The Significance of Socioeconomic Status to Complete Antenatal Care in Rural Philippines

Sri Handayani[1]*, Agung Dwi Laksono[1], Jane Kartika Propiona[1], Syarifah Nuraini[1], Irfan Ardani[1], Herti Windya Puspasari[1], Indah Pawitaningtyas[1], Hygeia Grace C. Agosto[2], and Carl Abelardo T. Antonio[3]

[1] Research Center of Public Health and Nutrition, National Research and Innovation Agency, Indonesia
[2] Department of Health Eastern Visayas Center for Health Development, Palo, Leyte, Philippines
[3] Department of Health Policy and Administration, College of Public Health, University of the Philippines Manila, Philippines
* Sri Handayani, corresponding author. Email: srih015@brin.go.id
Submitted: 5 September 2024. Accepted: 29 May 2025. Published: 5 January 2026
Volume 34, 2026. pp. 955–965. http://doi.org/10.25133/JPSSv342026.048

Abstract

Wealth is expected to correlate positively with antenatal care, due to the costs of consultations, medications, and indirect expenses such as travel. This study examines the relationship between wealth and antenatal care (ANC) in rural Philippines, focusing on socioeconomic factors and antenatal care completion. Data from the 2022 Philippines National Demographic and Health Survey (NDHS) were analyzed, focusing on 2,798 Filipino women, aged 15 to 49, residing in rural areas who had given birth in the past three years. Socioeconomic status was the exposure variable, with ANC completeness as the outcome. Using binary logistic regression, the analysis controlled for age group, marital status, employment status, education level, and parity. The ANC completion rate in rural Philippines was about 23%. Women in the poorer wealth group were 1.56 times more likely to complete ANC than those in the poorest group (AOR = 1.56, 95% CI [1.56, 1.561]). Middle-class women were 2.89 times more likely (AOR = 2.89, 95% CI [2.89, 2.892]) to experience the outcome, while those in the wealthier group had a 3.17 times higher likelihood of experiencing the outcome. The most affluent women were 6.25 times more likely to complete ANC than the poorest (AOR = 6.25, 95% CI [6.25, 6.256]). These findings indicate a clear correlation between socioeconomic status and ANC completion in rural areas of the Philippines, with wealthier women being more likely to receive complete ANC.

Keywords

Antenatal care; poverty; public health; socioeconomic

Background

The high rate of maternal mortality is still a significant problem in the world, especially in low-and middle-income countries (LMICs). One of the countries that still has a high maternal mortality rate in Southeast Asia is the Philippines. In 2017, the MMR for the Philippines was recorded at 121 deaths per 100,000 live births, a slight decrease from the 124 reported the preceding year. Although there has been a gradual decline in these figures, the Philippines has yet to achieve the Sustainable Development Goal target of maintaining maternal mortality below 70 per 100,000 live births. Maternal mortality may arise from both direct and indirect causes, with primary contributors including hemorrhage, pregnancy-induced hypertension, sepsis, and complications associated with childbirth (Bhusal, 2021). A lack of adequate antenatal care (ANC) visits and disparities in access to antenatal treatment significantly heighten the risk of maternal mortality, thus necessitating immediate intervention. Improving ANC services can increase expectant mothers' awareness of the significance of antenatal care and safe childbirth practices (Anik et al., 2021).

The government of the Philippines has implemented various policies to enhance pregnancy and childbirth services. The 'Safe Motherhood' initiative is designed to improve maternal healthcare and diminish maternal mortality rates while simultaneously encouraging expectant mothers to pursue antenatal care and deliver in healthcare institutions (Siy Van et al., 2021). Municipal regulations, such as those in a locality in Eastern Visayas Region, explicitly ban home births and enforce penalties for noncompliance (Perez et al., 2020). PhilHealth, the national health insurance program, offers supplementary services, while the conditional cash transfer program and other community partners deliver financial assistance. The Department of Health (DOH) (2022) also provides free maternity services and financial support to ensure women can access quality healthcare during pregnancy.

