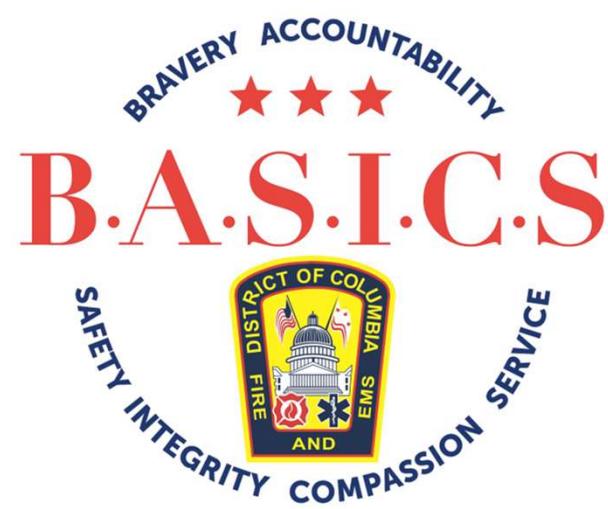




D.C. Resuscitation Collaborative: The State of Cardiac Arrest Performance in the District of Columbia

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July 29th, 2021



Goals

1. Show the state of cardiac arrest outcomes in the District of Columbia
2. Foster motivation to drive change that leads to improvement
3. Develop an appreciation for the complexity of the system(s)

Objectives

1. Present clear data on cardiac arrest performance from the years 2016 through 2021
2. Show where the challenges/barriers lie to improving cardiac arrest outcomes
3. Promote dialogue

Before we begin...

*Every **system** is perfectly designed to produce the results you get*

*Management of a **system** requires knowledge of the interrelationships between all of the components within the **system** and of everybody that works in it.*

Learning is not compulsory... neither is survival.

-W. Edwards Deming

So, when we talk about cardiac arrest – what do we mean?

We are talking about:

- Adults 18 years of age and older
- Have a “Presumed Cardiac”, “Respiratory/Asphyxia”, and “Drug Overdose” etiologies... essentially Non-Traumatic Cardiac Arrests
- And patients that were treated by D.C. Fire and EMS and other system partners

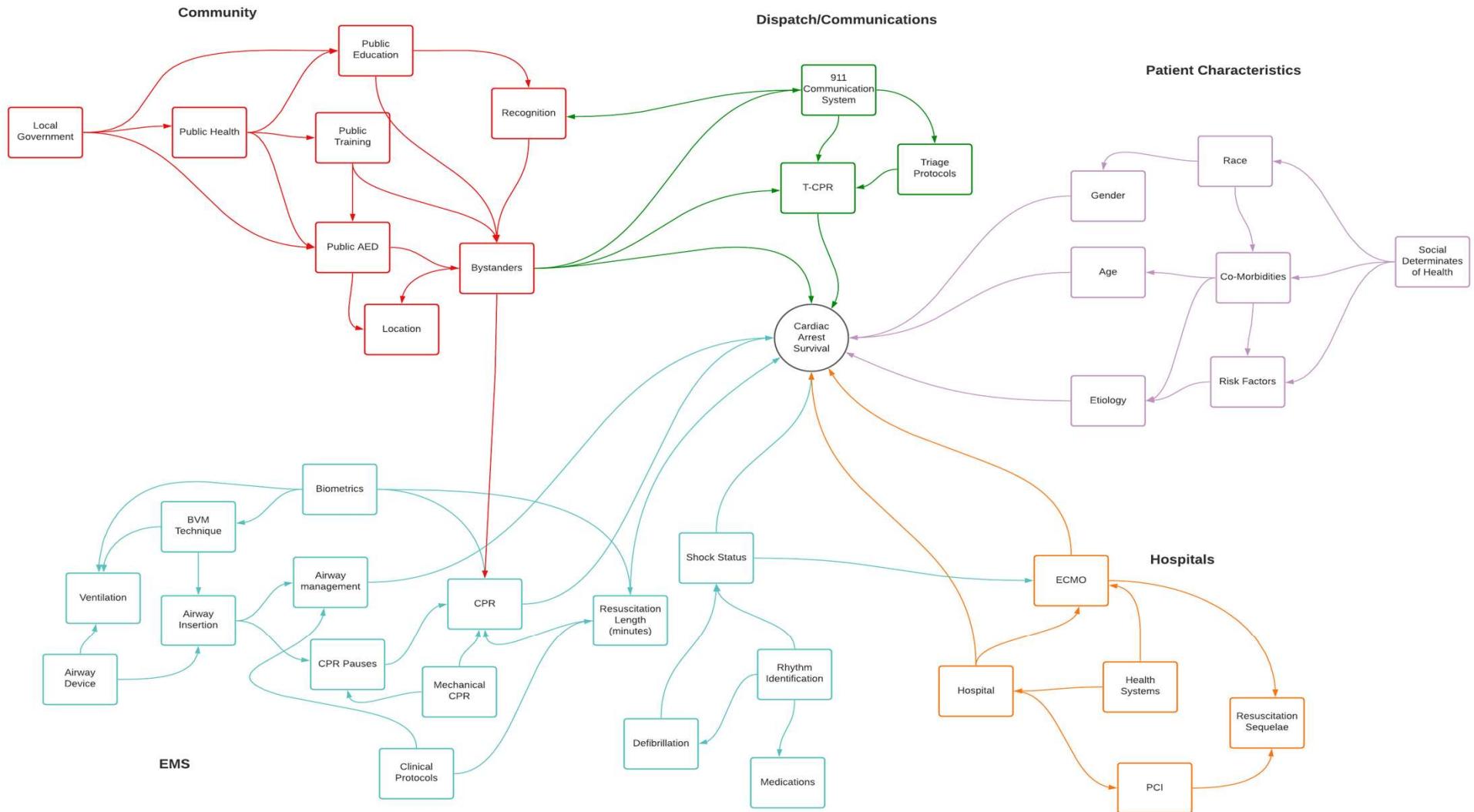
What we are not talking about:

- Special populations
- Traumatic cardiac arrest
- Patients who are deceased, and no resuscitation attempted

The American Heart Association, Out of Hospital Cardiac Arrest “Chain of Survival”



Image: https://cpr.heart.org/-/media/cpr-images/resources/cpr-facts-stats/adult_ohca_cos_600x415_72dpi_cropped_optimized.jpg?la=en&hash=BE12202D68A21FE49CF614588D91D0BD14042616



Data about ‘The System’

Data used for analysis were extracted out of the Cardiac Arrest Registry to Enhance Survival, aka CARES dataset for the District of Columbia

