

# Healthy Outcomes Plan (HOP) 2018 Evaluation Report

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Prepared Under Contract to the  
SC Department of Health and Human Services

Presented by

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Institute for Families in Society



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# HOP Evaluation Team

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# ACKNOWLEDGMENTS

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- The SC Department of Health and Human Services (DHHS) for the leadership and vision that made the HOP intervention possible to implement
- The HOP partners and participants whose experiences helped to inform this presentation
- The HOP Data Team for their efforts in support of this evaluation – SCHA and RFA
- The HOP Evaluation Team at the Institute for Families in Society at USC



# DISCLOSURES

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- I have no actual or potential conflict of interest in relation to this presentation.
- The content of this presentation does not relate to any product or commercial interest.
- I do not have a financial relationship/interest in any aspect of this data or presentation.



# FRAMING THE HOP PROGRAM:

## Background



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# ENVISIONING A NEW SERVICE DELIVERY FUTURE:

## Hospital and Clinic Innovation Proviso

- SC's HOP supports participating hospitals' delivery models to coordinate care for chronically ill, uninsured, high utilizers of emergency department (ED) services(at least 5 avoidable ED visits).
- Size of the hospital determined the target number of participants HOPs were required to identify and serve.

Minimum target  
of 50 for smallest  
hospitals



Target of at least 750  
for each of the 3  
largest metropolitan  
hospitals



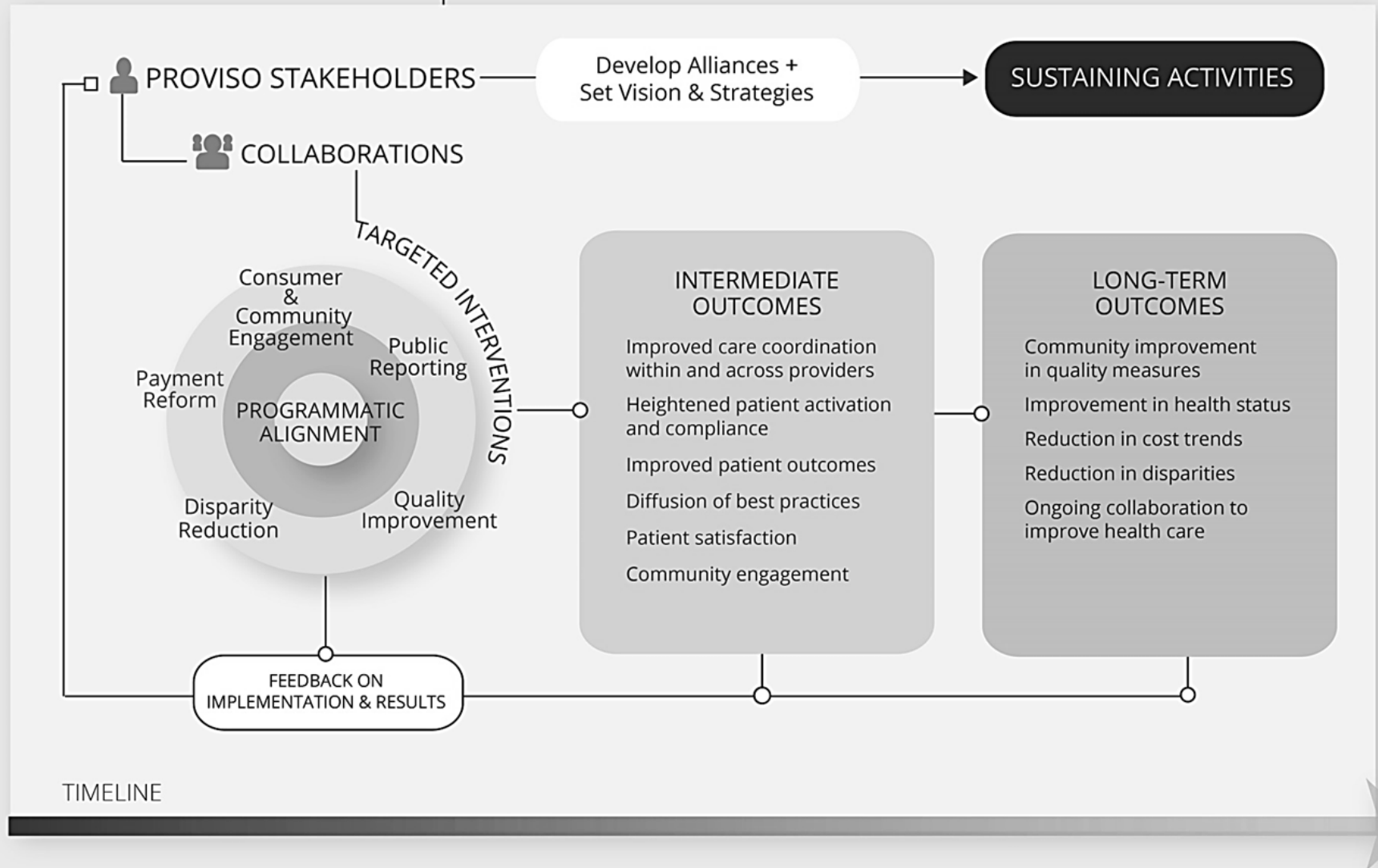
All SC hospitals  
with EDs are in  
the program.



# Hospital and Clinic Proviso EVALUATION FRAMEWORK

**PROVISO CONTEXT:**  
Health Care Reform

**TECHNICAL ASSISTANCE**



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# HOP Intervention Key Components

(July 2013 – Current)

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- Patient Medical Home  
(Comprehensive Physical Exam)
- Initiation of Care Plan
  - Social Determinants Assessment and Intervention Efforts
  - Patient Activation Measure<sup>©</sup> (PAM)
  - Global Appraisal of Individual Needs-Short Screener (GAIN-SS)
- Wilder Collaboration Index (Partnership Assessment)
- Robust Clinical and Economic Evaluation





# Key Findings

**STATISTICALLY SIGNIFICANT**

reductions in:



**ED VISITS  
& INPATIENT  
STAYS**

(Overall & preventable)



