

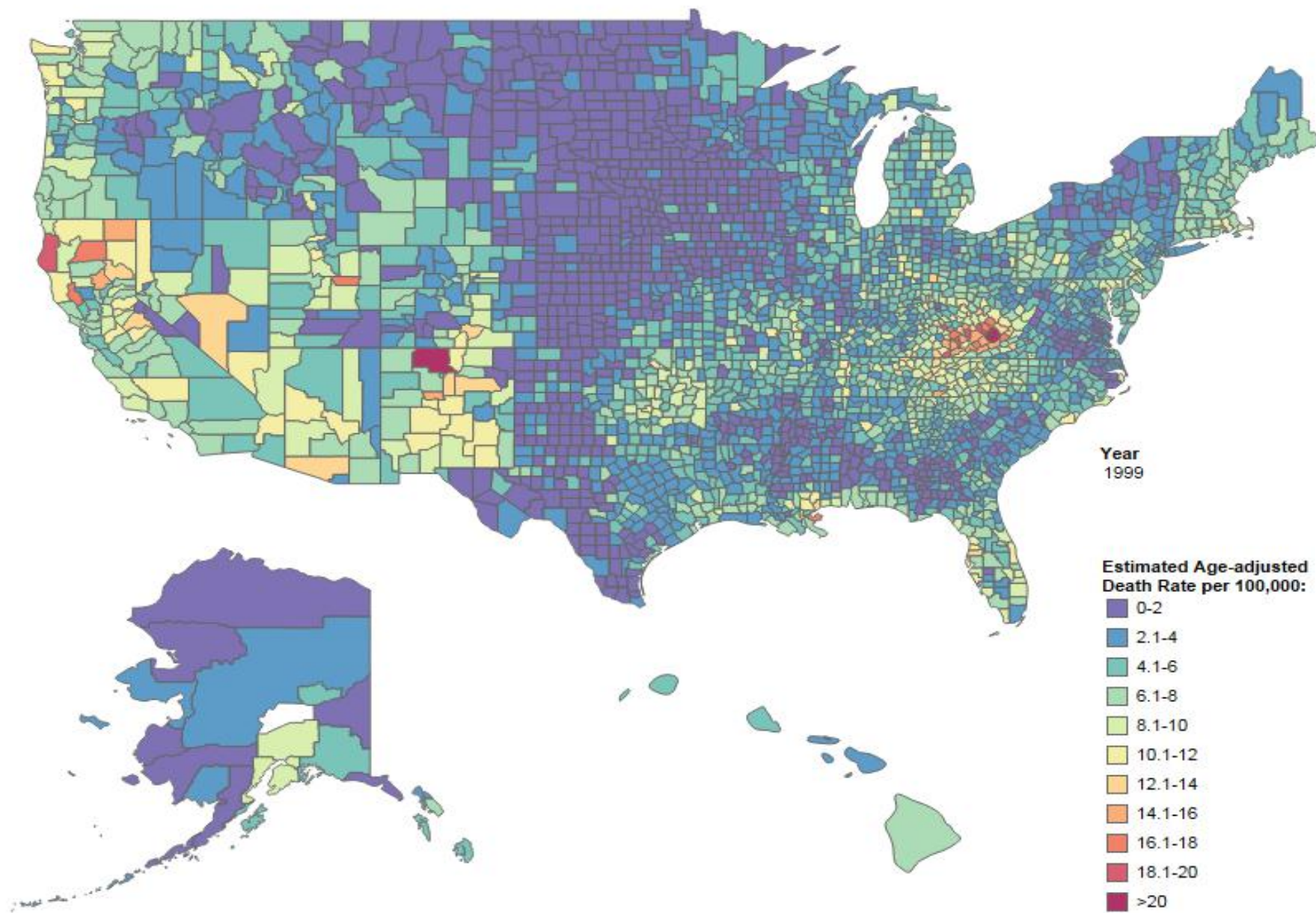
Challenges in interpreting analytical results for MDI and variation for toxicology assessment in death certification

Gregory G. Davis, M.D.

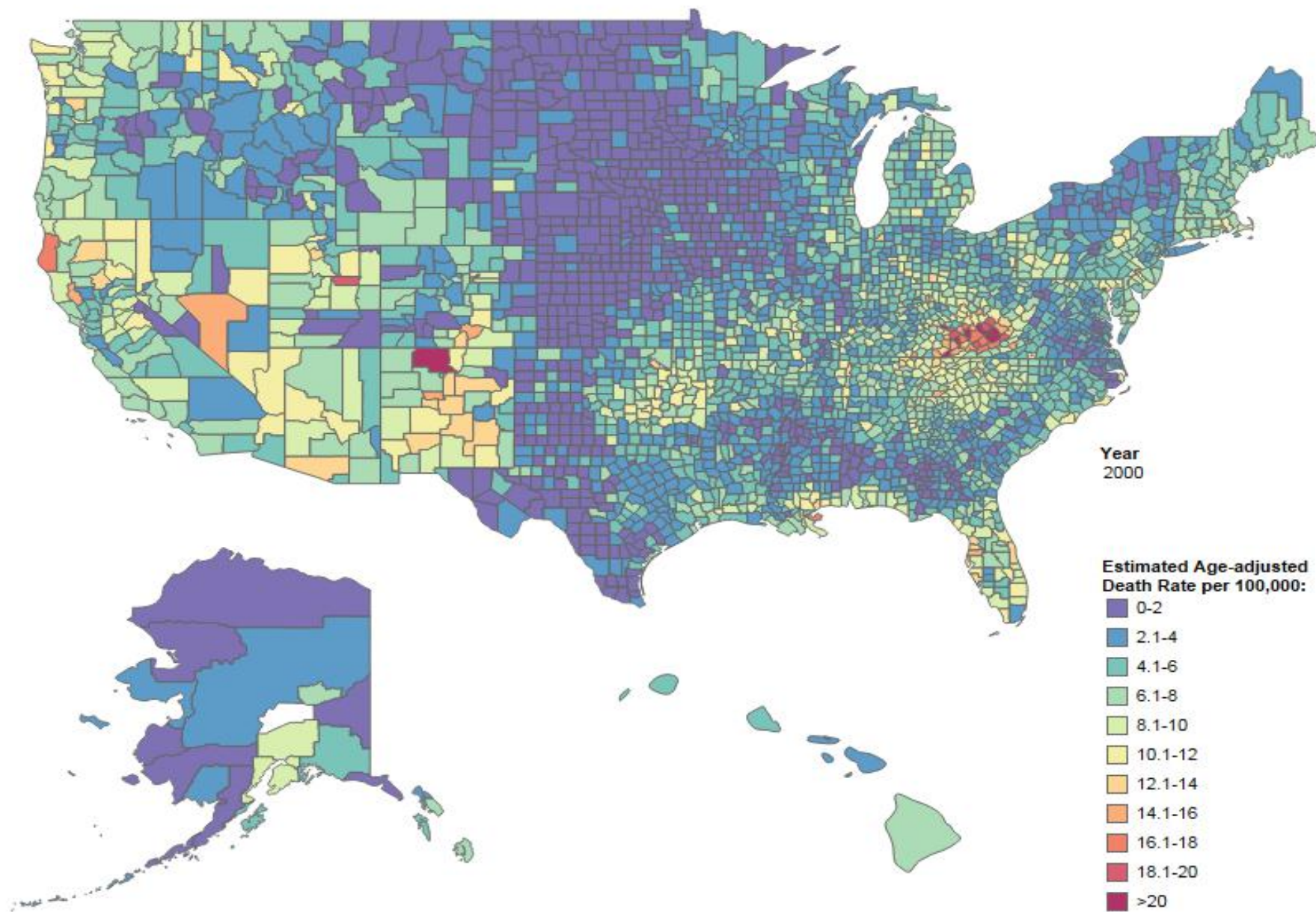
Jefferson County Coroner/Medical Examiner Office

