

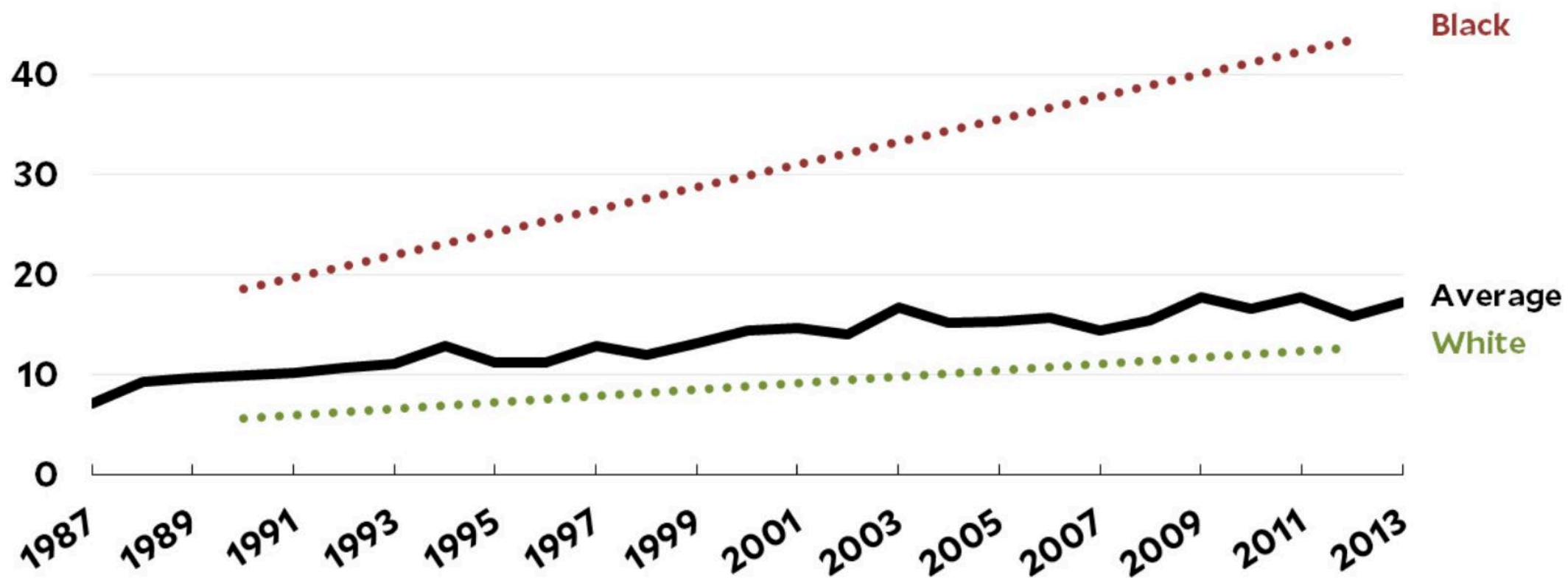
# Text message remote blood pressure monitoring reduces racial disparities in postpartum hypertension care

Adi Hirshberg, MD  
Sindhu Srinivas, MD, MSCE  
Maternal Fetal Medicine  
Penn Medicine



# US Maternal Death Rate

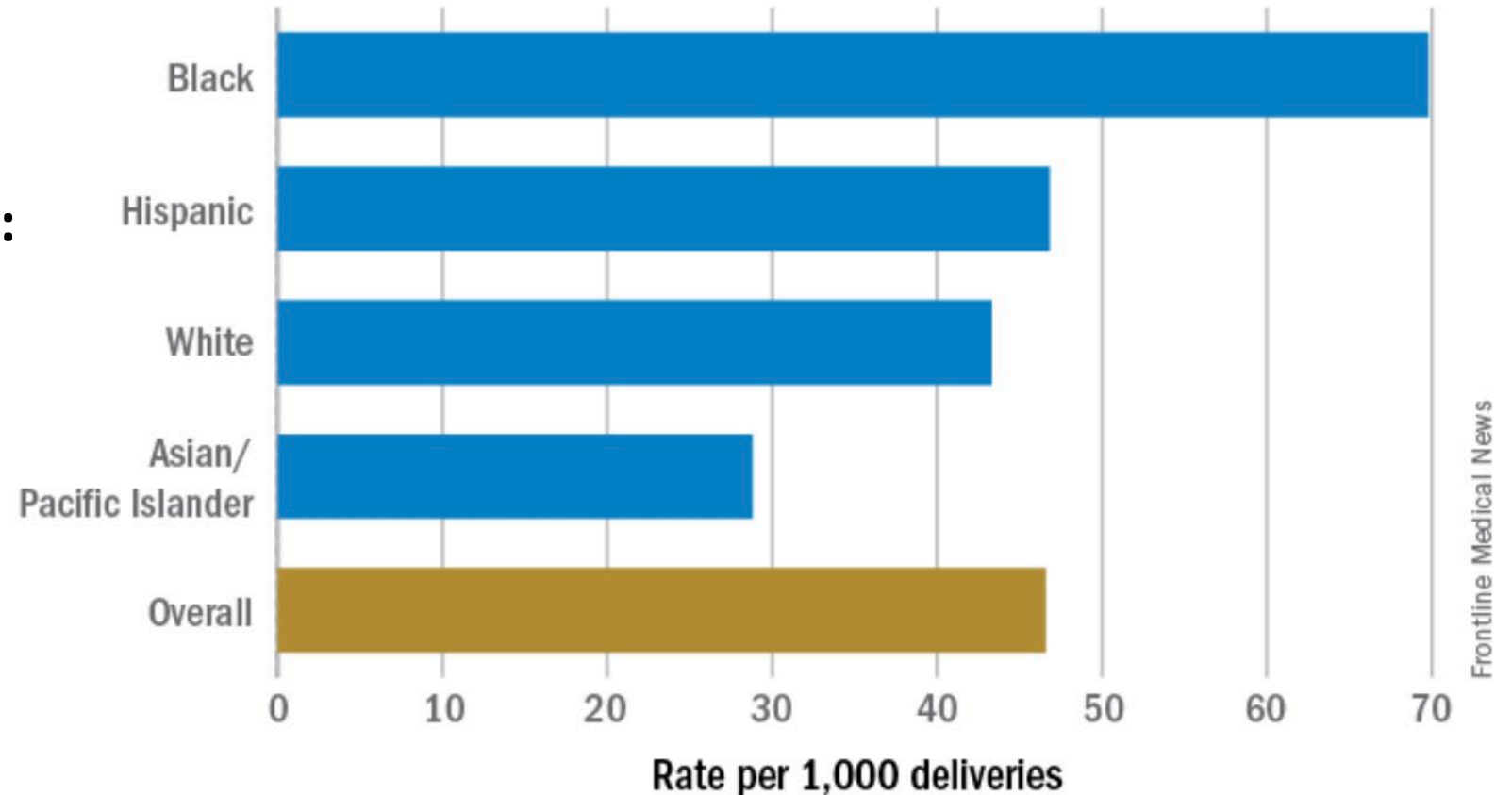
Per 100,000 live births



**Black women with preeclampsia:**

- 3 times more likely to die
- Increased risk of cardiac arrest and heart failure

## Preeclampsia/eclampsia rate by race and ethnicity, 2014



Note: Based on data from the National Inpatient Sample.

