Oregon Perinatal Collaborative Quality Initiative:

Severe Hypertension in Pregnancy

Karen Archabald, MD
Maternal Fetal Medicine
Director Obstetrics and Family Birth, Legacy Health
Member OPC Steering Committee

Objectives

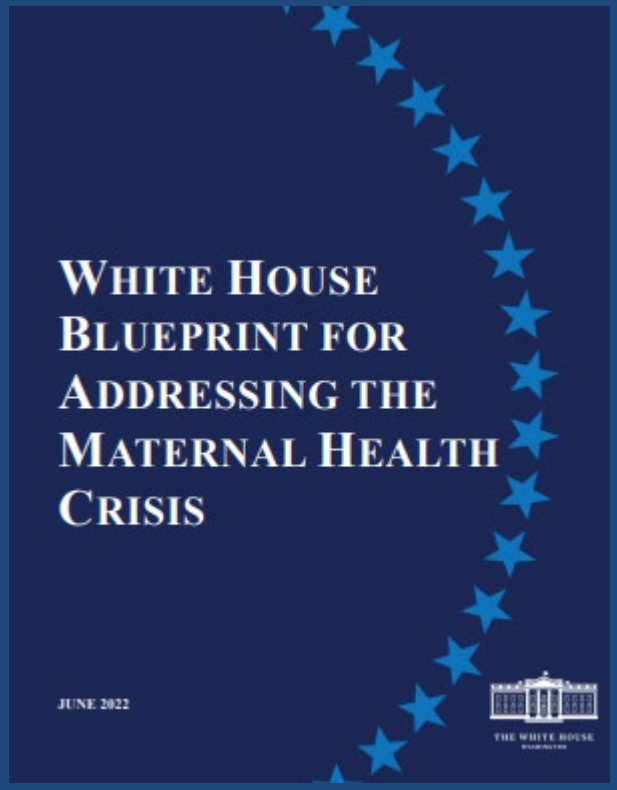
- National initiatives to address Maternal Morbidity/Mortality
- Contribution of severe hypertension to maternal morbidity and mortality in the US and Oregon
- Successful implementation of AIM Severe Hypertension Bundles in other states
- Updated AIM Hypertension Bundle 2022
- Oregon Perinatal Collaborative next steps

National Landscape

TJC: Elements of Performance 2020

“ Based on review of literature, prevention, early recognition, and timely treatment for maternal hemorrhage and severe hypertension/preeclampsia had the highest impact in states working on decreasing maternal complications”

The Joint Commission


WHITE HOUSE
BLUEPRINT FOR
ADDRESSING THE
MATERNAL HEALTH
CRISIS
JUNE 2022
THE WHITE HOUSE

Question:

Does your hospital or health system participate in a Statewide and/or National Perinatal Quality Improvement Collaborative Program aimed at improving maternal outcomes during inpatient labor, delivery and post-partum care, and has implemented patient safety practices or bundles related to maternal morbidity to address complications, including, but not limited to, hemorrhage, severe hypertension/preeclampsia or sepsis?

Answer Choices:

A) Yes,

B) No

C) N/A (our hospital does not provide inpatient labor/delivery care

maternal-morbidity-structural-measure-specifications.pdf (cms.gov)

Updated Sentinel Event: July 2023

Severe maternal morbidity (leading to permanent harm or severe harm):

A patient safety event that occurs from the intrapartum through the immediate postpartum period (24 hours), requiring the transfusion of 4 or more units of packed red blood cells (PRBC) and/or admission to the intensive care unit (ICU). Admission to the ICU is defined as admission to a unit that provides 24- hour medical supervision and can provide mechanical ventilation or continuous vasoactive drug support. Sources: American College of Obstetrics and Gynecology, the US Centers for Disease Control

The Joint Commission

Oregon Perinatal Collaborative

- In partnership with CDC and AIM, implementation of state wide QI project designed to reduce severe maternal morbidity and mortality related to obstetric hemorrhage among women who give birth in Oregon
- October 2019 through April 2022

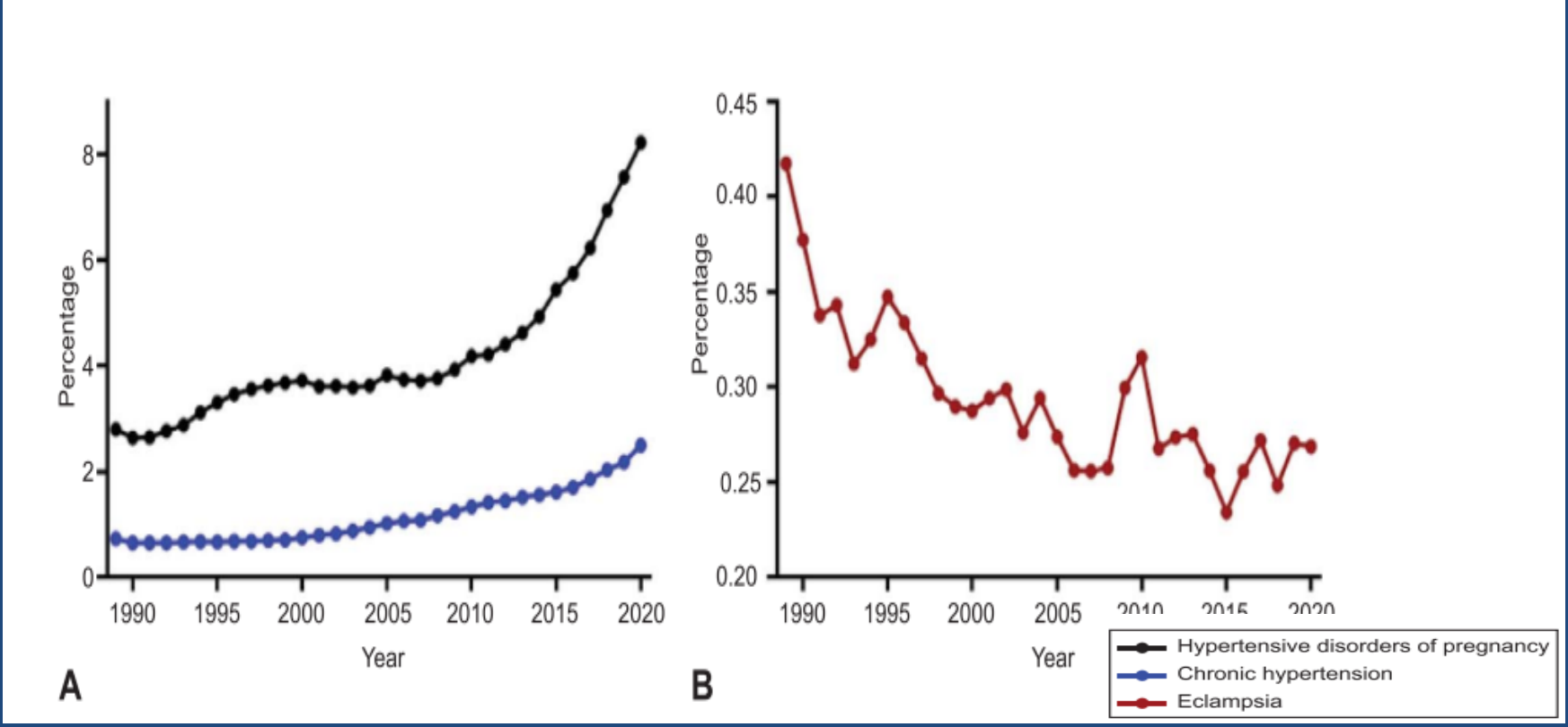
Next Steps for OPC QI Initiatives

Pregnancy Related Deaths: Data from 14 MMRC 2008-2017 (n=454)

Condition	Total	%
Cardiovascular Conditions	58	13.8
Hemorrhage	55	13.1
Infection	48	11.4
Embolism	40	9.5
Cardiomyopathy	39	9.3
Mental Health Conditions	37	8.8
Preeclampsia and Eclampsia	35	8.3

Davis NL, Smoots AN, Goodman DA. Pregnancy-Related Deaths: Data from 14 U.S. Maternal Mortality Review Committees, 2008-2017. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 2019.

