

Introduction

- Elevated blood pressure affects 10% of pregnancies worldwide, with nearly half of these cases developing preeclampsia.¹ Preeclampsia can emerge before women experience noticeable symptoms and may develop between prenatal visits.¹
- Hypertensive disorders in pregnancy (HDP) are a leading cause of maternal and fetal morbidity globally.¹
- The prevalence of HDP is increasing, particularly with the rising rates of cardiometabolic diseases among younger women and birthing individuals.²
- HDP can lead to serious **complications for both the pregnant person and the baby**, as well as increase the risk of subsequent cardiovascular disease.²
- Supplementing Kansas Maternal Mortality Review Committee (KMMRC) data with Kansas hospital discharge data (HDD) will enhance the understanding of HDP by providing a more comprehensive picture of maternal health outcomes.

Study Questions

- The distribution of HDP in Kansas is not yet known. Therefore, the purpose of this study is to examine the HDP trends in the state over time and the demographic characteristics associated with delivery hospitalizations.

Methods

- The Kansas hospital discharge data, provided by the Kansas Hospital Association, were used to estimate the prevalence of delivery hospitalization with HDP diagnoses.
- Numerator: Delivery hospitalizations with HDP were identified following the Centers for Disease Control and Prevention (CDC) and Alliance for Innovation on Maternal Health (AIM)-developed definition of HDP and from hospital discharge diagnosis and procedure codes that indicate a potentially life-threatening HDP condition or maternal complication. HDP are defined as chronic hypertension, pregnancy-associated hypertension (i.e., gestational hypertension, preeclampsia, eclampsia, and chronic hypertension with superimposed preeclampsia), and unspecified maternal hypertension.^{3,4,5,6}
- Denominator: Delivery hospitalizations were identified by diagnosis codes for an outcome delivery, diagnosis-related group delivery codes, and procedure codes for selected delivery-related procedures.^{3,4,5,6}
- Trends were assessed using joinpoint regression model with HDP prevalence as the outcome variable and discharge year as the independent variable between 2016 and 2023.
- Five years of data (2019-2023) were combined and analyzed to identify selected characteristics and health outcomes of women diagnosed with HDP. Descriptive and bivariate analyses were performed to compare the prevalence of HDP across selected demographic groups, with independent z-tests applied to assess these differences.

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For More Information

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In Kansas, the leading underlying causes of pregnancy-related death were (in order of prevalence):



Note: Mental health conditions, including those contributing to suicide; AFE: amniotic fluid embolism

