Determinants Of Adequate Antenatal Care (Anc K6) In Indonesia

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ABSTRACT

Background: Adequate antenatal care (ANC) is essential for reducing maternal and neonatal morbidity and mortality. Despite high initial ANC contact coverage in Indonesia, fulfillment of the six-visit standard (ANC K6) remains limited and socially patterned.

Objective: This study aimed to describe sociodemographic and socioeconomic determinants associated with adequate antenatal care (ANC K6) in Indonesia using national survey data.

Methods: A cross-sectional descriptive analysis was conducted using aggregated data from the 2023 Indonesian Health Survey, including 70,916 women aged 10–54 years who had given birth. The outcome variable was fulfillment of ANC K6. Independent variables included maternal age, education, marital status, parity, place of residence, and household wealth quintile. The analysis examined distributional patterns of ANC K6 across determinant categories without inferential modeling.

Results: Nationally, only 17.6% of mothers fulfilled the ANC K6 standard. Among mothers who achieved ANC K6, the majority were aged 20–34 years (76.5%), had secondary or higher education (79.3%), resided in urban areas (57.6%), and belonged to higher wealth quintiles (49.7%). These findings indicate a pronounced social gradient in continuity of antenatal care utilization.

Conclusion: Adequate antenatal care in Indonesia remains low and unequally distributed. Structural factors including education, residence, and household wealth - appear to shape continuity of care. Policies should prioritize reducing barriers to repeated visits among socioeconomically disadvantaged populations.

Keywords: Antenatal Care, ANC K6, Maternal Health, Health inequality, Continuity of Care, Social Determinants of Health

INTRODUCTION

Antenatal care (ANC) visits represent a key pillar in efforts to reduce maternal and infant morbidity and mortality. Adequate antenatal services enable early detection of pregnancy complications, prevention of anemia, strengthening of birth preparedness, and provision of continuous health education for pregnant women. Globally, the World Health Organization (WHO) emphasizes that both the quality and frequency of ANC are critical for improving pregnancy outcomes and reducing the risk of maternal and perinatal mortality, particularly in low- and middle-income countries (WHO, 2016). Although initial ANC contact coverage has increased worldwide, ensuring continuity of visits in accordance with recommended standards remains a persistent challenge.

In Indonesia, improving the quality of maternal health services has become a national strategic priority aligned with the commitment to achieving the Sustainable Development Goals (SDGs), particularly the target of reducing maternal mortality. The Indonesian government has adopted updated ANC standards recommending a minimum of six visits during pregnancy (ANC K6) as part of strengthening comprehensive maternal health services. However, national data indicate that ANC K6 coverage still lags behind initial ANC coverage, suggesting a gap between initial access and sustained utilization of antenatal services throughout pregnancy. The 2023 Indonesian Health Survey (Survei Kesehatan Indonesia/SKI) reported that although most pregnant women had at least one ANC visit, the proportion meeting the standard for adequate antenatal visits remains relatively low and varies across social groups (Kemenkes RI, 2023b).

In this study, adequate antenatal care refers to fulfillment of the minimum standard of six ANC visits (ANC K6) conducted by qualified health professionals across pregnancy trimesters. The concept of "adequate" emphasizes not only the number of visits but also continuity of maternal engagement with the health system during pregnancy. Within the framework of health determinants, utilization of adequate ANC is influenced by both individual and structural factors, including maternal demographic characteristics, household socioeconomic conditions, and residential context. This determinant-based approach aligns with the social determinants of health perspective, which views health service utilization as the result of interactions between individual and social environmental factors.

Several previous studies have examined factors associated with ANC utilization. Cross-country studies in Asia and Africa have identified maternal age, education level, and economic status as consistent determinants of adequate ANC visits (Broger et al., 2019). Using cross-sectional demographic and health survey data, these studies found that women with higher education and better economic status are more likely to complete ANC

visits according to recommended standards. Similar findings have been reported in systematic reviews highlighting socioeconomic inequality as a major barrier to sustained ANC access in developing countries (Arsenault et al., 2018).

