WHO, the majority of maternal and under-five deaths (99%) occur in developing countries, more than half of them in sub-Saharan Africa [1]. In Senegal, the maternal mortality rate is 392 deaths per 100,000 live births and the neonatal mortality rate is 29 deaths per 1000 live births [2].

Factors related to maternal and neonatal mortality are well documented as they have been the subject of several studies [3]. Pregnancy-related complications are diagnosed late and evacuation to health facilities for better care is often very difficult. The policy of the State of Senegal is to offer quality care as close as possible to the population through health structures and community-based services. According to the WHO, about 80% of maternal deaths are due to severe haemorrhage, infections, high blood pressure and abortions [1]. These deaths could be prevented through the implementation of key interventions delivered as part of a continuum of care linking families and communities to health systems. Prenatal consultations are recognized as one of the three main pillars in the fight against maternal and infant mortality [4]. They are defined as a preventive activity directed at the target population of pregnant women [5]. Indeed, pregnancy is a natural event that does not always take place normally. Its follow-up is then necessary in order to identify possible risks and improve the prognosis of pregnancy. The services provided by health care

professionals during ANCs have a positive impact on the evolution of pregnancy (health of the mother and the unborn child). The ANC also promotes the active participation of pregnant women in the monitoring of their pregnancy, which will contribute to the improvement of their health. Prenatal visits are also an opportunity for providers to enable the pregnant woman to have a check-up, provide preventive care and possibly treatment, and teach her measures to follow at home to better monitor her pregnancy and improve her newborn's chances of survival.

The overall objective of this study was to identify the determinants of ANC practice by women living in the health districts of Kolda and Sédhiou.

## II. Materials and Method

### A. Type of Study

This descriptive and analytical cross-sectional study focused on the use of reproductive health services through ANC by women of reproductive age (WRA) in the health districts of Kolda and Sédhiou.

### B. Study Population

The WRA living in these areas constituted the study population.

#### 1) The statistical unit

Any woman who gave birth within the last eleven months before the survey.

#### 2) Inclusion criteria

They targeted any woman who gave birth to a live or stillborn child in a health facility in both districts in the 11 months preceding the survey.

#### 3) Non-inclusion criteria

They concerned any woman who had been in the household or who had not given her consent for the interview.

### C. Sampling

#### 1) Sample size

The estimate was made on the basis of a 95% confidence interval ($\alpha$ =0.05 and 1-$\beta$=0.9), calculated according to the Casagrande and Pike method [6], and an estimated non-response rate of 5%. A number of 1216 women was thus calculated as the sample size.

#### 2) The sampling method

It is based on a two-stage random sampling. Census districts (CDs) represented by villages or neighborhoods were first randomly drawn, then any women meeting the inclusion criteria and living in the CD were interviewed until the sample size was reached.

### D. Data Collection and Analysis

#### 1) Data collection

- Socio-economics characteristics

Some personal characteristics of the women surveyed were explored: level of education, household income, existence of income-generating activities, proximity to health facilities in terms of distance and duration of journey.

- Knowledge and practices on antenatal consultation

Knowledge and practice on the number of ANCs to be done were explored as well as the timing of the first ANC ($ANC_1$). These data were collected during the individual interview with the woman and the consultation of the mother's health record.

#### 2) Data analysis

- Descriptive part

Qualitative variables were described through their frequencies and 95% confidence intervals.

- Analytical part

The nonparametric tests of Mann Withney and Kruskall Wallis as well as the Fisher exact test allowed the bivariate analysis to be performed using the khi2 for the comparison of proportions. A difference was considered significant when $p < 0.05$. The factors associated with ANC were thus identified.

Multivariate analysis identified confounders and modelled the dependent variable (ANC). The independent variables focused on the socio-economic characteristics of the women surveyed on the one hand and their knowledge and practices on reproductive health on the other hand.

