

# Risk of Pregnancy Complications Also a Concern for Younger Patients

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*Abstract: Younger patients, not just older patients, face risks during their pregnancies that can also affect their babies.*

Starting at age 35, pregnancies are considered to be high risk due to advanced maternal age and can result in complications for both the patient and the baby.<sup>1</sup> Adolescent patients also face risks in pregnancy.<sup>2,3</sup> We reviewed 1.45 million live births for patients ages 13 to 45 between January 1, 2016 and June 1, 2021 and found that rates for some complications increase as patients get older while rates for other complications are higher for both younger and older patients.

Rates of venous placental abruption, thromboembolism (VTE) or pulmonary embolism, and cesarean section were lower in younger pregnant patients and higher in older patients, as shown in Figure 1. While placental abruption and VTE/pulmonary embolism rates were very low across all age groups, cesarean section rates increased by an average of about 1% with each additional year of patient age, reaching a rate of more than 40% for patients over age 42.

## Rates of Placental Abruption, VTE/Pulmonary Embolism, and Cesarean Section by Maternal Age

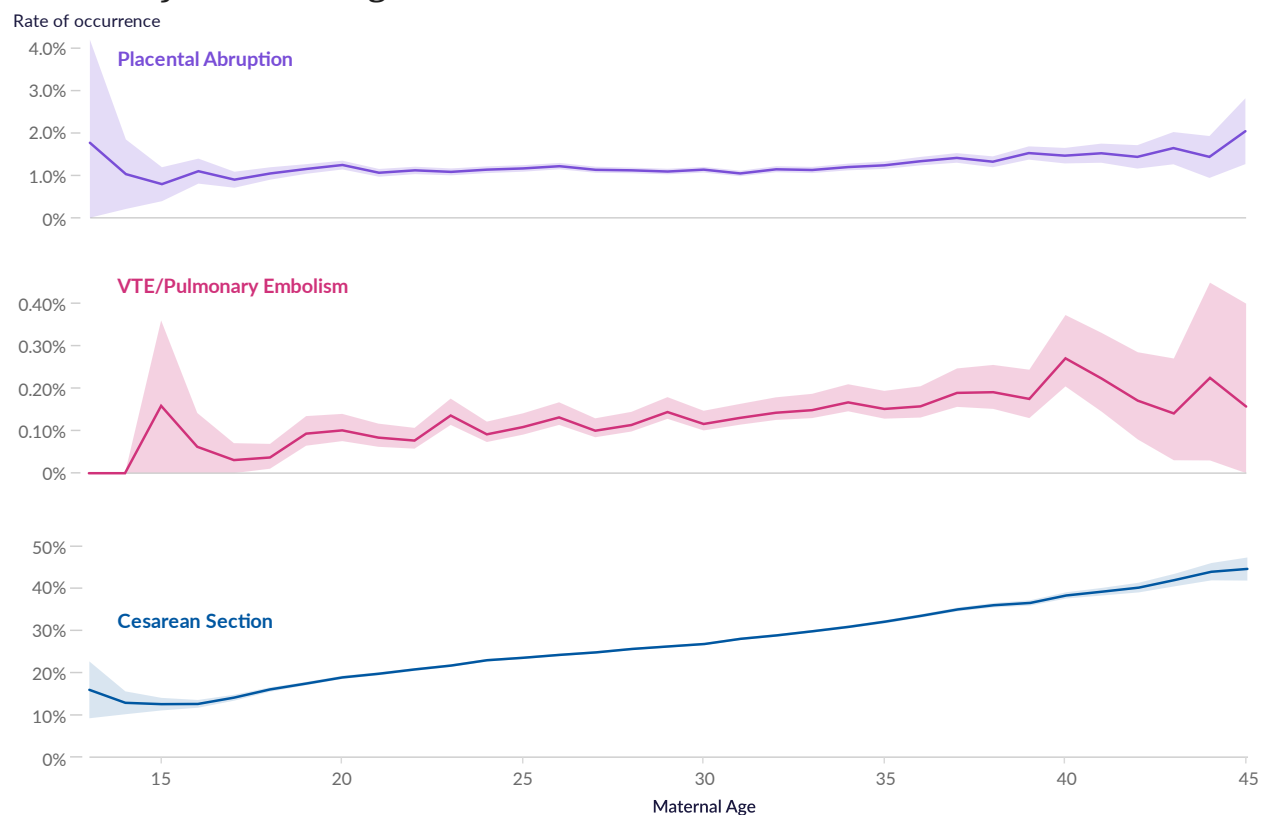


Figure 1. Percentage of pregnancies by maternal age where the pregnant patient experienced placental abruption or VTE/pulmonary embolism, and percentage of births by maternal age delivered by cesarean section. The shaded areas indicate the 95% confidence interval.

