

## University Partnership Research Brief

“Trends in the incidence of gestational diabetes mellitus and hypertensive disorders of pregnancy and their associations with adverse pregnancy outcomes among the Louisiana Medicaid population”



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### WHAT IS KNOWN ABOUT THE TOPIC?

Gestational diabetes mellitus (GDM) is a common pregnancy complication, affecting approximately 8% of pregnancies in the U.S. Hypertensive disorders of pregnancy (HDP), which include a range of high blood pressure conditions, affect around 5%-13% of pregnancies in the U.S. Women with GDM or HDP are at increased risk for adverse pregnancy outcomes. The Medicaid population generally experiences poorer health and may have a higher prevalence of GDM and HDP. Therefore, assessing trends in the incidence of GDM and HDP, along with their associations with adverse pregnancy outcomes, is crucial for improving pregnancy outcomes within the Louisiana Medicaid population.

### WHAT DID THIS PROJECT DO?

This project has analyzed trends in the annual incidence of GDM and HDP among Louisiana Medicaid pregnant women from 2011 to 2020. It also examined whether maternal GDM or HDP was associated with increased risks of adverse pregnancy outcomes.

### INTRODUCTION AND BACKGROUND

Gestational diabetes mellitus (GDM) is a common pregnancy complication, affecting ~8% of pregnancies in the US.<sup>1</sup> It is estimated that the US health care cost associated with GDM is \$1.6 billion per year.<sup>2</sup> Hypertensive disorders of pregnancy (HDP) are a group of high blood pressure disorders in pregnancy that include preeclampsia, preeclampsia superimposed on chronic hypertension, gestational hypertension, and chronic hypertension. In the US, HDP affects about 5% to 13% of pregnancies.<sup>3</sup> Women with GDM or HDP are at increased risk for adverse pregnancy outcomes including cesarean delivery, preterm birth, and macrosomia. Moreover, mothers with GDM and HDP have an increased risk for cardiometabolic disorders in both mothers and their children later in life.

Louisiana ranks among the lead-states in prevalence of obesity, diabetes, cardiovascu-

lar disease (CVD), physical inactivity, and tobacco use.<sup>4</sup> Medicaid provides medical benefits to low-income individuals and families, and the Medicaid population generally has poor health. In Louisiana, over 1.4 million residents receive health care coverage through Medicaid, most of whom are children under 19. The prevalence of obesity, diabetes, and CVD is higher among the Louisiana Medicaid population.<sup>4</sup> However, the trend in the prevalence of GDM and HDP among Louisiana Medicaid pregnant women has not been investigated. Moreover, it is not known of the association of maternal GDM and HDP with adverse pregnancy outcomes among the Louisiana Medicaid population. Therefore, assessing trends in the incidence of GDM and HDP, along with their associations with adverse pregnancy outcomes, is crucial for improving pregnancy outcomes within the Louisiana Medicaid population.

### WHAT CAN MEDICAID DO WITH THIS INFORMATION?

Our findings, showing increases in the prevalences of GDM and HDP and their associations with higher risks of adverse pregnancy outcomes, will provide a strong rationale for targeted interventions aimed at improving pregnancy outcomes for women with these conditions.

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## PROJECT DESIGN AND METHODOLOGY

The overarching goal of this application was to assess the trends in the annual incidence of GDM and HDP from 2016 to 2021 among Louisiana Medicaid pregnant women, and also to examine whether maternal GDM or HDP was associated with increased risks of adverse pregnancy outcomes.

