Summer Pool Data Project

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VIRGINIA DEPARTMENT OF HEALTH INTERNSHIP ACADEMY

VDH VIRGINIA DEPARTMENT OF HEALTH

Overview

Pool Map

Generate interactive GIS map of operating public pools for EH managers using Pool Permit data

Drowning/RWI Data

Updated data on Fatal and Non-Fatal Drownings and RWI in VA pulled from multiple offices of VDH for use in Pool Program Pool Report

Purpose

Pool Map

- *Estimation* of total operating permitted pools in VA
- How can OEHS accurately identify and locate public pools in operation in VA using Pool Permit data from EHD and PLUS?
- Why?
  - Determine impact of potential regulatory changes
    - Resource/Training needs, grant funding, small business impact
  - Improved response time if event occurs
  - Identify gaps in reporting
  - Potential policy revision for tracking pools not associated with TES

Drowning/RWI Data

- Updated data relevant to drownings and RWIs in Virginia
- Understand scope and types of data sources available within agency, what it can/can't tell us
- Establishing contacts for future data requests
- Significant intra-agency collaboration needed for project
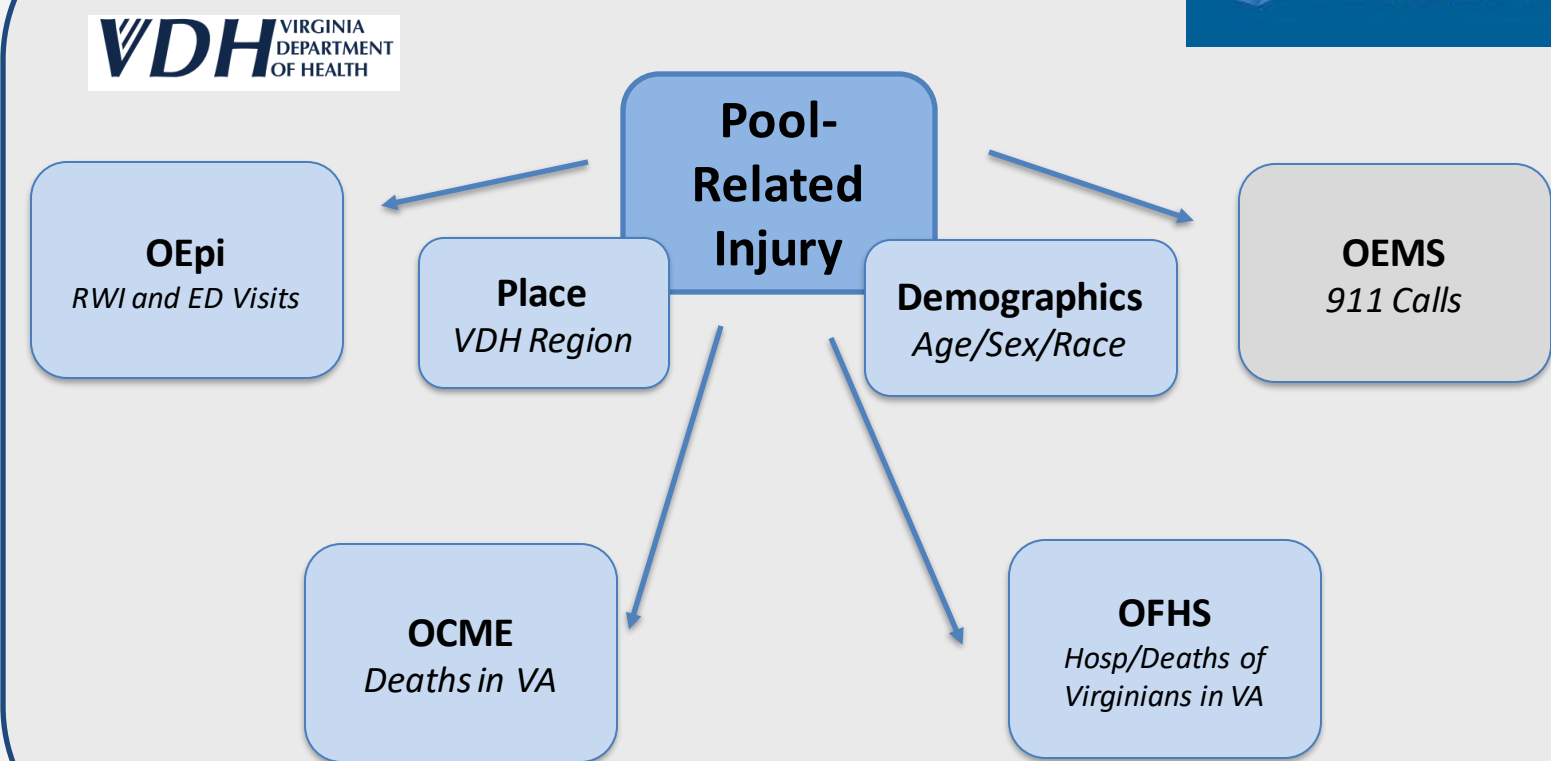
Data Sources

