

Tobacco-Related Lung Disease in Kentucky

Anthony D Weaver MD

December 1, 2017



Faculty Disclosure

- **I do not have any conflicts to report.**

Objectives

Upon completion of this educational activity, you will be able to:

- 1. Discuss the epidemiology and risk factors for tobacco-related lung disease in Kentucky**
- 2. Analyze the state's geographic distribution of lung disease and lung cancer**
- 3. Develop a plan to reduce the burden of lung disease in Kentucky**

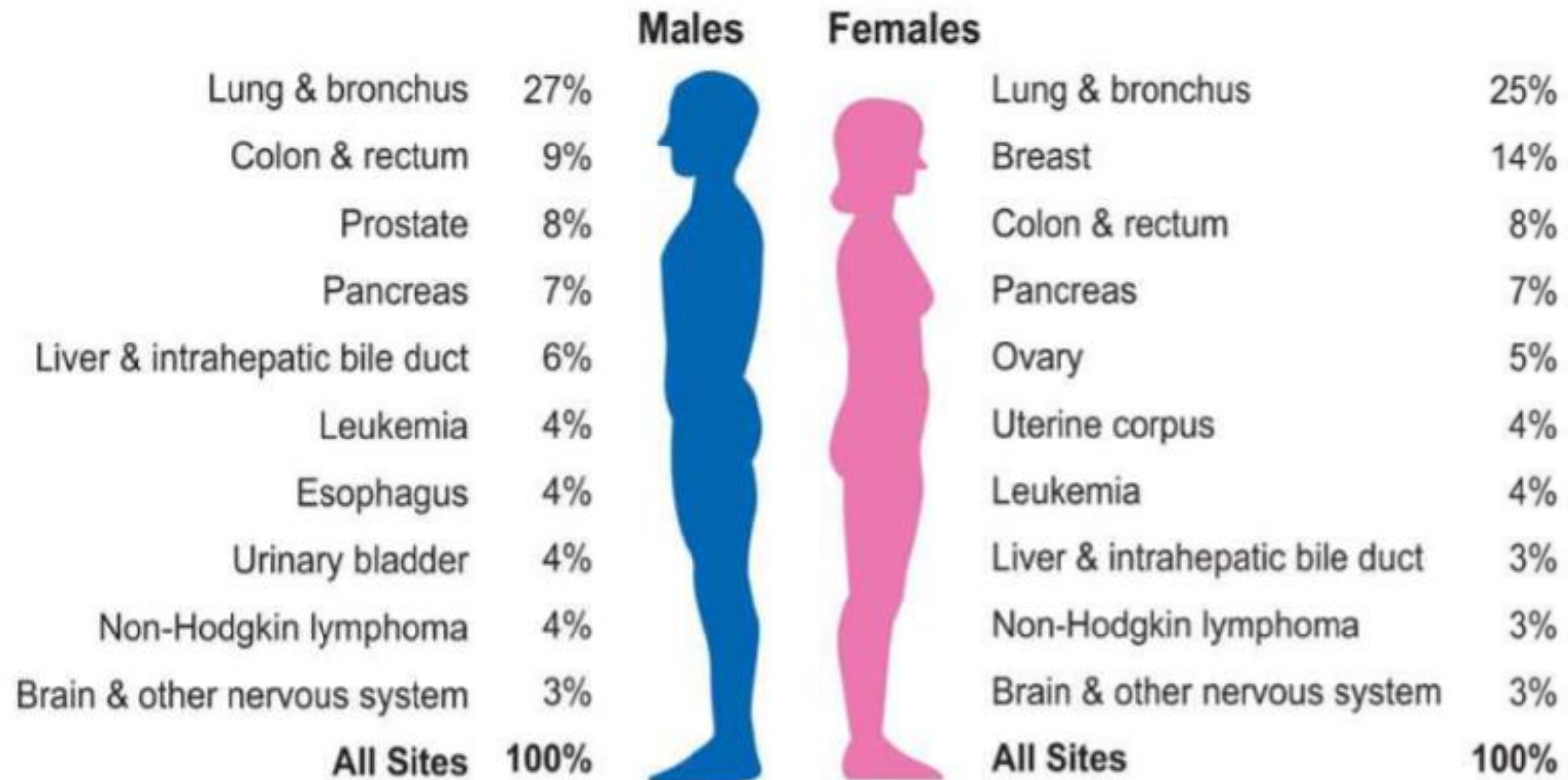
Leading Causes Of Kentucky Deaths, 2014

KY Life Expectancy at birth 75.1 years

	# Deaths	Nat'l Rank
1. Cancer	10263	1st
2. Heart Diseases	10013	8th
3. Respiratory Diseases	3214	1st
4. Unintentional Injuries	2622	5th
5. Stroke	2050	11th
6. Alzheimer's Disease	1523	10th
7. Diabetes Mellitus	1175	14th

Cancer Statistics, 2017

Estimated Deaths



Cigarettes and Lung Cancer

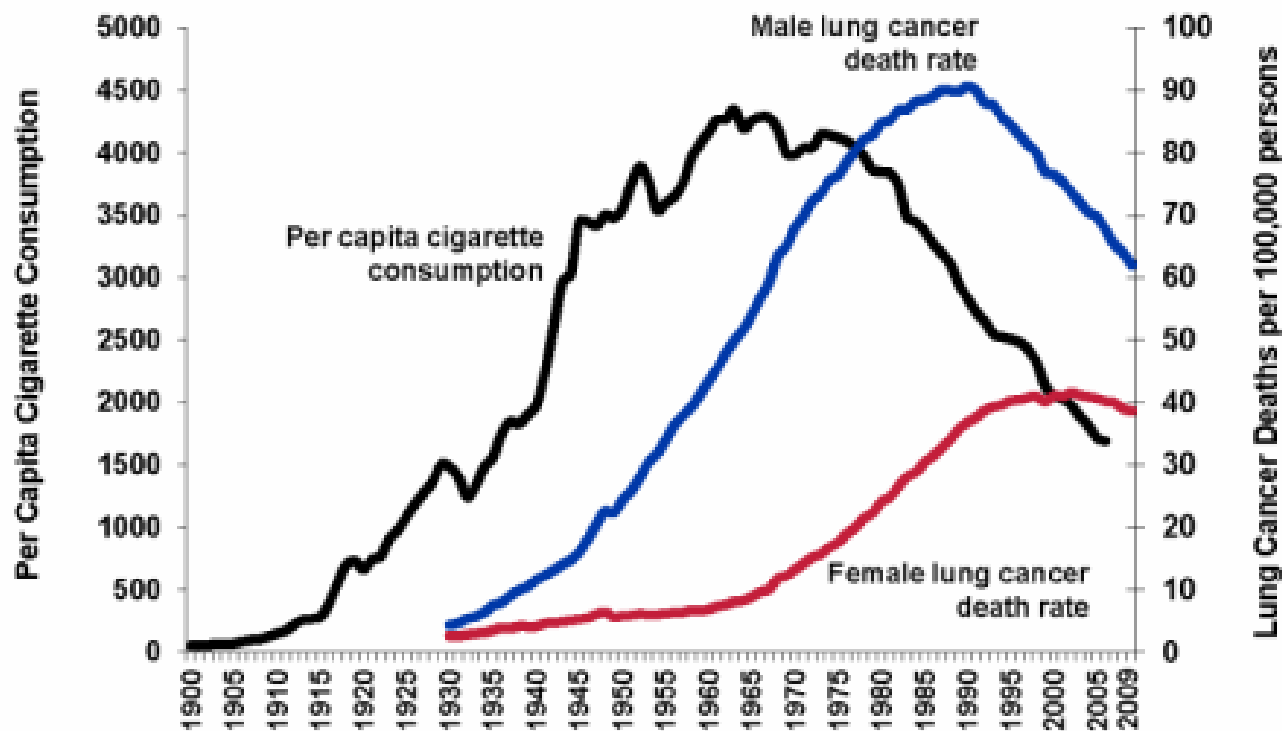
“By 1944 cigarette production was up to 300 billion a year. Service men received about 75% of all cigarettes produced.”

http://healthliteracy.worlded.org/docs/tobacco/Unit1/2history_of.html

Smoking on domestic U.S. airliners was banned on all domestic flights lasting two hours or less beginning in 1988.

In 1998, a master agreement settled the lawsuits of 46 states against the tobacco industry.

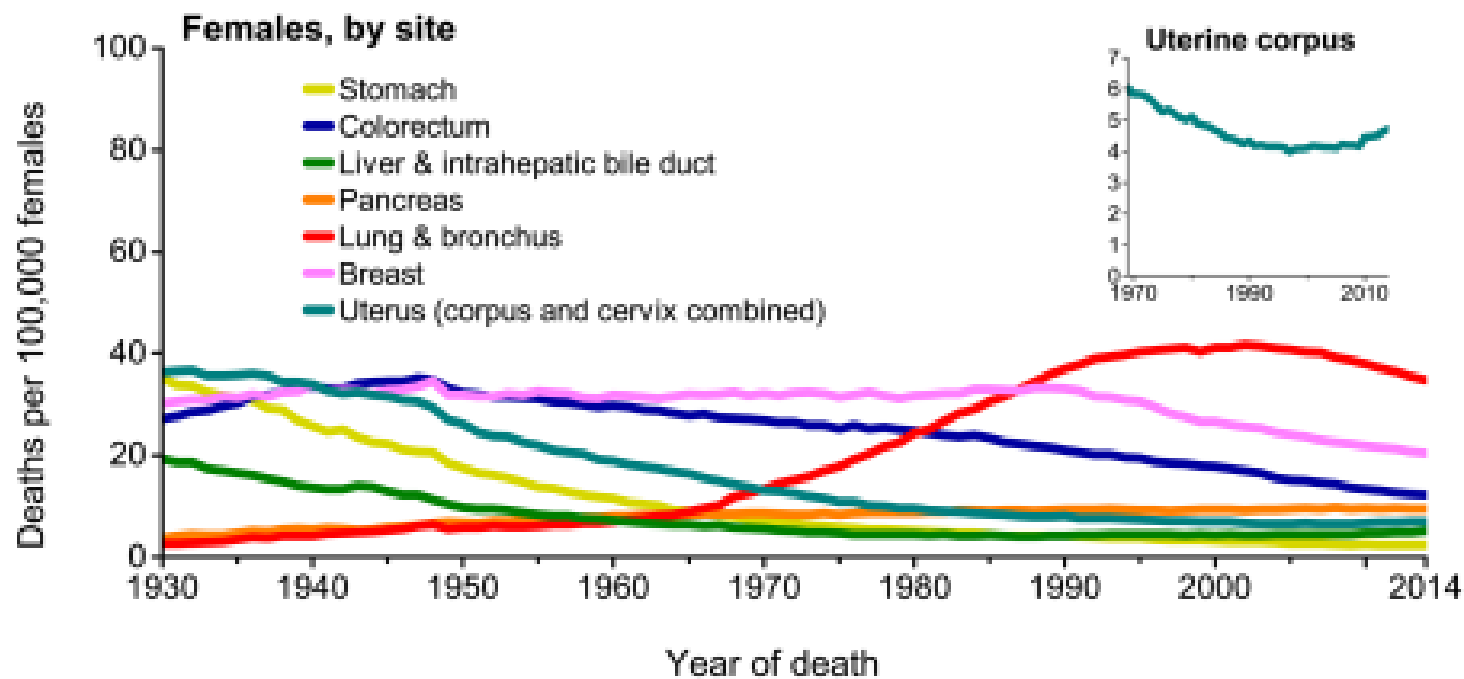
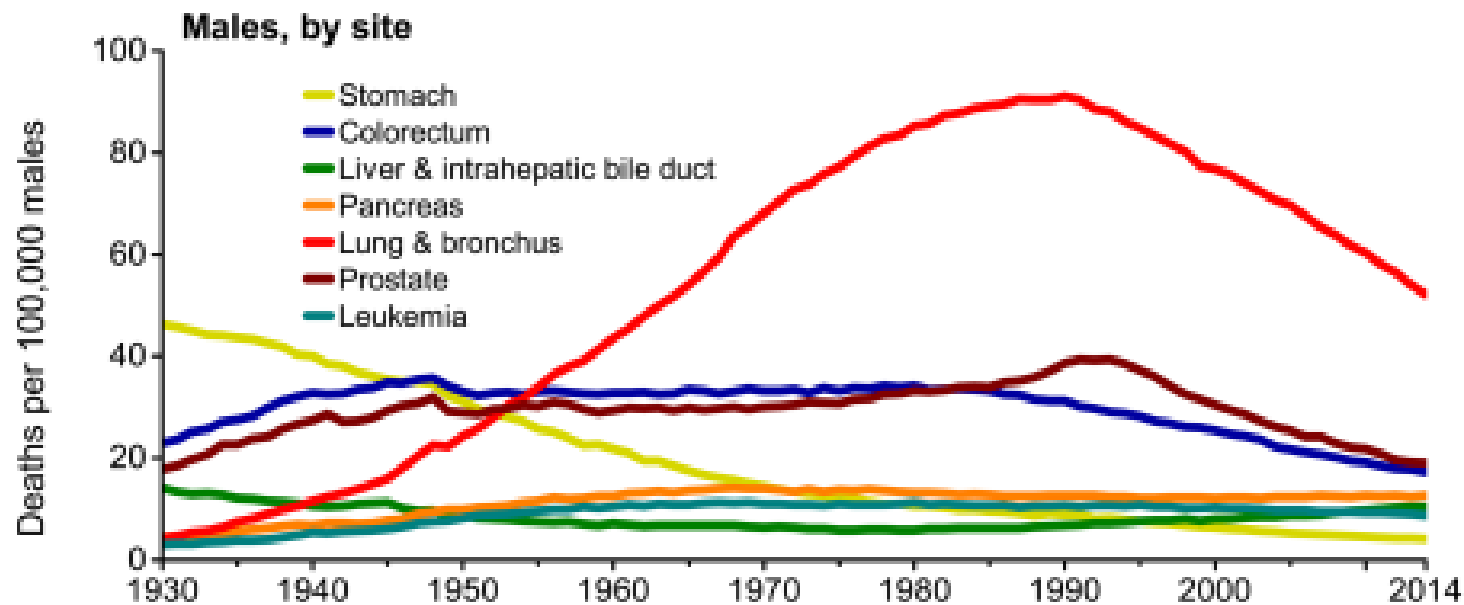
<http://scholarship.law.cornell.edu/facpub/421/>



*Age-adjusted to 2000 US standard population.

