**CORRELATION AND REGRESSION ANALYSIS FOR MARTENITY CARE (WHO HAD ANTENATAL CHECK UP IN THE FIRST TRIMESTER AND WHO HAD ATLEAST 4 ANTENATAL CARE VISITS)**

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BANASTHALI VIDYAPEETH

*STAT109- Measures of association and prob. Dist.*

Submitted to:- Submitted by:-

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**DECLARATION**

We, the undersigned solemnly declare that this report, entitled ‘**Correlation and regression analysis for martenity care (who had antenatal check up in the first trimester and who had atleast 4 antenatal care visits**’ is a record of original work done by us as part of the assignment for the paper. STAT 109-Measures of association and prob. Dist. of B.Sc. (Mathematics) Iyear during 2022. We further certify that whenever we have used materials (data, theoretical analysis, and text) from other sources, we have given due credit to them in the text of the report and giving their details in the references.

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| --- |
| Place: Banasthali Vidyapeeth Tanya (2111793)  ABBSM21198  Date:15/04/2022 |

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**INTRODUCTION**

Antenatal care coverage (at least one visit) is the percentage of women aged 15 to 49 with a live birth in a given time period that received antenatal care provided by skilled health personnel (doctor, nurse or midwife) at least once during pregnancy.

Skilled health personnel refers to workers/attendants that are accredited health professionals – such as a midwife, doctor or nurse – who have been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification,

management and referral of complications in women and newborns. Both trained and untrained traditional birth attendants are excluded.

Antenatal care coverage (at least four visits) is the percentage of women aged 15 to 49 with a live birth in a given time period that received antenatal care four or more times. Available survey data on this indicator usually do not specify the type of the provider; therefore, in general, receipt of care by any provider is measured.

Antenatal visits present opportunities for reaching pregnant women with interventions that may be vital to their health and well-being and that of their infants. WHO recommends a minimum of four antenatal visits based on a review of the effectiveness of different models of antenatal care. WHO guidelines are specific on the content of antenatal care visits, which should include:

* blood pressure measurement
* urine testing for bacteriuria and proteinuria
* blood testing to detect syphilis and severe anaemia
* weight/height measurement (optional).

Measurement limitations. Receiving antenatal care during pregnancy does not guarantee the receipt of interventions that are effective in improving maternal health. Receiving antenatal care at least four times, which is recommended by WHO, increases the likelihood of receiving effective maternal health interventions during antenatal visits. Importantly, although the indicator for ‘at least one visit’ refers to visits with skilled health providers (doctor, nurse or midwife), ‘four or more visits’ refers to visits with any provider, since standardized global national-level household survey programmes do not collect provider data for each visit. In addition, standardization of the definition of skilled health personnel is sometimes difficult because of differences in training of health personnel in different countries.

**Antenatal care (ANC) visits by pregnant women in their first trimester increased in most states and Union territories (UT), according to the latest National Family Health Survey (NFHS).**

Goa, Himachal Pradesh, Jammu and Kashmir, Sikkim and Tripura were the only states that showed a decline in the number of mothers going for checkups in the first trimester in 2019-20 compared to NFHS-4 (2015-16).

All UTs showed an improvement in the category. Lakshadweep topped the list of 22 states and UTs with 99.6 per cent women visiting ANC centres in their first trimester as compared to 90.6 per cent during NFHS-4 (2015-16).

* Dadra and Nagar Haveli and Daman and Diu as well as Manipur showed a significant increase in the area; southern states except Karnataka and north-eastern states except Assam, Nagaland and Manipur showed decline in ANC visits among pregnant women in the last five years.
* The decline in ANC visits in Kerala to 78.6 in NFHS-5 (2019-20) from 90.1 per cent in NFHS-4 (2015-16) questioned the validity of the maternal indicator in NFHS-5. The authorities reasoned that the decline was due to natural calamities and Nipah outbreak.

**According to NFHS-4 and NFHS-5 data, the number of mothers whose last birth was protected against neonatal tetanus declined in most states and UTs. Gujarat, Himachal Pradesh, Jammu and Kashmir and Karnataka showed significant increase in the category**.

The number of women consuming iron folic acid tablets for 100 days increased in West Bengal, Andaman and Nicobar Islands, Goa, Gujarat, Himachal Pradesh and Tripura and the UTs. Ladakh registered a decline in the category, followed by Jammu Kashmir and Karnataka. West Bengal showed the most significant increase whereas Lakshadweep and Jammu and Kashmir results were negligible.