**ED & INPATIENT  
PROCEDURES**



**ED & INPATIENT  
COST**



# FRAMING THE HOP PROGRAM:

## Contextual Factors

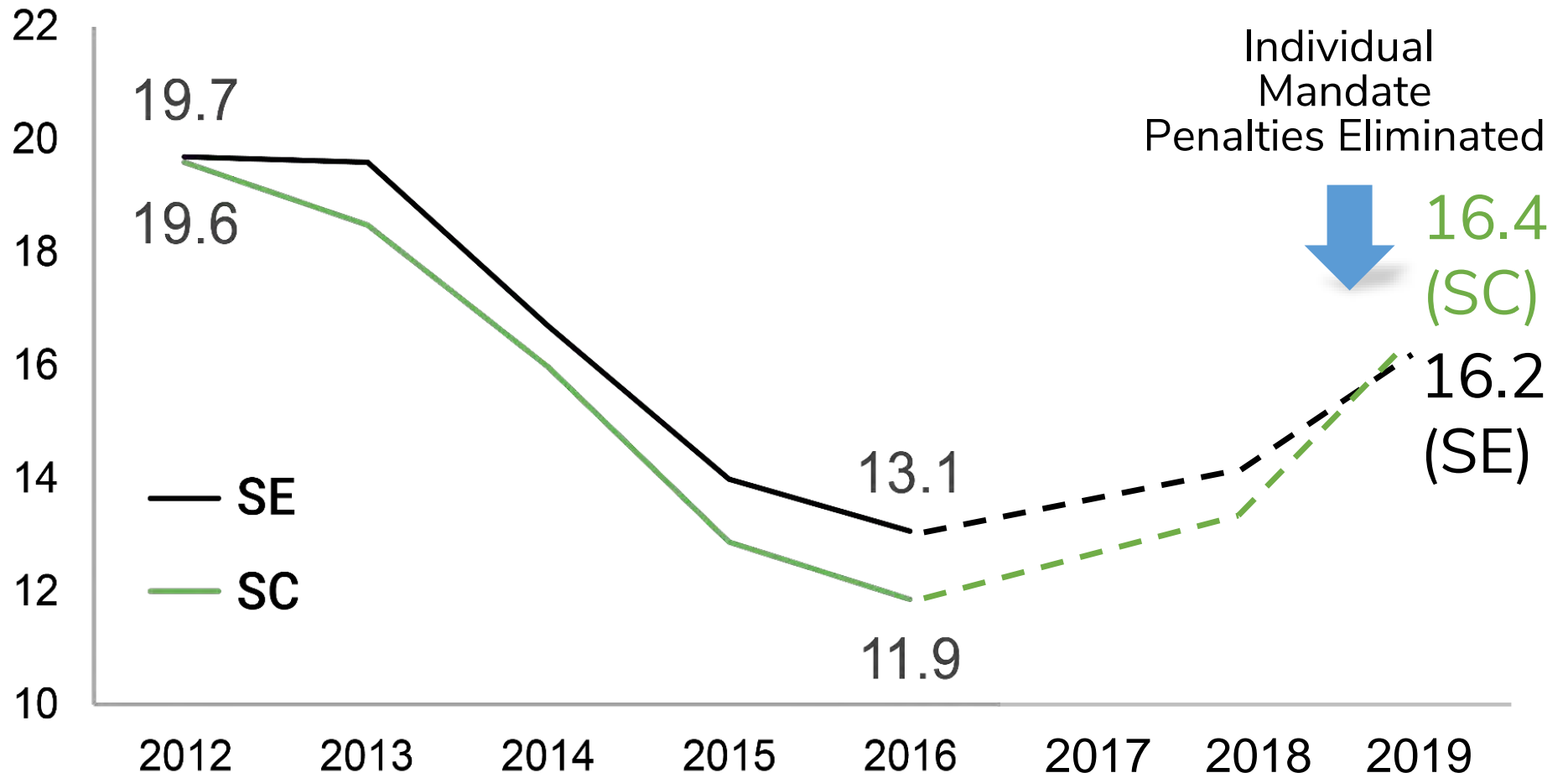


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# % Uninsured (Ages 0 to 64 Years), 2012-2019

(2017 to 2019 Estimated)

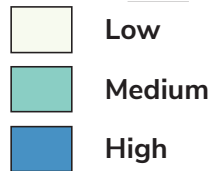
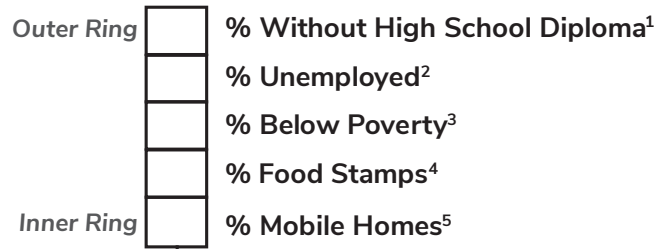


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Sources: ACS 1-Year Surveys, 2012-2016; Gallup-Sharecare Wellbeing Index, 2017; Buettgens, 2018.

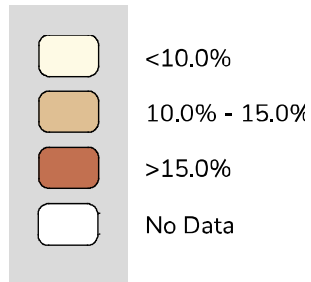
# Social Determinants of Health and HOP Participants

## Ring Key: Social Determinants of Health



County in Highest Class for 4 or more Social Determinants of Health Data Distributions

