Agenda

- Query summary for current contract year

- Updated respiratory viral illness surveillance information

- Cardiac complications after COVID infection

- Pre-exposure prophylaxis for HIV

- Gestational diabetes and hypertension

- Manuscripts

- Renewal contracts for 2024-25

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Scope of work for 2023-24

- Contract period from October 2023-July 2024

- 1-2 queries per month with expected number of 12 for the 10-month period; range of topics from respiratory viral illness to chronic disease

- Refresh COVID CDMs when needed (turned out to be unnecessary for most sites)

- Contribute patient-level datasets for ongoing work, with access for CDC analysts and investigators

- Contribute as collaborative authors on manuscripts

Queries completed during contract year

- October 23 – respiratory viral illness surveillance

- November 23 – repeat surveillance query using Full CDM

- December 23 – flu and meds

- January 24 – respiratory viral illness surveillance

- February 24 – cardiac complications after COVID

- March 24 – PrEP

- April 24 – gestational diabetes and pregnancy hypertension

- May 24 – respiratory viral illness surveillance

- May 24 – COVID and stroke/VTE

- June 24 – updated flu and meds

- July 24 – cancer screening and follow-up testing/diagnoses; opioid overdoses

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Long run times in some queries

○ Made significant progress on reducing run times from last Summer

○ Noted some increased run times with a few of this year's queries; some troubleshooting and adjustments improved

○ Recognize that future queries that are highly complex could have issues with run times

- Have a solution that could employ if necessary

- Might require some query reengineering

Summary of infrastructure innovations to date

○ Sites developed capability to develop rapidly refreshed CDMs – no longer need for the majority of sites

○ Reusable modular program now has capability of utilizing

- Mortality, immunization, laboratory, and payer type data
- Can accommodate queries using laboratory and vital sign information for categorizing cohorts
- Can complete analyses using distributed analytics, including regression modeling

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Provision of patient-level data for analytics

- Patients with COVID – currently have data from 27 sites for patients 20+ years of age, April 2022 – March 2024
  - Data updated from 2 prior queries (through Dec 22 & Sept 23)
  - Added a few additional variables with queries – vaccines, census bureau region, area deprivation index, underlying use of medications
  - Will soon add additional 7 sites that have had some delays in processing
- Patients with flu initially treated in the outpatient setting during 2022-23 and 2023-24 seasons
  - Data updated from only 2022-23 season
- Data stored on LPHI server with access given to CDC analysts

Surveillance query, April 2022 to March 2024

	All patients	COVID	Flu	RSV
All Children	**11.7 million**	340k	530k	155k
+ Underlying medical condition		91k	184k	
Adults	30 million	1.8 million (31% treated with pax)	437k (54% treated)	40k
+ Underlying medical condition		1.1 million (33% treated)	255k (56% treated)	

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Adults and cases, Oct 2022 to March 2024
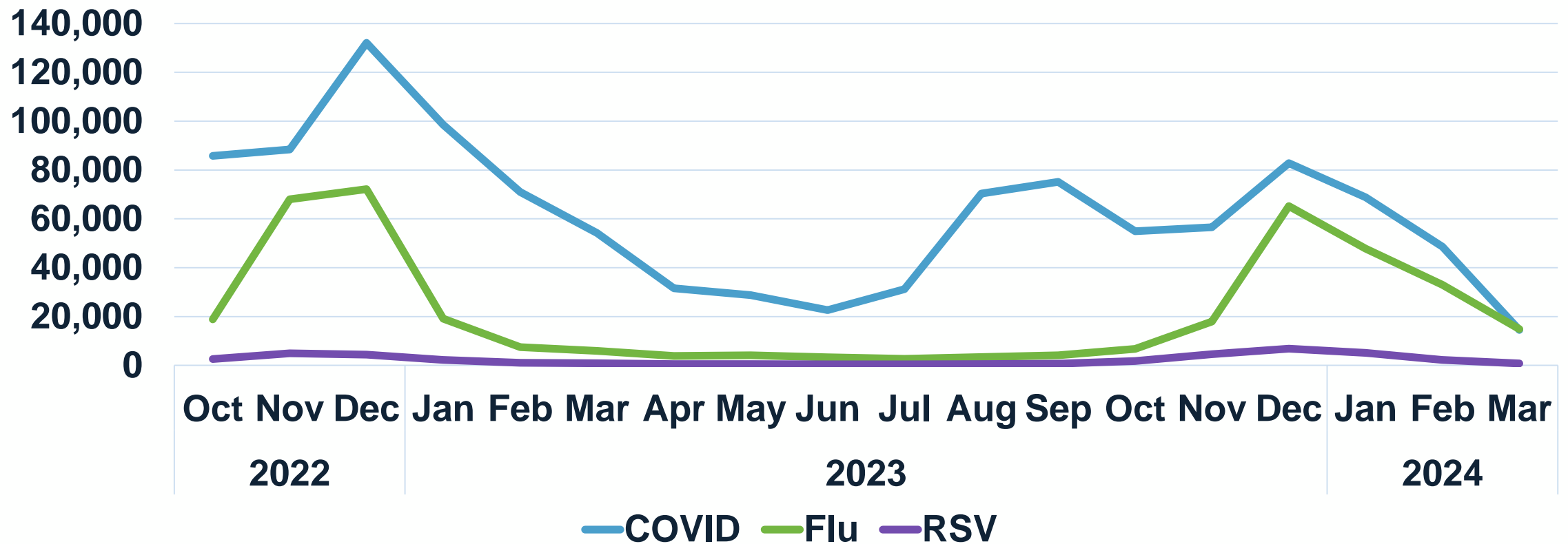
Children and cases, Oct 2022 to March 2024
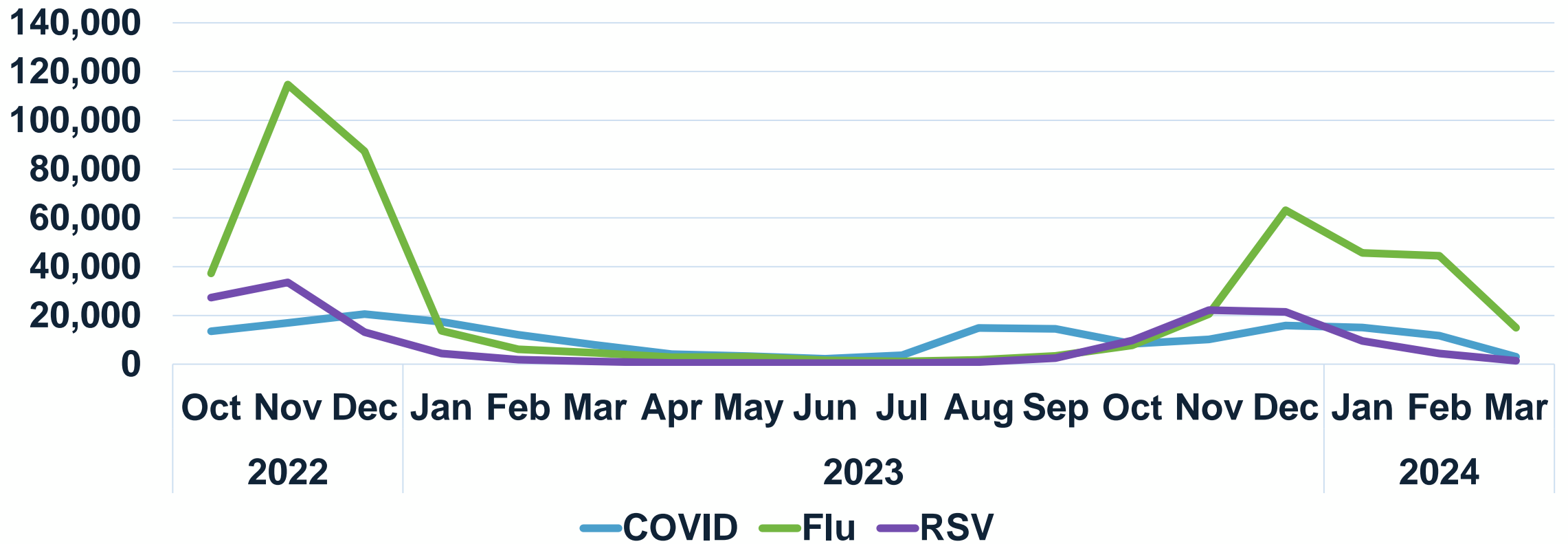
Cardiac outcomes after COVID infection

