

# **Current and future demographics of the Veteran population, 2014–2024**

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# VA health care assessment

- The Department of Veterans Affairs (VA) provides health care to eligible Veterans
- Veterans Access, Choice, and Accountability Act of 2014
  - Improve access to high-quality health care
  - Independent assessment of VA's health care delivery systems and management processes
  - Estimate current and projected demographics of Veterans

# Objectives

- Project the Veteran population from 2014 to 2024 and their geographic distribution
  - Surveys collect information on Veterans, but no full national accounting since 2000 Census
- Describe the demographic characteristics of Veterans
  - Age, sex, race/ethnicity, service era, geographic distribution (PUMA level)

# Projections for each service era

- Pre-1950
- Korean War: July 1950–January 1955
- Pre-Vietnam: February 1955–July 1964
- Vietnam: August 1964–April 1975
- Post-Vietnam: May 1975–July 1990
- Gulf War: August 1990–August 2001
- Post-9/11: September 2001 or later

# Data

- 2000 Demographic Census
  - Baseline of Veteran population
  - Age, sex, race/ethnicity, service era
- U.S. Defense Manpower Data Center (DMDC)
  - Age, sex, race/ethnicity, anticipated loss date
- American Community Survey (ACS)
  - 5-year estimates: 2005–09, 2009–13
  - American FactFinder (U.S. Census Bureau)
  - Prior to 2005, no migration information (residence in previous year)

# ACS specificities

- Undercounts number of Veterans
  - We used 2000 Census and estimated Veterans who would be alive in 2013
  - Number is equivalent to 2013 ACS estimates
  - ACS undercounts new Veterans from 2000 to 2013
- Captures distribution of Veterans by age, sex, race/ethnicity, service era, location
- Determines Veteran geographic distribution and migration patterns

# Population projection

## 1. Standard cohort component model

- U.S. Census Bureau's Rural and Urban Projection (RUP) Program
- 2000 Census provides counts of Veterans
- New Veterans (DMDC): 2000–24
- Apply mortality rates (VA, CDC): 2000–24
- Estimate national Veteran population: 2005–24

## 2. Distribute projections into PUMAs (ACS)

## 3. Adjust initial projections by migration (ACS)

# Mortality rates

- 2014 Veteran population mortality rates
  - Department of Veterans Affairs (VA)
  - By age, sex, but not race/ethnicity
- 2011 rates by race/ethnicity
  - Centers for Disease Control and Prevention (CDC)
- Derive race/ethnicity rates based on CDC that reflect overall VA rates
- Following estimates are done for each sex...



# Steps to estimate mortality rates

## (1/4)

| Race / Ethnicity | Distribution of Veterans in each age group |          |     |          |     | CDC mortality rates |          |     |          |     | Standardized rates if Veterans had same rates as civilians |          |     |          |     |
|------------------|--|----------|-----|----------|-----|---------------------|----------|-----|----------|-----|--|----------|-----|----------|-----|
|                  | 17 to 20                                   | 20 to 24 | ... | 80 to 84 | 85+ | 17 to 20            | 20 to 24 | ... | 80 to 84 | 85+ | 17 to 20   | 20 to 24 | ... | 80 to 84 | 85+ |
| White            | a  |          |     |          |     | b                   |          |     |          |     | a*b  |          |     |          |     |
| Black            |  |          |     |          |     |                     |          |     |          |     |  |          |     |          |     |
| Hispanic         |  |          |     |          |     |                     |          |     |          |     |  |          |     |          |     |
| Asian            |  |          |     |          |     |                     |          |     |          |     |  |          |     |          |     |
| Other            |  |          |     |          |     |                     |          |     |          |     |  |          |     |          |     |
| Total            | 1.0  | 1.0      | 1.0 | 1.0      | 1.0 | —                   | —        | —   | —        | —   | s  | s        | s   | s        | s   |

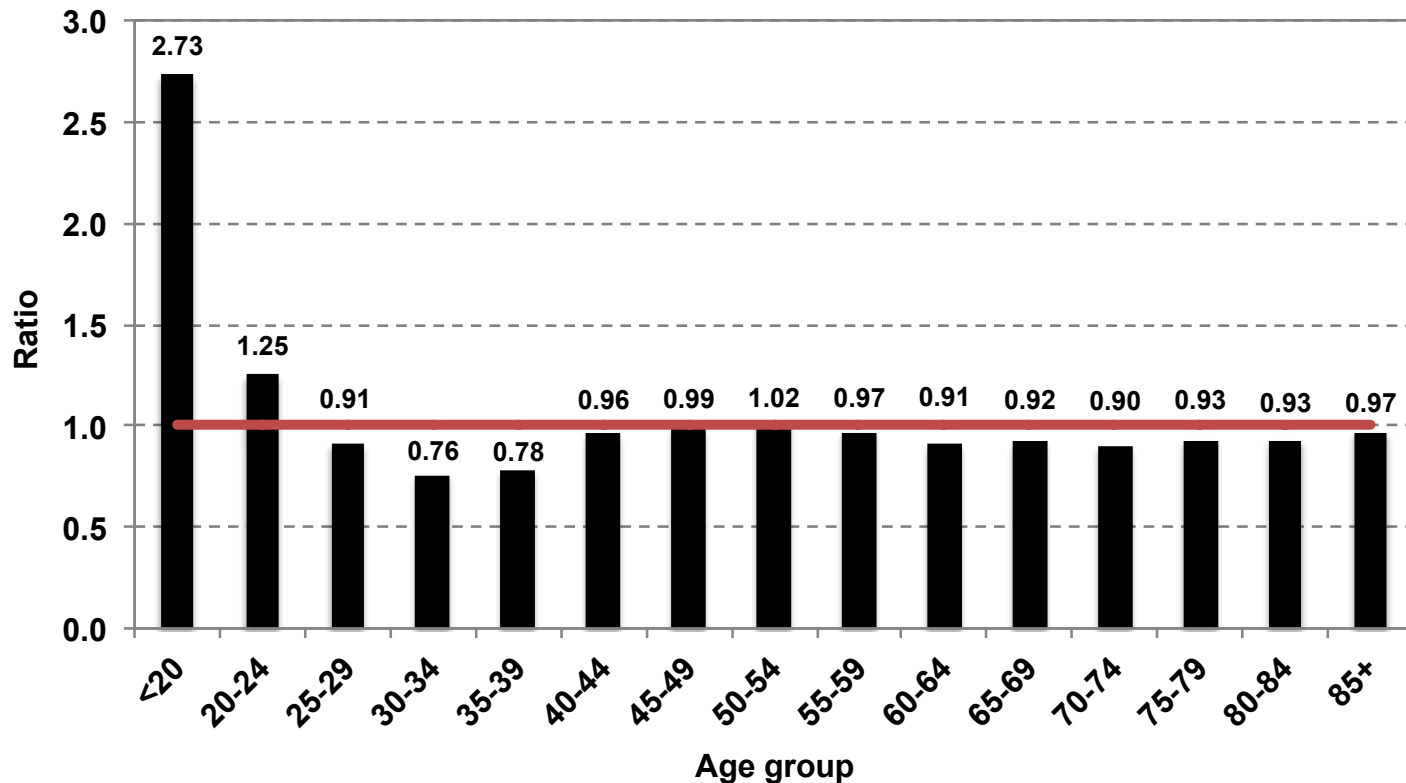
# Steps to estimate mortality rates (2/4)

| Mortality rates   | Age group      |                |     |                |     |
|---|----------------|----------------|-----|----------------|-----|
|   | 17<br>to<br>20 | 20<br>to<br>24 | ... | 80<br>to<br>84 | 85+ |
| Standardized rates<br>if Veterans had same rates as civilians | S              | S              | S   | S              | S   |
| VA mortality rates  | v              | v              | v   | v              | v   |
| VA rates / Standardized rates                                 | v/s            | v/s            | v/s | v/s            | v/s |

