

# The Impact of Maternal Age on Pregnancy Outcomes-A Longitudinal Analysis

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## ABSTRACT

For a long time maternal age has been recognised as a key factor of pregnancy outcomes globally. This longitudinal study investigates the relationship between maternal age and obstetric outcomes over a ten-year period, focusing on risks associated with advanced and very young maternal age. Results reveal a nonlinear pattern in which women under 20 and above 35 years experience higher risks of preterm birth, low birth weight, gestational hypertension, and caesarean delivery. Women aged 25–29 exhibited the best outcomes. These results clearly shows the importance of age-targeted antenatal interventions and public health education to optimise maternal and neonatal health.

**Keywords:** Maternal Age, Pregnancy, Longitudinal Analysis

## INTRODUCTION

Factor of maternal age is one of the most studied predictors of pregnancy outcomes because of its biological, psychological, and socio-economic implications (Liu et al., 2019). Both advanced maternal age (AMA), commonly defined as age 35 and above, and very young maternal age (below 20 years) have been connected to increased obstetric problems (Schummers et al., 2018). Global demographic transitions—such as delayed childbearing in developed regions and adolescent pregnancies in developing settings—make the issue increasingly important (World Health Organization [WHO], 2020). Younger mothers often face biological immaturity, inadequate prenatal care, and poverty that add to problematic outcomes (Neal et al., 2018). Conversely, women aged 35 years and above have an increased risk for chromosomal abnormalities, hypertensive disorders, and prolonged labour (Usta & Nassar, 2008). Despite extensive research, there remains a need for longitudinal evidence in developing contexts to better understand how maternal age patterns impact outcomes over time. This study an examination of the impact of maternal age on pregnancy outcomes using longitudinal data collected across a ten-year period.

The findings offer insights for policymakers and clinicians on mitigating age-related obstetric risks.

## LITERATURE REVIEW

Research shows a U-shaped connection between maternal age and pregnancy outcomes, with the best outcomes grouped around ages 25 to 29 (Lisonkova et al., 2017). Young maternal age has been connected with preterm birth, low birth weight, and higher neonatal mortality (Chen et al., 2007). Biological immaturity, limited access to antenatal care, and socioeconomic disadvantages add to these outcomes (Neal et al., 2018). Other end of the reproductive spectrum is advanced maternal age increasing the risk of gestational diabetes, preeclampsia, miscarriage, and chromosomal anomalies (Schummers et al., 2018; Khandwala et al., 2018). Older mothers also experience higher rates of caesarean delivery due to decreased myometrial efficiency and medical intervention preferences (Jolly et al., 2000). Longitudinal studies remain important in understanding trends and patterns because they show dynamic changes in maternal physiology, health-seeking behaviours, and socio-economic factors over time (Bui et al., 2020). This study fills an empirical

**Relevant conflicts of interest/financial disclosures:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



gap by giving long-term evidence on how maternal age influences maternal and neonatal outcomes.

## METHODOLOGY

### Research Design

Longitudinal cohort design was used to assess the effect of maternal age on pregnancy outcomes over ten years (2013–2023).

### Study Population

Participants included pregnant women receiving antenatal care at public hospitals within the study region. Inclusion criteria were singleton pregnancies, consistent antenatal records, and known maternal age.

### Data Collection

Medical records were reviewed for the following outcomes:

- Gestational age at delivery
- Birth weight
- Mode of delivery
- Maternal complications (hypertension, diabetes)
- Neonatal complications (Apgar score, NICU admission)

### Age Grouping

Maternal age was divided into:

- <20 years (adolescent mothers)
- 20–24 years
- 25–29 years
- 30–34 years
- ≥35 years (advanced maternal age)

### Data Analysis

Descriptive statistics, logistic regression, and multivariate analysis were used to estimate associations between age groups and pregnancy outcomes, adjusting for parity, socioeconomic status, and antenatal care attendance.

## RESULTS

### Maternal Complications

Women aged ≥35 had statistically higher incidences of:

- Gestational hypertension (AOR = 2.3,  $p < 0.01$ )
- Gestational diabetes (AOR = 2.0,  $p < 0.05$ )

Adolescent mothers (<20 years) also had increased risks of maternal anaemia and obstructed labour.