Source: American Cancer Society, Cancer Facts & Figures 2013

CA: A Cancer
Journal for
Clinicians
Volume 67, Issue 1,
pages 7-30, 5 JAN
2017



Cigarettes and Lung Cancer

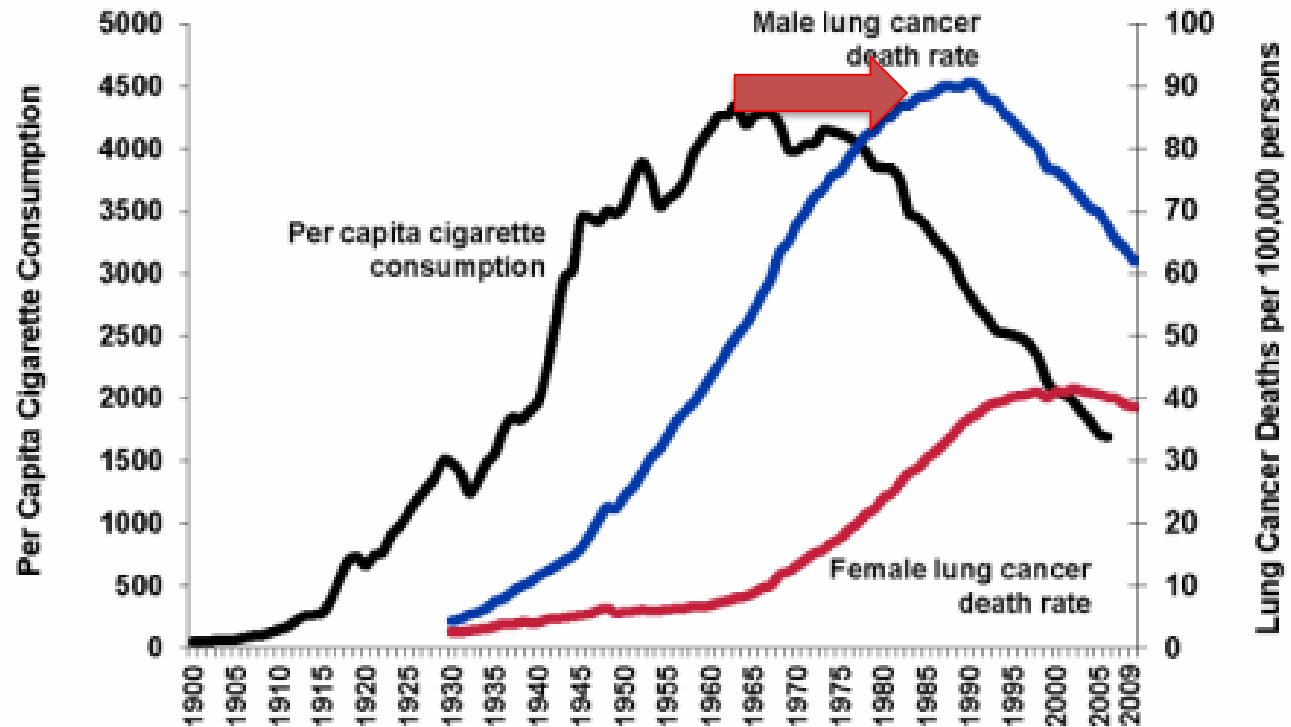
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*Age-adjusted to 2000 US standard population.

Source: American Cancer Society, Cancer Facts & Figures 2013

Smokers Get a Raw Deal

By Stanley S. Scott

The civil rights act, the voting rights act and a host of antidiscrimination laws notwithstanding, millions of Americans are still forced to sit in the back of planes, trains and buses. Many more are subject to segregation in public places. Some are even denied housing and employment: victims of an alarming — yet socially acceptable — public hostility.

This new form of discrimination is based on smoking behavior.

If you happen to enjoy a cigarette, you are the potential target of violent antismokers and overzealous public enforcers determined to force their beliefs on the rest of society.

Ever since people began smoking, smokers and nonsmokers have been able to live with one another using common courtesy and common sense. Not anymore. Today, smokers must put up with virtually unenforceable laws regulating when and where they can smoke — laws intended as much to discourage smoking itself as to protect the rights of nonsmokers. Much worse, supposedly responsible organizations devoted to the "public interest" are encouraging the har-

Stanley S. Scott is vice president and director of corporate affairs of Philip Morris Inc.

assment of those who smoke.

This year, for example, the American Cancer Society is promoting programs that encourage people to attack smokers with canisters of gas, to blast them with horns, to squirt them with oversized water guns and burn them in effigy.

Zealots, stop maltreating cigarette users

Harmless fun? Not quite. Consider the incidents that are appearing on police blotters across America:

• In a New York restaurant, a young man celebrating with friends was zapped in the face by a man with an aerosol spray can. His offense: lighting a cigarette. The aggressor was the head of a militant antismoker organization whose goal is to mobilize an army of two million zealots to spray smokers in the face.

• In a suburban Seattle drug store,

a man puffing on a cigarette while he waited for a prescription to be filled was ordered to stop by an elderly cus-

• A 23-year-old lit up a cigarette on a Los Angeles bus. A passenger objected. When the smoker objected to the objection, he was fatally stabbed.

• A transit policeman, using his reserve gun, shot and fatally wounded a man on a subway train in the Bronx in a shootout over smoking a cigarette.

The basic freedoms of more than 50 million American smokers are at risk today. Tomorrow, who knows what personal behavior will become socially unacceptable, subject to restrictive laws and public ridicule? Could travel by private car make the social engineers' hit list because it is less safe than public transit? Could ice cream, cake and cookies become socially unacceptable because their consumption causes obesity? What about sky diving, mountain climbing, skiing and contact sports? How far will we allow this to spread?

The question all Americans must ask themselves is: can a nation that has struggled so valiantly to eliminate bias based on race, religion and sex afford to allow a fresh set of categories to encourage new forms of hostility between large groups of citizens?

After all, discrimination is discrimination, no matter what it is based on. □

Smoking-ban survey upsets tobacco forces

Agriculture panel hostile to ban on school smoking

By TODD MURPHY
Staff Writer

FRANKFORT, Ky. — Smoking opponents met Kentucky's House agriculture committee yesterday — and the bill to ban smoking on school grounds looked a bit ashier afterward.

The bill would prohibit elementary and secondary students from using tobacco at school.

After about 45 minutes of testimony and intense questioning related to the bill, discussion of it was postponed until Tuesday. The chairman of the committee plans a vote then.

But some members of the House Agriculture and Small Business Committee, many of whom represent tobacco-producing areas and some of whom are farmers, left little doubt yesterday what they think of the bill.

None directly argued for allowing children to smoke. But they criticized the bill for restricting children's smoking

while it allows teachers to smoke, for excluding university college students from

designate or enforce such a policy,

Taliaferro, a non-smoker, said he raised the issue with the advisory committee because of "complaints by numerous state workers that exposure to smoke has cut their productivity and in some cases caused illness."

Ray Mackey, president of the Kentucky Farm Bureau, said he was

Rep. Jon David Reinhardt, R-Alexandria, said he did not like children smoking. But, he said: "Ninety-six school districts have indeed taken a firm stand on it. They've provided smoking areas in those high schools, and I think it's just simply for management. They recognize they're not going to stop kids from smoking in those schools."

Enforcement of smoking ordinance at Greater Cincinnati airport under fire

Associated Press

HEBRON, Ky. — Opinion, sharply divided on the smoking issue, is also divided on how well Greater Cincinnati International Airport is enforcing its restrictions on smoking.

Violators can be fined \$100, and although no have ever been issued, says Ted Bushelman says that mean the airport is taking nance lightly.

The airport has stepped enforcement in the past n said. Now, the security at keeping staff give "courte to people smoking in areas. The airport also ha

Ahron Leichtman, president of the national organization Citizens Against Tobacco Smoke, and Phil Murphy, assistant to the president of the Cincinnati chapter of Group Against Smoking Pollution, are not satisfied.

Kentucky lawmakers, anti-smoking groups at odds

system and hang signs that contain the international no-smoking logo: a cigarette in a circle with a diagonal line through it.

They asked the airport board at its meeting last month for stronger action. The airport now has signs

concerned about reports that enforcement had been stepped up.

"I don't care what they propose, as long as they don't enforce it," said Gedling, D-Hardinsburg.

"We told them what we do if they enforced it," he added, referring to the threat of restricting alcohol sales at the airport.

Gedling, like Crupper, is a tobacco farmer and a smoker. He said that if he didn't like what was being done at the airport, he would ask his task force to take the matter up at its meeting next month.

House Speaker Pro Tem Pete Worthington, D-Ewing, said that although some legislators might want to retaliate against the airport, he doesn't think most of them would

"I don't care what they propose, as long as they don't enforce it," said Gedling, D-Hardinsburg.

U of L smoking plan may not start a fire

By TIM ROBERTS
Staff Writer

OWENSBORO, Ky. — Despite some saber rattling by tobacco-belt legislators over a proposal to restrict smoking at the University of Louisville, a full-fledged conflagration appears unlikely.

Sunday night, 10 members of the General Assembly's Tobacco Task Force met with University of Louisville representatives and gave them until Dec. 5 to rethink the proposed restrictions.

Several legislators warned that the law-

makers could retaliate against smoking restrictions when budget time rolls around in January 1990.

But yesterday morning, the task-force chairman, Rep. Donnie Gedling, D-Hardinsburg, said he's hoping that U of L will change its mind long before then.

"They need time to work things out, and we need to give them a way out," Gedling said at a gathering of tobacco-industry representatives, local officials and legislators in Owensboro. The task force is scheduled to meet with U of L officials in Frankfort on Dec. 5 before taking any action.

In Owensboro Sunday night, when half of the 20 task-force members met, the lawmakers made no direct threats but made it clear they want U of L to back down.

"There's no threat except for the fact that the members of this committee who represent tobacco farmers will be totally concerned with anything that affects these people," Gedling said.

But if U of L doesn't back down?

"It'll open up the awfulest can of

See SMOKING
PAGE 4, col. 1, this section

U.S.

Antismoking Measures Gain In Heart of Tobacco Country

By DAVID M. HALBFINGER MARCH 4, 2003



The tobacco patches that cover the hilltops near here are dusted with snow, their sheds locked up till the spring thaw. But what is occupying farmers and politicians across Kentucky, the Carolinas and the rest of tobacco country seems as improbable as a blizzard in August.

Here in Lexington, the Fayette County Board of Health voted unanimously on Feb. 10 to draft a smoking ban for bars and restaurants. It would be the first such prohibition anywhere in Kentucky, where farmers in 119 out of 120 counties make this the most tobacco-dependent state in the nation and where a nation-leading 3 in 10 adults and 4 in 10 high school students are smokers.

The Courier-Journal

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KENTUCKY
EDITION

DERBY 130

Lexington smoking ban stands

Court rules city can bar tobacco in public buildings

By MARK PITTSCH
mpitsch@courier-journal.com
The Courier-Journal

FRANKFORT, Ky. — The Kentucky Supreme Court yesterday upheld Lexington's ban on smoking in most buildings used by the public, including restaurants and bars.

The ban — the first such ordinance in Kentucky — went into effect immediately upon yesterday's ruling, although city officials

said they'll begin enforcement on Tuesday.

The 6-1 decision, which dissolved a lower court order that had put enforcement on hold, likely closes a contentious legal battle over whether the Lexington-Fayette Urban County Council acted within its authority last July when it adopted an ordinance banning smoking in most public places.

Phil Scott, a lawyer for the Lexington council and the city's

health department, called the ruling an "extraordinarily good opinion" and said the smoking ban, which passed following a study on secondhand smoke, marks a "breakthrough in our culture."

Scott said city officials will begin enforcement at 12:01 a.m. Tuesday. In the meantime, he said, the Lexington health department will distribute information to business owners about the ordinance.

John Walters, a lawyer for a group of Lexington bar and restaurant owners who opposed the

See COURT

Page 3, col. 1, this section

School chiefs lose hiring control

From Staff and Wire Dispatches

Russell Independent school districts.

FRANKFORT, Ky. — In a victory for teacher unions, the Kentucky Supreme Court ruled yesterday that a public school council hiring a principal is no longer restricted to applicants who were screened and recommended by the superintendent.

The councils, on which teachers have the most seats, can consider all qualified applicants, the court said in a ruling involving the Adair County and

The 5-2 decision upheld two rulings by the state Court of Appeals last year.

Superintendents, who once had great control over hiring and firing, said the ruling would reduce them to playing little more than a clerical role and puts them in a position of having to closely manage employees whom they did not necessarily recommend.

"This decision is a travesty,"

said Marty Bell, deputy superintendent for Jefferson County Public Schools. "To have no decision-making authority at all in the selection of who is going to run the schools is absolutely beyond comprehension."

Legislation to get around the rulings was attempted in the General Assembly this year.

One proposal would have required superintendents to

See SCHOOL

Page 5, col. 1, this section

On the ground and in the air, events are part of Derby magic

Weekend Extra takes you out to the races



Insurgents warned about weapons

U.S. soldiers assisted a sick Iraqi woman at a military checkpoint in Fallujah yesterday. U.S. officials warned

Can be revised

Darkness just down the road

Indiana observatory will offer star-gazing to educate public

the appeals panel cited a Fayette Lambert refused, saying the order restaurants would be harmed if the

Push to revive VET is dropped

Judge tells activists who sued to propose financial penalties

By JAMES BRUGGERS
jbruggers@courier-journal.com
The Courier-Journal

Page 6, col. 5, this section • OCT. 6.