# Steps to estimate mortality rates

## (3/4)

- Ratio of observed Veteran mortality rate to the standardized rate



# Steps to estimate mortality rates (4/4)

| Race / Ethnicity | CDC mortality rates |          |     |          |     | Adjusted mortality rates |          |     |          |     |
|------------------|---------------------|----------|-----|----------|-----|--------------------------|----------|-----|----------|-----|
|                  | 17 to 20            | 20 to 24 | ... | 80 to 84 | 85+ | 17 to 20                 | 20 to 24 | ... | 80 to 84 | 85+ |
| White            | b                   |          |     |          |     | b*v/s                    |          |     |          |     |
| Black            |                     |          |     |          |     |                          |          |     |          |     |
| Hispanic         |                     |          |     |          |     |                          |          |     |          |     |
| Asian            |                     |          |     |          |     |                          |          |     |          |     |
| Other            |                     |          |     |          |     |                          |          |     |          |     |
| Ratio            | v/s                 | v/s      | v/s | v/s      | v/s | —                        | —        | —   | —        | —   |

Assumption: ratio (inflation/deflation factor) is the same for each race/ethnicity

# 1. National projection (apply “births” and mortality)

## 2000 Census & 2000 DMDC Population data

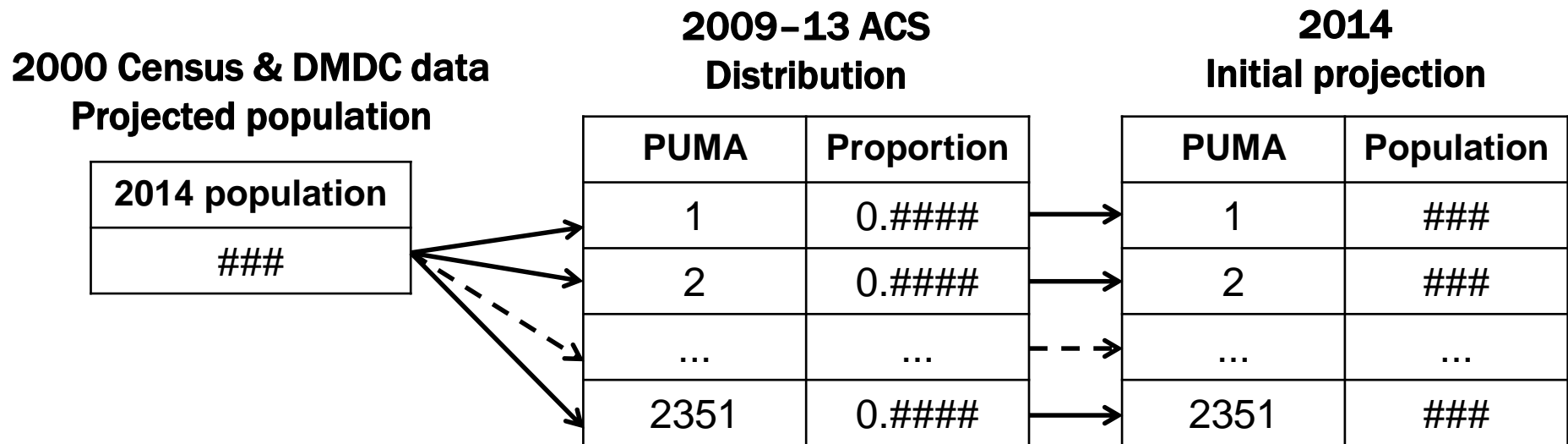
Each cell has  
number of Veterans  
by 5-year age group, sex,  
race/ethnicity, service era

- Apply mortality rates from 2000 to 2001
- Add DMDC data in 2001
- Apply mortality rates from 2001 to 2002
- Add DMDC data in 2002
- ...

|                        |
|------------------------|
| <b>2000 population</b> |
| ###                    |

|                        |     |                        |     |                        |
|------------------------|-----|------------------------|-----|------------------------|
| <b>2001 population</b> | ... | <b>2014 population</b> | ... | <b>2024 population</b> |
| ###                    | ... | ###                    | ... | ###                    |

