# **MOD001768: EPIDEMIOLOGY AND STATISTICS**

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## **INTRODUCTION**

#### Rationales of the study

The Antenatal care is a term used under medical care that supports healthcare facility to the pregnant women. Being stated by Sylvia Patience Ngxongo, (2019), throughout the world the use of antenatal care is considered to reduce child's deaths along with enhancing maternal health. The rationales for following principles of healthcare under antenatal care is to identify or prevent and treating conditions that might threaten the health of fetus or mother and aid woman to approach pregnancy and birth as a positive experience (Sylvia Patience Ngxongo, 2019). The safety and welfare of respectively the child and the mother depend on the availability of medical care throughout pregnancy, labour, and the developing fetus. Antenatal care (ANC) monitors pregnancies and checks for issues to lower health risks for women and their infants. Labour and delivery problems and infections are less likely to occur when the birth takes place in a medical setting with expert medical care and sanitary settings. After birth, difficulties can be treated and the mother can learn how to take care of both herself and her child with prompt postnatal care (Biaggi et al., 2016). For the survey conducted by SADH, (2016), in which women between ages 15 to 49 was taken who gave live birth in the past 5 years before the survey was conducted. 94% of women aged 15 to 49 who gave birth to a live child in the five years preceding the study had antenatal care through a qualified practitioner throughout their recently pregnancy. 17% of women result of effective from a doctor; 77% of women obtained care through a nurse or a caregiver. There has been variations in the kinds of ANC providers, even though the proportion of women obtaining ANC from a competent practitioner in 2016 remains the same as it was in 1998 (94% and 95%, respectively). In 1998, 30% of women and 65% of nurses or midwives provided ANC; in 2016, 17% of women and 77% of nurses or midwives provided ANC (SADH, 2016). The provided report that undertakes

secondary research analysis on the data from South Africa Demographics and Health Survey (SADHS) 2016.

#### Mini-literature review

The systematic review by Adigun Akinrinoye and Obilor, (2021), undertakes comprehensive research through major four bibliographic data base that contains 10,375 academic papers. The literature explores in-depth analysis related to D/deaf pregnant women's use of antenatal care. The research explores difficulties and challenges faced in antenatal care when treating such demographic category of patients (Adigun Akinrinoye and Obilor, 2021). Similarly, by performing analysis on Clinical Trials Registry Platforms Peña-Rosas et al., (2015), the favourable impact on numerous different mother and child outcomes is less noticeable, however supplementation reduces the likelihood of adolescent pregnancy and iron shortage in pregnancy. Considering on the communities' underlying vulnerability to low preterm birth and malnutrition, as well as the degree of non-compliance to the treatment, the execution of iron supplementation guidelines may have diverse effects (Peña-Rosas et al., 2015). On the other side, Berry, (2000), identifies clinical variation galactosemia could indeed cause dietary issues, inability to develop, liver damage, causing cirrhosis, and bleed in uncontrolled babies, among other existence symptoms. The illness that affects African Americans and native Africans in South Africa serves as an example of this. As the hyper-galactosemia is not as obvious as in galactosemia and breathing test is normal, people with diagnostic variation galactosemia may be overlooked during prenatal testing (Berry, 2000).

Through extracting data from CENTRAL, Ovid MEDLINE, CINAHL, Embase and six other database, O'Doherty et al., (2015), the data demonstrates that screening improves the detection of women who are undergoing IPV in medical settings. Still, aggregate rates were relatively low compared to the most accurate predictions of the incidence of IPV among women who sought medical assistance. Intensive study is required to prove that pregnant women in prenatal

settings are more likely to reveal IPV when tested. There was no proof of a connection with other results. As a result, despite the fact that testing improves diagnosis, there is not enough support for screenings in healthcare institutions. In attempt to improve IPV identification strategies in healthcare settings, research contrasting universal screenings to specific instance for women's long-term welfare are still required (O'Doherty et al., 2015). Comprehensively, the literature by Barker et al., (2018), considers a twofold approach that targets particular populations actively considering pregnancy while also enhancing the general health of the populace. A socialist movement centred on an economic and metaphorical link between better prospective mother health and nutrition and genetic health might be promoted using contemporary marketing strategies. The research propose that smart collaboration with the business sector might lead to quick and sustainable improvements in public health. The creation of an advocacy alliance of organisations concerned with preconception health is encouraged by political theory in order to mobilise the democratic will and management needed to translate high-level policy into efficient, well-coordinated action (Barker et al., 2018).

