St. Jude Children's Research Hospital | HPV Cancer Prevention Program

HPV VACCINATION ROUNDTABLE OF THE SOUTHEAST

2025 HPV AWARENESS DAY SEMINAR SERIES

Realizing a Regional Plan to Eliminate HPV Cancers, Starting with Cervical Cancer, as a Public Health Concern in the Southeast

March 5, 2025

stjude.org/hpv • #EndHPVCancers

Organizers

Madeline McNee, MPH
Program Coordinator
St. Jude HPV Cancer Prevention Program

Samantha Wells, MPH
Program Coordinator
St. Jude HPV Cancer Prevention Program

Welcome to the HPV Awareness Day Seminar Series

HPV VACCINATION ROUNDTABLE OF THE SOUTHEAST

- Today's meeting will be recorded. The link to view the recording and PDF of materials will be shared with all who have registered. In addition, the recording link will be posted publicly in the future.
- If you have any issues during today's meeting, please use the chat or email PreventHPV@stjude.org.
- We will use the Q&A feature for questions. You can post questions at any time to engage with the presenters and organizers.

Learning Objectives

By the end of the seminar, participants will be able to:

- Discuss ongoing national efforts to eliminate cervical cancer as a public health problem
- Review and discuss a regional plan to eliminate HPV cancers, starting with cervical cancer as a public health problem in the southeast
- Discuss ongoing state-level efforts to eliminate cervical cancer as a public health problem

Jennifer S. Smith, PhD

MODERATOR

Professor

Department of Epidemiology

Gillings School of Global Public Health

University of North Carolina

Presenters

Eve McDavid
CEO and Founder, Mission-Driven Tech

Trisha Amboree, PhD
Assistant Professor, Department of Public Health Sciences, Medical University of South Carolina

Ran Zhao, PhD
Researcher, University of Minnesota School of Public Health

William (Sam) Greenfield, MD
Professor, Obstetrics & Gynecology, University of Arkansas for Medical Sciences

HPV VACCINATION ROUNDTABLE OF THE SOUTHEAST

Eve McDavid

SPEAKER

CEO & Co-Founder

Mission-Driven Tech

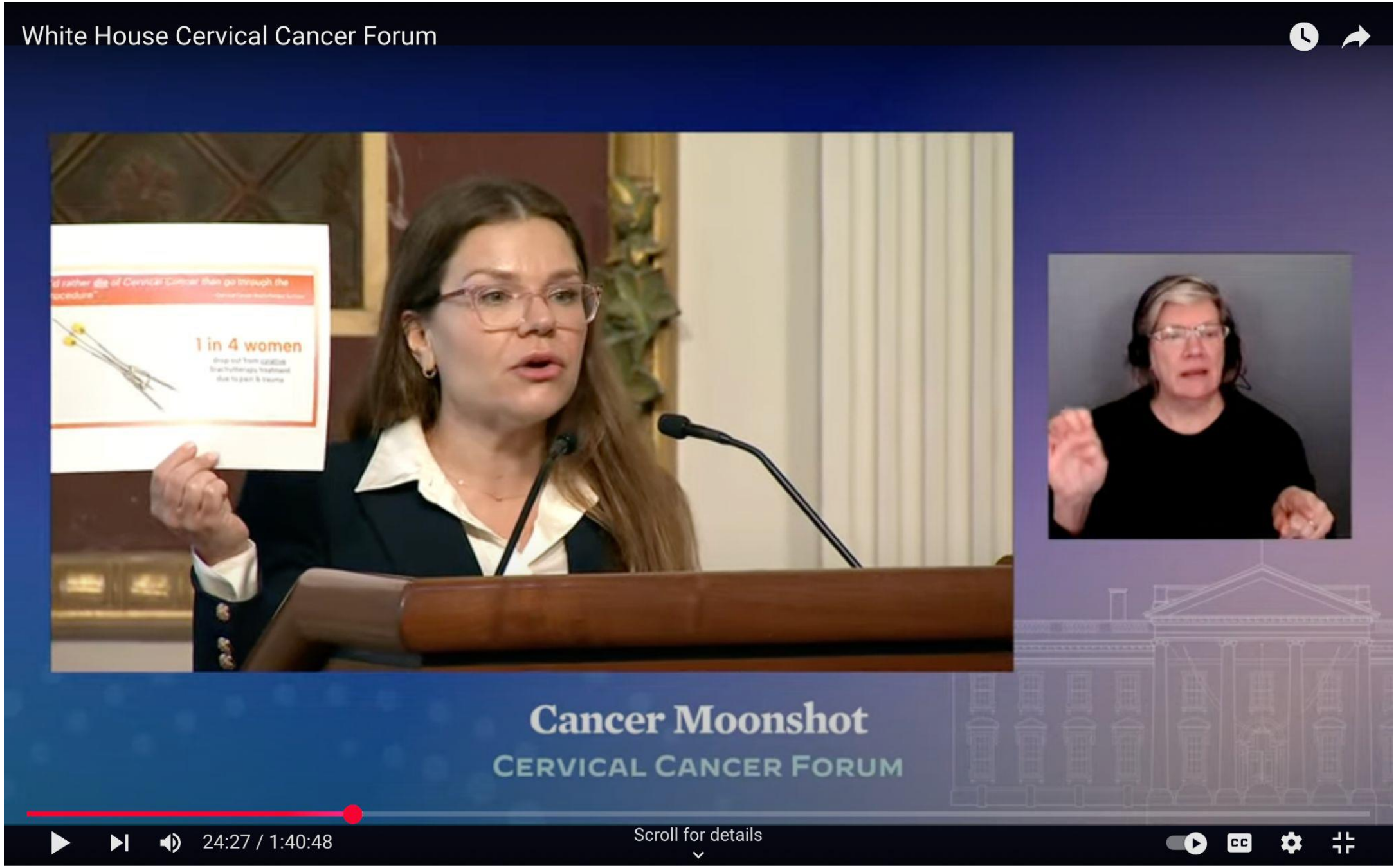
Eve McDavid
Chief Executive Officer and Co-Founder

Mission-Driven Tech™

A Cervical Cancer innovation company.