## 2. Distribute national projection into PUMAs: 2014 example

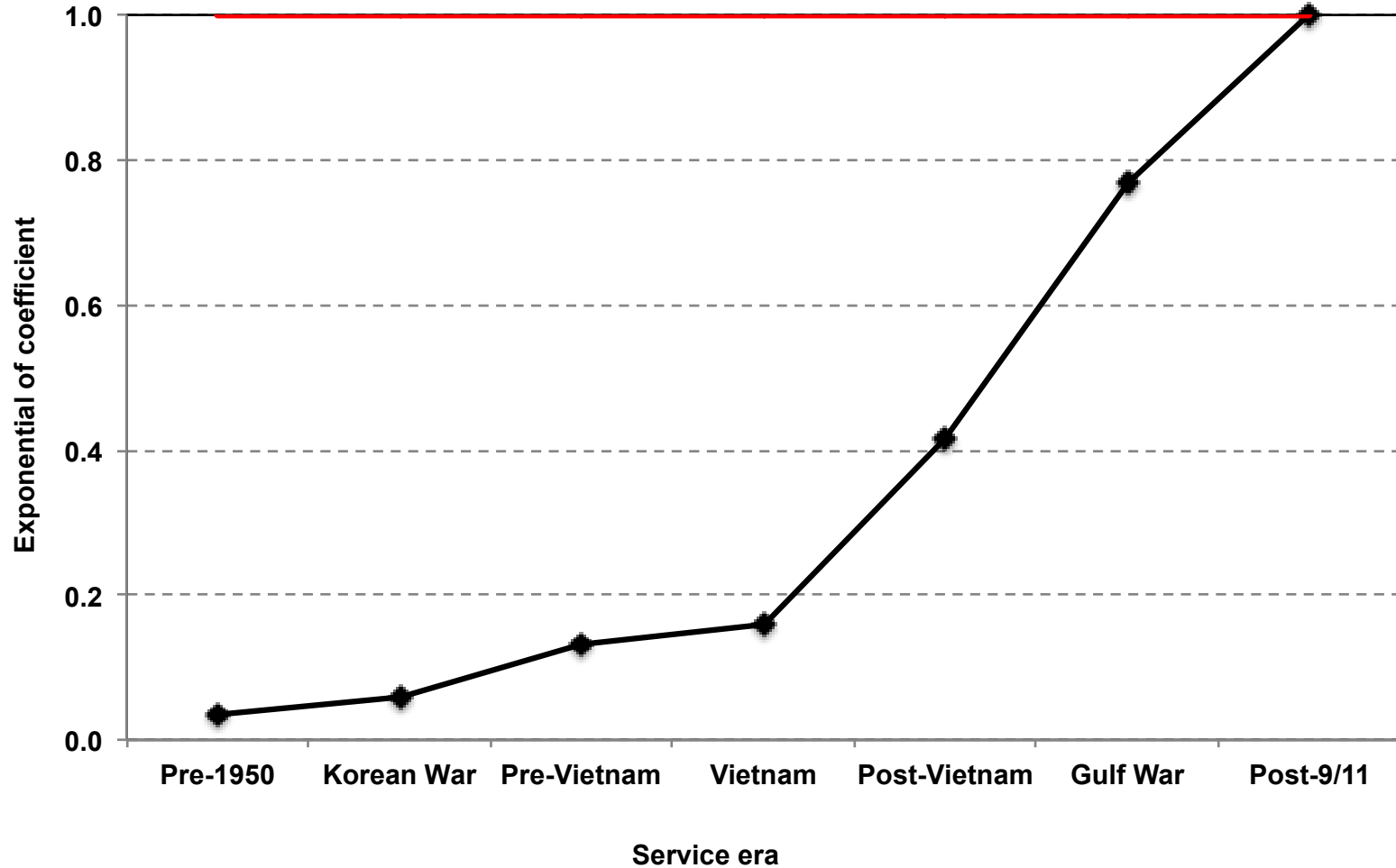


- Assumption: ACS captures geographic distribution
- By 5-year age group, sex, race/ethnicity, service era

# 3. Migration procedures

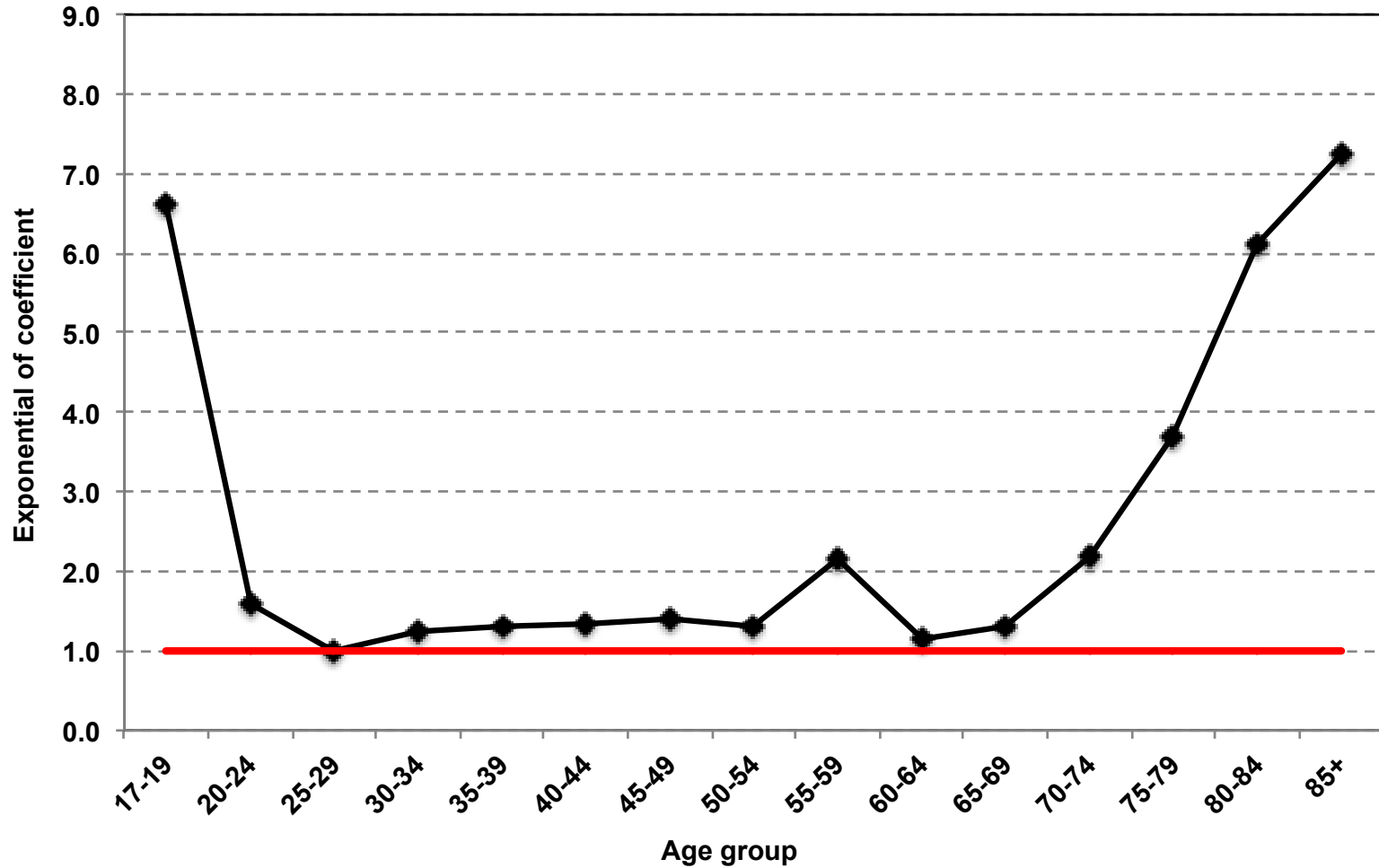
- Disaggregate PUMA groups in previous year
  - Correspondence files in IPUMS-USA website
- Convert 2009-11 PUMAs into 2010 codes
  - Engine by Missouri Census Data Center
- Gravity models (2009-13)
  - Migration as a function of squared distance, sex, service era, age, race/ethnicity
- Apply predicted rates to 2014 projection
  - Generate number of in- and out-migrants
  - Adjust in-migrants to generate null net migration