Considering the research of Hofmeyr et al., (2019), reduction of deaths from hypertensive disorders of pregnancy is a global priority. The calcium supplement was considered to be as the solution to solve the problem of deficient and reduce death rates. The research undertaken 1355 women to receive calcium. The end results shows no signs of side-effects and successful birth of child (Hofmeyr et al., 2019). Contrary, the research by Dashraath et al., (2022), explored pregnancy, premature death, preterm delivery, and genetic infection have been linked to monkeypox infection during pregnancy. This article anticipates potential problems for maternity facilities and suggests policies to safeguard the health of expectant mothers and foetuses subjected to the monkeypox infection. Researchers go through the pathology and clinical characteristics of monkeypox virus and talk about how the exceptionally high incidence of anogenital infections affects pregnancy (Dashraath et al., 2022). Furthermore, Tekelab et al.,

(2019), considers impact of antenatal care on the neonatal mortality in sub-saharan Africa. A systematic review considering 898 studies depicted in sub-Saharan African nations, a qualified provider's prenatal visit during pregnancy lowers the risk of new-born death by 39%. Therefore, all pregnant women should get prenatal care throughout their pregnancies in order to hasten the reduction of neonatal fatalities (Tekelab et al., 2019).

#### METHODS

#### Assumptions

The assumptions for the respective research is developed to identify the real problem or issues related to timely utilisation of ANC (Heekes et al., 2018). The assumptions are highlighted through hypothesis in this research for which  $H_0$  states null hypothesis and  $H_1$  states alternative hypothesis. The null hypothesis presents negative relationship between two or more variables. On the other side, alternative hypothesis states positive relationship between two or more variables.

 $H_0$ : There is no association between characteristics of husband or partner and timely utilisation of ANC.

 $H_1$ : There is an association between characteristics of husband or partner and timely utilisation of ANC.

#### Steps to data analysis

- *Issue identification*: The first step covers efforts towards identification of specific research problem due to which the data is being analysed. For the given context, the problem related to problem for pregnant women in accessing health care is to be explored.
- Analysing the survey data: The next step towards the data analysis includes analysing the survey input data provided through SADHS, 2016. The data provided would

consider the background variables of the women in South Africa and the variable of Antenatal care (ANC) is to be only considered for this secondary analysis research.

- *Selection of variables*: For the provided stage selection of needful variables would be proceeded. By referring to the current research problem associated with research aim the variables of demographic of women as independent and women getting ANC as dependent variable would be considered.
- Appropriate test applicable/ hypothesis building: After the variables are selected appropriate test applicable would be operated through the use of SPSS software. Furthermore, the assumptions related to the research problem identified would be developed to evaluate the critical data values being obtained from the test.
- **Drawing interpretations**: In this step appropriate interpretations would be drawn considering the test results obtained. This would provide clear identity for the researcher considering selection of valid hypothesis and provide stage towards drawing effective findings for the research.

#### **Descriptive statistics**

A descriptive statistics is referred to as summary of data statistics being presented for a given research findings. The statistics describes quantitatively from a collection of huge data and provide more clear and concise evaluation to draw effective findings for the respective research.

#### Variables considered

The variables considered for the descriptive statistics are;

- Husband/partner's age
- Respondent's current age

## Rationales for the choice

The rationales over the choice of variables includes adding value to the research findings specific to secondary data analysis over antenatal care of women from South Africa and their relative background characteristics. The analysis performs frequency distribution in order to provide more clear vision for secondary data analysis with respect to demographic analysis of the respondents who were pregnant women undergoing antenatal care (Zegeye et al., 2018). For the same, mean and standard deviation was calculate to adhere average age demographic of the respondent (mean) and to acknowledge the possibilities from deviating to the mean value (SD).

#### **Regression** analysis



The regression analysis is useful to identifying a significant relationship between two or more variables. The analysis is tested through a set of hypothesis that identifies the possibilities for the research problem or a case. The analysis through providing results helps the researcher to identify critical relationship between the variables and influence of one variable on other.