National

America's new tobacco crisis: The rich stopped smoking, the poor didn't

Washington Post June 13, 2017

By William Wan June 13 

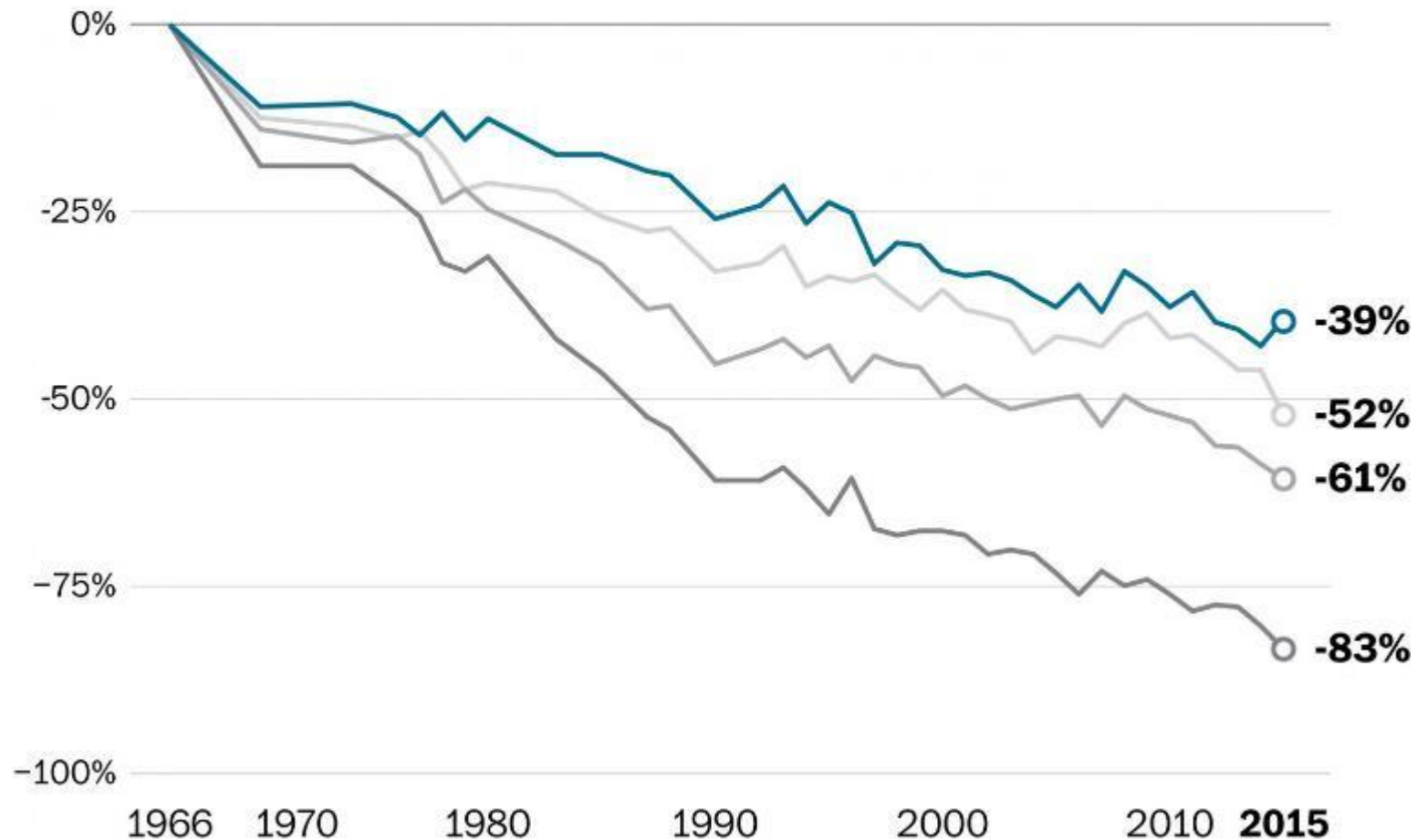


Victoria Cassell smokes a cigarette on the back deck of her house in Bassett, Va. (Jay Westcott/For The Washington Post)

Smoking has declined for all, but not equally

Change in U.S. adult smoking rates from 1966 to 2015, by education level

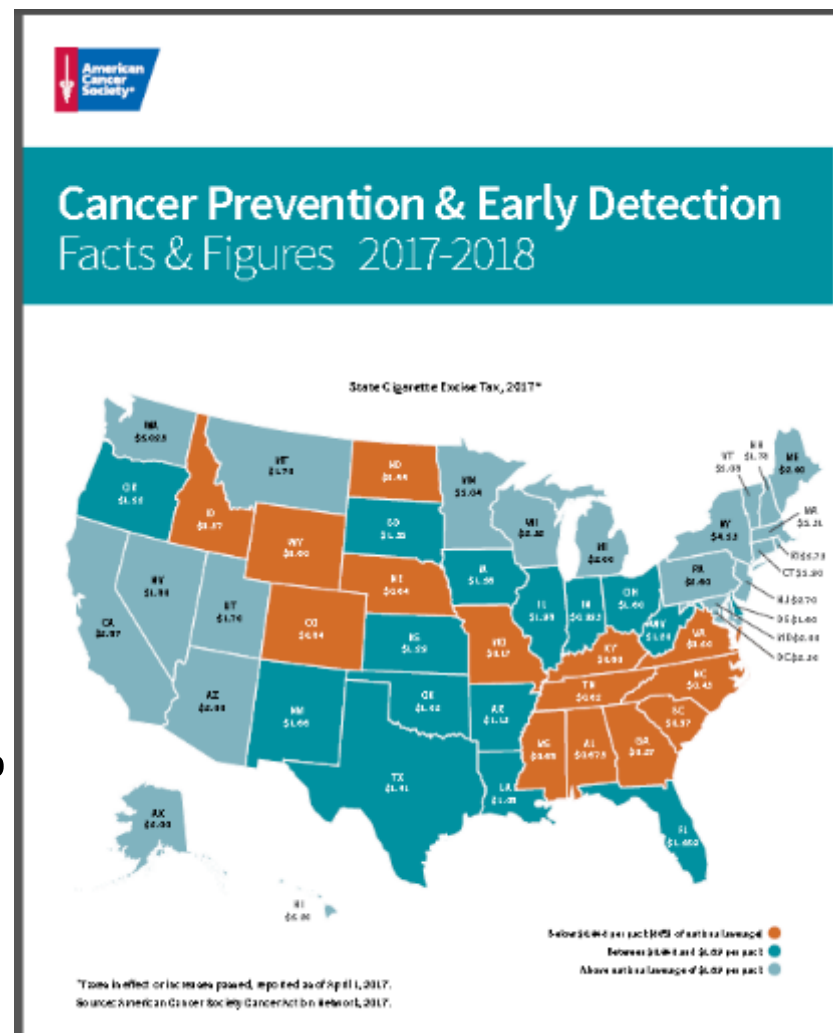
● Some high school ● HS degree ● Some college ● College degree



Although only 15% of US adults were smoking cigarettes in 2015, smoking rates vary widely state to state, ranging from 9% in Utah to 26% in Kentucky — the latter rate the same as in the high-flying 1970s.

Kentucky's adult smoking rates

- College degree or greater 10.6%
- Less than a HS degree 46.7%



Article

Modeling Joint Exposures and Health Outcomes for Cumulative Risk Assessment: The Case of Radon and Smoking

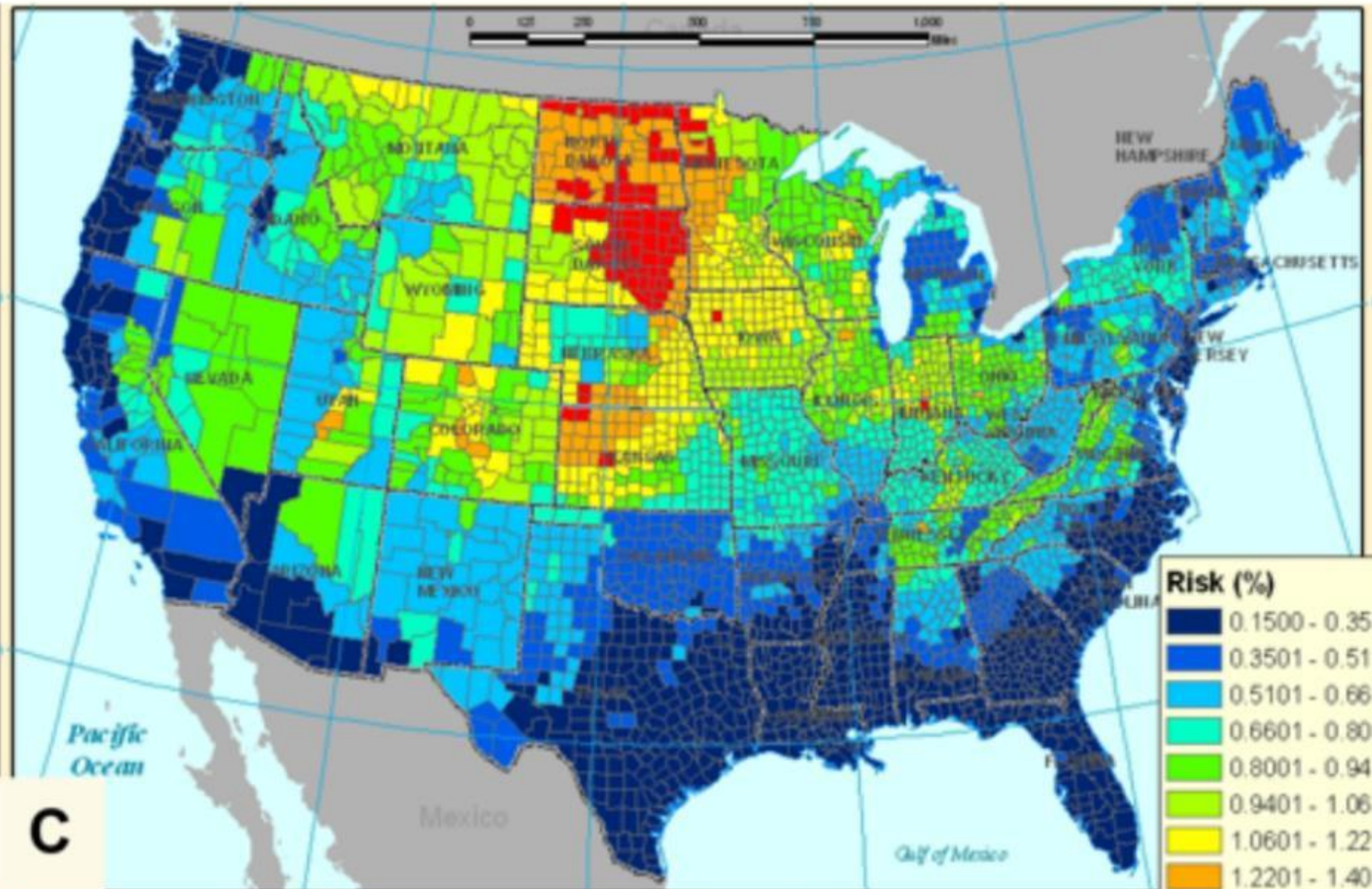
Teresa Chahine^{1,*}, **Bradley D. Schultz**², **Valerie G. Zartarian**², **Jianping Xue**²,
S. V. Subramanian¹, and **Jonathan I. Levy**^{1,3}

¹ Harvard School of Public Health, Harvard University, 677 Huntington Avenue, Boston, MA 02215, USA; E-Mails: svsubram@hsph.harvard.edu (S.V.S.); jonlevy@bu.edu (J.I.L.)

² US Environmental Protection Agency, Office of Research and Development, National Exposure Research Laboratory, Research Triangle Park, NC 27711, USA; E-Mails: schultz.brad@epa.gov (B.D.S.); zartarian.valerie@epa.gov (V.G.Z.); xue.jianping@epa.gov (J.P.X.)

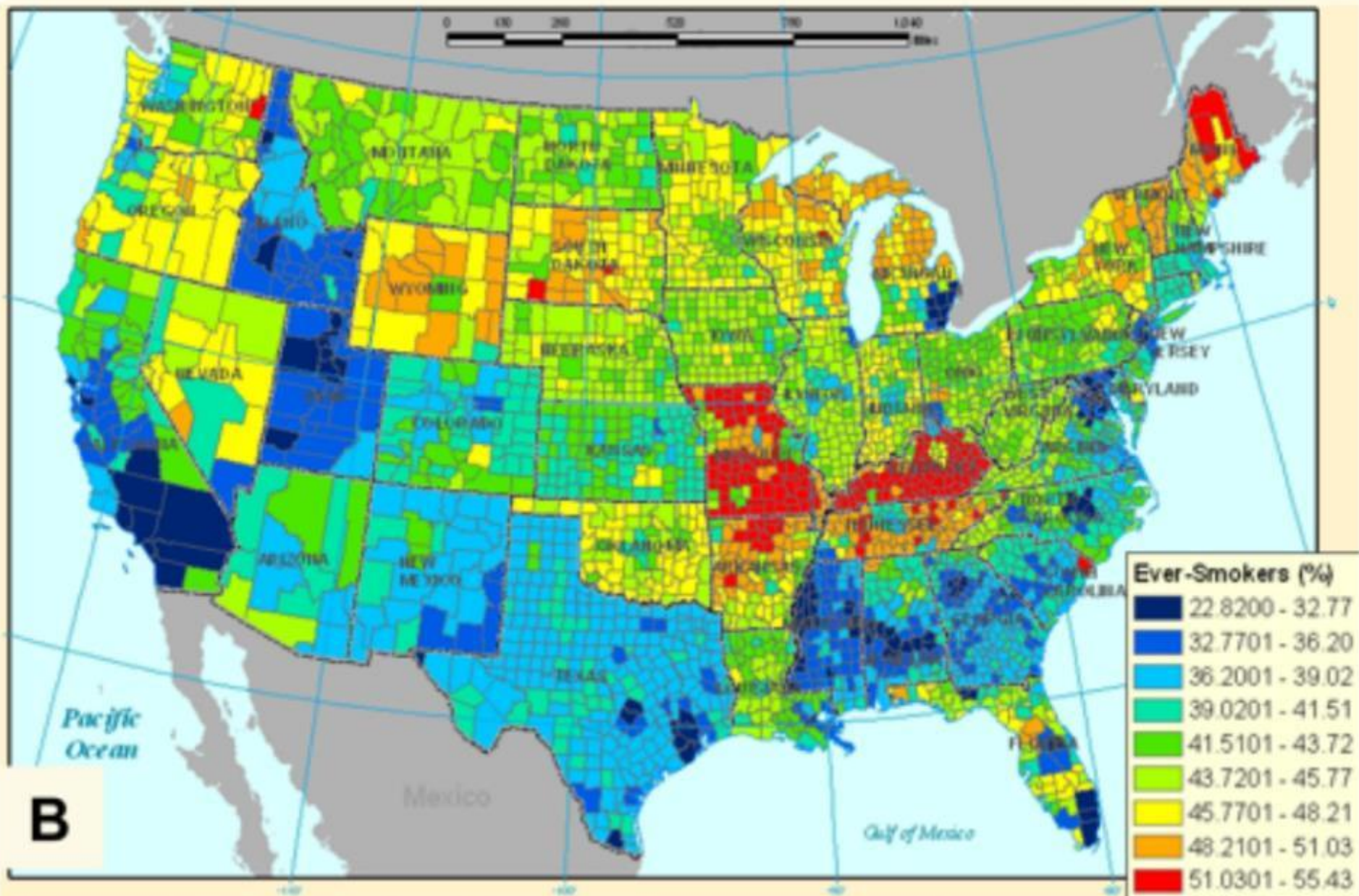
³ Boston University School of Public Health, 715 Albany Street, Talbot Building, Boston, MA 02118, USA

* Author to whom correspondence should be addressed; E-Mail: tchahine@post.harvard.edu; Tel.: +1-617-669-2235; Fax: +1-617-384-8859.