Prepared for St. Jude HPV Awareness Day Seminar,
March 5, 2025

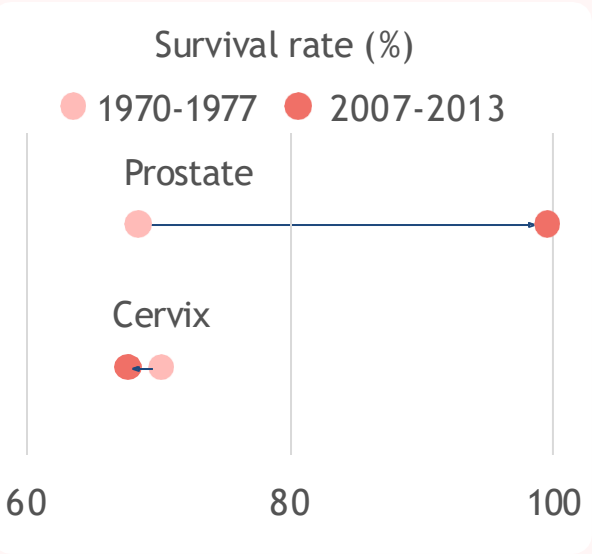

Weill Cornell Medicine
NewYork-Presbyterian


White House Cervical Cancer Forum
1 in 4 women
Cancer Moonshot
CERVICAL CANCER FORUM
24:27 / 1:40:48
Scroll for details

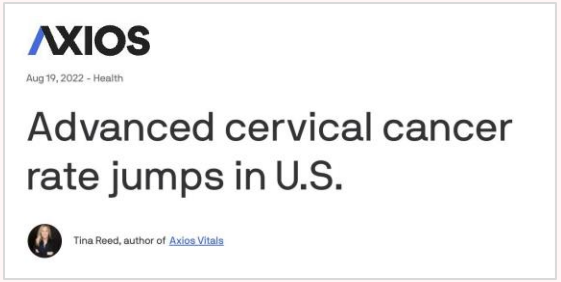

Google

A tale of two Brachytherapy outcomes:
Cervical Cancer survival rates have been stagnant for 50 years.
Prostate Cancer outcomes improved to nearly 100% over the same time period.

Stagnant
5-year survival rate



Late-stage diagnoses
rising in the U.S.



40% dropout rate
from Brachytherapy

"I'd rather die of cervical cancer than go through the procedure."

Cervical cancer
Brachytherapy patient

International Health Metrics and Evaluation, Global Burden of Disease from Roser, M. & Ritchie, H. 'Cancer' https://ourworldindata.org (2020)

INVESTMENT

RESEARCH

INNOVATION

WE CAN *END* CERVICAL CANCER

An Urgent Call for Elimination

January is Cervical Cancer Awareness Month

FUND INNOVATION NOW

amplexd Therapeutics

Mission-Driven Tech™

ANANYA HEALTH

AN URGENT CALL FOR CERVICAL CANCER ELIMINATION: FUND INNOVATION NOW

To the women [1] of the world:

We see you. You – and your cervix – deserve better.

We are female founders of cervical cancer treatment companies – clinicians, scientists, engineers, and survivors – representing voices of innovation.

This past November 17, 2023, our companies, along with the World Health Organization and leaders of the global cervical cancer elimination movement, gathered throughout the world to bend the arc of change toward elimination.

The movement, established in 2018 and approved by all 190 member nations, aims to mobilize efforts within every country across our planet to eliminate cervical cancer.

Why? Because cervical cancer is the only disease that can be:

- **Prevented** with HPV vaccination
- **Screened** for with HPV and Pap Testing
- **Treated to cure** with highly effective treatments including cryotherapy, thermal ablation, or LEEP for cervical pre-cancers and chemoradiation for invasive cervical cancer (ICC)

In order to reach elimination, all countries must adopt measures to increase vaccination and treatment rates to 90%, while screening rates must increase to 70%.

It can be done. But it isn't happening today.

Since 2020, more than 1,000,000 women – mothers, daughters, wives, sisters and friends – have died from cervical cancer. Currently, more than 600,000 women are diagnosed each year and 340,000 more are dying with a crushing ripple: as many as 100,000 children will not survive childhood after losing these women's protective presence.

[1] The word "women" is used throughout this letter in an inclusive capacity, to include any person who is biologically female and/or a person with a cervix

Cervical cancer is often the leading cause of cancer-related death among women in low- and middle-income countries, and now also on the rise among women 30-44 years old (in the prime of their lives!) here in the United States.

How did we get here?

High-risk strains of Human Papillomavirus (HPV), the most common sexually transmitted infections, are attributable to the development of almost all cervical cancer. More than 41M Americans 15-59 have a high-risk strain that can cause cervical cancer, 13M of which were contracted in the last year. However, according to a 2023 National Cancer Institute (NCI) study, the American public's awareness of HPV's link to cervical cancer is at a 10-year low. During the COVID-19 pandemic, on-time childhood vaccinations and preventive care screening appointments dropped precipitously. All these factors combust into an ugly truth: later-stage diagnoses are increasing. For years to come, more women each year will require more aggressive and invasive treatment to survive.

Each of our companies challenge today's treatment paradigm where women face insufficient options, despite readily available research and major technological breakthroughs.

–

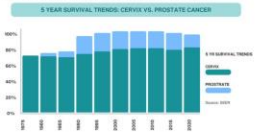
Today, women who are diagnosed with low-grade cervical dysplasia (the precursor to invasive cervical cancer) receive repeat pelvic exam screenings without access to any treatment options, told to "watch and wait," until their next gynecologic exam to determine whether abnormal cervical cell changes are advancing into cancer.

Today, women globally who are diagnosed with high-grade cervical dysplasia can't access highly effective, minimally-invasive cryoablation and other forms of treatment because the low cost of care is still considered too expensive for policymakers to fund.

Today, instead of being cured, women drop out from treatment and die preventable deaths because curative brachytherapy procedures are too brutalizing and traumatic to endure.

Today, women diagnosed with cervical cancer are *more likely to die* from their diagnosis than they were in the 1970s. By comparison, men's 5-year survival rate for prostate cancer diagnoses have jumped to almost 100% over the same time period.

As leading OB/GYN and field expert Dr. Linda Eckert proclaims, "ENOUGH."



We're calling for change. Here's how it happens:

1. INVESTMENT
Let's start with the money: cervical cancer elimination is a profitable endeavor.

It's our planet's simplest opportunity for millions of lives saved and billions of dollars made. Every $1 spent to prevent a woman's death in her prime returns $26 to the global economy. That's right – a 26X ROI. According to leading global nonprofit TogetHER for Health, a $10.5B global investment would fulfill WHO elimination targets to save millions of lives and also return a whopping $273B to the global economy.

We are far from there.

The 2021 $6.7B NCI domestic cancer research budget allocated 1% to cervical cancer. Prostate cancer, by contrast, commanded 4X the cervical cancer budget, totaling $270M.

Funding matters – major funders and motivated philanthropists have produced staggering survival and quality of life gains in prostate cancer. Until investment increases to fund, at minimum, cervical cancer elimination targets, we can expect the same lethal trends.

2. RESEARCH
Research & investment are inextricably linked.

Experts in our field will say that any woman's cervical cancer diagnosis and death is a reflection of a systemic gap in the care continuum. It is. It's also a reflection of deeper questions: Why do women continue to fall through the cracks? Why aren't today's solutions enough? When we look to other fields of medicine for inspiration, the groundwork to answer these questions already exists. From polio to COVID, we have learned the opportunities and the challenges of global mass vaccination and intervention.

Green tea catechins, known to have efficacy against cervical precancers, have been explored for over 20 years, without adequate research committed to determining how to stabilize and deliver the compound to infected cervical cells.

Cryotherapy treatments for high-grade cervical dysplasia, known to be highly effective, have been inaccessible in a real-world setting due to cost-prohibitive, difficult-to-transport cryogen gas.

Brachytherapy, a curative yet brutalizing internal radiation procedure, is performed with medical devices designed in the 1970s, two decades before women's inclusion in clinical trials, despite long-established research that hardware designed specifically for the female anatomy vastly improve procedure safety and outcomes, particularly for gynecologic procedures.