Cardiac outcomes after SARS-CoV-2 infection, Vaccinated vs not: January 2022-December 2023

- Ages: 6 months and up; stratified by age and sex

- Examined two cohorts with documented SARS-CoV-2 positive test and/or evidence of use of a COVID-19-specific therapeutic prescription/administration

  1. Documented prior mRNA COVID-19 vaccine 30+ days prior to infection
  2. No documented prior mRNA COVID-19 vaccine

- Exclusions: patients with vaccine in the 30 days prior to index, patients with outcomes in the year prior to HEI, sites with low vaccination rates

- Outcomes: Incidence per 100k of myocarditis, myocarditis/pericarditis, myocarditis/pericarditis/MIS

Analysis

- Obtained aggregate data output from sites; combined across sites

- Calculated incidence per 100,000 patients in the -3 to -1, 7- and 21-day risk windows

- Calculated risk ratios for outcomes (vaccine/no evidence of vaccine) with 95% confidence intervals; used Fisher's exact tests to compare statistical significance

Characteristics of patients

		Prior vaccine 30+ days prior N=528,429	No documented prior vaccine N=802,644
Age	6M-11y	12,837 (2%)	150,180 (19%)
	12-17y	20,074 (4%)	45,293 (6%)
	18-29y	57,786 (11%)	115,609 (14%)
	30+	437,732 (83%)	491,562 (61%)
Male Sex		203,809 (39%)	452,880 (56%)
Race/Ethnicity	Hispanic	74,072 (14%)	128,426 (16%)
	Non-Hispanic White	344,971 (65%)	436,944 (54%)
	Non-Hispanic, Non-White	90,882 (17%)	195,814 (24%)
High-risk Underlying Conditions		297,825 (56%)	282,459 (35%)

Associations (95% CI) of prior vaccine and cardiac diagnoses in males 21 days after index event

