

GEOGRAPHIC VARIATION IN TRANSTHYRETIN CARDIAC AMYLOIDOSIS IN U.S. VETERANS FROM 2012 TO 2021

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BACKGROUND

Prior studies suggest variability in cardiac amyloidosis (CA) detection across the U.S. with underdiagnosis in some regions. This is especially relevant in the VA because the disease is more prevalent in older males.

RESEARCH QUESTION

Is there geographic variation in the incidence and prevalence of transthyretin (ATTR) CA amongst U.S. Veterans?

METHODS

Outcomes: Incidence and prevalence rates of CA by state and U.S. Census regions and divisions per 100,000 patients.

Design: Retrospective cohort study of VA health records utilizing MDCIone ADAMS platform to access the VA Corporate Data Warehouse.

Population: All patients with an inpatient or outpatient VA encounter in 2012 and 2021 by state.

Incidence and prevalence rates calculation: State-level *incidence rate* (per 100,000 persons) was the annual new cases of CA, divided by patients with a VA encounter. State-level *prevalence rate* (per 100,000 persons) was all existing patients with CA at the beginning of the year and new cases in that year divided by total patients with a VA encounter. *U.S. Census region and division rates* were calculated by averaging state-level incidence and prevalence rates.

Case definition: ATTR CA was defined as ≥ 1 heart failure (HF) diagnosis, irrespective of EF, and ≥ 1 amyloidosis diagnosis (excluding light chain) at any time. Location of CA diagnosis was defined as the state of the VA facility in which the second of the two qualifying diagnoses occurred (i.e., either HF or amyloidosis). For this study, we excluded amyloid light chain disease.

Mapping: We constructed choropleth maps using R to visualize CA rates geographically.

Figure 1. ATTR CARDIAC AMYLOIDOSIS INCIDENCE AND PREVALENCE RATES BY STATE IN 2012 AND 2021 FOR ALL VETERANS

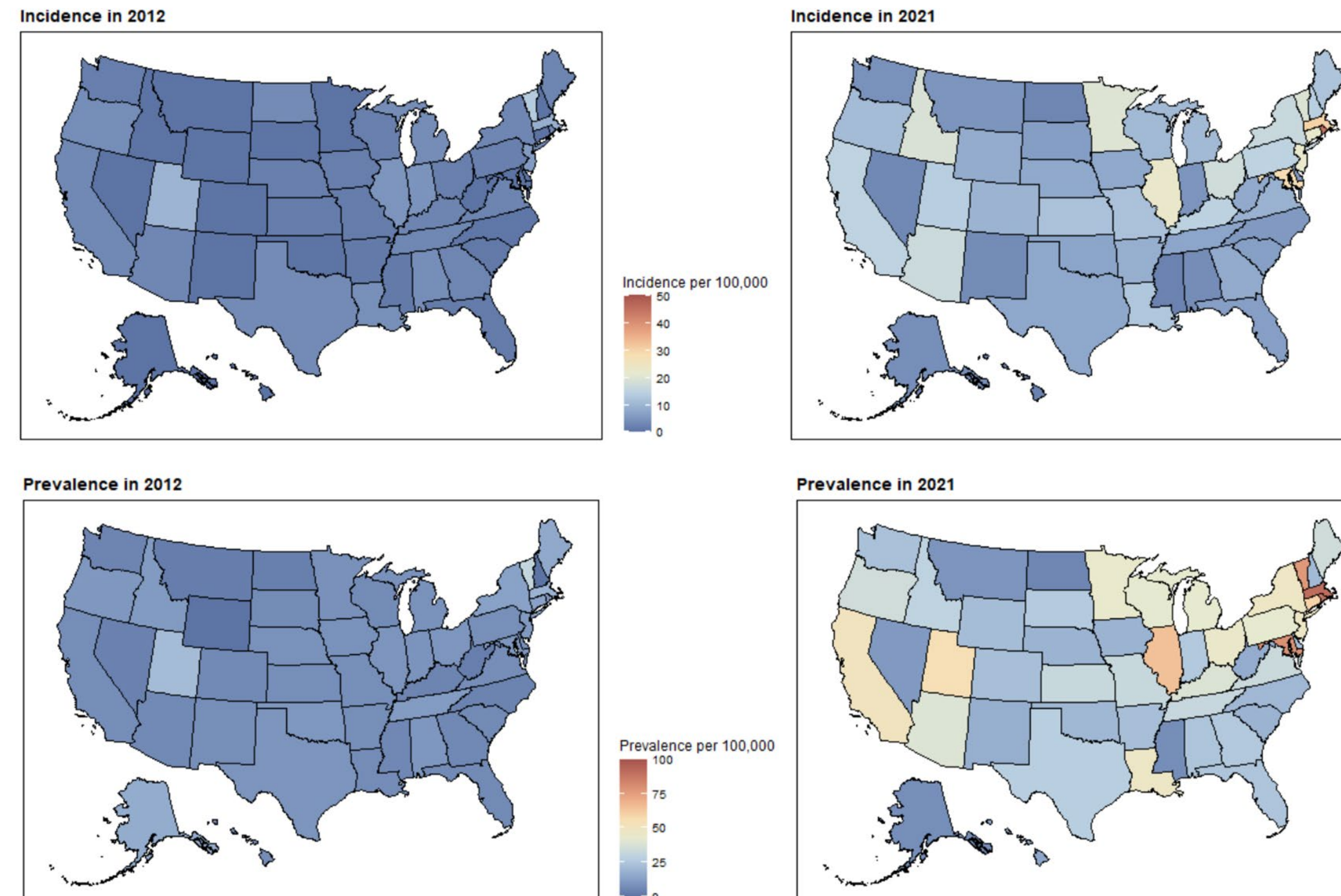
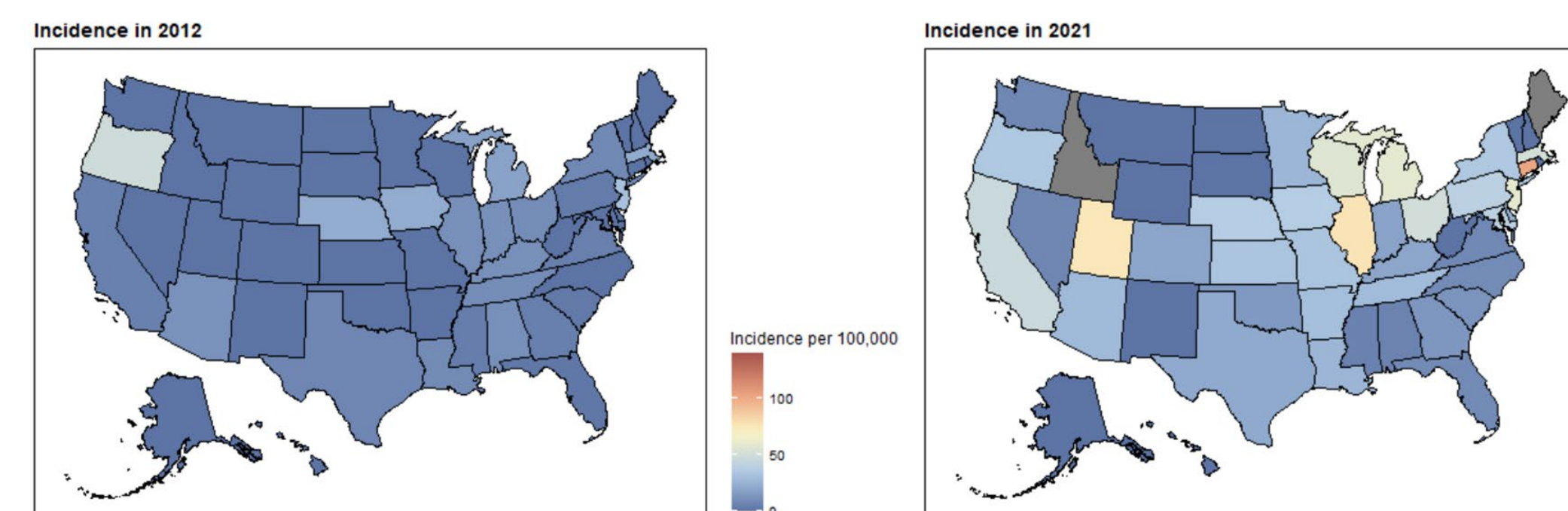