Source: Agency for Healthcare Research and Quality

> 50% of maternal deaths occur postpartum  
~ 40% occur > 48 hours postpartum



The American College of  
Obstetricians and Gynecologists  
WOMEN'S HEALTH CARE PHYSICIANS

## ACOG COMMITTEE OPINION

Number 736 • May 2018

*(Replaces Committee Opinion Number 666, June 2016)*

### **Presidential Task Force on Redefining the Postpartum Visit Committee on Obstetric Practice**

*The Academy of Breastfeeding Medicine, the American College of Nurse-Midwives, the National Association of Nurse Practitioners in Women's Health, the Society for Academic Specialists in General Obstetrics and Gynecology, and the Society for Maternal-Fetal Medicine endorse this document. This Committee Opinion was developed by the American College of Obstetricians and Gynecologists' Presidential Task Force on Redefining the Postpartum Visit and the Committee on Obstetric Practice in collaboration with task force members Alison Stuebe, MD, MSc; Tamika Auguste, MD; and Martha Gulati, MD, MS.*

### **Optimizing Postpartum Care**

# HYPERTENSION IN PREGNANCY



ACOG  
The American College  
Of Obstetricians &  
Gynecologists

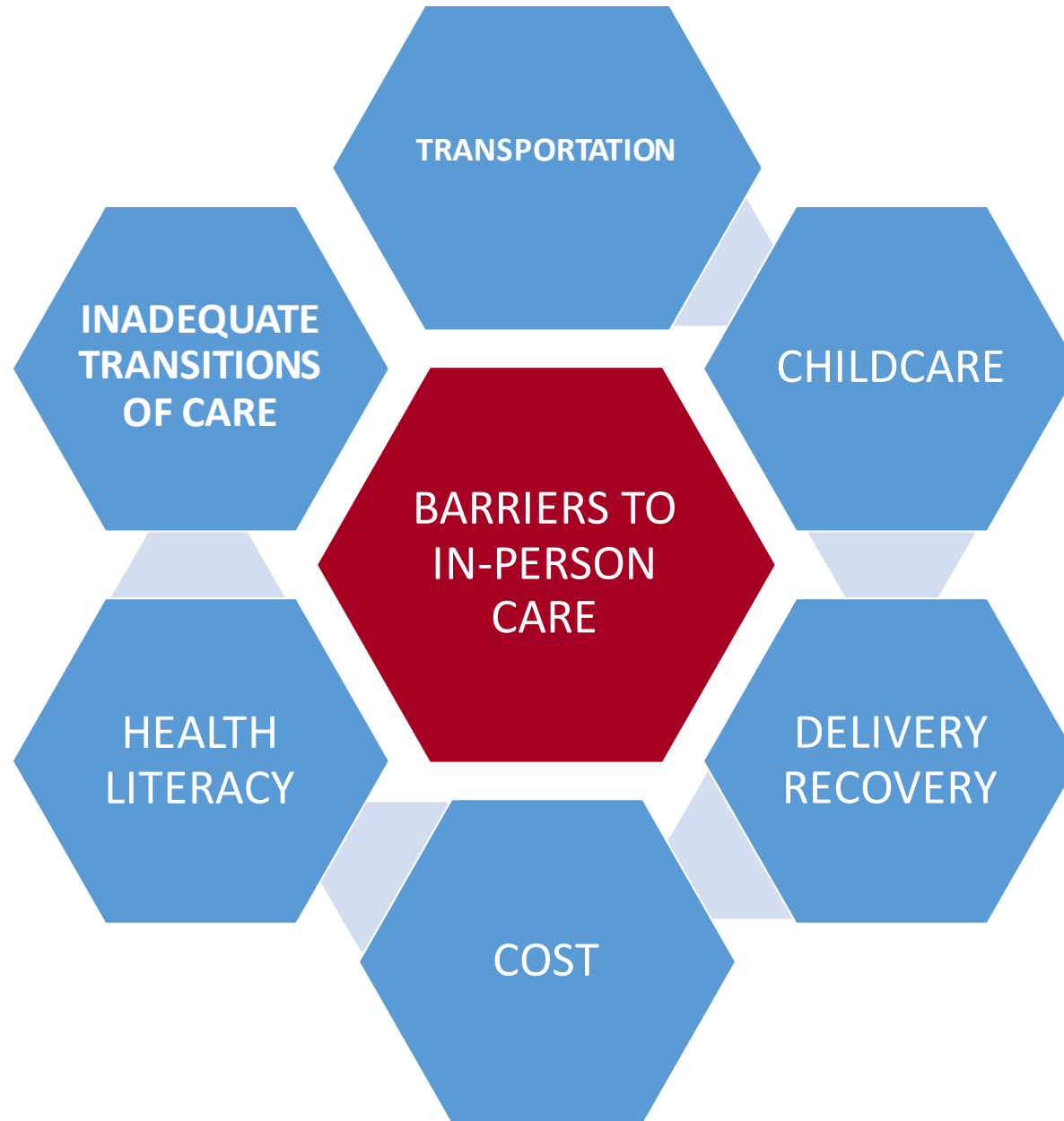


### STRATEGIES

- Alternate staffing models
- Expanded office hours
- Appointments all days of the week
- Phone reminders
- Text reminders