C

Estimated lifetime risk of fatal lung cancer from residential radon exposure, by county

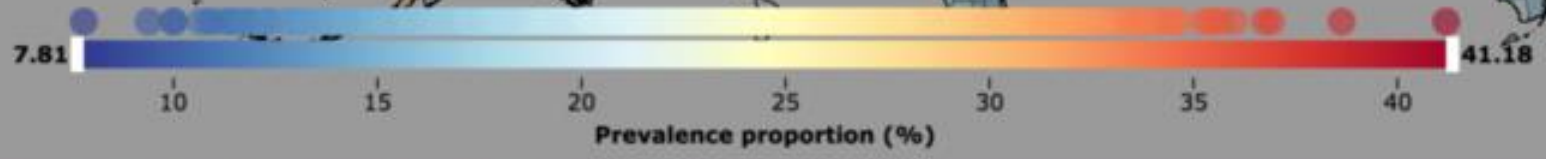
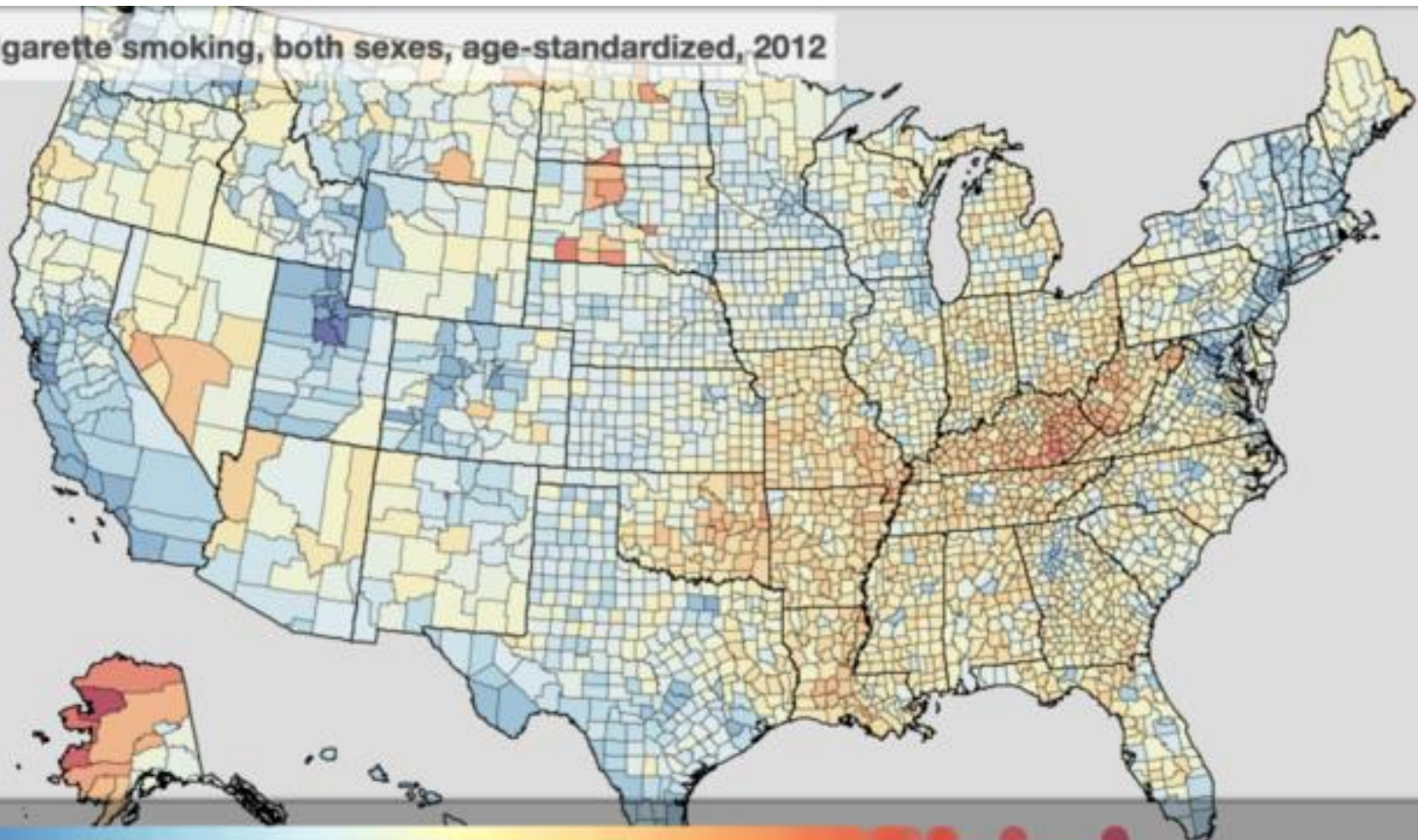


B

Predicted probability of ever-smoking, by county

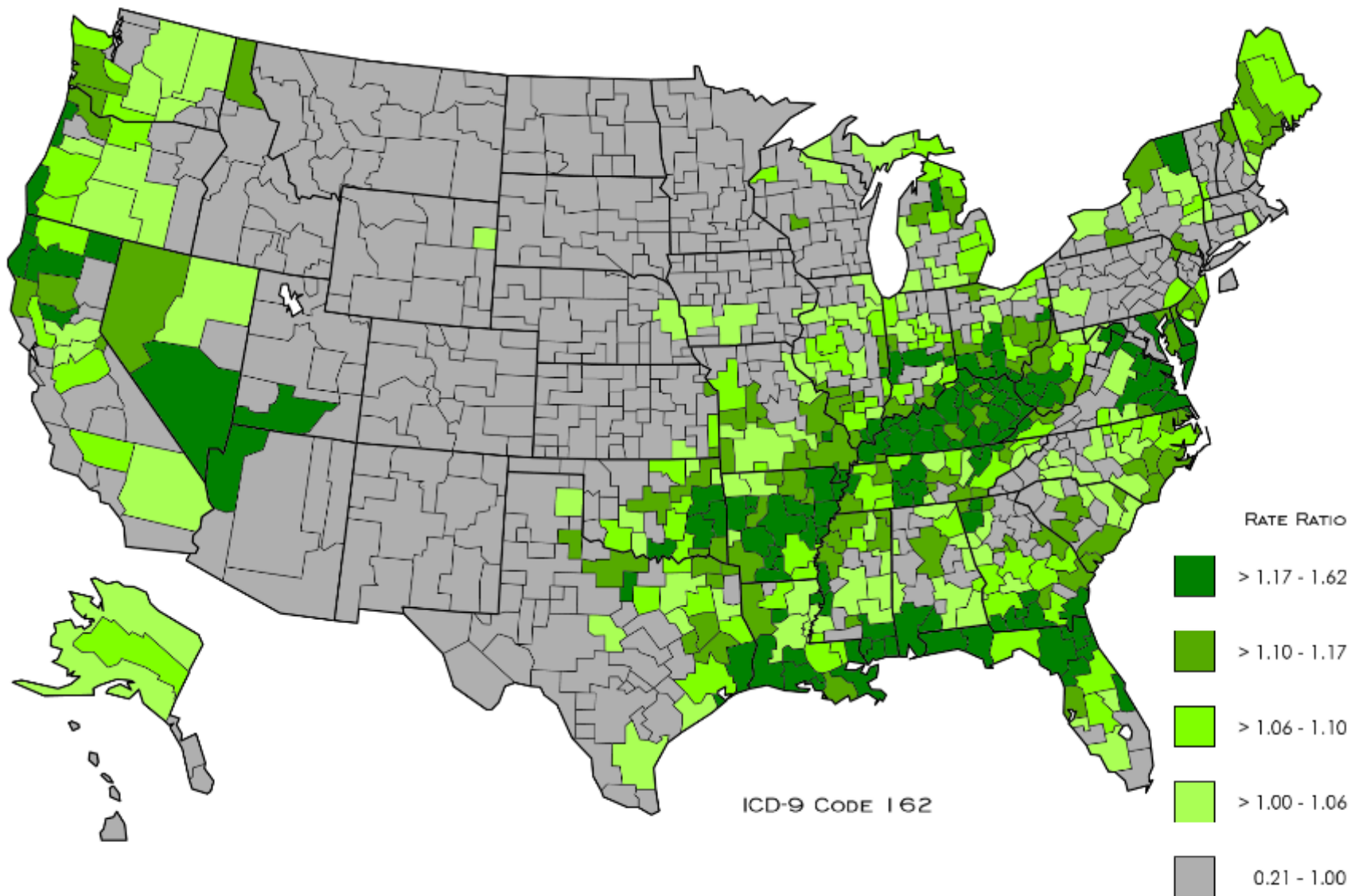


Prevalence of cigarette smoking, both sexes, age-standardized, 2012



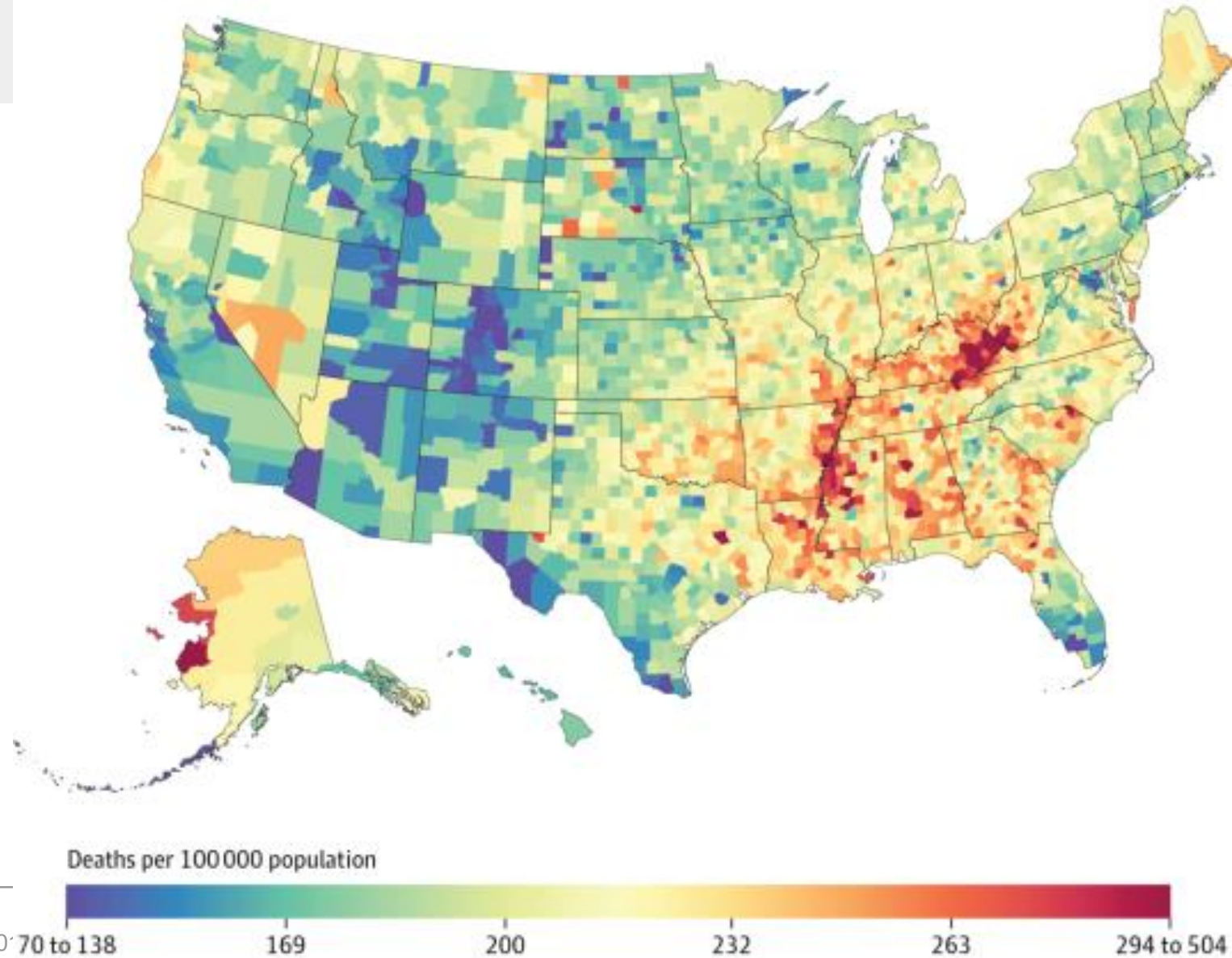
Show advanced

LUNG CANCER
DEATH RATES OF EACH HSA COMPARED WITH U.S. RATE
U.S. RESIDENTS 15 YEARS OF AGE AND OLDER, 1982-1993



From: Trends and Patterns of Disparities in Cancer Mortality Among US Counties, 1980-2014

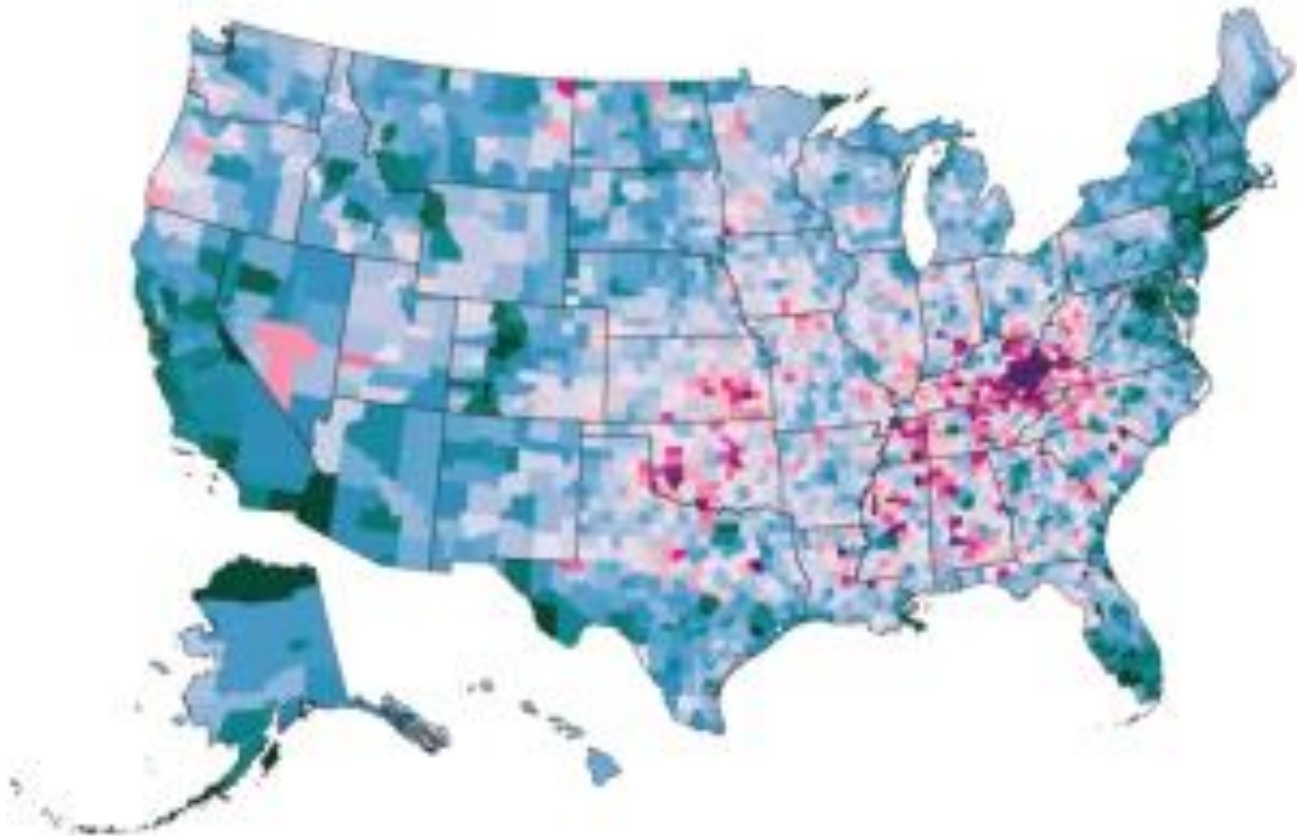
JAMA. 2017;317(4):388-406 **A** Age-standardized mortality rate from neoplasms, both sexes, 2014