Pool Map

Pool data from Pool Permits in Environmental Health Databases: EHD and PLUS
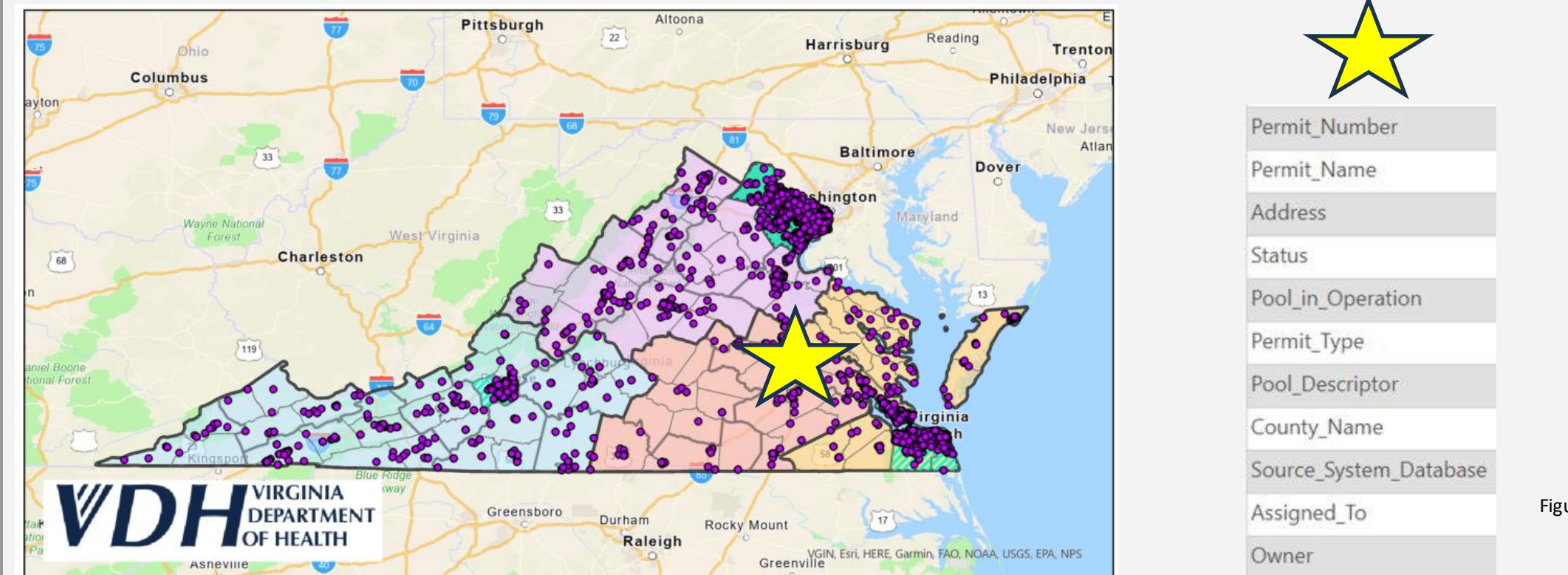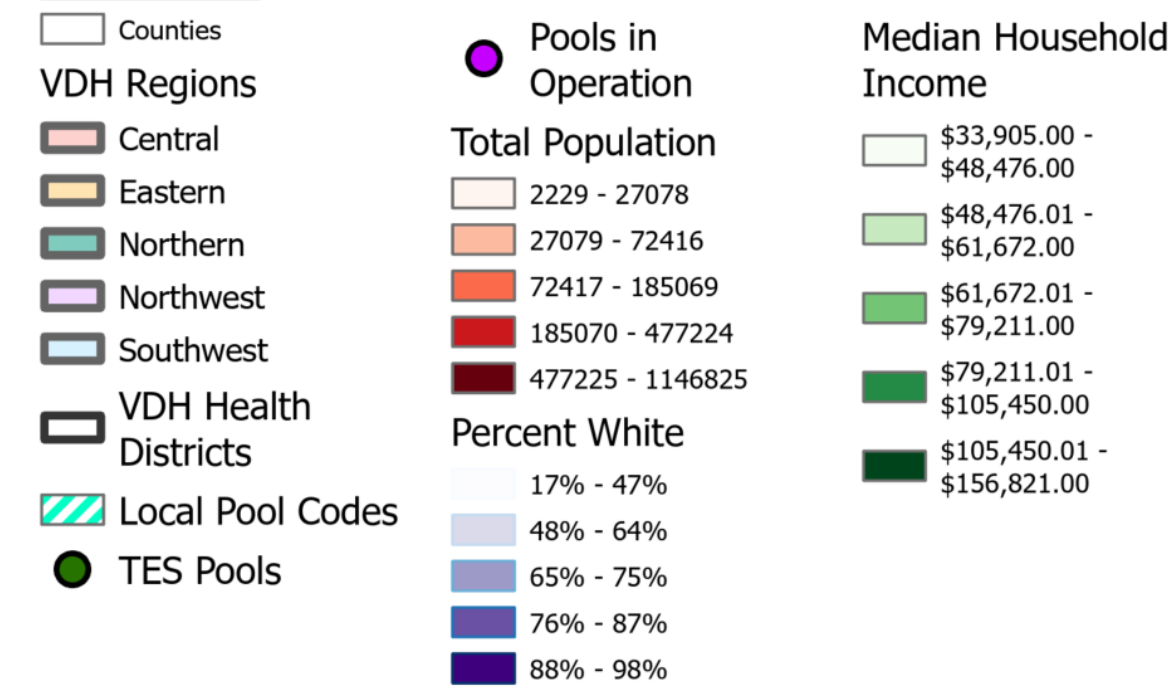
Demographic layers pulled from ACS 2018 Census Data