The model was developed through the approach of [7]. All independent variables with significance thresholds below 0.25 were selected for the final model. Unmaintained variables (apart from those with thresholds greater than 0.8) were introduced one by one. Then the different models were compared thanks to the likelihood ratio. Subsequently, the least significant variables were eliminated one by one by a top-down procedure and the comparison was made by the likelihood ratio test. Confusion was sought by a decrease of more than 10% in the beta coefficient [8].

### E. Ethical Considerations

The various administrative and local authorities had been informed by mail. Informed consent was sought from all women aged 18 and over; Permission from parents or guardians in addition to their consent had been sought for women under the age of 18.

One of the fundamental principles of ethics such as anonymity will be respected in future uses of the results. After reviewing the protocol, the National Ethics Committee for Health Research of Senegal gave its approval for the conduct of the study.

## III. Results

### A. Descriptive Part

TABLE I: Distribution of Women in the 2 Regions by Socio-Economics Characteristics, Knowledge and Practices Related to ANC (N=1216)

| Variables | N | % |
|---|---|---|
| Socio-economics characteristics | | |
| Educational attainment | | |
| None | 758 | 62,3 |
| Primary or higher | 458 | 37,7 |
| Household income | | |
| Less than 50,000 | 576 | 47,4 |
| 50,000 or more | 640 | 52,6 |
| Income-generating activities | | |
| Yes | 632 | 52 |
| No | 584 | 48 |
| Nearest health facility | | |

TABLE I: DISTRIBUTION OF WOMEN IN THE 2 REGIONS BY SOCIO-ECONOMICS CHARACTERISTICS, KNOWLEDGE AND PRACTICES RELATED TO ANC (N=1216) *(CONT)*

| Variables | N | % |
|---|---|---|
| Less than 5 km | 701 | 57,6 |
| 5 km or more | 515 | 42,4 |
| Time to get to the nearest health facility | | |
| Less than 15 mn | 510 | 41,9 |
| 15 mn or more | 706 | 58,1 |
| Parity | | |
| 0-3 | 680 | 55,9 |
| More than 3 | 536 | 44,1 |
| Attend an awareness program | | |
| Yes | 644 | 53 |
| No | 572 | 47 |
| Knowledge | | |
| $ANC_1$ period | | |
| Yes | 1009 | 83 |
| No | 207 | 17 |
| Number ANC during pregnancy | | |
| Yes | 858 | 70,6 |
| No | 358 | 29,4 |
| ANC Importance Tip | | |
| Yes | 844 | 69,4 |
| No | 372 | 30,6 |
| Practices | | |
| $ANC_1$ | | |
| Yes | 417 | 34,3 |
| No | 799 | 65,7 |
| Full ANC | | |
| Yes | 292 | 24 |
| No | 924 | 76 |

## B. *Bivariate Analysis*

TABLE II: FACTORS ASSOCIATED WITH EARLY ANC

| | Early ANC (%) | P |
|---|---|---|
| Socio-economics characteristics | | |
| Educational attainment | | |
| None | 241 (31,79) | 0,021 |
| Primary or higher | 176 (38,43) | |
| Household income | | |
| Less than 50,000 | 174 (30,21) | 0,005 |
| 50,000 or more | 243 (37,97) | |
| Revenue-generating activity | | |
| Yes | 221 (34.97to | 0,648 |
| No | 196 (33,56) | |
| Nearest health facility | | |
| Less than 5 km | 279 (39.80) | 0.001 |
| 5 km or more | 138 (26,80) | |
| Time to get to the nearest health facility | | |
| Less than 15 mn | 197 (38,63) | 0,008 |
| 15 mn or more | 220 (31,16) | |
| Parity | | |
| 0-3 | 254 (37,35) | 0,013 |
| More than 3 | 163 (30,41) | |
| Attend an awareness program | | |
| Yes | 248 (38,51) | 0,001 |
| No | 169 (29,55) | |
| Knowledge | | |
| $ANC_1$ period | | |
| Yes | 382 (37,86) | 0.001 |
| No | 35 (16,91) | |
| Number ANC during pregnancy | | |
| Yes | 318 (37,06) | 0,002 |
| No | 99 (27,65) | |
| ANC Importance Tip | | |
| Yes | 332 (39,34) | 0.001 |
| No | 85 (22,85) | |