From: Trends and Patterns of Disparities in Cancer Mortality Among US Counties, 1980-2014

JAMA. 2017;317(4):388-406

B Percent change in age-standardized mortality rate from neoplasms between 1980 and 2014, both sexes



% Change



Kentucky Annual Cancer Deaths 2009-2013

Site	KY Deaths/100k	KY Deaths/yr
Lung and bronchus	70.0	3,458
Colon	17.6	851
Breast	22.4	609
Pancreas	11.2	549*
Prostate	20.5	367
Liver	5.8	293*
Ovary	7.4	201

* Rate rising

<http://statecancerprofiles.cancer.gov/>

Risk Factors for Lung CA

- **Smoking** linked to about 80% of lung cancers.
 - Smokers are 15-30 times more likely to get lung cancer or die from lung cancer.
- **Secondhand smoke** 7,300 people every year.
- **Radon**
- **Other substances:** asbestos, arsenic, diesel exhaust, and silica and chromium.
- **Pulmonary fibrosis:** risk increased about 7x
- **Personal or family history of lung cancer**
- **HIV infection**
- **Radiation therapy to the chest.** Cancer survivors are at higher risk.
- **Diet**
 - beta-carotene supplements increase risk.
 - Antioxidants, cruciferous vegetables, phytoestrogens may reduce risk, but have not been successful in high-risk patients.
 - High Carb diets linked to higher risk (Ca Epi Bio Prev. Mar 2016)

Lung Cancer Incidence in Kentucky

Incidence Rates[†] for Kentucky
Lung & Bronchus, 2009 - 2013
All Races (includes Hispanic), Both Sexes, All Ages

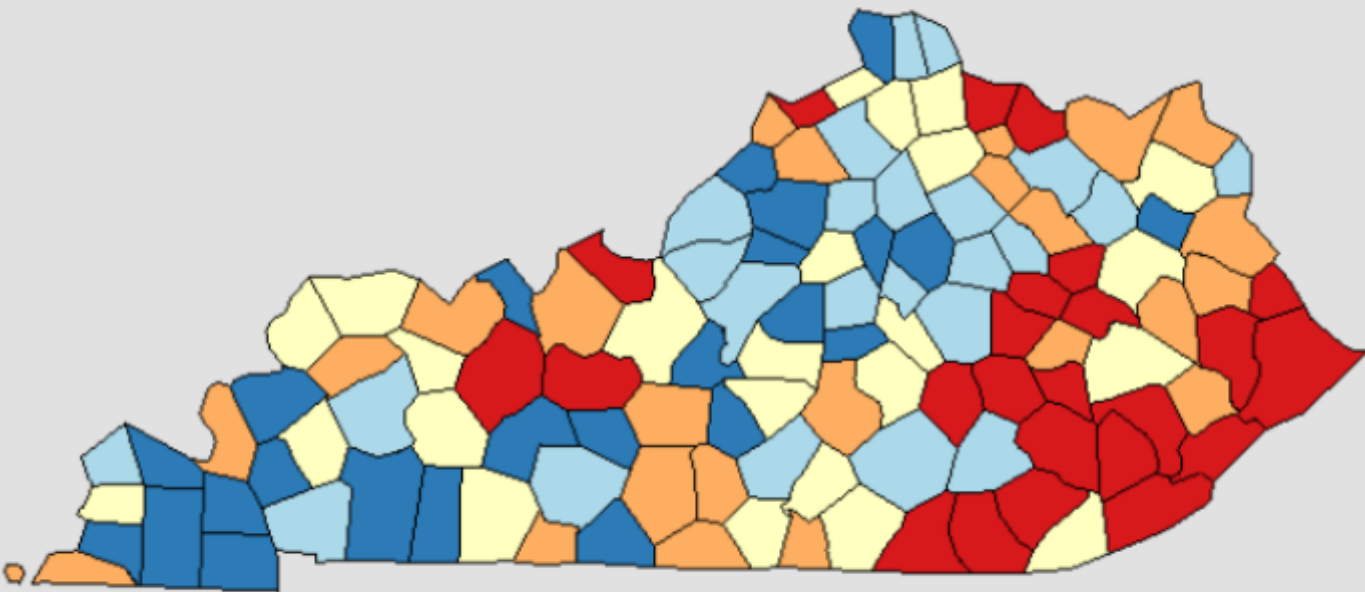
Age-Adjusted
Annual Incidence Rate
(Cases per 100,000)

Quantile Interval

- 68.2 to 87.2
- 87.2 to 94.8
- 94.8 to 106.4
- 106.4 to 117.7
- 117.7 to 157.5

US (SEER + NPCR)
Rate (95% C.I.)
62.4 (62.3 - 62.6)

Kentucky
Rate (95% C.I.)
96.4 (95.2 - 97.7)



The NEW ENGLAND
JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

AUGUST 4, 2011

VOL. 365 NO. 5

Reduced Lung-Cancer Mortality with Low-Dose Computed
Tomographic Screening

The National Lung Screening Trial Research Team*

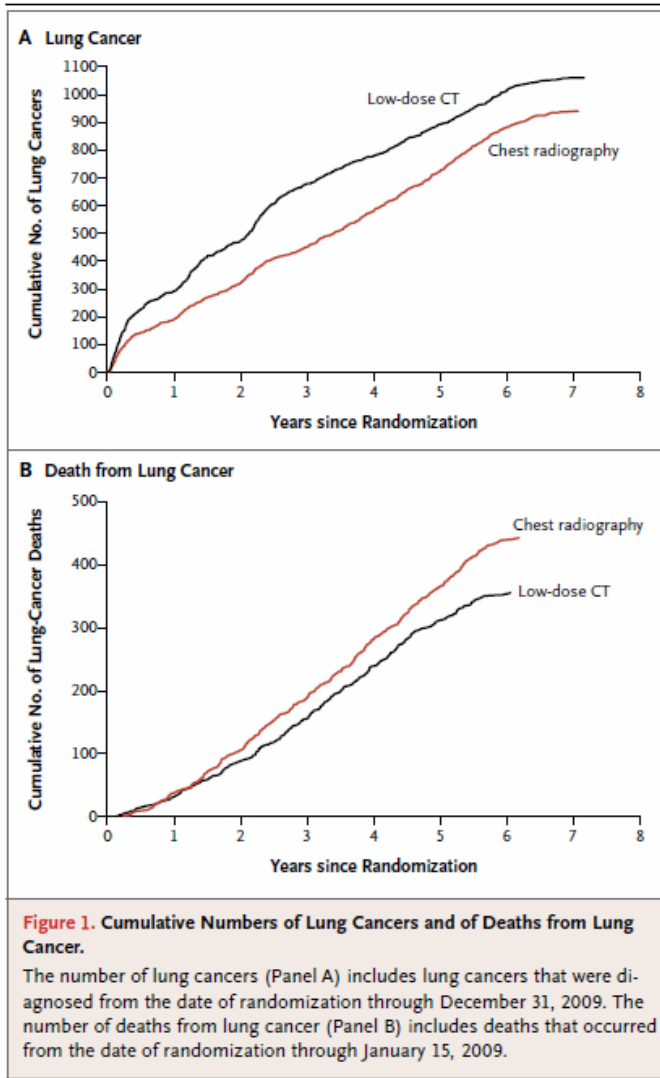
ABSTRACT

BACKGROUND

National Lung Screening Trial

- **Participants**
 - 53,454 participants
- **Intervention**
 - 3 annual screens: randomized to either LDCT or CXR
- **Eligibility Criteria**
 - 55 to 74 years of age
 - at least 30 pack-years history of cigarette smoking
 - former smokers must have quit within the past 15 years

National Lung Screening Trial



- **Primary Results**
 - **20% relative reduction in mortality**
 - **6.7% reduction in all-cause mortality**
- **Additional Results**
 - **Positive Screens**
 - **LDCT: 39%**
 - **CXR: 16%**
 - **False positive results:**
 - **96% CT group, 94% CXR group**
 - **>90% required further testing, most often imaging**

NLST (2011) *NEJM*, 365, 395-409.

NLST Sites Above/Below US Lung CA Incidence Rates

Washington DC	(59.6)	Rochester MN	(55.4)	Iowa city IA	(65.7)
Detroit MI	(69.1)	Aurora CO	(47.3)	Ann Arbor MI	(69.1)
Marshfield WI	(61.7)	Charleston SC	(69.7)	Philadelphia PA	(67.1)
Honolulu HI	(47.7)	Tampa FL	(64.6)	Houston TX	(58.1)
Birmingham AL	(73.4)	Chicago IL	(69.4)	Nashville TN	(77.5)
Minneapolis MN	(55.4)	Los Angeles CA	(48.0)	Winston-Salem NC	(71.5)
Pittsburgh PA	(67.1)	San Diego CA	(48.0)	New Brunswick NJ	(60.0)
Lebanon NH	(68.6)	St. Louis MO	(76.2)	Jacksonville FL	(64.6)
New Orleans LA	(73.0)	Baltimore MD	(60.7)	Salt Lake City UT	(28.6)
Youngstown OH	(71.6)	Boise ID	(52.6)	Louisville KY	(97.5)
		Atlanta GA	(68.8)		

Incidence Rate for Kentucky All Races & Sexes, Lung & Bronchus

County	Annual Incidence	Average Annual Count	Rate Period	Recent Trend	5-Year Trend
Kentucky	97.5	4,773	2008-12	falling	-2.3
<u>US (SEER+NPCR)</u>	63.7	213,812	2008-12	falling	-2.7
Floyd County	153.4	74	2008-12	stable	-4.5
Perry County	150.8	52	2008-12	stable	-7.5
Martin County	150.0	20	2008-12	stable	-4.1
Leslie County	142.4	20	2008-12	stable	7.7
McCreary County	140.7	28	2008-12	stable	12.1
Powell County	137.3	21	2008-12	stable	16.3

LEADING CAUSES OF KENTUCKY DEATHS, 2015

KY Life Expectancy at birth 75.1 years Nat'l

Rank

1. Cancer	10,085	1st
2. Heart Diseases	9971	7th
3. Respiratory Diseases	3187	1st
4. Unintentional Injuries	2513	5th
5. Stroke	1990	9th
6. Alzheimer's Disease	1462	9th
7. Diabetes Mellitus	1187	12th

http://www.cdc.gov/nchs/pressroom/states/KY_2015.pdf

JAMA September 26, 2017

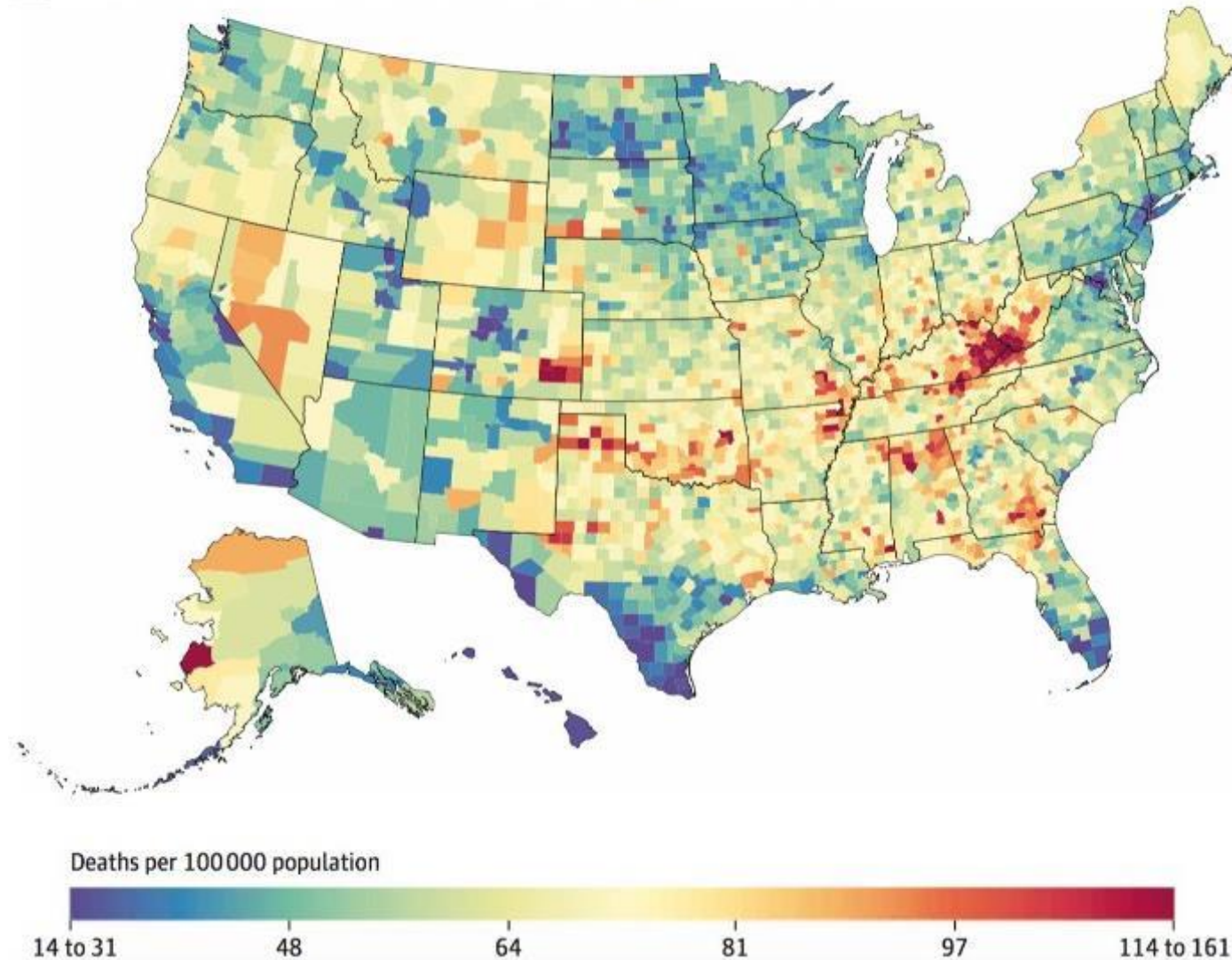
Trends and Patterns of Differences in Chronic Respiratory Disease Mortality Among US Counties, 1980-2014

Of the 4.6 million deaths due to chronic respiratory diseases, 85% were attributable to COPD.