Department of Pathology, University of Alabama at Birmingham

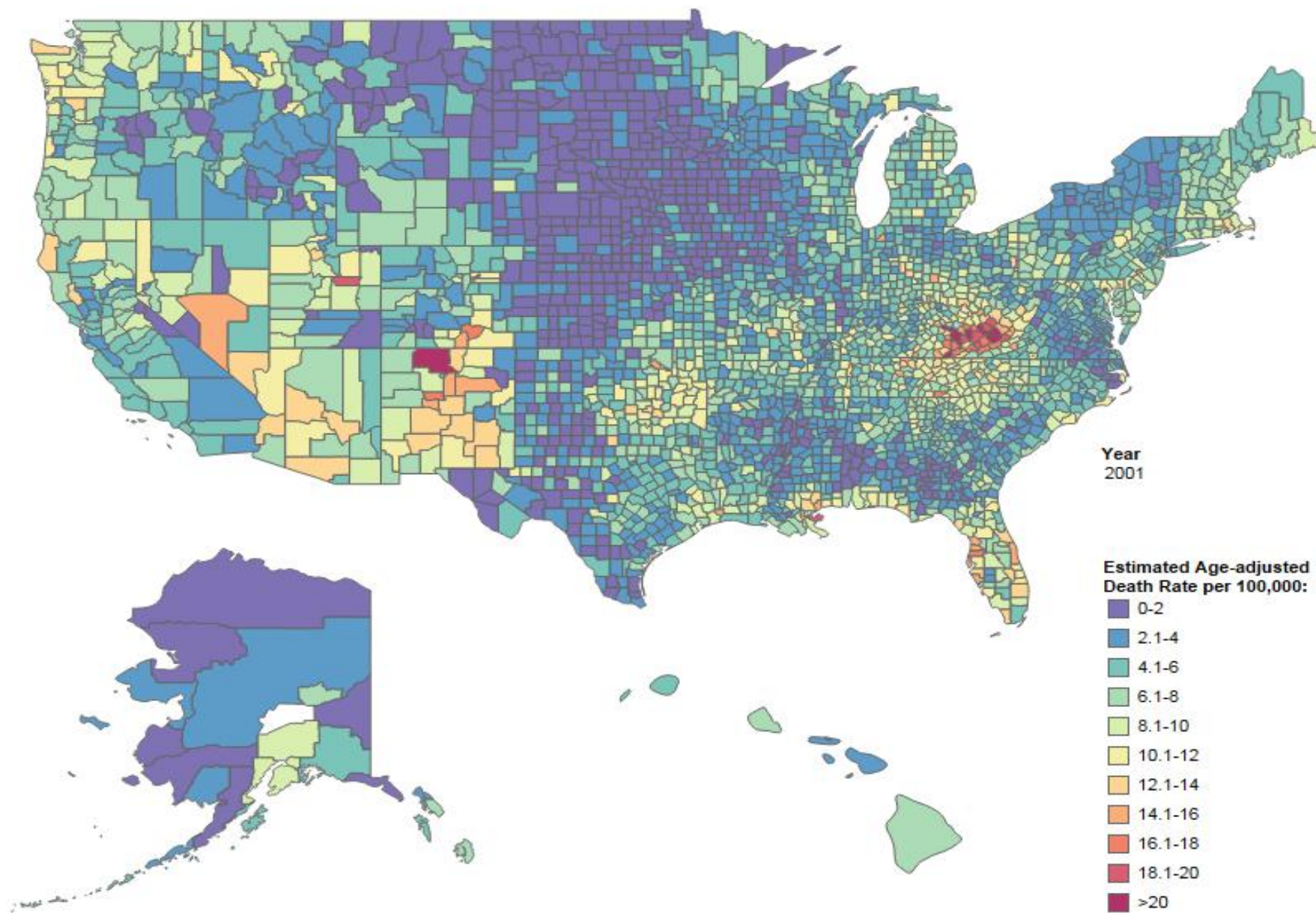
Estimated Age-adjusted Death Rates_s for Drug Poisoning by County, United States: 1999