Source: Kansas Maternal Mortality Review Committee, 2016-2023

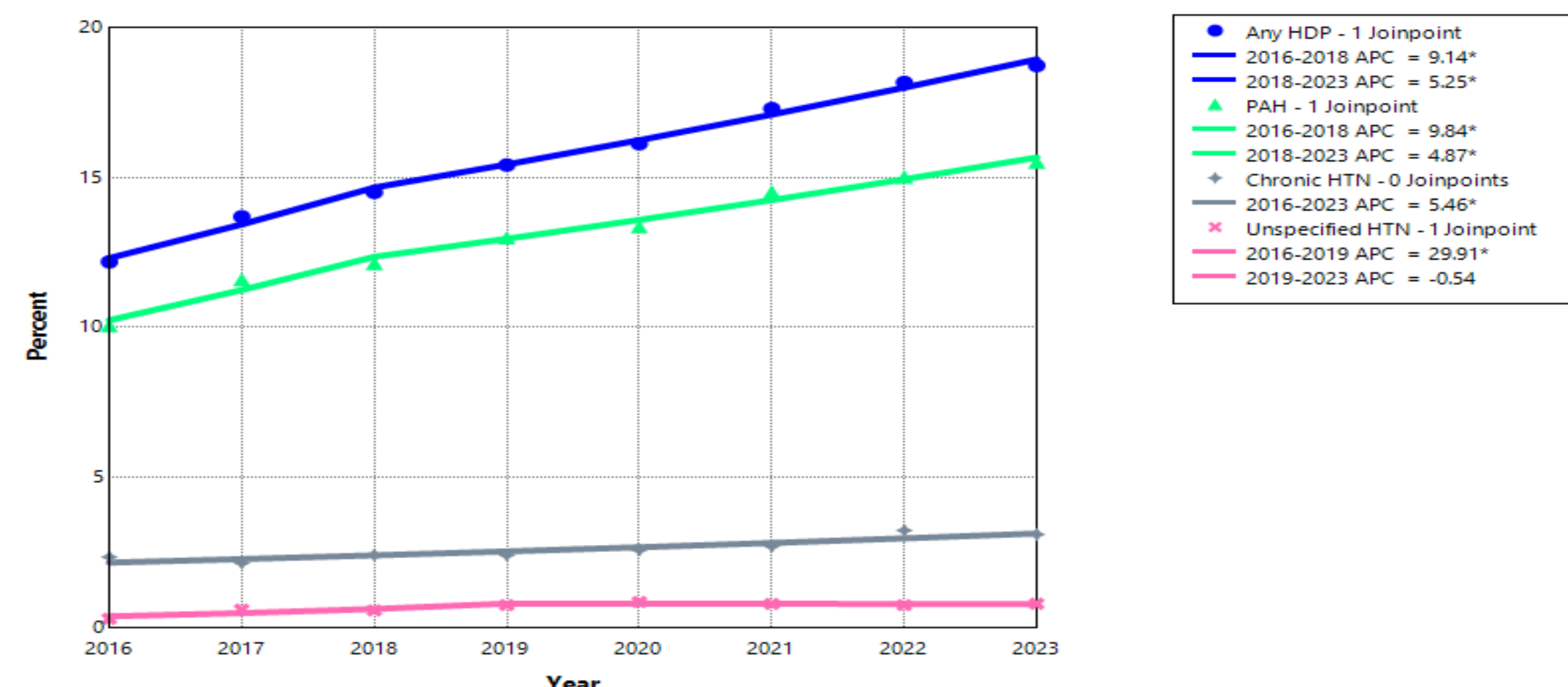
Hypertensive Disorders in Pregnancy

Prevalence of hypertensive disorders in pregnancy* among delivery hospitalizations by year, Kansas 2016-2023

Abbreviations

HDP: hypertensive disorder in pregnancy
HTN: hypertension
PAH: pregnancy-associated hypertension

*HDPs are defined as chronic hypertension, pregnancy-associated hypertension (i.e., gestational, hypertension, preeclampsia, eclampsia, and chronic hypertension with superimposed preeclampsia), and unspecified maternal hypertension.