In Indonesia, Efendi et al. (2019), using logistic regression analysis of Riskesdas data, found that mothers living in rural areas and those from poorer households were less likely to complete ANC visits according to standards. Other studies have highlighted the role of parity and marital status, indicating that multiparous mothers and those lacking partner support tend to utilize antenatal services less optimally (Prasetyo & Suryani, 2021).

Despite these findings, most studies in Indonesia still rely on outdated standards (ANC ≥4 visits) or datasets collected prior to full implementation of the ANC K6 policy. Furthermore, studies specifically utilizing the 2023 SKI dataset with a focus on core sociodemographic determinants remain limited. Yet, the 2023 SKI provides a current national snapshot that is highly relevant to contemporary maternal health policies. The lack of recent evidence may hinder the formulation of targeted strategies to improve adequate ANC coverage in Indonesia.

Addressing this gap, the present study aims to provide up-to-date empirical evidence on factors influencing the utilization of adequate antenatal visits in Indonesia. Using data from the 2023 Indonesian Health Survey and a quantitative analytical approach, this study focuses on key determinants, including maternal age, maternal education, marital status, parity, place of residence, and household wealth quintile. This focus is expected to generate findings that are both scientifically robust and policy-relevant.

The objective of this study is to analyze the determinants of adequate antenatal visits (ANC K6) among mothers in Indonesia based on the 2023 Indonesian Health Survey. Specifically, it seeks to examine the relationship between maternal sociodemographic characteristics and household socioeconomic status and the fulfillment of antenatal visits according to national standards. The findings are expected to inform the development of more equitable and evidence-based maternal health policies and programs.

METHODS
Research Design
This study employed a quantitative cross-sectional design using secondary data from the 2023 Indonesian Health Survey (Survei Kesehatan Indonesia/SKI), a nationally representative survey conducted by the Ministry of Health of the Republic of Indonesia. The analysis focused on describing distributional patterns of adequate antenatal care (ANC K6) across selected sociodemographic and socioeconomic characteristics.
Data Source and Study Population
The study utilized publicly available aggregated data derived from the official SKI 2023 publication. The SKI applies a stratified multistage sampling design to ensure national representativeness. The study population consisted of women aged 10–54 years who had given birth and had complete information on antenatal care visits during their most recent pregnancy. A total of 70,916 eligible respondents were included in the aggregated dataset.

Because the analysis relied exclusively on published aggregate tabulations rather than individual-level microdata, statistical modeling and inferential testing were not feasible. Therefore, the study is limited to descriptive analysis of proportional distributions.
Variables and Measurement
The dependent variable was fulfillment of adequate antenatal care (ANC K6), defined as completion of at least six antenatal visits during pregnancy according to national standards.
Independent variables included :
Maternal age, categorized as <20 years, 20–34 years, and ≥35 years.
Maternal education, grouped into low (≤ elementary school), secondary (junior–senior high school), and higher (tertiary education).
Marital status, as reported in the SKI dataset.
Parity, categorized according to number of previous births as defined in the survey.
Place of residence, classified as urban or rural based on national statistical definitions.
Household wealth quintile, derived from the SKI asset-based wealth index and grouped into low (lowest and lower-middle), middle, and high (upper-middle and highest) categories. All categorizations followed the official SKI 2023 classification framework.
Data Analysis
Data were analyzed using descriptive statistical methods to present proportions and distributional patterns of ANC K6 across determinant categories. The analysis emphasizes comparative distribution rather than prevalence estimation within each subgroup. No inferential statistical tests were performed due to the use of aggregated data.
Ethical Considerations
This study used publicly available secondary data from the 2023 Indonesian Health Survey. The SKI survey protocol received official ethical approval from the relevant national ethics committee under the Ministry of Health. Because the dataset analyzed in this study contains no identifiable individual information and is based on published aggregate data, additional ethical clearance was not required.