Trends in Hypertensive Disorders of pregnancy, chronic hypertension, and eclampsia 1989-2020



Bruno, A et al. Trends in Hypertensive Disorders of Pregnancy in the United States from 1989-2020. Obstetrics and Gynecology; 140; 1, July 2023 83-86

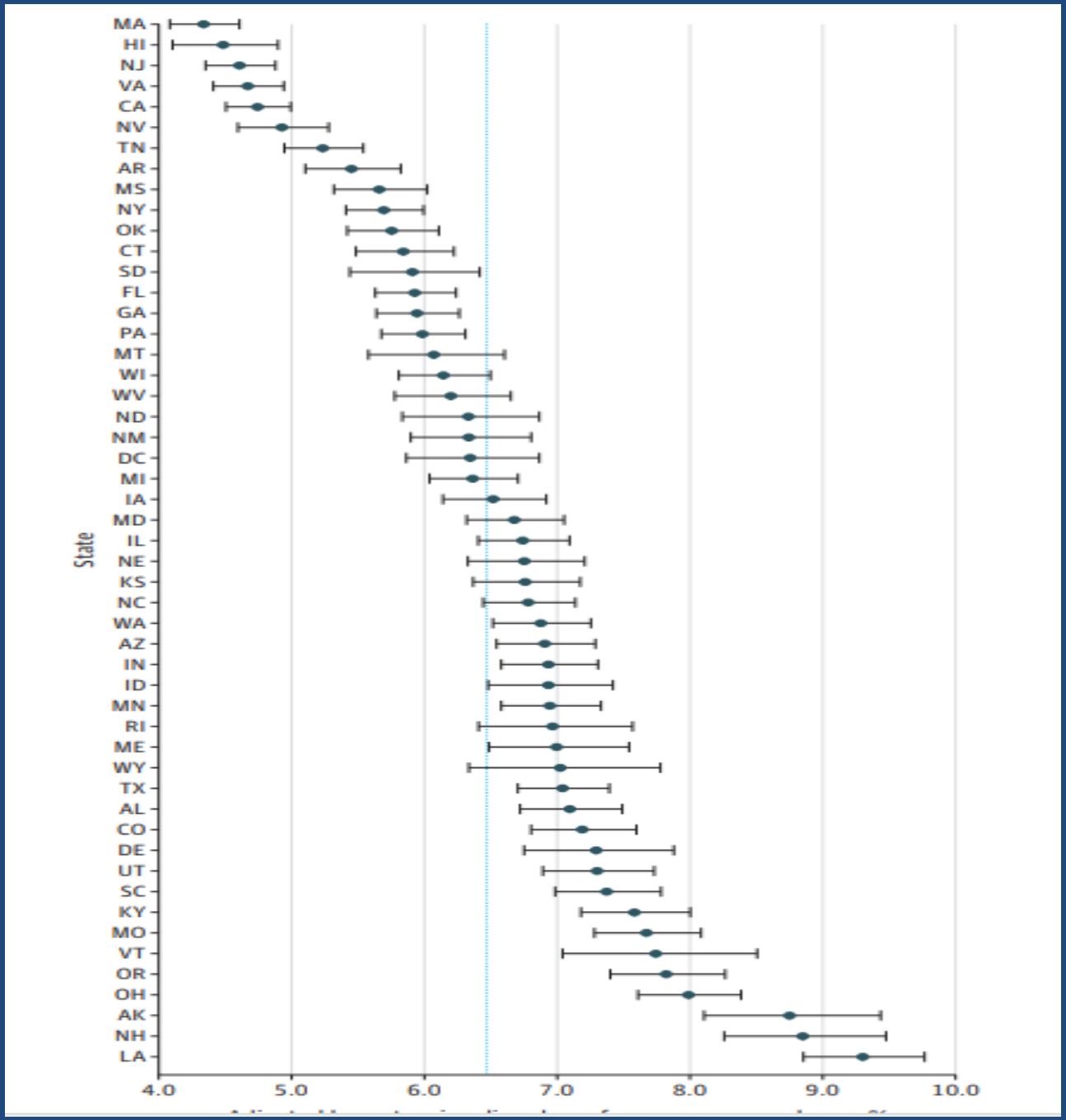
“CDC Press Release: Hypertensive disorders in pregnancy affect 1 in 7 hospital deliveries April 2022”

- (HDP) among delivery hospitalizations increased from about 13% in 2017 to 16% in 2019

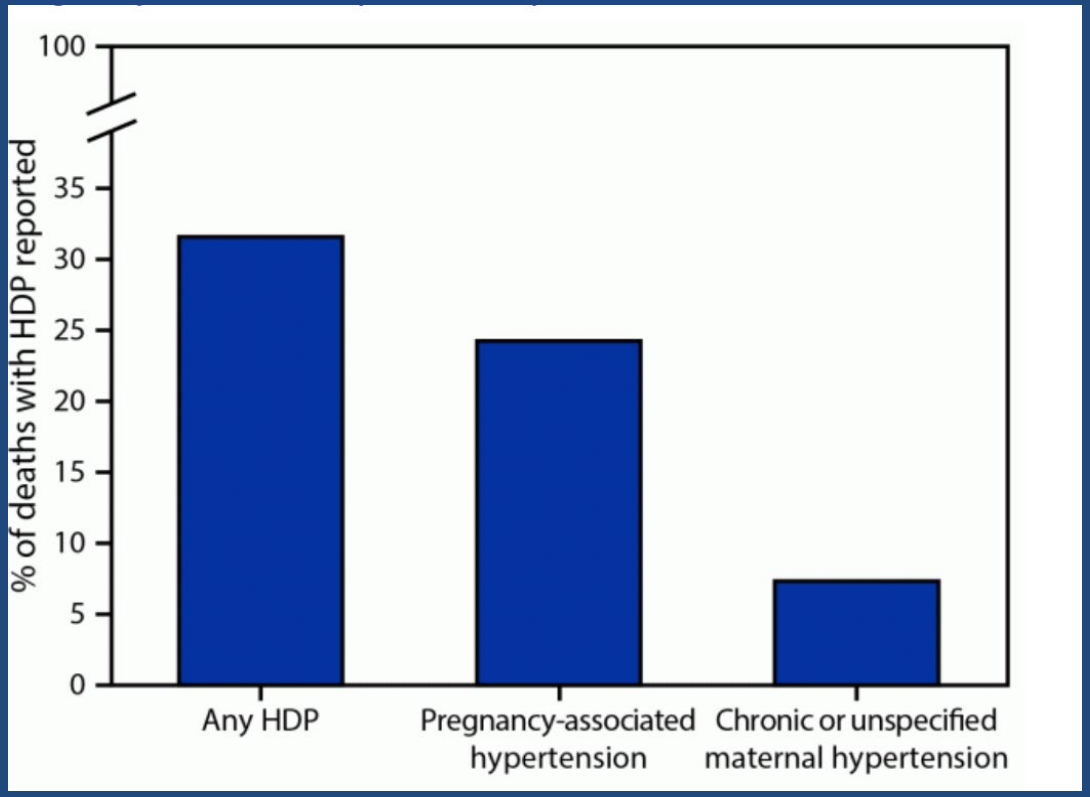
- 1 in 7 delivery hospitalizations

CDC Press Release: Hypertensive disorders in pregnancy affect 1 in 7 hospital deliveries | CDC Online Newsroom | CDC

Prevalence of Hypertensive Disorders of Pregnancy by State



Proportion of deaths* occurring during delivery hospitalization with a documented diagnosis code of a hypertensive disorder in pregnancy†—National Inpatient Sample, United States, 2017–2019



CDC Press Release: Hypertensive disorders in pregnancy affect 1 in 7 hospital deliveries | CDC Online Newsroom | CDC

Cause of Death in Preeclampsia Related Mortality: California

Stroke (n=33)

- Hemorrhagic (n=29)
- Ischemic (n=2)

Organ Failure (n=15)

Pulmonary Edema (n=3)

Eclampsia (n=2)

Hemorrhage/DIC (n=1)