* Northeastern states held their position (below average) in providing the first trimester care for mothers. Maipur’s delivery system improved; Nagaland was positioned at the bottom.
* Goa was the only state that performed well in the area; Ladakh topped the charts among the UTs. Bihar and Nagaland showed an increase in pregnant women visiting ANC centers.
* Most states and UTs showed improvement in the administration of tetanus toxin injection; it was 80 per cent in Mizoram to 95.2 per cent in Kerala. Vaccination against tetanus toxic performed a hetrogenous trend across the country irrespective of geographical pattern.
* At least 12 out of 22 states and UTs surveyed held more than 90 per cent coverage wheras the least performing state, Mizoram, had 80 per cent in coverage.

***Mothers consuming iron folic acid tablets for 100 days or more during their pregnancy period showed a heterogenous trend: It was 10 per cent in Nagaland and 87.2 per cent in Goa. The pattern of the indicator varied within the north-eastern states where Mizoram accounted for 61 percent mothers following the practice.***

* Antenatal care turns down the adverse health effect for both newborns and mothers during and after pregnancy. It is considered as the key element in healthcare delivery system. ANC prepares the mother for complications and alerts during childbirth and pregnancy. Pregnant women can access micronutrients, treatment for hypertension and gestational diabetes, immunisation against tetanus, prevention of transferring human immunodeficiency virus and acquired immunodeficiency syndrome (HIV / AIDS) from the mother to child and counselling.

The World Health Organization recommends at least four antenatal care visits on the basis of effectiveness of the healthcare system. It promotes institutional deliveries, less maternal mortality and incline of child survival. In India, the proportion of women receiving at least four antenatal care visits increased from 43.9 per cent in NFHS-3 (2005-06) to 58.6 in NFHS-4 (2015-16).

# Main objective

The main objective of each successive round of the NFHS has been to provide high-quality data on martenity care and family welfare and emerging issues in this area. NFHS-5 data will be useful in setting benchmarks and examining the progress the health sector has made over time. Besides providing evidence for the effectiveness of ongoing programmes, the data from NFHS-5 help in identifying the need for new programmes with an area specific focus and identifying groups that are most in need of essential services.  
  
Four Survey Schedules - Household, Woman’s, Man’s, and Biomarker - were canvassed in local languages using Computer Assisted Personal Interviewing (CAPI). *The Woman’s Schedule* covered a wide variety of topics, including the woman’s characteristics, marriage, fertility, contraception, children’s immunizations and healthcare, nutrition, reproductive health, sexual behaviour, HIV/AIDS, women’s empowerment, and domestic violence*.*

Traditional prenatal care in high-income countries generally consists of:

* monthly visits during the first two trimesters (from the 1st week to the 28th week)
* fortnightly visits from the 28th week to the 36th week of pregnancy
* weekly visits after 36th week to the delivery, from the 38th week to the 42nd week

Assessment of parental needs and family dynamics. The traditional form of antenatal care has developed from the early 1900s and there is very little research to suggest that it is the best way of giving antenatal care. Antenatal care can be costly and uses many staff. The following paragraphs describe research on other forms of antenatal care, which may reduce the burden on maternity services in all countries.

# Data source and study population

Data from four nationally representative surveys designed to collect data on **Martenity care who had antenatal check up in the first trimester and who had atleast 4 antenatal care visits** were used in these analyses. The NFHS-3 (2005–06) collected anthropometry from 46,655 children under five. The RSOC (2013–14) collected anthropometry from 90,908 children under five. The NFHS-4 (2015–16) collected anthropometric measures from 259,627 children under five. The CNNS (2016–18) collected data from 38,060 children under five. The NFHS-4 was designed to provide district-level estimates, while NFHS-3, RSOC and CNNS were designed to provide state-level estimates. The detailed methodology for the NFHS, RSOC and CNNS surveys has been published elsewhere . After excluding the flagged or missing observations for weight-for-height z scores based on WHO 2006 growth standards (WHZ; <-5 or >5) and for missing data on month of interview, our initial sample contains information on 384,130 children under five years made up of 41,306, 82,544, 225,002 and 35,278 children from the NFHS-3, RSOC, NFHS-4 and CNNS, respectively.