# Results of service era for out-migration

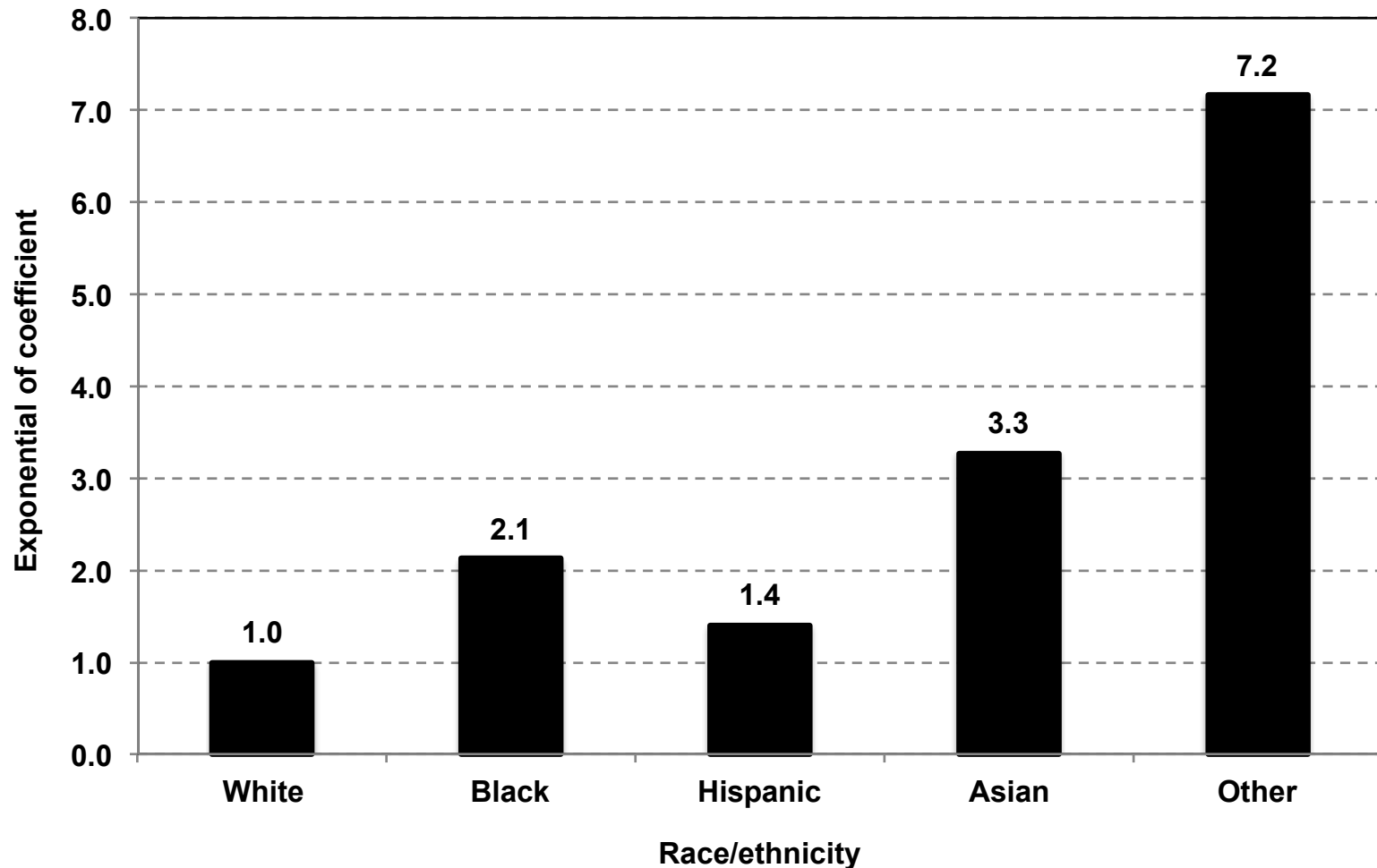




# Results of age group for out-migration



# Results of race/ethnicity for out-migration



# Migration: final projection

**2014**

## Number of in-migrants

(estimated with ACS rates and initial projection)

| PUMA | Number of in-migrants |
|------|-----------------------|
| 1    | ###                   |
| 2    | ###                   |
| ...  | ...                   |
| 2351 | ###                   |

**2014**

## Initial projection

| PUMA | Population |
|------|------------|
| 1    | ###        |
| 2    | ###        |
| ...  | ...        |
| 2351 | ###        |

**2014**

## Final projection

(after migration)

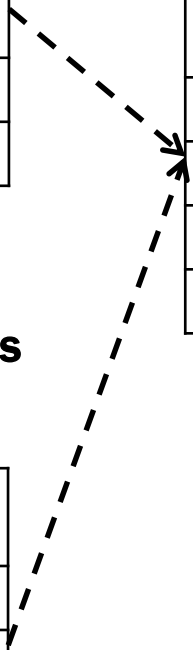
| PUMA | Population | Net migration | Population after mig. |
|------|------------|---------------|-----------------------|
| 1    | ###        | +/- ###       | ###                   |
| 2    | ###        | +/- ###       | ###                   |
| ...  | ...        | ...           | ...                   |
| 2351 | ###        | +/- ###       | ###                   |

**2014**

## Number of out-migrants

(estimated with ACS rates and initial projection)

| PUMA 1-year ago | Number of out-migrants |
|-----------------|------------------------|
| 1               | ###                    |
| 2               | ###                    |
| ...             | ...                    |
| 2351            | ###                    |



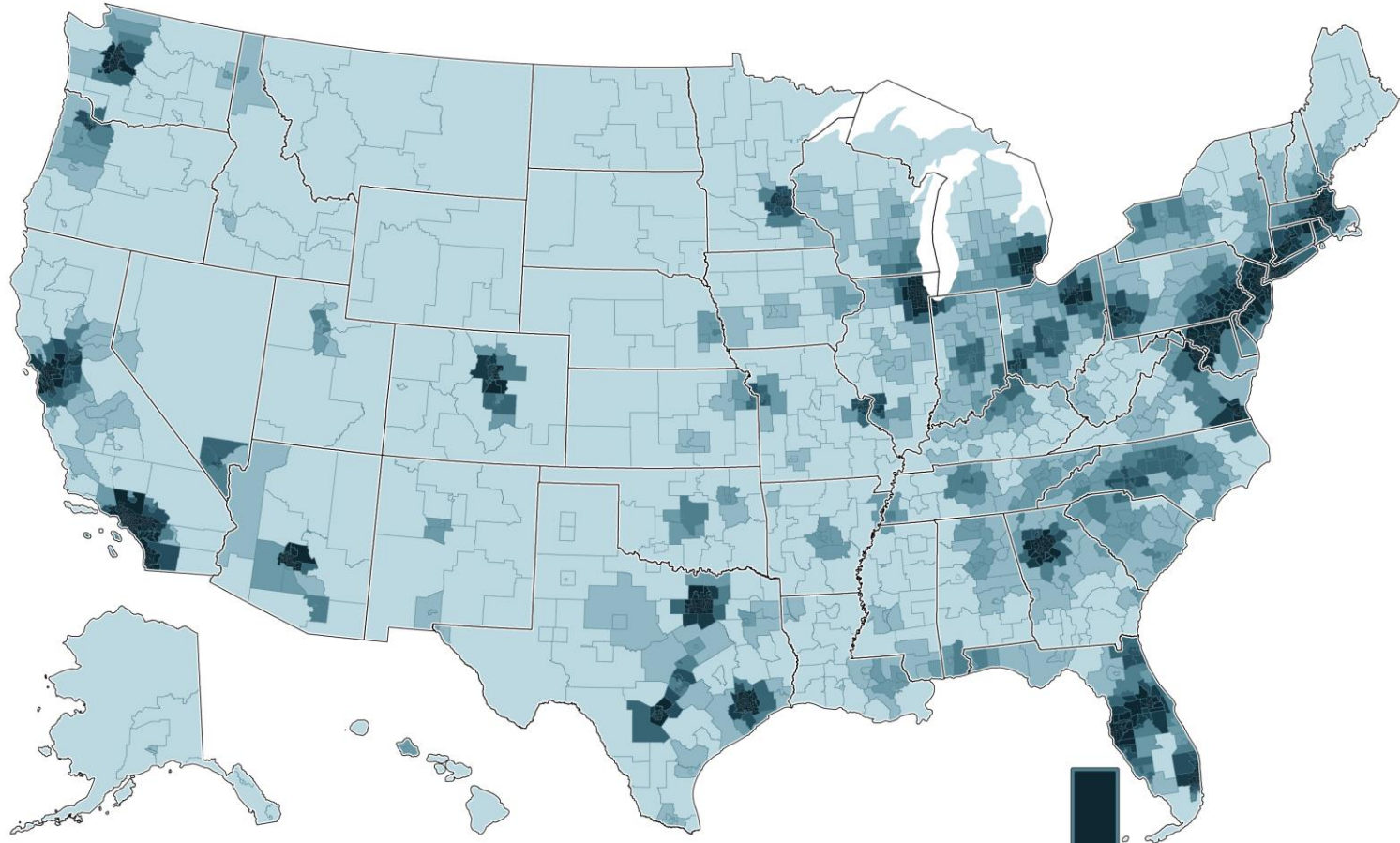
# Migration for 2015–24

- Iterate this process for subsequent years
- Use final 2014 projection as baseline for 2015 national projection
- Apply migration rates to get final 2015 distribution
- Adjust marginal counts with weight calibration to keep national totals
  - Iterative proportional fitting (raking)
- Process continues through 2024