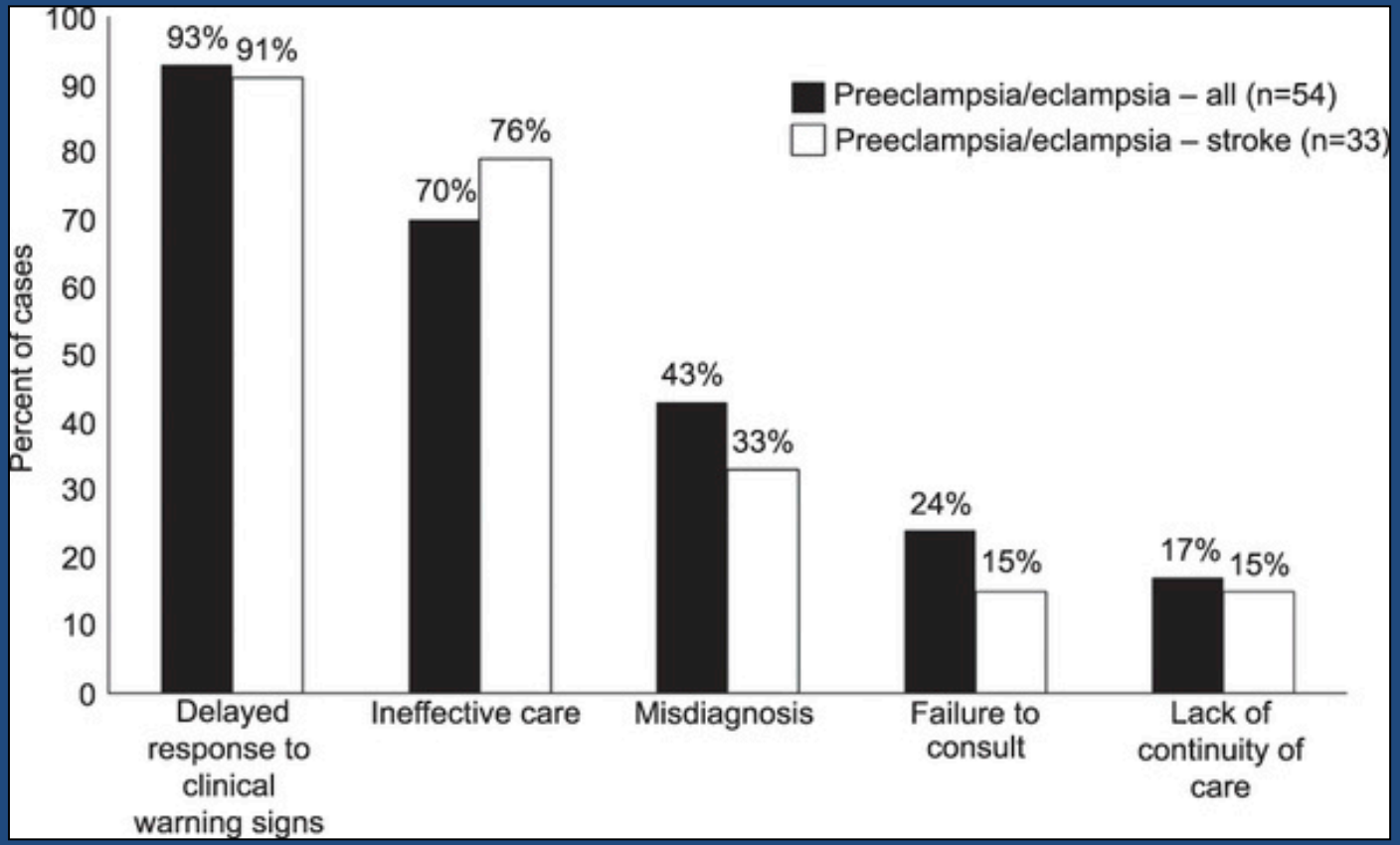
Judy, A. Systolic Hypertension, Preeclampsia-Related Mortality, and Stroke in California, Obstetrics & Gynecology, Issue: Volume 133(6), June 2019, p 1151-1159

Preeclampsia Related Mortality

- Good-to-strong chance to alter outcome was identified in stroke cases 66% (21/32)
  - Delayed response to clinical warning signs in 91% (30/33) of cases
  - Ineffective treatment in 76% (25/33) cases

Judy, A. Systolic Hypertension, Preeclampsia-Related Mortality, and Stroke in California, Obstetrics & Gynecology, Issue: Volume 133(6), June 2019, p 1151-1159

Contributing factors among preeclampsia deaths: health care provider factors, California 2002-2007



Judy, A. Systolic Hypertension, Preeclampsia-Related Mortality, and Stroke in California, Obstetrics & Gynecology, Issue: Volume 133(6), June 2019, p 1151-1159

Preeclampsia Related Mortality

- Systolic blood pressure exceeded 160 mm Hg in 96% of cases, and diastolic blood pressure was 110 or higher in 65% of cases.
- 48% of women received antihypertensive treatment.

Judy, A. Systolic Hypertension, Preeclampsia-Related Mortality, and Stroke in California, Obstetrics & Gynecology, Issue: Volume 133(6), June 2019, p 1151-1159

Preeclampsia Related Mortality

Treatment	n (%)
Any medication*	15 (48)
IV hydralazine	8 (53)
IV labetalol	3 (20)
Oral labetalol	2 (13)
Other	2 (13)
Standard treatment	6 (40)
Nonstandard treatment	9 (60)
Standard medication, lower dose than recommended (n=7)	
Standard medication, alternative route of administration (n=1)	
Nonstandard medication (n=1)	
Additional dose administered	17

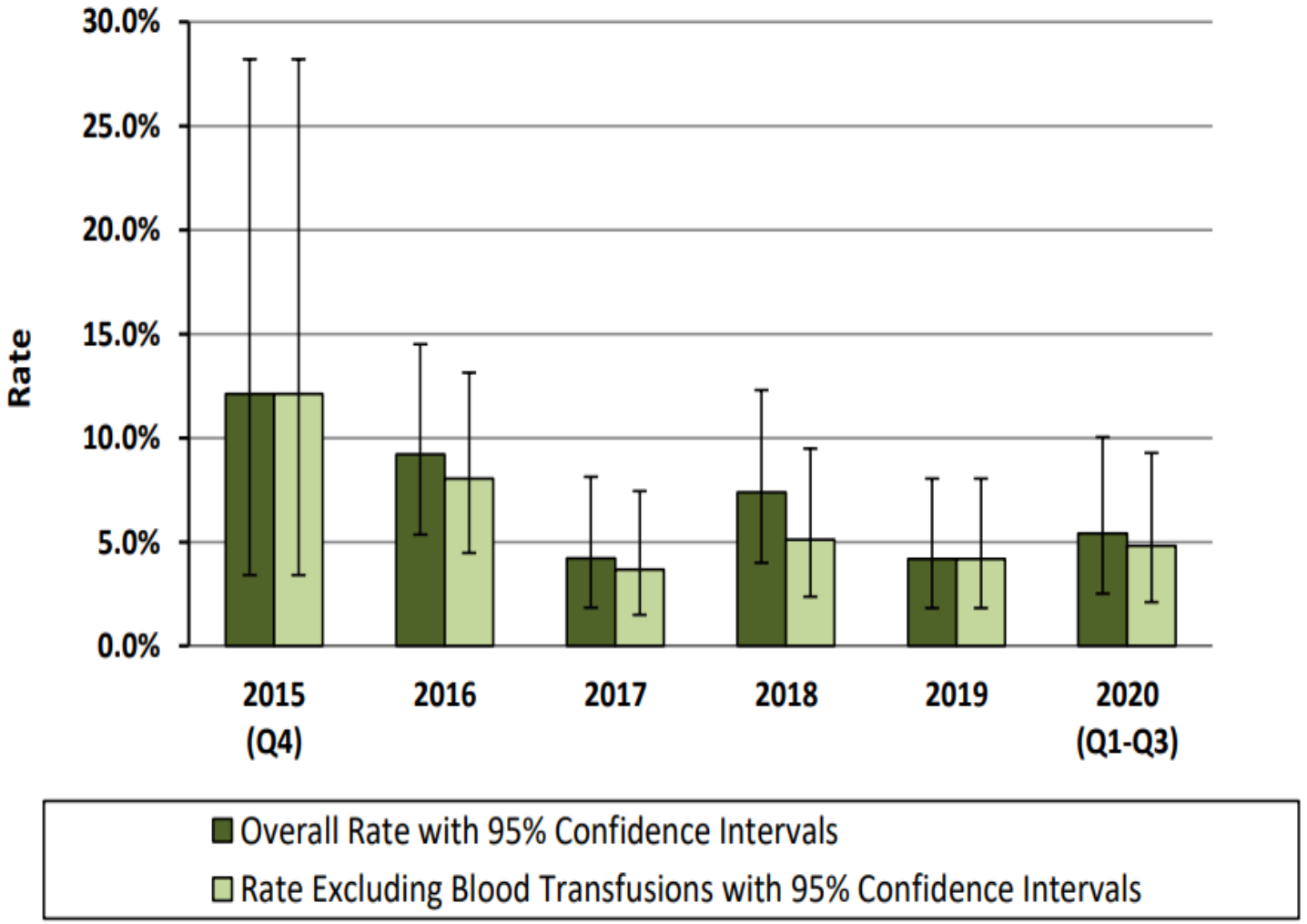
IV, intravenous.
* No source data for two patients. Patients may have more than one symptom.