We continued to evaluate additional complication rates by maternal age for gestational hypertension, preterm delivery, low birth weight, and postpartum hemorrhage. We found rates for this subset of complications were higher for pregnant patients 21 and younger or 35 and older. For older patients, the rates begin to increase in the early 30s. We did not differentiate between first and subsequent pregnancies and deliveries in this investigation.

## Rates of Occurrence by Age for Gestational Hypertension, Preterm Delivery, Low Birth Weight, and Postpartum Hemorrhage

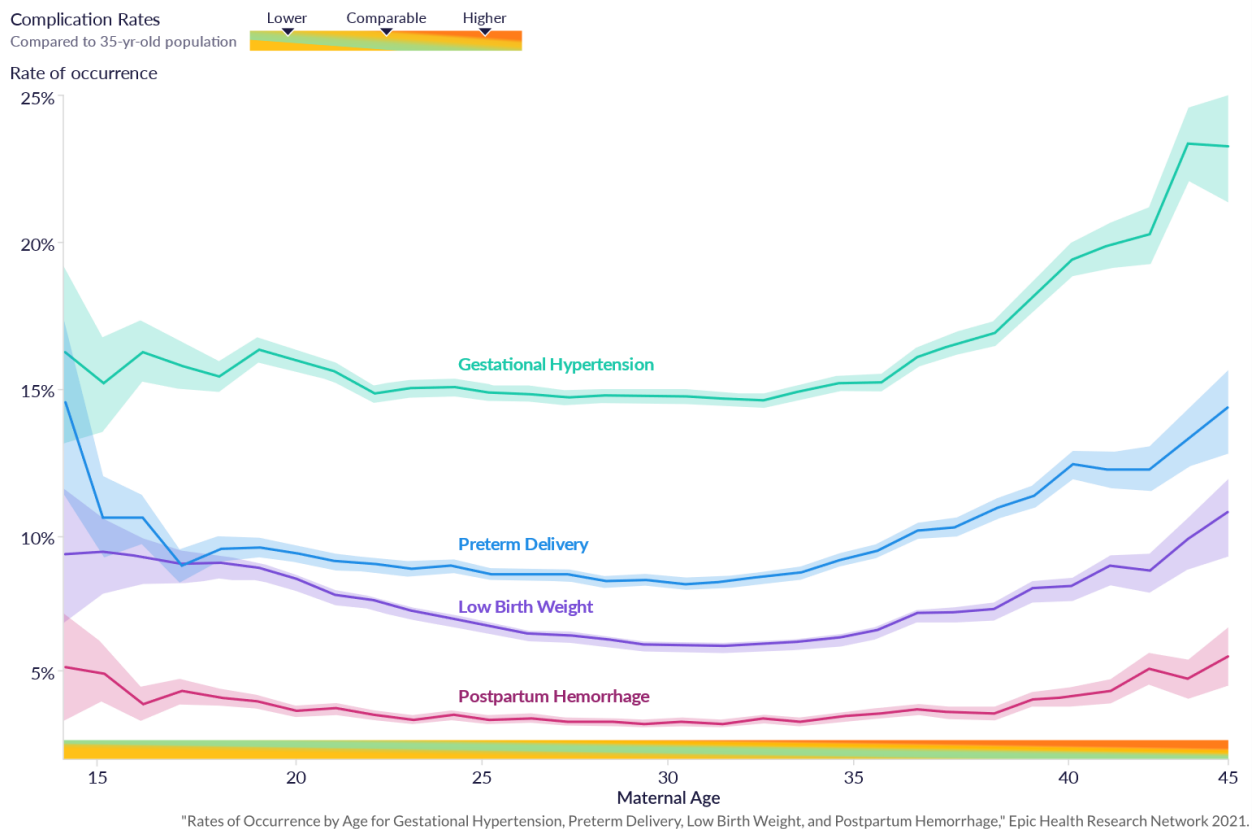


Figure 2. Rates of gestational hypertension, preterm delivery, low birth weight, and postpartum hemorrhage by maternal age. The shaded areas indicate the 95% confidence interval.

While our findings show the greatest rate of complication after age 35, we also found that pregnant patients 21 or younger show increased rates of certain complications, such as preterm delivery.