But in cervical cancer treatment, today's care features relics of the past, critical unmet needs under-researched and under-addressed. As researchers, we know the same strategies that got us here today won't get us to elimination. And so we must adapt, by ushering in a new era of properly funded cervical cancer research, to address the challenges of now and those of the future.

3. INNOVATION
Innovation is the byproduct of investment and research.

It's the result of maniacally studying these challenges and having the capital to experiment with new ideas. It's been almost 25 years since the last major cervical cancer treatment advancement – when Cisplatin, a chemotherapy drug was added to standard of care.

This lagging rate of change is unthinkable in other fields of cancer research.

As female founders, we begin at a deficit, taking home a paltry $2 for every $100 invested in male-founded companies. But the unflappable progress of our companies' research and development efforts demonstrates our will to overcome systemic barriers to bring lifesaving, innovative solutions into the world.

With proper industry investment and research, our new treatment technologies will become but a handful to select amongst, an innovative care continuum that features many new solutions that reflect the best of modern medicine and modern technology.

Cervical cancer innovation is bigger than the sum of its parts – it is a *moonshot*: for the first time in human history, human innovation will eradicate a cancer.

–

Shortly after our webinar, an open letter addressed to First Lady Dr. Jill Biden circulated throughout our networks. The letter underscored the systemic, historic deprioritization of women's health, wellbeing and outcomes. But also how supercharging long-term research, investment and innovation will reverse these deadly trends.

In just a couple weeks, almost 500 CEOs signed onto the letter, signaling our collective hunger and appetite for change.

We call for leaders and decision-makers at every level of government, private industry and philanthropy to do the right thing: to realize the monumental economic and societal significance of cervical cancer elimination and prioritize the investment, research and innovation to take us there.

The table is set. We've already started. We invite you to join us.

Onyi Balogun, MD
Chief Medical Officer & Co-Founder, Mission-Driven Tech

Eve McDavid
CEO & Co-Founder, Mission-Driven Tech

Alia Rahman
Co-Founder & CEO, Amplexd Therapeutics

Anu Parvatiyar
Cofounder & CEO, Ananya Health

Julie Yip
Cofounder & Engineer, Ananya Health

INVESTMENT

TOTAL COST: GLOBAL CERVICAL CANCER ELIMINATION

$10.5B

PACING TO FUNDING TARGET

15%

source: World Health Organization, TogetHER for Health

RESEARCH

Brachytherapy cures invasive Cervical Cancers and is the standard of care, first-line treatment for ~70% of cases 1B-4A cases

+94%

5-year survival rate

+26%

tumor remission

-16%

cancer remission

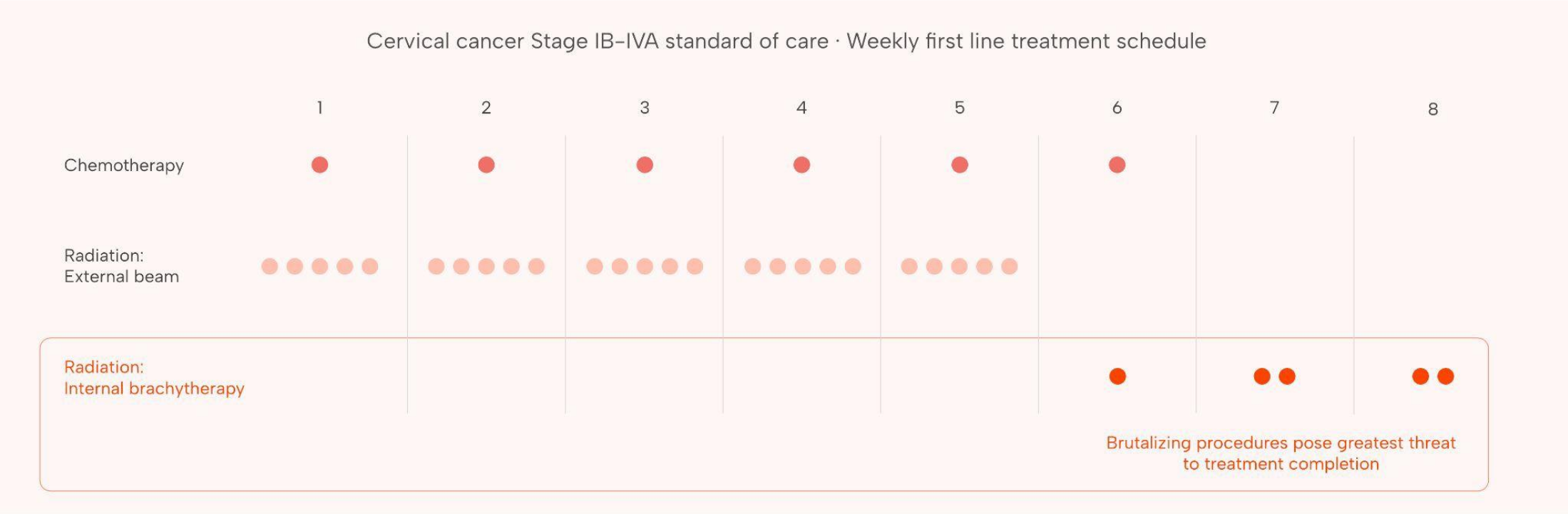
Mission-Driven Tech™

Brachytherapy is standard of care for ~70% of Stage IB-IVA diagnoses.
PubMed.gov, 2017: Differences in outcome for Cervical Cancer patients treated with or without brachytherapy; Patient outcomes for Cervical Cancer treatment when compared to external beam (ERBT) alone