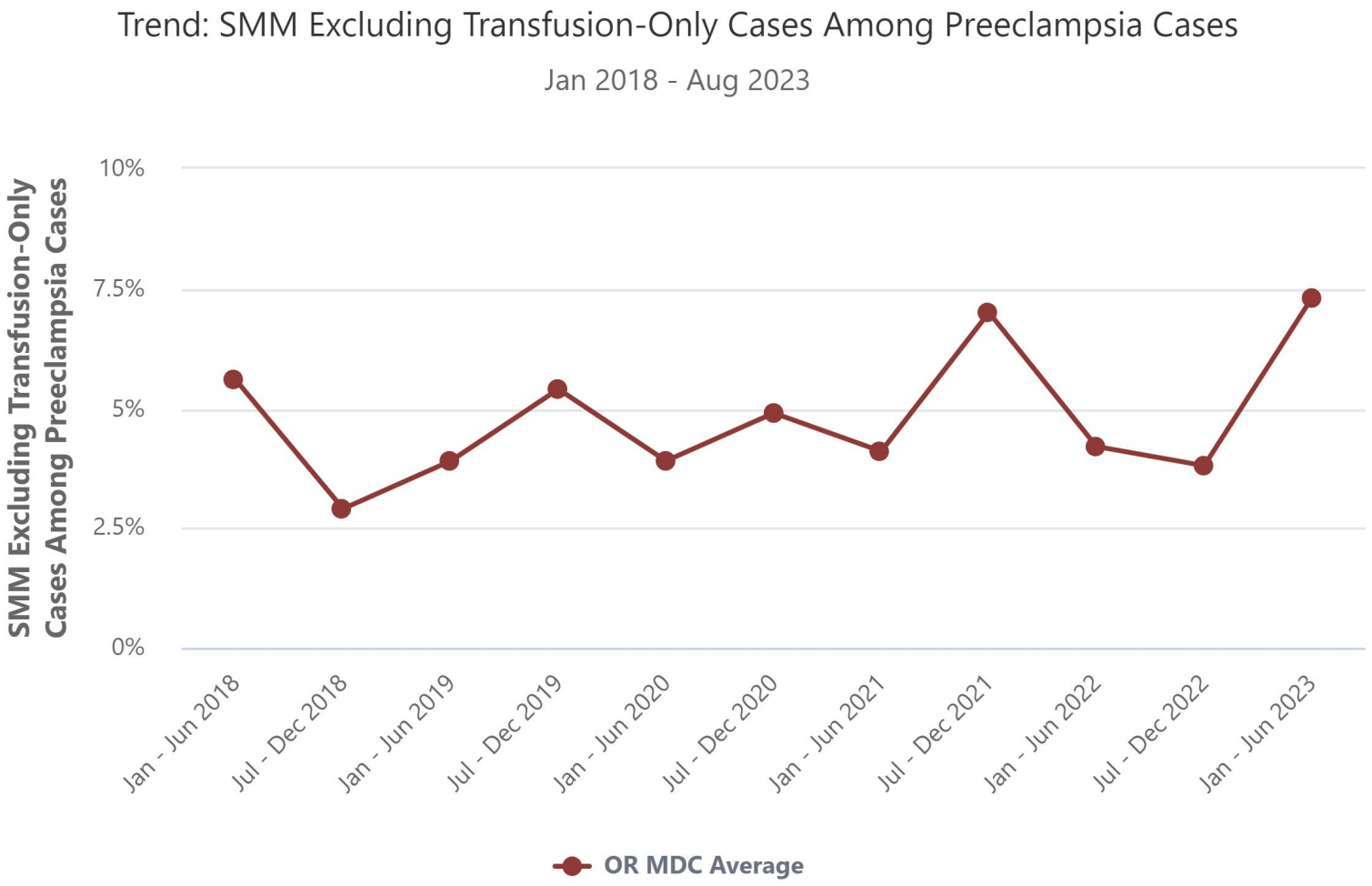
Judy, A. Systolic Hypertension, Preeclampsia-Related Mortality, and Stroke in California, Obstetrics & Gynecology, Issue: Volume 133(6), June 2019, p 1151-1159

Recognition: Missed Symptoms or Misdiagnosed	
Missed Symptoms: (didn't see it)	Misdiagnosed: (saw it as something else)
Headache	
Elevated blood pressures	
Abnormal fetal heart rate tracings	
Blurred vision	Seizure disorder
Low oxygen saturation	Gallstones
Severe pain, epigastric pain, chest pain	Chronic hypertension
Altered behavior (confusion, combative)	New onset asthma
Tea colored urine, oliguria	Postpartum psychosis
Bleeding, anemia, coagulopathy	
Cough, wheezing, shortness of breath	
Proteinuria	
Abnormal lab values	

Morton CH, et al. Journal of Obstetric, Gynecologic and Neonatal Nursing. https://doi.org/10.1016/j.jogn.2019.02.008

Trend Analysis: SMM Among Preeclampsia Cases
Overall Rate and Rate Excluding Blood Transfusions