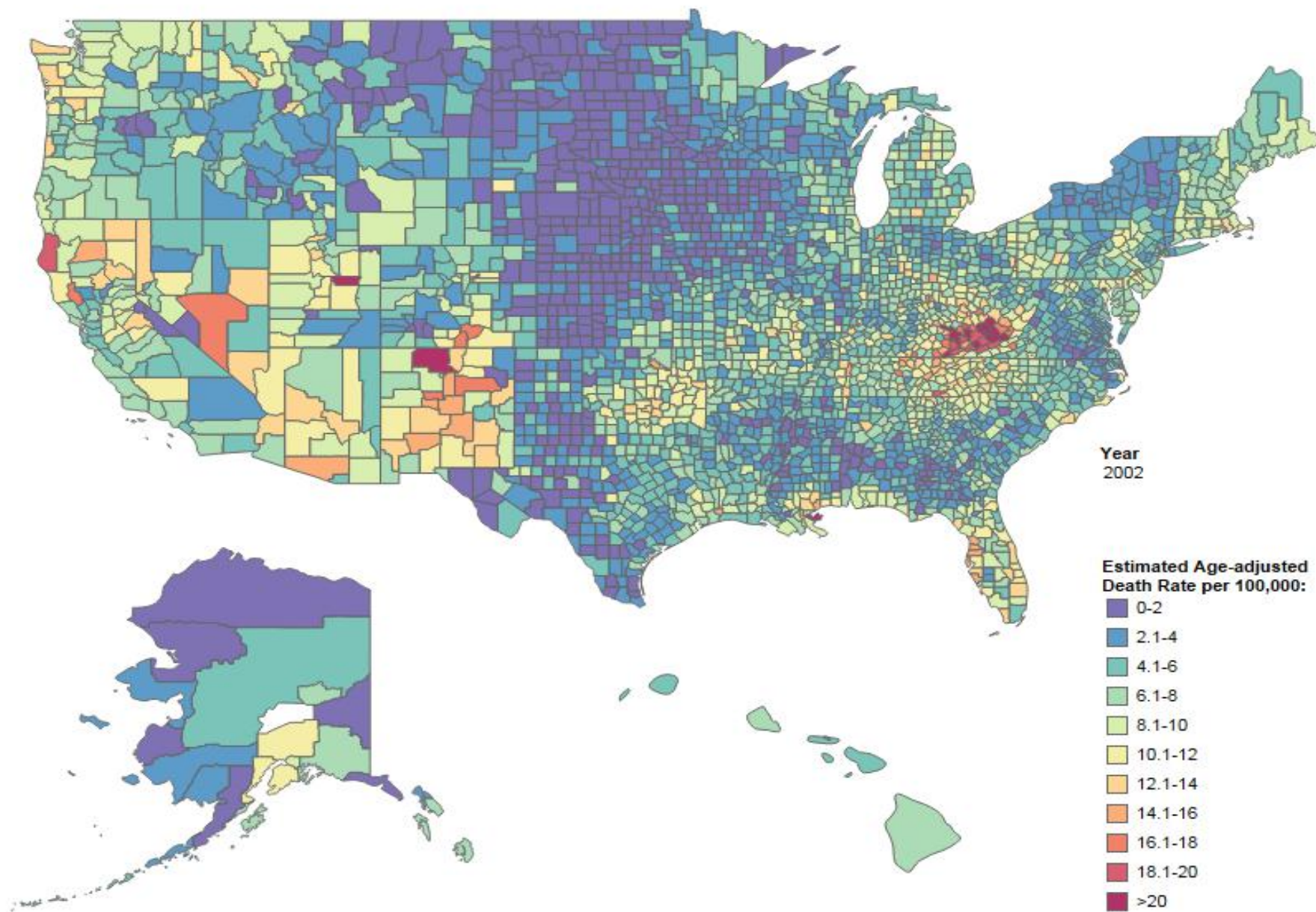
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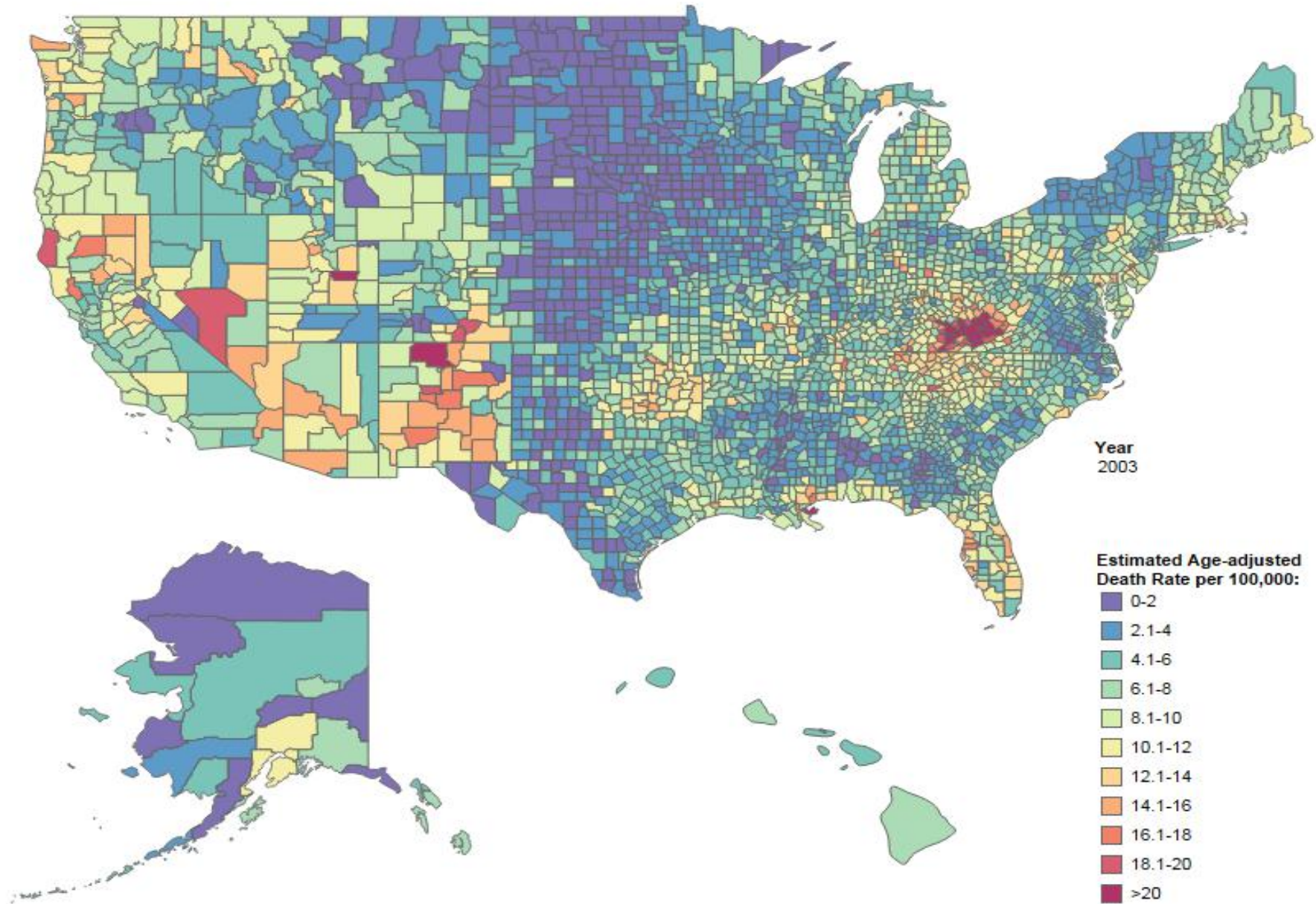
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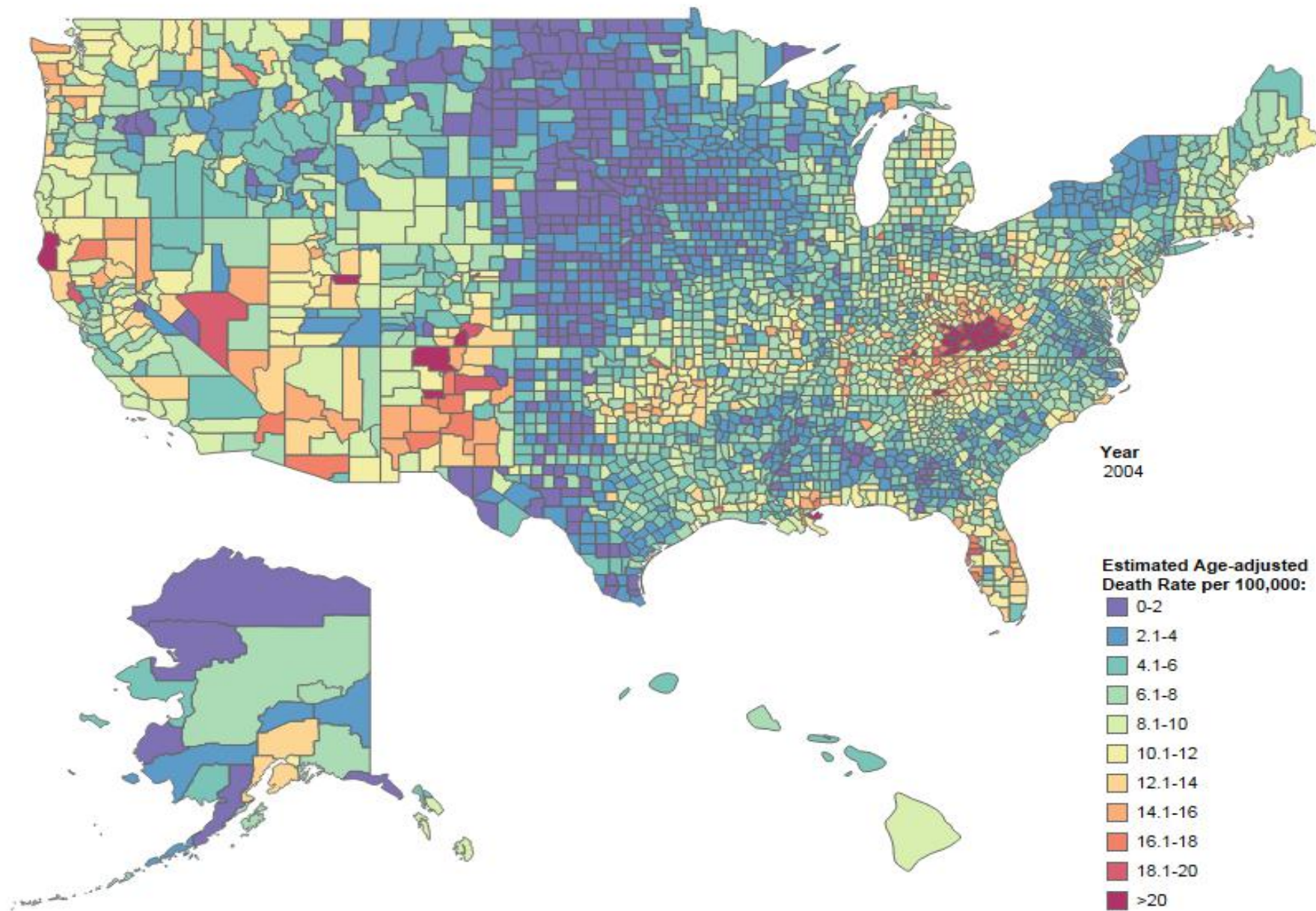
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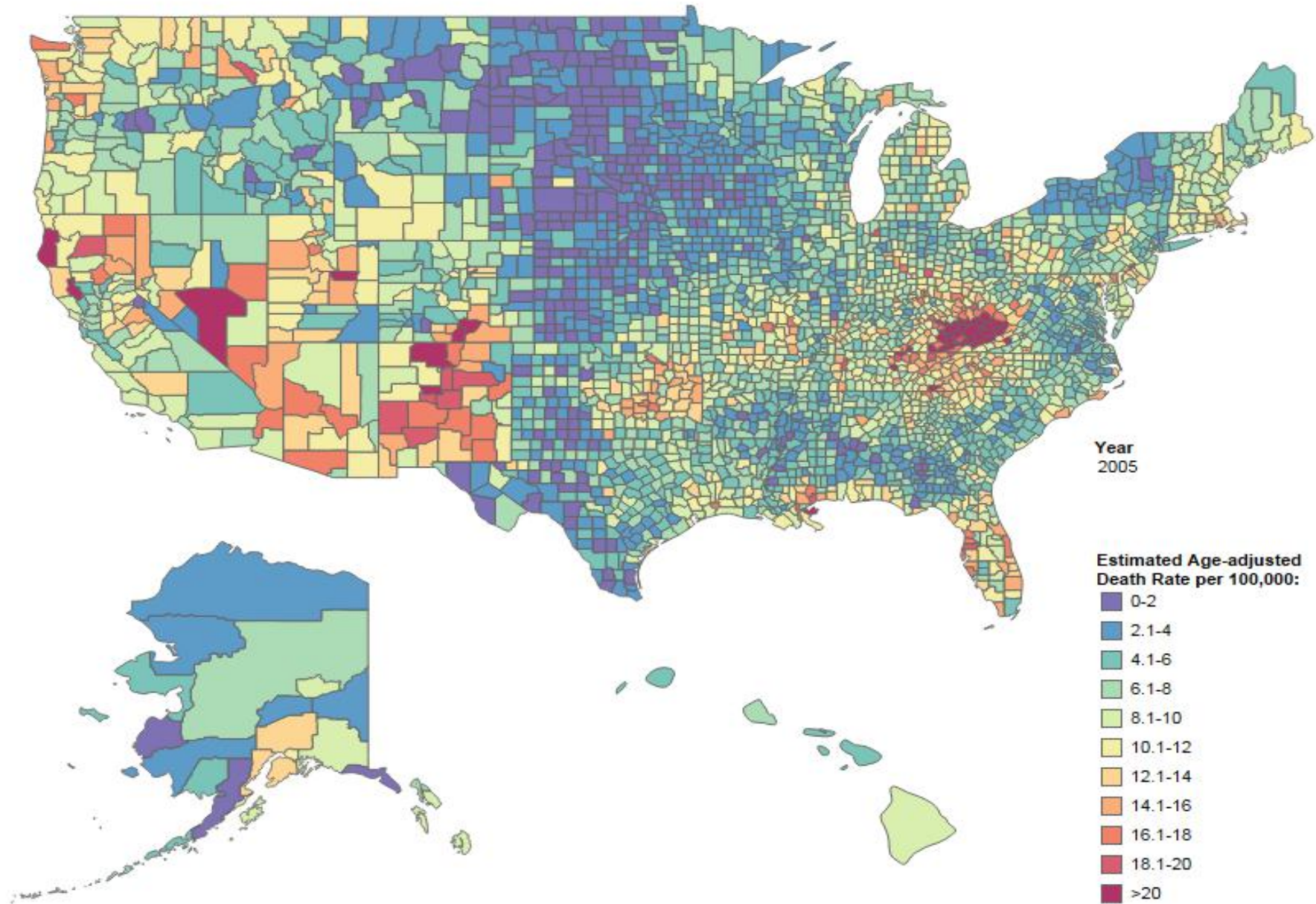