RESEARCH

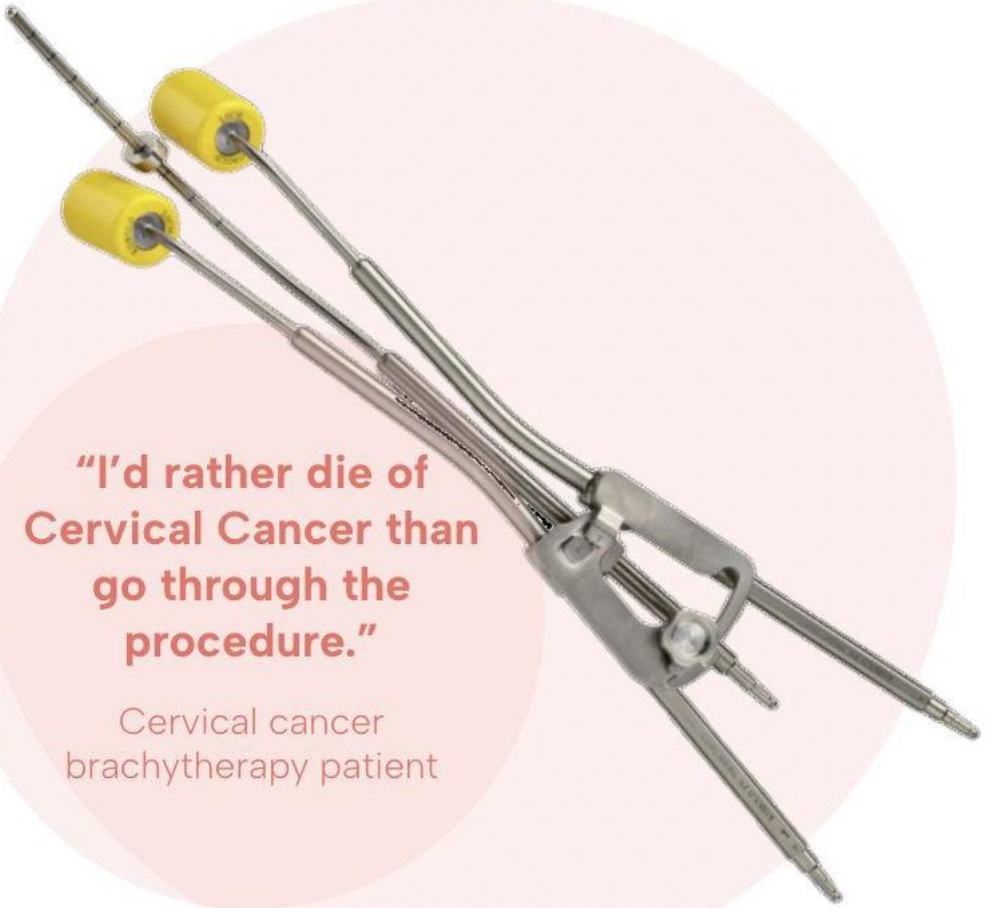
70% of diagnoses require the below standard of care

Established quality measure: Complete within eight weeks for optimal patient outcomes



RESEARCH

40% of brachytherapy patients prematurely drop out from the cure for cancer



"I'd rather die of Cervical Cancer than go through the procedure."

Cervical cancer brachytherapy patient

- **Designed in the 1970s**
  20 years before clinical trials included women
- **Rigid, inflexible, cannot be adjusted**
  Imprecise, sub-optimal dose delivery
- **Complications + side effects**
  uterine perforation, vaginal laceration, hospital admittance, bladder, bowel and sexual dysfunction, post-traumatic stress disorder
- **$$ complications > $$ treatment costs**
  $60K complications per patient
  failure to meet quality measures + treatment abandonment + recurrence + death

Cervical Cancer Brachytherapy Survivor interviews: Illuminate critical unmet needs in patient education, treatment experience, pain management protocol and outcomes. Study Authors: Areion Allmond, BS, Onyinye Balogun, MD, MSc, Eve McDavid, BJ

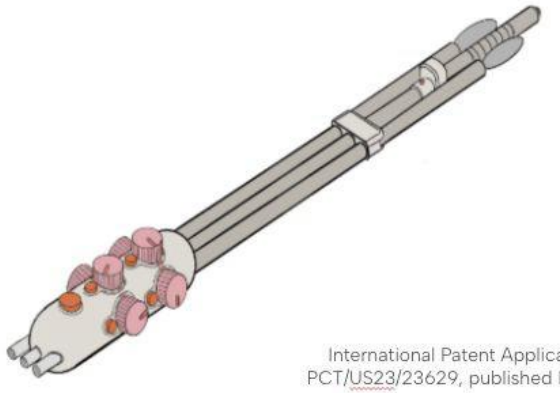
INNOVATION

Modern brachytherapy by Mission-Driven Tech™

The Blossom

A safer cure for cancer

medical device



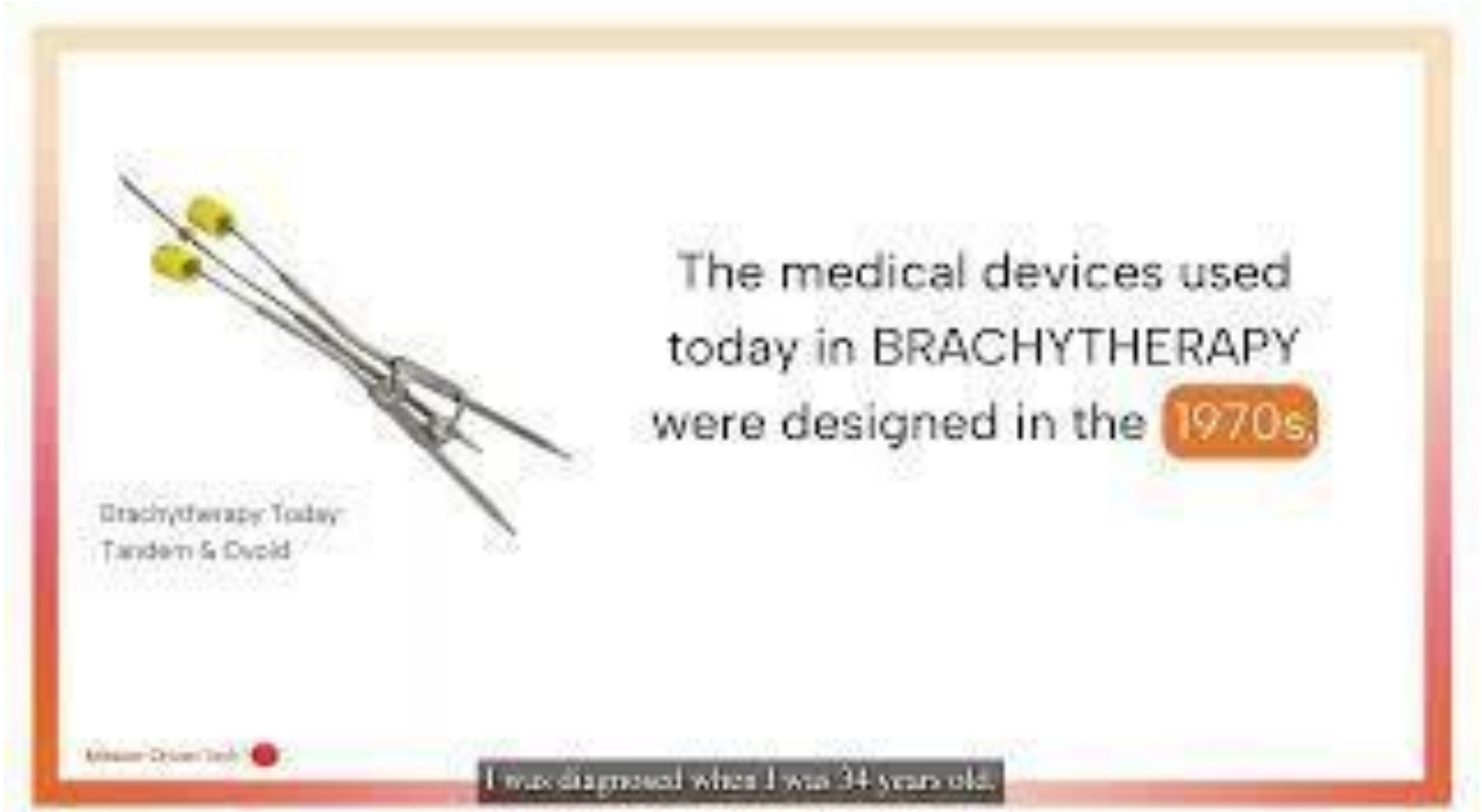
International Patent Application Number:
PCT/US23/23629, published November 2023

BrachyStories

Improving care now

outcome improvement consulting – launched!