RESULT
General Overview of Adequate Antenatal Visits
Based on data from the 2023 Indonesian Health Survey, 17.6% of mothers fulfilled the recommended six antenatal visits (ANC K6), while 82.4% did not meet this standard. These tables represent the national proportion of mothers achieving adequate antenatal care among the total sample of 70,916 respondents. (Kemenkes RI, 2023).

Table 1. Distribution Of Adequate Antenatal Visits in Indonesia.

Category	Percentage (%)	N
ANC K6 (Adequate)	17.60	23,007
Non-ANC K6 (Inadequate)	82.40	47,909
Total	**100.00**	**70,916**

Source: Indonesian Health Survey (SKI) 2023

Adequate Antenatal Visits by Maternal Age

Among mothers who fulfilled ANC K6 (n = 23,007), the majority were aged 20–34 years (76.5%), followed by those aged ≥35 years (21.1%), and <20 years (2.4%). These percentages represent the distribution of age categories within the ANC K6 group rather than age-specific prevalence rates.

Table 2. Adequate Antenatal Visits (ANC K6) by Maternal Age.

Maternal Age Group	Percentage (%)	N
<20 years	2.4	550
20–34 years	76.5	17,591
≥35 years	21.1	4,866
Total	**100.0**	**23,007**

Source: Indonesian Health Survey (SKI) 2023

Adequate Antenatal Visits by Maternal Age

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Table 3. Adequate Antenatal Visits (ANC K6) by Maternal Educational Level.

Maternal Education Level	Percentage (%)	N
Low (≤Elementary School/equivalent)	20.7	4,759
Secondary (Junior–Senior High School/equivalent)	57.2	13,159
Higher (Tertiary Education)	22.1	5,089
Total	**100.0**	**23,007**

Source: Indonesian Health Survey (SKI) 2023

Adequate Antenatal Visits by Place of Residence

The distribution of mothers who met the criteria for adequate antenatal visits by place of residence shows that the majority of mothers with ANC K6 reside in urban areas, accounting for 57.6%. Meanwhile, mothers residing in rural areas comprise 42.4% of the total mothers who successfully met antenatal visit standards. The proportions in this table total 100%, representing the complete distribution of mothers with adequate antenatal visits based on residential area classification.

Table 4. Adequate Antenatal Visits (ANC K6) by Place of Residence.

Place of Residence	Percentage (%)	N
Urban	57.6	13,248
Rural	42.4	9,759
Total	**100.0**	**23,007**

Source: Indonesian Health Survey (SKI) 2023

Table 5. Adequate Antenatal Visits (ANC K6) by Household Wealth Quintile.

Household Wealth Category	Percentage (%)	N
Low (Lowest + Lower middle)	28.8	6,629
Middle	21.5	4,948
High (Upper middle + Highest)	49.7	11,430
Total	**100.0**	**23,007**

DISCUSSION

Summary of Main Findings

This study confirms that fulfillment of adequate antenatal visits (ANC K6) in Indonesia remains low and demonstrates inequalities across social groups. Nationally, K6 achievement lags far behind initial ANC contact, indicating that the main problem is not merely "initial access" but rather continuity of visits to meet standards. Consistent patterns are evident across maternal age, education, place of residence, and household welfare level, leading to the conclusion that ANC K6 is an indicator sensitive to structural barriers (Kemenkes RI, 2023b).

Interpretation of Findings and Support for Research Questions

The objective of this study was to analyze determinants of ANC K6 based on sociodemographic and socioeconomic characteristics. Based on descriptive-analytical findings, this study supports the research question at the level of identifying determinant patterns, namely that fulfillment of ANC K6 is more concentrated

among groups with better socioeconomic resources and service access. However, because the data used are aggregated and no inferential tests were conducted, this study does not claim support for hypotheses in a causal or statistical sense, but rather confirms descriptive support for the existence of a social gradient in maternal health service utilization (Aryastami & Mubasyiroh, 2023).