### Variables

Our primary outcomes were mean WHZ scores in children <5 years, which indicates a child’s growth in reference to a well-nourished child population and wasting defined as WHZ < -2 SD. Across all the surveys, WHO 2006 growth standards were used to calculate the WHZ scores.

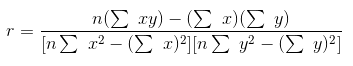
The response rate for the national sample was 56.6 % (N = 4904), and retest data were provided by 123 women. Statistics and theoretical considerations were used to construct 16 scales, covering the following 4 phases of the care: pregnancy control (4 scales), the delivery (3 scales), the postnatal hospital stay (5 scales) and the services in the public health clinic (4 scales). All scales had a Cronbach’s α of >0.7, and all but three scales had an intraclass correlation coefficient for test-retest stability of >0.700. CFA revealed a satisfactory fit between the questionnaire data and the model, with a four-factor solution of the care experiences with pregnancy, birth and postnatal care. CFA provided support for the suggested structures, and demonstrated that the first-order factors are indicators of a second-order factor.

**MATERIAL AND METHODS**

1.Correlation Coefficient- It is a measure of linear correlation between two sets of data. It is the ratio between the covariance of two variables and the product of their standard deviations thus it is essentially a normalized measurements of the covariance, such that the result always has a value between -1 and 1.

As with covariance itself, the measure can only reflect a linear correlation of variables, and ignores many other types of relationship or correlation.

Formula



n = Number of values or elements

x = Sum of 1st values list

y = Sum of 2nd values list

xy = Sum of the product of 1st and 2nd values

x2 = Sum of squares of 1st values

y2 = Sum of squares of 2nd values

2. Regression- It is a set of statistical processes for estimating the relationship between a dependent variable and one or more independent variable.

The most common form of regression analysis is linear regression, in which one finds the line that most closely fits the data according to specific mathematical criterion.

Formula

**Y=a + bX + ∈**

* Y – is the dependent variable
* X – is the independent (explanatory) variable
* a – is the intercept
* b – is the slope
* ∈ – and is the residual (error)

3. Scatter plot- It is a type of plot or mathematical diagram using cartisean coordinates to display values for typical two variables for a set of data. If the points are coded, one additional variable can be displayed. The data are displayed as a collection of points, each having the value of one variable determining the position on the horizontal axis and the value of the other variable determining the position on the vertical axis.

ANALYSIS

Table 1: NFHS-5 Urban data of Ind-30 ,Ind-31, Ind-40, Ind-41

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| State/UT | NFHS5\_U\_Ind40 | NFHS5\_U\_Ind41 | NFHSS-U-Ind30 | NFHS5-U-Ind31 |
| 1 India | 75.5 | 68.1 | 52.6 | 2.1 |
| 2 Andaman & Nicobar | 81.2 | 86 | 81.8 | 0 |
| 3 Andhra Pradesh | 82.7 | 67.2 | 41.8 | 1 |
| 4 Arunachal Pradesh | 57.2 | 47.8 | 82.1 | 3.2 |
| 5 Assam | 72.7 | 62.6 | 66.3 | 2.2 |
| 6 Bihar | 59.8 | 32.4 | 47.4 | 3.6 |
| 7 Chandigarh | 82.2 | 79.1 | 83.4 | 0 |
| 9 Chhattishgarh | 71.5 | 62.2 | 58.5 | 3 |
| 10 Daman and Diu and Dadra and Nagar Haveli | 71.8 | 77.9 | 60.4 | 0.9 |
| 11 Goa | 66.5 | 92.9 | 62.8 | 2.4 |
| 12 Gujarat | 83.7 | 82.4 | 53.1 | 0 |
| 13 Haryana | 85 | 63.1 | 36.6 | 1.1 |
| 14 Himachal Pradesh | 81.6 | 77.3 | 48.6 | 0.7 |
| 15 Jammu and Kashmir | 90 | 83.1 | 64.2 | 0.8 |
| 16 Jharkhand | 76.2 | 48.5 | 87.4 | 0.6 |
| 17 Karnataka | 73.7 | 71.2 | 47.3 | 4.2 |
| 18 Kerala | 93.9 | 79.3 | 56 | 1.1 |
| 19 Lakshadweep | 99.5 | 86.2 | 30 | 0.1 |
| 20 Ladakh | 84.5 | 78.2 | 56.3 | 0.5 |
| 21 Madhya Pradesh | 78.4 | 63.3 | 98.4 | 0.9 |
| 22 Maharashtra | 69.5 | 72.2 | 71.9 | 1.2 |
| 23 Manipur | 84 | 88.8 | 50.8 | 1.1 |
| 24 Meghalaya | 63.2 | 67.5 | 64.5 | 3.1 |
| 25 Mizoram | 81 | 70.3 | 57.4 | 3.2 |
| 26 Nagaland | 64.5 | 39.9 | 79.8 | 0.3 |
| 27 Delhi | 76.5 | 77.1 | 41.5 | 11.6 |
| 28 Odisha | 79.2 | 82 | 70.8 | 1 |
| 29 Puducherry | 87.8 | 90 | 72.4 | 0.5 |
| 30 Punjab | 67.1 | 60.8 | 47 | 3 |
| 31 Rajasthan | 80.5 | 60.6 | 70.5 | 0.8 |
| 32 Sikkim | 58.5 | 51.4 | 66.6 | 4 |
| 33 Tamilnadu | 76.7 | 88.8 | 58 | 0.2 |
| 34 Tripura | 71.8 | 64.2 | 43.4 | 0.7 |
| 35 Uttar Pradesh | 70.8 | 52.3 | 78.2 | 1.6 |
| 36 Uttarakhand | 74.6 | 71 | 43.1 | 5.2 |
| 37 West Bengal | 74.9 | 81.2 | 52.3 | 1.3 |
| 38 Telengana | 89.8 | 71.1 | 62.8 | 2.7 |