United States Census Bureau

Drowning/RWI Data

ArcGIS Pro

Pool-Related Injury

- OEpi — RWI and ED Visits
- Place — VDH Region
- Demographics — Age/Sex/Race
- OEMS — 911 Calls
- OCME — Deaths in VA
- OFHS — Hosp/Deaths of Virginians in VA

O = Office, OEpi = Epi, OCME = Medical Examiner, OFHS = Family Health Services, OEMS = Emergency Medical Services

Pool Map

Permit_Number
Permit_Name
Address
Status
Pool_in_Operation
Permit_Type
Pool_Descriptor
County_Name
Source_System_Database
Assigned_To
Owner

Figure 1

Click on a point for at-a-glance Pool Permit info

LEGEND

- Counties
- VDH Regions
  - Central
  - Eastern
  - Northern
  - Northwest
  - Southwest
  - VDH Health Districts
- Local Pool Codes
- TES Pools
- Pools in Operation

Total Population
- 2229 - 27078
- 27079 - 72416
- 72417 - 185069
- 185070 - 477224
- 477225 - 1146825

Percent White
- 17% - 47%
- 48% - 64%
- 65% - 75%
- 76% - 87%
- 88% - 98%

Median Household Income
- $33,905.00 - $48,476.00
- $48,476.01 - $61,672.00
- $61,672.01 - $79,211.00
- $79,211.01 - $105,450.00
- $105,450.01 - $156,821.00