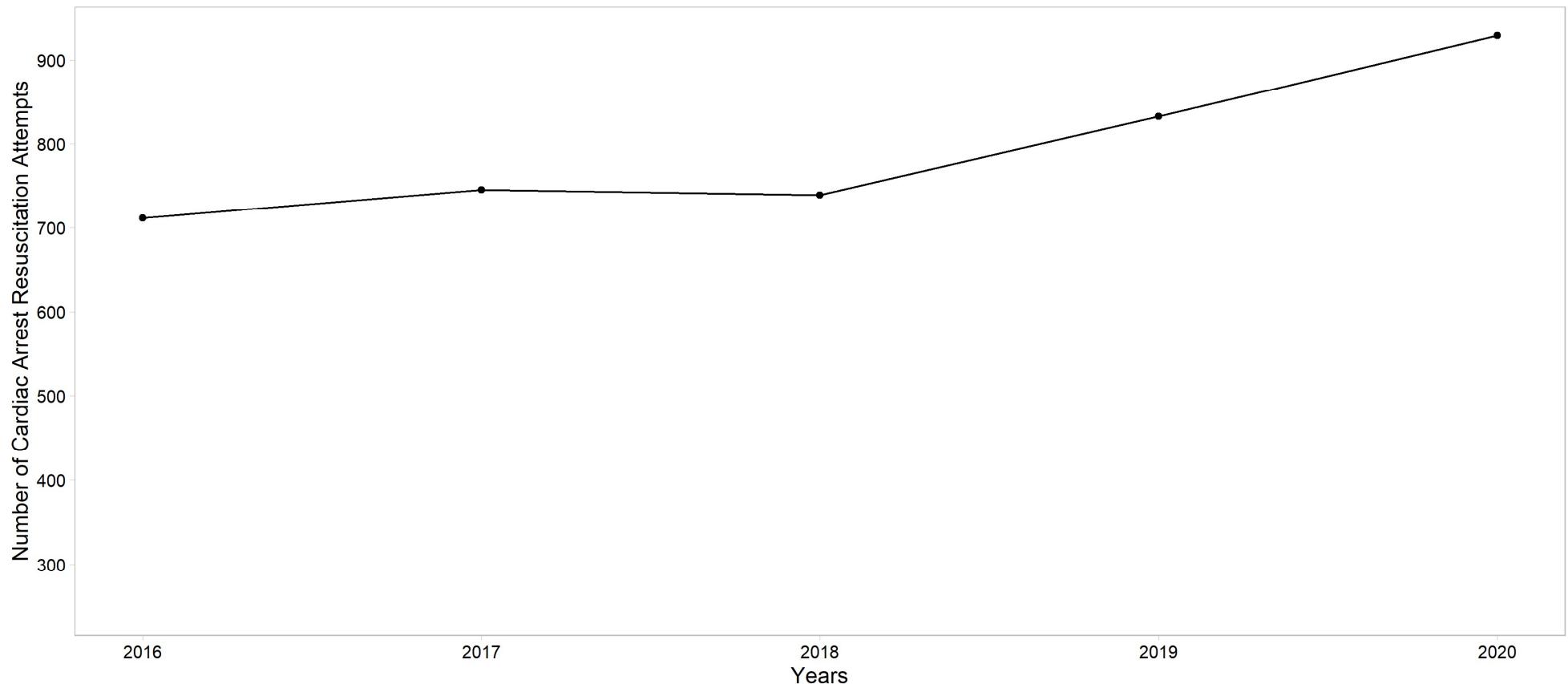
Total number of cases: N=4,656

Removing trauma related cases: n=4,352

A difference of n=304; or ~6.5% of the data not included

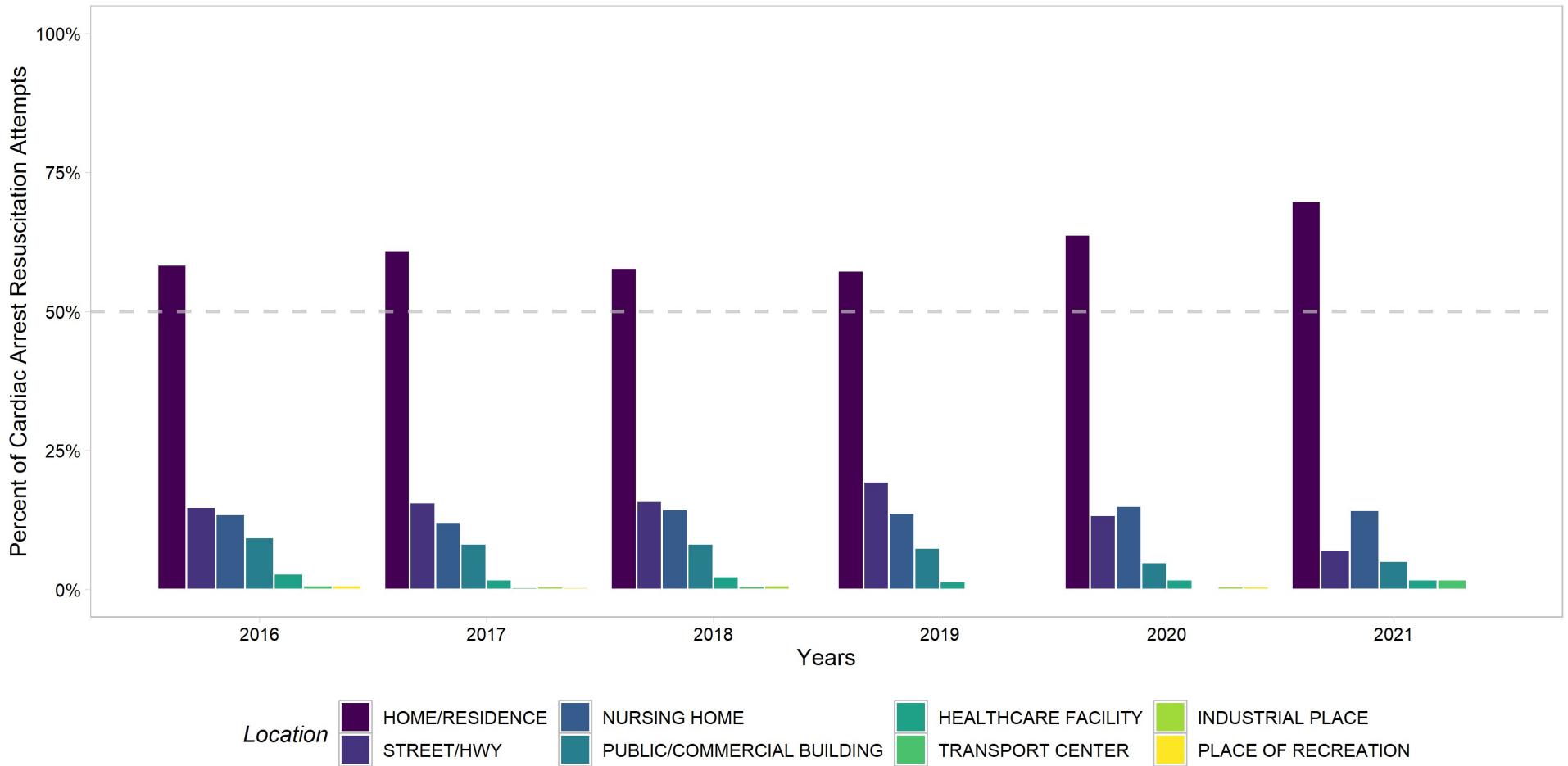
The state of cardiac arrests...

DC Fire and EMS Resuscitation attempts over the years...

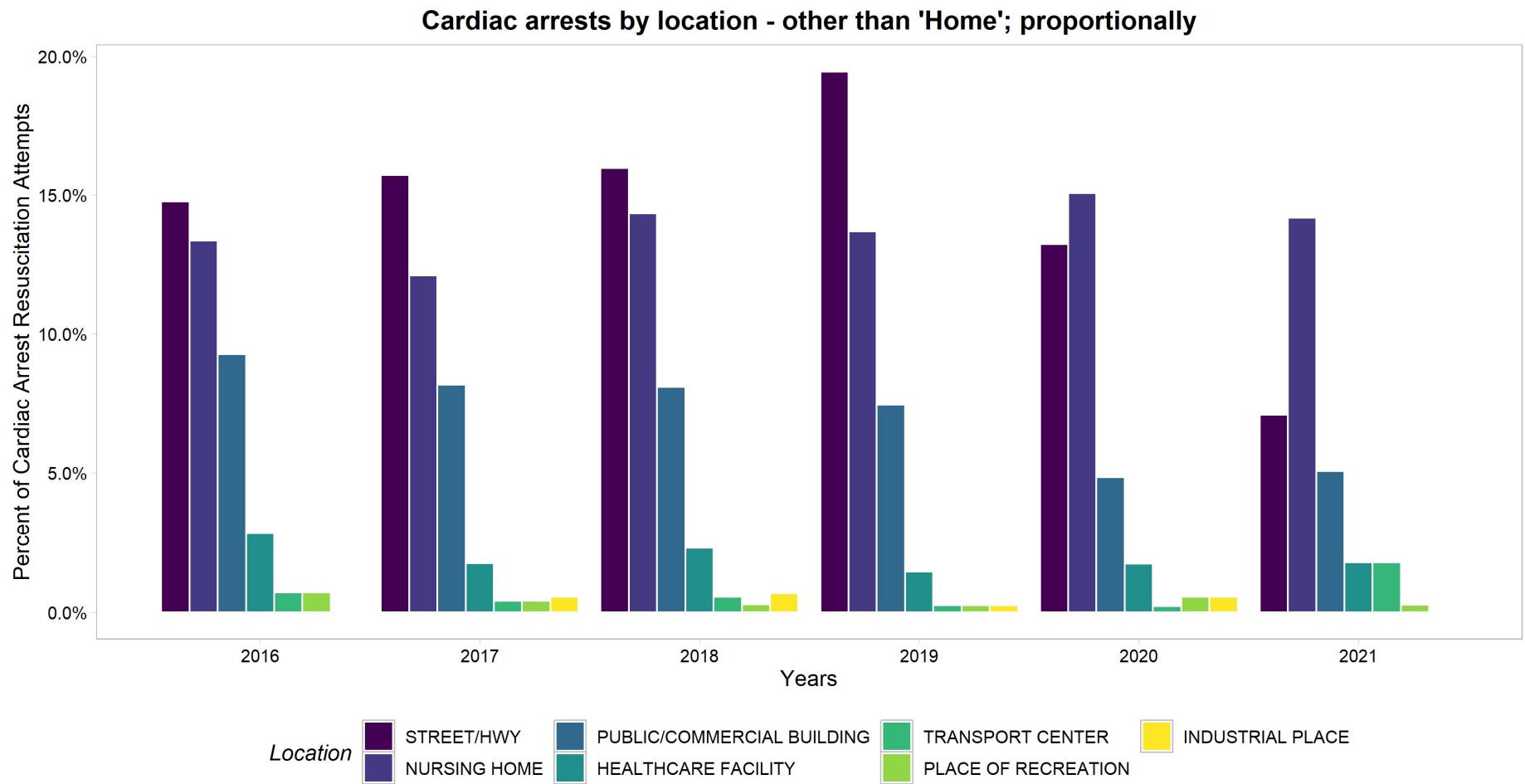


Where do cardiac arrests occur?

Cardiac arrests by location - proportions



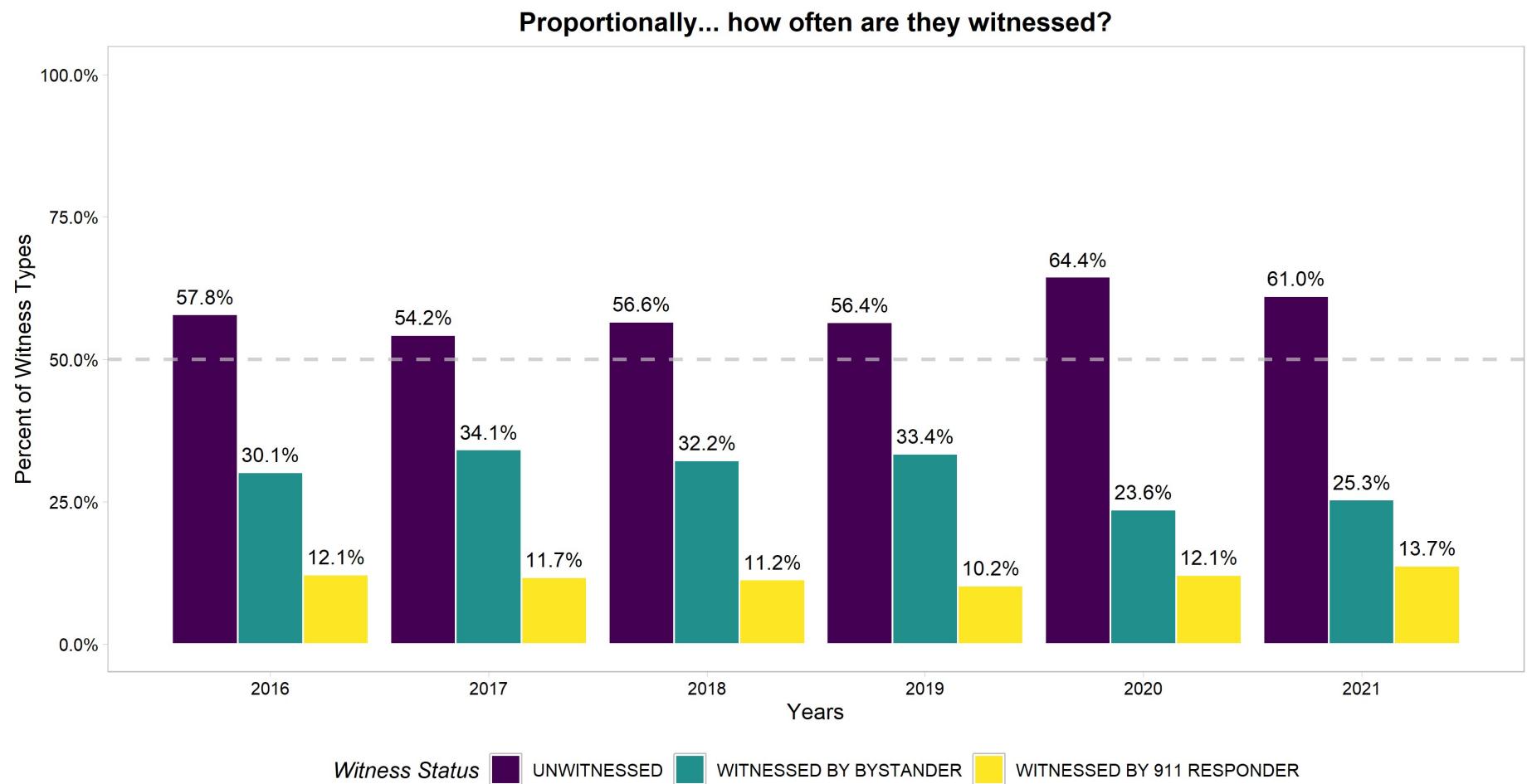
Drilling down beyond “Home”