#### Variables considered

#### Dependent

• Number of antenatal visits during pregnancy

#### Independent

- Region,
- Type of place of residence

#### Rationales for the choice

The regression analysis is performed out of several other inferential statistics analysis as, it provides with clear and simple testing results. The respective analysis builds better consideration towards the considered hypothesis for testing and provide clear results through extracting results from the ANOVA and model summary table.

#### Chi-square test

The Chi-square test is a useful statistical tool that helps the researcher to consider contingency tables when the sample size is larger. The current input data comprises a total of 8514 respondents, therefore, the test would help the researcher to acknowledge the appropriate research findings and relative interpretations.

### Variables considered

#### Dependent

• Number of antenatal visits during pregnancy

### Independent

• Type of place of residence

## Rationales for the choice

The rationales for the choice made to develop findings on chi-square test includes; nature of variable considered. Both the variable are identified to be independent in terms of influencing on the test statistics.

ne Student Helpline

## RESULTS

		Husband/partner's age	Respondent's current age						
N	Valid	2841	14144						
IN .	Missing	11303	0						
Mean		40.63	36.13						
Median		40.00	36.00						
Mode		33	46						
Std. Deviation		9.564	8.155						
Variance	46	The Student <sup>91,463</sup>	66.509						
V Helpline									

#### **Table 1: Descriptive statistics**

The above table provided the descriptive analysis considering variables of Husband/partner's age and Respondent's current age. The mean was obtained at 40.63 and 36.13 that provides with average age of Husband/partner's age and Respondent's current age respectively. A higher standard deviation was reported for Husband/partner's age variable which is of 9.564 that provides with higher possibilities of deviating the results in the input from the man value shifting from one respondent to another.

# Table 2: Husband/partner's age frequency distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
	15	2	.0	.1	.1
	18	3	.0	.1	.2
	19	3	.0	.1	.3
	20	4	.0	.1	.4
	21	8	.1	.3	.7
	22	10	.1	.4	1.1
	23	16	o Stude	.6	1.6
	24	31	lelplin	<b>e</b> 1.1	2.7
	25	33	.2	1.2	3.9
	26	41	.3	1.4	5.3
	27	42	.3	1.5	6.8
	28	57	.4	2.0	8.8
	29	63	.4	2.2	11.0
Valid	30	104	.7	3.7	14.7
	31	86	.6	3.0	17.7
	32	106	.7	3.7	21.4
	33	123	.9	4.3	25.8
	34	87	.6	3.1	28.8
	35	108	.8	3.8	32.6
	36	99	.7	3.5	36.1
	37	109	.8	3.8	40.0
	38	105	.7	3.7	43.6
	39	107	.8	3.8	47.4
	40	122	.9	4.3	51.7
	41	103	.7	3.6	55.3
	42	99	.7	3.5	58.8
	43	108	.8	3.8	62.6

				-
44	118	.8	4.2	66.8
45	94	.7	3.3	70.1
46	90	.6	3.2	73.2
47	95	.7	3.3	76.6
48	88	.6	3.1	79.7
49	65	.5	2.3	82.0
50	86	.6	3.0	85.0
51	73	.5	2.6	87.6
52	54	.4	1.9	89.5
53	49	.3	1.7	91.2
54	52	e stude Ielplin	e 1.8	93.0
55	32	.2	1.1	94.2
56	31	.2	1.1	95.2
57	22	.2	.8	96.0
58	18	.1	.6	96.7
59	12	.1	.4	97.1
60	19	.1	.7	97.7
61	9	.1	.3	98.1
62	6	.0	.2	98.3
63	6	.0	.2	98.5
64	10	.1	.4	98.8
65	5	.0	.2	99.0
66	12	.1	.4	99.4
67	1	.0	.0	99.5
68	3	.0	.1	99.6
69	2	.0	.1	99.6
71	2	.0	.1	99.7
72	1	.0	.0	99.8
74	1	.0	.0	99.8
81	1	.0	.0	99.8

	84	1	.0	.0	99.9
	95	4	.0	.1	100.0
	Total	2841	20.1	100.0	
Missing	System	11303	79.9		
Total		14144	100.0		



Figure 1: Descriptive statistics of Husband/partner's age

(Source: SPSS Output)