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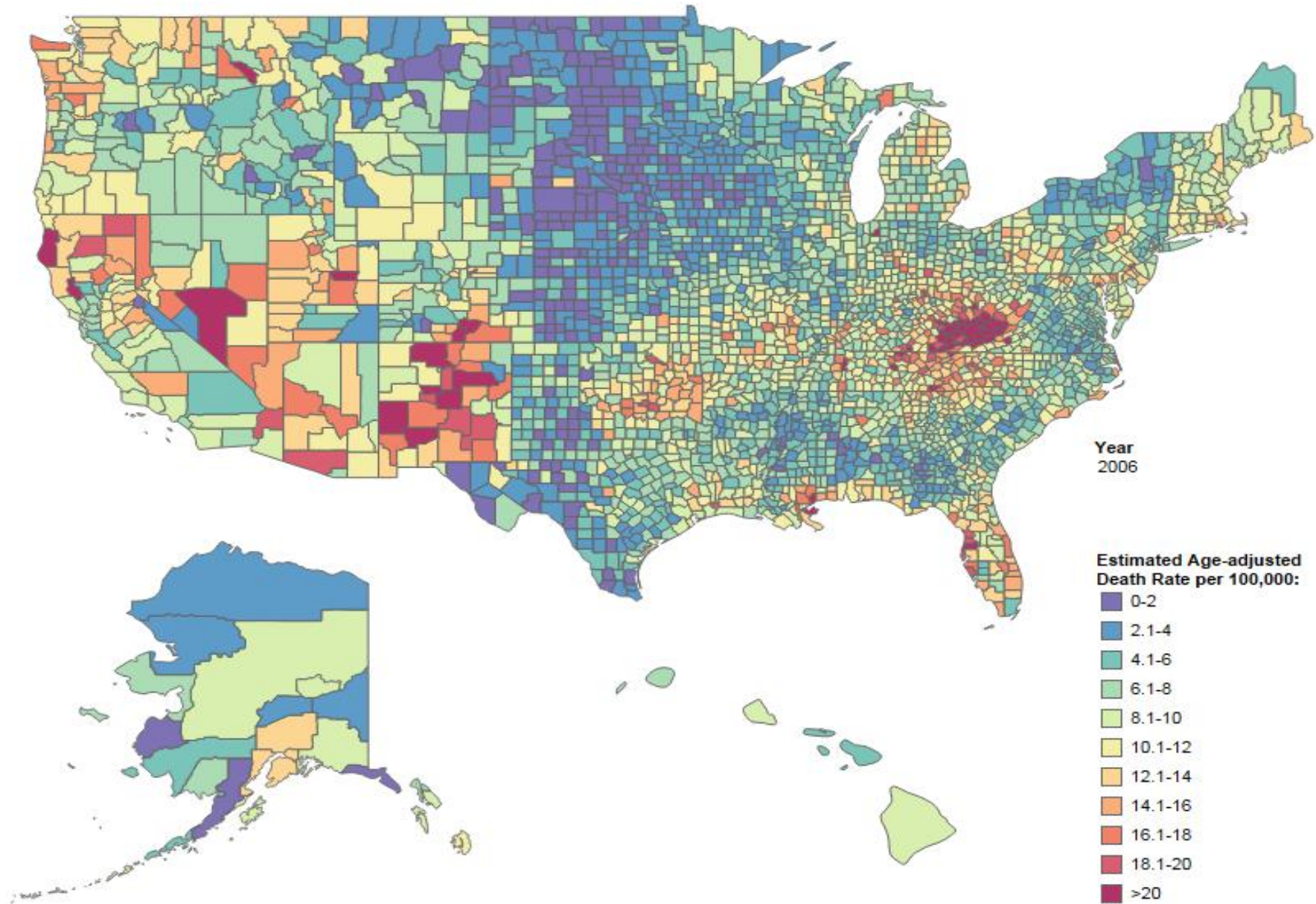
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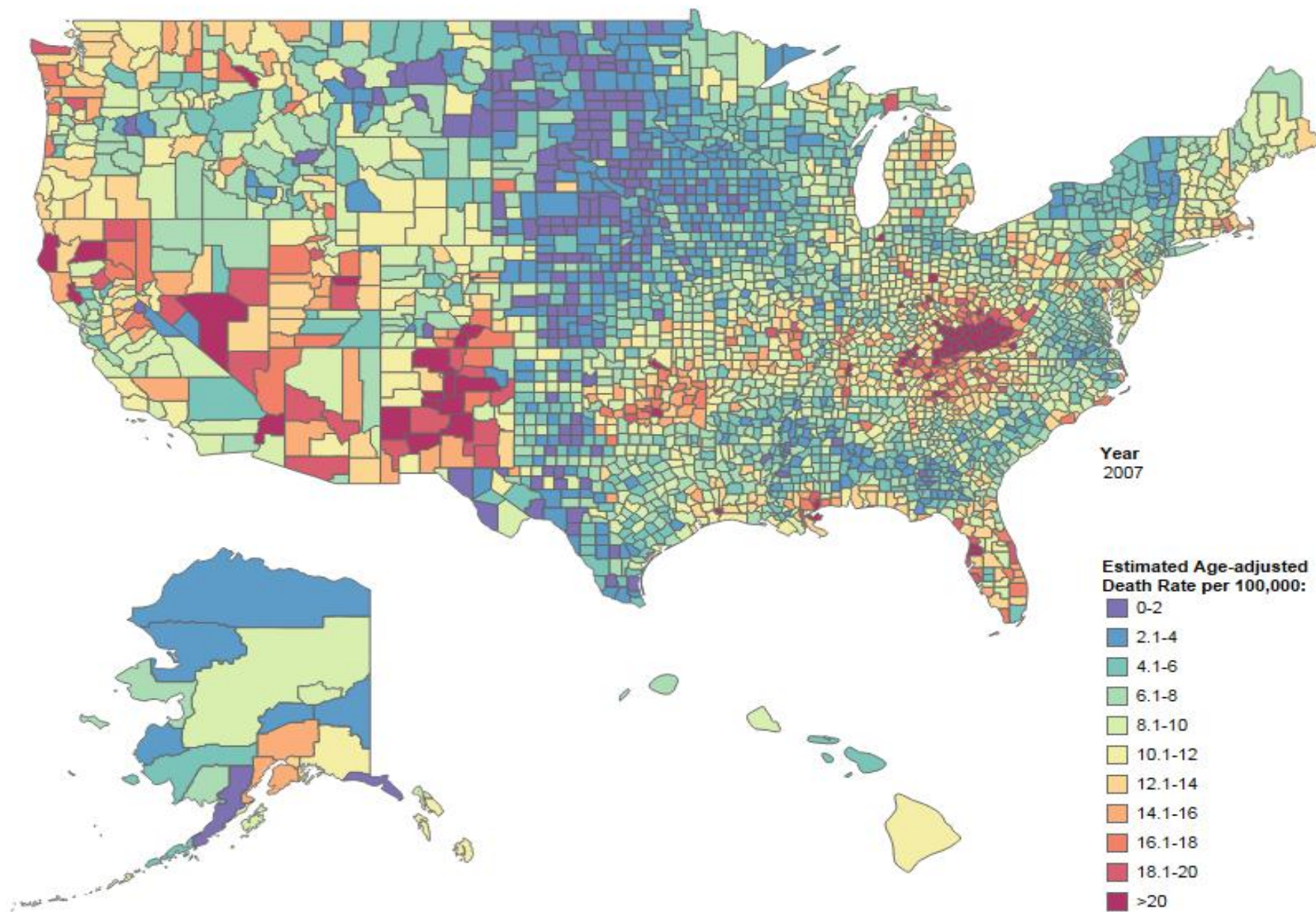
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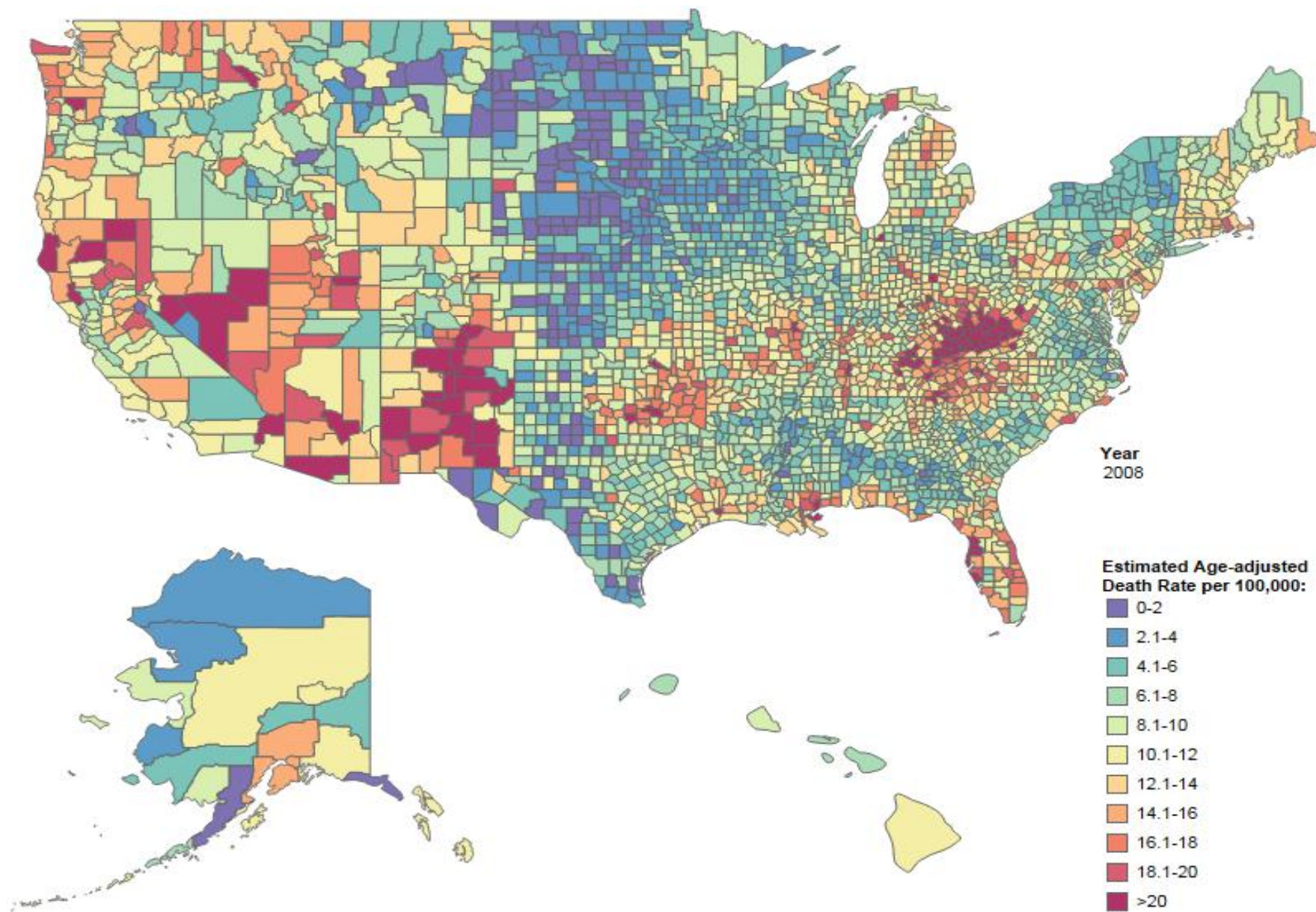
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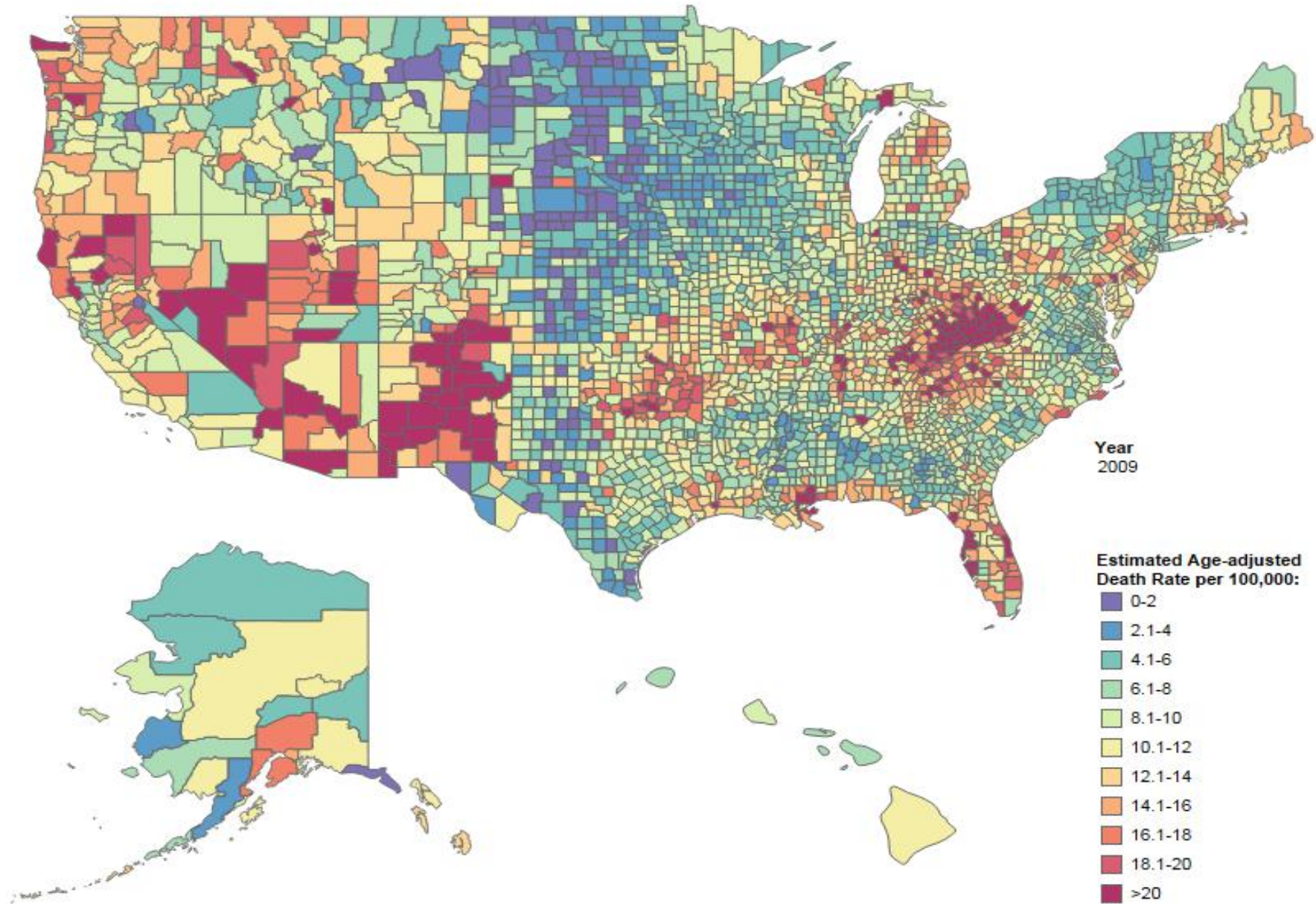