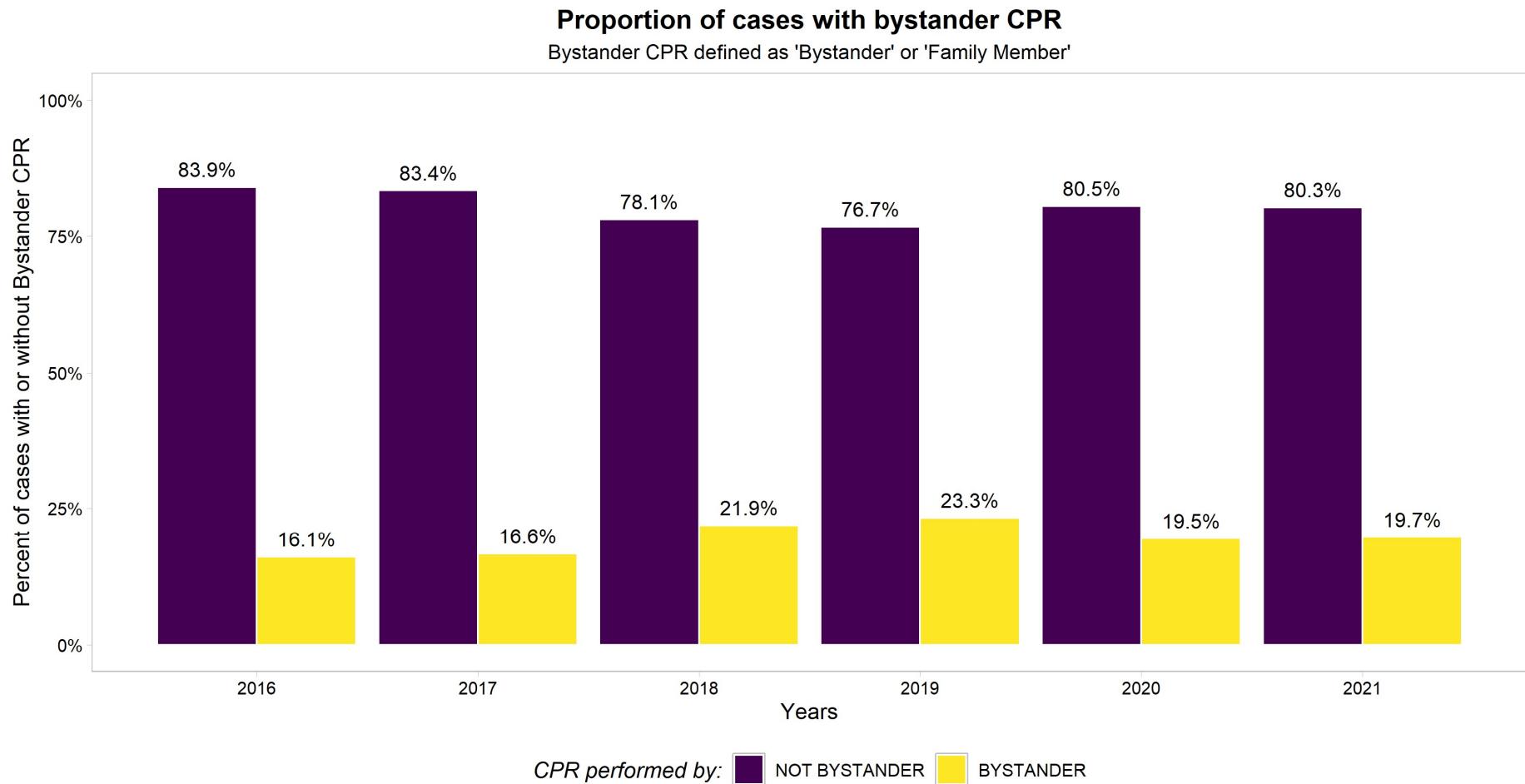
There are 3 factors that affect survival

- 1) Was it a witnessed and recognized cardiac arrest?
- 2) Was early (immediate) CPR initiated?
- 3) Was an AED applied; and if applicable, early defibrillation?

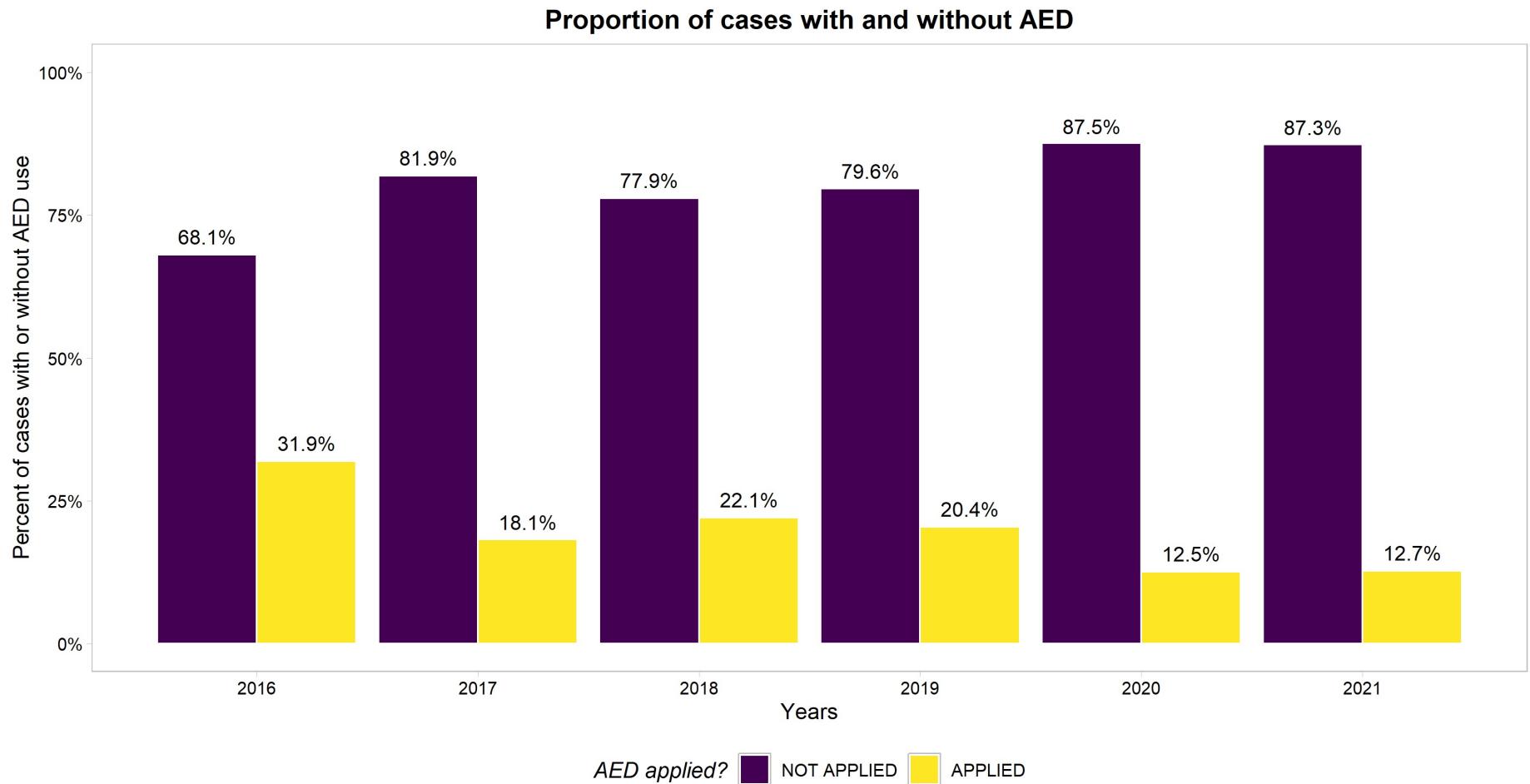
So how often are cardiac arrests ‘witnessed’?



And bystander CPR initiated?



And AED use...



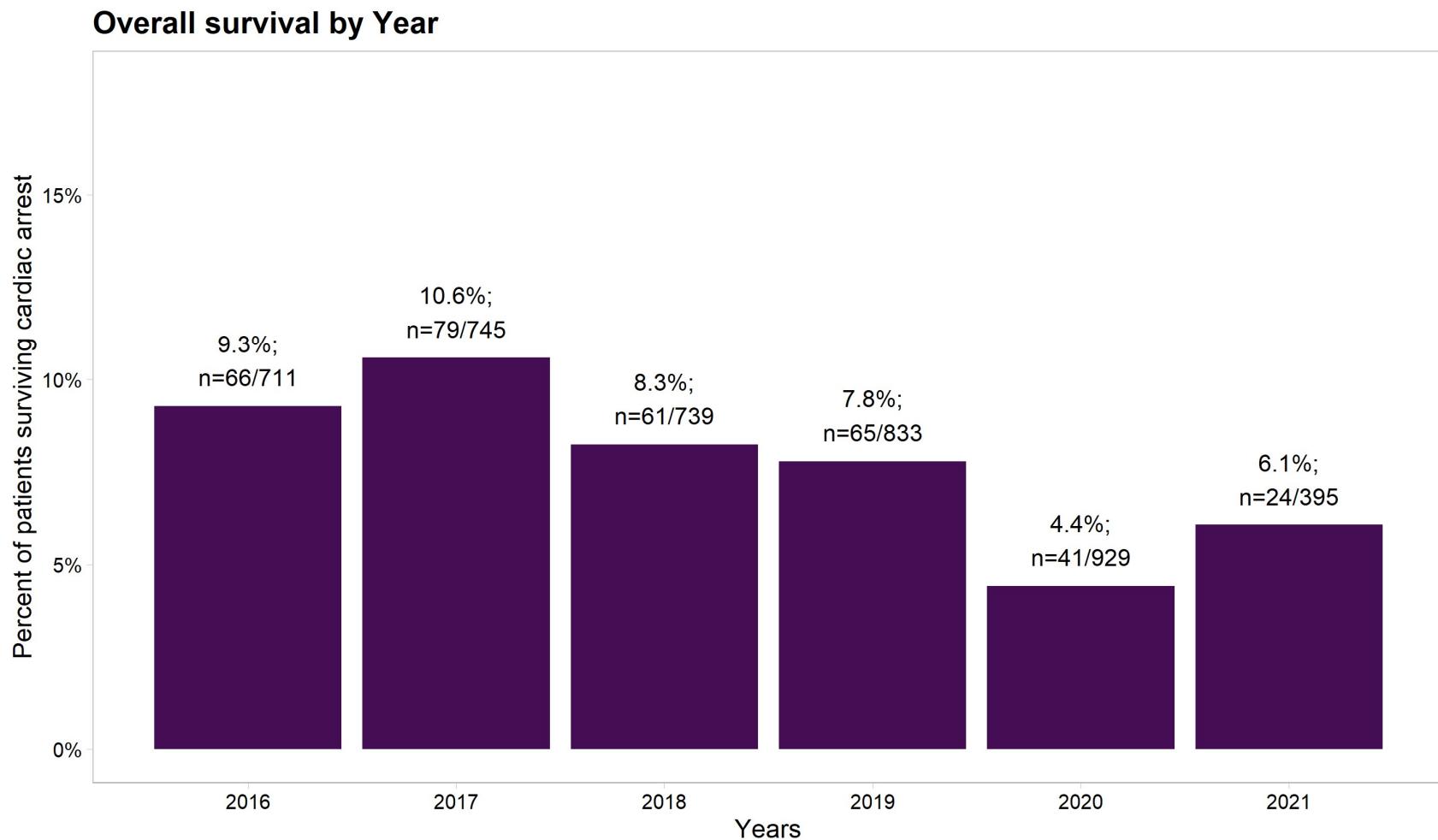
So when someone got all three elements

	Discharged - Yes	Discharged - No
Survival Bundle - Yes	39	60
Survival Bundle - No	297	3956