Maternal Age and Risk-Support Dynamics

The concentration of ANC K6 in the primary reproductive age group (20–34 years) can be understood through combined mechanisms: biological readiness, more stable social support, and better connectivity with primary care systems. Conversely, extreme ages (adolescents and older mothers) are often situated in more vulnerable social contexts such as limited family/partner support, experiences of stigma, or barriers in negotiating with services which can disrupt continuity of visits. Recent literature emphasizes that inequalities in maternal health service experiences (including unpleasant experiences/mistreatment) can be a barrier to sustained service utilization among vulnerable groups (Bohren et al., 2024).

Education as "Cognitive Capital" and Health Literacy

Differences according to education suggest that education likely operates through enhanced health literacy, ability to understand visit schedules and danger signs, and skills in interacting with health providers. Recent evidence shows that limited health literacy occurs more frequently among women with low education and limited economic conditions, and is associated with suboptimal utilization of antenatal services. Thus, education is not merely "social status," but rather cognitive capital that facilitates ANC continuity (Essam et al., 2022).

Residential Context and Repeated Access Barriers

The urban-rural gap in ANC K6 distribution reflects cumulative access problems. The K6 standard requires repeated visits; therefore, minor barriers (distance, transportation, indirect costs, waiting time, provider availability) that may not prevent the first visit can become major obstacles for subsequent visits. Studies highlighting regional inequalities and maternal service access challenges in Indonesia reinforce that geographical context remains a determinant of sustained service utilization (Rahmawati & Hsieh, 2024).

Household Wealth and Direct-Indirect Costs

The gradient according to wealth quintile demonstrates that ANC K6 is strongly influenced by household capacity to bear both direct and indirect costs. Although health insurance programs can reduce service cost barriers, the need for repeated visits still requires transportation costs, time, and family logistical support. This finding is consistent with studies on inequalities in maternal health service utilization in Indonesia, showing concentration of service use among more affluent groups even in the era of universal health coverage

indicating the presence of non-financial barriers and unequal service access (Wahyuningsih et al., 2025).

Comparison with Global Research

Globally, many low- and middle-income countries face similar patterns: initial ANC contact coverage is increasing, but continuity to achieve optimal visit standards remains lagging, particularly among poor and marginalized groups. Cross-country analyses in Countdown priority countries demonstrate substantial variation in the number of ANC contacts and emphasize the importance of strategies to promote repeated visits, not just the first visit (Jiwani et al., 2020).

Comparison with Previous Research in Indonesia : K6 Standards Sharpen Inequalities

Many previous Indonesian studies used the ANC ≥4 indicator, so when the standard was raised (K6), inequalities became more apparent. Recent studies examining socioeconomic differences in ANC adequacy in Indonesia also demonstrate that socioeconomic inequalities remain prominent when ANC adequacy measures are more stringent, confirming that raising service standards must be accompanied by interventions targeting service continuity among vulnerable groups (Suparmi et al., 2023).

Explaining Contextual Differences: Eastern Regions and Service Disparities

Variations in maternal health service utilization in Indonesia are also shaped by pronounced regional disparities, particularly in the eastern regions, which frequently face geographic constraints and uneven distribution of health facilities. Recent analyses focusing on eastern Indonesia highlight access barriers and local contextual factors as key determinants of antenatal care (ANC) utilization. These findings reinforce the interpretation that urban–rural and socioeconomic gaps in ANC K6 reflect broader inequities in regional health system capacity rather than individual preferences alone (Titaley et al., 2025).

Theoretical Framework: Social Determinants of Health and Andersen's Behavioral Model

The findings of this study are most coherently explained through a combination of the social determinants of health framework emphasizing the roles of education, economic resources, and place of residence and Andersen's Behavioral Model, which conceptualizes health service utilization as a function of predisposing, enabling, and need factors. In the context of ANC K6, maternal education and age can be understood as predisposing characteristics, while household wealth and place of residence operate as enabling factors that facilitate or constrain repeated service use. Recent empirical applications of Andersen's model to ANC utilization demonstrate that enabling factors often emerge as the primary differentiators when access requires multiple contacts over time (Anshebo et al., 2025).