Several studies have investigated the factors influencing ANC utilization. Utilization of ANC services is influenced by factors such as geographic location, socioeconomic status, educational level, and parity (Wulandari et al., 2022). In the Philippines, marginalized populations encounter substantial obstacles in accessing maternal and child health services, including ANC, mainly due to constraints imposed by household income (Paredes, 2016). Another study in the Philippines identified the primary factors contributing to complete ANC included maternal age, infant gender, the provider of ANC, smoking status, maternal education level, parity, wealth index, residential area, and socio-family empowerment factors (Arsyi et al., 2022). A Southeast Asian study highlighted that maternal health services, including antenatal care, professional support during childbirth, and postnatal care, are crucial in decreasing maternal and child mortality rates (Wulandari et al., 2021).

Moreover, socioeconomic factors can significantly impact the utilization of antenatal care and pregnancy outcomes, mainly through financial aspects such as household income and distance to health facilities (Herwansyah et al., 2022). Although maternal services are provided free of charge, mothers still incur out-of-pocket expenses. Women from low-income backgrounds often lack the financial means to cover the expenses of high-quality ANC, including consultation fees, diagnostic tests, medications, and transportation to health facilities (Sakib et al., 2025). Despite the availability of free maternal health services, financial barriers such as travel expenses continue to hinder the effectiveness of ANC utilization, especially for pregnant women from low-income families (Jo et al., 2019).

While previous studies have examined factors influencing antenatal care in the Philippines, limited studies focus on the impact of socioeconomic status on complete ANC in rural Philippines. Studying in rural areas is essential due to socioeconomic losses, dispersed communities, and limited access to health facilities (Saurman, 2016). In light of the above, the objective of this study is to investigate the relationship between socioeconomic factors and the completion of ANC in rural Philippines.

The results of this study can contribute to population and social studies by explaining how social and economic structures influence maternal health behaviors among women in rural areas, particularly regarding antenatal care coverage in the Philippines. Its findings will support government efforts to improve ANC policy and coverage in these regions. As Green and Ottoson (2005) stated, health-seeking behavior is influenced by three main factors: predisposing, reinforcing, and enabling. Predisposing factors include knowledge, attitudes, cultural values, education level, occupation, perceptions, and age of the individual (Setyowati et al., 2024). This study examines the predisposing factors identified by Green and Ottoson in their analysis of antenatal care utilization among women in rural Philippines. These predisposing factors include socioeconomic status, education, occupation, marital status, age, and parity.

Methods

Data source and study design

This study is based on an analysis of secondary data from the 2022 Philippines National Demographic and Health Survey (NDHS). The NDHS is designed to provide data for monitoring the population and health situation in the Philippines, as conducted by the Philippine Statistics Authority (PSA) and ICF (2023). The NDHS received partial funding from the Commission on Population and Development (POPCOM) for handheld tablets used in data collection, while the Philippine government funded the overall project. The Demographic and Health Survey Program, supported by the US Agency for International Development (USAID), provided technical assistance through the Inner-City Fund (ICF). A nationally representative sample of 27,821 women aged 15–49 in 30,372 households was interviewed. The 2022 NDHS took place from May 2 to June 22, 2022, using individual and household interviews, and employed multistage, stratified random sampling to ensure accuracy.

In this study, we focused on 2022 NDHS data from women aged 15 to 49 from rural areas of the Philippines who had given birth within the three years preceding the interview. Of 27,821 respondents, the weighted sample consisted of 2,798 women, indicating a response rate of 98% among eligible Filipino women.

Setting

The study was conducted in rural areas of the Philippines. The rural category is based on the definition used by the PSA and ICF (2023). Research on antenatal care in rural areas is essential because limited access to health services and cultural factors often hinder pregnant women from receiving adequate maternal care.

Outcome variable

Completed ANC was used as an outcome variable in the study. The World Health Organization (2018) stipulates that completed ANC must include a minimum of eight visits throughout the whole pregnancy. We divided the completed ANC into "No" and "Yes" responses.