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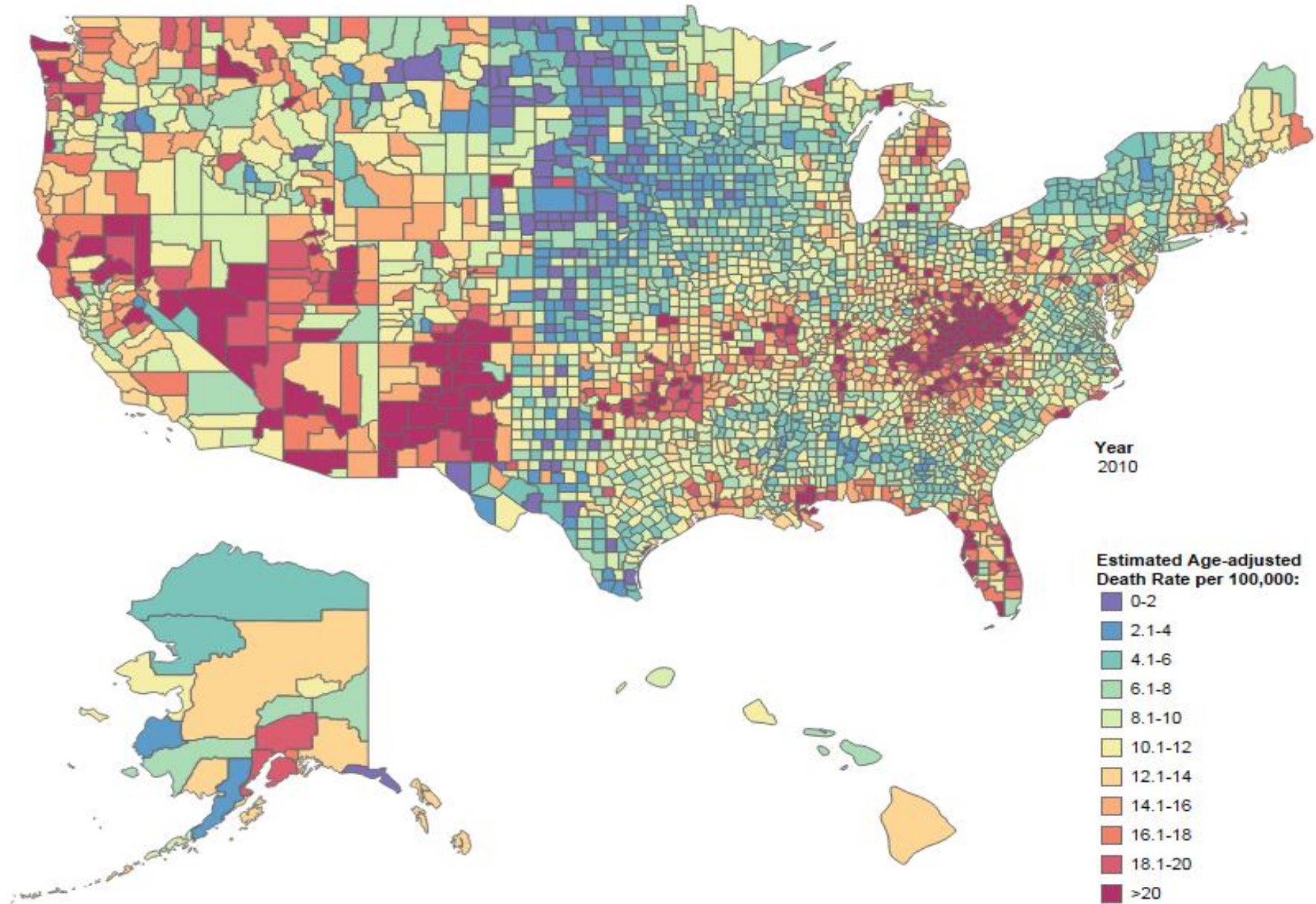
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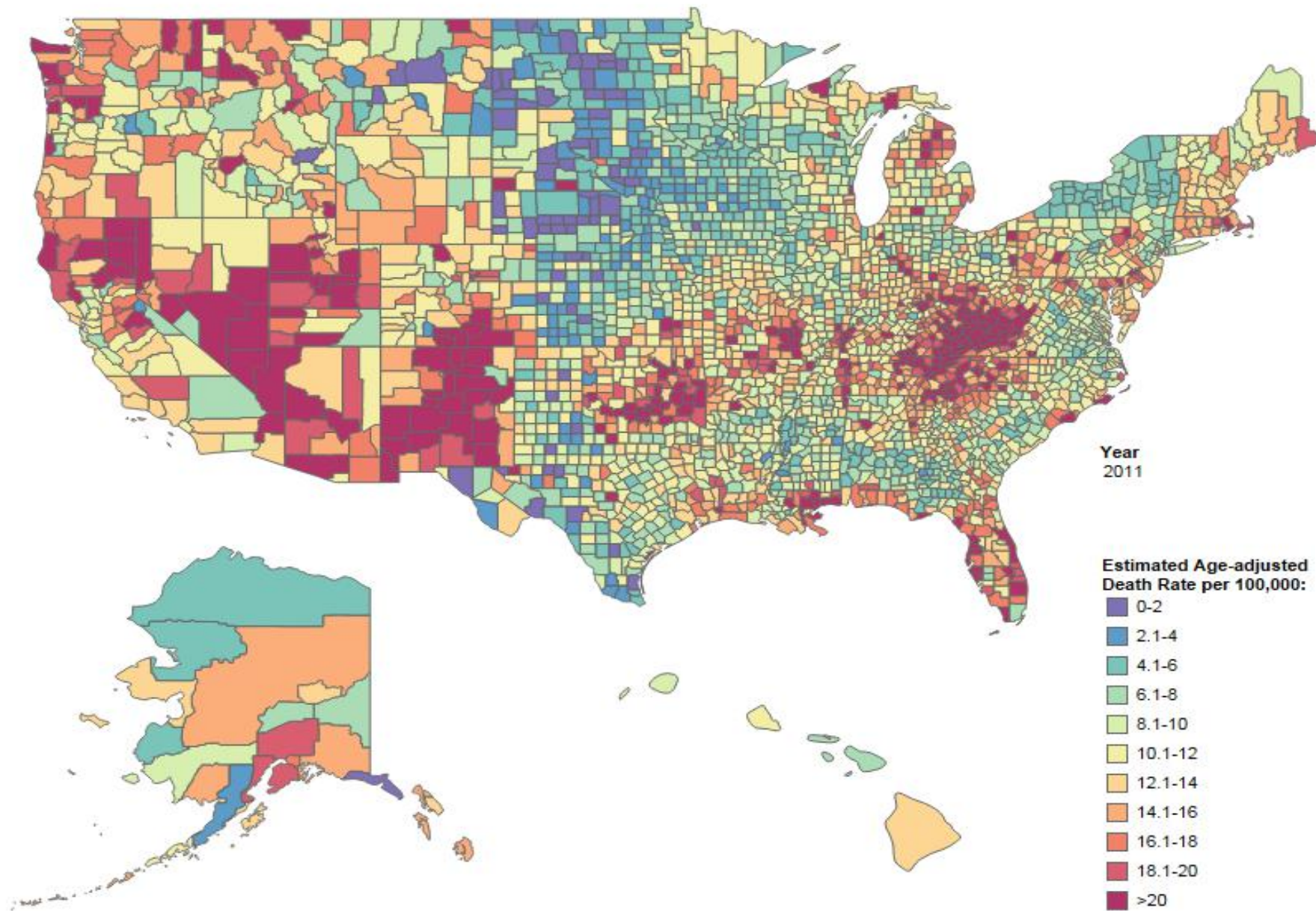
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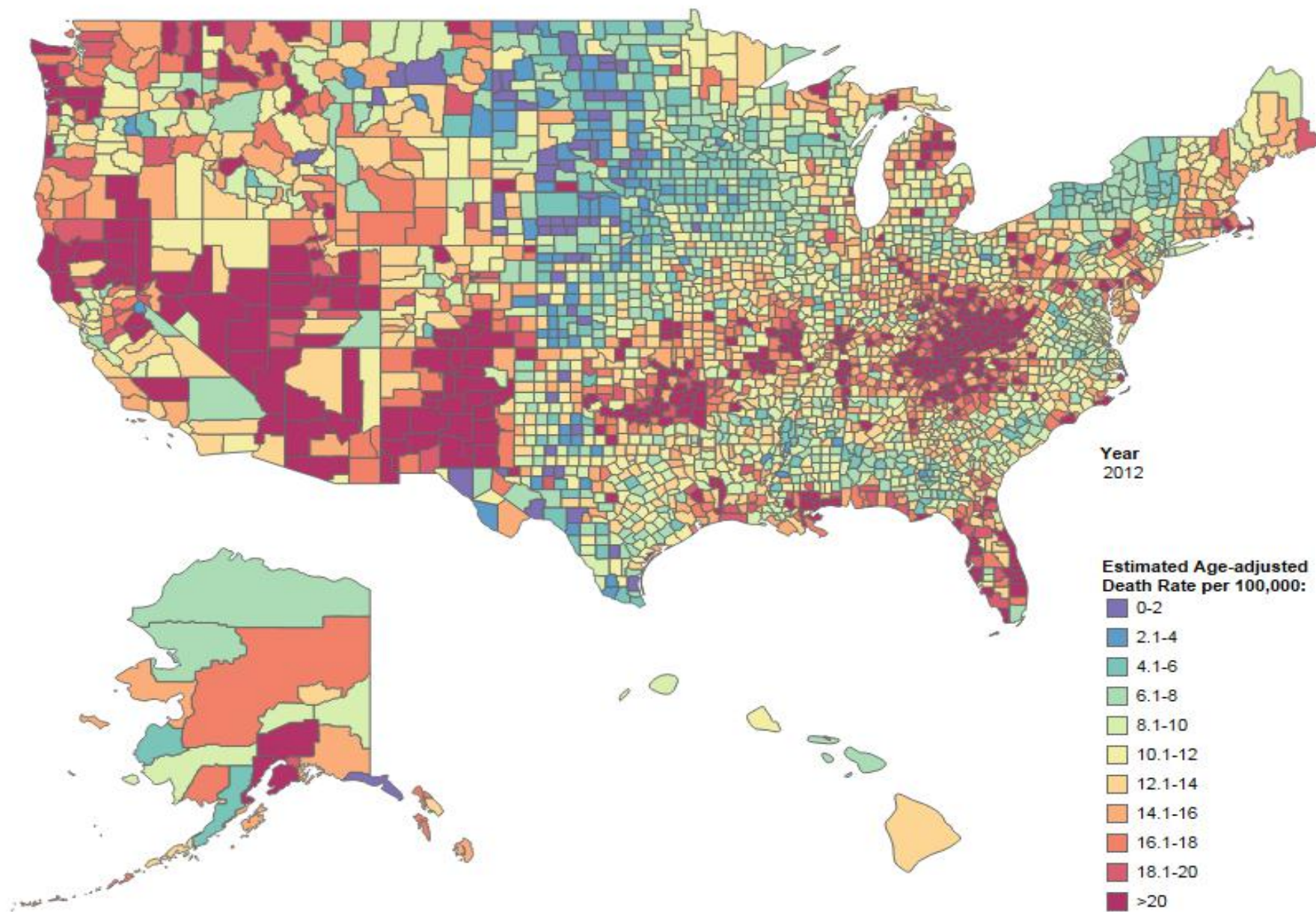
Estimated Age-adjusted Death Rates§ for Drug Poisoning by County, United States: 2010