Males, 21 days	RR (95%CI)
6 months - 4 years	
Myocarditis	NC
Myocarditis, pericarditis, or MIS	NC
5 - 11 years	
Myocarditis	NC
Myocarditis, pericarditis, or MIS	0.24 (0.03, 0.75)
12 - 17 years	
Myocarditis	0.46 (0.10, 2.10)
Myocarditis, pericarditis, or MIS	0.60 (0.26, 1.37)
18 - 29 years	
Myocarditis	0.55 (0.18, 1.63)
Myocarditis, pericarditis, or MIS	0.66 (0.31, 1.38)
30+ years	
Myocarditis	0.44 (0.30, 0.63)
Myocarditis, pericarditis, or MIS	0.48 (0.38, 0.60)
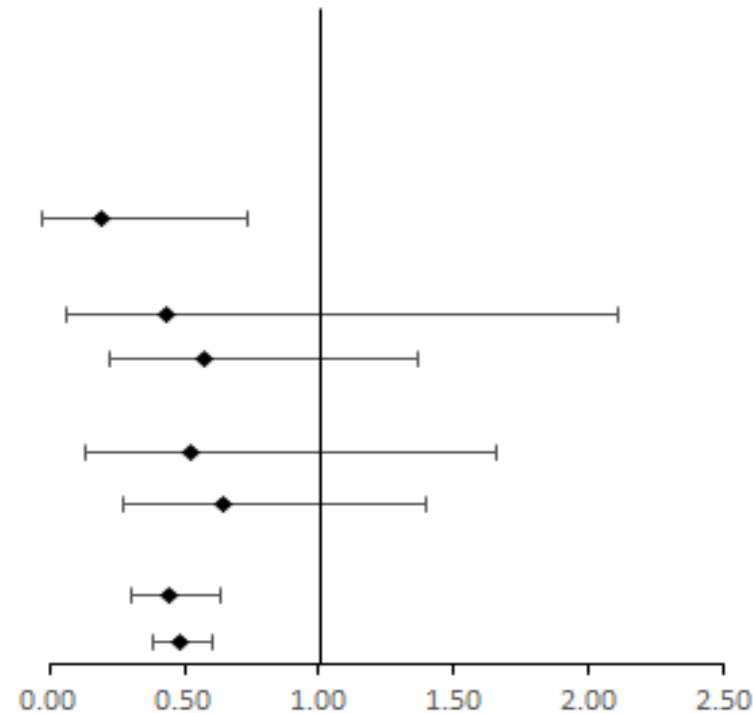
Associations (95% CI) of prior vaccine and cardiac diagnoses in females 21 days after index event

Females, 21 days	RR (95%CI)
6 months - 4 years	
Myocarditis	NC
Myocarditis, pericarditis, or MIS	NC
5 - 11 years	
Myocarditis	5.38 (0.34, 85.97)
Myocarditis, pericarditis, or MIS	0.98 (0.22, 4.41)
12 - 17 years	
Myocarditis	0.34 (0.08, 1.51)
Myocarditis, pericarditis, or MIS	0.59 (0.20, 1.78)
18 - 29 years	
Myocarditis	0.41 (0.09, 1.89)
Myocarditis, pericarditis, or MIS	0.56 (0.24, 1.31)
30+ years	
Myocarditis	0.42 (0.29, 0.63)
Myocarditis, pericarditis, or MIS	0.48 (0.38, 0.61)
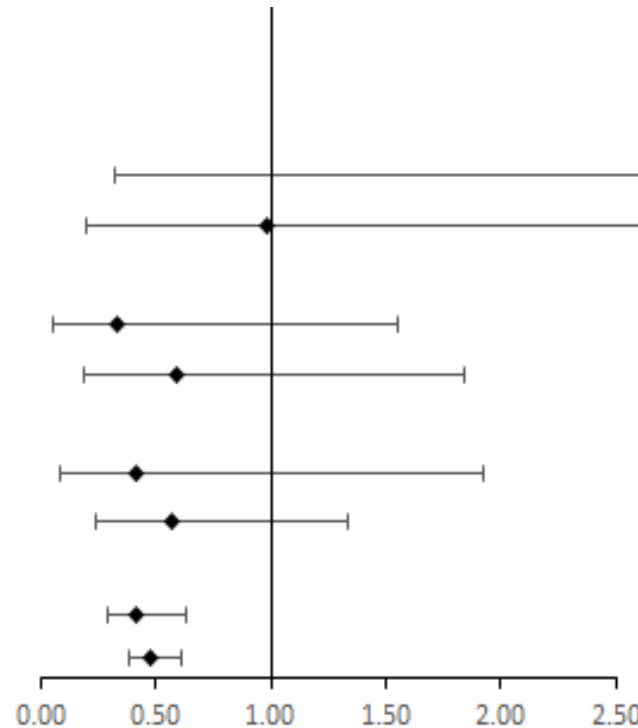
Surveillance of pre-exposure prophylaxis (PrEP) for HIV

Pre-exposure prophylaxis for HIV - Background

Query distributed in March 2024 to 34 DataMarts

- Query Period: Jan 1, 2017 – Dec 31, 2023

- Inclusion
  - Prescription for a PrEP drug
  - 16 years of age or older
  - At least one encounter during query period

- Exclusion
  - PEP prescription within 30 days of index PrEP prescription
  - HIV diagnosis **or** Hepatitis B diagnosis in the 3 years prior to index prescription