Exposure variable

The study assessed socioeconomic status using wealth quintiles as exposure variables. Household evaluations considered the number and type of assets, such as televisions, bicycles, or cars, as well as home features like access to toilets and drinking water, and the materials used for constructing the first floor. Principal component analysis was used to calculate scores. Each representing 20% of the population, these five categories were converted into national wealth quintiles by averaging the household scores of each member within each category. The survey results divided the population into five socioeconomic groups: poorest, poorer, middle, wealthier, and most prosperous.

Control variables

The study examined five control variables: age group, marital status, employment status, education level, and parity. Age groups were categorized as 15–19, 20–24, 25–29, 30–34, 35–39, 40–45, and 45–49. Education levels were classified into no formal education, primary, secondary, and higher education. Marital status was divided into three categories: never married, married, and divorced/widowed. Employment status was categorized as employed or unemployed. Parity was assessed by counting the number of live births, categorized as follows: primiparous (one or fewer births), multiparous (two to four births), and grand multiparous (five or more births).

Initially, a chi-square test was used for bivariate analysis to determine whether there is a significant association between all the independent variables and the completeness of antenatal care. Subsequently, binary logistic regression was performed, yielding adjusted odds ratios (AORs) and 95% confidence intervals (CIs). The AOR is necessary due to the inclusion of covariate variables in the analysis. Statistical analysis was carried out using IBM SPSS 26.

Ethical approval

The 2022 Philippines NDHS utilized two questionnaires: one for households and one for women. These questionnaires were adapted to address the specific population and health issues of the Philippines, using model questionnaires from the DHS program. Input was sought from various stakeholders, including government agencies, academic institutions, and international organizations. The ICF Institutional Review Board reviewed the survey protocol, adhering to the "Protection of Human Subjects" regulations (45 CFR 46) set by the US Department of Health and Human Services. Data for the 2022 Philippines NDHS were collected through computer-assisted personal interviewing (CAPI) using the website https://dhsprogram.com.

Result

The results show that approximately 23% of women in the rural Philippines received antenatal care. Table 1 shows the percentage distribution of women who received incomplete or complete antenatal care across various sociodemographic characteristics. There is a statistically significant difference between the proportions of women with incomplete versus complete ANC across the sociodemographic categories ($p < .001$).

Table 1: Descriptive Statistics of Antenatal Care in Rural Philippines (n = 2,798)

Characteristic	Antenatal Care		p value
	Incomplete (n = 2,153)	Complete (n = 645)	
Socioeconomic			< .001
Poorest	87.3%	12.7%	
Poorer	79.3%	20.7%	
Middle	66.6%	33.4%	
Richer	62.2%	37.8%	
Richest	41.1%	58.9%	
Age Groups			< .001
15–19	89.6%	10.4%	
20–24	79.9%	20.1%	
25–29	71.0%	29.0%	
30–34	70.8%	29.2%	
35–39	75.4%	24.6%	
40–44	70.4%	29.6%	
45–49	65.5%	34.5%	
Education			< .001
No Education	94.3%	5.7%	
Primary	86.4%	13.6%	
Secondary	78.2%	21.8%	
Higher	60.8%	39.2%	
Marital Status			< .001
Never Married	83.1%	16.9%	
Married/Living with Partner	73.6%	26.4%	
Divorced/Widowed	83.3%	16.7%	
Employment Status			< .001
Unemployed	78.0%	22.0%	
Employed	68.6%	31.4%	
Parity			< .001
Primiparous	70.5%	29.5%	
Multiparous	73.0%	27.0%	
Grand Multiparous	85.7%	14.3%	

Table 1 indicates that all variables were statistically significant. According to socioeconomic status, the richest women had the highest proportion of completed ANC (58.9%). Regarding age groups, those in the 45–49 age group had the highest completion rate of ANC (34.5%). Higher-education women are more likely to complete ANC based on their level of education. Regarding marital status, those who were married or living with a partner had the highest proportion of ANC care compared with never-married and divorced/widowed women (26.4%). Moreover, employed women received more ANC care than those who were

unemployed (31.4%). In comparison, primiparous women had a higher proportion of complete ANC than multiparous and grand multiparous mothers.

