



High Blood Pressure and Pregnancy

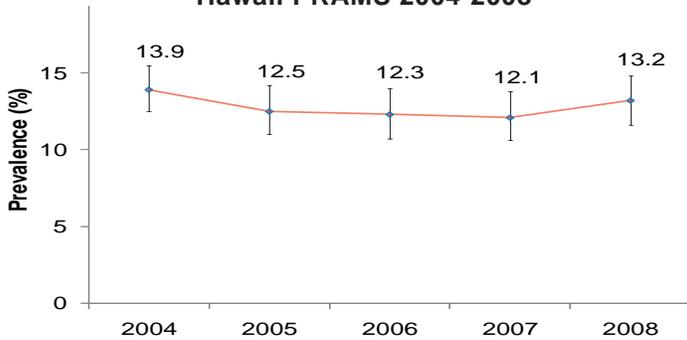
Pregnancy Risk Assessment Monitoring System

Hospital Discharge Data

High Blood Pressure and Pregnancy

High blood pressure (HBP) is a common medical condition that can become a major complication during pregnancy. Chronic Hypertension, pre-eclampsia and pregnancy induced hypertension are related to adverse outcomes including preterm delivery, intrauterine growth retardation, fetal death, maternal stroke, maternal heart and kidney failure, and maternal death.¹ High blood pressure during pregnancy is increasingly being recognized to have long term adverse consequences to mothers and children.^{2,3} A recent review showed a nearly 4-fold greater risk among those with pre-eclampsia compared to those who had normal blood pressure during pregnancy.³ High blood pressure identified during pregnancy appears to be an early clinical marker of cardiovascular risk and appropriate follow up postpartum may help decrease the burden of heart disease.

Trends in High Blood Pressure and Pregnancy, Hawaii PRAMS 2004-2008



Trends in High Blood Pressure

High Blood Pressure among new mothers has not changed since 2004. An estimated 13.2% of new mothers reported having high blood pressure in 2008. Similarly there was little changes in chronic high blood pressure (2%) and pregnancy related high blood pressure (11%) in mothers with a recent live birth.

About the Data

The Hawai'i Pregnancy Risk Assessment Monitoring System (PRAMS) is a self-reported survey of recent mothers conducted by mail with telephone follow-up. It is designed to monitor the health and experiences of women before, during, and just after pregnancy. Every year, about 2,000 women who deliver a live infant in Hawai'i are randomly selected to participate. For this analysis we defined High Blood Pressure based on its presence on either the birth certificate (Chronic Hypertension, Pregnancy Associated Hypertension, Eclampsia, Seizures during Labor) or the PRAMS Survey (high blood pressure, hypertension (including pregnancy-induced hypertension), pre-eclampsia, or toxemia). Unfortunately, the PRAMS and birth certificate data does not allow differentiation of the type of high blood pressure.

Suggested Citation

Hayes D, Shor R, Roberson E, Fuddy L. "Maternal High Blood Pressure and Pregnancy Fact Sheet" Honolulu, HI: Hawai'i Department of Health, Family Health Services Division; August 2010.

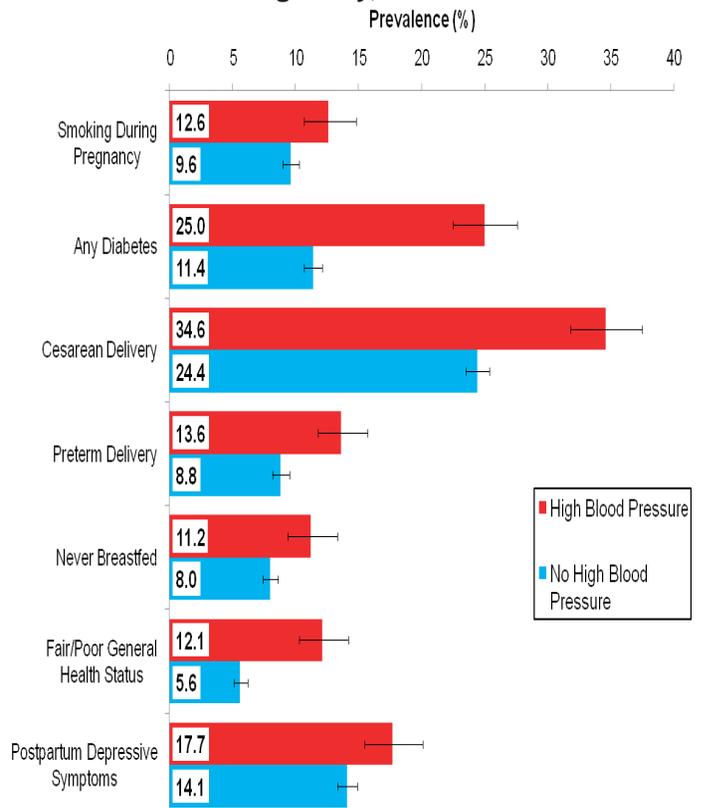
Data Highlights

- More than 1 in 8 mothers with a recent live birth had high blood pressure
- Black, Hawaiian, and Other Pacific Islander women had the highest rates of high blood pressure
- Women more likely to have high blood pressure were overweight or obese prior to conception, not married, a first time mother, had at least 3 previous pregnancies, or lived in Hawai'i and Honolulu Counties
- Women with high blood pressure were more than twice as likely to also have diabetes, a preterm delivery, or report a fair/poor health status than those without high blood pressure
- Women with high blood pressure were 1.5 times less likely to try to breastfeed their infants and 1.5 times more likely to have a cesarean delivery compared those without high blood pressure
- Mothers with high blood pressure had higher hospital charges for both mother and infant

Risk Factors and Outcomes

Mothers with high blood pressure were more likely to have several adverse risks and birth outcomes such as smoking during pregnancy, maternal diabetes, a cesarean delivery, a preterm delivery, never breastfed, have postpartum depressive symptoms, and a fair/poor general health status compared to those without high blood pressure.