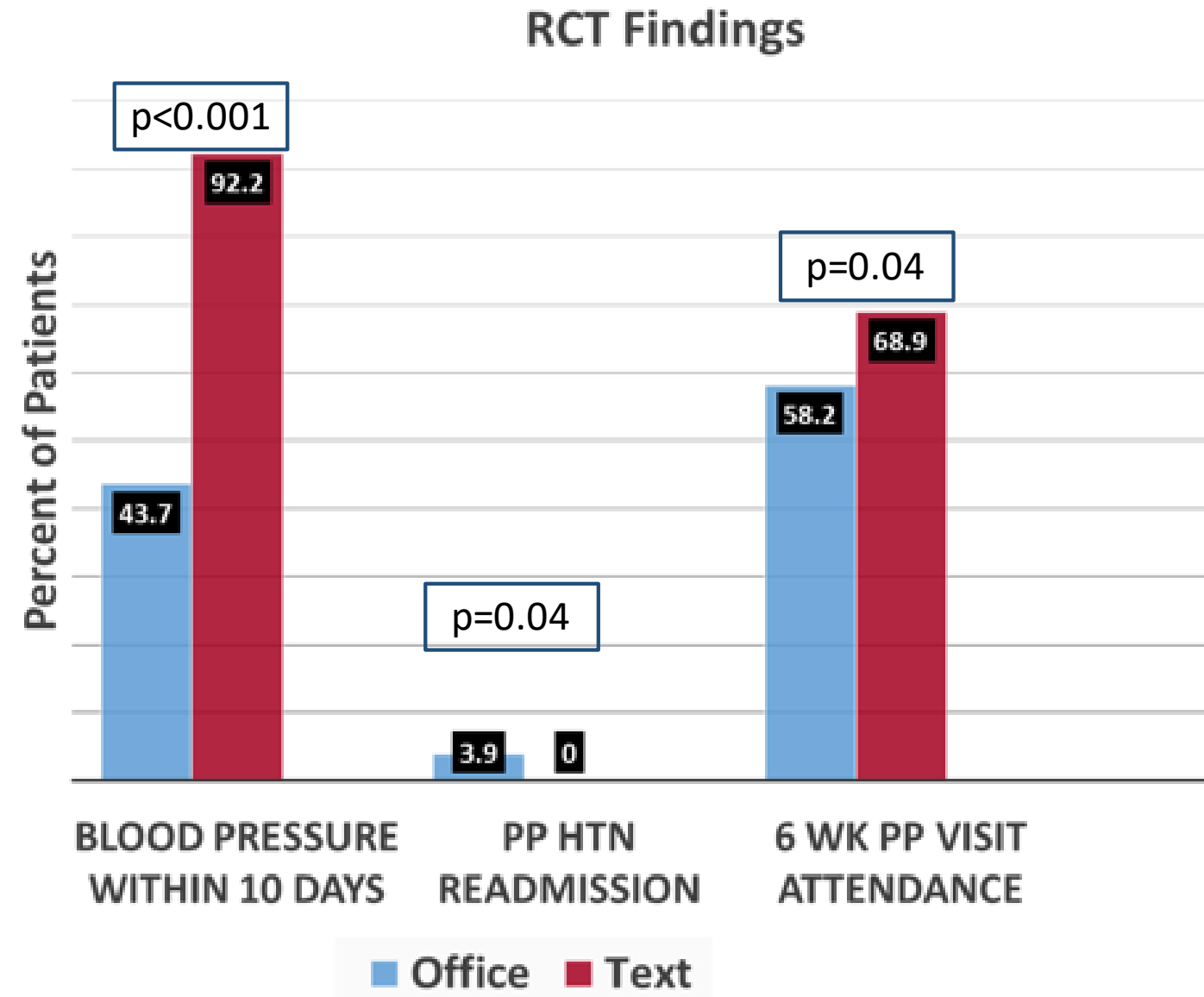
### Hospital of the University of Pennsylvania Office Blood Pressure Check Attendance

	2012	2013	2014	Total
Non-black	55.6%	47.4%	33.9%	42.5%
Black	33.6%	24.6%	20.0%	24.1%



# Comparing standard office-based follow-up with text-based remote monitoring in the management of postpartum hypertension: a randomised clinical trial

Adi Hirshberg, Katheryne Downes, Sindhu Srinivas



Comparing standard office-based follow-up with text-based remote monitoring in the management of postpartum hypertension: a randomised clinical trial

- Inclusion criteria:
  - Postpartum women with gestational hypertension, preeclampsia, chronic hypertension with superimposed preeclampsia, HELLP based on ACOG criteria diagnosed prior to delivery or during delivery admission
  - Singleton and multiple gestations
  - Able to speak and read English
  - Access to a cell phone with unlimited text message capabilities