Legend – Layer by Layer

- Base Navigation Map
- Pool Data
  - Pools in Operation: Based on Status field
  - TES Pools: Tourist Pools
  - Local Pool Codes: Localities with Local Pool Codes
- VA Counties
- VDH Districts/Regions
- Demographic Layers by County:
  - Population
  - Median Household Income
  - Race/Ethnicity: Percent White

Initial Model: Status, Pool in Operation, Date fields back to 1/1/2018

Final Model: Status only

To be published to VDH Arc Enterprise for internal use by EH managers and OEHS
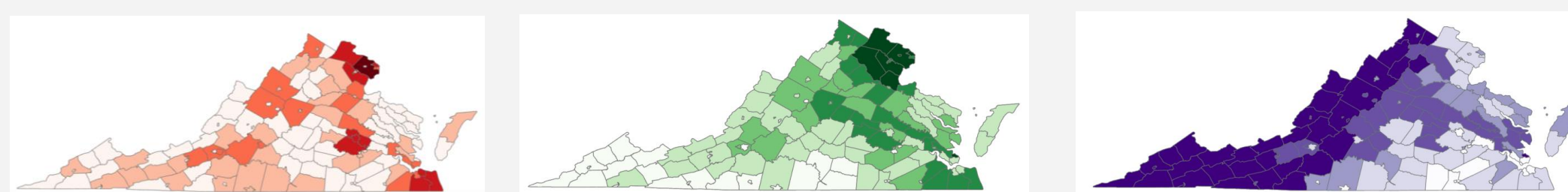
Drowning/RWI Data Dive

At-a-Glance Summary:

- VA trends match overall with National drowning/pool injury trends where the largest morbidity is in the following groups:
  - Age: Children aged 1-4
  - Sex: Males
  - Race*: White
    - unable to fully illustrate racial disparities with data as received
- These trends are similar regardless of severity of pool injury:
  - Emergency room/Urgent care visits
  - Hospitalizations
  - Deaths
- Regional trends: counts vs incidence rates
  - Counts: Eastern has highest count of ED Visits and Deaths
  - **BUT** more complicated for Rates
    - ED Visits: SW/NW trailing marginally behind E
    - Deaths: E/NW approx. equal, huge drop for N
  - Why?? – ongoing discussion
    - Possible factors include population, race, income, available resources, generational attitudes towards swimming
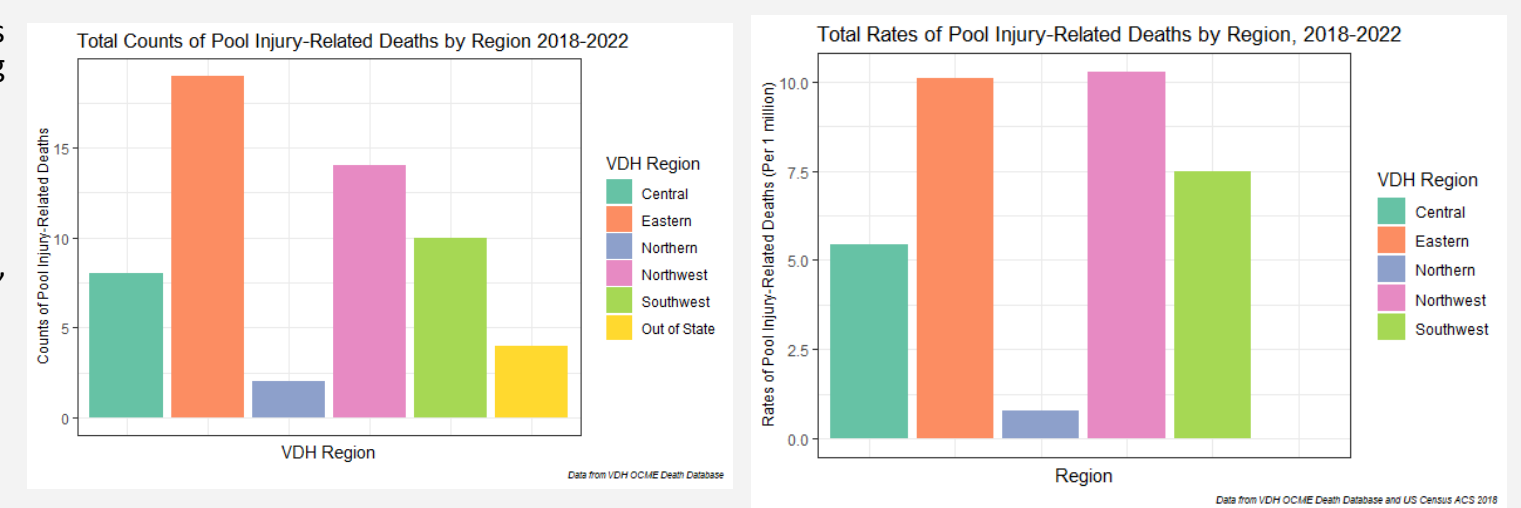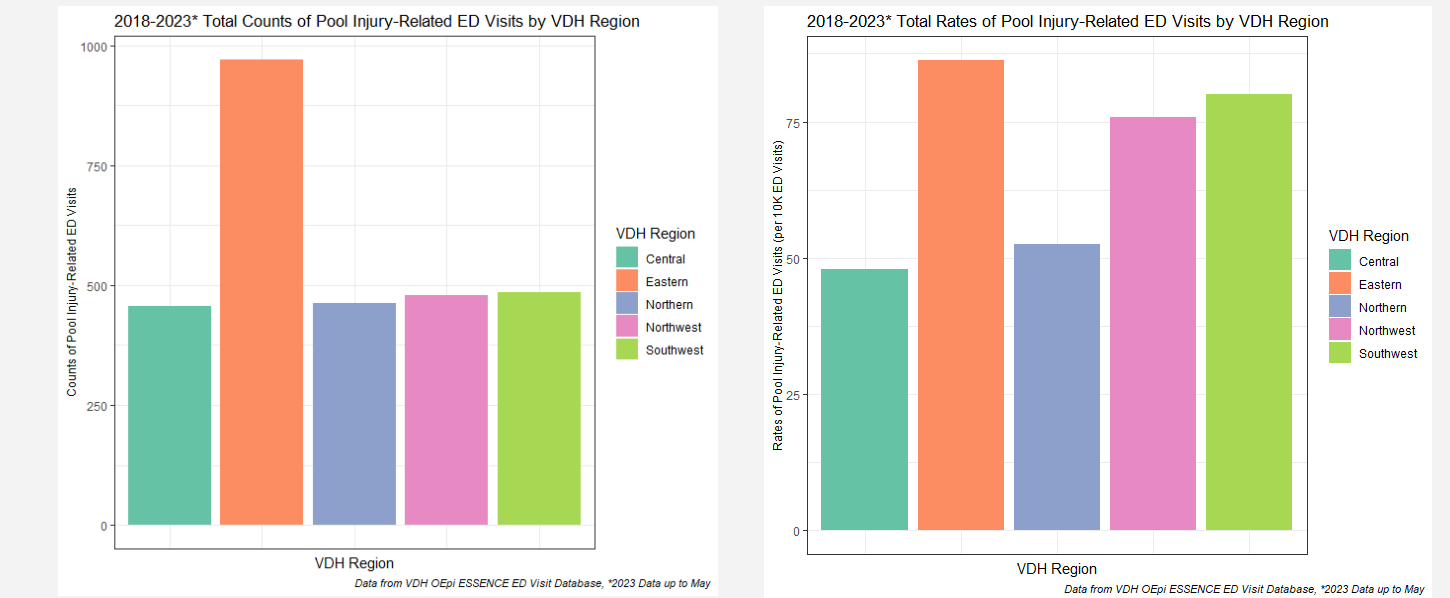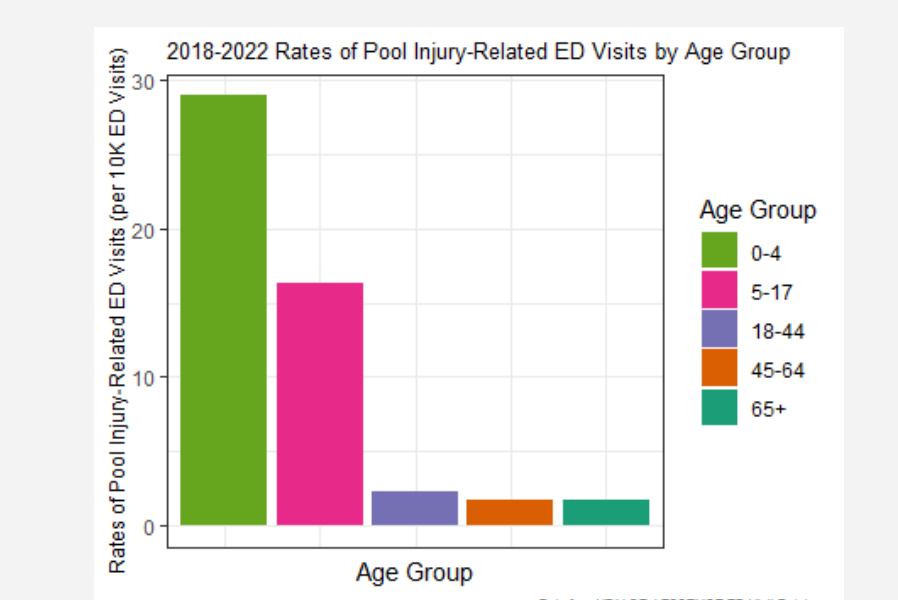
Sample R Code