Risk Factors and Outcomes Associated with High Blood Pressure and Pregnancy, Hawaii PRAMS 2004-2008



Characteristics of Mothers with High Blood Pressure and Pregnancy, Hawaii PRAMS 2004-2008

	Prevalence (%)	95% CI*
Maternal Race		
White	11.9	(10.5-13.5)
Black	17.9	(12.9-24.3)
Hispanic	10.8	(6.7-16.8)
Hawaiian	16.9	(15.3-18.6)
Samoan	14.8	(10.7-20.0)
Other Pacific Islander	10.7	(8.0-14.3)
Filipino	12.1	(10.7-13.6)
Japanese	9.6	(8.0-11.5)
Chinese	6.8	(5.6-8.4)
Korean	6.3	(4.5-8.6)
Other Asian	5.8	(3.1-10.6)
Maternal Age		
Under 20 years	15.9	(13.2-19.0)
20-24 years	13.4	(12.0-15.0)
25-34 years	11.8	(10.8-12.8)
35 or more years	13.3	(11.8-15.0)
Maternal Education		
<High School	12.9	(10.6-15.7)
High School	14.3	(13.1-15.5)
Some College	13.4	(12.1-14.9)
College Graduate	10.0	(8.9-11.2)
Marital Status		
Married	11.5	(10.7-12.4)
Other	15.1	(13.8-16.5)
Prenatal Insurance Coverage		
None	11.8	(7.8-17.5)
QUEST/Medicaid	13.5	(12.1-15)
Private Insurance	12.8	(12.0-13.7)
Pre-pregnancy Weight Status		
Underweight (BMI <18.5)	4.4	(3.0-6.5)
Normal (BMI 18.5- 24.9)	9.2	(8.4-10.0)
Overweight (BMI 25.0-29.9)	16.3	(14.7-18.1)
Obese (BMI >=30.0)	22.5	(20.3-24.9)
County of Residence		
Hawaii	15.7	(13.6-18.0)
Honolulu	13.1	(12.3-13.9)
Kauai	7.3	(5.2-10.2)
Maui	9.9	(8.1-12.0)
Parity		
First Birth	14.6	(13.5-15.8)
Second or Third Birth	10.8	(9.9-11.8)
Fourth or more Birth	14.5	(12.4-16.9)
Overall	12.8	(12.1-13.5)

* 95% CI refers to the 95% confidence interval around estimate.

Maternal Characteristics

In Hawai'i, 12.8% of mothers have high blood pressure. Blacks, Hawaiians, and Samoans have the highest estimates. High blood pressure was similar across all maternal age, maternal education, and prenatal insurance groups. Women who were not married, those who lived in Hawai'i and Honolulu Counties, first time mothers, those that had four or more pregnancies, and those that were overweight or obese prior to conception were more likely to have high blood pressure.

About the Data

Hospital discharge data was furnished by the Hawai'i Health Information Corporation which is a private, not for profit corporation that maintains data on all emergency room and hospitalizations in the state. For this analysis, maternal and newborn discharge records were analyzed for 92,346 births from 2004-2008. The International Statistical Classification of Diseases (ICD-9) maternal codes 401-405, 642 were used to define high blood pressure. Total charges were calculated by summation of maternal and infant charges. Charge per day was calculated from charges and length of stay.

Hospital Charges

Analyses of hospital discharge data from 2004-2008, demonstrated that the median total hospital charges among women with high blood pressure who had a baby was significantly higher compared to those without high blood pressure. This was not accounted for by the increased proportion of cesarean deliveries in those with high blood pressure as there was a similar pattern observed by method of delivery. The median charge per day for both newborns and mothers was higher compared to births when the mother did not have high blood pressure.

Median Hospital Charges by Maternal High Blood Pressure Status, Hospital Discharge 2004-2008

	Mothers with High Blood Pressure (\$)	Mothers without High Blood Pressure (\$)
Median Total Charges		
Overall	12,527	9,126
Cesarean Delivery	16,606	13,052
Vaginal Delivery	10,203	8,185
Newborn Charge per day	1,057	1,015
Maternal Charge per day	3,464	3,181

Discussion

About 1 in 8 women in Hawai'i with a recent live birth had high blood pressure during pregnancy, either chronic or pregnancy related. High blood pressure was associated with higher rates of poor outcomes and associated risk factors. There were some disparities with certain groups having higher estimates of high blood pressure.

The Hawai'i Department of Health, Maternal and Child Health Branch Perinatal Support and Family Planning Programs screen all clients for high blood pressure. Early screening can identify women at risk so that appropriate referrals and interventions are made as early as possible in the course of disease to prevent morbidity.

The Hawai'i Department of Health, Heart Disease and Stroke Prevention Program is developing a state plan along with collaborators to address high blood pressure at the population level. Population level efforts and targeted interventions towards groups at risk will help decrease the burden of high blood pressure in Hawai'i.

References

- 1 National Heart, Lung, and Blood Institute. Report of the Working Group on Research on Hypertension During Pregnancy. 2001. Bethesda (MD): National Heart, Lung, and Blood Institute.
- 2 Smith GN, Walker MC, Liu A, et al. A history of preeclampsia identifies women who have underlying cardiovascular risk factors. Am J Obstet Gynecol. 2009; 200:58.e1-58.e8.
- 3 Belamy L, Casas JP, Hingorani AD, Williams DJ. Pre-eclampsia and risk of cardiovascular disease and cancer in later life: systematic review and meta-analysis. BMJ. 2007;335:974.

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