# RANDOMIZATION

USUAL CARE

**Office Based In-Person BP Check**

4-6 day PP visit for nursing BP check provided at discharge

RN/MD escalation of care and initiation of BP med as indicated

INTERVENTION

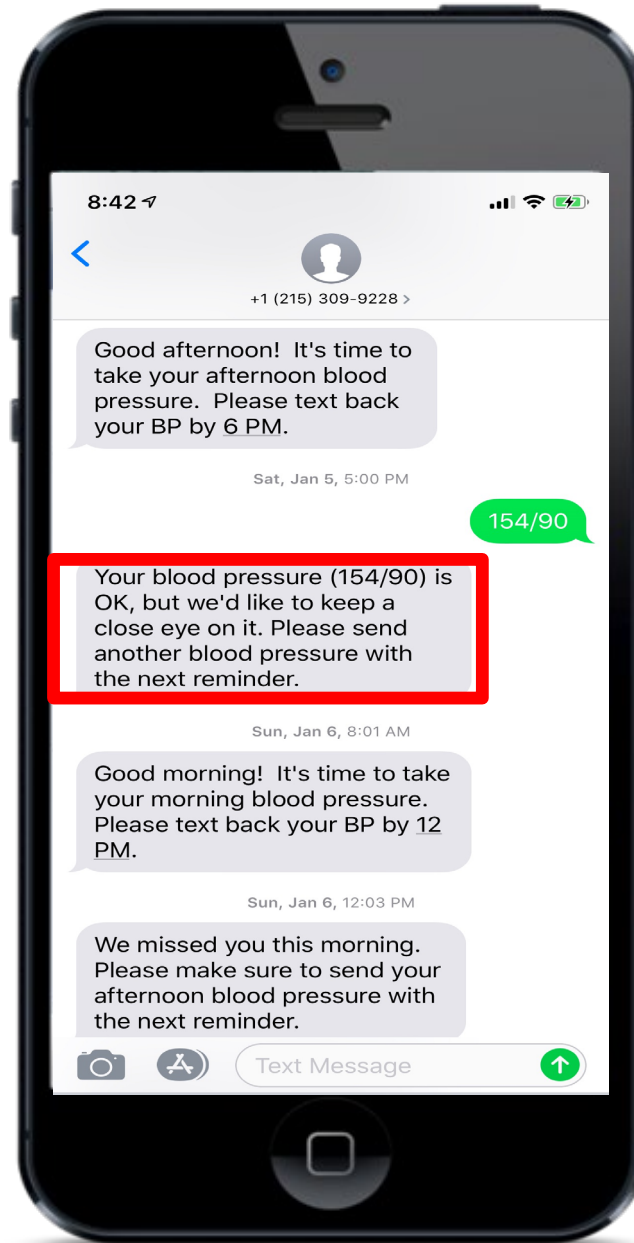
**Text-Based Surveillance**

Omron BP monitor provided

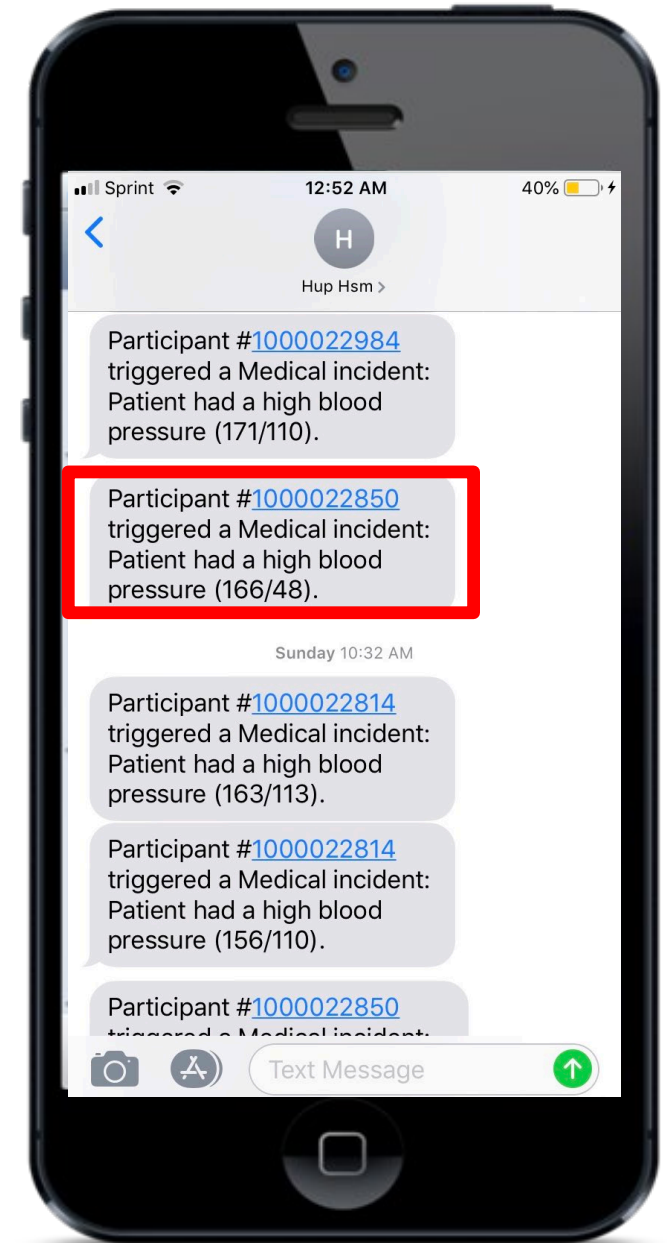
Twice daily text reminders to check/text BP

Immediate feedback per algorithm

MD escalation of care and initiation of BP med as indicated



**PATIENT**



**PROVIDER**

Primary outcome:

Ascertainment of outpatient blood pressure



OFFICE VISIT  
ATTENDANCE

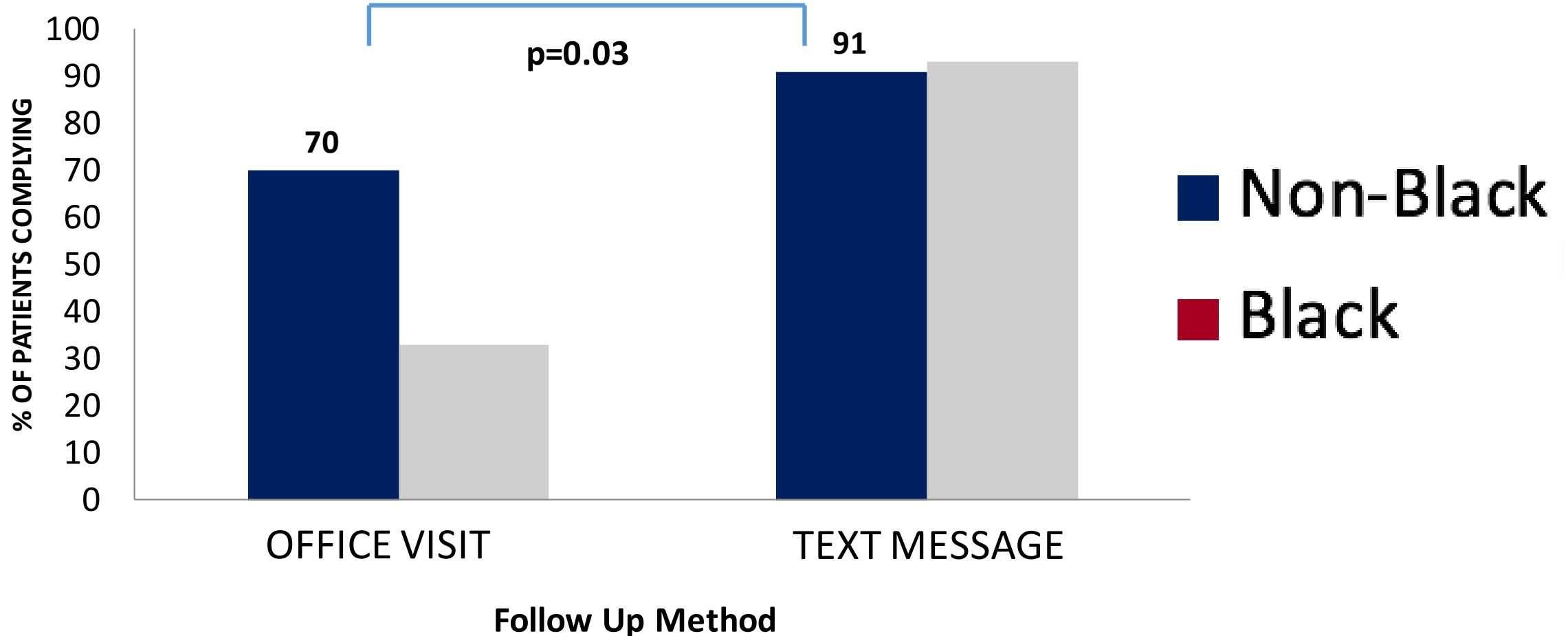


BLOOD PRESSURE  
TEXTED

All outcomes were compared between women self-identifying as **black** or **non-black**