Theoretical Implications: Advancing the Understanding of "Continuity of Care

The key theoretical contribution of this study lies in emphasizing that the ANC K6 indicator captures a dimension distinct from initial access namely, the continuity of maternal contact with the health system throughout pregnancy. Consequently, the findings strengthen the argument that evaluations of maternal health programs should shift their focus from coverage alone to continuity of care. This perspective aligns with recent global discourse underscoring that implementing WHO recommendations involves not only setting standards but also providing operational mechanisms to ensure equitable and sustained service delivery (Bonet et al., 2025).

Practical Implications: Policy Strategies to Improve ANC K6

From a practical standpoint, the findings suggest that policies aimed at improving ANC K6 should address barriers that disrupt repeated visits. These include strengthening follow-up mechanisms (such as reminders and tracking), providing transportation support or mobile outreach services, improving service availability in rural areas, and tailoring health education strategies to maternal health literacy levels. Policies should also prioritize vulnerable groups—such as women with low educational attainment and households with limited economic resources—through community-based approaches integrated within primary health care. National frameworks for strengthening maternal services in Indonesia likewise emphasize the need to enhance equity in service provision as a core component of maternal and child health agendas (Kemenkes RI, 2023a).

Study Limitations

This study has several limitations. First, it relies on aggregated data from the published 2023 Indonesian Health Survey, which precludes inferential analyses (e.g., p-values or odds ratios) and adjustment for confounding factors through multivariable modeling; therefore, interpretations are limited to distributional patterns. Second, the cross-sectional design does not allow assessment of temporal ordering between determinants and ANC utilization. Third, ANC visit indicators are based on self-reported survey data and may be affected by recall bias or reporting errors, particularly when there is a long interval between pregnancy and interview. Fourth, the use of broad categorical groupings (e.g., age, education, and wealth) may obscure within-group heterogeneity. Fifth, the study does not assess dimensions of service quality such as care experiences, waiting times, or provider availability which are known to influence continuity of care (Anshebo et al., 2025).

Directions for Future Research

Future research should leverage SKI microdata to enable bivariate and multivariable analyses that estimate the independent contribution of each determinant after controlling for confounders. Longitudinal or panel studies are also needed to assess how changes in household conditions or service access influence ANC continuity across pregnancy. Mixed-methods approaches are recommended to explore contextual barriers such as transportation constraints, social norms, care experiences, and partner support that are not captured in aggregated data, and to inform more targeted interventions, particularly in regions with pronounced disparities (Titaley et al., 2025).

CONCLUSION

This study analyzed the determinants of adequate antenatal care visits (ANC K6) in Indonesia using data from the 2023 Indonesian Health Survey to identify sociodemographic and socioeconomic patterns related to continuity of antenatal care under the current national standard.

The findings show that the achievement of ANC K6 remains low nationally and is unevenly distributed across social groups. Adequate antenatal care is more frequently observed among women in the primary reproductive age group, those with higher educational attainment, urban residents, and mothers from wealthier households. These patterns indicate that continuity of antenatal care is strongly influenced by structural factors, including access to services, socioeconomic resources, and living environments. Thus, the study supports the research objective by confirming the presence of a clear social gradient in ANC K6 utilization, although no causal or statistical inferences are made.

Theoretically, this study reinforces the view of antenatal care as a continuum of care rather than a single service contact. The use of the ANC K6 indicator demonstrates that higher service standards can reveal inequalities that may be overlooked when lower thresholds are applied. Practically, the findings suggest that maternal health strategies should move beyond increasing initial ANC contact and focus on sustaining engagement throughout pregnancy.

Policy efforts should prioritize reducing barriers to repeated antenatal visits, particularly among socioeconomically disadvantaged and rural populations, through strengthened follow-up systems, targeted health education, and improved service availability. Future studies should use individual-level and longitudinal data to further examine pathways influencing antenatal care continuity.

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