TABLE III: FACTORS ASSOCIATED WITH FULL ANC

| | Full ANC (%) | P |
|---|---|---|
| Socio-economics characteristics | | |
| Education level | | |
| None | 147 (19,39) | 0.001 |
| Primary or higher | 145 (31,66) | |
| Household income | | |
| Less than 50,000 | 112 (19,44) | 0.001 |
| 50,000 or more | 180 (28,13) | |
| Revenue-generating activity | | |
| Yes | 155 (24,53) | 0,713 |
| No | 137 (23,46) | |
| Nearest health facility | | |
| Less than 5 km | 196 (27,96) | 0,001 |
| 5 km or more | 96 (18,64) | |
| Time to get to the nearest health facility | | |
| Less than 15 mn | 155 (30,39) | 0,001 |
| 15 mn or more | 137 (19,41) | |
| Parity | | |
| 0-3 | 185 (27,21) | 0,004 |
| More than 3 | 107 (19,96) | |
| Attend an awareness program | | |
| Yes | 178 (27,64) | 0,002 |
| No | 114 (19,93) | |
| Knowledge | | |
| $ANC_1$ period | | |
| Yes | 261 (25,87) | 0,001 |
| No | 31 (14,98) | |
| Number ANC during pregnancy | | |
| Yes | 909 (19.4) | 0.001 |
| No | 474 (04.6) | |
| ANC Importance Tip | | |
| Yes | 246 (29,15) | 0,001 |
| No | 46 (12,37) | |
| Early $ANC_1$ realization | | |
| Yes | 165 (39,57) | 0,001 |
| No | 127 (15,89) | |

## C. *Multivariate Analysis*

TABLE IV: FACTORS DETERMINING EARLY ANTENATAL CONSULTATION

| | GOLD [95%CI] | P |
|---|---|---|
| Socio-economics characteristics | | |
| Household income | | 0,114 |
| Less than 50,000 | 1 | |
| 50,000 or more | 1,23 (0,95-1,58) | |
| Nearest health facility | | < 0.001 |
| 5 km or more | 1 | |
| Less than 5 km | 1,7 (1,31-2,2) | |
| Parity | | 0,003 |
| More than 3 | 1 | |
| 0-3 | 1.46 (1.14-1.89)] | |
| Attend an awareness program | | 0,012 |
| No | 1 | |
| Yes | 1,4 (1,08-1,81) | |
| Knowledge | | |
| $ANC_1$ period | | < 0.001 |
| No | 1 | |
| Yes | 2,7 (1,82-4,01) | |
| Number ANC during pregnancy | | 0.043 |
| No | 1 | |
| Yes | 1.38 [1.01-1.88] | |
| ANC Importance Tip | | < 0.001 |
| No | 1 | |
| Yes | 1,88 (1,4-2,53) | |

TABLE V: FACTORS DETERMINING COMPLETE ANTENATAL CONSULTATION

| | GOLD [95%CI] | P |
|---|---|---|
| Socio-economics characteristics | | |
| Education level | | < 0.001 |
| None | 1 | |
| Primary or higher | 1,79 (1,34-2,39) | |
| Household income | | 0,115 |

TABLE V: FACTORS DETERMINING COMPLETE ANTENATAL CONSULTATION *(CONT)*

| | GOLD [95%CI] | P |
|---|---|---|
| Less than 50,000 | 1 | |
| 50,000 or more | 1,27 (0,94-1,71) | |
| Time to get to the nearest health facility | | 0,005 |
| 15 mn or more | 1 | |
| Less than 15 mn | 1,52 (1,14-2,04) | |
| Knowledge | | |
| Number ANC during pregnancy | | < 0.001 |
| No | 1 | |
| Yes | 3,47 (2,33-5,16) | |
| ANC Importance Tip | | < 0.001 |
| No | 1 | |
| Yes | 2,35 (1,63-3,38) | |
| Practices' | | |
| Early ANC realization | | < 0.001 |
| No | 1 | |
| Yes | 2,95 (2,21-3,93) | |