Trend: SMM Excluding Transfusion-Only Cases Among Preeclampsia Cases
Jan 2018 - Aug 2023
SMM Excluding Transfusion-Only Cases Among Preeclampsia Cases
10%
7.5%
5%
2.5%
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Jan - Jun 2018
Jul - Dec 2018
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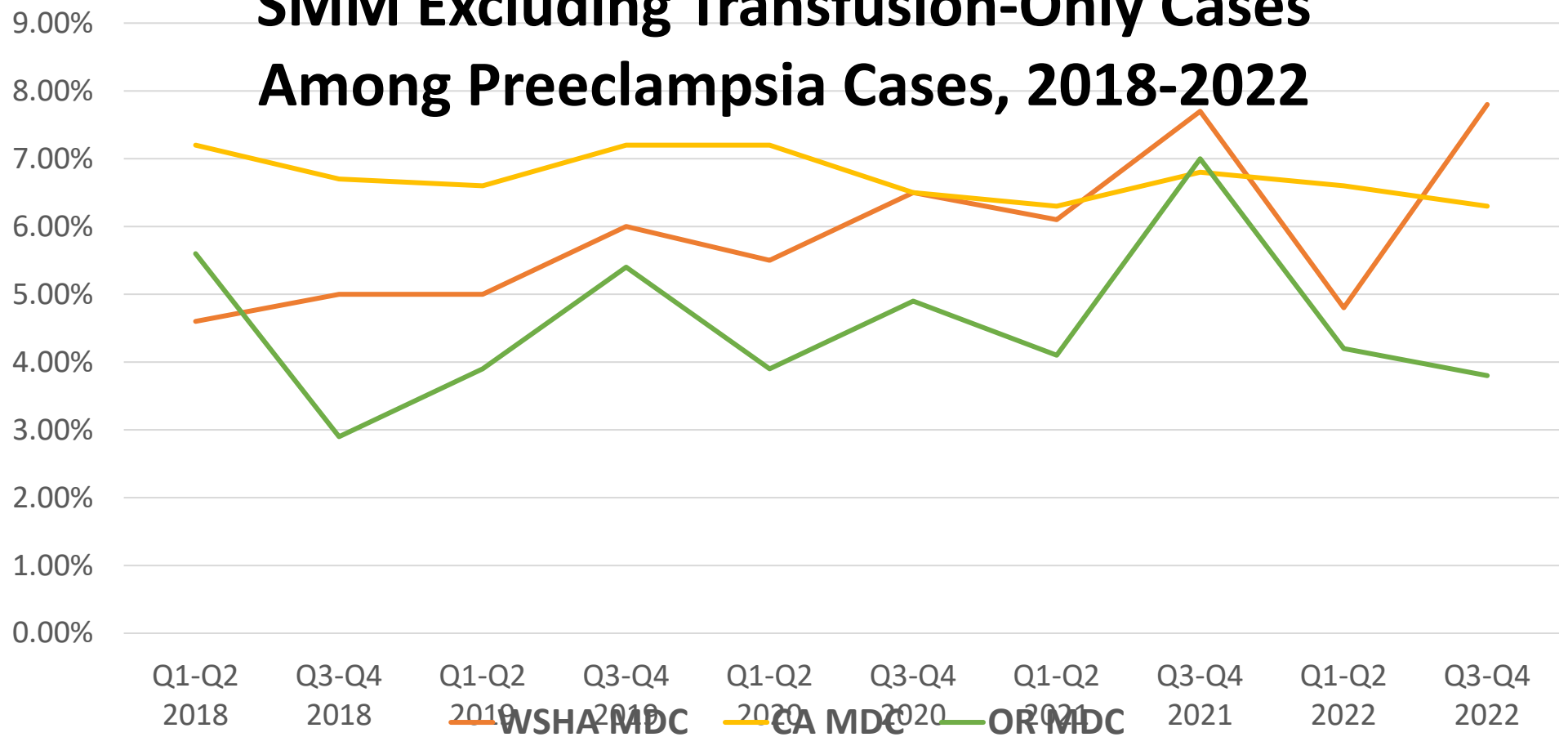
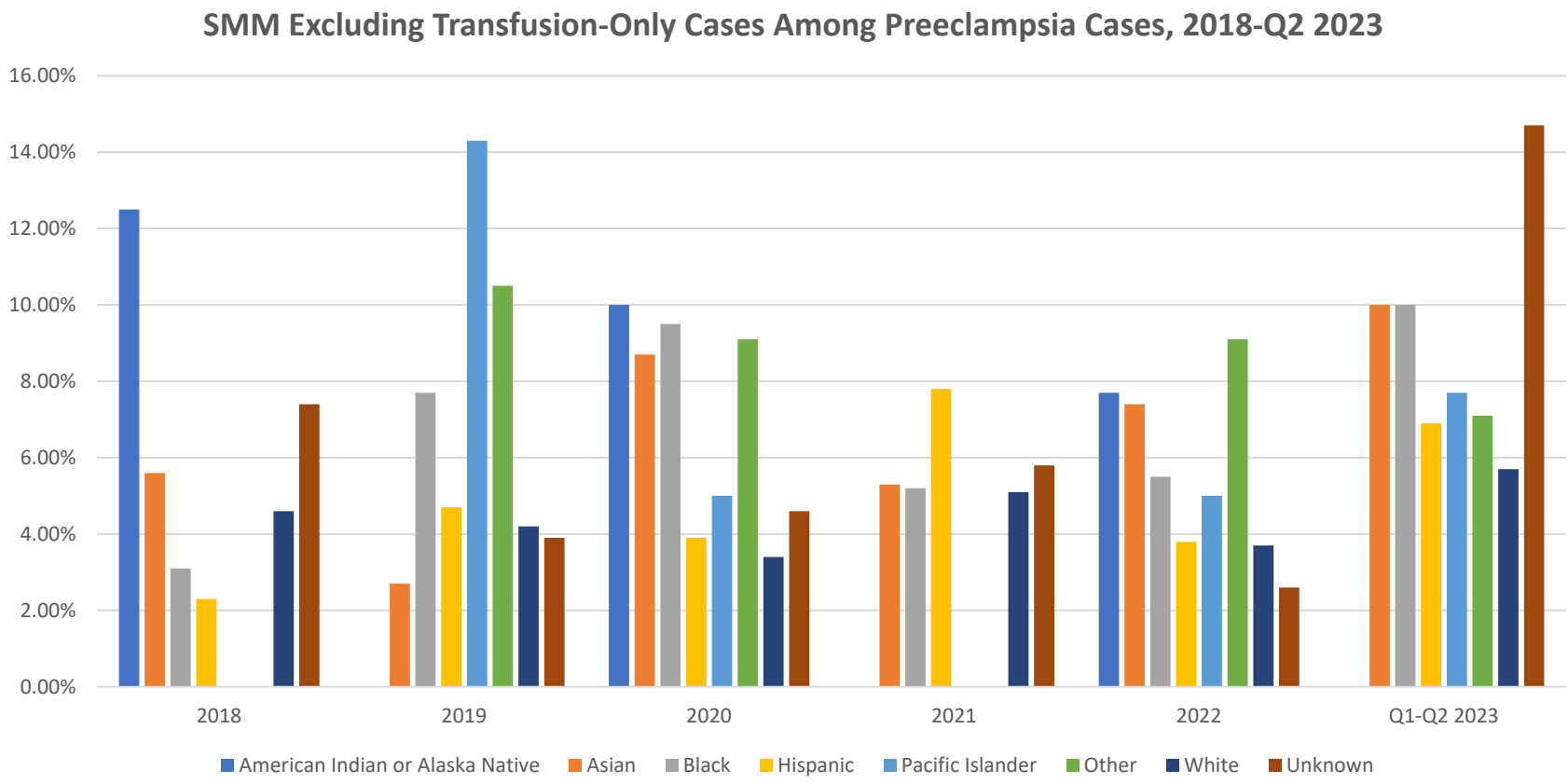
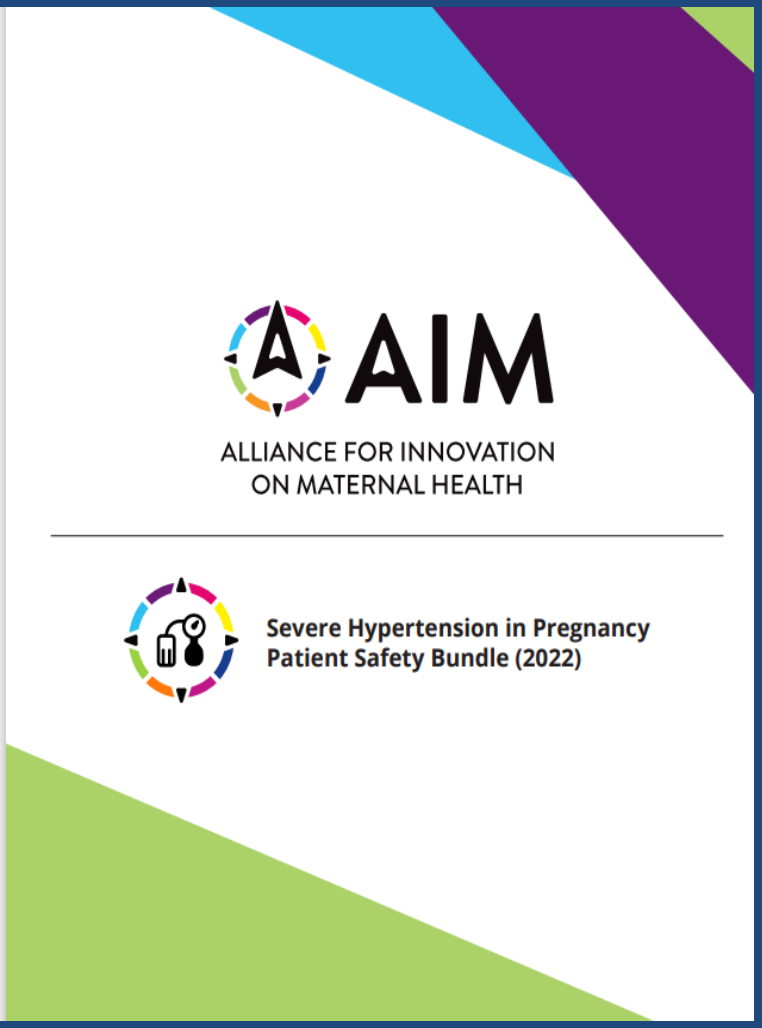
OR MDC Average

SMM Excluding Transfusion-Only Cases Among Preeclampsia Cases, 2018-2022




SMM Excluding Transfusion-Only Cases Among Preeclampsia Cases, 2018-Q2 2023
16.00%
14.00%
12.00%
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
2018
2019
2020
2021
2022
Q1-Q2 2023
American Indian or Alaska Native
Asian
Black
Hispanic
Pacific Islander
Other
White
Unknown



Updated 2022

Readiness: Every Care Setting

Recognition and Prevention: Every Patient

Response: Every Event

Reporting and System Learning:

Every Unit

Respectful, Equitable, and Supportive Care:

Every Unit , Provider, and Team Member

Severe Hypertension in Pregnancy Patient Safety Bundle

Readiness — Every Care Setting

Develop processes for management of pregnant and postpartum patients with severe hypertension, including:

- A standard protocol for maternal early warning signs, diagnostic criteria, monitoring and treatment of severe preeclampsia/eclampsia (including order sets and algorithms)
- A process for the timely triage and evaluation of pregnant and postpartum patients with severe hypertension or related symptoms
- A system plan for escalation, obtaining appropriate consultation, and maternal transfer as needed

Ensure rapid access to medications used for severe hypertension/eclampsia with a brief guide for administration and dosage in all areas where patients may be treated.