**BASEMAP:**  
Percent of HOP Participants to Uninsured, Impoverished Adults Below 138% of Federal Poverty Level

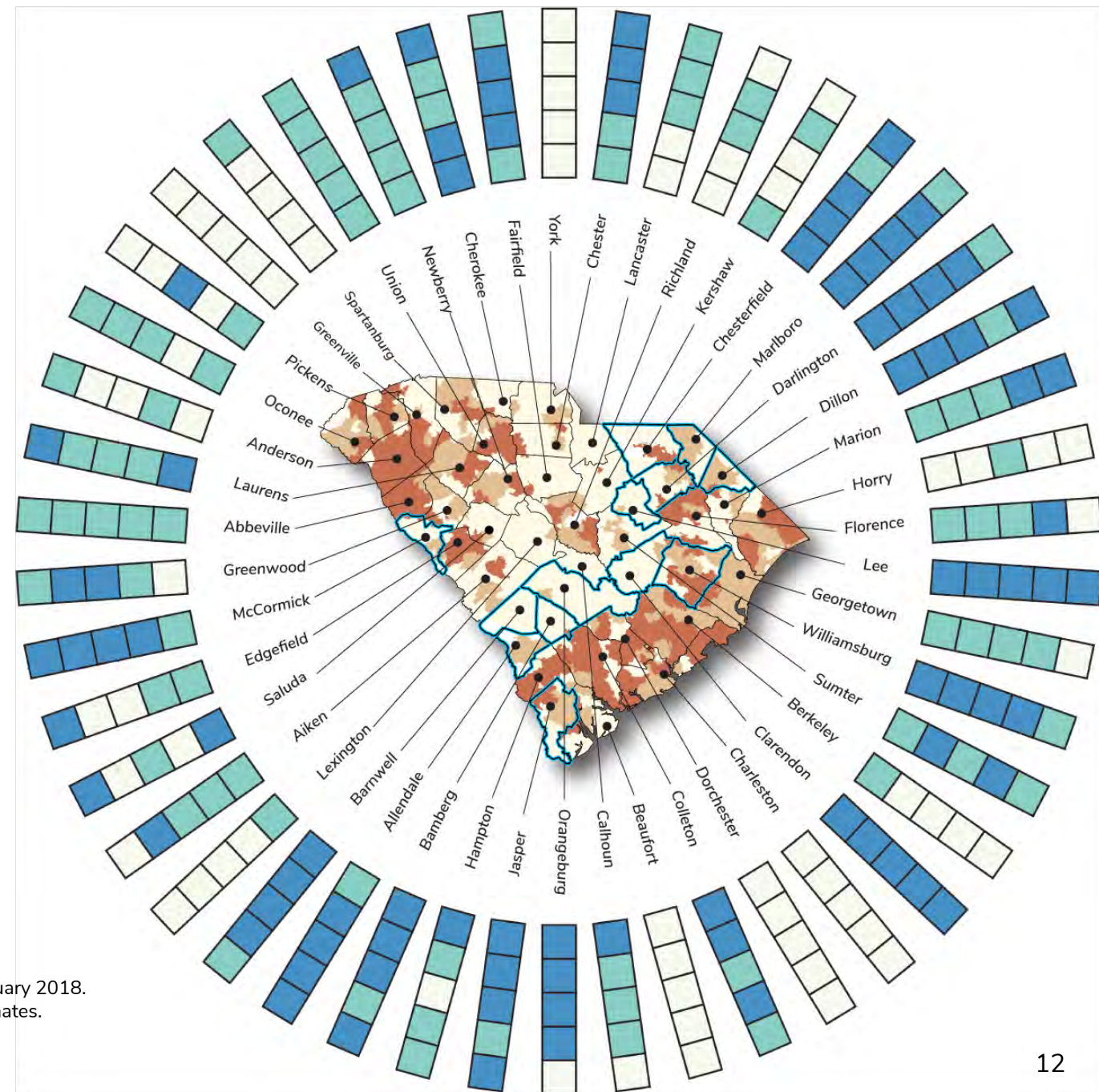


HOP Participants Statewide **(31,681)**

Impoverished Adults Below 138% of FPL **(251,036)**

=

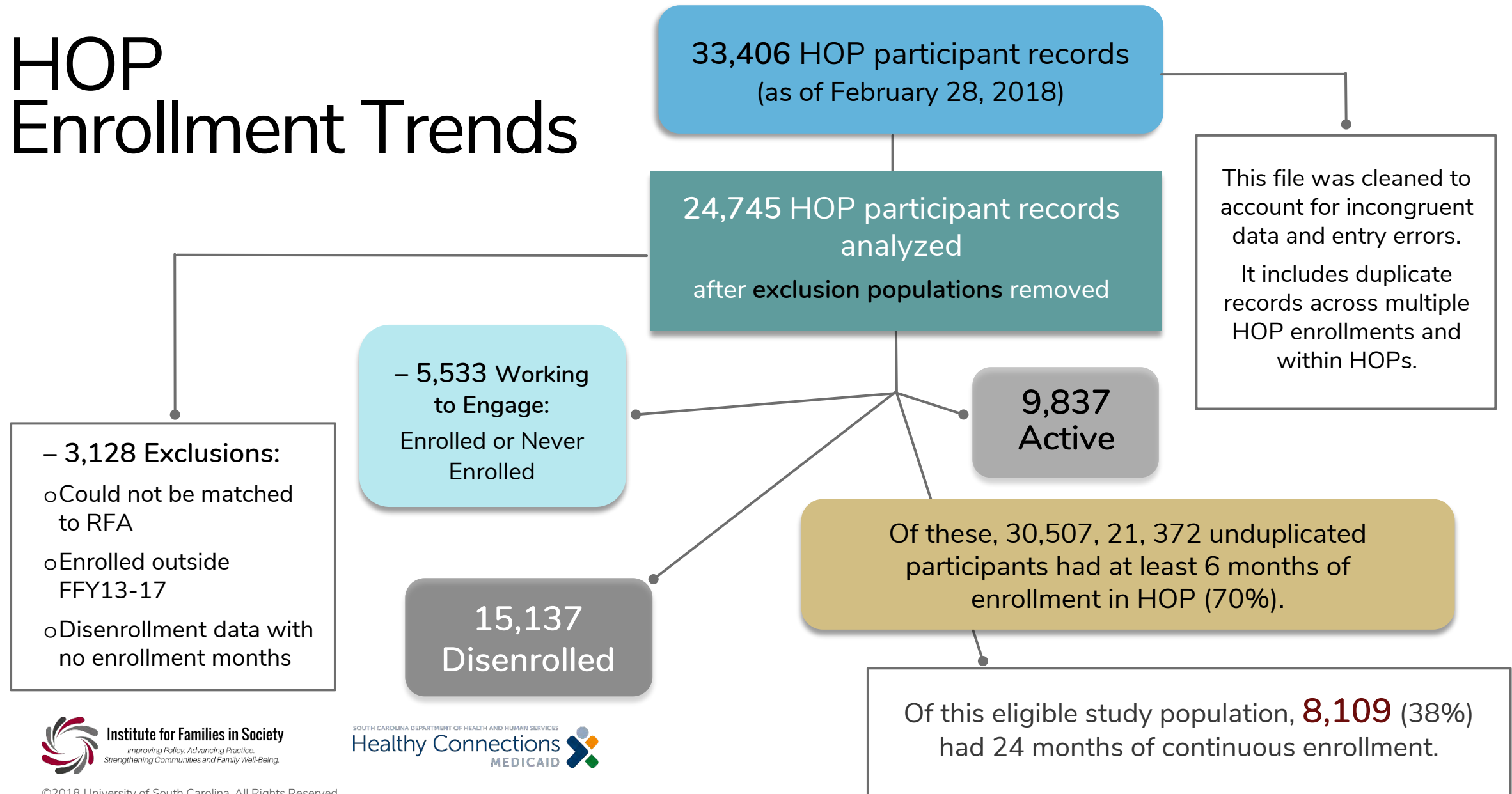
% of HOP Participants to Uninsured Adults Below 138% FPL **(12.6%)**