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Results

At a Glance

127,159 — Number of patients in PrEP cohort

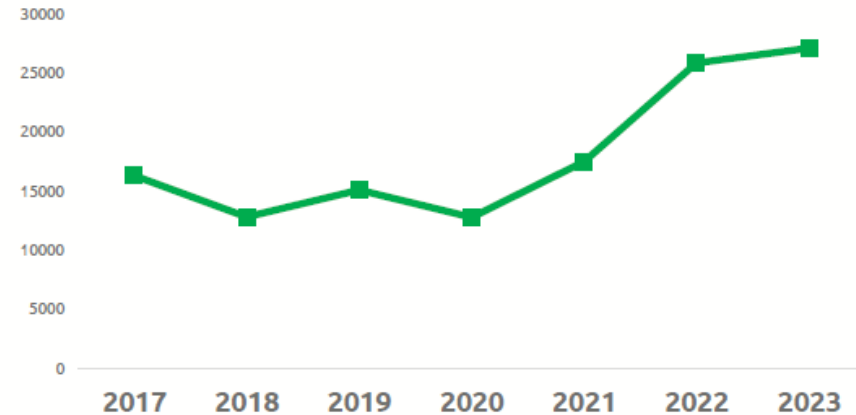**36** — Mean age of PrEP cohort

~6x — % magnitude of PrEP patients covered by commercial insurance (1.97%) compared to Medicaid (0.31%)
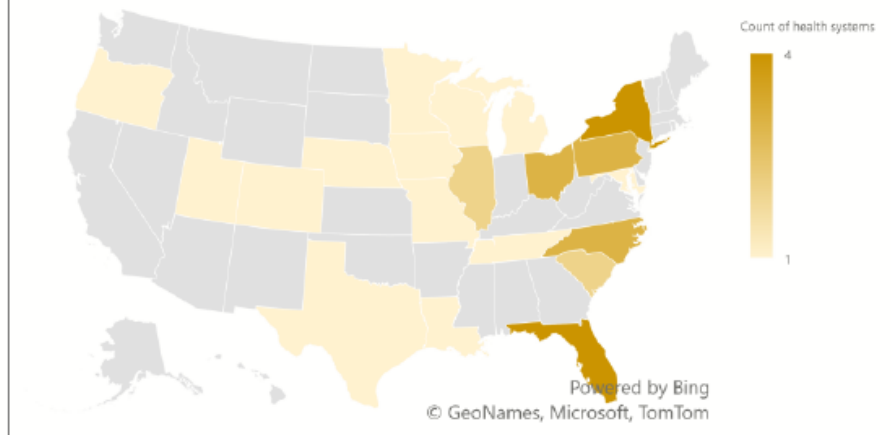
92 — % of PrEP patients living in an urban area

Number of patients with PrEP prescription*
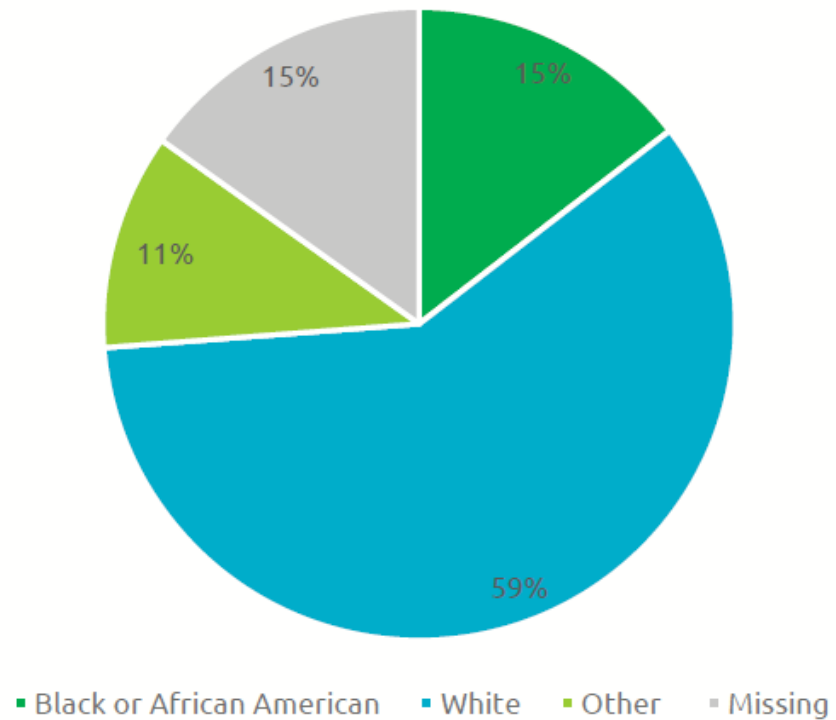
*Not presented as a percentage of total population

Geographic distribution of participating PCORnet Data Marts in this query (N=34)

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by Race
2017 – 2023

Proportion of patients w PrEP prescription
N=127,159

- Black or African American
- White
- Other
- Missing

15% · 15% · 11% · 59%

Rates of PrEP prescription in total population, by race
N=44,690,164

Black or African American	White	Other
0.25%	0.23%	0.29%
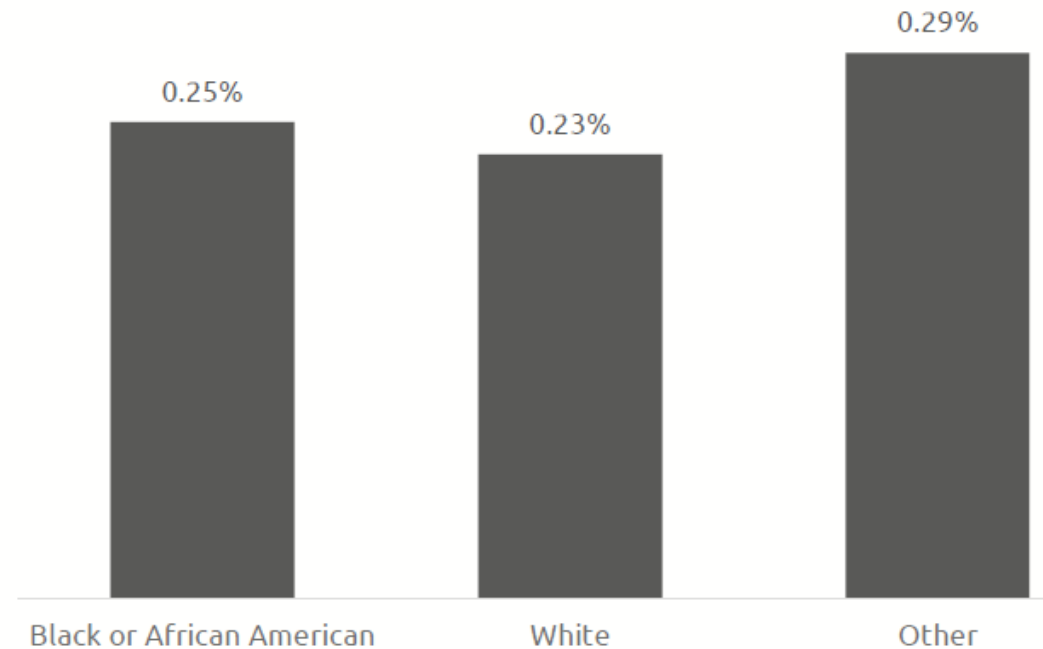
by Payer Type
2017 – 2023

