The incidence and predictability of high-risk maternal conditions
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Objective: The Levels of Maternal Care were established to facilitate regionalization and risk appropriate care of maternal conditions. The objective of this study was to understand the incidence and predictability of high-risk conditions among women delivering in diverse hospital settings within a single health system.

Methods: This retrospective cohort study examined women delivering over a three-year time period from 7 hospitals within a single health system. Conditions considered to be appropriate for Level III and IV hospitals, per the Levels of Maternal Care guidelines, were identified using ICD-10 codes from the delivery admission. All those identified at the Level I-III centers and a random 33% sample from the two Level IV centers were reviewed. Chart review was performed to confirm the accuracy of the ICD-10 code as well as to determine when the high-risk condition was diagnosed and if consultations or referrals preceded the delivery admission.

Findings: Over the study period, there were 46,138 deliveries. The annual hospital delivery volume ranged from 128 to 6,114. 457 women (99.1 per 10,000) had a diagnosis code for conditions appropriate for a Level III center, and 41 (8.9 per 10,000) for a Level IV center. Nearly all delivered at corresponding Level III or IV center (94.6%). Conditions were confirmed in 217 (91.6%) of the 237 with diagnosis codes for high-risk conditions, of which 85.7% were diagnosed prior to the delivery admission. Of those diagnosed before delivery, 96.7% (178/186) delivered at a Level III/IV center or had a prenatal MFM consultation. Of those not diagnosed before delivery, the majority 18/31 (58%) were placenta accreta spectrum disorders.

Conclusion: Maternal conditions requiring Level III or IV maternal care occur rarely, and the vast majority within our health system are diagnosed before delivery and deliver at a hospital with the level of services recommended based on the Levels of Maternal Care. These findings can help inform hospitals and health systems in understanding and implementing regionalization plans to optimize risk appropriate maternal care.

Figure 1: Incidence of high-risk conditions identified by diagnosis codes, overall and stratified by Levels of Maternal Care
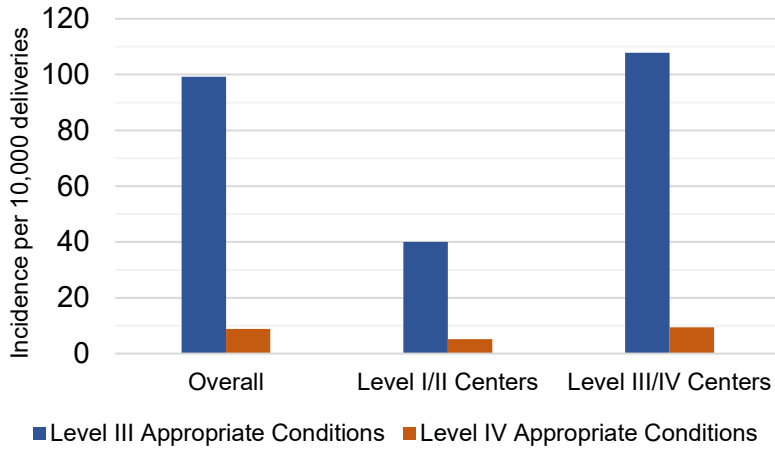
Level III Appropriate Conditions: moderate cardiac disease, previa with prior cesarean delivery, placenta accreta, acute respiratory distress syndrome, coagulation disorders, sickle cell disease, systemic lupus erythematosus, and pre-eclampsia with severe features <34 weeks of gestation.

Level IV Appropriate Conditions: severe cardiac disease, pulmonary hypertension, cardiac or neurosurgery.

Figure 2: Timing of diagnosis of high-risk conditions, confirmed by chart review

Diagnosed during or after delivery

Diagnosed before delivery

Placenta accreta

Other
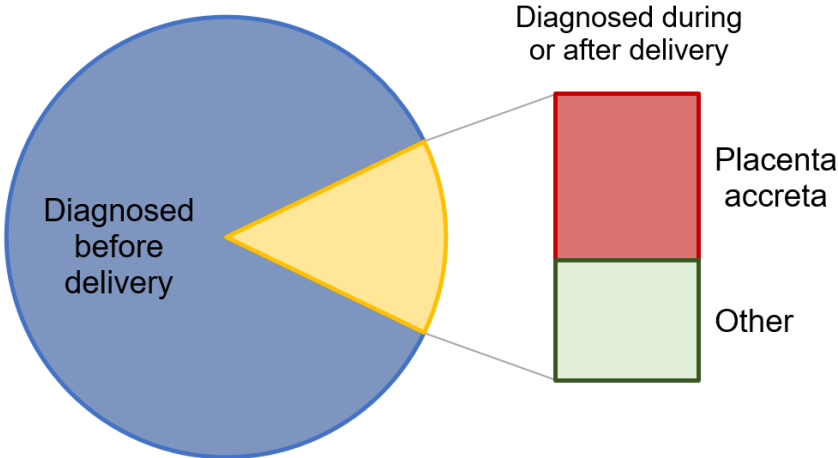
High-risk conditions confirmed in 217 of 237 chart-reviewed cases.