# HOP POPULATION PROFILE



# HOP Enrollment Trends



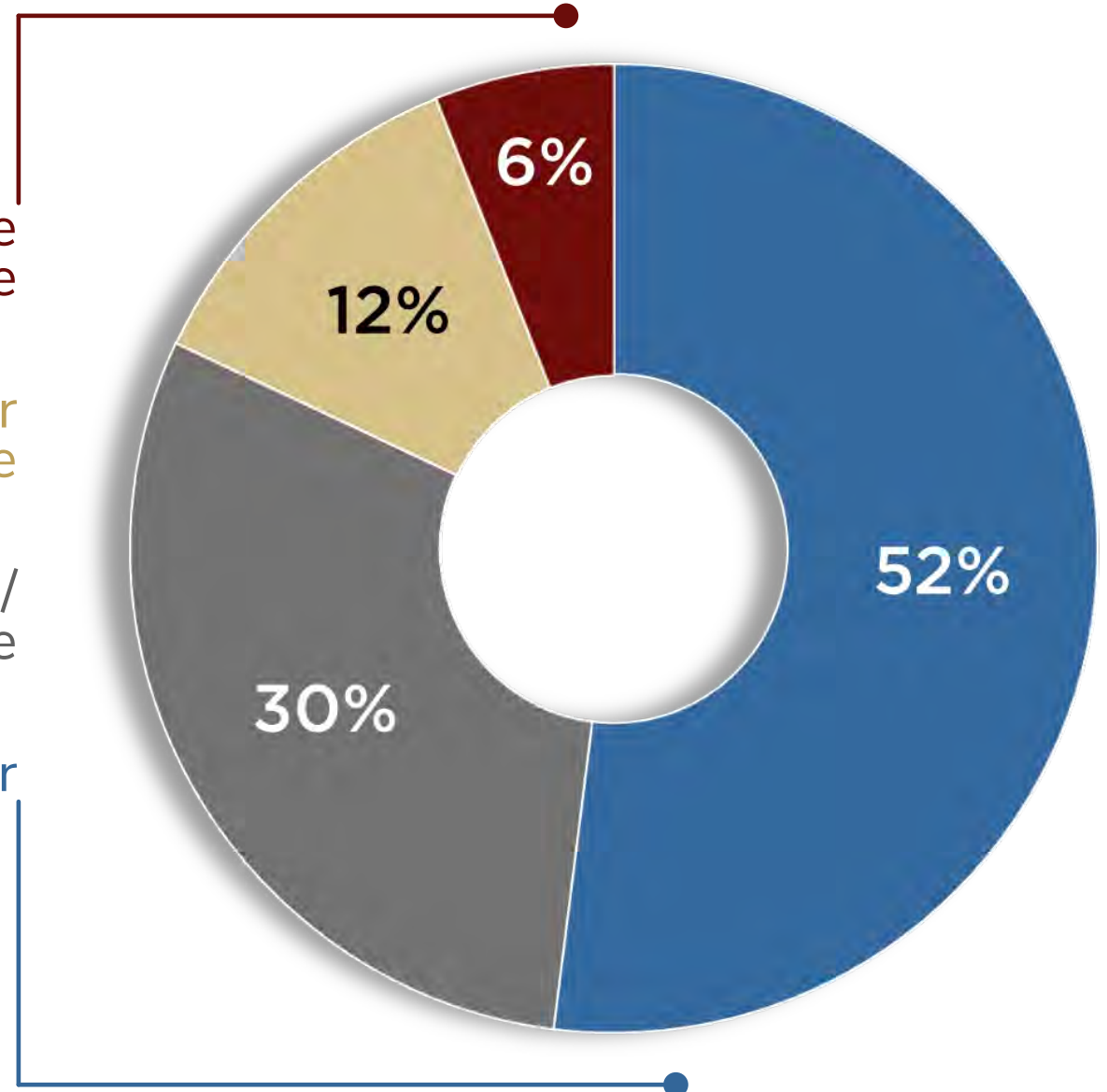
# Top 5 Reasons for HOP Disenrollment

Moved/Unable to Locate

Other Insurance

Medicaid/Medicare

Other



# Demographics

Total in 2018 Analysis Cohort = 8,109

HOPs Represented		% Care Plan				
<b>All</b> (min: 36, max: 1,802)		89				
%						
Mean Enroll. Months	Mean Age	Female	Male	White	Black	Other/ Unknown Race
35	45	56	44	48	47	5
% Diabetes	% Hypertension	% CVD	% Substance Abuse	% Mental Health		
34	66	43	64	43		





# Cost Analysis & Clinical Outcomes



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# Why was 24 Months used?

- After 18 months, the trends level out.
- Looking at a smaller cohort through 36 months would restrict N while not adding anything to the analysis.
- Increasing the N by cutting off the analysis at 18 months would not allow us to see the final dip in rates and stabilization.

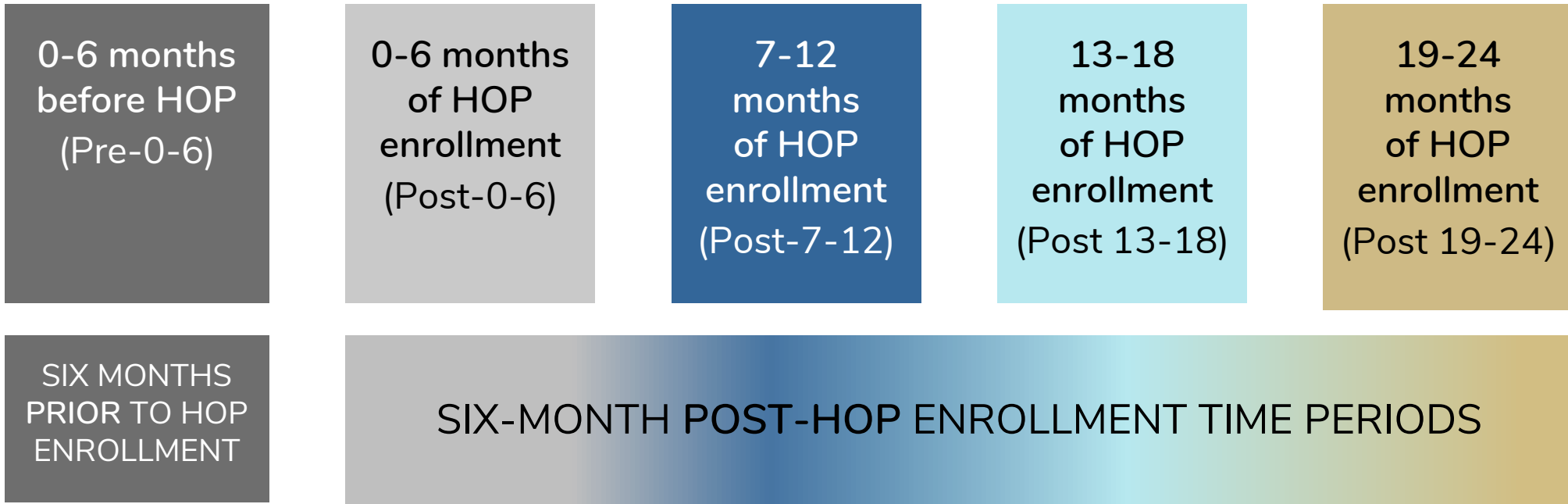
# Methods

- For the 24-months continuous enrollment cohort, inpatient and ED utilization outcomes were summarized for pre- and post-HOP enrollment periods.
- For cost measures, cost-to-charge ratios for the hospitals were applied.
- The medical price index was applied to remove price factor.
- The later fiscal year price was applied to the base year. From 2013 to 2017, if price increased 5%, the adjusted costs in 2017 would be 5% smaller than crude costs.



# Statistical Analysis

Outcomes for the cohort were broken into 5 different enrollment time periods.



# Statistical Analysis (continued)

Statistical testing on the means per person per month for each time period were completed by using a **paired dependent t-test** for two time period comparisons and **one-way repeated measures ANOVA** for testing throughout the 5 time periods.

We also tested counts throughout time for some outcomes using **generalized linear regression models**.

For cost, a **generalized linear model** was used.



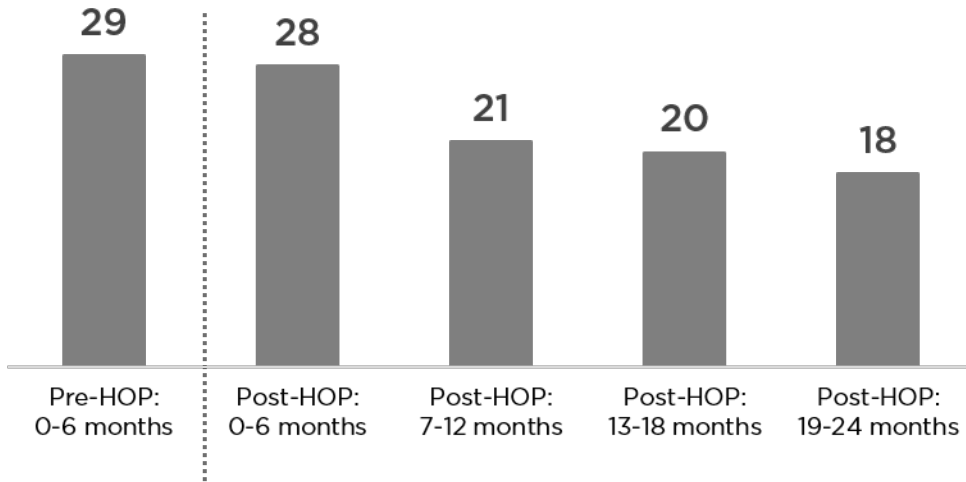
# EMERGENCY DEPARTMENT UTILIZATION



# Reduction in ED Visits & Patients

## Mean ED Visits

(Per 100 Participants per Month)