Odds of being Discharged from Hospital if Witnessed + Bystander CPR + AED application: **8.65**

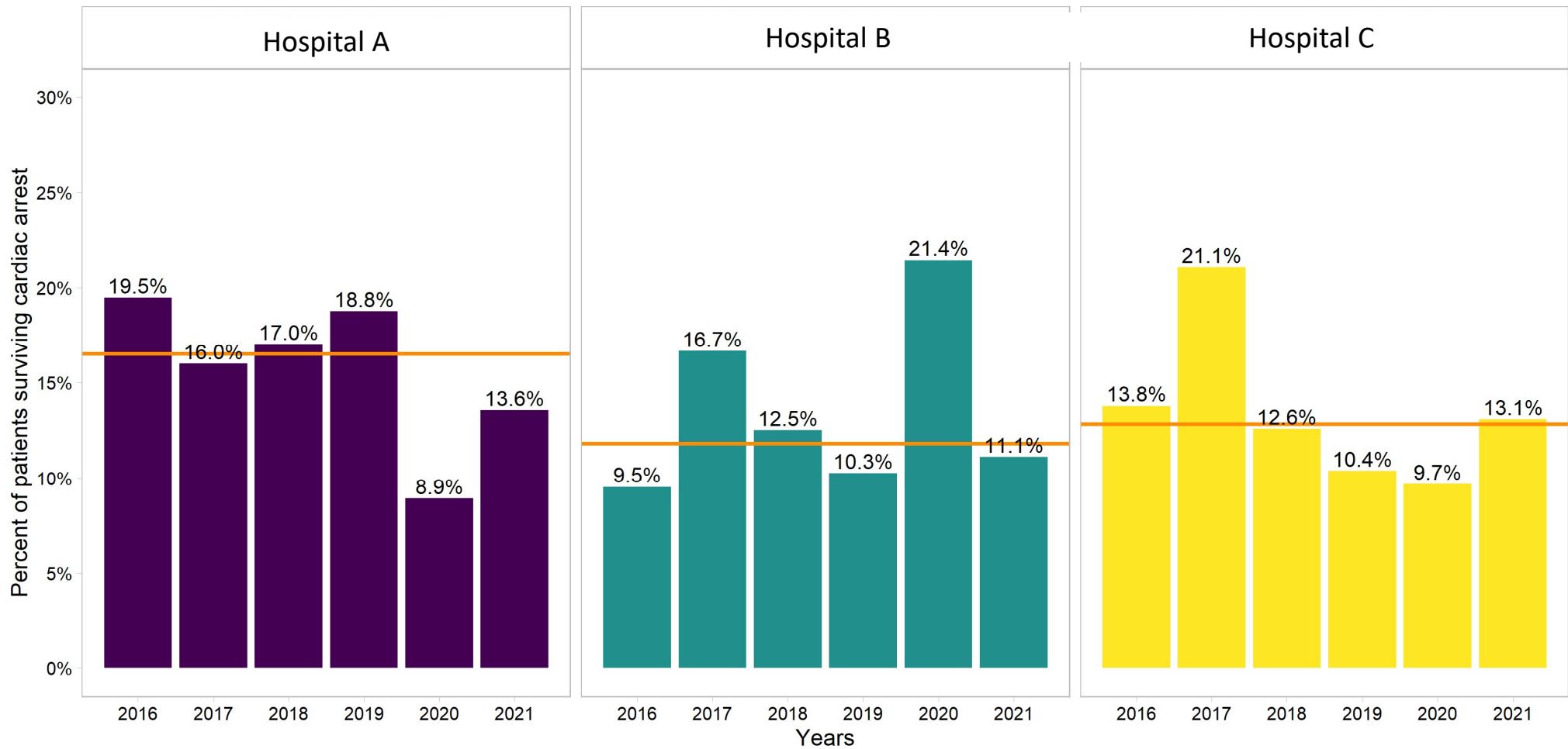
Translation: 8.65x's more likely to be discharged compared to not having all 3 elements

How many patients are surviving?



Survival by Hospital

STEMI/ROSC Hospitals



To recap what we've seen so far...

- Majority of cardiac arrests occur in the home
- More than half all of cardiac arrests are unwitnessed
- Low rates of cardiac arrest Bystander or Family Member CPR
- Low rates of AED use
- COVID-19 has had a detrimental impact

An important question we are left with is...

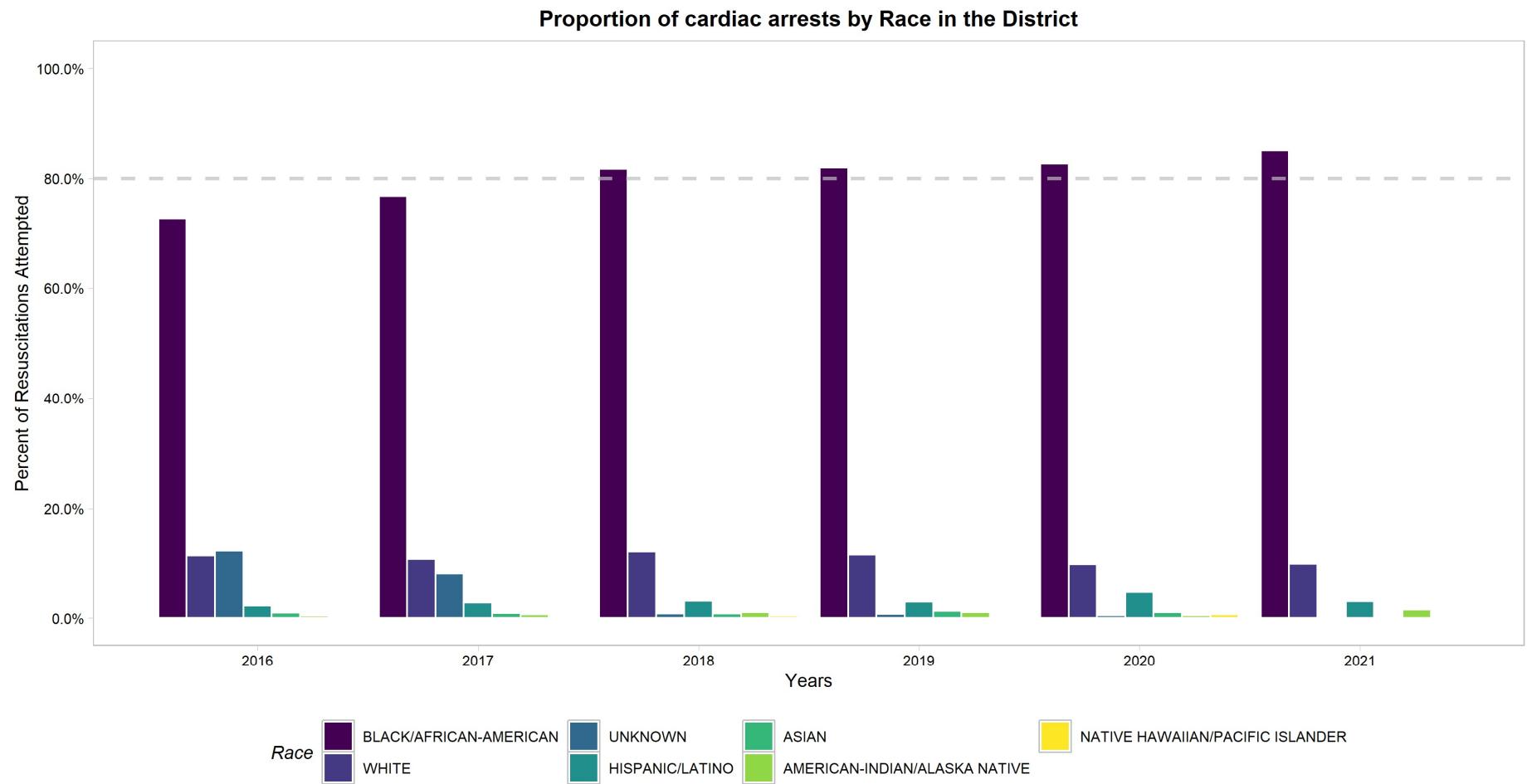
- Which groups in our community suffer more negative impacts from cardiac arrest than others?

What we know about the District

The 2019 1-Year American Community Survey population estimate of the District of Columbia is ~705,000

- 45.4% Black/African-American, alone (n~320,000)
- 42.5% White, alone (n~300,000)
- 4.3% Asian (n~30,000)
- Ethnically – 11.3% Hispanic/Latino

Proportionally...