Conduct interprofessional and interdepartmental team-based drills with timely debriefs that include the use of simulated patients.

Develop and maintain a set of referral resources and communication pathways between obstetric providers, community-based organizations, and state and public health agencies to enhance services and supports for pregnant and postpartum families.

Develop trauma-informed protocols and provider education to address health care team member biases to enhance equitable care.

Recognition & Prevention — Every Patient

Assess and document if a patient presenting is pregnant or has been pregnant within the past year in all care settings.

Ensure accurate measurement and assessment of blood pressure for every pregnant and postpartum patient.

Screen for structural and social drivers of health that might impact clinical recommendations or treatment plans and provide linkage to resources that align with the pregnant or postpartum person's health literacy, cultural needs, and language proficiency.

Provide ongoing education to all patients on the signs and symptoms of hypertension and preeclampsia and empower them to seek care.

Provide ongoing education to all health care team members on the recognition of signs, symptoms, and treatment of hypertension.

Severe Hypertension in Pregnancy Patient Safety Bundle

Response — Every Event

Utilize a standardized protocol with checklists and escalation policies including a standard response to maternal early warning signs, listening and investigating patient-reported and observed symptoms, and assessment of standard labs for the management of patients with severe hypertension or related symptoms.

Initiate postpartum follow-up visit to occur within 3 days of birth hospitalization discharge date for individuals whose pregnancy was complicated by hypertensive disorders.

Provide trauma-informed support for patients, identified support network, and staff for serious complications of severe hypertension, including discussions regarding birth events, follow-up care, resources, and appointments.

Reporting and Systems Learning — Every Unit

Establish a culture of multidisciplinary planning, huddles, and post-event debriefs for every case of severe hypertension, which identifies successes, opportunities for improvement, and action planning for future events.

Perform multidisciplinary reviews of all severe hypertension/eclampsia cases per established facility criteria to identify systems issues.

Monitor outcomes and process data related to severe hypertension, with disaggregation by race and ethnicity due to known disparities in rates of severe hypertension.

Respectful, Equitable, and Supportive Care — Every Unit/Provider/Team Member

Engage in open, transparent, and empathetic communication with pregnant and postpartum people and their identified support network to understand diagnoses, options, and treatment plans.

Include pregnant and postpartum persons as part of the multidisciplinary care team to establish trust and ensure informed, shared decision-making that incorporates the pregnant and postpartum person's values and goals.

Original Research

The Ohio Maternal Safety Quality Improvement Project: initial results of a statewide perinatal hypertension quality improvement initiative implemented during the COVID-19 pandemic

- 29 Hospitals between July 2020 and September 2021
- 4948 hypertensive events
- 4678 unique patients

Schneider, P. et al. Am J Obstet Gynecol MFM 2023;5,100912.

Original Research

The Ohio Maternal Safety Quality Improvement Project: initial results of a statewide perinatal hypertension quality improvement initiative implemented during the COVID-19 pandemic

Primary Process Measure:

Proportion of birthing people in Ohio with sustained severe hypertension who received treatment with appropriate acute antihypertensive therapy within 60 minutes.

Secondary Process Measure:

Receipt of follow-up appointment after hospital discharge within 72 hours if discharged on medication, 10 days if discharged without medication, a blood pressure cuff, and education about urgent maternal warning signs. .

Schneider, P. et al. Am J Obstet Gynecol MFM 2023;5,100912.

TABLE 1

Ohio AIM Hypertension Quality Improvement Project primary and secondary process measures

Measure definition	Numerator	Denominator
Primary process measure		
Timely treatment	All cases who received appropriate treatment (IV labetalol, IV hydralazine, PO IR nifedipine) within 60 min of the first elevated BP	All pregnant and postpartum people with severe hypertension (SBP of ≥160 mm Hg or DBP of ≥110 mm Hg) that is sustained >15 min and sequential (≥2 occurrences)
Secondary process measures		
Follow-up appointment scheduled (all)	All cases who have a follow-up appointment scheduled within 10 d before discharge	All pregnant and postpartum people with severe hypertension (SBP of ≥160 mm Hg or DBP of ≥110 mm Hg) that is sustained >15 min and sequential (≥2 occurrences) who were not transferred out to another hospital
Follow-up appointment scheduled (discharged on medications)	All cases who were discharged on antihypertensive medications and had a follow-up appointment scheduled within 72 h	All pregnant and postpartum people with severe hypertension (SBP of ≥160 mm Hg or DBP of ≥110 mm Hg) that is sustained >15 min and sequential (≥2 occurrences) who were not transferred out to another hospital and were discharged on medications
Discharge education	All cases that received discharge education materials about preeclampsia	All pregnant and postpartum people with severe hypertension (SBP of ≥160 mm Hg or DBP of ≥110 mm Hg) that is sustained >15 min and sequential (≥2 occurrences) who were not transferred out to another hospital
BP cuff receipt	All cases who were provided with a BP cuff or an order was placed for a cuff	All pregnant and postpartum people with severe hypertension (SBP of ≥160 mm Hg or DBP of ≥110 mm Hg) that is sustained >15 min and sequential (≥2 occurrences) who were not transferred out to a different hospital

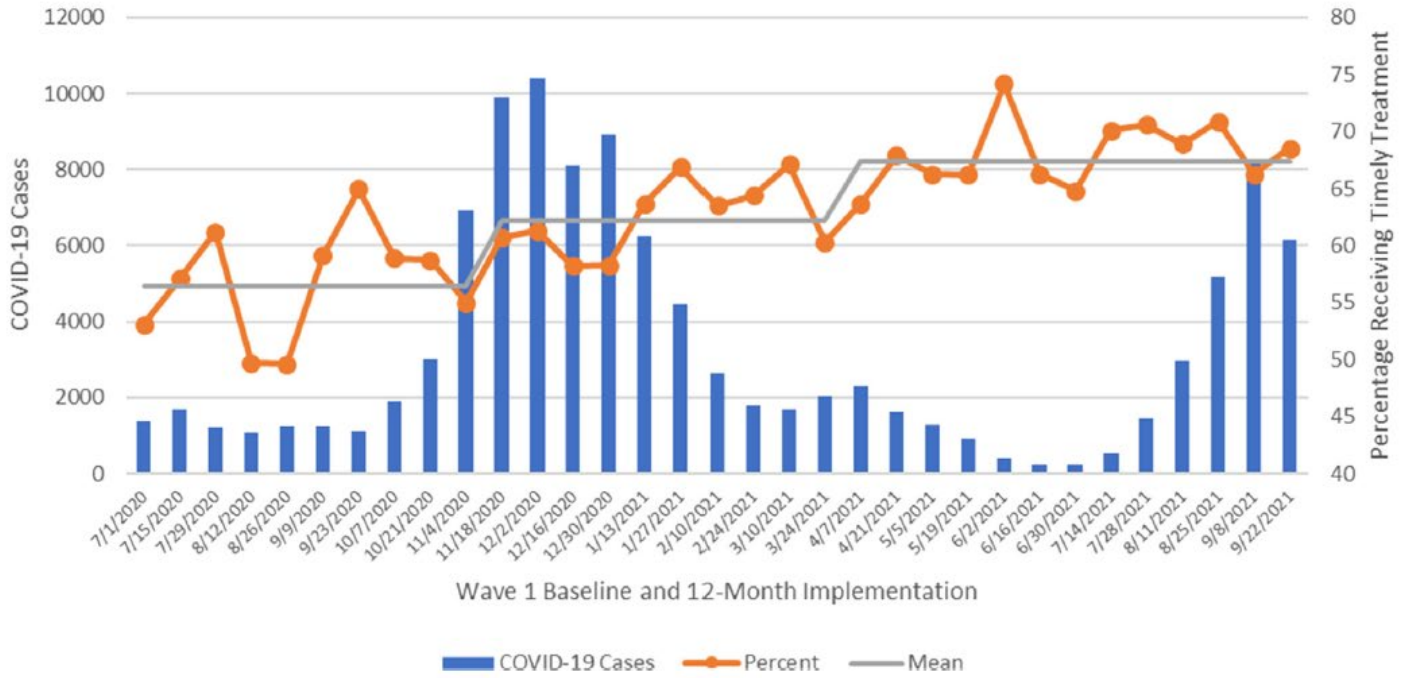
AIM, Alliance for Innovation on Maternal Health; *BP*, blood pressure; *DBP*, diastolic blood pressure; *IR*, immediate release; *IV*, intravenous; *PO*, oral; *SBP*, systolic blood pressure.