Fig1

From figure 1., data is showing linear relationship between the variables. It is showing positive but weak correlation between the variables. Since R^2 = 0.425, hence we can say that 42.5% of variation in urban(ind30) can be explained with % of urban(31).

It is a very less variation between the variables.

|  |  |
| --- | --- |
| *Regression Statistics* |  |
| Multiple R | 0.652456198 |
| R Square | 0.42569909 |
| Adjusted R Square | 0.409290492 |
| Standard Error | 9.575496992 |
| Observations | 37 |

From figure 2., data is showing linear relationship between the variables. It is showing positive but weak correlation between the variables.Since R^2 = 0.193,hence we can say that 19.3% of variation in urban(ind31) can be explained with % of urban(ind40).

|  |  |
| --- | --- |
| *Regression Statistics* |  |
| Multiple R | 0.440328759 |
| R Square | 0.193889416 |
| Adjusted R Square | 0.170857685 |
| Standard Error | 11.34459206 |
| Observations | 37 |

It shows little variation between the variables.

Table 1: NFHS-5 Rural data of Ind-30 ,Ind-31, Ind-40, Ind-41

|  |  |  |
| --- | --- | --- |
| NFHS5\_R\_Ind41 | NFHS5-R-Ind30 | NFHS5-R-Ind31 |
| 54.2 | 65.3 | 3.7 |
| 81 | 92.1 | 0.4 |
| 67.6 | 53.7 | 1.4 |
| 34.6 | 73.6 | 4.1 |
| 49.2 | 75.4 | 2.6 |
| 24 | 58.3 | 6.5 |
| \* | . | . |
| 59.6 | 72.7 | 6.5 |
| 24.8 | 82.9 | 1.9 |
| 93.1 | 51.9 | 0.7 |
| 73.3 | 61.1 | 0 |
| 59.2 | 47.3 | 1.9 |
| 69.3 | 61.1 | 1.3 |
| 80.2 | 72.7 | 1.8 |
| 36.4 | 86.6 | 3.8 |
| 70.6 | 58.8 | 9.3 |
| 78 | 70 | 2.6 |
| 94.2 | 37.7 | 0.2 |
| 78.5 | 92 | 0 |
| 55.6 | 93.7 | 2.6 |
| 68.7 | 82.6 | 2.9 |
| 74.5 | 59.5 | 2.6 |
| 49.6 | 56.9 | 7.1 |
| 45 | 47.9 | 7.3 |
| 13.1 | 67.7 | 6.7 |
| 83.1 | 33.7 | 9 |
| 77.4 | 80 | 2.1 |
| 78.9 | 86.7 | 0 |
| 58.4 | 57.6 | 2.3 |
| 53.9 | 78.6 | 1.6 |
| 62.3 | 85.6 | 1.9 |
| 90.8 | 74 | 0.3 |
| 41.1 | 53.6 | 1.7 |
| 39.6 | 78.9 | 1.1 |
| 57.3 | 61.5 | 4.6 |
| 73.8 | 53.8 | 4.4 |
| 70 | 75.8 | 2.6 |

From figure 4., data is showing linear relationship between the variables. It is showing positive but weak correlation between the variables.Since R^2 = 0.552,hence we can say that 5.52% of variation in rural(ind30) can be explained with % of rural(ind40).