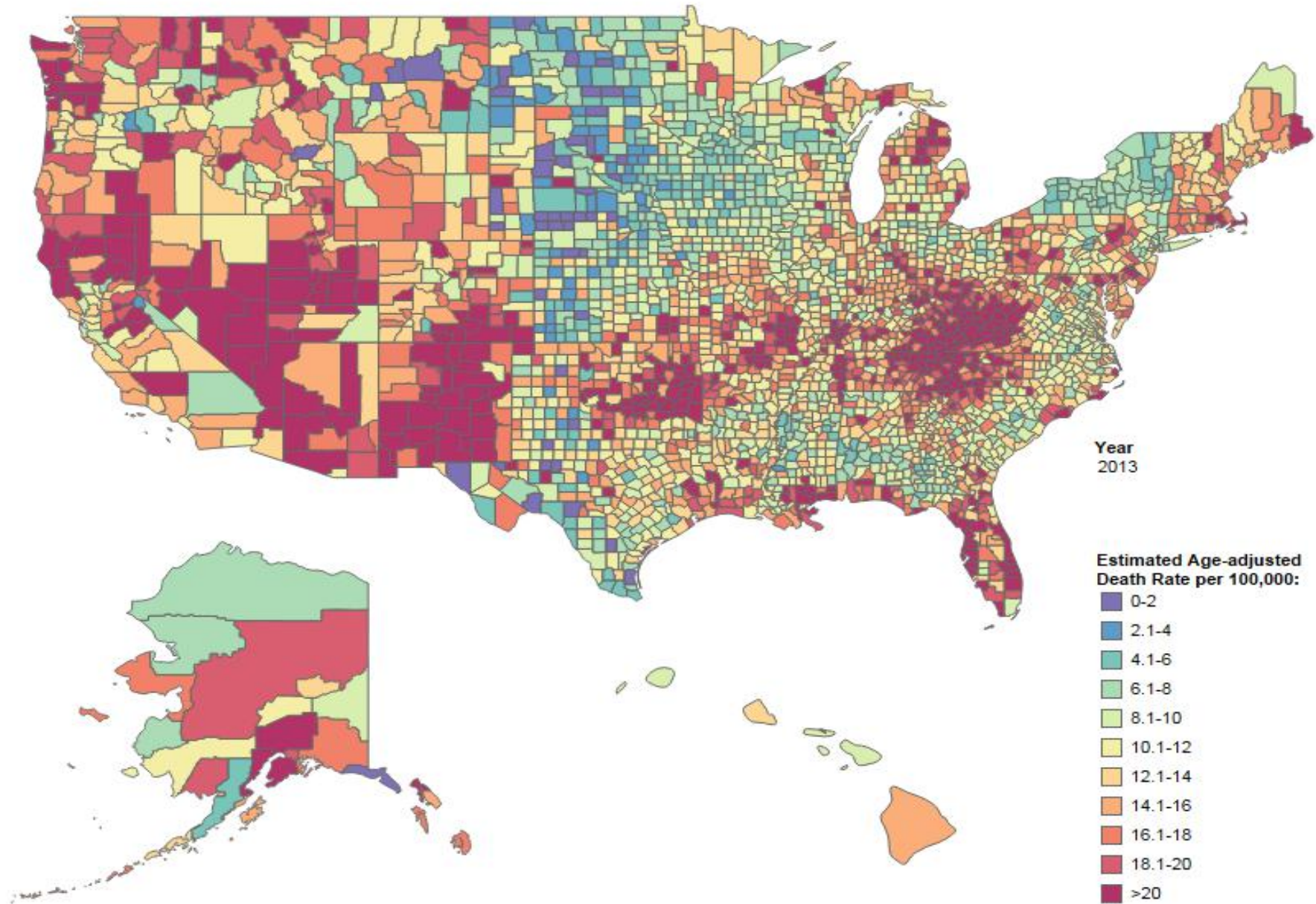
Estimated Age-adjusted Death Rates§ for Drug Poisoning by County, United States: 2011