Schneider. Maternal hypertension safety project: initial results. Am J Obstet Gynecol MFM 2023.

Ohio: Severe hypertension treated within 60 minutes

FIGURE 3

Severe hypertension episodes treated within 60 minutes and daily COVID-19 cases during baseline and implementation



Schneider. Maternal hypertension safety project: initial results. Am J Obstet Gynecol MFM 2023.

Change in primary and secondary process measures

Process Measure	Baseline Mean	Current Mean	% Increase	P value
Treatment within 60 min	56.5	67.4	19.3	<0.001
Education Materials	72.5	92.4	27.4	<0.001
Follow up scheduled within 10 days (no antihypertensives)	43.6	55.0	26.1	<0.001
Follow up scheduled within 72 hrs of discharge (on antihypertensive therapy)	14.5	38.6	166.8	<0.001
BP Cuff Provided	38.4	65.4	70.4	<0.001

Schneider P, Lorenz A, Menegay MC, et al. The Ohio Maternal Safety Quality Improvement Project: initial results of a statewide perinatal hypertension quality improvement initiative implemented during the COVID-19 pandemic. Am J Obstet Gynecol MFM 2023;5:100912

Illinois Perinatal Collaborative Objectives:

1) Reduce the rate of severe morbidities in women with severe preeclampsia, eclampsia, or preeclampsia superimposed on pre-existing hypertension by 20% over the course of the initiative.
2) Increase the proportion of patients with severe maternal hypertension treated within 60 minutes to 80%
3) Increase to 80% the proportion of patients who receive appropriate discharge education and follow-up appointments within 7-10 days post-discharge
4) Increase to 50% the proportion of severe maternal hypertension cases with a debrief

Between January 2016 and October 2017

ILPQC
Illinois Perinatal Quality Collaborative

West Virginia

- Implemented Bundle between between Q4 2020 and Q1 2022

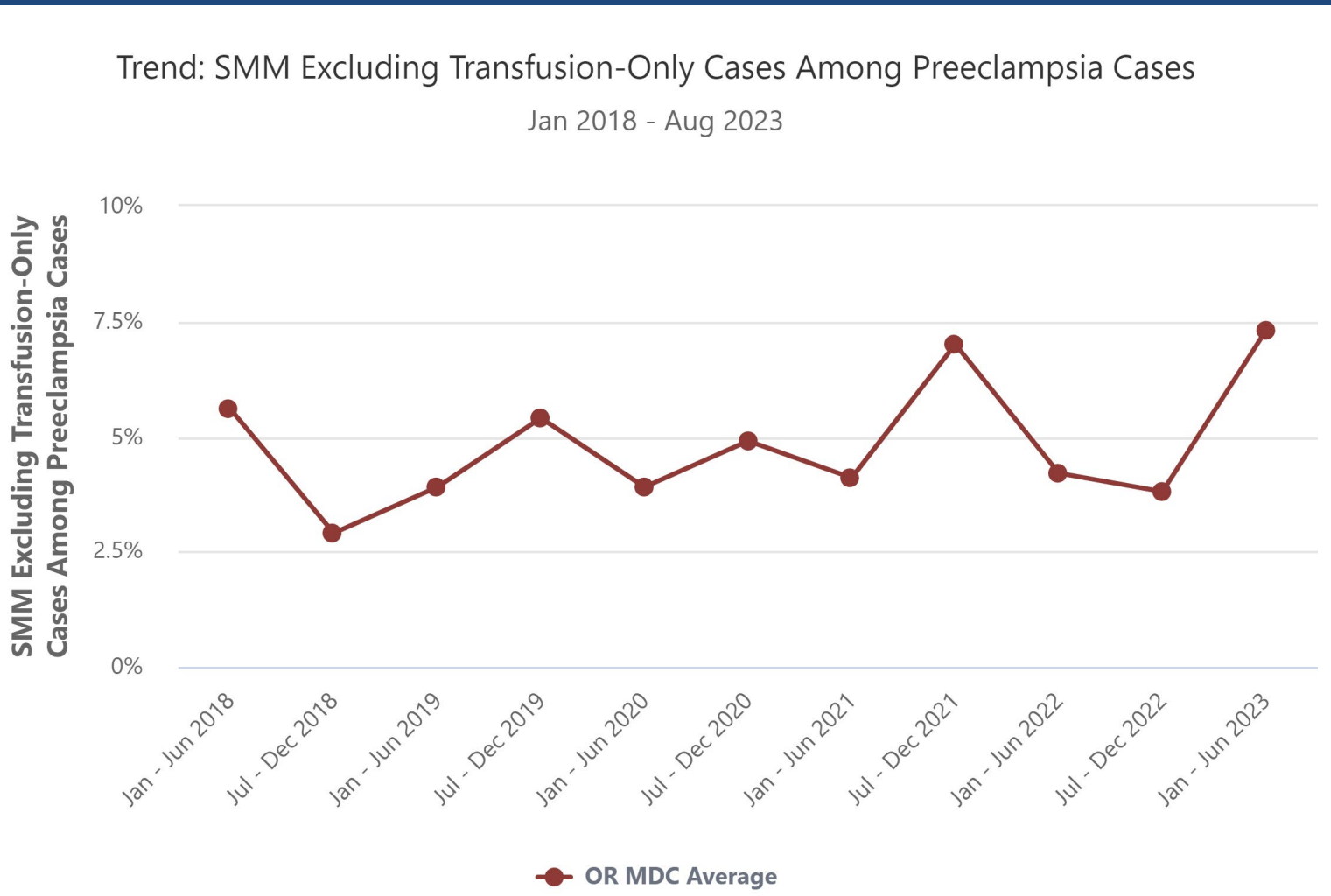
- Statewide rate of SMM among people with preeclampsia decreased from 7.6% in 2017 to 5.4% in 2021, a reduction of 28.9%.