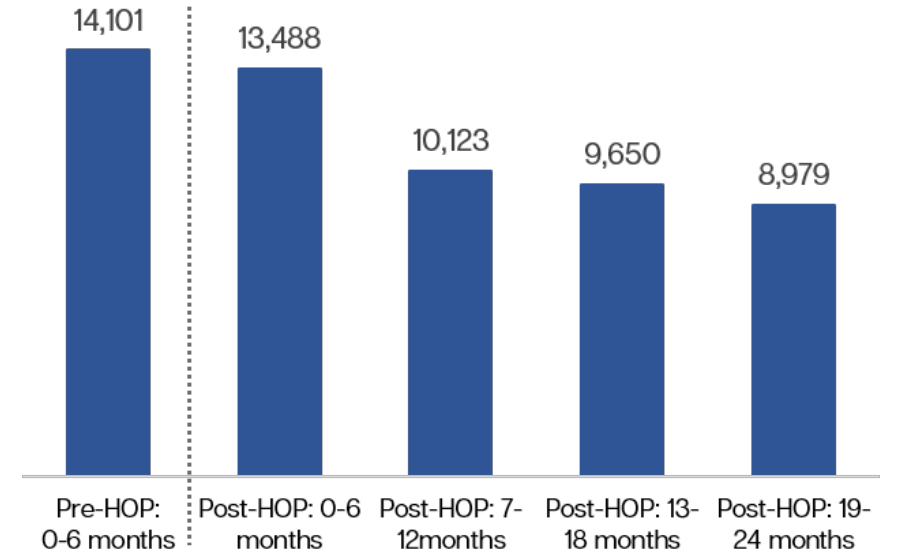
Relative change from pre-HOP to 19-24 months of enrollment:

**-36%**

Repeated Measures ANOVA:  $F(4,32432) = 218.73, p < 0.0001$

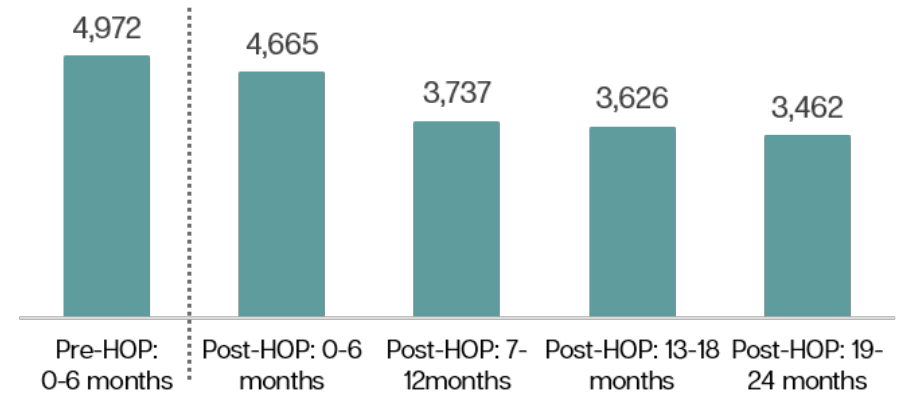
T-test Comparing Pre-HOP 0-6 months to Post-HOP 19-24 months:  $t(8,108) = 19.96, p < 0.0001$

## Total ED Visits



RR = (0.88)

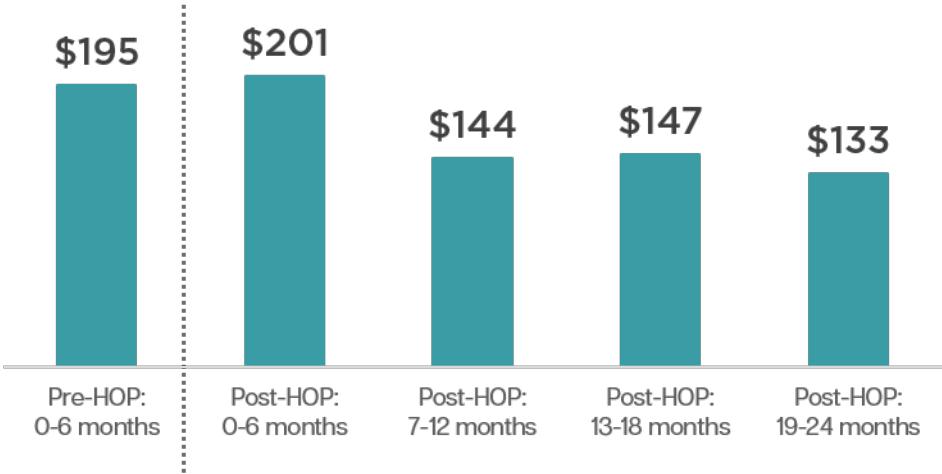
## Total ED Patients



RR = (0.91)

# Reduction in ED Cost

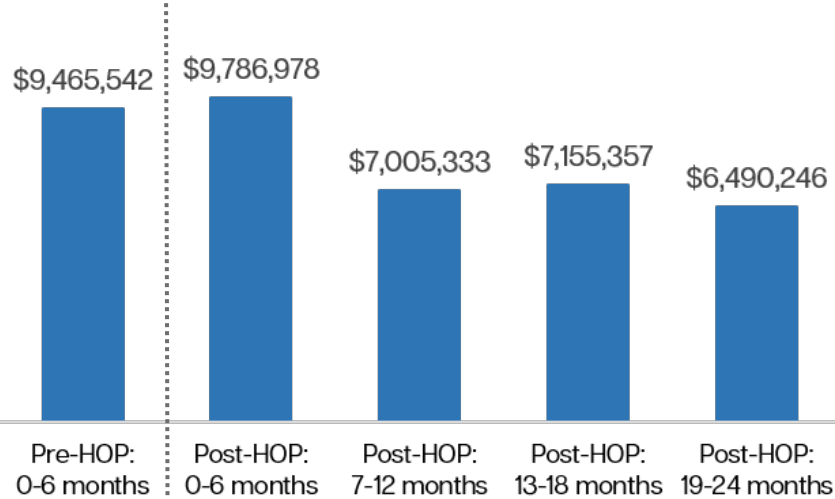
Mean ED Cost  
(Per Participant per Month)



There was a **31% reduction in mean ED cost** from pre-HOP to 19-24 months of enrollment, a reduction on average of \$62 per person per month within 24 months.

Repeated Measures ANOVA:  $F(4,32432) = 101.57, p < 0.0001$   
 T-test Comparing Pre-HOP 0-6 months to Post-HOP 19-24 months:  $t(8,108) = 13.07, p < 0.0001$

Total ED Cost



RR = (0.90)

ED Cost:  
**-31%**





What was the annual  
**ED cost avoidance** for  
this cohort of HOP  
participants with at  
least two years of  
enrollment?



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Apply the average **-\$744** reduction per person per year (**\$62 X 12 months**) to the **8,109** enrollees who had **24 months** of continuous enrollment.

ED POTENTIAL ANNUAL  
COST AVOIDANCE:

**\$6,033,096**



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# ED VISITS BY CATEGORY

Category	Difference between Means Per 100 Participants per Month (Pre-HOP to 19-24 months)	Relative Improvement
NYU ED ALGORITHM TYPE		
ED Care Needed, Preventable/Avoidable *	-0.56	↓ 49%
CHRONIC DISEASE		
Cardiovascular Disease	-0.49	↓ 19%
----- Hypertension *	-3.55	↓ 34%
Diabetes	-0.79	↓ 15%
BEHAVIORAL HEALTH CONDITIONS		
Mental Health *	-1.45	↓ 35%
----- Substance Abuse	-5.33	↓ 49%

\* ANOVA tests for trend were significant at  $p < 0.0001$ . All measures had significant pre/post t-test results ( $< 0.001$ ).