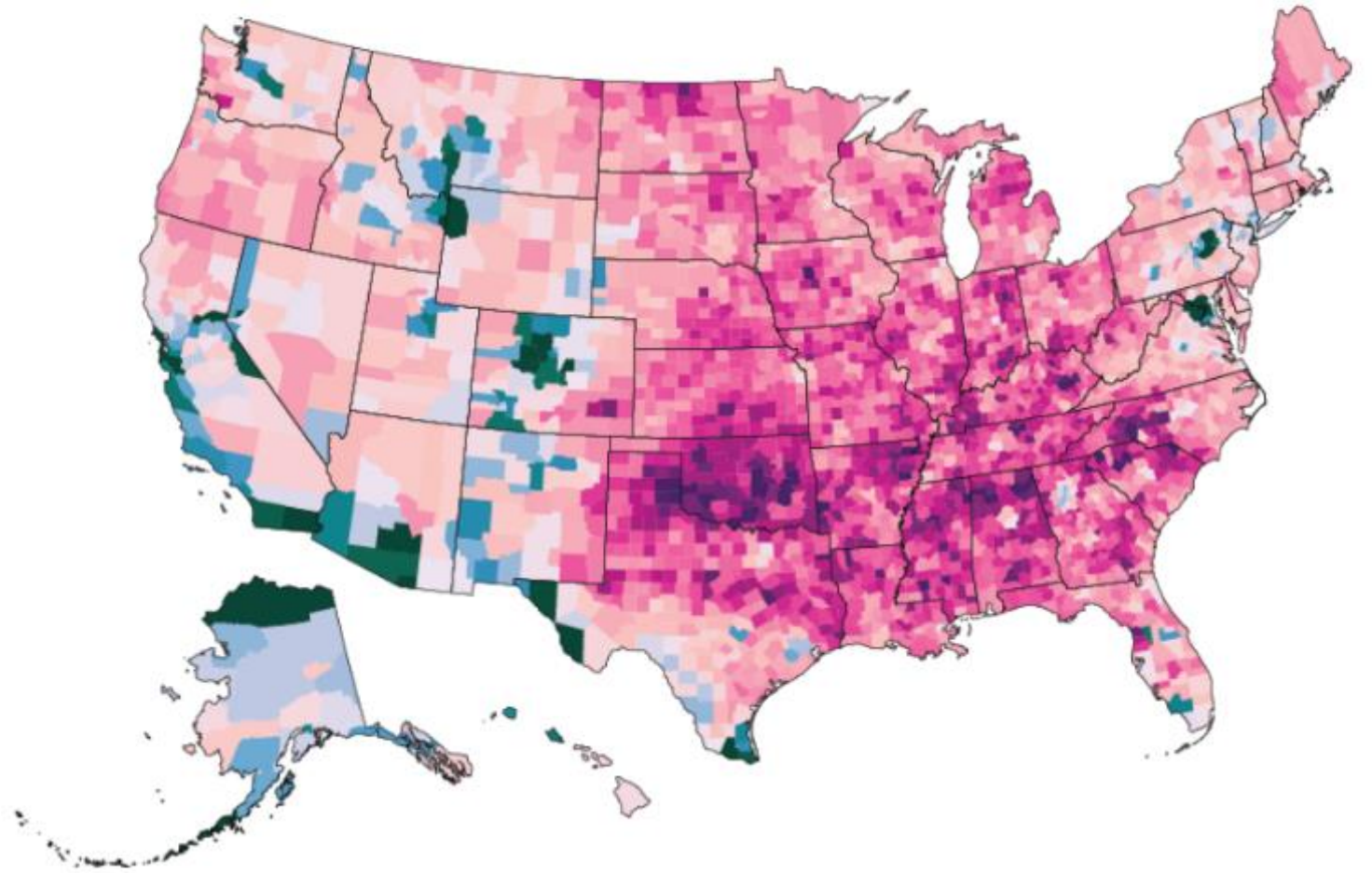
During this period, COPD increased from being the fourth to the third leading cause of death in the United States, surpassing stroke.

Figure 6. County-Level Mortality From Chronic Respiratory Diseases

A Age-standardized mortality rate from chronic respiratory diseases, both sexes, 2014



B Percent change in age-standardized mortality rate from chronic respiratory diseases between 1980 and 2014, both sexes



% Change



SPECIAL ARTICLE

Smoking and Mortality — Beyond Established Causes

Brian D. Carter, M.P.H., Christian C. Abnet, Ph.D., Diane Feskanich, Sc.D.,
Neal D. Freedman, Ph.D., Patricia Hartge, Sc.D., Cora E. Lewis, M.D.,
Judith K. Ockene, Ph.D., Ross L. Prentice, Ph.D., Frank E. Speizer, M.D.,
Michael J. Thun, M.D., and Eric J. Jacobs, Ph.D.

[n engl j med 372;7 nejm.org February 12, 2015](https://doi.org/10.1056/NEJMoa1414886)

ABSTRACT

BACKGROUND

Mortality among current smokers is 2 to 3 times as high as that among persons who never smoked. Most of this excess mortality is believed to be explained by 21 common diseases that have been formally established as caused by cigarette smoking and are included in official estimates of smoking-attributable mortality in the United States. However, if smoking causes additional diseases, these official estimates may significantly underestimate the number of deaths attributable to smoking.

nejm.org February 12, 2015

2014 Surgeon General's report estimates that cigarette smoking causes more than 480,000 deaths each year in the United States.

This considers deaths only from the 21 diseases that have been formally established as caused by smoking (12 types of cancer, 6 categories of cardiovascular disease, diabetes, chronic obstructive pulmonary disease [COPD], and pneumonia including influenza).

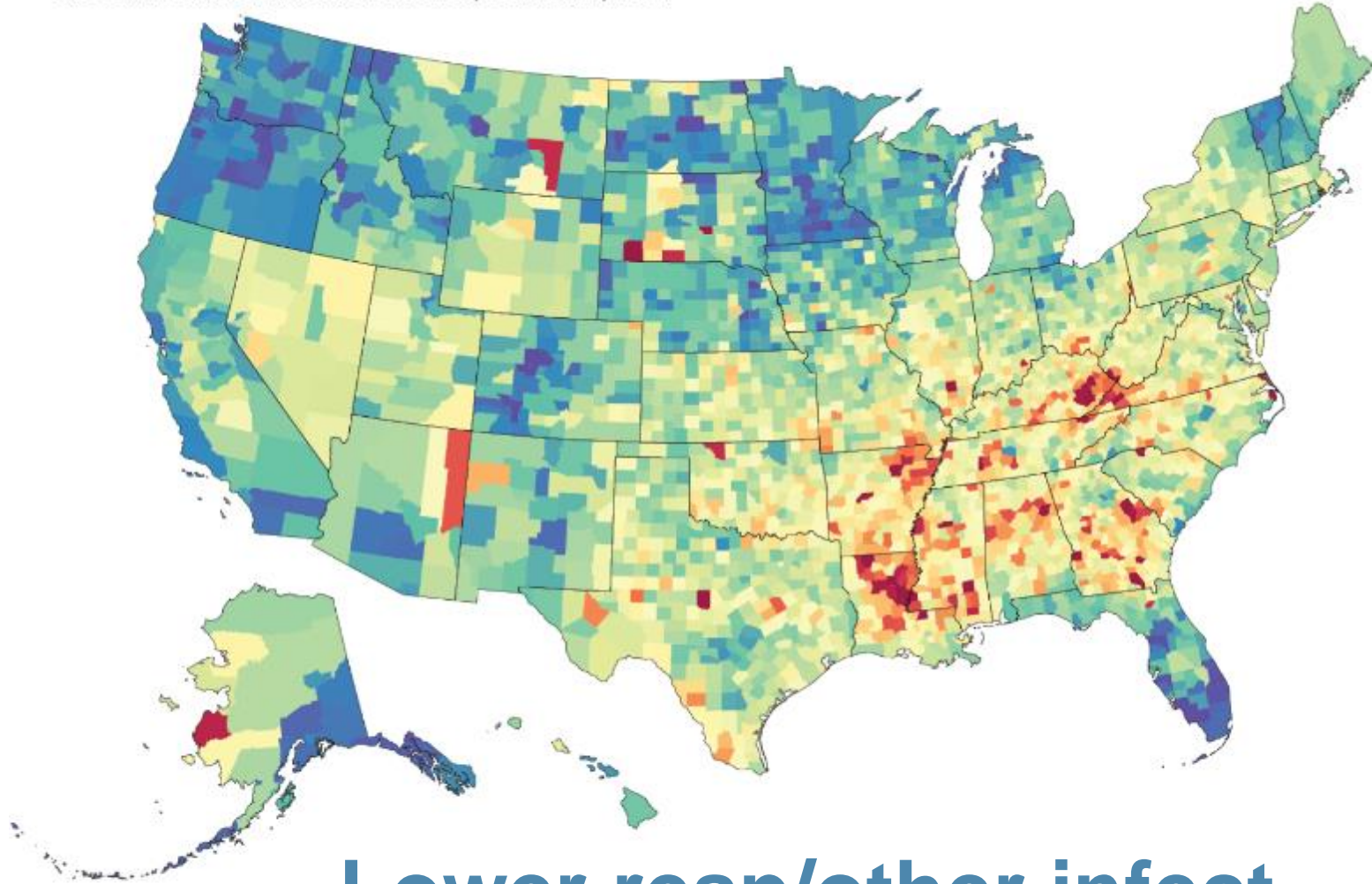
Table 2. Relative Risks of Death from Specific Causes among Persons 55 Years of Age or Older, According to Sex and Smoking Status.^a

Cause of Death	Women				Men			
	Never Smoked		Current Smoker		Never Smoked		Current Smoker	
	no. of deaths	relative risk	no. of deaths	relative risk (95% CI)	no. of deaths	relative risk	no. of deaths	relative risk (95% CI)
All causes	31,786	1.0	8150	2.8 (2.7–2.9)	24,863	1.0	8325	2.8 (2.8–2.9)
Diseases established as caused by smoking†								
Lip and oral cavity cancer, C00–C14	57	1.0	42	5.6 (3.7–8.6)	82	1.0	64	5.7 (4.1–8.1)
Esophageal cancer, C15	81	1.0	50	5.1 (3.5–7.4)	178	1.0	104	3.9 (3.0–5.0)
Stomach cancer, C16	184	1.0	34	1.7 (1.2–2.5)	154	1.0	45	1.9 (1.4–2.7)
Colorectal cancer, C18–C20	1,016	1.0	174	1.6 (1.4–1.9)	753	1.0	160	1.4 (1.2–1.7)
Liver cancer, C22	228	1.0	40	1.8 (1.3–2.5)	228	1.0	74	2.3 (1.8–3.0)
Pancreatic cancer, C25	948	1.0	184	1.9 (1.6–2.2)	747	1.0	153	1.6 (1.4–1.9)
Laryngeal cancer, C32	2	1.0	27	103.8 (24.2–445.5)	23	1.0	50	13.9 (8.3–23.3)
Lung cancer, C33–C34	735	1.0	1872	22.9 (21.0–25.0)	480	1.0	1754	25.3 (22.8–28.1)
Urinary bladder cancer, C67	123	1.0	48	3.9 (2.8–5.5)	201	1.0	84	3.9 (3.0–5.1)
Kidney and renal pelvis cancer, C64–C66	256	1.0	32	1.2 (0.9–1.8)	237	1.0	62	1.8 (1.4–2.4)
Acute myeloid leukemia, C92.0	180	1.0	22	1.1 (0.7–1.7)	210	1.0	48	1.9 (1.4–2.7)
Diabetes, E10–E14	743	1.0	110	1.5 (1.3–1.9)	729	1.0	142	1.6 (1.3–1.9)
Ischemic heart disease, I20–I25	4,119	1.0	1014	3.0 (2.8–3.2)	4,947	1.0	1522	2.6 (2.4–2.7)
Other heart disease, I00–I09 and I26–I51	2,329	1.0	340	1.9 (1.7–2.1)	1,736	1.0	364	2.0 (1.8–2.2)
Total stroke, I60–I69	2,435	1.0	385	2.1 (1.8–2.3)	1,399	1.0	279	1.9 (1.7–2.2)
Atherosclerosis, I70	76	1.0	12	2.1 (1.1–4.0)	57	1.0	32	5.0 (3.2–7.9)
Aortic aneurysm, I71	99	1.0	91	10.1 (7.4–13.6)	126	1.0	116	7.5 (5.8–9.7)
Other arterial diseases, I72–I78	81	1.0	47	5.6 (3.9–8.2)	57	1.0	36	5.3 (3.4–8.2)
Pneumonia, influenza, and tuberculosis, J10–J18 and A16–A19	723	1.0	100	1.9 (1.6–2.4)	487	1.0	87	2.0 (1.6–2.6)
COPD, J40–J44	410	1.0	941	25.0 (21.2–28.1)	259	1.0	825	27.8 (24.1–32.0)
Additional diseases associated with smoking‡								
All infections, A00–B99§	598	1.0	137	2.5 (2.1–3.0)	475	1.0	125	2.2 (1.8–2.7)
Breast cancer, C50	1,748	1.0	274	1.3 (1.2–1.5)	—	—	—	—
Prostate cancer, C61	—	—	—	—	1,101	1.0	166	1.4 (1.2–1.7)
Rare cancers¶	1,233	1.0	143	1.1 (0.9–1.3)	402	1.0	84	1.6 (1.2–2.0)
Cancers of unknown site	866	1.0	237	2.7 (2.3–3.2)	665	1.0	268	3.2 (2.8–3.7)
Hypertensive heart disease, I11	244	1.0	45	1.9 (1.4–2.7)	193	1.0	75	2.9 (2.2–3.9)
Essential hypertension and hypertensive renal disease, I10 and I15	249	1.0	48	2.4 (1.7–3.4)	175	1.0	49	2.6 (1.9–3.6)
All other respiratory diseases‡	442	1.0	69	1.9 (1.5–2.5)	375	1.0	77	2.0 (1.5–2.6)
Ischemic disorders of the intestines, K35	93	1.0	48	6.1 (4.2–8.7)	46	1.0	29	5.6 (3.5–9.0)
Liver cirrhosis, K70 and K74	201	1.0	69	2.6 (2.0–3.5)	174	1.0	109	3.6 (2.8–4.6)
All other digestive diseases**	618	1.0	105	2.1 (1.7–2.5)	378	1.0	107	2.6 (2.0–3.2)
Renal failure, N17–N19	504	1.0	77	1.9 (1.5–2.5)	407	1.0	84	2.1 (1.6–2.6)
Additional rare causes combined††	1,565	1.0	290	2.0 (1.8–2.3)	624	1.0	130	1.9 (1.5–2.2)
Unknown causes	955	1.0	274	2.2 (1.9–2.5)	787	1.0	221	1.9 (1.6–2.2)