Table 2: The result of the Binary Logistic Regression of Antenatal Care in Rural Philippines (*n* =2,798)

Predictor	Complete ANC AOR (95% CI)
Socioeconomic	
Poorest	1.000
Poorer	1.560 (1.560, 1.561)*
Middle	2.891 (2.890, 2.892)*
Richer	3.172 (3.171, 3.173)*
Richest	6.253 (6.251, 6.256)*
Age Groups	
15–19	1.000
20–24	2.048 (2.046, 2.049)*
25–29	3.123 (3.121, 3.125)*
30–34	3.572 (3.569, 3.574)*
35–39	3.021 (3.018, 3.023)*
40–44	6.068 (6.063, 6.073)*
45–49	8.853 (8.843, 8.862)*
Education	
No Education	1.000
Primary	2.404 (2.400, 2.409)*
Secondary	3.330 (3.324, 3.336)*
Higher	3.722 (3.715, 3.729)*
Marital Status	
Never Married	1.000
Married/Living with Partner	2.391 (2.390, 2.393)*
Divorced/Widowed	1.668 (1.667, 1.670)*
Employment Status	
Unemployed	1.000
Employed	1.127 (1.126, 1.127)*
Parity	
Primiparous	2.422 (2.421, 2.423)*
Multiparous	1.814 (1.813, 1.815)*
Grand Multiparous	1.000

*Note: * $p < .01$*

Table 2 presents the results of the binary logistic regression analysis on antenatal care in Rural Philippines. The AOR provides an adjusted measure of the odds of receiving complete ANC for each sociodemographic variable category, controlling for potential confounders. Based on socioeconomic status, individuals from the poorer group were 1.560 times more likely than those from the poorest group to achieve complete ANC (AOR = 1.560, 95% CI [1.560, 1.561]). Middle-class women were 2.891 times more likely to utilize ANC than the poorest women (AOR = 2.891, 95% CI [2.890, 2.892]). Women with wealthier wealth were 3.172 times more likely to achieve ANC. Moreover, the richest women were 6.253 times more likely to achieve ANC than the poorest (AOR = 6.253, 95% CI [6.251, 6.256]).

Regarding age groups, women in the older age group had a greater chance of achieving complete ANC than women in the 15–19 age group (AOR = 8.853, 95% CI [8.843, 8.862]). Furthermore, women with higher education had a greater chance of completing ANC than

uneducated women (AOR = 3.722, 95% CI [3.715, 3.729]). On the other hand, married women had a higher likelihood of completing ANC than never-married women (AOR = 2.391, 95% CI [2.390, 2.393]). Meanwhile, employed women were 1.127 times more likely than unemployed women to complete ANC (AOR = 1.127, 95% CI [1.126, 1.127]). Lastly, primiparous mothers had a greater chance of completing ANC than grand multiparous mothers (AOR = 1.814, 95% CI [1.813, 1.815]).

Discussion

The result of this study revealed that socioeconomic status was significantly associated with complete antenatal care in rural Philippines. Wealthier women were more likely to achieve complete ANC than poorer women in the rural Philippines. Women from higher socioeconomic status in the Philippines tend to be able to obtain complete ANC due to easy access to health facilities, such as transportation, and having emergency funds (Sande, 2022). A study in Mindanao and Luzon, Philippines, also found that wealthier women had higher access to healthcare services due to their higher educational status compared to poorer women (Quintos, 2017).

This study also found that women from poor socioeconomic backgrounds have a lower chance of utilizing adequate antenatal care services. Poor socioeconomic factors limited mothers' utilization of antenatal care services. Women from lower economic backgrounds faced barriers in accessing antenatal care due to expenses related to transportation, distance to healthcare facilities, and educational disparities compared to women from higher-income households (Ahissou et al., 2023). Studies in Indonesia, the Philippines, Cambodia, and Myanmar also found that poor women in rural areas are more likely to experience inadequate antenatal care services due to financial constraints (Arsyi et al., 2022). Additionally, lower levels of motivation and knowledge among pregnant women with low economic status have contributed to fewer antenatal care visits in rural areas (Amit et al., 2022). Limited improvement in pro-poor services also contributes to inequality in the use of maternal-child health services in rural areas (Hodge et al., 2016).