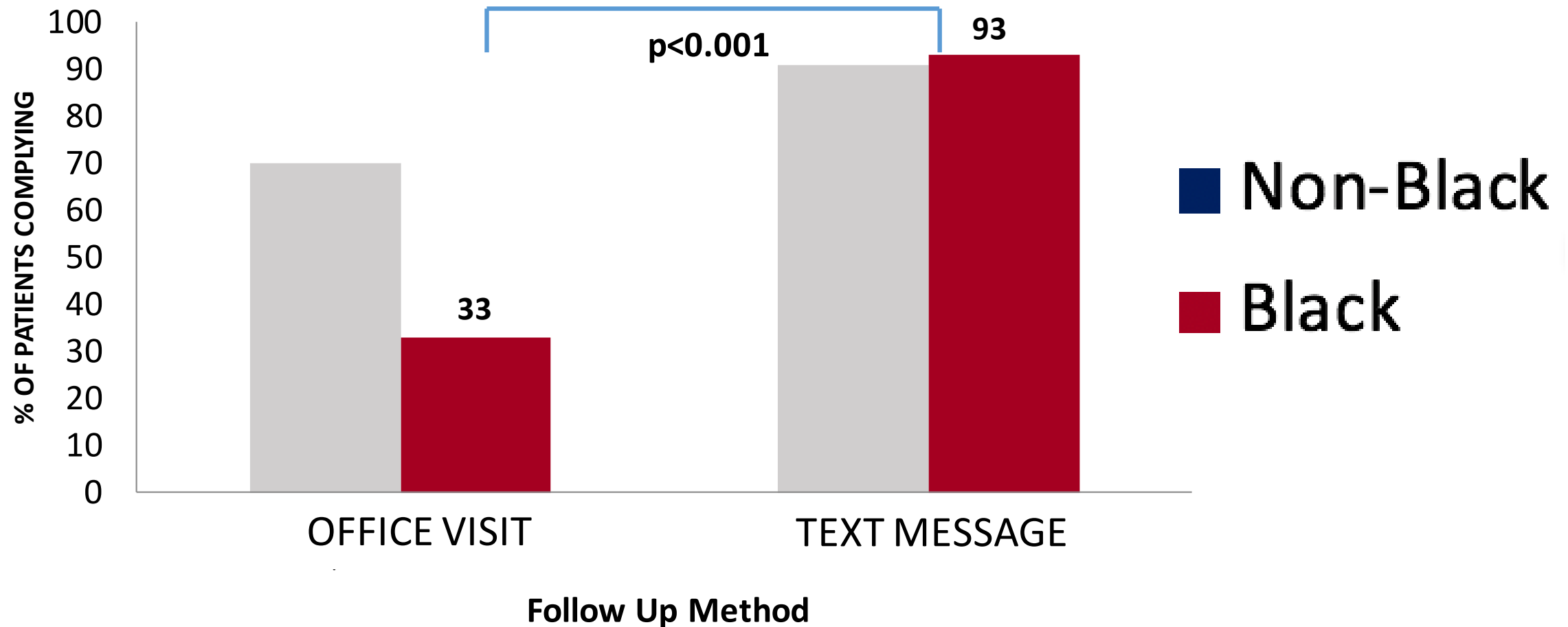
# Primary Outcome: Non-black Women

Postpartum blood pressure ascertainment by race and follow up method



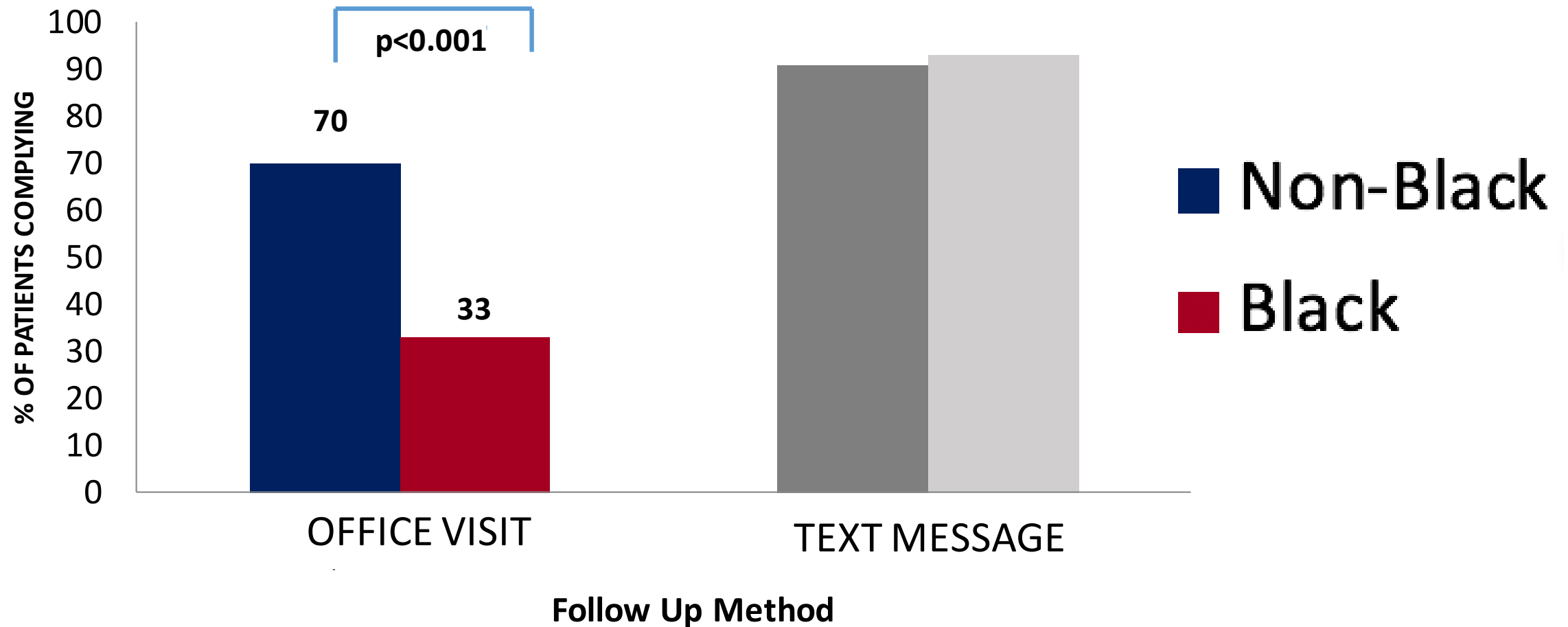
# Primary Outcome: Black Women

Postpartum blood pressure ascertainment by race and follow up method



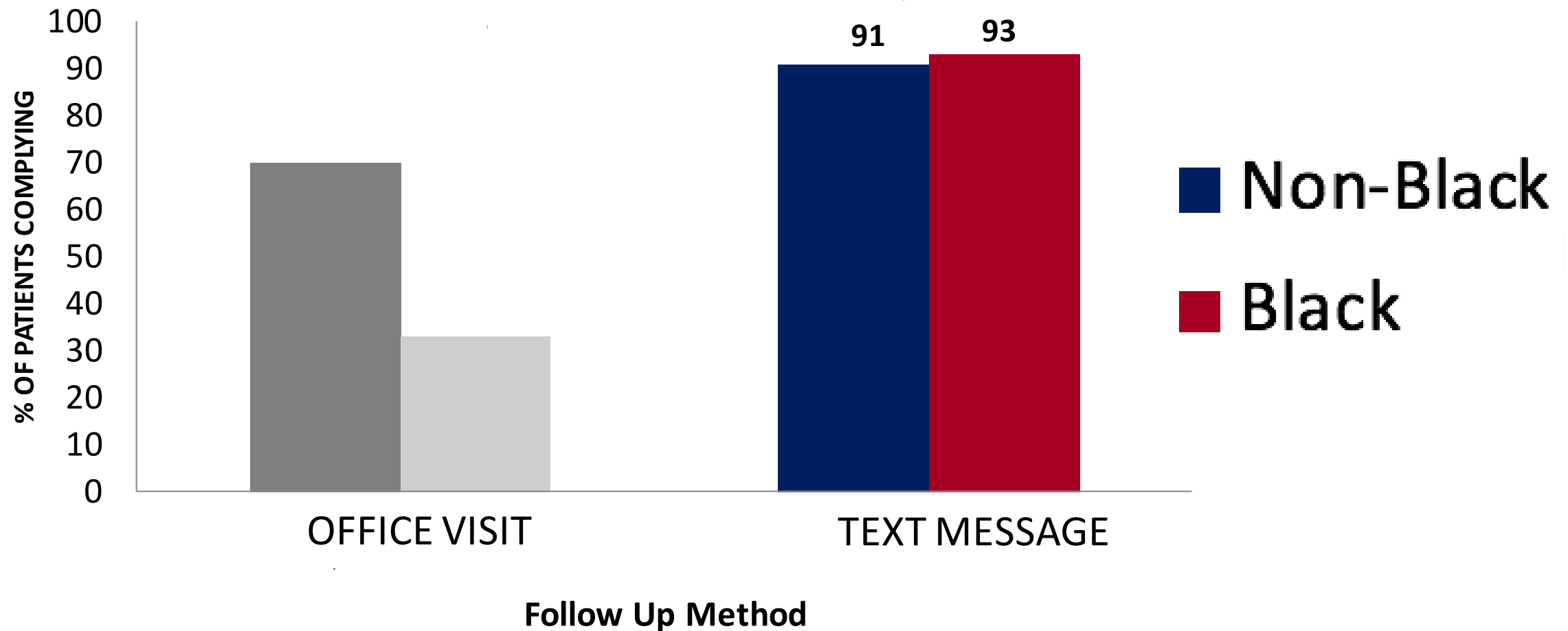
# Primary Outcome: Usual Care

Postpartum blood pressure ascertainment by race and follow up method