Proportion of patients with PrEP prescription
N=127,159

- Medicare — 4%
- Medicaid — 13%
- Other Government — 3%
- Commercial — 43%
- Self Pay — 2%
- Other — 0%
- Missing — 34%
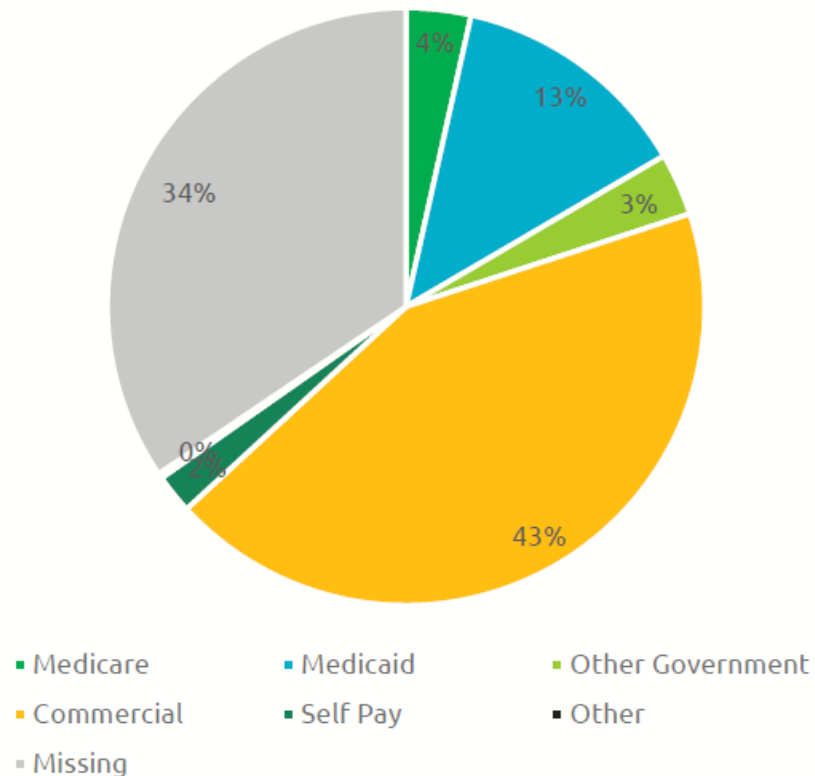
Rates of PrEP prescription in total population, by Payer Type
N=37,178,820*

Medicare	Medicaid	Other Government	Commercial	Self Pay	Other
0.07%	0.31%	0.02%	1.97%	0.11%	0.07%
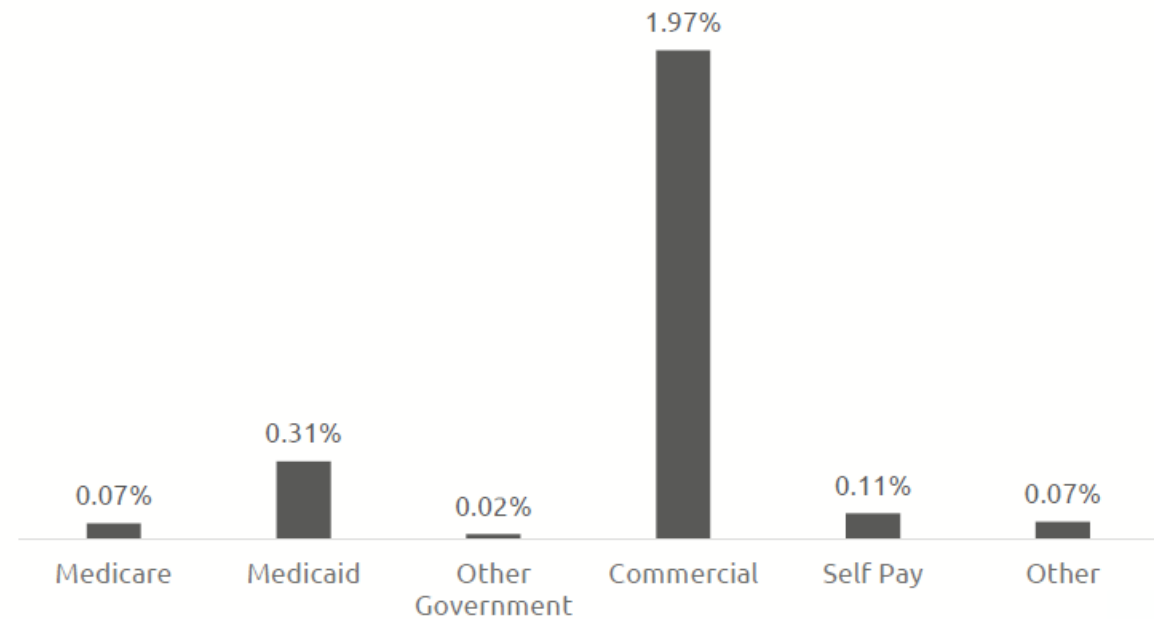
Findings
N=125,829

- Highest rate of PrEP Rx (compared to other subgroups):
  - Age 25-34
  - Male
  - Other Race (Asian, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, Multiple Race)
  - Hispanic
  - Urban
  - High area deprivation (i.e. low SES)
  - Commercial insurance
  - Pacific states (California, Oregon, California)

- Low rates of PrEP prescription in the South despite high HIV prevalence rates (CDC, 2023)