From: US County-Level Trends in Mortality Rates for Major Causes of Death, 1980-2014

A Age-standardized mortality rate from diarrhea, lower respiratory, and other common infectious diseases, both sexes, 2014



Lower resp/other infect

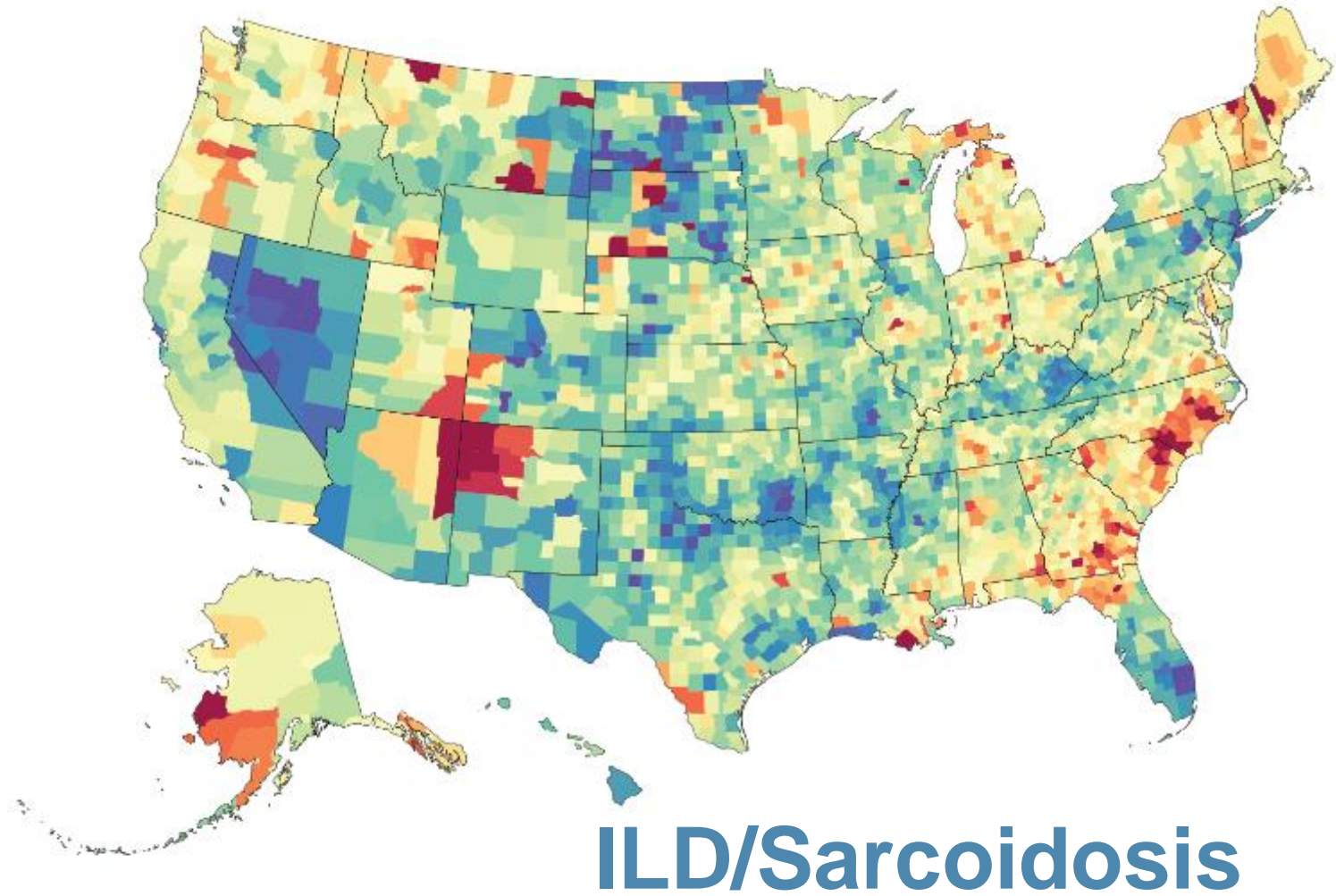
Deaths per 100 000 population



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Trends and Patterns of Differences in Chronic Respiratory Disease Mortality Among US Counties, 1980-2014

A Age-standardized mortality rate from interstitial lung disease and pulmonary sarcoidosis, both sexes, 2014

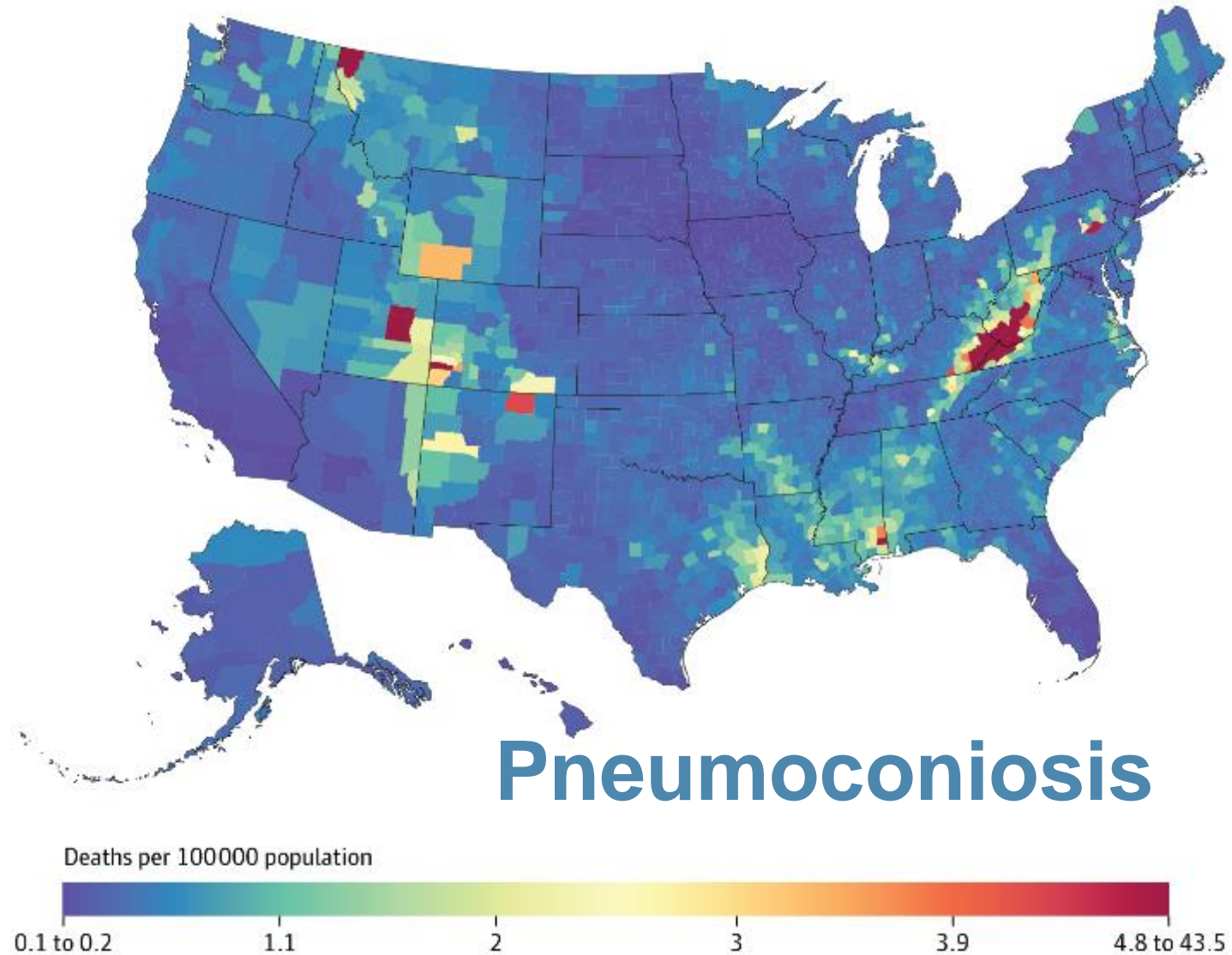


Deaths per 100000 population

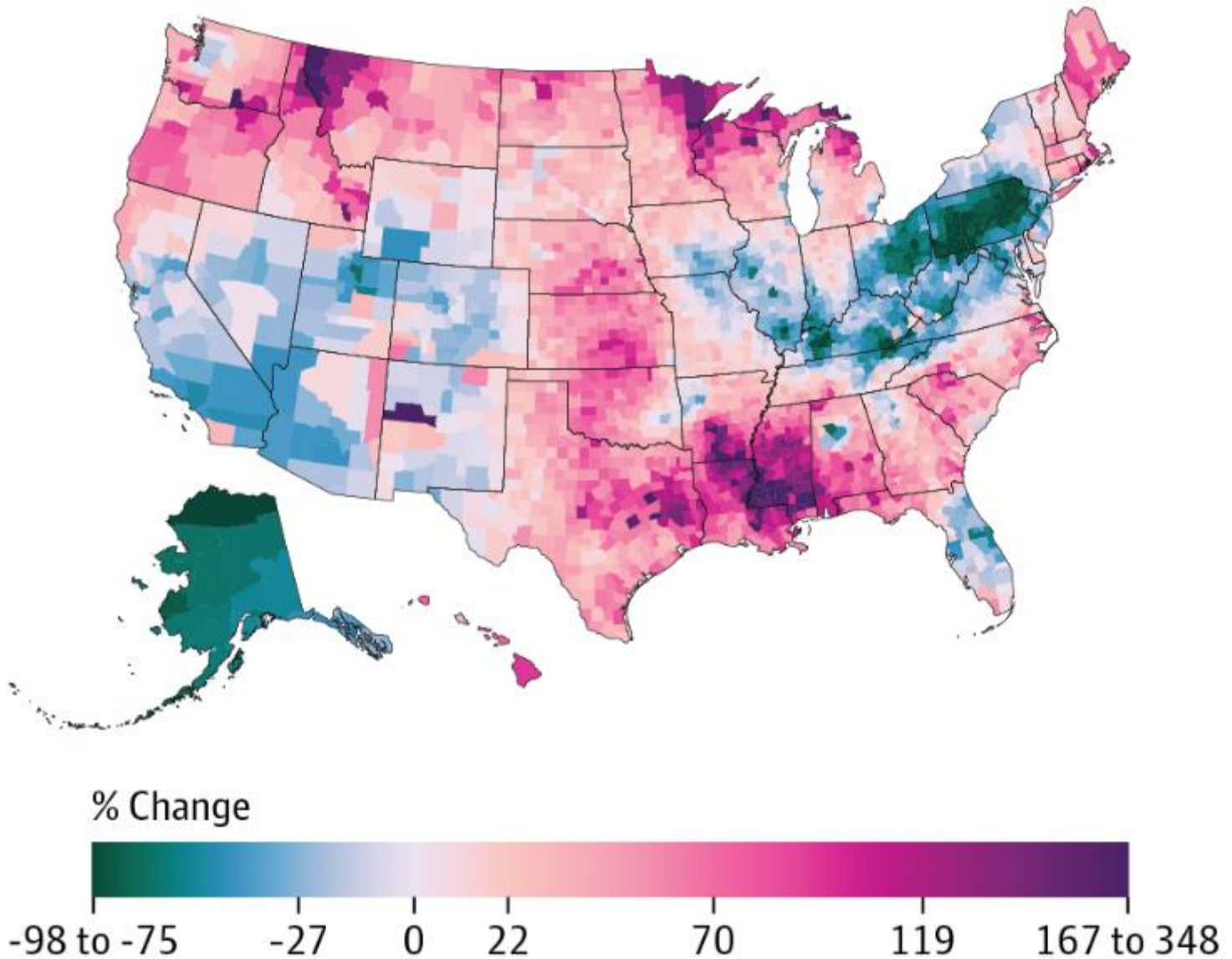


Trends and Patterns of Differences in Chronic Respiratory Disease Mortality Among US Counties, 1980-2014

A Age-standardized mortality rate from pneumoconiosis, both sexes, 2014



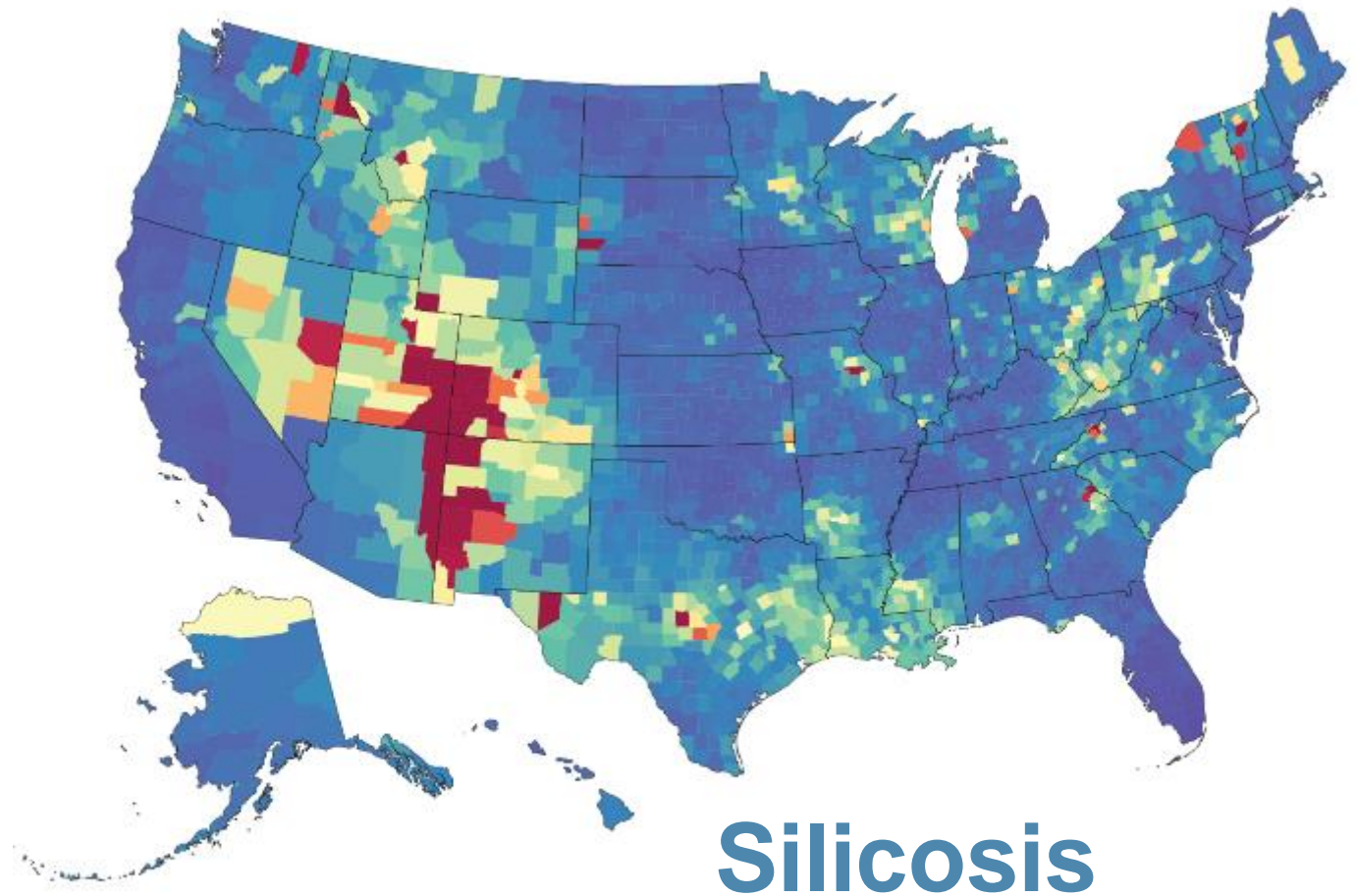
B Percent change in age-standardized mortality rate from pneumoconiosis between 1980 and 2014, both sexes