INNOVATION



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International Health Metrics and Evaluation, Global Burden of Disease from Roser, M. & Ritchie, H. 'Cancer' https://ourworldindata.org (2020)

ELIMINATION ✅

International Health Metrics and Evaluation, Global Burden of Disease from Roser, M. & Ritchie, H. 'Cancer' https://ourworldindata.org (2020)

Send us a note!
welcome@missiondriventech.com

Let's connect on LinkedIN!

HPV VACCINATION ROUNDTABLE OF THE SOUTHEAST

Trisha Amboree, PhD

SPEAKER

Assistant Professor

Department of Public Health Sciences,
Medical University of South Carolina

Cancer Prevention and Control Program,
Hollings Cancer Center

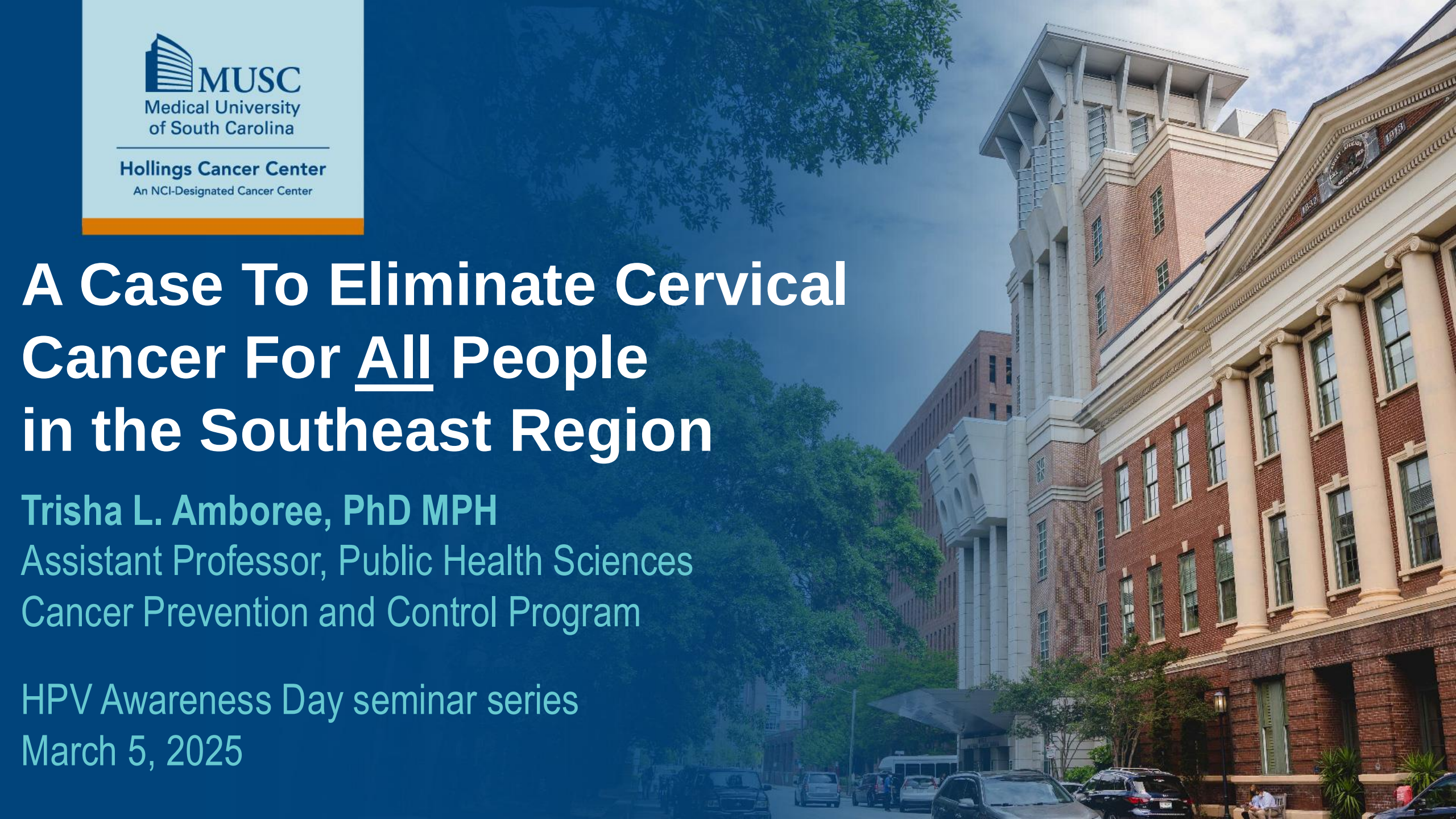
MUSC
Medical University of South Carolina

Hollings Cancer Center
An NCI-Designated Cancer Center

A Case To Eliminate Cervical Cancer For All People in the Southeast Region

Trisha L. Amboree, PhD MPH
Assistant Professor, Public Health Sciences
Cancer Prevention and Control Program

HPV Awareness Day seminar series
March 5, 2025

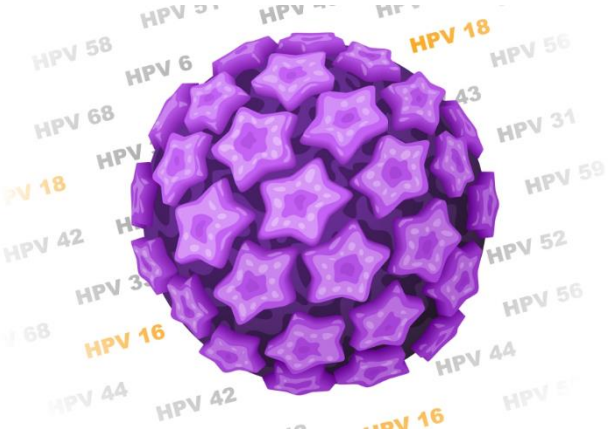


Disclosures

I have no financial relationships or conflicts of interest to disclose

The ideas presented in this talk are my own and do not necessarily represent my funder or employer.

What is cervical cancer and why does it matter?