Gestational diabetes and pregnancy hypertension surveillance

Creation of GDM and pregnancy hypertension cohorts

○ Identified cohorts of patients with

- Incident gestational diabetes or diabetes diagnosed during pregnancy
- Prevalent hypertension, either chronic or pregnancy induced

○ Stratified by year (18-19, 20-21, 22-23), race/ethnicity

○ Separately assessed levels of bp control after pregnancy

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Covariates that collected in query

- Demographics

- Record in 1-3 years: COVID, cerebrovasc disease, HTN, preDM, DM, depression, postpartum depression, anxiety, ADHD, PCOS, weight change, glyburide, nutrition referrals, antipsychotics

- During pregnancy: hypertension and medication use, pregnancy hypertension, gestational diabetes, eclampsia, glucose measures, OGTT, visits, metformin, insulin

- Delivery outcomes: induction, instrument, csection, postpartum hemorrhage, preterm, stillbirth, etc

Gestational diabetes or diabetes incidence during pregnancy over time

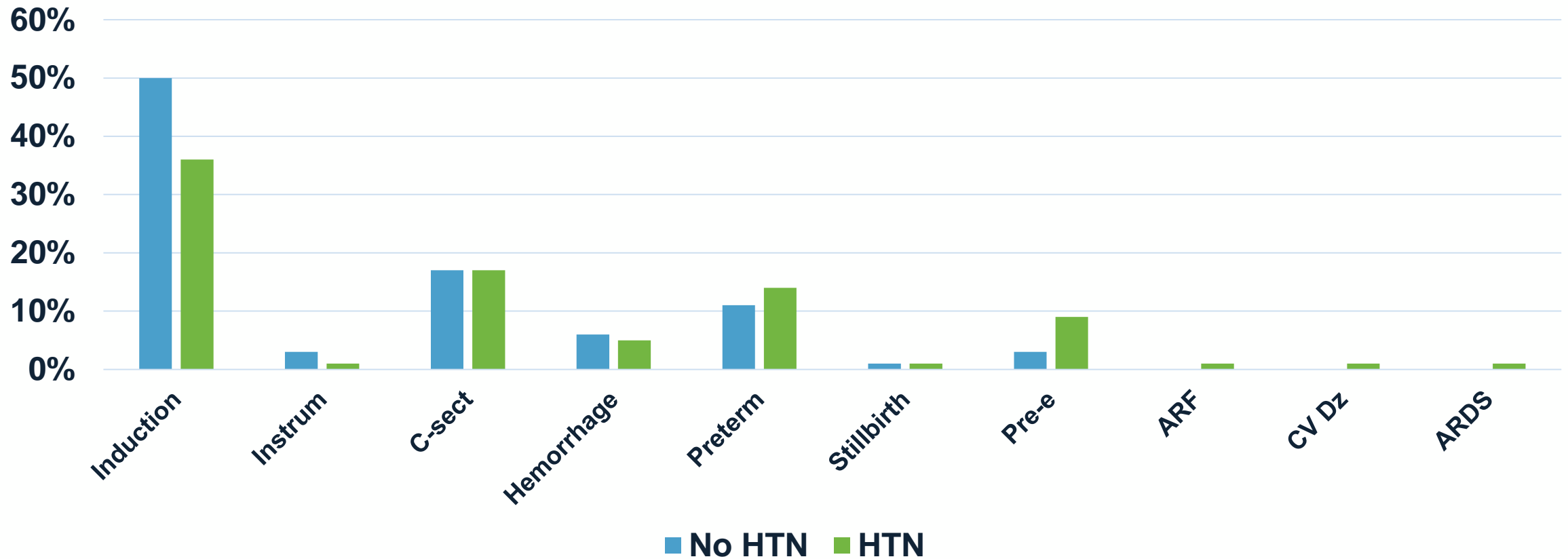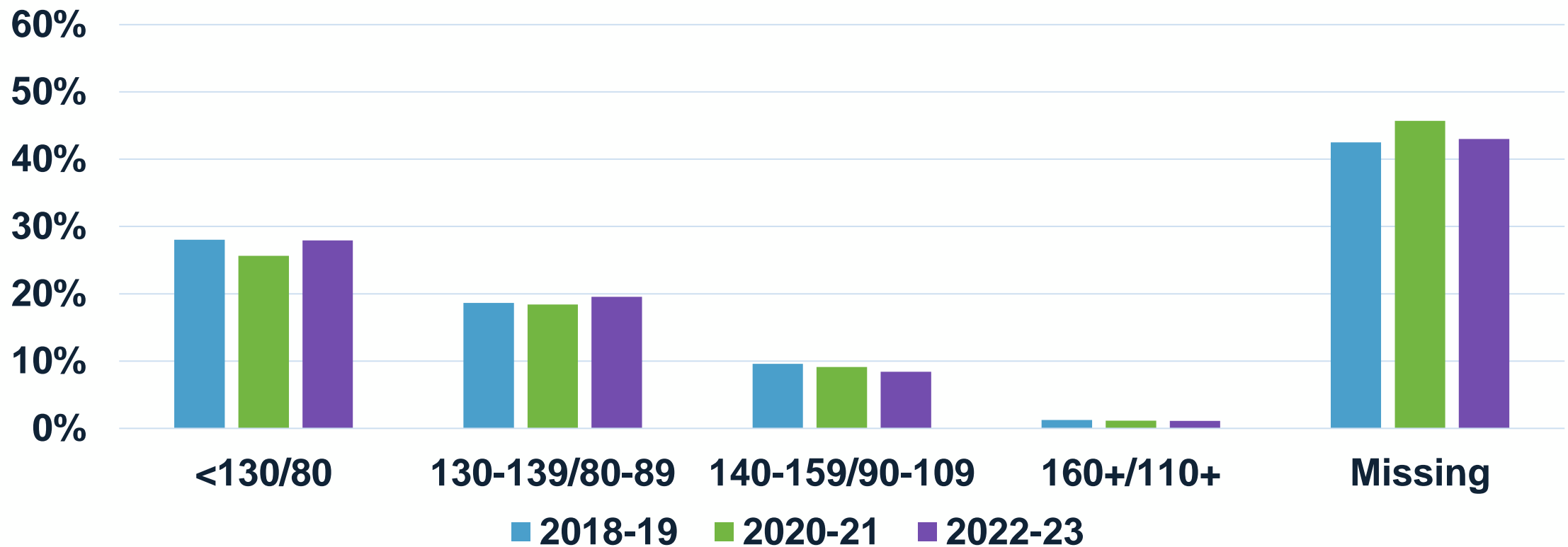|	N total deliveries	N delivery & no diabetes	% gestational diabetes				
			Overall	Hisp	Black	White	Other
2018-19	307,001	271,289	8.1%	9.2%	7.5%	7.0%	12.7%
2020-21	309,446	268,726	8.7%	9.7%	8.4%	7.5%	13.3%
2022-23	336,789	285,660	9.8%	10.6%	9.5%	8.5%	15.4%