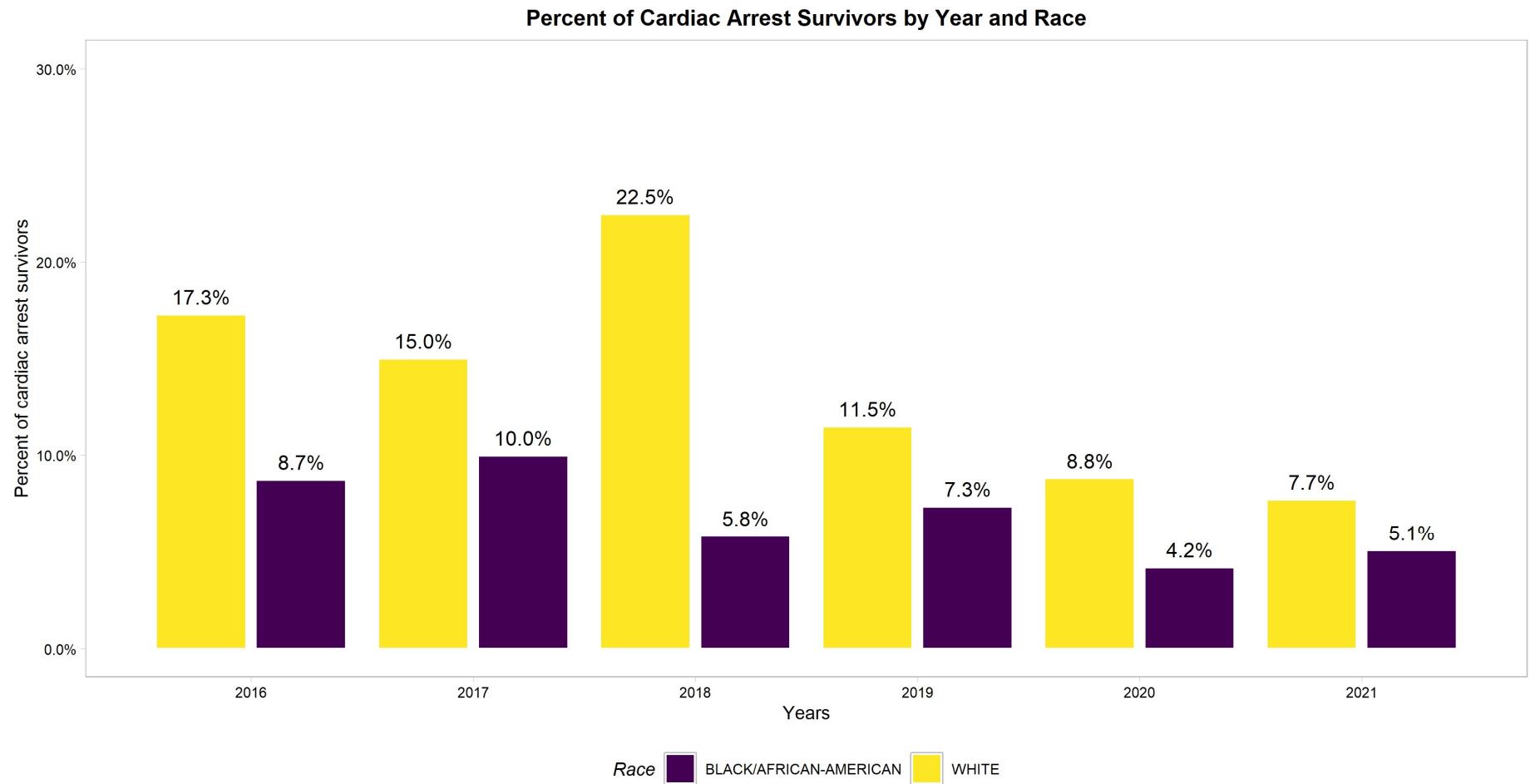
Black and African Americans make up ~45% of the Districts population, and account for **over 80% of all cardiac arrests**

Estimates based on the 2019 ACS Data...

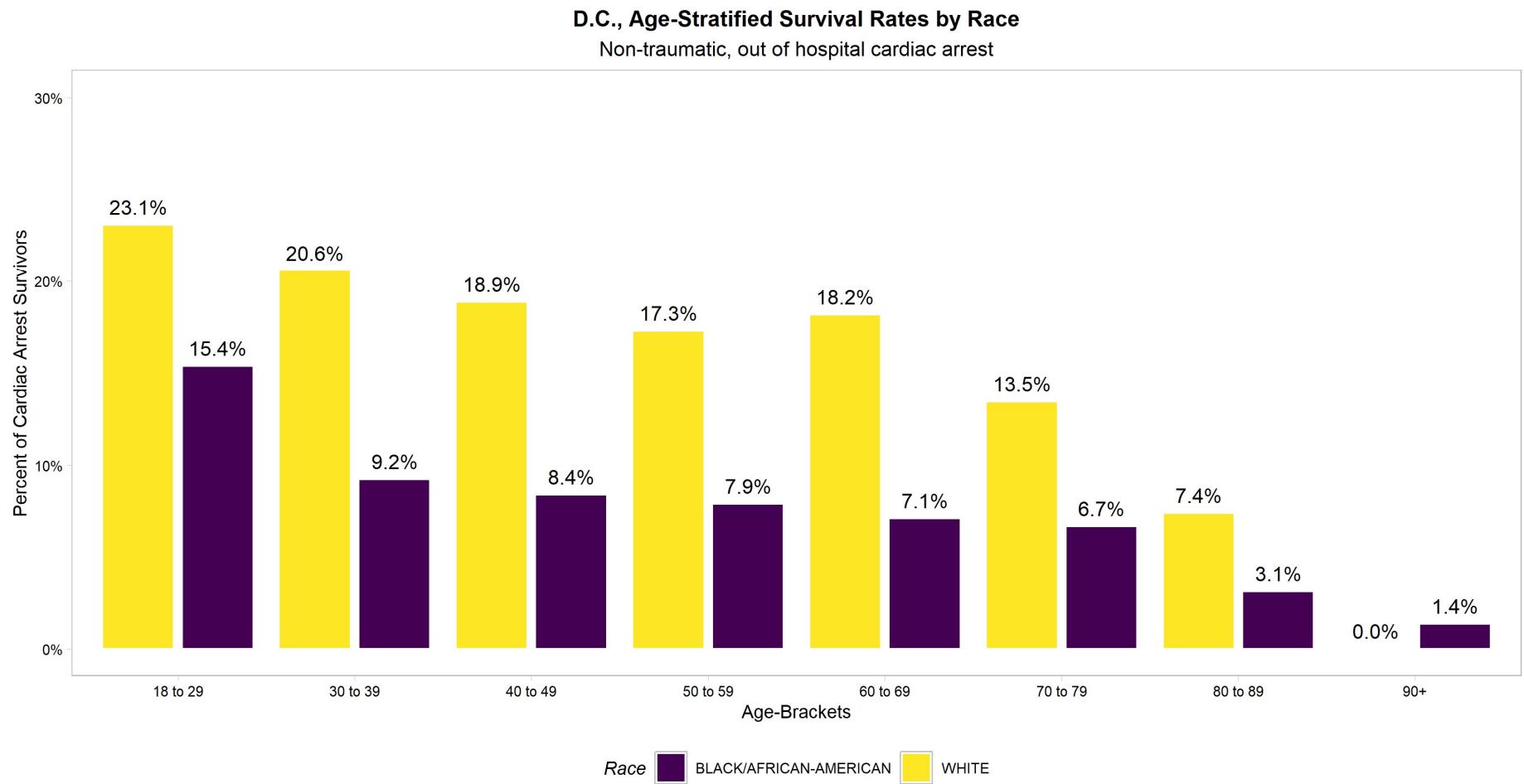
- Black/African-Americans: 16 cardiac arrests per 10,000
- Whites: 2.7 cardiac arrests per 10,000

Black/African-American Residents suffered cardiac arrests at **5.9x's the rate** of White residents in 2019

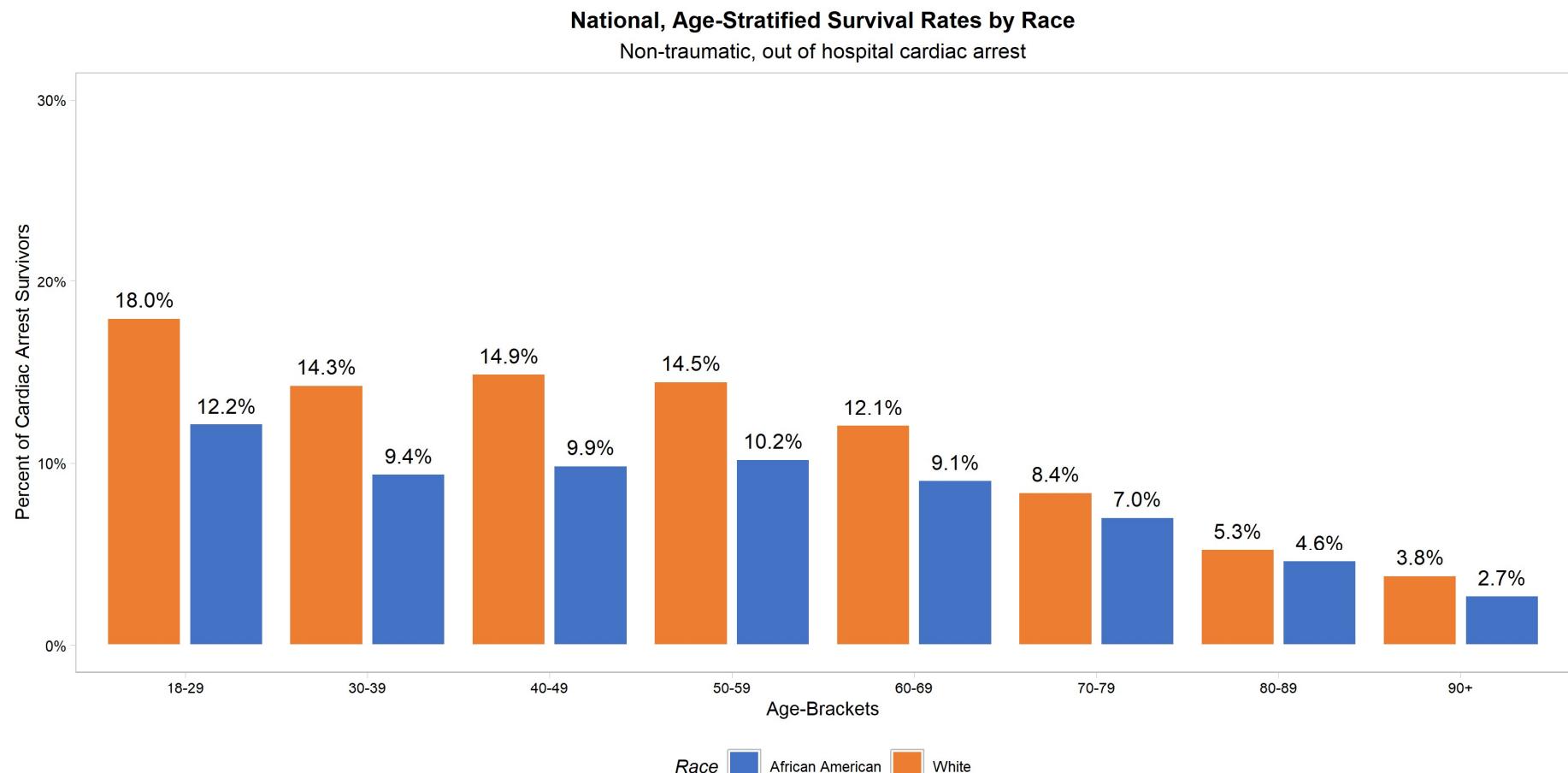
When we break down survival...