		Frequency	Percent	Valid Percent	Cumulative Percent
	15	5	.0	.0	.0
	16	14	.1	.1	.1
	17	42	.3	.3	.4
	18	61	.4	.4	.9
	19	100	.7	.7	1.6
	20	121	.9	.9	2.4
	21	168	1.2	1.2	3.6
	22	242	he Stur	1.7	5.3
	23	243	Helpi	ne 1.7	7.0
	24	312	2.2	2.2	9.2
	25	323	2.3	2.3	11.5
	26	405	2.9	2.9	14.4
	27	471	3.3	3.3	17.7
Valid	28	458	3.2	3.2	21.0
vanu	29	484	3.4	3.4	24.4
	30	450	3.2	3.2	27.6
	31	509	3.6	3.6	31.2
	32	482	3.4	3.4	34.6
	33	568	4.0	4.0	38.6
	34	607	4.3	4.3	42.9
	35	527	3.7	3.7	46.6
	36	533	3.8	3.8	50.4
	37	464	3.3	3.3	53.7
	38	456	3.2	3.2	56.9
	39	573	4.1	4.1	60.9
	40	568	4.0	4.0	64.9
	41	592	4.2	4.2	69.1
	42	526	3.7	3.7	72.9

 Table 3: Respondent's current age

43	548	3.9	3.9	76.7
44	507	3.6	3.6	80.3
45	438	3.1	3.1	83.4
46	653	4.6	4.6	88.0
47	649	4.6	4.6	92.6
48	557	3.9	3.9	96.5
49	488	3.5	3.5	100.0
Total	14144	100.0	100.0	





Figure 2: Descriptive statistics on respondent's current age

(Source: SPSS Output)

# **Regression analysis**

# Hypothesis set

*H*<sub>0</sub>: *There is no significant association between characteristics of husband or partner and timely utilisation of ANC.* 

 $H_1$ : There is a significant association between characteristics of husband or partner and timely

utilisation of ANC.

**Table 4: Descriptive statistics** 

	Mean	Std. Deviation	N
Number of antenatal visits	° 20	The Stu	dent
during pregnancy	0.39	Heip	ine
Type of place of residence	1.47	.499	3036
Region	5.39	2.499	3036

# Table 5: Model summary

Model	R	R	Adjusted R	Std. Error of	Change Statistics						
		Square	Square	the	R Square	F	df1 df2		Sig. F		
				Estimate	Change	Change			Change		
1	.059 <sup>a</sup>	.003	.003	16.224	.003	5.241	2	3033	.005		

a. Predictors: (Constant), Region, Type of place of residence

# Table 6: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	2758.915	2	1379.458	5.241	.005 <sup>b</sup>
1	Residual	798356.677	3033	263.223		
	Total	801115.593	3035			

a. Dependent Variable: Number of antenatal visits during pregnancy

b. Predictors: (Constant), Region, Type of place of residence

## Interpretation

By considering the model summary table, R and R-square value was interpreted at .059 and .003 respectively. This represents less to no correlation and influence of independent variable on the dependent variable. The ANOVA table provided significant value of .005 that supports null hypothesis for the research testing is to be selected (p> .005).

# **Chi-square test**

## Hypothesis set

H<sub>0</sub>: There is no relationship between background characteristics of women and timely

utilisation of ANC.



H<sub>1</sub>: There is a relationship between characteristics of husband or partner and timely utilisation

of ANC.

## Table 7: Crosstabs

						Number of antenatal visits					s	Total												
										du	ring	pre	gna	ancy	/									
		No	1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	1	2	Do	
		antena										0	1	2	3	4	5	6	7	8	9	0	n't	
		tal																					kno	
		visits																					w	
Туре	Urb	86	3	54	13	18	23	28	20	14	10	2	8	1	5	2	5	4	2	4	1	7	57	16
of	an	00	3	0.	5	6	9	9	6	4	1	5	U	4		-		'		1	<sup>•</sup>	<i>'</i>		07
place																								
of	Rur	00	3	50	11	19	23	29	18	12	<b>F</b> 4	2	_	1									07	14
residen	al	66	0	50	7	4	3	0	9	0	54	2	2	2	3	1		0	0	3			31	29
се																								
Total		150	6	10	25	38	47	57	39	26	15	4	1	2		2	 		۱ م	7	ן 	ן 	I 04	303
rotal		152	3	4	2	0	2	9	5	4	5	7	0	6	8	3	1	4	2	1	3	Э	94	6