## ED SEVERITY LEVELS

	ED Patients	ED Visits	% ED Visits	Mean ED Cost	Median ED Cost
Self limited or minor	1,338	2,507	2%	\$84	\$58
Low to moderate severity	3,005	7,591	7%	\$129	\$101
Moderate severity	5,927	35,588	35%	\$318	\$251
Significant threat to life or physiologic function	6,118	33,756	33%	\$809	\$628
High severity and pose an immediate significant threat to life or physiologic function	4,828	17,230	17%	\$1,565	\$1,090

# INPATIENT HOSPITAL UTILIZATION

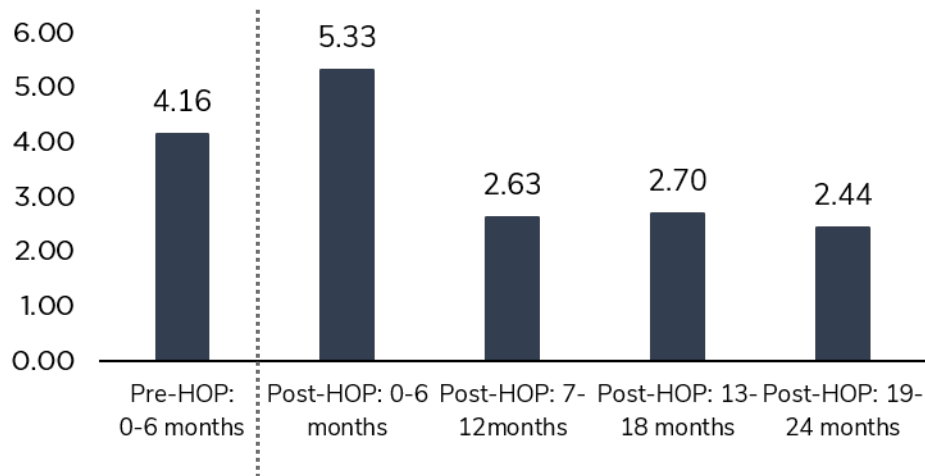


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# Reduction in Inpatient Stays & Inpatients

Mean Inpatient Stays  
Per 100 Participants per Month



Relative change  
from pre-HOP  
to 19-24 months  
of enrollment:  
**-41%**

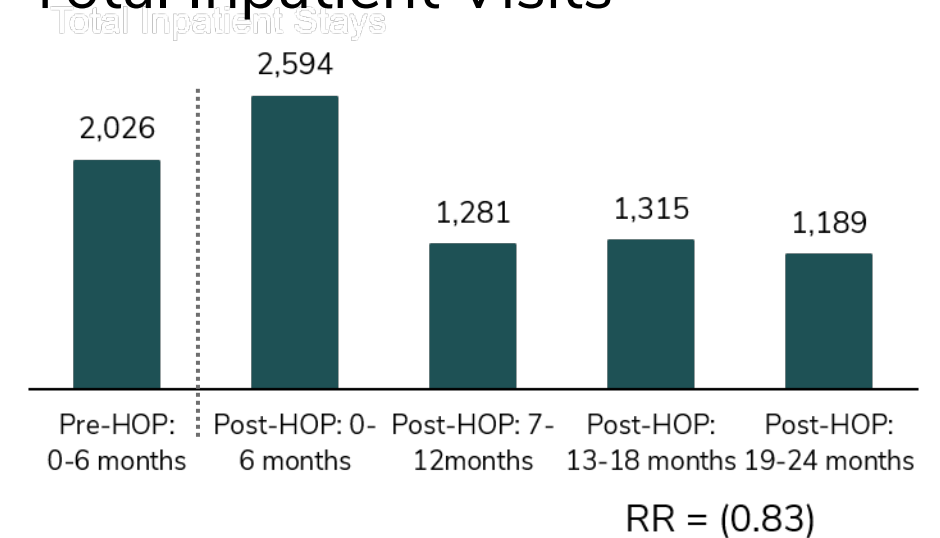


Repeated Measures ANOVA:  $F(4,32432) = 168.12, p < 0.0001$   
 T-test Comparing Pre-HOP 0-6 months to Post-HOP 19-24 months:  $t(8,108) = 12.31, p < 0.0001$

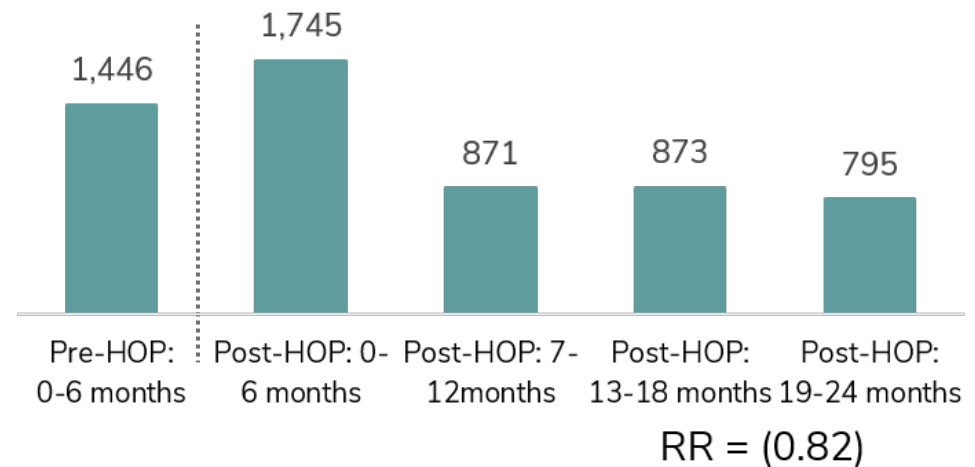


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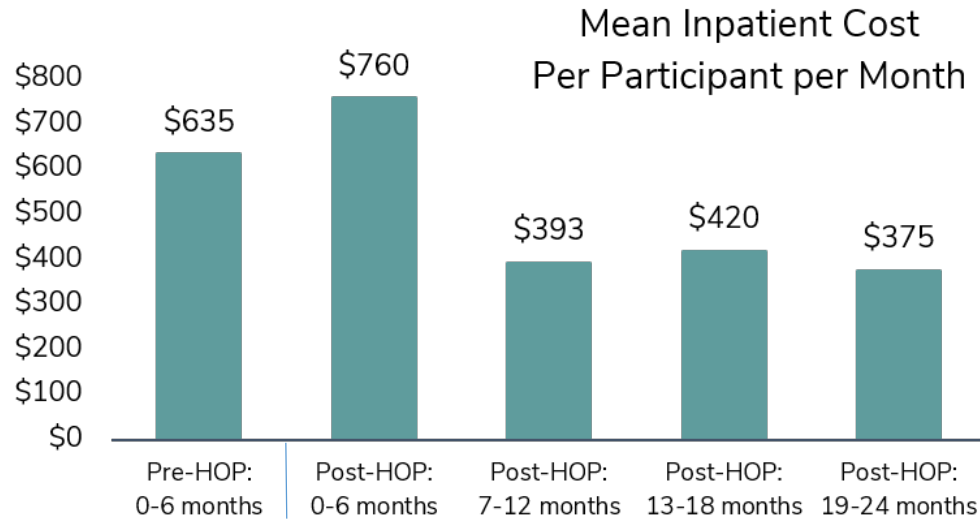
## Total Inpatient Visits