And when we stratify by age



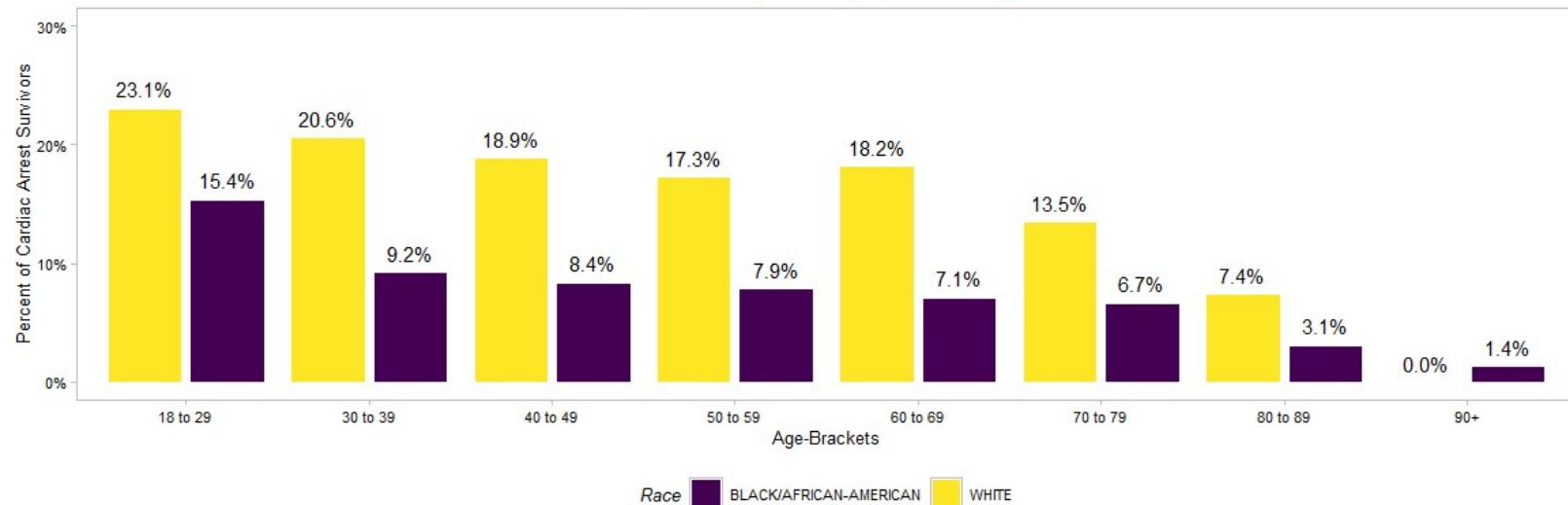
National, Age-Stratified Survival Rate



Data supplied by CARES, validated National dataset 2013-2020

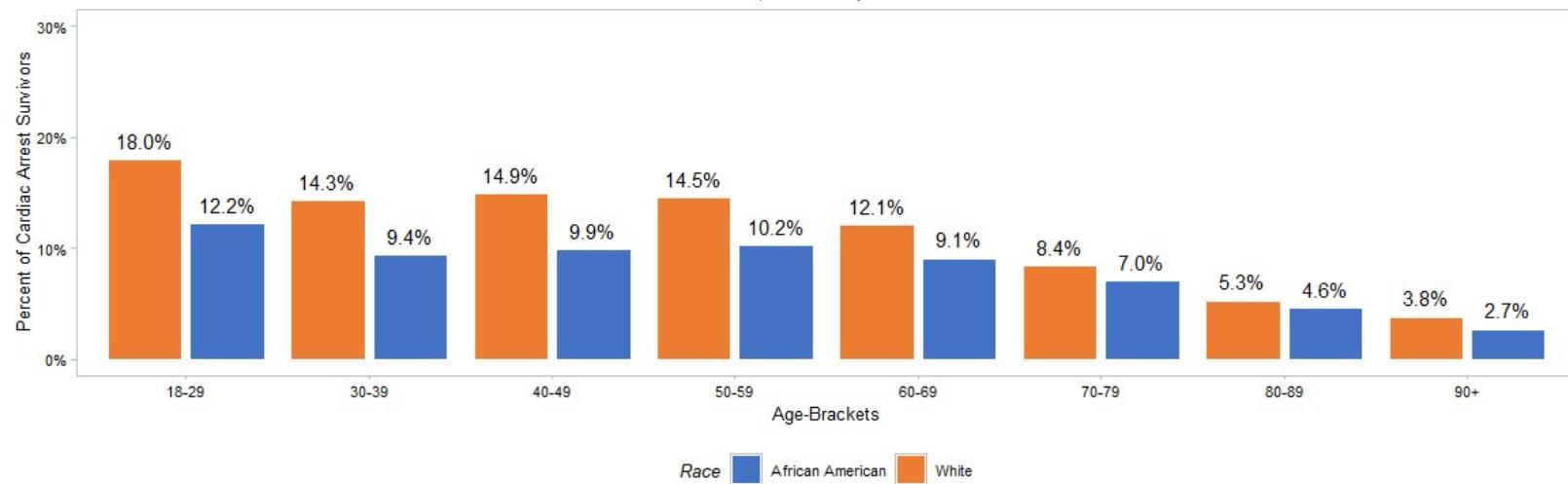
D.C., Age-Stratified Survival Rates by Race

Non-traumatic, out of hospital cardiac arrest



National, Age-Stratified Survival Rates by Race

Non-traumatic, out of hospital cardiac arrest



Data supplied by CARES, validated National dataset 2013-2020

Key Points:

- 1) Black/African-American residents are **disproportionately suffering** from cardiac arrest

- 2) Black/African-American residents are **disproportionately dying** from cardiac arrest (not surviving)

Other significant contributing factors...

Compared to White patients, Black/African-American patients were:

- 48.7% less likely to have a “Witnessed” arrest
- 37.3% less likely to have “Bystander” CPR
- 38.8% less likely to have an AED applied

Survival bundle... by Race

	Black/African-American	White
Survival Bundle - Yes	52	36
Survival Bundle - No	3428	440

Odds of being Black/African-American and having a witnessed cardiac arrest + bystander CPR + AED; OR: 0.185

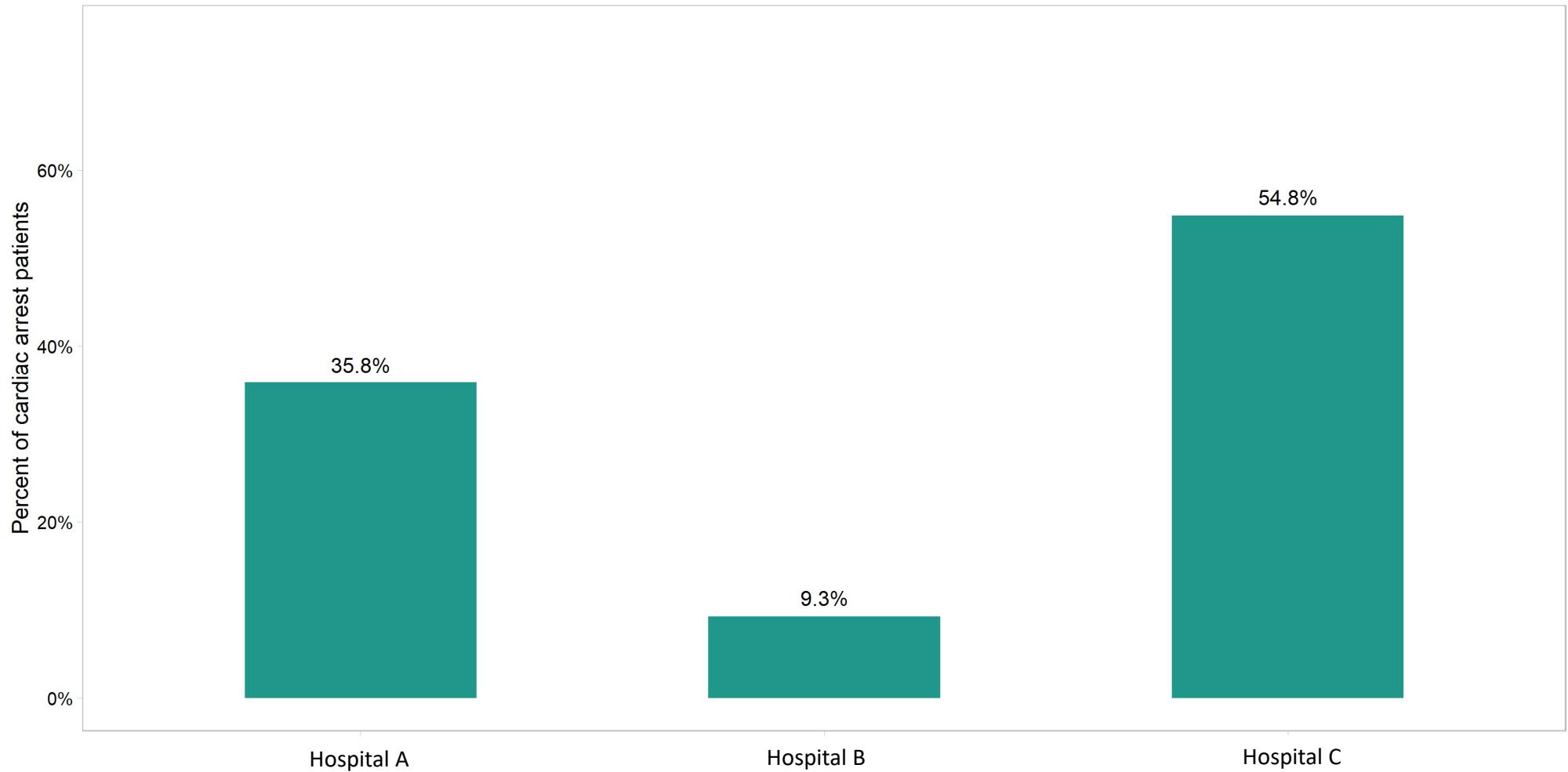
Translation: Black/African-American patients were 81.5% less likely to have all three elements, compared to White patients