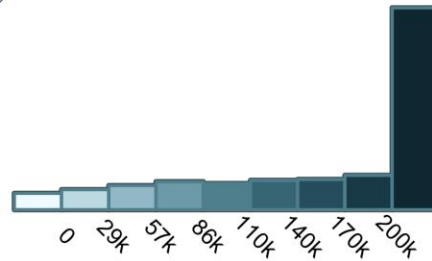
# Main results

- Veterans will decrease by 19%
  - 21.6 million (2014), 17.5 million (2024)
- Mean age will increase slightly
  - 65+ years: 49% (2014), 52% (2024)
- Modest changes by sex and race/ethnicity
  - Males: 92% (2014), 89% (2024)
  - White: 80% (2014), 76% (2024)
- Service era composition will change
  - Vietnam: 31% (2014), 29% (2024)
  - Gulf War, Post-9/11: 27% (2014), 42% (2024)

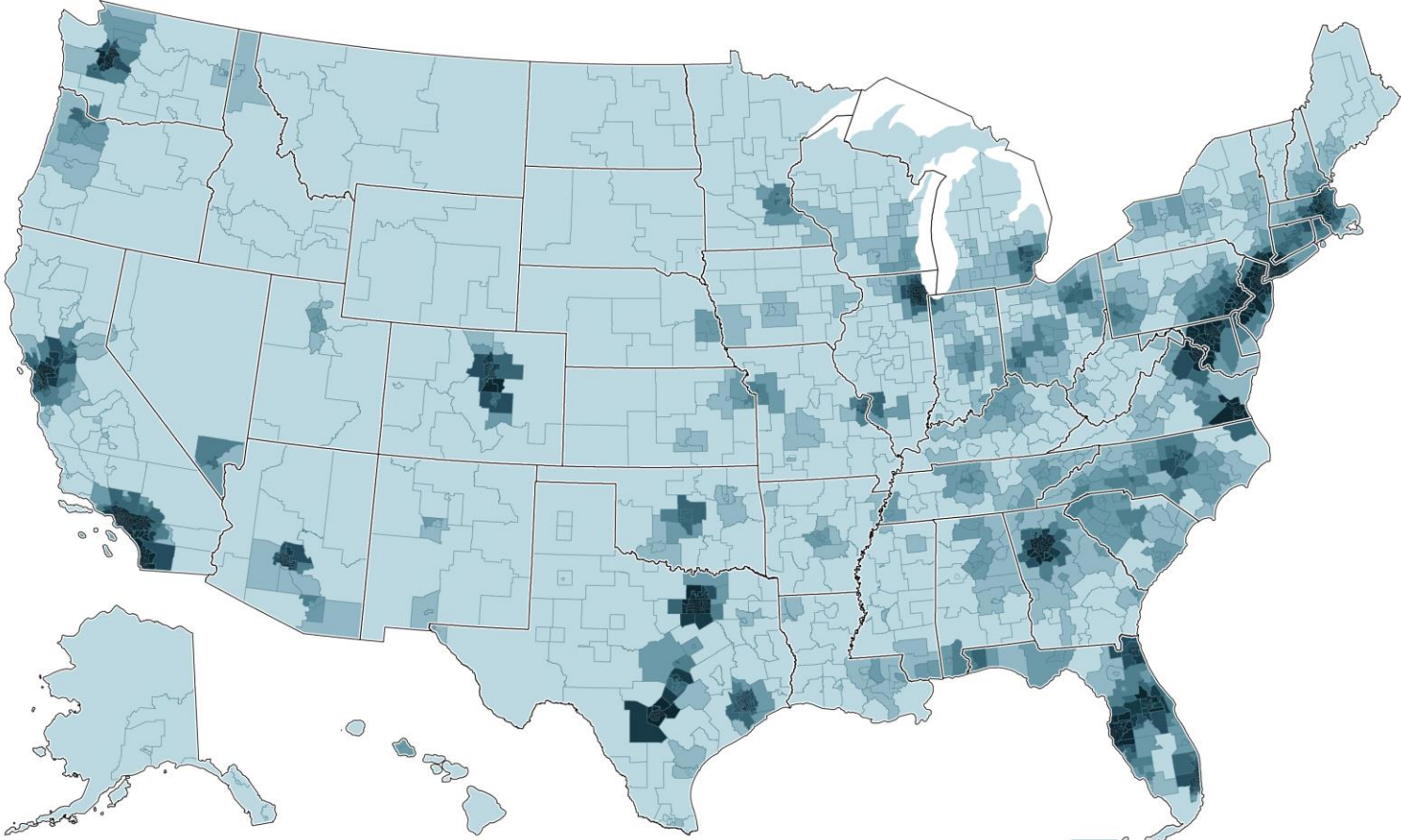
# Total Veteran population, 2014



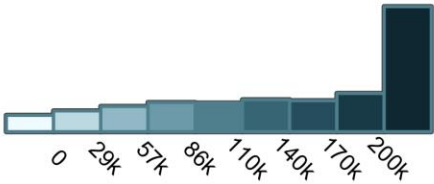
Total: 21.6m (100%)  
Lambert Conformal Conic Projection  
Alaska Rendered at One-Third Scale