NEXT STEPS:

- Additional analysis of contributing factors to pool-related morbidity/mortality Determine impact of potential regulatory changes
  - population, race/eth, income, etc
- Further look into intra-agency variation in data collection methods for racial categories from office to office
  - Categories not comparable
    - Unable to interpret due to other/unknown categories
    - Unable to calculate rates for deaths by race/eth
- Analyze OEMS data – data on 911 calls related to pool injuries available
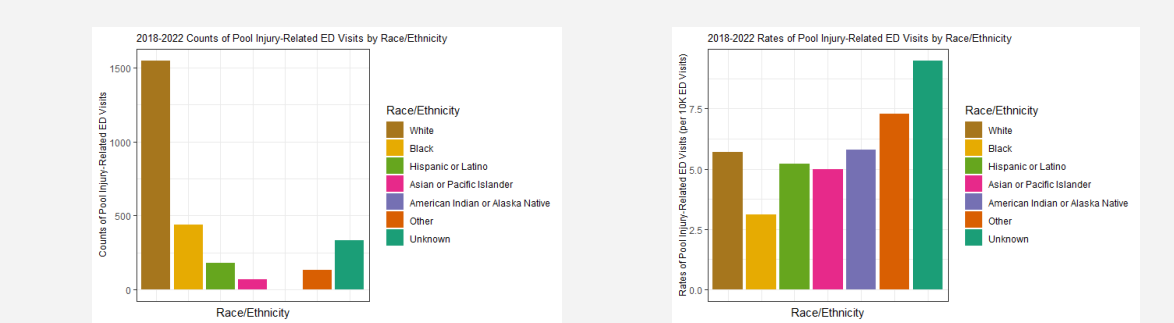
Note: *Pool injury-related data was collected from various VDH offices outlined in Data Sources section. Excluded from this analysis are any water-related injuries occurring outside of pools, including natural water sources, bathtubs/showers and homicides/suicides/motor vehicle crashes involving water. Additional information on case definitions is available on request.*

Skills/Lessons Learned

- Programs: R, ArcGISPro, SQL
- Data Analyst workflow processes
  - Data cleaning/Exploratory data analysis
  - Time management: data analyst vs field epi work
  - "Protect your brain" –pacing
  - Behind the scenes: map and data R scripts are 500+ lines of code!
- Tailoring findings to audience: public vs internal vs graduate program
  - Protecting PHI (aggregate vs visit level data, data suppression)
- Effects of COVID-19 pandemic on 2020 data collection and analysis

ArcGIS Pro   R Studio   SQL

VCU