*These data come from Cosmos, a HIPAA-defined Limited Data Set of more than 120 million patients from 141 Epic organizations including 832 hospitals and 13,421 clinics, serving patients in all 50 states. This study was completed by two teams, each composed of a clinician and research scientists who worked independently. The two teams came to similar conclusions.*

## References

1. Lean SC, Derricott H, Jones RL, Heazell AEP. Advanced maternal age and adverse pregnancy outcomes: A systematic review and meta-analysis. *PLoS One*. 2017;12(10):e0186287. Published 2017 Oct 17. doi:10.1371/journal.pone.0186287
2. Kawakita T, Wilson K, Grantz K, Landy H, Huang C-C, Gomez-Lobo V. Adverse maternal and neonatal outcomes in adolescent pregnancy. *Journal of Pediatric and Adolescent Gynecology*. 2015;29(2):130-136. doi:10.1016/j.jpjag.2015.08.006
3. Adolescent pregnancy. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/adolescent-pregnancy>. Published January 31, 2020. Accessed October 4, 2021.

## Data Definitions

Term	Definition
<b>Preterm Delivery</b>	A birth with a gestational age less than 259 days.
<b>Cesarean Section</b>	A birth with a delivery method containing the text “cesarean.” We did not differentiate between elective and emergent procedures.
<b>Low Birth Weight</b>	A birth with a weight less than 2,500 grams.
<b>Venous Thromboembolism (VTE) or Pulmonary Embolism</b>	A diagnosis documented as an encounter diagnosis, final billing diagnosis, or problem list entry on the delivery admission that was mapped to one or more of the following ICD-10-CM codes: I82, I82.290, I82.401, I82.402, I82.403, I82.409, I82.411, I82.412, I82.413, I82.419, I82.421, I82.422, I82.423, I82.429, I82.431, I82.432, I82.433, I82.439, I82.441, I82.442, I82.443, I82.449, I82.451, I82.452, I82.453, I82.459, I82.461, I82.462, I82.463, I82.469, I82.491, I82.492, I82.493, I82.499, I82.4Y1, I82.4Y2, I82.4Y3, I82.4Y9, I82.4Z1, I82.4Z2, I82.4Z3, I82.4Z9, I82.501, I82.502, I82.503, I82.509, I82.51, I82.511, I82.512, I82.513, I82.519, I82.521, I82.522, I82.523, I82.529, I82.53, I82.531, I82.532, I82.533, I82.539, I82.54, I82.541, I82.542, I82.543, I82.549, I82.551, I82.552, I82.553, I82.559, I82.561, I82.562, I82.563, I82.569, I82.591, I82.592, I82.593, I82.599, I82.5Y1, I82.5Y2, I82.5Y3, I82.5Y9, I82.5Z1, I82.5Z2, I82.5Z3, I82.5Z9, I82.611, I82.612, I82.613, I82.619, I82.621, I82.622, I82.623, I82.629, I82.711, I82.712, I82.713, I82.719, I82.721, I82.722, I82.723, I82.729, I82.8, I82.89, I82.890, I82.90, I82.A1, I82.A11, I82.A12, I82.A13, I82.A19, I82.A29, I82.B1, I82.B11, I82.B12, I82.B13, I82.B19, I82.B19, I82.B21, I82.B22, I82.B23, I82.C1, I82.C11, I82.C12, I82.C13, I82.C19, I82.C21, I82.C22, I26, I26.0, I26.01, I26.02, I26.09, I26.9, I26.90, I26.92, I26.93, I26.94, I26.99, I27.82, O03.7, O88.211, O88.212, O88.213, O88.219, O88.22, O88.23, O88.3, O88.311, O88.312, O88.313, O88.319, O88.32, O88.33, O88.811, O88.812, O88.813, O88.819, O88.83

<b>Placental Abruption</b>	A diagnosis documented as an encounter diagnosis, final billing diagnosis, or problem list entry on the delivery admission that was mapped to one or more of the following ICD-10-CM codes: O45, O45.0, O45.001, O45.002, O45.003, O45.009, O45.01, O45.011, O45.012, O45.013, O45.019, O45.02, O45.021, O45.022, O45.023, O45.029, O45.09, O45.91, O45.92, O45.93, O45.99, O45.8, O45.8X, O45.8X1, O45.8X2, O45.8X3, O45.8X9, O45.9, O45.90, O45.91, O45.92, O45.93
<b>Gestational Hypertension</b>	A diagnosis documented as an encounter diagnosis, final billing diagnosis, or problem list entry on the delivery admission that was mapped to one or more of the following ICD-10-CM codes: O13, O13.1, O13.2, O13.3, O13.4, O13.5, O13.9, O14, O14.0, O14.00, O14.02, O14.03, O14.1, O14.10, O14.12, O14.13, O14.2, O14.20, O14.22, O14.23, O14.24, O14.9, O14.90, O14.92, O14.93, O14.95, O16, O16.1, O16.2, O16.3, O16.9
<b>Postpartum Hemorrhage</b>	A diagnosis documented as an encounter diagnosis, final billing diagnosis, or problem list entry on the delivery admission that was mapped to one or more of the following ICD-10-CM codes: O72, O72.1, O72.2, O72.3