It shows little variation between the variables.

|  |  |
| --- | --- |
| *Regression Statistics* |  |
| Multiple R | 0.743429345 |
| R Square | 0.552687192 |
| Adjusted R Square | 0.539906826 |
| Standard Error | 7.925157885 |
| Observations | 37 |

From figure 5., data is showing linear relationship between the variables. It is showing positive but weak correlation between the variables.Since R^2 = 0.046,hence we can say that 4.6% of variation in rural(ind30) can be explained with % of rural(ind41).

It shows little variation between the variables.

|  |  |
| --- | --- |
| *Regression Statistics* |  |
| Multiple R | 0.216502854 |
| R Square | 0.046873486 |
| Adjusted R Square | 0.0196413 |
| Standard Error | 11.5685128 |
| Observations | 37 |

From figure 6., data is showing linear relationship between the variables. It is showing positive but weak correlation between the variables.Since R^2 = 0.291,hence we can say that 2.91% of variation in rural(ind31) can be explained with % of rural(ind30).

It shows little variation between the variables.

|  |  |
| --- | --- |
| *Regression Statistics* |  |
| Multiple R | 0.539483068 |
| R Square | 0.291041981 |
| Adjusted R Square | 0.270786037 |
| Standard Error | 9.977288162 |
| Observations | 37 |

Table 1: NFHS-5 Total data of Ind-30 ,Ind-31, Ind-40, Ind-41

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| State/UT | NFHS5\_T\_Ind40 | NFHS5\_T\_Ind41 | NFHS5-T-Ind30 | NFHS5-T-Ind31 |
| 1 India | 70 | 58.1 | 61.9 | 3.2 |
| 2 Andaman & Nicobar | 77.1 | 83.4 | 87.3 | 0.2 |
| 3 Andhra Pradesh | 81.7 | 67.5 | 50.4 | 1.3 |
| 4 Arunachal Pradesh | 53.1 | 36.5 | 74.8 | 4 |
| 5 Assam | 63.8 | 50.7 | 74.4 | 2.6 |
| 6 Bihar | 52.9 | 25.2 | 56.9 | 6.1 |
| 7 Chandigarh | 82.3 | 78.7 | 83.2 | 0.2 |
| 9 Chhattishgarh | 65.7 | 60.1 | 70 | 5.8 |
| 10 Daman and Diu and Dadra and Nagar Haveli | 77.7 | 86.2 | 71.9 | 1.4 |
| 11 Goa | 70.3 | 93 | 62.4 | 2.3 |
| 12 Gujarat | 79.3 | 76.9 | 56.2 | 0 |
| 13 Haryana | 85.2 | 60.4 | 43.3 | 1.6 |
| 14 Himachal Pradesh | 72.4 | 70.3 | 57.5 | 1.1 |
| 15 Jammu and Kashmir | 86.6 | 80.9 | 71.7 | 1.7 |
| 16 Jharkhand | 68 | 38.6 | 86.8 | 3 |
| 17 Karnataka | 71 | 70.9 | 56.8 | 8.4 |
| 18 Kerala | 93.6 | 78.6 | 64.8 | 1.6 |
| 19 Lakshadweep | 99.6 | 88.3 | 74.1 | 0.2 |
| 20 Ladakh | 85.8 | 78.4 | 65.3 | 0.4 |
| 21 Madhya Pradesh | 75.4 | 57.5 | 94.7 | 2.3 |
| 22 Maharashtra | 70.9 | 70.3 | 80.2 | 2.5 |
| 23 Manipur | 79.9 | 79.4 | 55.8 | 2 |
| 24 Meghalaya | 53.9 | 52.2 | 59.4 | 5.8 |
| 25 Mizoram | 72.7 | 58 | 49.1 | 6.6 |
| 26 Nagaland | 49.5 | 20.7 | 73.8 | 3.5 |
| 27 Delhi | 76.4 | 77.2 | 75.8 | 10.4 |
| 28 Odisha | 76.9 | 78.1 | 78.7 | 1.9 |
| 29 Puducherry | 82.4 | 86.9 | 76.6 | 0.3 |
| 30 Punjab | 68.5 | 59.3 | 53.9 | 2.6 |
| 31 Rajasthan | 76.3 | 55.3 | 77 | 1.4 |
| 32 Sikkim | 63.7 | 58.4 | 78.6 | 2.8 |
| 33 Tamilnadu | 77.4 | 89.9 | 66.9 | 0.2 |
| 34 Tripura | 63.2 | 52.7 | 49.7 | 1.3 |
| 35 Uttar Pradesh | 62.5 | 42.4 | 78.7 | 1.2 |
| 36 Uttarakhand | 68.8 | 61.8 | 57.7 | 4.7 |
| 37 West Bengal | 72.6 | 75.8 | 53.3 | 3.4 |
| 38 Telengana | 88.5 | 70.4 | 72.4 | 2.6 |