Hospital Survival

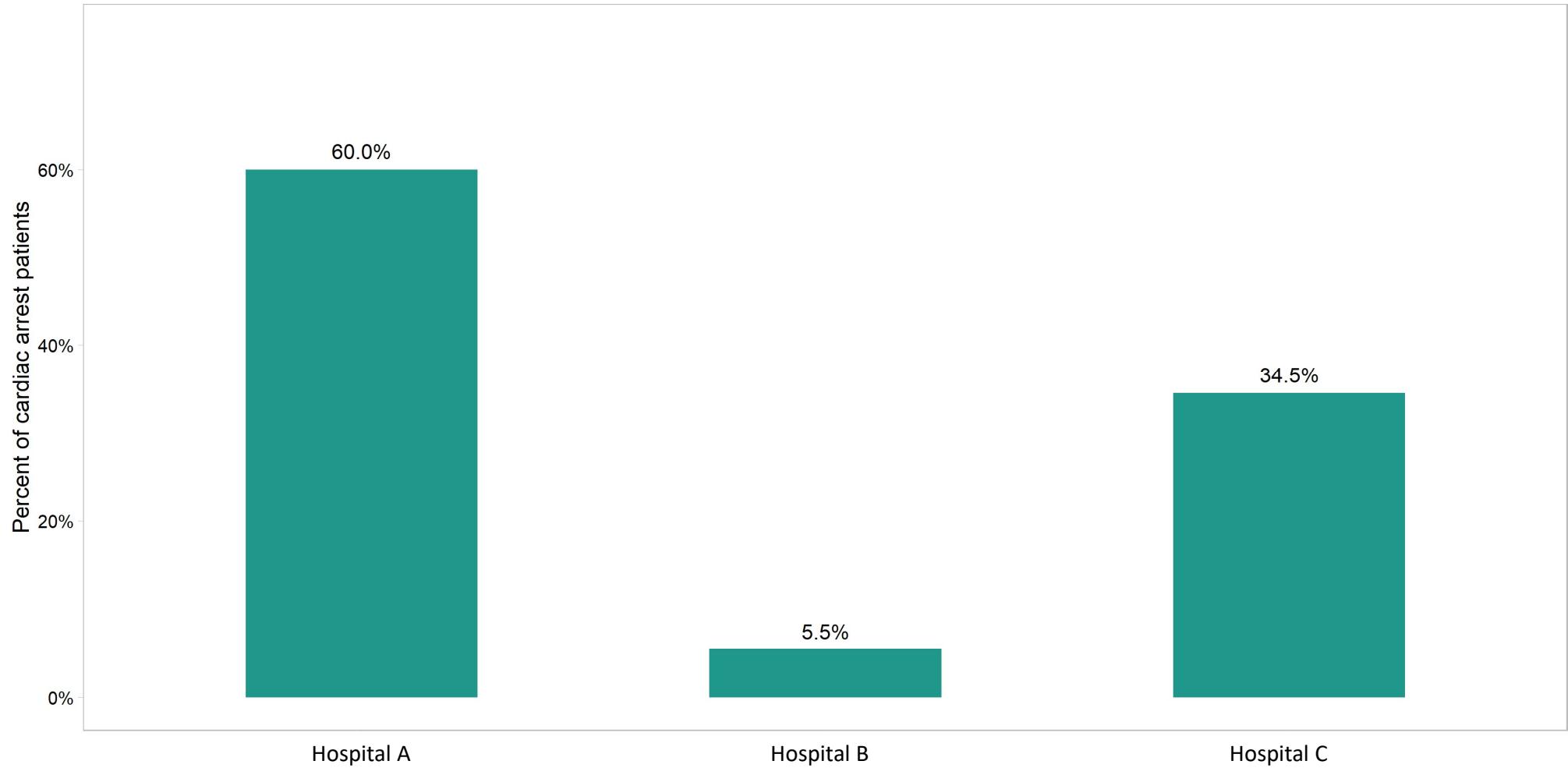
Three hospitals in the District of Columbia receive over 70% of all cardiac arrests. Outcomes for these three hospitals are presented.

To protect their identities, they have been denoted as Hospital A, Hospital B, and Hospital C.

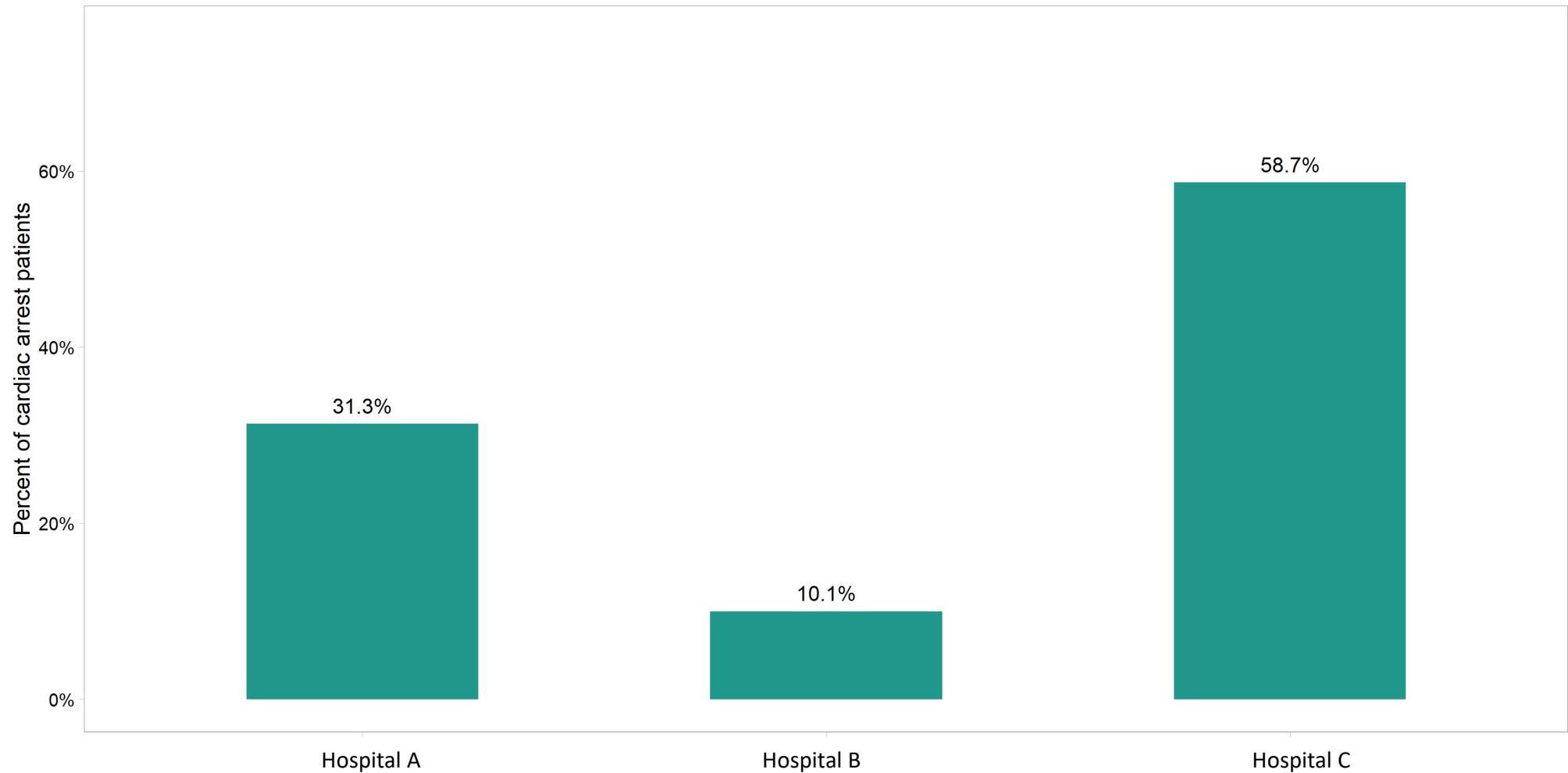
Where are cardiac arrest patients transported to?



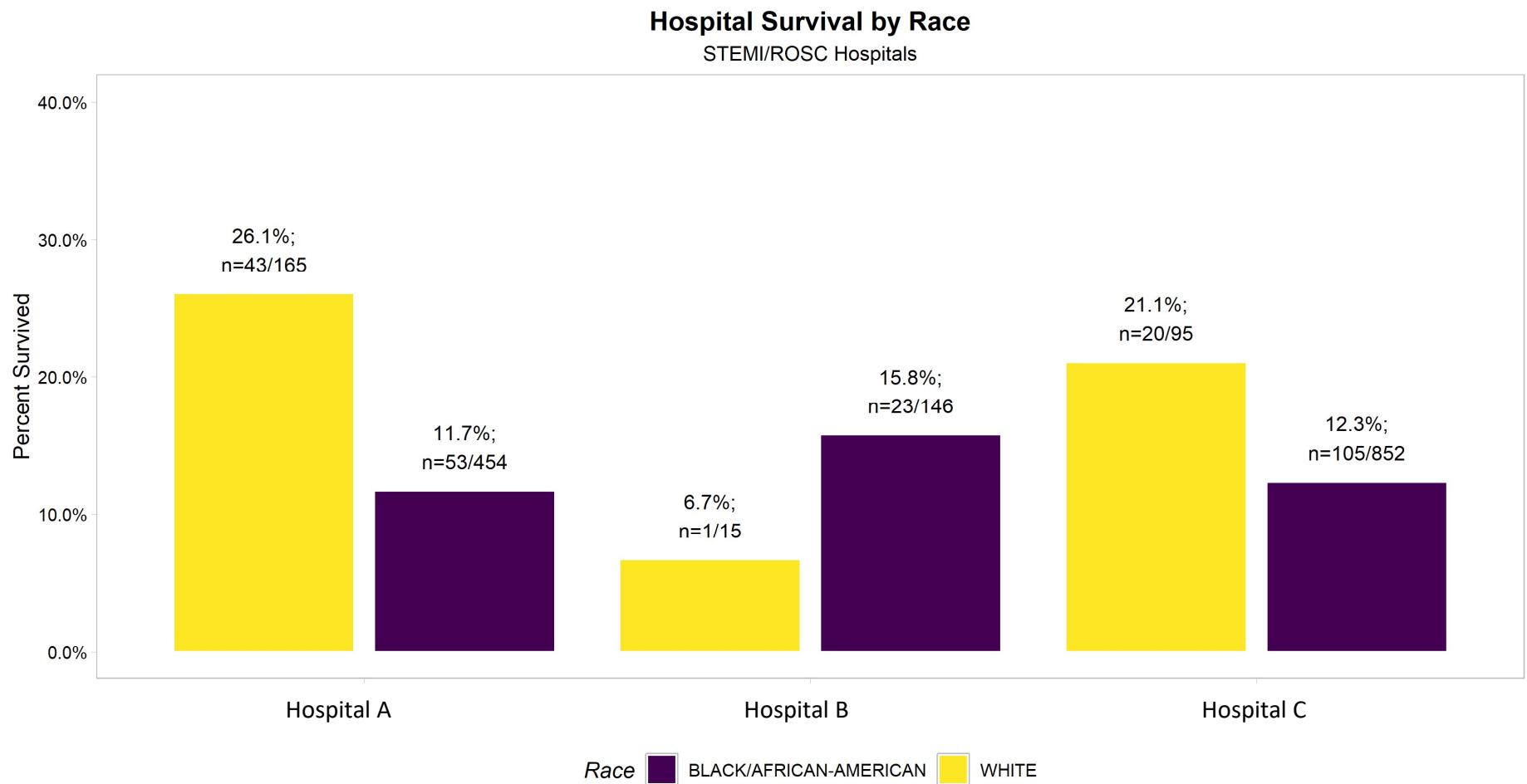
Where are 'White' cardiac arrest patients transported?