The present project used the most updated data from the Louisiana Medicaid dataset. Cohorts of pregnancies between January 1, 2016, and December 31, 2021, were identified from the database. A total of 111,936 women aged 18–50 during their first pregnancies, were included in the present project. The number of pregnancies and newborns, cases of GDM and HDP, and adverse pregnancy outcomes (cesarean section, preterm birth, macrosomia, small for gestational age, infant death, etc.) were identified by using the International Classification of Disease (ICD-9 and ICD-10) codes or procedure codes. Our specific aims were:

**Aim 1:** To assess the trends in the annual incidence of GDM and HDP among Louisiana Medicaid pregnant women.

**Aim 2:** To examine whether maternal GDM was associated with increased risks of adverse pregnancy outcomes.

**Aim 3:** To address whether maternal HDP was associated with increased risks of adverse pregnancy outcomes.

## RESULTS

A total of 111,936 first-time pregnant women were identified in our dataset from 2016 to 2021. The mean maternal age during pregnancy was  $26.1 \pm 5.0$  years, and it did not change significantly over the study period. The age-standardized prevalence of diabetes before pregnancy increased from 2.8% in 2016 to 3.4% in 2018 and decreased to 2.3% in 2021 ( $p$  for trend  $< 0.001$ ).<sup>5</sup> The age-standardized incidence of GDM increased from 10.2% in 2016 to 14.8% in 2020 and decreased to 14.0% in 2021 ( $p$  for trend  $< 0.001$ ). The age-standardized rate of HDP increased from 10.5% in 2016 to 17.7% in 2021 ( $P$  for trend  $< 0.001$ ).<sup>6</sup>

Women with GDM during pregnancy and women with diabetes before pregnancy were significantly associated with increased odds ratios for preterm birth (1.18 and 1.68, all  $P < 0.001$ ), primary caesarean section (1.36 and 2.26, all  $P < 0.001$ ), large for gestational age (1.42 and 3.05, all  $P < 0.001$ ), macrosomia (1.47 and 3.09, all  $P < 0.001$ ), neonatal hypoglycemia (13.1 and 23.7, all  $P < 0.001$ ), neonatal

jaundice (1.22 and 1.62, all  $P < 0.001$ ), and NRDS (1.33 and 3.07, all  $P < 0.001$ ), respectively, compared to women with normal glucose tolerance during pregnancy.

Maternal gestational hypertension, preeclampsia or eclampsia, and pre-existing hypertension were associated with higher risks of preterm birth, primary caesarean section, low birth weight, small for gestational age, large for gestational age, macrosomia, neonatal hypoglycemia, neonatal jaundice, and neonatal respiratory distress syndrome (all  $P < 0.05$ ), respectively, compared with women with normal blood pressure during pregnancy.

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## RESULTS, CONT.

neonatal respiratory distress syndrome (all  $P < 0.05$ ), respectively, compared with women with normal blood pressure during pregnancy.

	Years of first pregnancy						P values
	2016	2017	2018	2019*	2020*	2021	
No. of first-time pregnancies	21,018	18,985	18,059	20,547	15,484	17,843	
Incidence/prevalence (%)							
Diabetes before pregnancy	2.8	2.8	3.4	2.8	2.9	2.3	<0.001
Gestational diabetes mellitus	10.2	10.4	12.6	11.5	14.8	14.0	<0.001
Hypertensive disorders of pregnancy	10.5	12.4	15.3	16.1	17.0	17.7	<0.001

\*The 2019 dataset consisted of dates from 2019 until the COVID-19 pandemic in February 2020. The 2020 dataset consisted of dates from March 2020 until December 2020.

The odds ratios for the above adverse pregnancy outcomes were significantly higher during the early and late COVID-19 pandemic periods compared to those before the pandemic. Most of these associations during the early and late pandemic periods were consistent with those observed before the COVID-19 pandemic.

## CONCLUSIONS AND HEALTH POLICY IMPLICATIONS

The present study found that the incidence of GDM and HDP among women in the Louisiana Medicaid population increased from 2016 to 2020 or 2021. Maternal hyperglycemic and hypertensive disorders during pregnancy, compared to normal glucose or blood pressure levels, were associated with higher risks of adverse maternal and neonatal outcomes. The Louisiana Medicaid population generally experiences poor health and has a high prevalence of GDM and HDP. The results of this study provide important public health information regarding the incidence of GDM and HDP among pregnant women in the Louisiana Medicaid population, as well as insights into preventing adverse pregnancy outcomes in women with a history of GDM and HDP. The proposed interventions would target these women before pregnancy, during pregnancy, and postpartum, addressing the health of both mothers and their children.

## ACKNOWLEDGEMENTS

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