From figure 7., data is showing linear relationship between the variables. It is showing positive but weak correlation between the variables.Since R^2 = 0.762,hence we can say that 76.2% of variation in nhfs4\_total(ind31) can be explained with % of nfhs4\_total(ind40).

It shows little variation between the variables.

|  |  |
| --- | --- |
| *Regression Statistics* |  |
| Multiple R | 0.873024232 |
| R Square | 0.76217131 |
| Adjusted R Square | 0.755376205 |
| Standard Error | 5.882396348 |
| Observations | 37 |

From figure 8., data is showing linear relationship between the variables. It is showing positive but weak correlation between the variables.Since R^2 = 0.331,hence we can say that 3.31% of variation in nfhs4\_total(ind30) can be explained with % of nfhs4\_total(ind31).

It shows little variation between the variables.

|  |  |
| --- | --- |
| *Regression Statistics* |  |
| Multiple R | 0.575453392 |
| R Square | 0.331146606 |
| Adjusted R Square | 0.312036509 |
| Standard Error | 9.864785107 |
| Observations | 37 |

**Figure 9**

From figure 9., data is showing linear relationship between the variables. It is showing positive but weak correlation between the variables.Since R^2 = 0.579,hence we can say that 57.9% of variation in nfhs4\_total(ind30) can be explained with % of nfhs4\_total(ind40).

It shows little variation between the variables.

|  |  |
| --- | --- |
| *Regression Statistics* |  |
| Multiple R | 0.761075053 |
| R Square | 0.579235236 |
| Adjusted R Square | 0.567213385 |
| Standard Error | 7.657725103 |
| Observations | 37 |

**RESULTS AND DISCUSSION**

Some women were treated respectfully and reported comprehensive, individualized care. However, some women experienced long waits and rushed visits, and perceived prenatal care as mechanistic or harsh. Women's preferences included reasonable waits, unhurried visits, continuity, flexibility, comprehensive care, meeting with other pregnant women in groups, developing meaningful relationships with professionals, and becoming more active participants in care. Some low income and minority women experienced discrimination or stereotyping as well as external barriers to care.

After reviewing several hundred abstracts, inclusion/exclusion criteria were developed to identify literature that:

1) was relevant to a significant proportion of the U.S. population,

2) examined women's overall experience of PNC, and

3) was as diverse as possible while allowing sufficient comparability between articles to permit synthesis. The first criterion was operationalized by including articles with samples from ethnic or racial minority groups that represented over 10% of the U.S. population in 2008.

Therefore, articles were included only if data had been collected on Caucasian (66%), African-American (14%) or Hispanic (15%) women or on racially and ethnically mixed samples.The second criterion was operationalized by excluding articles that focused narrowly on specific aspects of care (e.g., women's experience of receiving abnormal genetic test results). The third criterion was operationalized by including studies

**CONCLUSION**

Further research is recommended to understand women's experiences and to develop and implement evidence-based, women-centered approaches. Clinicians should inquire regarding women's needs and modify care accordingly and also advocate for institutional changes that reduce barriers to care. Implementing comprehensive, redesigned models of care may be one effective way to simultaneously address a variety of women's needs and preferences. If prenatal care becomes more attractive as well as more accessible, women's experience and pregnancy outcomes may both improve.