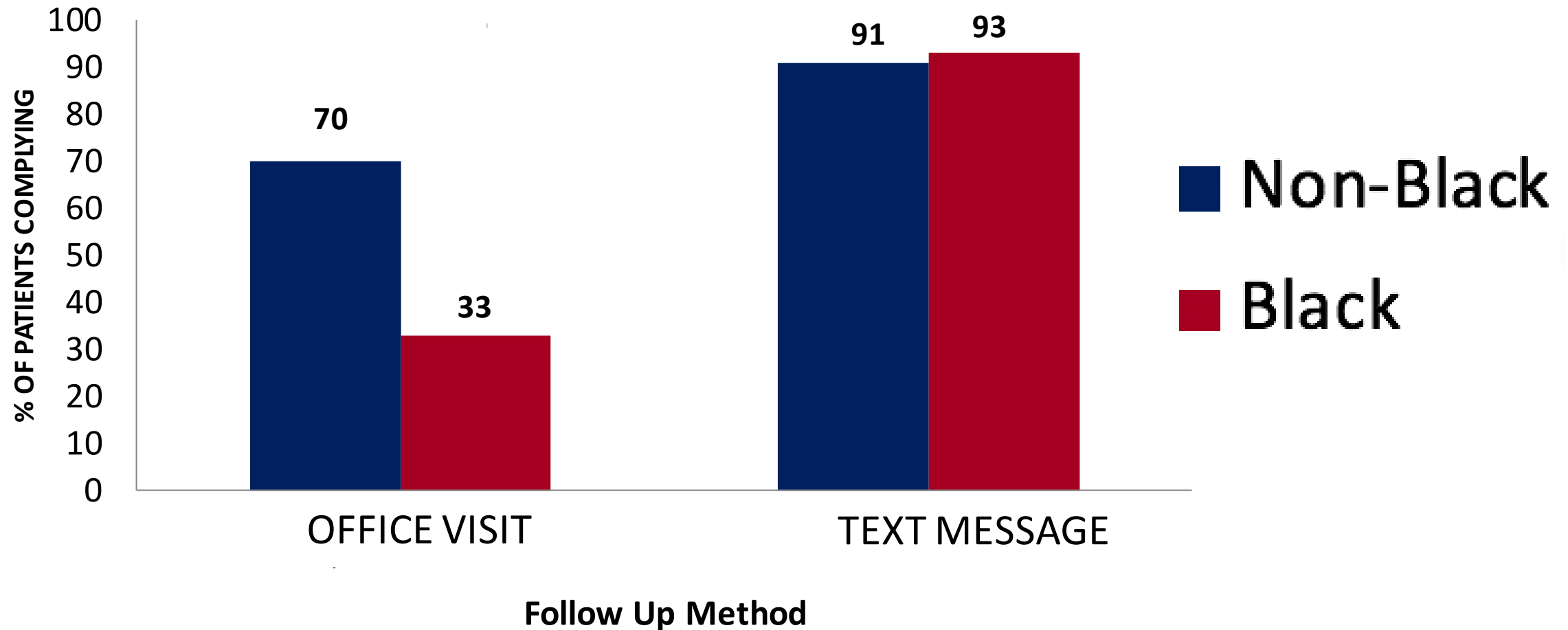
# Primary Outcome: Text Messaging

Postpartum blood pressure ascertainment by race and follow up method



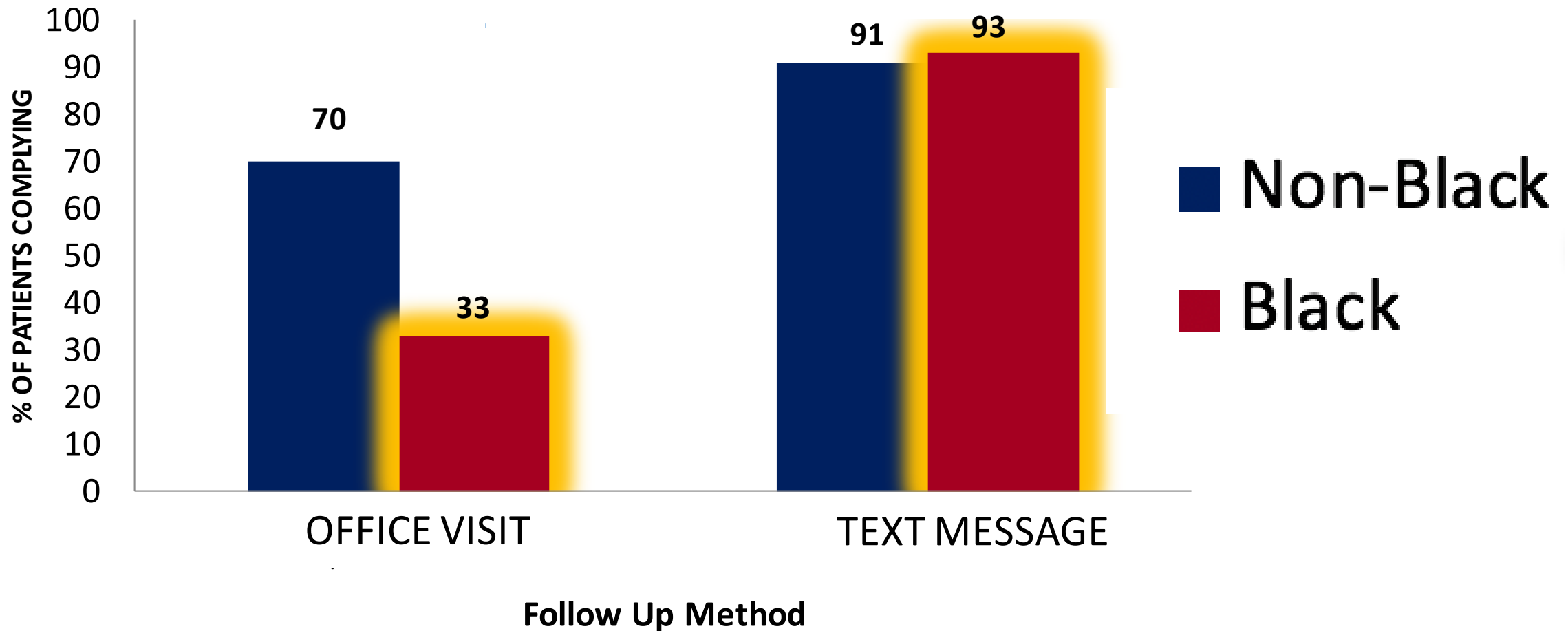
# Primary Outcome: Interaction

Postpartum blood pressure ascertainment by race and follow up method



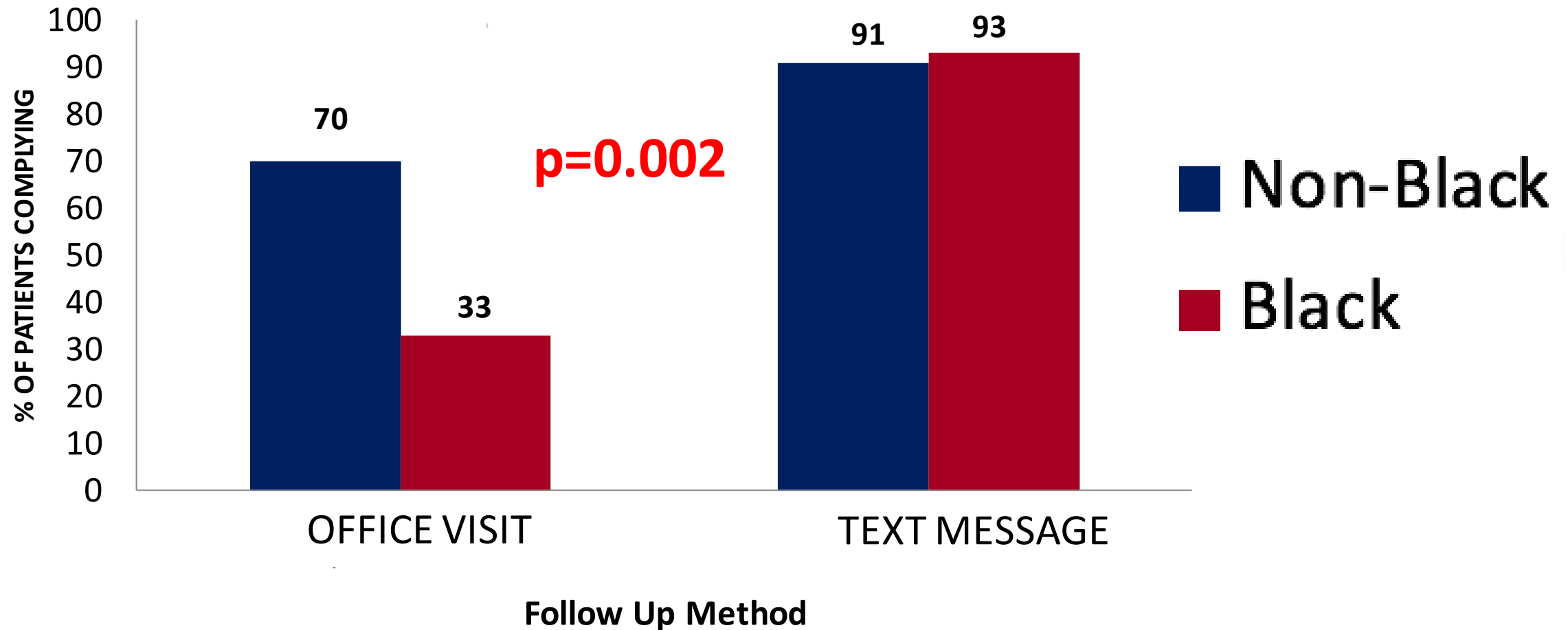
# Primary Outcome: Interaction

Postpartum blood pressure ascertainment by race and follow up method