Based on maternal age, this study showed that in the rural Philippines, older mothers are more likely to achieve complete ANC than younger mothers (Senewe et al., 2025). This can be attributed to greater awareness, increased access to resources, and social and familial support. They may also better understand the importance of antenatal care and be more proactive in seeking and completing antenatal care visits. This finding is further supported by another study encompassing 105 countries, including the Philippines, which corroborates this trend by confirming that adolescent mothers consistently experience poorer coverage of at least four ANC visits compared to adult mothers (Li et al., 2020).

Marital status also influences mothers' decisions to undertake ANC at health facilities. The findings of this study indicate that married mothers in the Philippines tend to have higher ANC utilization rates than divorced, widowed, or unmarried mothers. Social support and family structure can significantly influence a woman's access to and utilization of ANC services. Conversely, the lower rates observed in unmarried, divorced, or widowed mothers suggest a lack of consistent spousal support, which can play a crucial role in facilitating access to antenatal care (Laksono et al., 2020; Paul, 2022).

Regarding education and employment, this study found that education status and employment also influence the extent of antenatal care received. Higher levels of education are positively correlated with the completion of antenatal care. Educated women often emphasize the importance of antenatal care and have greater access to information and resources (Idris & Sari, 2023; Matemanosak & Suwanrath, 2021). Additionally, according to the results, employed women are more likely than unemployed women to achieve completed ANC. A possible explanation for this difference is that working women may have more economic resources, allowing them to access and participate in ANC services. Women are economically dependent on their husbands and do not engage in any work, creating a financial barrier to accessing ANC (Gamberini et al., 2022). Working women may have easier access to health facilities because they may have health insurance through employment or have greater financial resources. Health insurance coverage is a positive factor for working women to have four or more ANC visits (Denny et al., 2022).

Based on parity, this study showed that mothers with fewer children were more likely to complete ANC in the rural Philippines than those with many children. Mothers with fewer children are more likely to utilize antenatal care because those in their first pregnancy are generally more cautious, leading to more frequent use of antenatal services. Meanwhile, mothers with more children may feel more confident, depending on their previous pregnancy experiences, and are less likely to prioritize ANC visits (Trisnawati et al., 2020). These results are in line with an earlier study that stated being multiparous and having no history of high-risk pregnancy were statistically associated with inadequate antenatal care (ANC) attendance (Soeung et al., 2020; Suvanwanich, 2020).

Furthermore, there has been an approach to decrease maternal mortality in the Philippines through the Basic Emergency Obstetric and Newborn Care (BEmONC) pregnancy (Department of Health, 2022). However, this policy did not appear to be sufficient to achieve the Sustainable Development Goals (SDGs) target. The provision of BEmONC services may have increased facility-based deliveries and skilled birth attendance; however, this has not led to a decrease in maternal mortality (Cagayan et al., 2022). Capacity building in rural and impoverished areas, along with the alignment of national and local policies, is needed. Addressing social determinants, such as income and social protection, is also crucial to building an efficient healthcare system that delivers maternal health services (Nisperos et al., 2022).

Even if the national government creates programs to address the needs of pregnant women and mothers, there are still barriers affecting the utilization of these programs and services. Lack of financial resources, inadequate facilities for providing laboratory tests, immunizations, and free medicines, and the unavailability of skilled health workers hinder patients from accessing decent healthcare services (Cagayan et al., 2022).