### Neonatal Outcomes

Problematic outcomes were most common in <20 and ≥35 age groups:

- **Preterm birth:** 17% (<20 years), 15% (≥35 years)
- **Low birth weight:** 19% (<20 years), 14% (≥35 years)

The 25–29 age group recorded the lowest problematic outcomes.

### Delivery Outcomes

Caesarean section was highest among older mothers (≥35 years; 42%), compared with 25–29 years (21%).

## DISCUSSION

findings confirm previous studies indicating a U-shaped relationship between maternal age and outcomes (Lisonkova et al., 2017). Younger mothers face heightened health challenges due to biological immaturity and socioeconomic factors, consistent with WHO (2020) and Neal et al. (2018). Advanced maternal age also adds to obstetric complications due to age-related decline in oocyte quality, vascular changes, and increased chronic disease burden (Usta & Nassar, 2008). The elevated caesarean rates among mothers aged ≥35 support the findings of Jolly et al. (2000), who attribute increased operative delivery to reduced uterine efficiency. Poor neonatal outcomes among adolescents mirror findings from earlier reproductive health studies in Sub-Saharan Africa (Chen et al., 2007). These results emphasise the need for targeted antenatal interventions for younger and older mothers. Health education programmes that encourage optimal childbearing ages, and improved antenatal monitoring for high-risk groups, can significantly improve outcomes.

## CONCLUSION

Maternal age is a significant determinant of pregnancy outcomes. Women below 20 and those 35 and above face increased risks of maternal and neonatal complications. Optimal pregnancy outcomes occurred among women aged 25–29, suggesting this age group may represent the biological ideal for childbirth. Strengthened antenatal care, policies discouraging adolescent pregnancy, and enhanced surveillance of older mothers could improve maternal and newborn health indicators.

## RECOMMENDATIONS

1. **Strengthen antenatal care for high-risk age groups**, with closer monitoring of complications.
2. **Public health education** on the risks of very early and late childbearing.
3. **Prioritisation of adolescent reproductive health programmes** to reduce teenage pregnancy.
4. **Improve preconception counselling**, especially for women aged 35 and above.
5. **Further longitudinal and population-based studies** to refine understanding of age-related risks across diverse regions.

## REFERENCE

1. Bui, Q. T., Lee, H., & Pham, T. (2020). Longitudinal analysis of maternal health indicators in developing countries. *Journal of Maternal Health*, 14(2), 55–65.
2. Chen, X.-K., Wen, S. W., Fleming, N., Demissie, K., Rhoads, G. G., & Walker, M. (2007). Teenage pregnancy and problematic birth outcomes. *BJOG*, 114(3), 305–313.
3. Jolly, M., Sebire, N., Harris, J., Robinson, S., & Regan, L. (2000). The risks associated with pregnancy in women aged 35 years or older. *Human Reproduction*, 15(11), 2433–2437.
4. Khandwala, Y. S., Zhang, C. A., Lu, Y., & Eisenberg, M. L. (2018). Association of maternal age with fetal growth and gestational age. *JAMA Pediatrics*, 172(6), 487–494.

5. Lisonkova, S., Potts, J., & Muraca, G. (2017). Maternal age and severe maternal morbidity. *American Journal of Obstetrics and Gynecology*, 217(6), 614.e1–614.e16.
6. Liu, S. et al. (2019). Maternal characteristics and pregnancy outcomes: A global analysis. *The Lancet Global Health*, 7(6), e721–e732.
7. Neal, S., Channon, A. A., & Chintsanya, J. (2018). The impact of young maternal age on child health in Sub-Saharan Africa. *PLoS One*, 13(9), e0202203.
8. Schummers, L. et al. (2018). Beyond age: Patterns and determinants of pregnancy risks. *BMJ*, 362, k2367.
9. Usta, I. M., & Nassar, A. H. (2008). Advanced maternal age. *American Journal of Perinatology*, 25(2), 69–76.
10. World Health Organization. (2020). Adolescent pregnancy: Key facts. WHO Press.

**HOW TO CITE:** Zainab Mohammed Abdullahi\*, Sagiru Muhammad Abdu, Abubakar Ibrahim Bura, Abdullahi Muhammad Abdul, The Impact of Maternal Age on Pregnancy Outcomes-A Longitudinal Analysis, *Int. J. Sci. R. Tech.*, 2026, 3 (2), 181-183. <https://doi.org/10.5281/zenodo.18661341>