# Primary Outcome: Interaction

Postpartum blood pressure ascertainment by race and follow up method



# Secondary Outcomes

## Text Messaging Arm

	<b>Black n=68</b>	<b>Non-black n=35</b>	<b>p-value</b>
ACOG recommendations: BP at 7-10 days postpartum	57(83.8%)	31(88.6%)	0.52

# Secondary Outcomes

Antihypertensive medication or dose adjustment after discharge

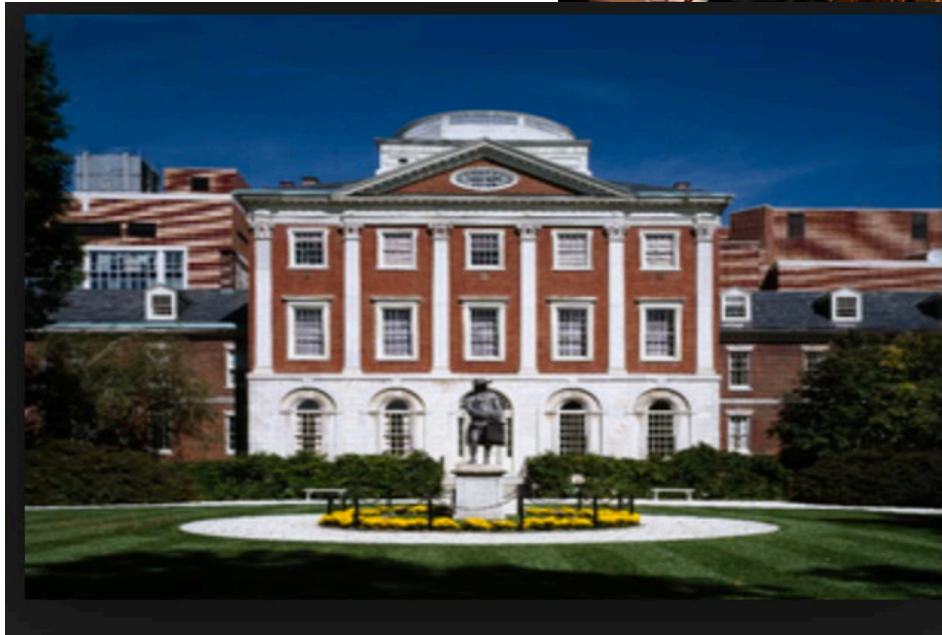
Office Visit	Text Message
5/24(20.8%)	12/63 (19.0%)