## Total Inpatients



# Reduction in Inpatient Cost



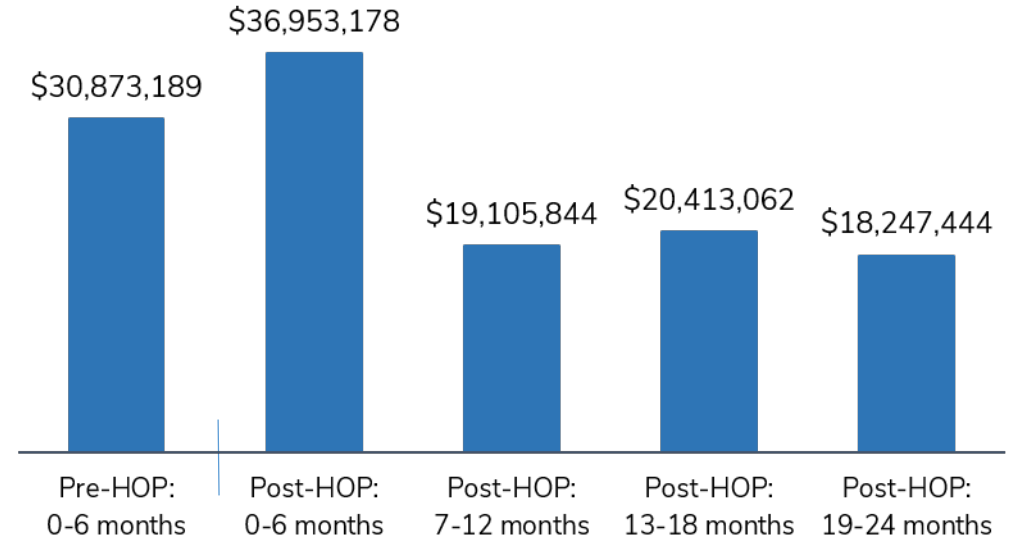
Repeated Measures ANOVA:  
 $F(4,32432) = 54.31, p < 0.0001$   
 T-test Comparing Pre-HOP 0-6 months to Post-HOP 19-24 months:  
 $t(8,108) = 7.44, p < 0.0001$

There was a 41% reduction in mean inpatient cost PPPM from pre-HOP (\$635) to 19-24 months of enrollment (\$375), a reduction on average of \$260 per person per month within 24 months.



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# Total Inpatient Cost



RR = (0.67)



Cut  
 nearly in  


---

 HALF

What was the annual **inpatient cost avoidance** for this cohort of HOP participants with at least two years of enrollment?



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Apply the average  $-\$3,120$  reduction per person per year ( $\$260 \times 12$  months) to the 8,109 enrollees who had 24 months of continuous enrollment.

INPATIENT POTENTIAL  
ANNUAL COST AVOIDANCE:

**\$25,300,080**



# Inpatient Stays by Category

Category	Difference between Means Per 100 Participants per Month (Pre-HOP to 19-24 months)*	Relative Improvement
NYU ED ALGORITHM TYPE		
Preventable Chronic Stays	-0.46	↓ 47%
CHRONIC DISEASE		
Cardiovascular Disease	-0.69	↓ 37%
-----Hypertension	-0.97	↓ 45%
Diabetes	-0.41	↓ 26%
BEHAVIORAL HEALTH CONDITIONS		
Mental Health	-0.41	↓ 33%
-----Substance Abuse	-1.22	↓ 52%

\* All measures were significant (< 0.0001).



# KEY FINDING



**Total annual cost avoidance**  
(due to the reduction in ED visits and inpatient stays)  
for this 24-month cohort would be approximately

**\$31 MILLION.**



# HOP POPULATION ANALYSIS:

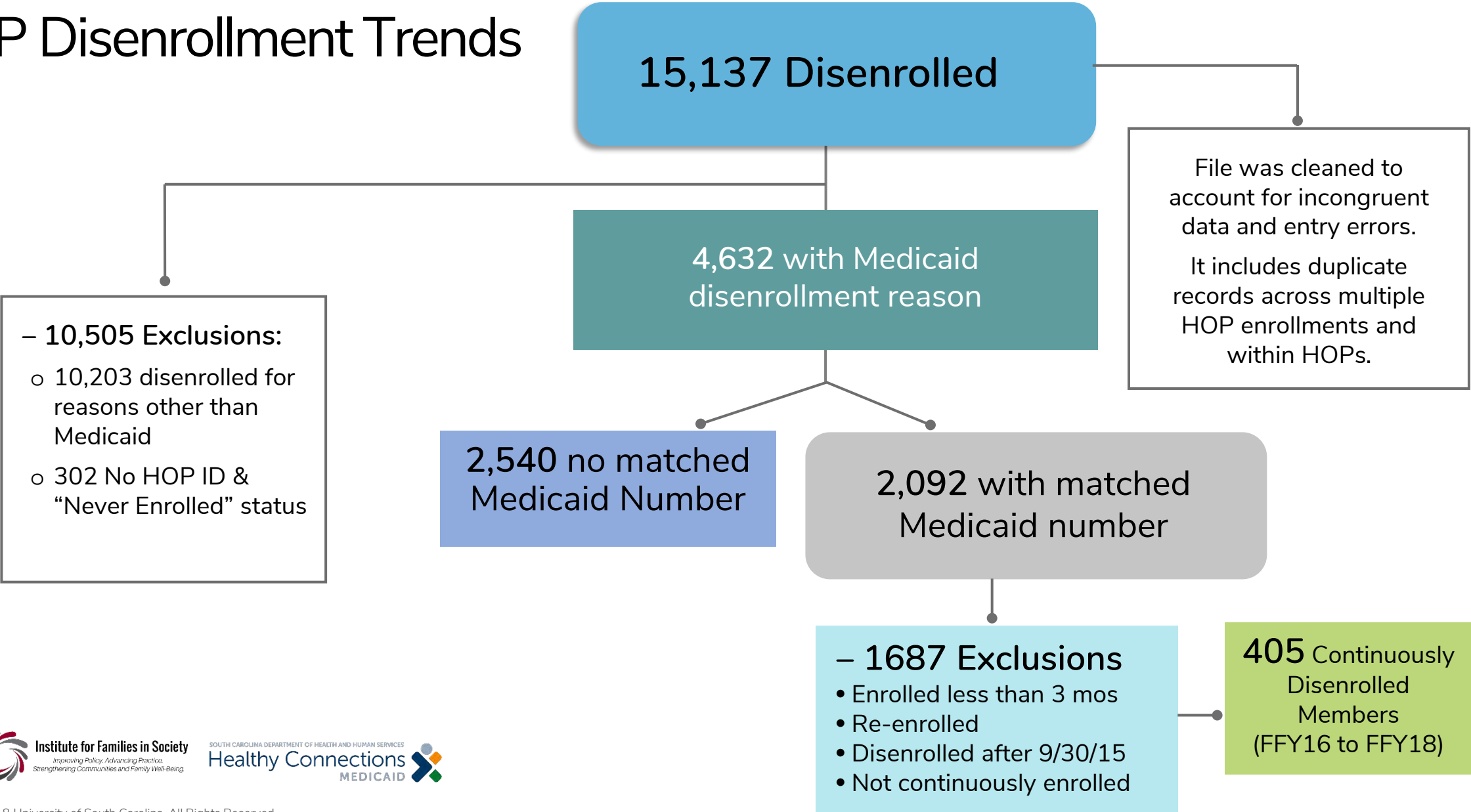
Disenrolled HOP  
Participants With  
Continuous Enrollment in  
Medicaid