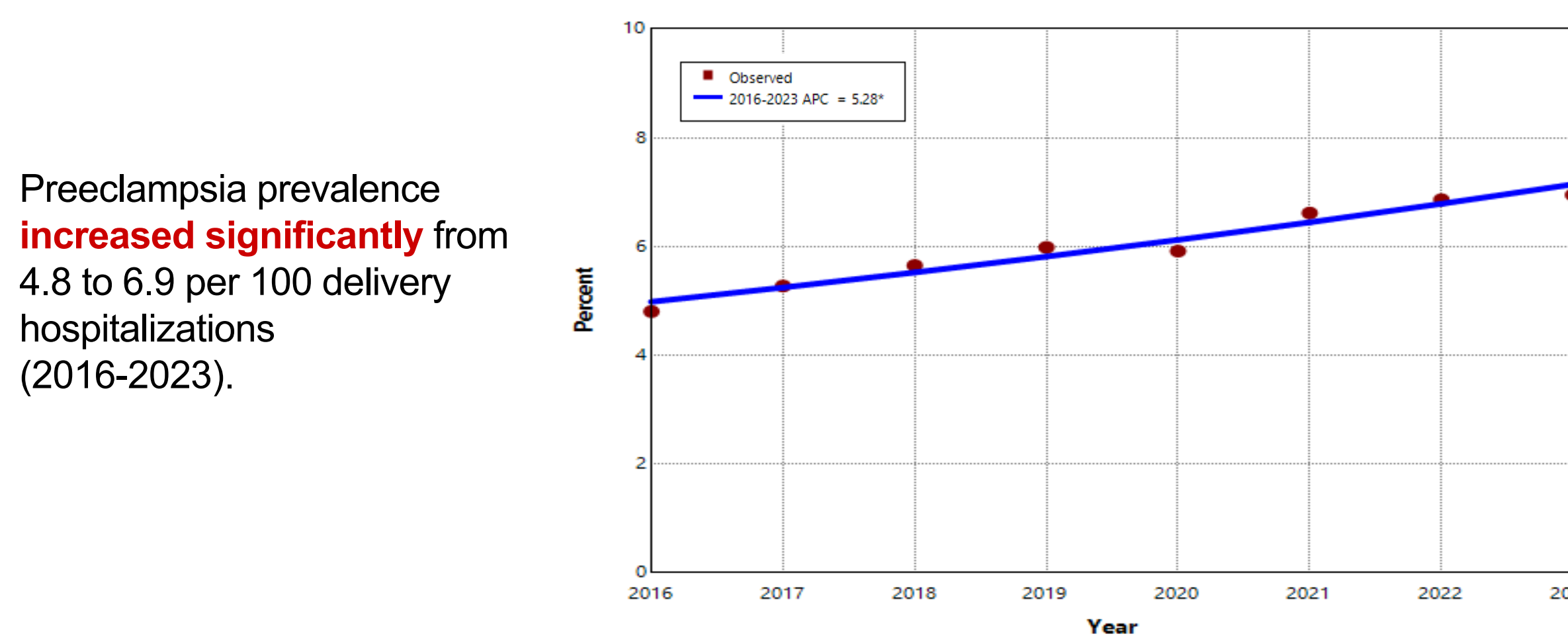


* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.

Source: Kansas hospital discharge data, 2016-2023

Highlight on Preeclampsia

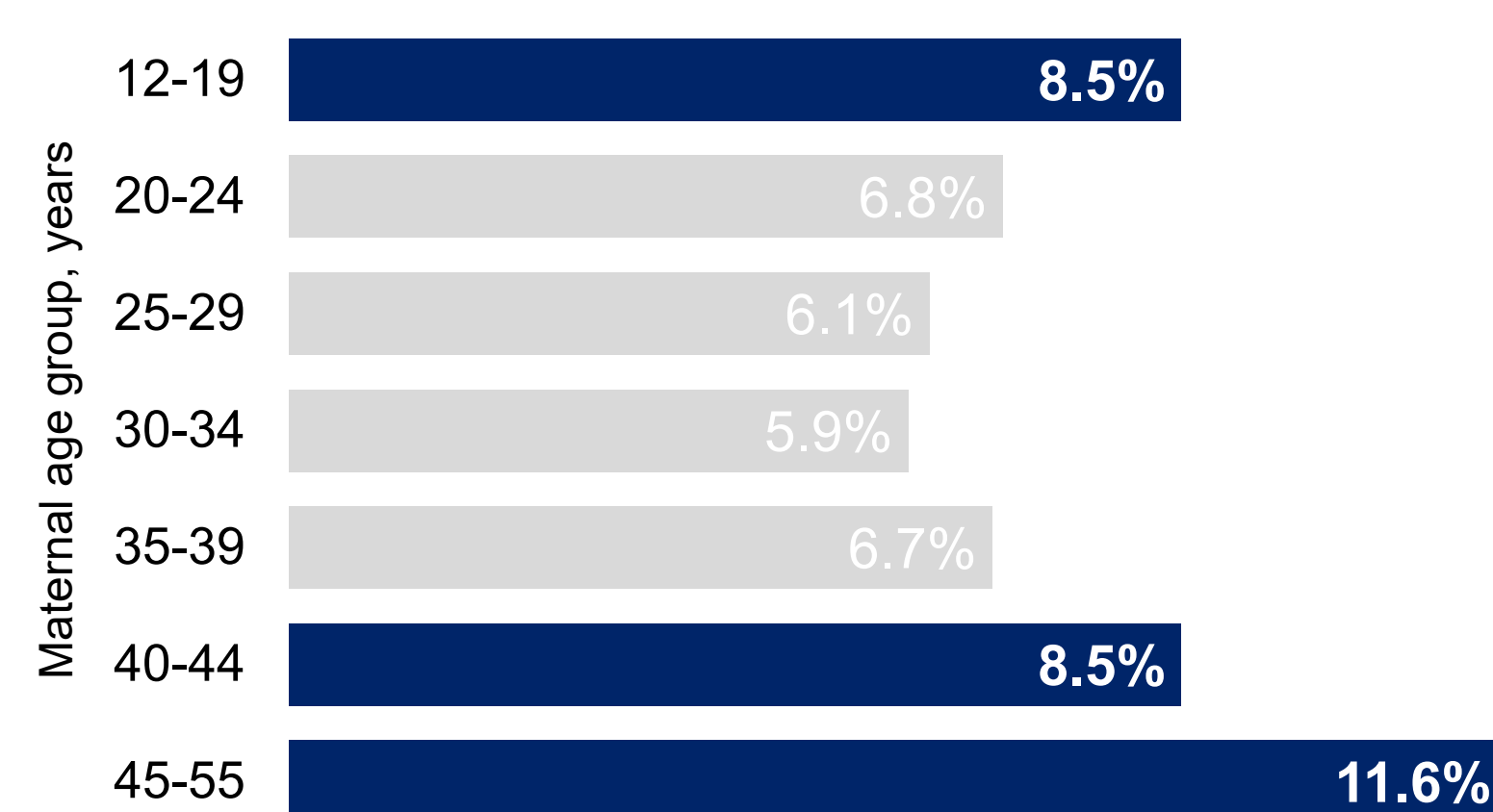
Preeclampsia is a serious disorder that can affect all the organs in the body. It usually develops after 20 weeks of pregnancy, often in the third trimester. When it develops before 34 weeks of pregnancy, it is called early-onset preeclampsia. It can also develop in the weeks after childbirth.