Strengths and limitations

The strength of this study lies in the use of comprehensive data from the Philippines National Demographic Health Survey. Therefore, this study can provide a thorough understanding of the relationship between socioeconomic status and the utilization of antenatal care in rural Philippines. Conversely, the analysis relied on secondary data, with variables restricted by data availability. As a result, certain factors, such as family support or dietary taboos during pregnancy, which have been explored in prior studies, were not examined in this research.

Conclusion

Our findings underscore the significant influence of socioeconomic status on ANC completion. There is a strong positive correlation between wealth quintile and ANC completion. The wealthiest women have over six times the odds of adequate ANC compared to the poorest. We also found that other sociodemographic factors, such as older age, higher education, and marriage, were associated with higher ANC completion rates. While employment status showed a modest positive association, primiparous women were more likely to complete ANC than grand multiparous women. These findings highlight the interplay between socioeconomic and demographic factors influencing the use of essential maternal healthcare services.

To address these disparities, we recommend strengthening targeted interventions for economically vulnerable women, developing age-specific health education programs, promoting female education, enhancing support systems for unmarried pregnant women, conducting further research on the lower ANC completion rates among grand multiparous women, and integrating maternal health initiatives within employment settings. These multifaceted strategies are crucial for improving maternal health outcomes and ensuring equitable access to essential ANC services.

Acknowledgments

The author acknowledges the Philippine Ministry of Health for granting permission to analyze the 2022 Philippines National Demographic and Health Survey (NDHS) data.

References

Ahissou, N. C. A., Nonaka, D., Takeuchi, R., de los Reyes, C., Uehara, M., Khampheng, P., Kounnavong, S., & Kobayashi, J. (2023). Trend of sociodemographic and economic inequalities in the use of maternal health services in the Lao People's Democratic Republic from 2006 to 2017: MICS data analysis. *Tropical Medicine and Health*, *51*(1), Article 56. https://doi.org/10.1186/s41182-023-00548-2

Amit, A. M. L., Pepito, V. C. F., De los Reyes, S. J., Tang, C. S., Aliazas, N. A. K., & Sumpaico-Tanchanco, L. (2022). Prevalence and determinants of home delivery in urban and rural Philippines: Evidence from the 2017 National Demographic and Health Survey. *Women's Health*, *18*. https://doi.org/10.1177/17455057221117957

Anik, A. I., Islam, M. R., & Rahman, M. S. (2021). Do women's empowerment and socioeconomic status predict the adequacy of antenatal care? A cross-sectional study in five South Asian countries. *BMJ Open*, *11*(6), Article e043940. https://doi.org/10.1136/bmjopen-2020-043940

Arsyi, M., Besral, B., Herdayati, M., & Phalkey, R. (2022). Antenatal care services and incidence of low birth weight: A comparison of Demographic and Health Surveys in 4 ASEAN Countries. *Journal of Preventive Medicine and Public Health*, *55*(6), 559–567. https://doi.org/10.3961/jpmph.22.316

Bhusal, U. P. (2021). Predictors of wealth-related inequality in institutional delivery: A decomposition analysis using Nepal Multiple Indicator Cluster Survey (MICS) 2019. *BMC Public Health*, *21*(1), Article 2246. https://doi.org/10.1186/s12889-021-12287-2

Cagayan, M. S. F. S., Nisperos, G. A., Facun, G. M. G., Cagayan, B. S. S., Castro, M. C. R., & Silverio, C. E. (2022). Mothers' perspectives on utilization of maternal health services in rural health units

in Luzon: A qualitative study. *Acta Medica Philippina, 56*(16), 56–63. https://doi.org/10.47895/amp.v56i16.5761

Denny, H. M., Laksono, A. D., Matahari, R., & Kurniawan, B. (2022). The determinants of four or more antenatal care visits among working women in Indonesia. *Asia Pacific Journal of Public Health*, *34*(1), 51–56. https://doi.org/10.1177/10105395211051237

Department of Health (DOH). (2022). *Safe motherhood program*. Department of Health, Republic of the Philippines. https://doh.gov.ph/uhc/health-programs/safe-motherhood-program

Gamberini, C., Angeli, F., & Ambrosino, E. (2022). Exploring solutions to improve antenatal care in resource-limited settings: An expert consultation. *BMC Pregnancy and Childbirth*, *22*(1), Article 449. https://doi.org/10.1186/s12884-022-04778-w

Green, J. M., & Ottoson, L. W. (2005). *A framework for planning and evaluation: PRECEDE–PROCEED evolution and application of the model.* McGraw-Hill.