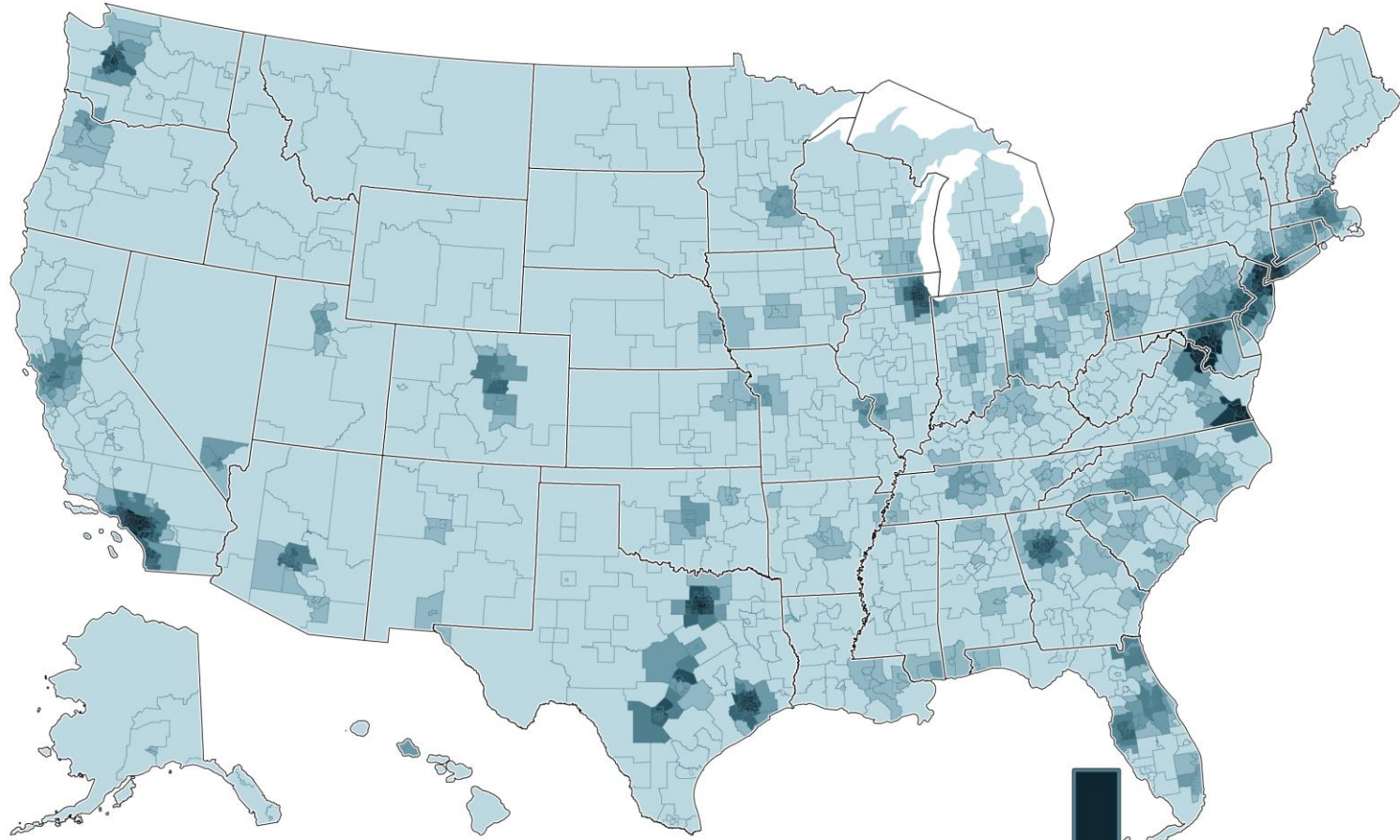
# Total Veteran population, 2024



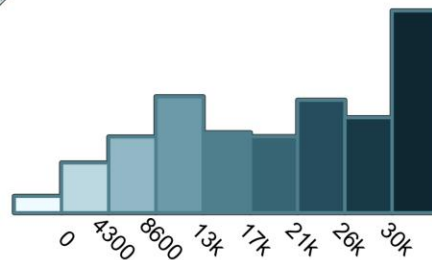
Total: 17.5m (100%)  
Lambert Conformal Conic Projection  
Alaska Rendered at One-Third Scale



# Veterans under age 35, 2014

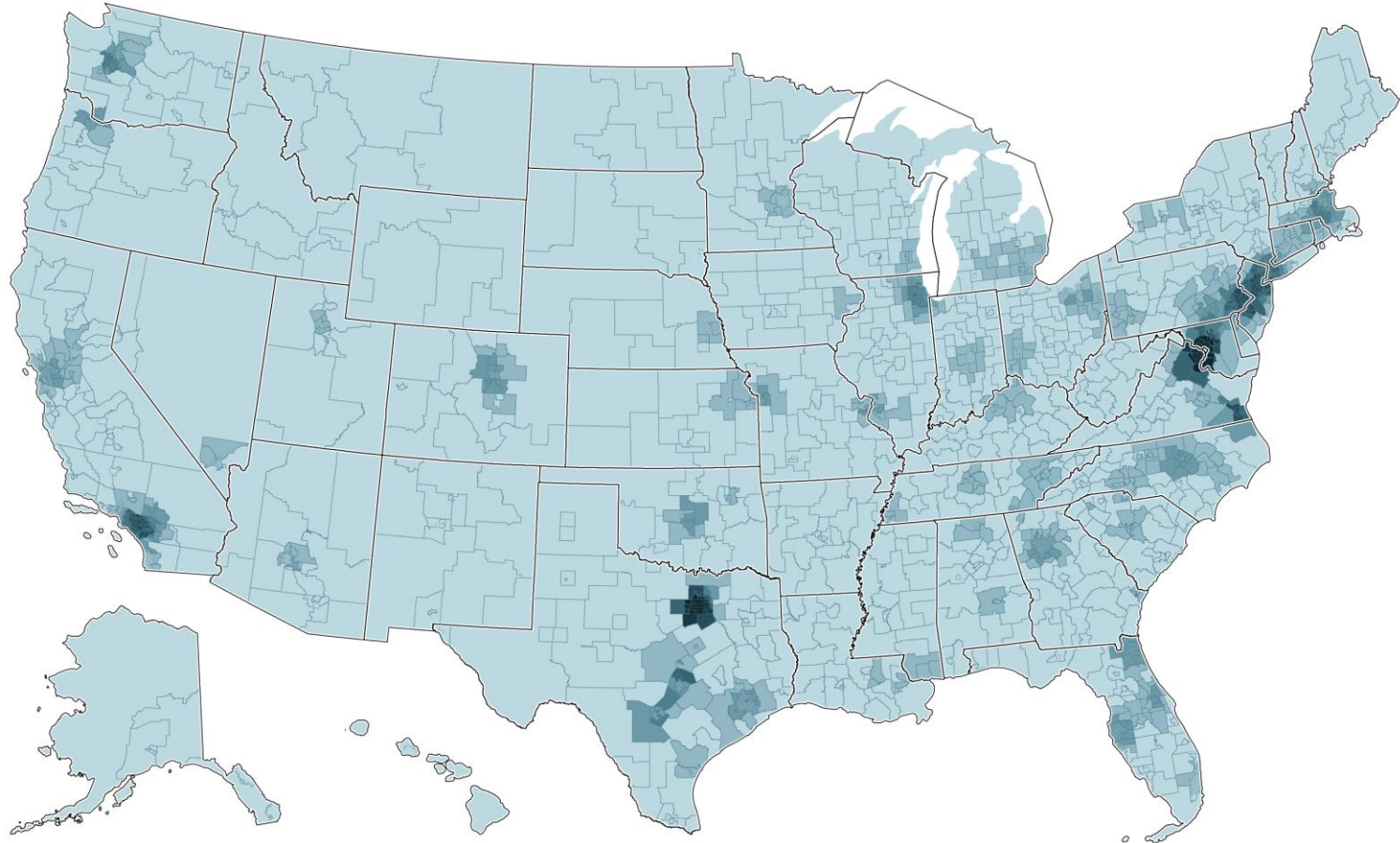


Total: 1.6m (7%)  
Lambert Conformal Conic Projection  
Alaska Rendered at One-Third Scale