Preeclampsia prevalence **increased significantly** from 4.8 to 6.9 per 100 delivery hospitalizations (2016-2023).

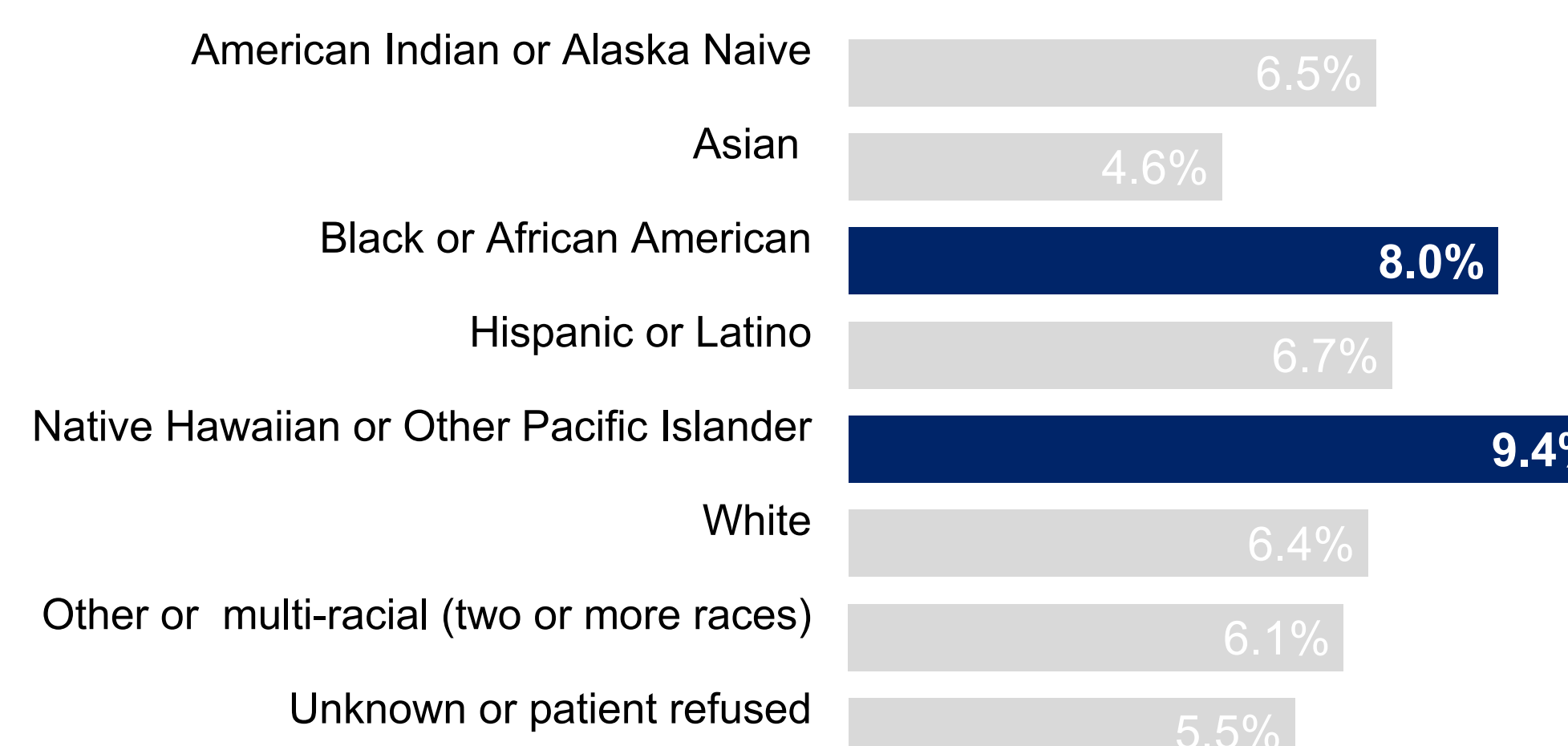
* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.