Herwansyah, H., Czabanowska, K., Kalaitzi, S. & Schröder-Bäck, P. (2022). The utilization of maternal health services at primary healthcare settings in Southeast Asian Countries: A systematic review of the literature. *Sexual & Reproductive Healthcare*, *32*, Article 100726. https://doi.org/10.1016/J.SRHC.2022.100726

Hodge, A., Firth, S., Bermejo, R., Zeck, W., & Jimenez-Soto, E. (2016). Utilisation of health services and the poor: Deconstructing wealth-based differences in facility-based delivery in the Philippines. *BMC Public Health, 16*, Article 523. https://doi.org/10.1186/s12889-016-3148-0

Idris, H. & Sari, I. (2023). Factors associated with the completion of antenatal care in Indonesia: A cross-sectional data analysis based on the 2018 Indonesian Basic Health Survey. *Belitung Nursing Journal*, *9*(1), 79–85. https://doi.org/10.33546/bnj.2380

Jo, Y., Alland, K., Ali, H., Mehra, S., Lefevre, A. E., Pak, S., Shaikh, S., Christian, P., & Labrique, A. B. (2019). Antenatal care in rural Bangladesh: Current state of costs, content, and recommendations for effective service delivery. *BMC Health Services Research*, *19*(1), Article 861. https://doi.org/10.1186/s12913-019-4696-7

Laksono, A. D., Rukmini, R. & Wulandari, R. D. (2020). Regional disparities in antenatal care utilization in Indonesia. *PLOS ONE*, *15*(2), Article e0224006. https://doi.org/10.1371/journal.pone.0224006

Li, Z., Patton, G., Sabet, F., Subramanian, S. V., & Lu, C. (2020). Maternal healthcare coverage for first pregnancies in adolescent girls: A systematic comparison with adult mothers in household surveys across 105 countries, 2000-2019. *BMJ Global Health*, *5*(10), Article e002373. https://doi.org/10.1136/bmjgh-2020-002373

Matemanosak, P. & Suwanrath, C. (2021). Knowledge and attitudes of pregnant Thai women regarding modes of birth: A hospital-based study in Southern Thailand. *The Open Public Health Journal*, *14*(1), 484–491. https://doi.org/10.2174/1874944502114010484

Nisperos, G. A., Castro, M. C. R., Balahadia-Mortel, A. P. A., Gavino, C. G., & Cagayan, M. S. F. S. (2022). The development of basic emergency obstetric and newborn care (BEmONC) and maternal health in the Philippines: A historical literature review. *Acta Medica Philippina, 56*(16), 64–71. https://doi.org/10.47895/amp.v56i16.5614

Paredes, K. P. P. (2016). Inequality in the use of maternal and child health services in the Philippines: Do pro-poor health policies result in more equitable use of services? *International Journal for Equity in Health*, *15*(1), Article 181. https://doi.org/10.1186/s12939-016-0473-y

Paul, P. L. (2022). Male partners' role in maternal health service utilization: a secondary analysis using 2015-16 National Family Health Survey (NFHS) data. *Midwifery*, *113*, Article 103423. https://doi.org/10.1016/j.midw.2022.103423

Perez, A., Pagatpatan, C., & Ramirez, C. M. (2020). Incentivizing (and disincentivizing) mothers to utilize maternal health services: A focus group study. *Philippine Journal of Nursing, 90*(1), 27–36. http://www.pna-pjn.com/1396-2/

Philippine Statistics Authority (PSA), & ICF. (2023, June). *2022 Philippine National Demographic and Health Survey (NDHS): Final report.* https://www.dhsprogram.com/pubs/pdf/FR381/FR381.pdf