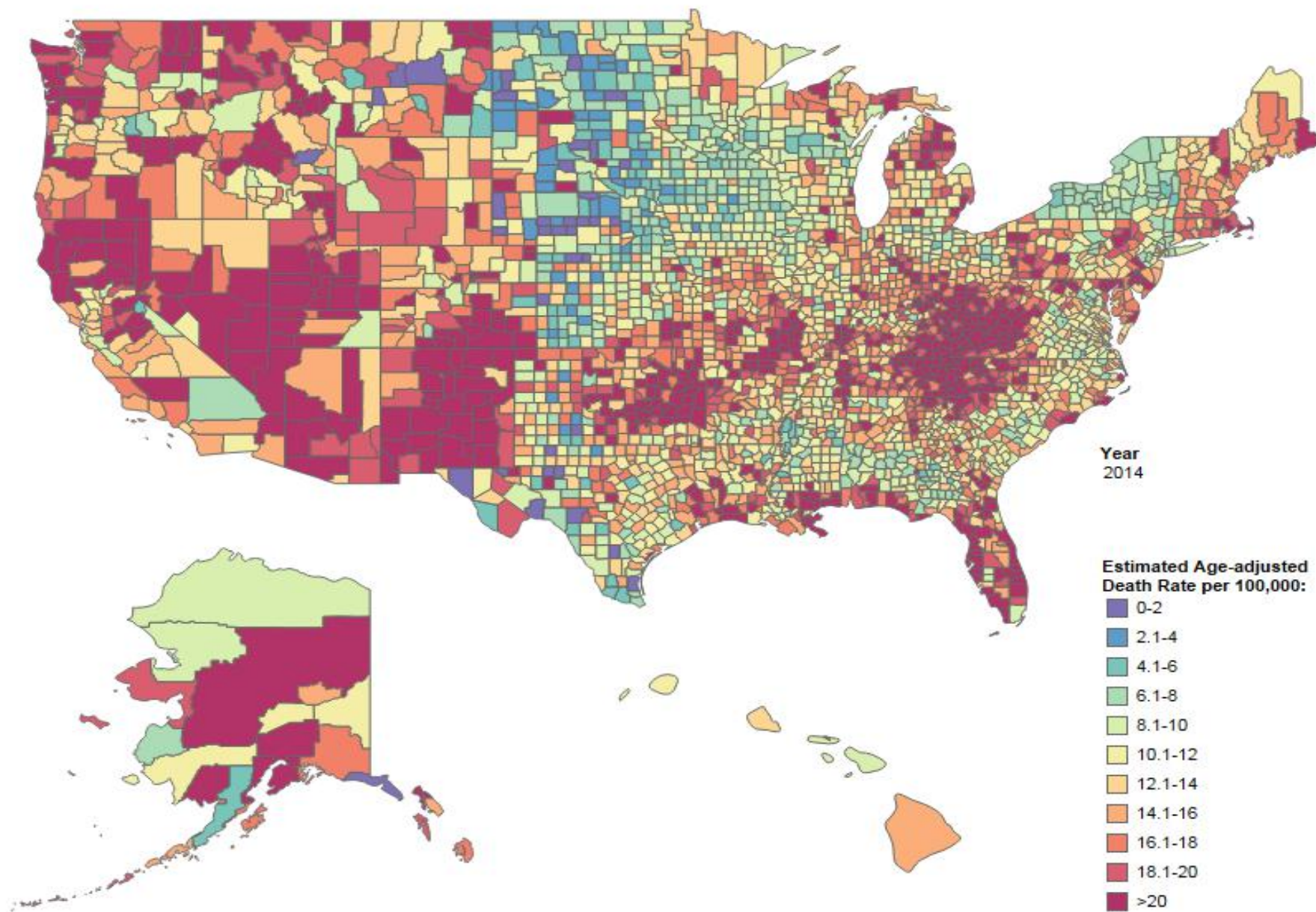
Estimated Age-adjusted Death Rates§ for Drug Poisoning by County, United States: 2012



