

Study reveals that night and weekend births have substantially higher risk of delivery complications

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As if expecting mothers didn't have enough to worry about, a new study published in *Risk Analysis: An International Journal* found that the quantity of delivery complications in hospitals are substantially higher during nights, weekends and holidays, and in teaching hospitals.

Each year, nearly four million women give birth in U.S. hospitals, making childbirth the most common cause of hospitalization in this country. Serious but preventable complications occur at the point of [delivery](#), with approximately 700 women dying every year in the U.S. from preventable causes related to pregnancy and childbirth.

In the study, "Clinical capital and the risk of maternal labor and delivery complications: Hospital scheduling, timing and cohort turnover effects," Sammy Zahran, Colorado State University, David Mushinski, Colorado State University, Hsueh-Hsiang Li, Colorado State University, Ian Breunig, Abt Associates, Inc., and Sophie McKee, U.S. Department of Agriculture, analyzed more than two million cases from 2005 to 2010, using detailed data obtained from the Texas Department of State Health Services.

The study looked at labor or delivery complications including third- or fourth-degree perineal laceration, ruptured uterus, unplanned hysterectomy, admission to [intensive care unit](#) and unplanned operating room procedure following delivery. The research team focused only on

women with a single birth (i.e., not twins) who had gestation of more than 20 weeks, a delivery attended by a physician, and a normal labor onset.

Timing Matters

The study evaluated whether delivery complications (1) vary by work shift (day vs night), (2) increase as the hours pass within work shifts, and (3) increase on weekends (Friday evening to Monday morning) and holidays (Christmas, New Year's Eve and the Fourth of July).

The results suggest that:

- The odds of a mother experiencing a delivery complication are 21.3 percent higher during the night shift, and that the odds of a delivery complication increase 1.8 percent with every hour worked within a shift.
- A mother delivering an infant on a weekend is 8.6 percent more likely to encounter a complication than a mother delivering on a weekday.
- Births occurring on holidays are particularly susceptible to labor or delivery complications, with holiday births being 29.0 percent more likely to have a complication.

Location Matters: Teaching vs. Non-teaching Hospitals

The study also explored whether delivery complication rates are higher in [teaching hospitals](#), and whether they increase when a new cohort of residents enter teaching hospitals in July, causing abrupt declines in physician experience and coordination between members of the healthcare team.

- Mothers delivering their infants in teaching hospitals are 2.2 times more likely to experience a delivery complication than [mothers](#) birthing at non-teaching hospitals.
- The risk also increases by a multiplicative factor of 1.3 at teaching hospitals in July, when new residents join the staff rotation. By June, after a full year of training and integration, the risk of a delivery [complication](#) at these same hospitals is statistically indistinguishable from chance.

"Across an ensemble of hospital situations where clinical quality is known to vary independently of patient characteristics and volume, we see corresponding variation in the risk of preventable harm to expectant mothers," states Zahran, an associate professor of demography at Colorado State University.

Obstetric care in [hospital](#) settings is a team effort and ineffective teamwork has been implicated in an estimated 75 percent of preventable medical errors. The researchers hypothesize that hospitals could decrease the risk of harm to mothers by putting more emphasis on scheduling inexperienced physicians with more senior health professionals, among other things.

More information: Sammy Zahran et al, Clinical Capital and the Risk of Maternal Labor and Delivery Complications: Hospital Scheduling, Timing, and Cohort Turnover Effects, *Risk Analysis* (2019). [DOI: 10.1111/risa.13273](https://doi.org/10.1111/risa.13273)

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