Quintos, M. A. M. (2017). Regional differences in maternal mortality in the Philippines. *Asia Pacific Journal of Education, Arts and Sciences, 4*(1), 1–14. http://www.apjeas.apjmr.com

Sakib, M. M. H., Alam, M. K., Yasmin, N. & Rois, R. (2025). Unveiling the sociodemographic and socioeconomic determinants of antenatal care utilization in Bangladesh: insights from the 2017–

18 BDHS. *Journal of Health, Population and Nutrition*, *44*(1), Article 159. https://doi.org/10.1186/s41043-025-00839-w

Sande, M. J. B. (2022). Antenatal care utilization of mothers in selected cities in Bicol Region: A quantitative study. *Acta Medica Philippina, 56*(16), 19–26. https://doi.org/10.47895/amp.v56i16.5593

Saurman, E. (2016). Improving access: Modifying Penchansky and Thomas's Theory of Access. *Journal of Health Services Research and Policy*, *21*(1), 36–39. https://doi.org/10.1177/1355819615600001

Senewe, F. P., Laksono, A. D., Massie, R. G. A., Latifah, L., Nuraini, S., Agustiya, R. I., Propiana, J. K., & Nugraheni, W. P. (2025). Institutional delivery in the Philippines: Does a minimum of 8 antenatal care visits matter? *Journal of Preventive Medicine and Public Health, 58*(1), 44–53. https://doi.org/10.3961/jpmph.24.245

Setyowati, D., Nurrahmania, A. P., Ummah, N. I., Prasasti, A. R., Aditya, C., Rahmi, Z. A., Apriliani, R. R., Hemadi, A. S., Kamila, N. N., & Ulhaq, A. D. (2024). Behavior of pregnant women to improve oral health knowledge during pregnancy according to Lawrence Green's theory in Pakis Public Health Service Area. *Indonesian Journal of Dental Medicine*, *7*(1), 20–24. https://doi.org/10.20473/ijdm.v7i1.2024.20-24

Siy Van, V. T., Uy, J., Bagas, J., & Ulep, V. G. T. (2021). Trends in national-level governance and implementation of the Philippines' Responsible Parenthood and Reproductive Health Law from 2014 to 2020. *Global Health Science and Practice*, *9*(3), 548–564. https://doi.org/10.9745/GHSP-D-21-00184

Soeung, K., Loahasiriwong, W. & Sornlom, K. (2020). View of socioeconomic disparities, pregnancy factors, and inadequate antenatal care utilization in rural Cambodia. *Indian Journal of Public Health Research & Development*, *11*(7), 1520–1525. https://medicopublication.com/index.php/ijphrd/article/view/10311/9655

Suvanwanich, M. (2020). Factors associated with inadequate antenatal care of pregnant women delivered in Ratchaburi Hospital. *Medical Journal Region 4-5*, *39*(4), 648–654. https://share.google/2kxu7J8hWHNOswD4X

Trisnawati, R. E., Weraman, P. & Manongga, S. P. (2020). Determinant factors of visiting antenatal care among pregnant mothers in Dictor Public Health Center, Manggarai Regency. *International Journal of Nursing and Health Services (IJNHS)*, *4*(1), 42–51. https://doi.org/10.35654/ijnhs.v4i1.381

World Health Organization (WHO). (2018). *WHO recommendations on antenatal care for a positive pregnancy experience: Summary.* https://www.who.int/publications/i/item/9789241550468

Wulandari, R. D., Laksono, A. D., & Matahari, R. (2022). Does husband's education level matter to antenatal care visits? A study on poor households in Indonesia. *Indian Journal of Community Medicine, 47*(2), 263–267. https://doi.org/10.4103/ijcm.ijcm_981_21

Wulandari, R. D., Laksono, A. D., & Rohmah, N. (2021). Urban-rural disparities of antenatal care in South East Asia: A case study in the Philippines and Indonesia. *BMC Public Health, 21*(1), Article 1221. https://doi.org/10.1186/s12889-021-11318-2