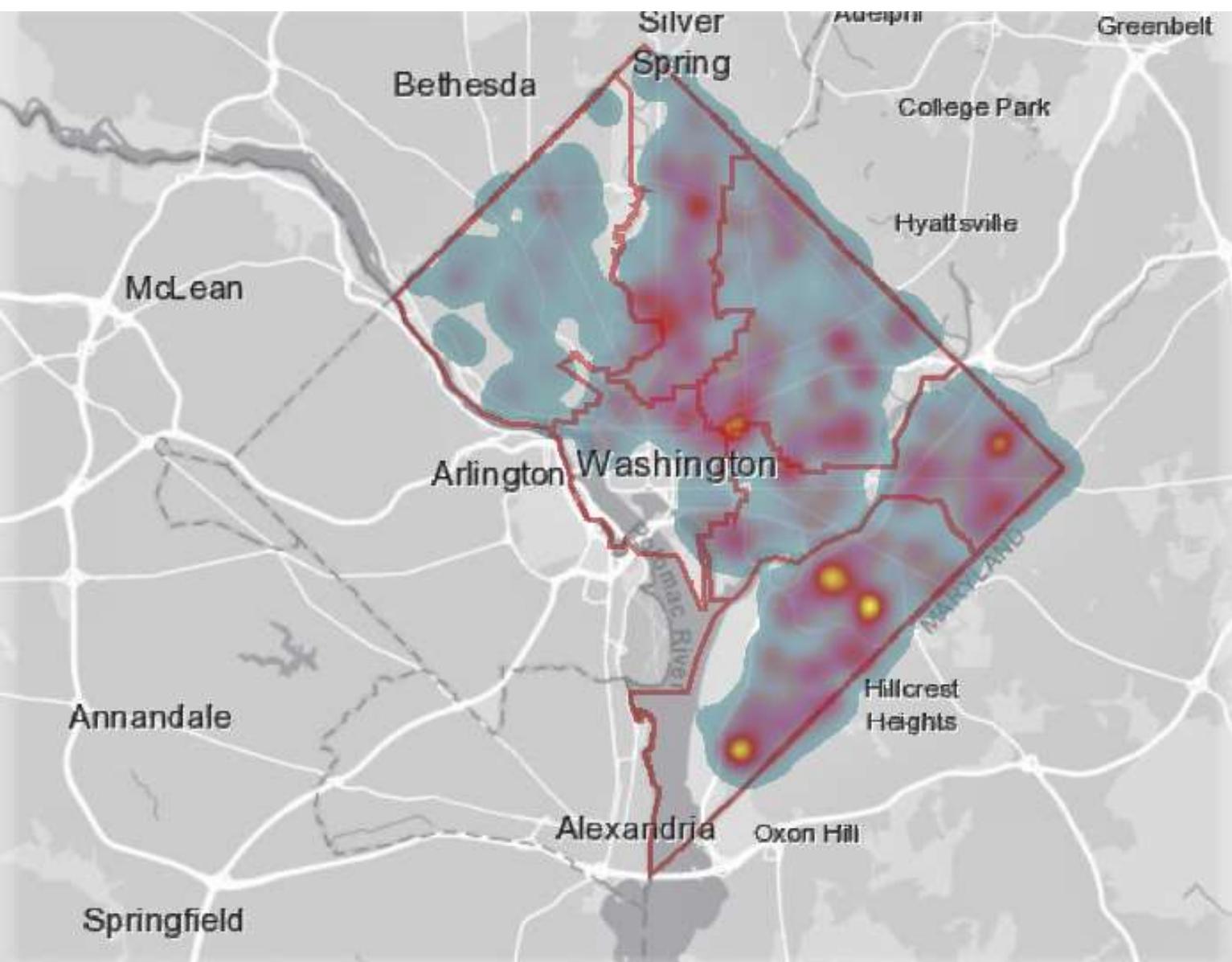


Where are 'Black/African-American' cardiac arrest patients transported?



What about survival by hospital?





Filters

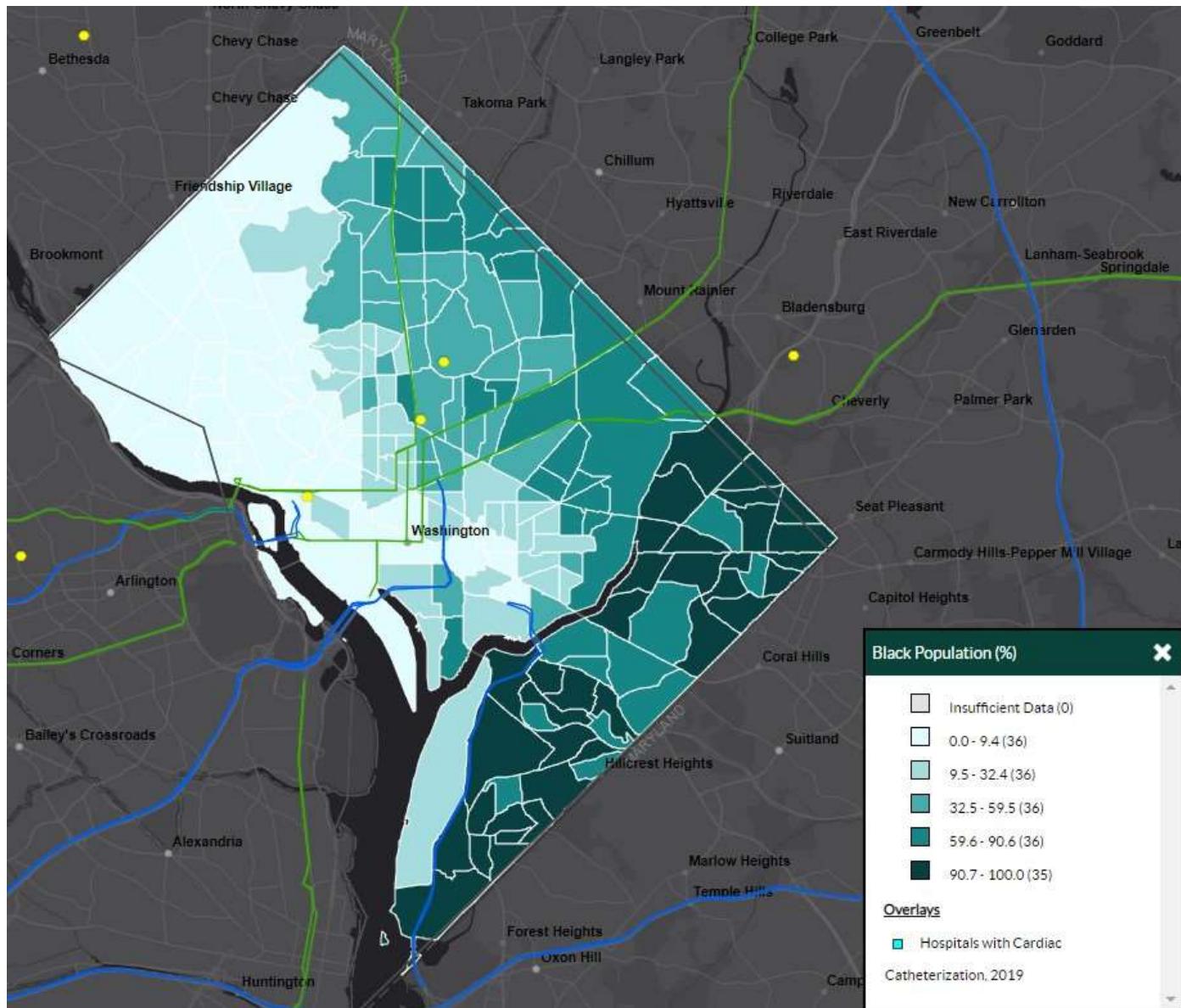
DCFEMS Cardiac Arrest (FP)

(1/1/2020 12:00:00 AM - 12/31/2020 11:59:59 PM) ⓘ

Group By Problem

Select All

- Abdominal Pain/Problems (2)
- Assault (7)
- Breathing Problem (38)
- Carbon Monoxide/Hazmat/Inhalation/CBRN (1)
- Cardiac Arrest/Death (1305)
- Chest Pain (Non-Traumatic) (4)
- Convulsions/Seizure (3)
- Diabetic Problem (2)
- Drowning/Diving/SCUBA Accident (2)
- Falls (8)
- Fire (4)
- Hemorrhage/Laceration (3)
- Industrial Accident/Inaccessible Incident/Other Entrapments (Non-Vehicle) (2)
- No Other Appropriate Choice (6)
- Overdose/Poisoning/Ingestion (4)
- Pregnancy/Childbirth/Miscarriage (1)
- Psychiatric Problem/Abnormal Behavior/Suicide Attempt (3)
- Sick Person (11)
- Stab/Gunshot Wound/Penetrating Trauma (65)
- Stroke/CVA (1)
- Traffic/Transportation Incident (19)
- Unconscious/Fainting/Near-Fainting (66)
- Unknown Problem/Person Down (3)



In summary...

1. Cardiac arrest cases appear to be increasing in the District of Columbia
2. We have low rates of witnessed cardiac arrests, low rates of bystander CPR, and low rates of AED application
3. Overall survival rates have declined, and remain low so far
4. Black/African-American residents disproportionately suffer from cardiac arrest, and the negative consequences from it
5. There is disparity in across our three STEMI/PCI hospitals

Knowing what we now know... consider:

If every system is perfectly designed to get the results you get... then what do these outcomes tell us about our system?

Are there immediate steps we can take to address gaps in care/outcomes?

What else do we need to consider as it relates to these outcomes?

Look around the room and ask yourself...

Who isn't here, that should be?

What is my role in the system of cardiac arrest prevention, treatment and recovery?

How can I help or contribute to other elements/parts of the system of prevention, treatment and recovery?