Estimated Age-adjusted Death Rates§ for Drug Poisoning by County, United States: 2013



Estimated Age-adjusted Death Rates§ for Drug Poisoning by County, United States: 2014



Purpose of death certificate

- Fact of death
- Financial accounts and other matters
- Public health

Purpose of death certificate

- Public health
 - Fact of death
 - Financial accounts and other matters

Death certification

- Financial accounts and other matters – tremendous pressure to complete death certificate and complete it quickly

Death Investigation and Certification

- Toxicological analysis takes time

Tension in death certification

- Death certificate necessary and quickly.
- Toxicological analysis may be slow.
- Pending the cause and manner of death does not resolve this tension.

Tension in death certification

- Public health wants speed and specificity.
- Family wants speed and possibly vagueness.
- Death certificate may be a focus of family's denial, anger, or bargaining.
- Some families perceive that death certificate is means to revise family history.

Tension in death certification

- NCHS wants uniformity and specificity.
- Death investigation is a state function.
 - Patchwork system.
 - Personal philosophy plays a role in death certification
- A given death investigation system may be uniform, but systems across nation are not coherent.

Tension in death certification

- Patchwork system
 - Some offices consider mission a public health measure
 - Some offices consider mission devoted to potential criminal cases.

Challenges in death certification

- Overlap of therapeutic and toxic concentrations of opioids is nearly complete.

	<u>Rx</u>	<u>Toxic</u>	<u>Lethal</u>
Morphine	0.01-0.3	0.04-5	0.1-4
Oxycodone	0.005-0.1	0.01-0.5	0.12-14
<u>Methadone</u>	<u>0.01-1.06</u>	<u>>0.2</u>	<u>0.06-3.1</u>

all units mg/L

Challenges in death certification

- Manipulation of chemical structures now common, making it more difficult for toxicologists to find substances even in a setting suggestive of death from drug toxicity.

Challenges in death certificate

- Lack of recognition of opioid deaths
 - Slow toxicology results
 - No toxicology results
 - New formulations escape detection
 - Tests not ordered

Challenges in death certificate

- Pressure to accommodate family requests
 - Cause of death
 - Manner of death

Challenges in death certificate

- Philosophy of cause of death certification
 - List one drug only?
 - List some drugs?
 - List all drugs?

Challenges in death certificate

- Toxicology results
 - Oxycodone 0.12 mg/L
 - Morphine 0.01 mg/L
 - Alprazolam 0.13 mg/L
 - Cocaine 0.008 mg/L
 - Ethanol 0.07 g/dL
- What is cause of death?

Challenges in death certificate

- Philosophy of manner of death certification
 - Accident?
 - Suicide?
 - Undetermined?

Summary

- Tensions exist for which no easy solution exists.
 - Rapid DC versus slower tox results
 - Specificity for PH, vagueness for family
 - Federal desires versus state function
 - Toxicological analysis of new compounds
 - Interpretation of toxicological results
 - Philosophy
 - Certification