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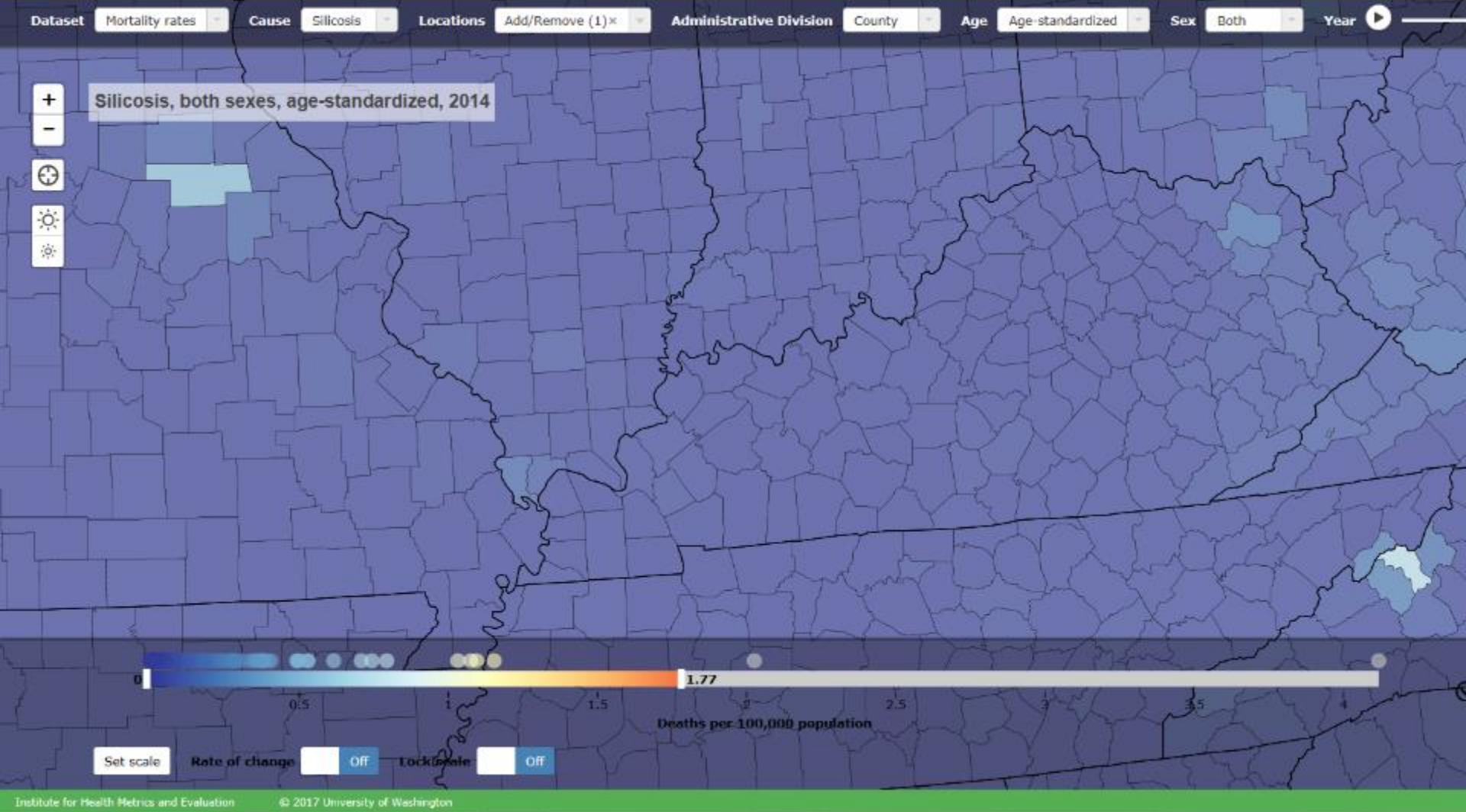
Trends and Patterns of Differences in Chronic Respiratory Disease Mortality Among US Counties, 1980-2014

Age-standardized mortality rate from silicosis, both sexes, 2014



Deaths per 100000 population





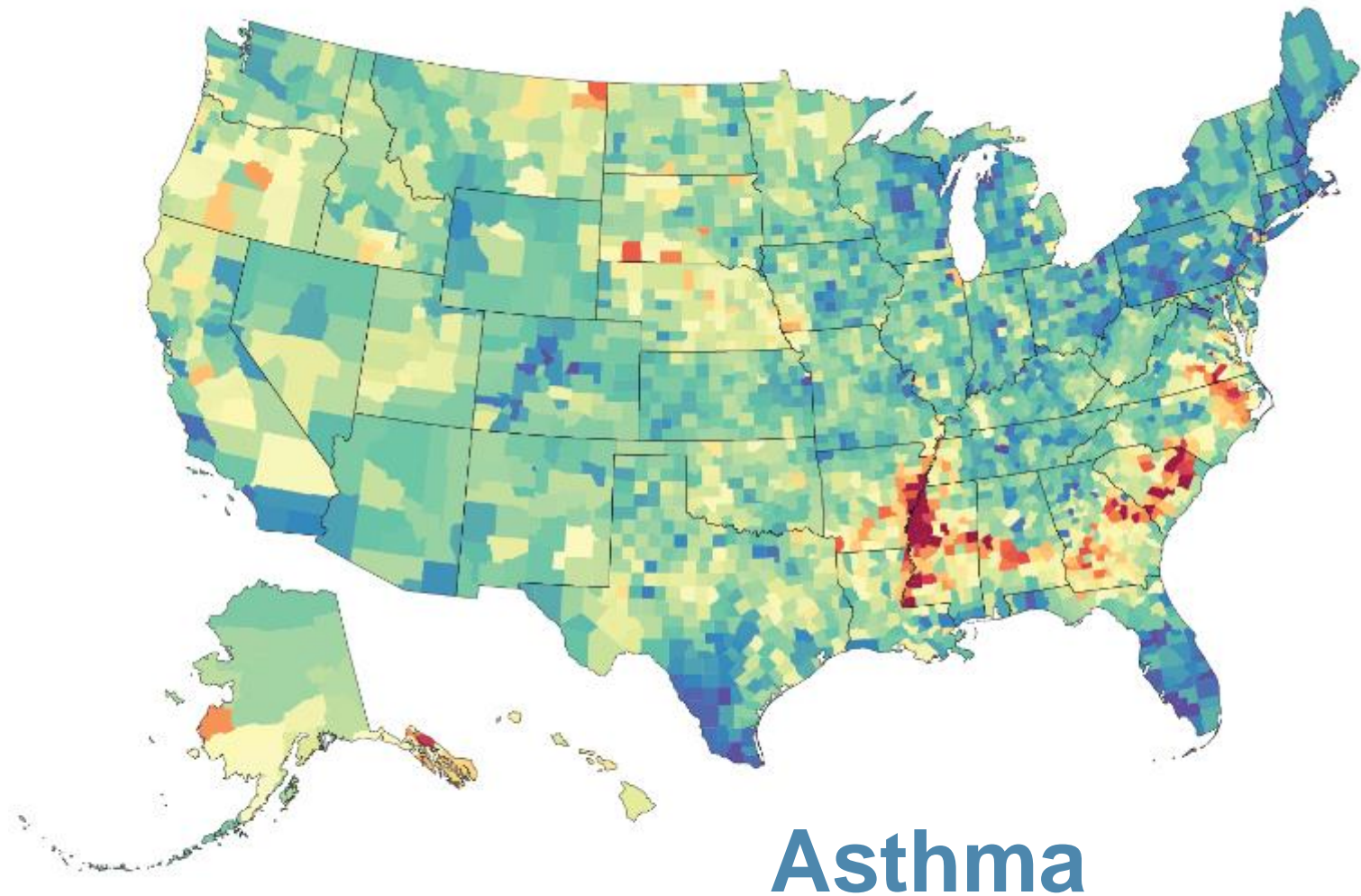
Silicosis in Kentucky

<https://vizhub.healthdata.org/subnational/usa>

JAMA September 26, 2017

Trends and Patterns of Differences in Chronic Respiratory Disease Mortality Among US Counties, 1980-2014

A Age-standardized mortality rate from asthma, both sexes, 2014



Asthma

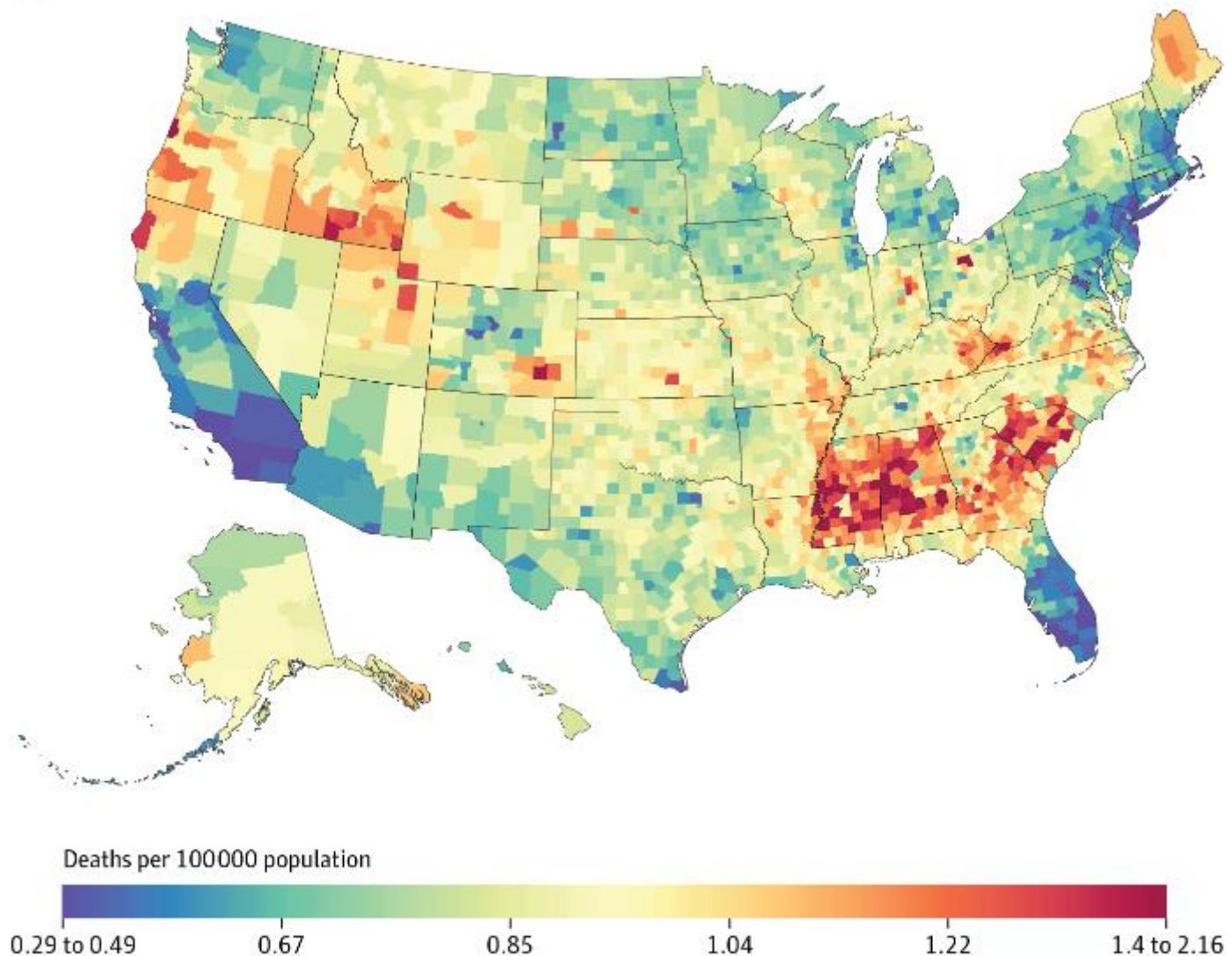
Deaths per 100000 population



Trends and Patterns of Differences in Chronic Respiratory Disease Mortality Among US Counties, 1980-2014

“Other chronic respiratory diseases” is defined as the combination of all chronic respiratory diseases **except** chronic obstructive pulmonary disease, interstitial lung disease and pulmonary sarcoidosis, asthma, asbestosis, coal workers’ pneumoconiosis, silicosis, and other pneumoconiosis.

A Age-standardized mortality rate from other chronic respiratory diseases, both sexes, 2014



Using Big Data to Reveal Chronic Respiratory Disease Mortality Patterns and Identify Potential Public Health Interventions

[David M. Mannino, MD^{1,2}](#); [Wayne T. Sanderson, PhD²](#)

- Of 4.6 million deaths due to chronic respiratory diseases, 85% were attributable to COPD.
- COPD increased from the fourth to the third leading cause of death, surpassing stroke
- COPD has not seen the improvements in mortality and morbidity from large-scale public health campaigns focused on improved recognition of early symptoms, community screening efforts, and chronic disease self-management education
- Deaths from coal workers' pneumoconiosis have declined 85% since 1980, but the prevalence of CWP, particularly in central Appalachia, has increased in recent years

Summary

- **Much progress has been made, but we need a new generation of leaders in the fight against tobacco**
- **Indoor smoking bans and raising the price of cigarettes have been effective in reducing cigarette smoking**
- **Raising the legal age of smoking may also prove effective**
- **We will need to organize and push to make these legislative changes. Meanwhile, 7,000 Kentuckians per year will die from respiratory complications of smoking.**
- **We must implement lung cancer screening in addition to tobacco control in order to save our patients**