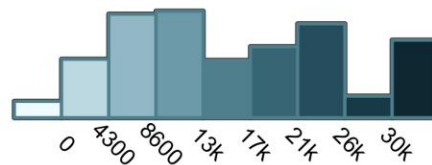




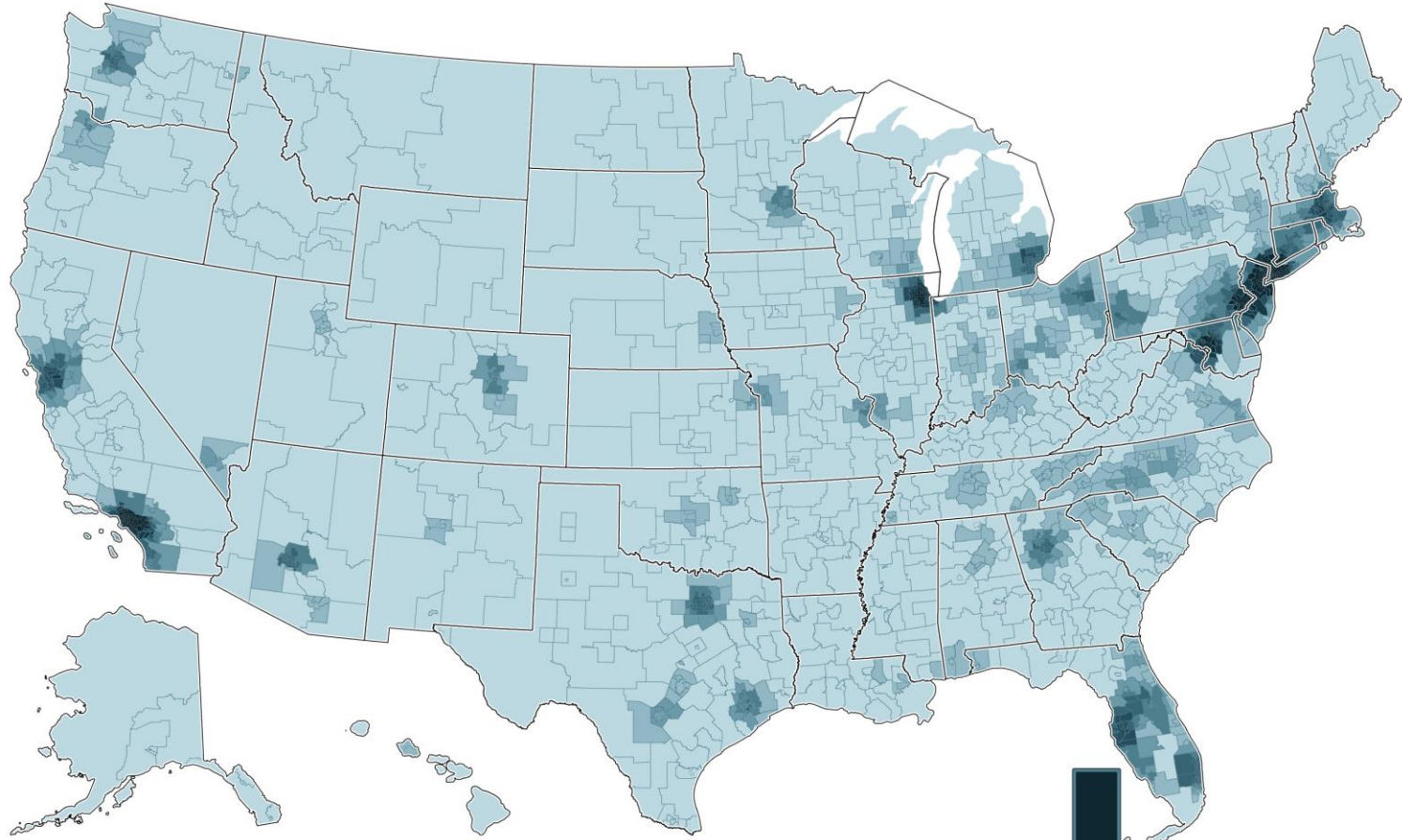
# Veterans under age 35, 2024



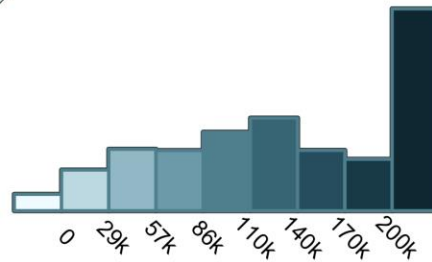
Total: 1.1m (7%)  
Lambert Conformal Conic Projection  
Alaska Rendered at One-Third Scale



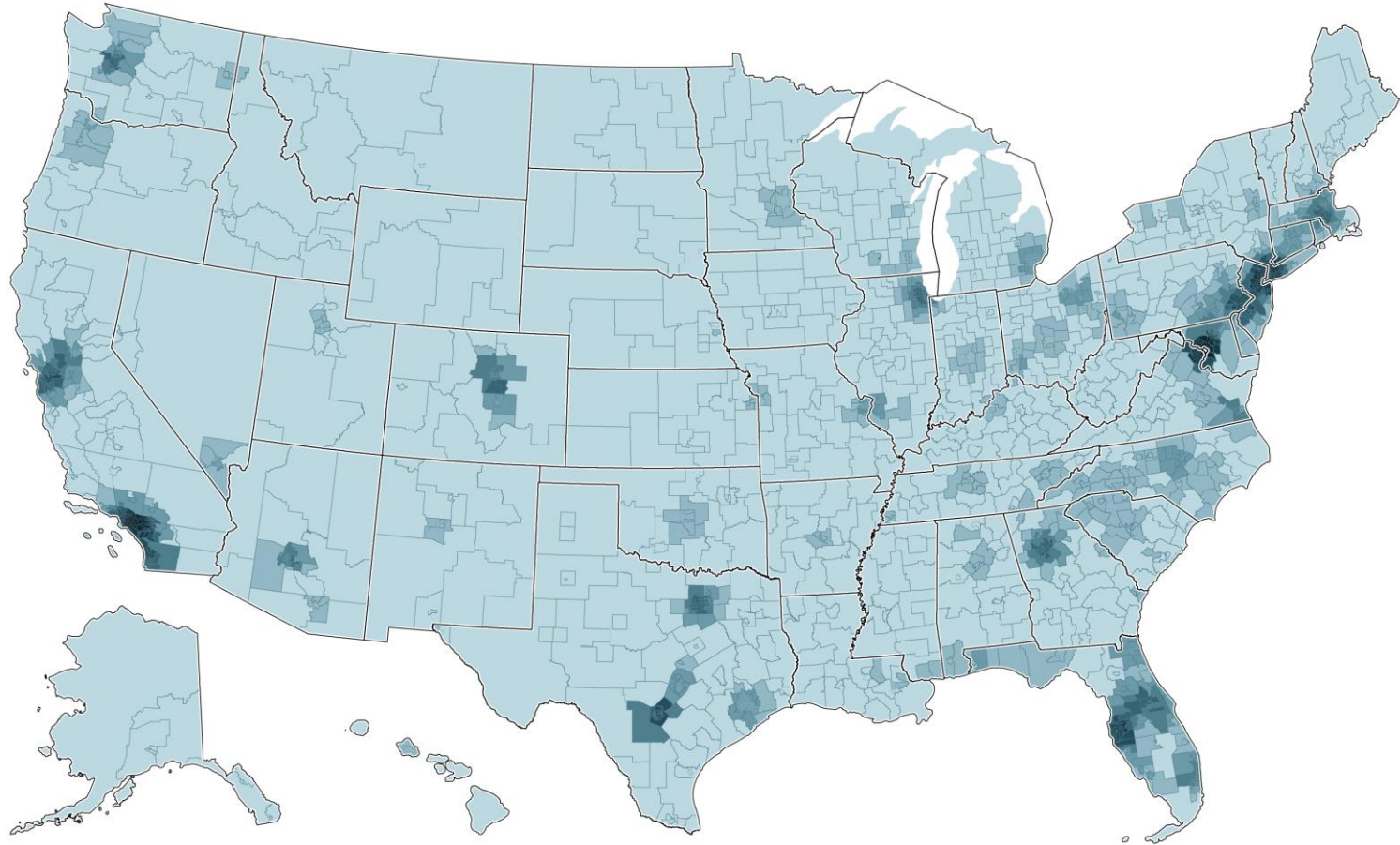
# Veterans age 65+, 2014



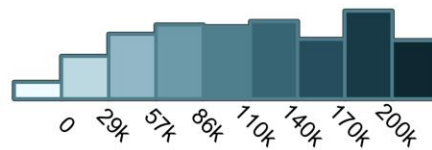
Total: 10.5m (49%)  
Lambert Conformal Conic Projection  
Alaska Rendered at One-Third Scale