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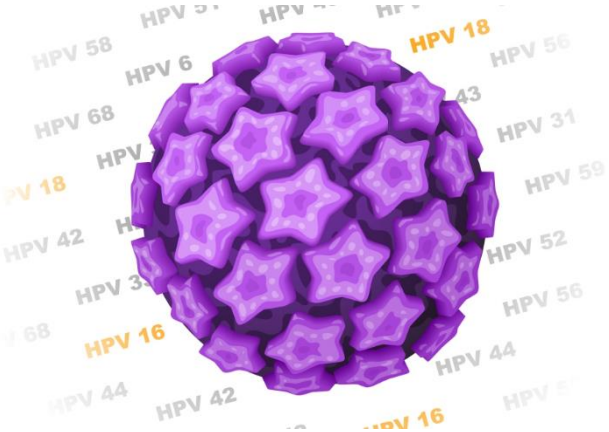
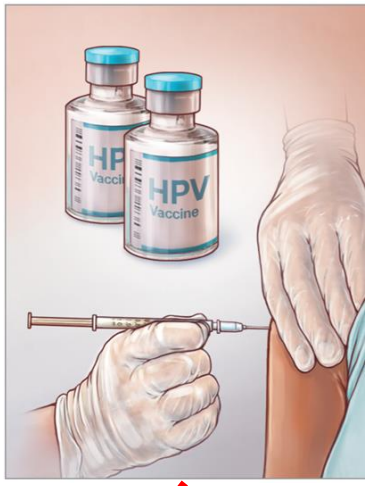
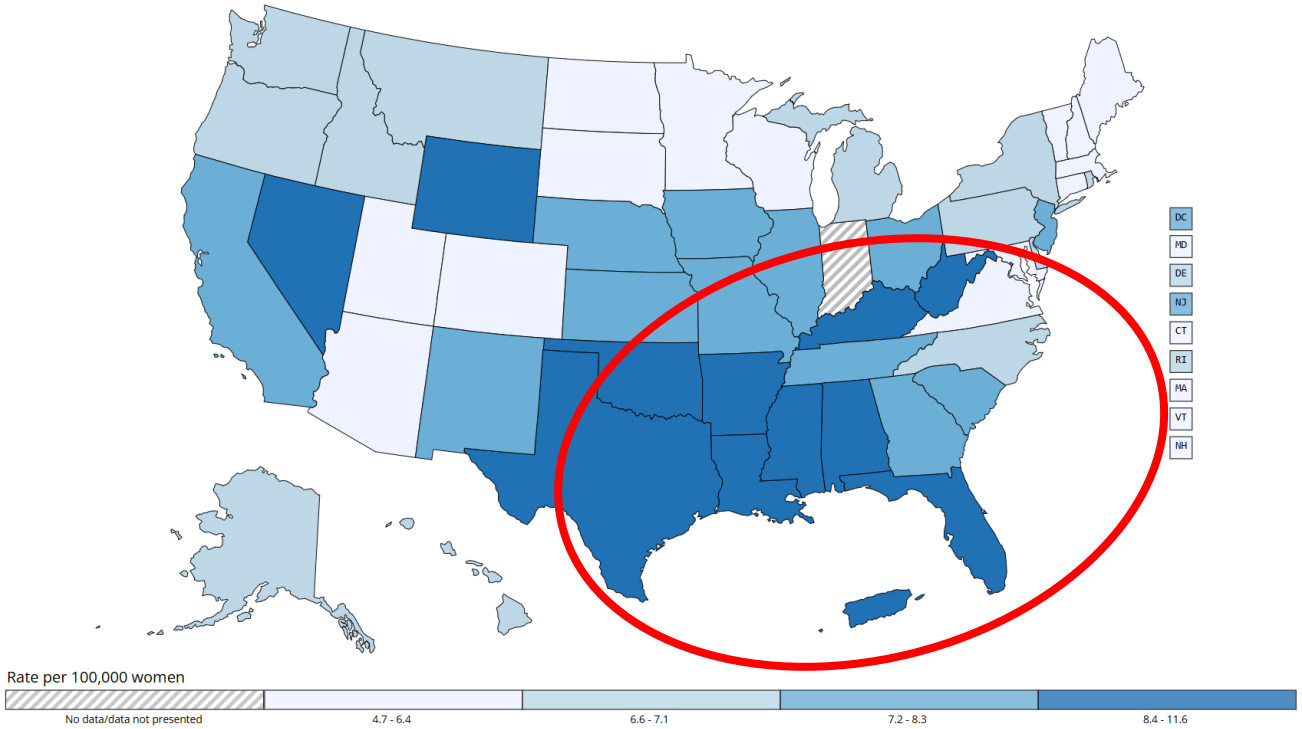




Higher Incidence in the South

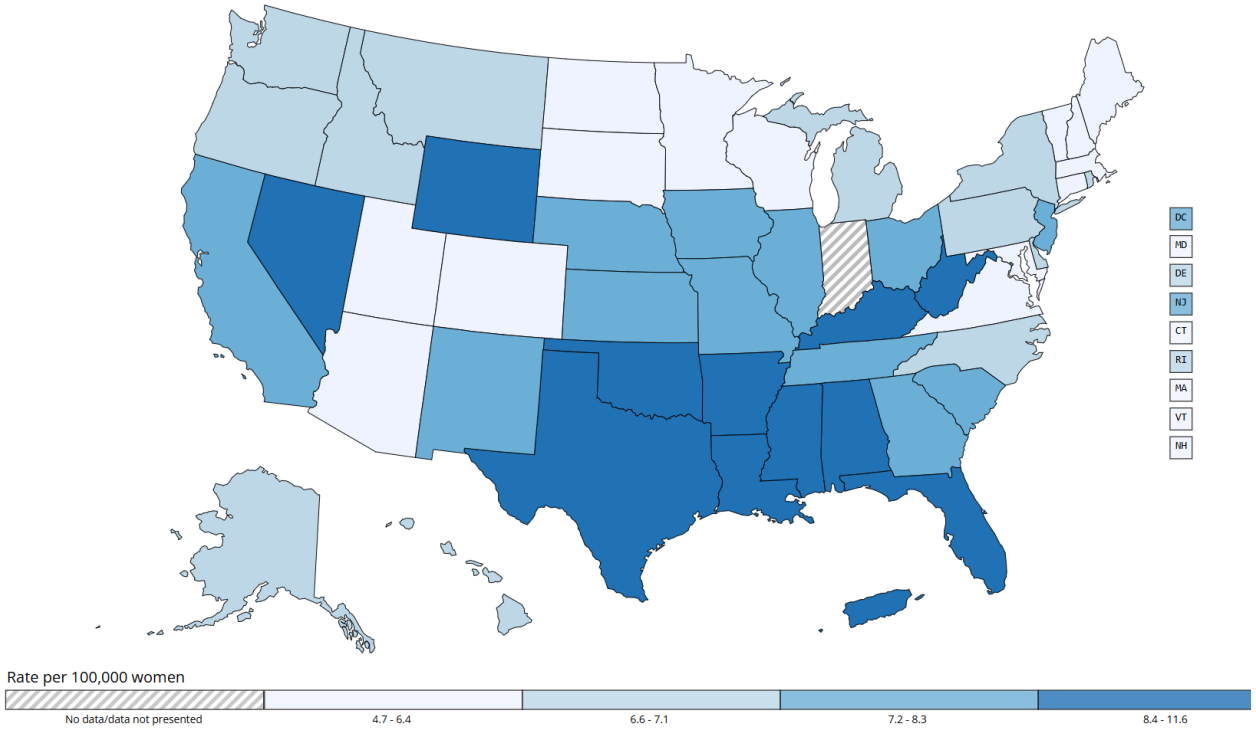
- Cervix Uteri: Age-Adjusted Incidence Rates, 2017-2021