AIM Impact Statements: Severe Hypertension

- Alaska
- Georgia
- Indiana
- Louisiana
- Maryland
- Mississippi
- Missouri
- New Jersey
- Tennessee
- West Virginia

Impact Statements | AIM (saferbirth.org)

Current State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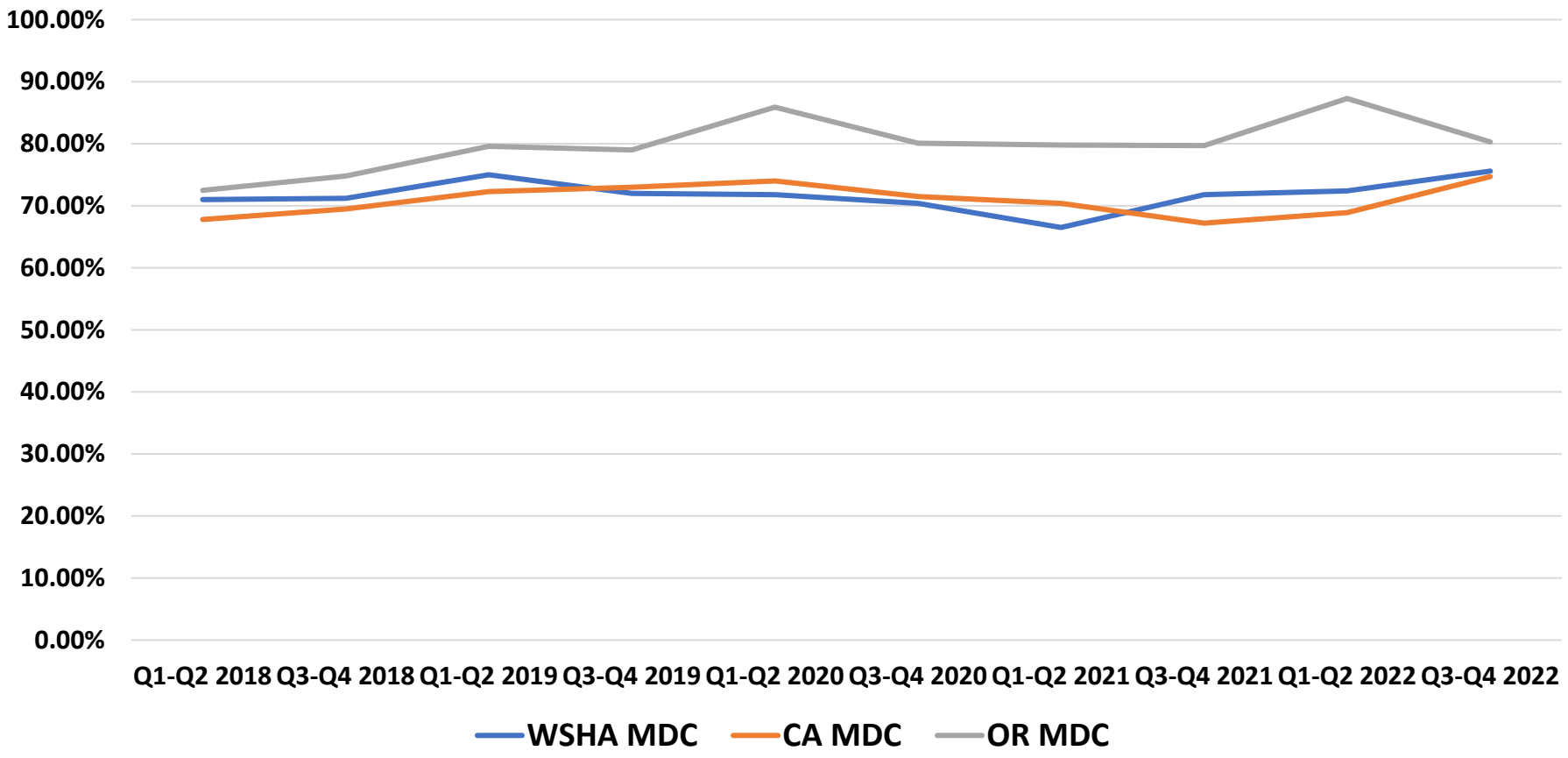
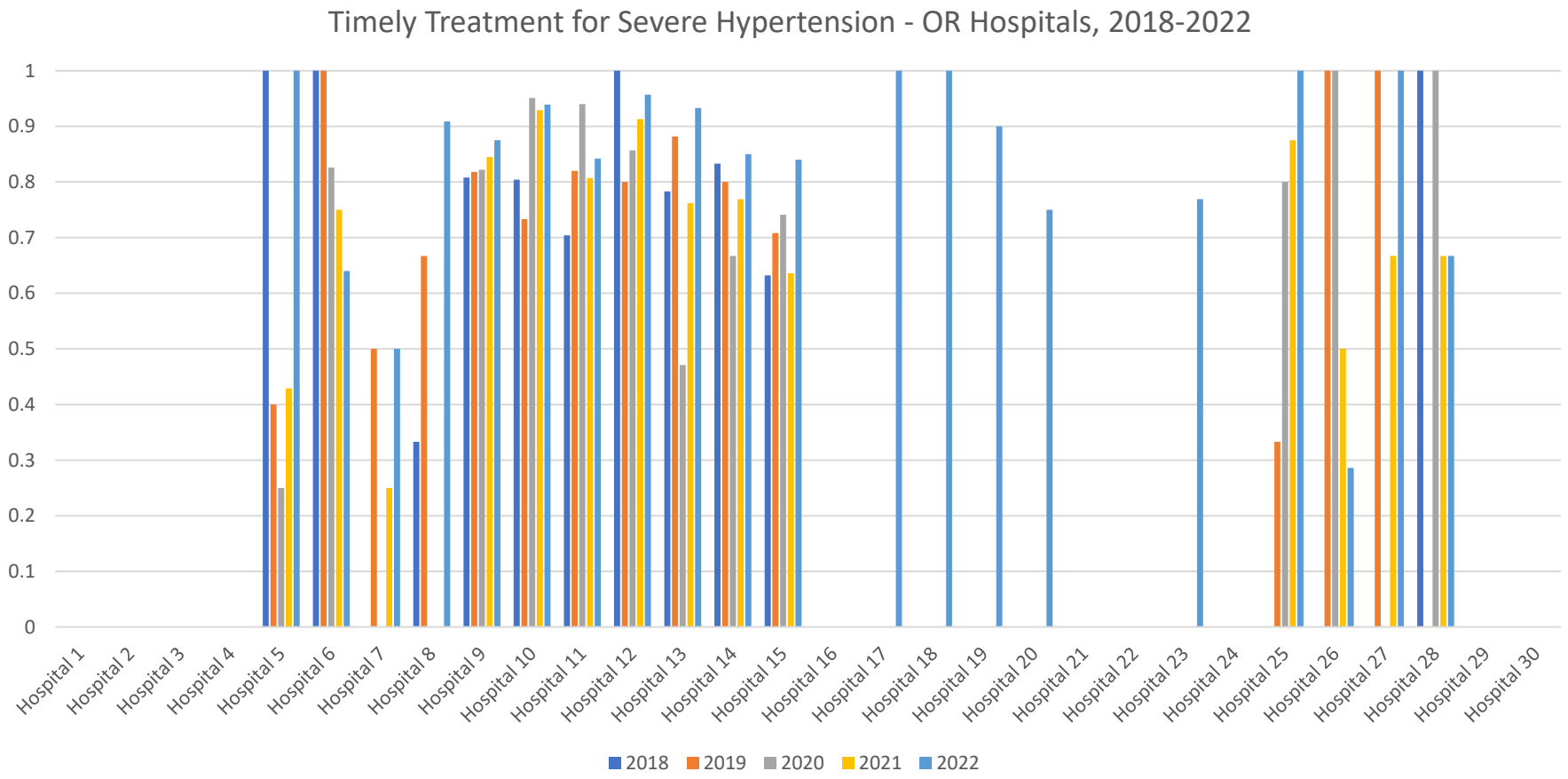
Timely Treatment for Severe Hypertension by State MDC




Timely Treatment for Severe Hypertension - OR Hospitals, 2018-2022
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Hospital 1
Hospital 2
Hospital 3
Hospital 4
Hospital 5
Hospital 6
Hospital 7
Hospital 8
Hospital 9
Hospital 10
Hospital 11
Hospital 12
Hospital 13
Hospital 14
Hospital 15
Hospital 16
Hospital 17
Hospital 18
Hospital 19
Hospital 20
Hospital 21
Hospital 22
Hospital 23
Hospital 24
Hospital 25
Hospital 26
Hospital 27
Hospital 28
Hospital 29
Hospital 30
2018
2019
2020
2021
2022

Summary of current State: Oregon

- Prevalence of HDP in Oregon is approximately 8%, 46th highest of 50 States
- SMM among cases of Preeclampsia ranges from 2.5 to 7.5% (National Average 5%)
- Significant range in SMM associated with race/ethnicity
- Timely Treatment of HTN reported in 18/30 reporting hospitals
- In reporting hospitals, timely treatment is 80%

Next Steps: OPC Severe Hypertension Bundle

- Recruit participants
- Set Objectives
- Set plan for rollout

Thank you!