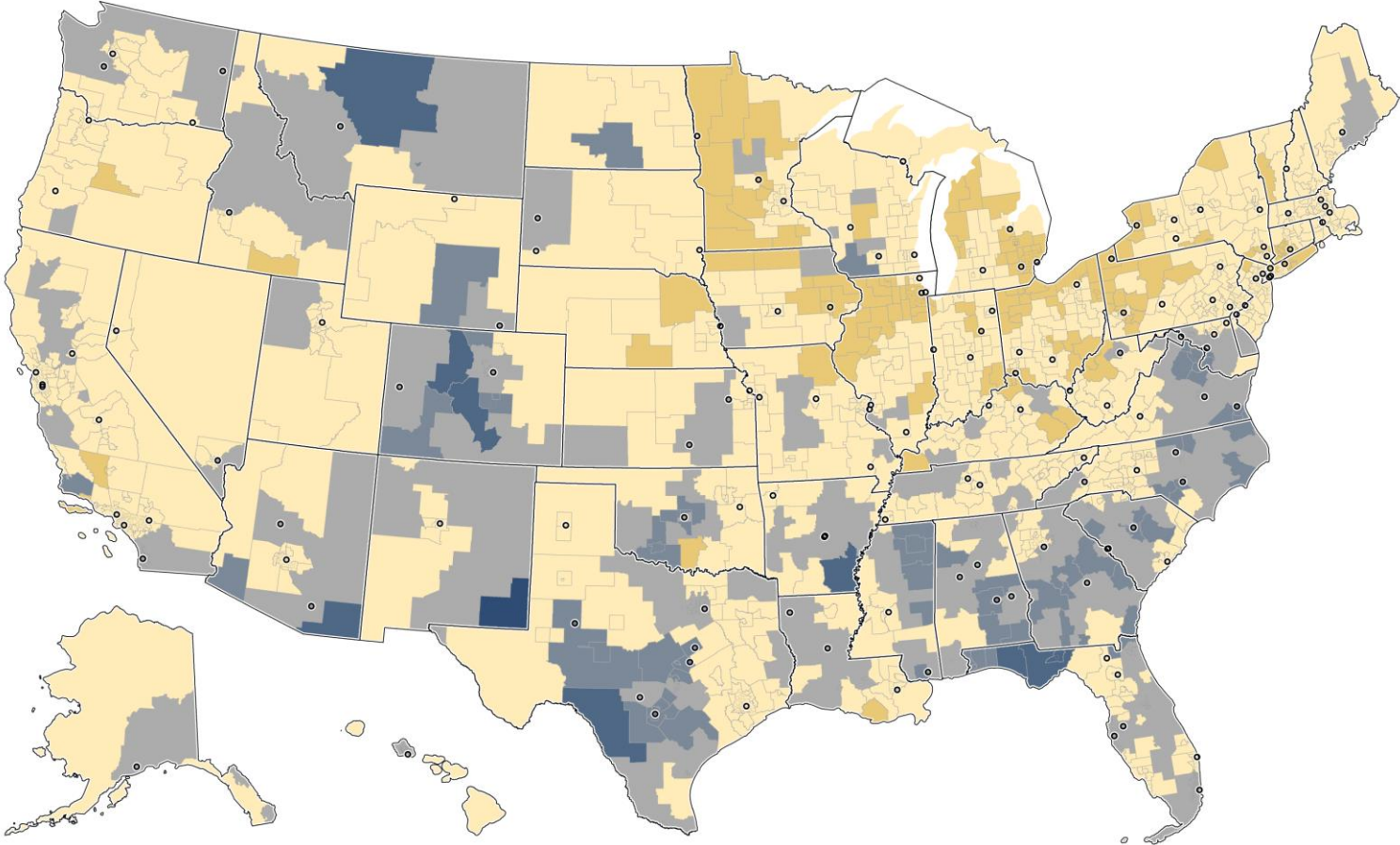
# Veterans age 65+, 2024



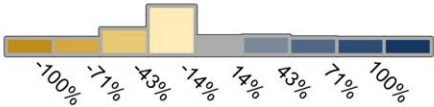
Total: 9m (51%)  
Lambert Conformal Conic Projection  
Alaska Rendered at One-Third Scale



# Percent Veteran population change and VA medical centers, 2014-24



Total number: 17.5m (100%)  
Lambert Conformal Conic Projection  
Alaska Rendered at One-Third Scale



# Final considerations

- Concentration in urban areas
  - Ohio River Valley and upper Midwest: proportion of Veterans will diminish
  - Southwest will not be supported properly by existing VA medical centers
- Migration is less frequent among Veterans than non-Veterans
  - Will not play substantial role in 2014–24 geographic distribution

# Policy recommendations: data collection

- Re-implement data collection on the Veteran population in 2020 Census
- This allows smaller surveys to refine sampling strategies to reflect population of Veterans

# Policy recommendations: plan for shrinking population

- VA should begin to plan for a shrinking population
- Consider alternative approaches to meeting the needs of its population
- E.g., purchase care from civilian sector even while patient population is growing

# Policy recommendations: services for specific age groups

- Overall Veteran population will continue to age over the projection horizon
  - Health services for aging will be needed
- Younger Veterans (<35) are expected to concentrate in several areas
  - Los Angeles; Dallas; Washington, DC; northern New Jersey; northern California; central Washington state; Midwest; Wyoming; Utah
  - Provide health care services for young adults



# Policy recommendations: geographic distribution

- Geographic distribution of Veterans will moderately change from 2015–24
- Areas with adequate VA health services
  - Decline of Veterans: Ohio River Valley, upper Midwest
  - Growth of Veterans: Washington, DC; Charlotte, NC; San Antonio, Austin, TX
- Areas that need more VA health services
  - Growth of Veterans: e.g., Montana, Wyoming, Colorado, Southwest

# Rural Communities Explorer

- These projection methods can be applied to the Oregon context
  - Census, ACS
  - Migration models
- Demographic projections can be linked to other topics of the Communities Reporter Tool
  - Health services
  - Education
  - Employment, income
  - Environment, natural resources
  - Crime, corrections
  - Social service needs

# Extension Activities

- Previous experience
  - In Brazil, policy studies to improve the quality of life in locally underserved communities
  - At RAND, projects' outcomes are frequently reported to non-academic audiences
- OSU Division of Outreach and Engagement, and OSU Extension Service
  - Applied studies where I can see the impact of work on communities more quickly
  - Linked with a research university, which combines academic and applied environments
  - Direct relation to the government, policymakers