U.S. Cancer Statistics Data Visualizations Tool, 2024

Higher Mortality in the South

- Cervix Uteri: Age-Adjusted Incidence Rates, 2017-2021



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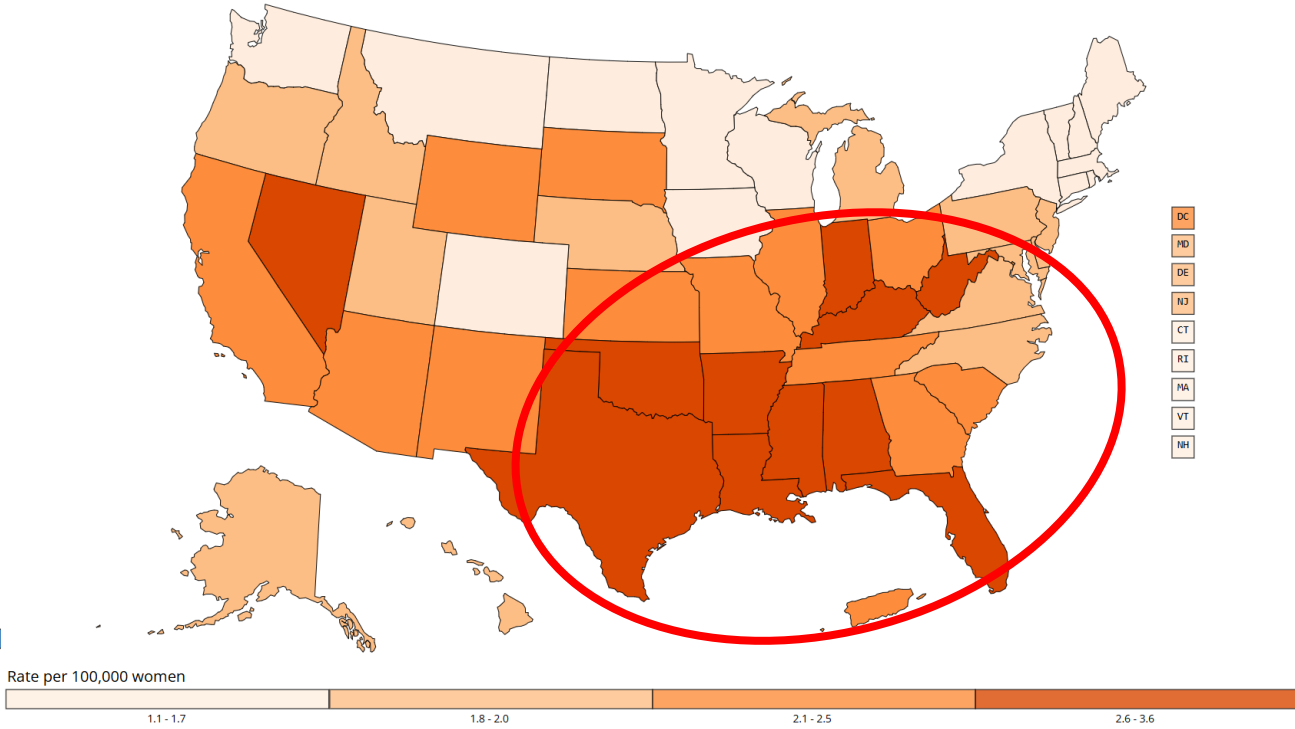
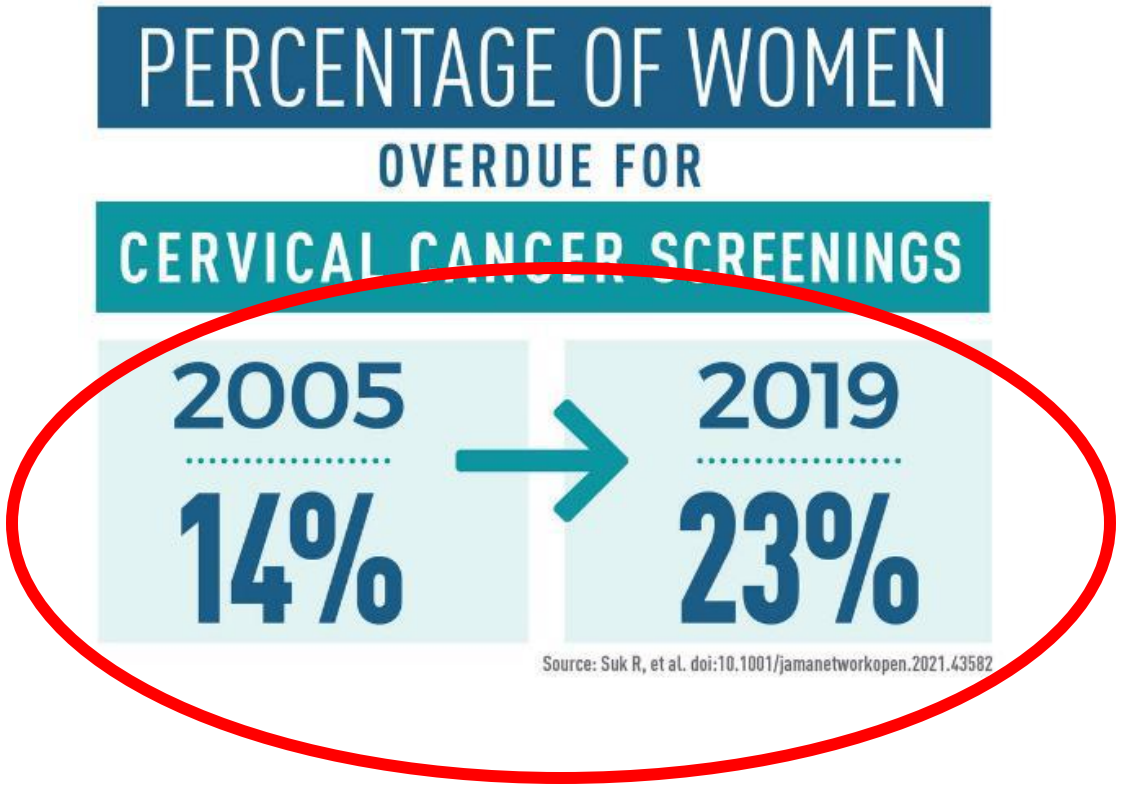