Figure 2. ATTR CARDIAC AMYLOIDOSIS INCIDENCE RATES BY STATE IN 2012 AND 2021 FOR BLACK VETERANS



RESULTS

- There was a substantial increase in ATTR CA incidence and prevalence in all regions in 2012 and 2021.
- In both years, incidence and prevalence were highest in the Northeast region and lowest in the South. In 2021, there was a 2.3-fold difference in incidence between these two regions.
- Census division level variation was greater than regional variation. The highest incidence rate in 2021 was in New England which had a 3.8-fold higher incidence than East South Central.
- Incidence in Black patients in 2021 was highest in Midwest and 3.2-fold higher than the South region.

	2012	2021	2012	2021
	Incident Cases		Prevalent Cases	
VA cases - all regions (n)	179	807	1,521	5,417
Total VA population - all regions (n)	5,694,401	5,694,401	7,267,263	7,267,263
VA cases - Black race, all regions (n)	55	299	182	1,009
Total VA population - Black race, all regions (n)	859,962	1,170,534	859,962	1,170,534
Distribution by U.S. Census Region – All VA cases	Incidence Rates (cases per 100,000 patients)		Prevalence Rates (cases per 100,000 patients)	
Northeast	4.3	19.0	43.4	124.1
Midwest	3.3	12.8	26.7	81.1
South	2.8	8.1	22.7	60.3
West	2.9	11.3	23.8	69.6

LIMITATIONS & CONSIDERATIONS

- Does not include Medicare or other non-VA care received
- Iowa and Kansas patient encounters were counted under their parent facilities in Nebraska and Missouri, respectively
- Patient characteristics do not generalize to the broader US population.

CONCLUSION

- Despite increasing recognition of ATTR CA in the VA Health System, there is regional variation in incidence and prevalence when comparing 2012 and 2021.
- VA facilities in the Midwest, West and especially the South may have differences in ATTR CA detection relative to those in the Northeast region. This geographic variation appears largest in Black patients.
- Further research into health system, provider, and patient factors leading to this variation is needed to ensure health equity and quality of care for patients with CA.