## IV. DISCUSSION

The objective of the ANC is to help the woman to carry a pregnancy to term in the best conditions and to ensure a smooth delivery through the screening of health problems and their follow-up in the mother and the fetus. It is during these occasions that advice on good practices to adopt during pregnancy is provided to pregnant women as well as the promotion of childbirth in health facilities. According to the guidelines of policies, standards and protocols in Senegal, pregnant women must perform four ANCs, the first of which is done in the first trimester of pregnancy.

This study focused on the determinants of ANC through the realization of $ANC_1$ and full ANC in time standards according to guidelines.

The results of the study show that 62.3% had no level of education, 48% had no IGA, 57.6% were within 5 km of a health facility and 44.1% were multiparous. The link between economic level and use of health services for ANC has been found in several studies [9]. Wilkinson and Marmot have shown the relationship between the role of economic income and the health status of populations [10]. It thus appears that the reduction of social inequalities can help to solve health problems. It will then be imperative to involve all actors and to establish sustainable public policies. Participation in awareness-raising activities involved 53% of women. The percentage of women who had completed their ANC was 24% while 34% had completed $ANC_1$ on time. The results of the multivariate analysis showed that the practice of $ANC_1$ in time was related to proximity to the health facility (1.7 [1.31-2.2)]), simple multiparity (1.46 [1.14-1.89]) and participation in the awareness programme (1.4 [1.08-1.81]). Completion of all ANCs was associated with schooling (79 [1.34-2.39]), knowledge of the number and importance of ANC and the fact that the woman lived within 15 minutes of the structure (1.52 [1.14-2.04]).

The problem of accessibility of health facilities is not only financial, it is also geographical [11]. Due to the quality of roads and the poor transport system, women often travel long distances to access health services.

Strengthening women's awareness at the level of health facilities Particular emphasis should be placed on sensitizing women in health facilities to improve their knowledge of the benefits of ANC. This awareness must also be done at the household level by neighborhood godmothers (Bajenou Gox) and community relays, especially among first-time mothers who do not yet have a great deal of experience of pregnancy because many social constructs and myths surround pregnancy [12]. This explains the late declarations of pregnancy in order to protect oneself from evil spirits [13].

For the ANC to achieve its objectives it must be complete but also $ANC_1$ must be done within the appropriate period. The proportion of women who performed full ANC is 24% in our study. This proportion is even lower if the mother's health record is anything to go by. This difference can be explained by under-notification of providers. The results found in our study are lower than those of the Demographic and Health Survey (DHS) IV whose national average is 40% [14]; it is the same for the DHS V where the national average is 50% [2]. The achievement of full ANC by women was also higher in the Gossass health district with a rate of 35% [15]. It should also be noted that a good proportion of women who have completed a $ANC_1$ do not do the four ANCs. This is corroborated by the results of DHS IV and V. This situation is a real problem in the continuity of services. Emphasis should be placed on interventions targeting women to engage them in carrying out ANCs in health facilities. There is also a need to strengthen advocacy strategies at the community level for greater involvement of support groups. The contribution of Bajenou Gox in this process would be a great asset in the accompaniment of women [16]. It appears in this study that women who had participated in the information sessions on ANC were more likely to do four ANCs, hence the interest in focusing on raising awareness and informing women in order to strengthen their knowledge. Indeed, knowledge improves both $ANC_1$ and full ANC coverage.

## V. CONCLUSION

The results of the study show that the useof reproductive health services for ANC was linked to environmental, economic, cultural and structural factors. Improving the accessibility of these services requires joint actions by the government, NGOs, community actors and the involvement of the population.

## CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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