## Table 8: Chi-Square tests

	Value	df	Asymp. Sig. (2-							
			sided)							
Pearson Chi-Square	30.869 <sup>a</sup>	21	.076							
Likelihood Ratio	33.827	21	.038							
Linear-by-Linear	3 1/19	1	063							
Association	5.445		.005							
N of Valid Cases	3036									
a. 17 cells (38.6%) have expected count less than 5. The minimum										
expected count is .94.		The S	tudent Ipline							
Interpretation		_								

#### **Chi-Square Tests**

# Interpretation

The Chi-square tests table interprets the p-value of .076 that is greater than .005 p-value. Therefore, null hypothesis of the test can be selected and interpretations over no relationship between background characteristics of women and timely utilisation of ANC can be framed.

#### DISCUSSION

The SADHS, 2016 findings explores women's most recent pregnancy that resulted in a live delivery, 76% of women all have at least four Antenatal visits, 13% had two to three visits, and 2% had only one. Six percent of pregnant women seemed to have no ANC visits at all. In the first trimester, about half of women received their first ANC visit. Only 2% postponed treatment until the eighth month, while 32% began receiving ANC in the fourth or fourth month of pregnancy (SADHS, 2016). The findings of Adigun Akinrinove and Obilor, (2021), who conducted in-depth analysis linked to D/deaf pregnant women's usage of prenatal care, might be used to support the topic. The study examines the problems and difficulties encountered in prenatal care when caring for patients in this demographic group. The research emphasises the value of ANC for women during their whole pregnancy (Adigun Akinrinoye and Obilor, 2021). Throughout the secondary data analysis under SADHS, 2016, research report, it can be discussed that, tetanus toxoid injections are administered during pregnancy to avoid neonatal tetanus, a serious condition that frequently results in unhygienic delivery practises and is a leading cause of child mortality in many underdeveloped nations. A pregnant woman may require up to two tetanus toxoid injections throughout the pregnancy to protect their unborn child from neonatal tetanus, depending on when and if she had the tetanus vaccine before her most recent pregnancy. Although it is South Africa's official policy for pregnant women to receive a tetanus toxoid vaccination to reduce neonatal tetanus, neonatal tetanus-related deaths are uncommon there. Indeed, the Western Cape Province has not been putting the national strategy into practise for years, as shown by the SADHS 2016 data (SADHS, 2016). The provided data was completely different from the research findings of; Barker et al. (2018), that take into account a dual strategy that both targets persons actively contemplating motherhood and improves the overall health of the community. Using modern marketing techniques, a socialist movement that emphasises the symbolic and economic relationship between improved

diet, genetic health, and prospective maternal health may be pushed. According to the research, effective corporate sector partnership might result in rapid and long-lasting public health gains. Political theory advocates the formation of a coalition of organisations that care about preconception health in order to mobilise the democratic will and management required to transform high-level policy into effective, well-coordinated action (Barker et al. 2018).

Despite being low throughout all background factors, the proportion of women whose most recent delivery was tetanus-free varies the most by province. Compared to 29%-41% in other provinces, only 6% of women in the Western Cape obtained the necessary number of tetanus toxoid immunizations to protect their unborn children from tetanus. The Western Cape's policy leipiine of not regularly administering tetanus toxoid immunizations during prenatal care is consistent with this result (SADHS, 2016). However, the findings from Lattof et al., (2020), research complements earlier initiatives to provide thorough metrics for high-quality ANC and highlights the demand for more accurate evaluation of ANC experiences. New standardised measures are needed to evaluate the quality of regular ANC since the quantity and placement of existing ANC measures throughout the domains of the conceptual framework for quality of care are insufficient. When evaluating the effectiveness and implementation of ANC, girls' and women's views should be given more weight (Lattof et al., 2020). Contrary findings from Peña-Rosas et al., (2015), considers the use of supplementation lowers the chance of adolescent pregnancy and iron deficiency in pregnancy, while the positive influence on many different mother and child outcomes is less obvious. The use of iron supplementation recommendations may have a variety of consequences depending on the communities' inherent susceptibility to low preterm birth and malnutrition as well as the degree of non-compliance with the therapy (Peña-Rosas et al., 2015).

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