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GDM Delivery Outcomes
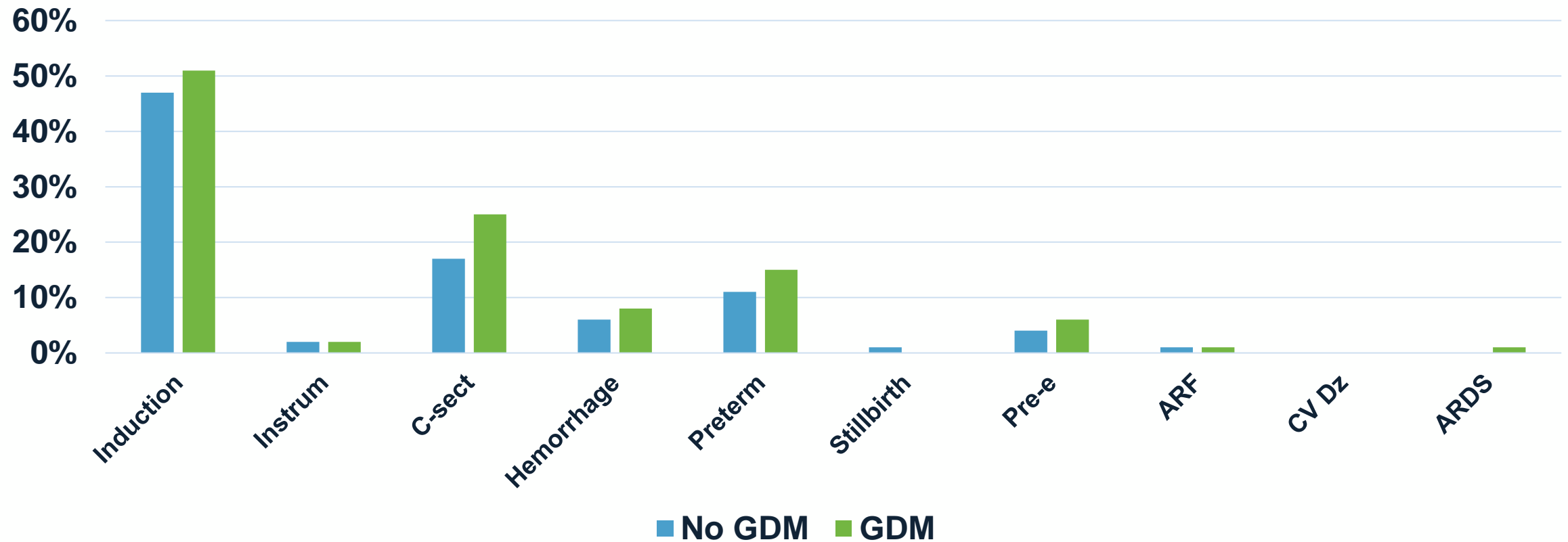
HTN (before and during preg) prevalence over time

	N total deliveries	N delivery & no HTN	% HTN (before or during preg)				
			Overall	Hisp	Black	White	Other
2018-19	382,530	335,131	16.2%	20.0%	23.2%	16.9%	15.8%
2020-21	395,262	339,315	18.8%	14.1%	26.8%	19.3%	18.8%
2022-23	420,346	349,736	22.0%	17.1%	30.4%	22.6%	24.5%

HTN Delivery Outcomes

Legend: No HTN, HTN

BP control 7-84 days after delivery, patients with HTN

Bar chart showing percentage of patients by BP category across three time periods (2018-19, 2020-21, 2022-23):

- **<130/80**: 2018-19 ≈ 28%, 2020-21 ≈ 26%, 2022-23 ≈ 28%
- **130-139/80-89**: 2018-19 ≈ 19%, 2020-21 ≈ 18%, 2022-23 ≈ 19%
- **140-159/90-109**: 2018-19 ≈ 10%, 2020-21 ≈ 9%, 2022-23 ≈ 8%
- **160+/110+**: all ≈ 1%
- **Missing**: 2018-19 ≈ 42%, 2020-21 ≈ 46%, 2022-23 ≈ 43%

Legend: ■ 2018-19 ■ 2020-21 ■ 2022-23

BP control 7-84 days after pregnancy among patients with HTN and non-missing BP measures