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# HOP Disenrollment Trends



# Disenrolled Demographics

Total in 2018 Disenrolled Analysis Cohort = 405

## DISENROLLED COHORT IS MORE LIKELY TO BE:

- Continuously enrolled for 33 months vs. 35 months for HOP cohort
- Continuously enrolled in Fee For Service (63%) vs. Managed Care (27%)
- Female (74%) and African American (51%)



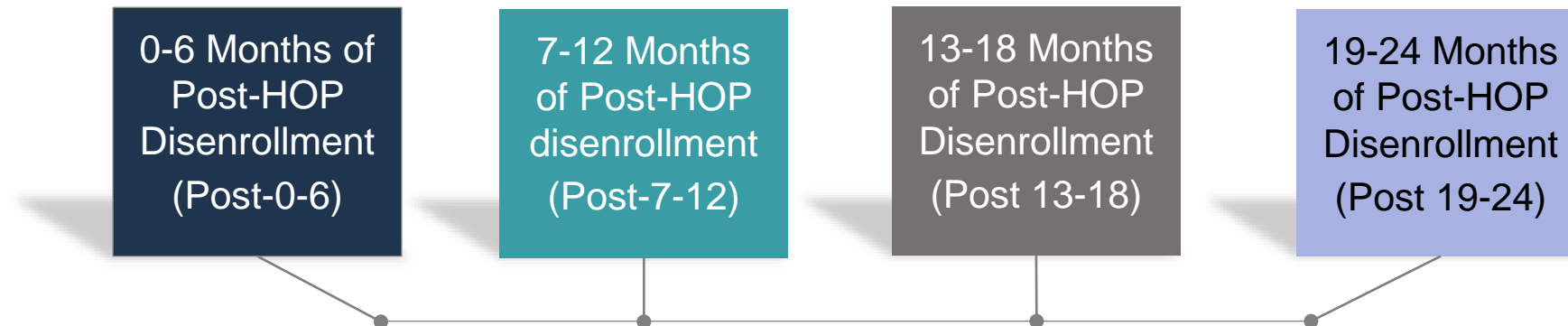
# Methods



- For the 24-months continuously enrolled in Medicaid cohort (N=405), inpatient, ED, outpatient, and prescription utilization outcomes were summarized for post-HOP disenrollment periods.
  - Data could only be tracked 24 months post-HOP given available data for the cohort's disenrollment dates.
- For cost measures, cost-to-charge ratios for the hospitals were applied.
- The medical price index was applied to remove price factor.
- The later fiscal year price was applied to the base year. From 2013 to 2017, if price increased 5%, the adjusted costs in 2017 would be 5% smaller than crude costs.

# Disenrollment Time Periods

Outcomes for the cohort were broken into 4 different post-HOP disenrollment time periods.





# Reductions in ED and Inpatient Utilization: 0-6 Months Compared to 19-24 Months



## INPATIENT STAY

(% Decrease)

- 25% mean inpatient stays PPPM
- 46% mean inpatient cost PPPM
- 29% total inpatients
- 21% total inpatient stays
- 77% total cost per month

## EMERGENCY DEPARTMENT

(% Decrease)

- 28% mean ED visits PPPM
- 59% mean ED cost PPPM
- 6% total ED patients
- 19% total ED visits
- 137% total cost per month



# Outpatient Utilization:

0-6 Months Compared to 19-24 Months



## OUTPATIENT PLACES OF SERVICE (% Change)

- <1% Mean outpatient visits PPPM
- +26% Mean outpatient cost PPPM
- +5% Total outpatients
- +5% Total outpatient visits
- +24% Total cost per month

## PRESCRIPTIONS (% Change)

- 13% Mean prescriptions PPPM
- +141% Mean Rx cost PPPM
- 10% Total patients receiving prescriptions
- 9% Total prescriptions
- +60% Total cost per month



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# Matched Comparison Analysis: HOP vs. Uninsured



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# Pre-HOP Propensity Score Matching



**Demographics:** Chronic/Behavioral Health Status, Age  $\geq 18$ , Gender, Race, County, and Charlson Risk Index

- Values for demographics were based on earliest admission record.

**HOP:** At least 24 months of continuous enrollment

**Uninsured:** Claims within pre- and post time periods

# Methods Pre/Post Time Periods



## HOP

- Pre was 6 months pre- and post-enrollment date
- Post was 18-30 months post-enrollment

## Uninsured

- Pre was minimum of Pre-HOP and maximum of Pre-HOP for uninsured admission dates
- Post was minimum of Post-HOP and maximum of Post-HOP for uninsured admission dates

# Measure Specifications



- All means were calculated as per person per month (out of 12 months) for each pre- and post-time periods.
- Chronic/Behavioral Health status (Both, None, Chronic, Behavior) used as the unit of analysis

# Analysis

## **Within-group:**

Paired T-tests were used to test each measures' mean per person per month for Pre vs. Post (within HOP and Uninsured) by Chronic/Behavior Health Status.

## **Between-groups:**

T-tests (independent two-sample) were used to test each measures' mean per person per month values for HOP vs. Uninsured by Chronic/Behavior Health Status.



# Clinical Outcomes and Key Findings





# Clinical Outcomes

Consistent with prior years,

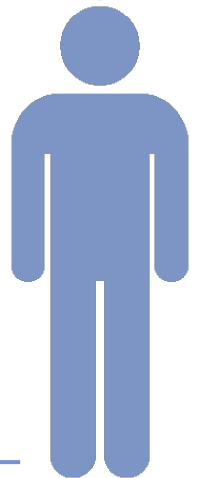
• **HOP Participants** are sicker than **General Uninsured** •

They average higher pre- (**5.29** vs. **2.26**) and post-utilization (**3.15** vs. **2.16**) admissions.

• **1.67 times** as likely to initially experience chronic disease

• **2.4 times** as likely to initially experience the combination of chronic disease/BH

Conversely, the uninsured match (even considering Charlson) was **1.73 times** as likely to have had neither a chronic disease, nor behavioral health-related claim during the initial time period.



# KEY FINDINGS:

## Within-Group Analysis

- With only a few exceptions, **HOP** pre/post reductions in means PPPM were significant regardless of the subgroup analyzed or the type of visit/stay.
- This was not always the case for the **uninsured**, which more often even saw increased means PPPM.
- **NONE** of the uninsured subgroups, while **ALL HOP** subgroups, had a significant reduction in mean inpatient cost PPPM.
  - All four **HOP** subgroups had significant reductions in chronic-preventable inpatient stays PPPM, but the only **uninsured** group with a reduction was the group qualified as “None.”

# KEY FINDINGS: Between-Group Analysis



Significant between-group comparisons between **HOP** and uninsured **avored the uninsured**, who had lower means for both inpatient and ED, but the pre/post gap between the two groups dropped considerably.

# HOP Improvement Levels are Better Than Their Matched Counterparts

Pre/Post Mean PPSM Differences on average across four subgroups:  
Both, None, Chronic, and Behavioral Health

MEASURE	HOP	UNINSURED	BETWEEN-GROUP HOP-UNINSURED GAP REDUCTION
ED Visits Per 100 Persons Per Month	-15	-1	-69%
ED Cost Per Person Per Month	-\$93	+\$2	-67%
Inpatient Stays per 100 Persons Per Month	-3	- <0.1	-67%
Inpatient Cost Per Person Per Month	-\$431	-\$16	-70%

# CONTACT



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