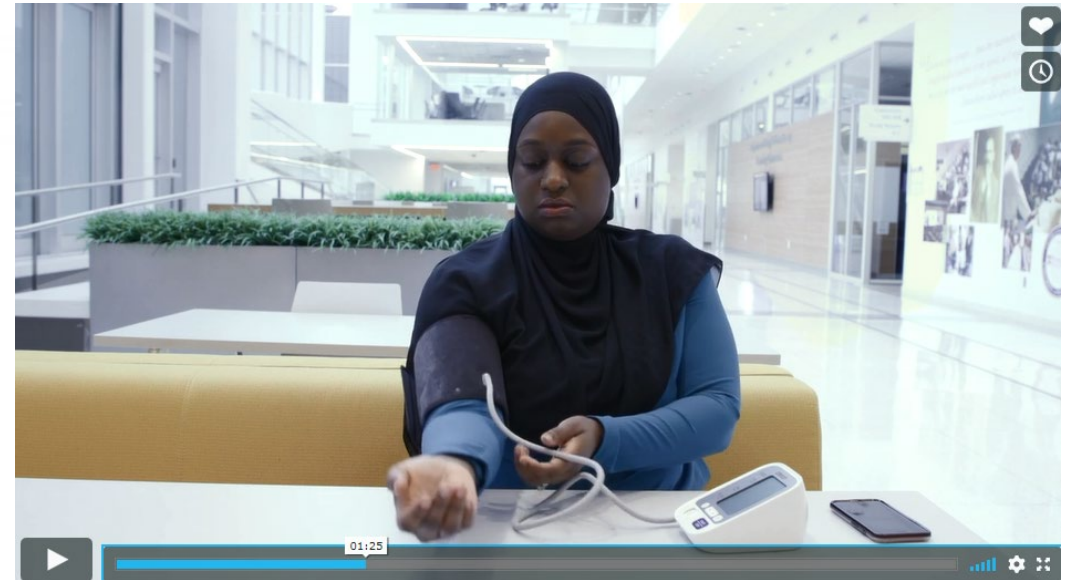
# Additional Findings

	Black		Non-Black	
	Office n=73	Text n=68	Office n=30	Text n=35
Additional HTN office/ER visits	2	3	0	0
HTN Readmissions	3	0	1	0
Mean # BP texted (max 28 texts)	-	14.9	-	18.7

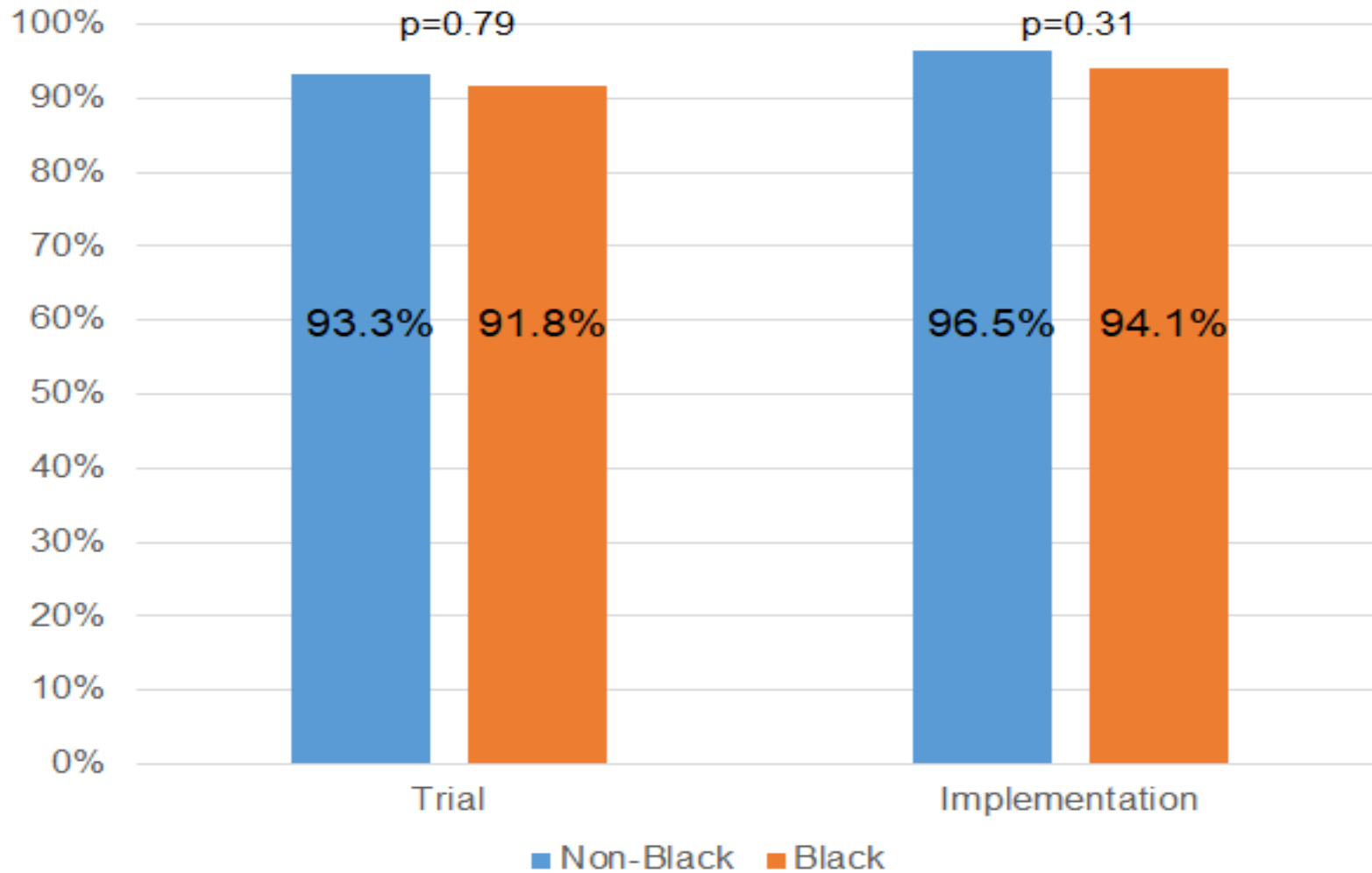
# At scale



# At scale



# At scale



Credit: Triebwasser,  
Hirshberg, Srinivas

# Real life Implementation

- Keys to success
  - Simple technology
    - text based, not app based
    - No need for Bluetooth/wireless
- Program supported through departmental support
  - BP cuff supply
  - Way to Health platform/technology support

# Questions?

- [Abbie.lund@pennmedicine.upenn.edu](mailto:Abbie.lund@pennmedicine.upenn.edu)
- [Heartsafemotherhood.org](https://heartsafemotherhood.org)