The prevalence was highest at the **youngest** (12-19 years, 8.5%) and **oldest** (45-55 years, 11.6%) age groups.



Source: Kansas hospital discharge data, 2019-2023

Non-Hispanic **Native Hawaiian or Other Pacific Islander** and Non-Hispanic **Black or African American** mothers experienced the highest prevalence.



Source: Kansas hospital discharge data, 2019-2023

Results

- From 2016 to 2023, there were 257,210 delivery hospitalizations among Kansas residents, with 40,363 cases of HDP documented in discharge records.
- The estimated annual **prevalence of HDP increased** significantly from 12.2 per 100 delivery hospitalizations in 2016 to 14.5 in 2018, with an annual percent change (APC) of 9.14%. This **upward trend continued significantly** from 2018 to 2023, reaching 18.7 per 100 delivery hospitalizations, with an APC of 5.25%.
- Analyzing the five-year combined data (2019-2023), the overall prevalence of HDP was 17.1%.
 - Prevalence of HDP was more prominent among mothers ages 35-44 (21.7%) and 45-55 (34.5%) years, as well as among non-Hispanic Black or African American (21.5%), non-Hispanic Native Hawaiian or Other Pacific Islander (19.3%), and non-Hispanic American Indian or Alaska Native (19.2%).
 - Additionally, a higher prevalence was observed among those residing in urban and semi-urban counties (17.3% and 18.1%, respectively).

Conclusions

- Hospital discharge data, supplemented with the Kansas Maternal Mortality Review Committee data, can help inform strategies and drive action to help prevent most HDP-related deaths by early detection and timely medical interventions.

Upstream Thinking in Action

With support from the Maternal Health Innovation program, Kansas Department of Health and Environment has been piloting the **Kansas Cuff Project** across seven sites in collaboration with the implementation of the AIM Severe Hypertension in Pregnancy patient safety bundle. This initiative provides at-risk individuals with personal blood pressure monitors and educational resources for home monitoring. By complementing the existing Well-Woman Toolkit, Maternal Warning Signs Toolkit, Perinatal Hypertension Toolkit, and Perinatal Hypertension Patient Education Guide, the Kansas Cuff Project aims to reduce racial and ethnic disparities in HDP.

References

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