Legend: ■ 2018-19 ■ 2020-21 ■ 2022-23

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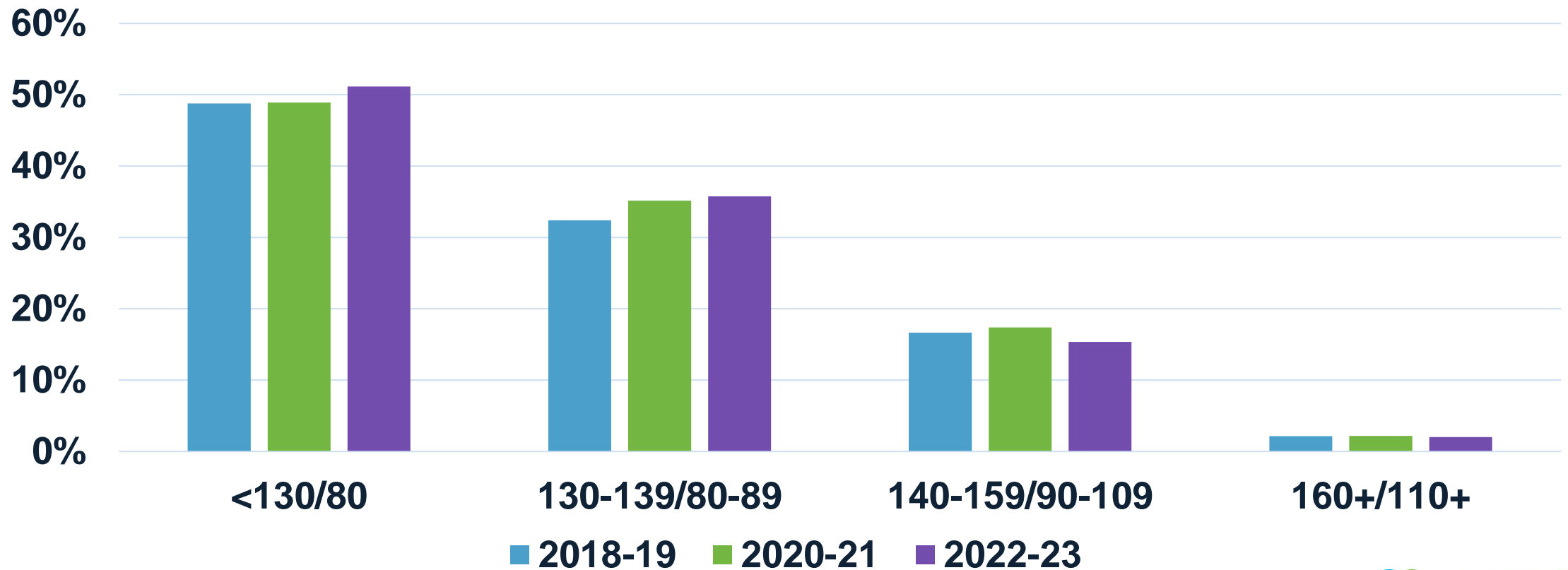
Manuscript updates – 3 published with site authors

- Jackson SL, Woodruff R, Nagavedu K, Fearrington J, Rolka D, Twentyman E, Carton T, Puro J, Denson JL, Kappelman MD, Paranjape A, Thacker D, Weiner MG, Goodman AB, Lekiachvili A, Boehmer TK, Block JP, on behalf of PCORnet Collaborative Authors. Association between hypertension and diabetes control and COVID-19 severity, PCORnet, United States, March 2020-February 2022. J Am Heart Assoc. 2023. 12(21): e030240. PMID: 37850404.

- Zhang Y, Romieu-Hernandez A, Boehmer TK, Azziz-Baumgartner E, Carton TW, Gundlapalli AV, Fearrington J, Nagavedu K, Dea K, Moyneur E, Cowell LG, Kaushal R, Mayer KH, Puro J, Rasmussen SA, Thacker D, Weiner MG, Saydeh S, Block JP, PCORnet Network Partners. Association between SARS-CoV-2 infection and select symptoms and conditions 31 to 150 days after testing among children and adults. BMC Infect Dis. 2024; in press.

- Jackson SL, Lekiachivili A, Block JP, Richards TB, Nagavedu K, Draper CC, Koyama AK, Womack LS, Carton TW, Mayer KH, Rasmussen SA, Trick W, Chrischilles EA, Weiner MG, Podila PS, Boehmer BK, Wiltz JL, on behalf of PCORnet Network Partners. Preventive service utilization and new chronic disease diagnoses: Using PCORnet data to identify emergent trends, United States, 2018-2022. Prev Chronic Dis. 2024; in press.

More papers in process

○ Drafted

- Exploration of trend in disease severity from COVID, May 2020 – November 2022

- Cardiac complications after COVID among those vaccinated vs. not

○ Preliminary analyses completed

- Predictors of hospitalizations and death among patients with COVID, all patients 20+ years of age – *patient-level data*

- Disparities in uptake of oral antivirals – *patient-level data*

Manuscripts under consideration

- Assessing data currently available

  - Flu medication effectiveness – *patient-level data*

  - Trends in uptake of pre-exposure prophylaxis for HIV

  - Characteristics of patients with gestational diabetes and hypertension during pregnancy

  - Stroke and venous thromboembolism after COVID infection

- Possible manuscripts once data full processed

  - Cancer screening and follow-up testing/diagnoses

  - Readmissions to ED after opioid overdose and use of opioid use disorder medications

Contract for 2024-25

- CDC has expressed interest in continuing our collaboration and expect to have some continuing of project, starting October 2024

- Some structural changes expected in way that CDC funds projects through cooperative agreements

- Expect that project funding for the next year will be less than this past year and might have to trim some sites; also expect fewer queries to fit with a small site budgets (initial ideas are for 5-6 queries in the next contract)

- All details are pending because limited information available to date; probably will not get clarity until August/September

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Thank you!

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Thanks to Liz Crull for reuse of slides