U.S. Cancer Statistics Data Visualizations Tool, 2024

Low Screening Uptake



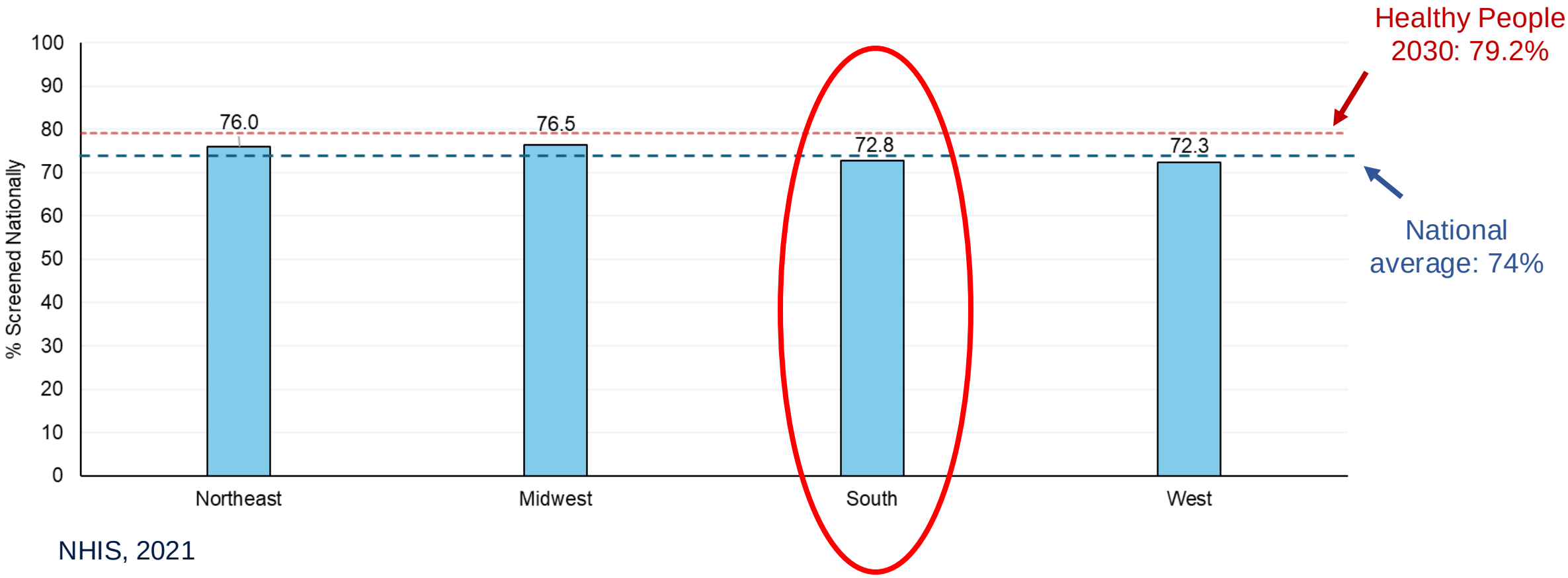
Suk et al., *JAMA Netw Open*, 2021

Predicted Probability of Overdue Screening

	Age 21-29y	Age 30-65y
Asian	36%	36%
Hispanic	31%	30%
NH Black	23%	21%
NH White	22%	21%
Other	28%	29%

	Age 21-29y	Age 30-65y
Private	20%	20%
Public	28%	28%
Other	24%	23%
None	41%	41%

Lower Cervical Cancer Screening in the South



NHIS, 2021

DEFINING ELIMINATION

Elimination does not imply the complete absence of disease. Instead, it signifies the potential to significantly reduce the burden of HPV-related diseases, specifically cervical cancer, and their impact on communities. The World Health Organization (WHO) defines elimination as an incidence rate (new cases of cervical cancer) of less than 4 cases of cervical cancer per 100,000 women[1].

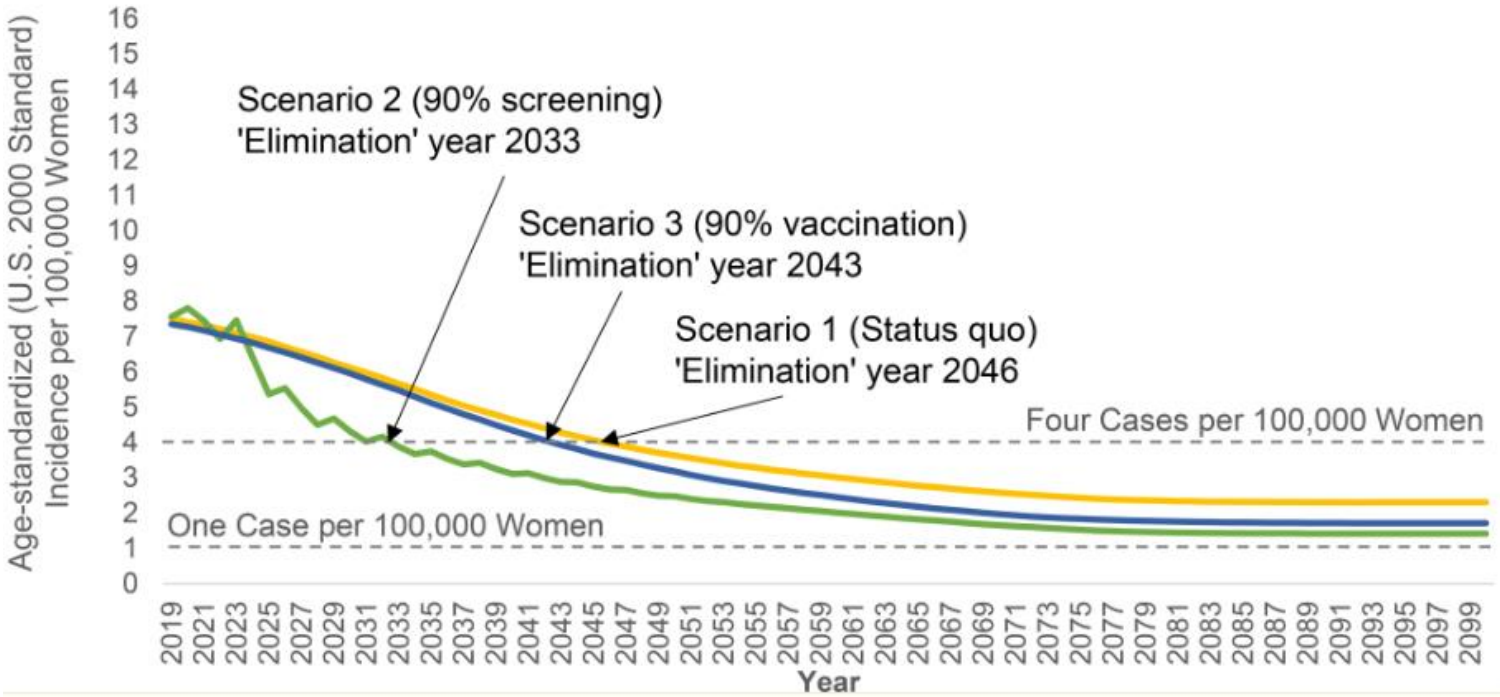
vs.

Elimination is not to be confused with eradication, and these terms should not be used interchangeably.

LESS THAN
4 CASES
OF CERVICAL CANCER
PER 100,000 WOMEN[1]

HPV Vaccination Roundtable of the Southeast, 2024

Mathematical models indicate that the United States can achieve the goal of cervical cancer elimination (reducing incidence from ~7/100,000 to <4/100,000) by 2030 if we meet the goals set for the country for both vaccination and screening/treatment. The fastest way to achieve the goal is to ensure that all age-eligible women follow cervical



AR Giuliano, "The Road to Cervical Cancer Elimination", 2022

Burger, *Lancet Public Health*, 2021

The WHO Global Strategy to Accelerate Cervical Cancer Elimination[1], which focuses on girls and women, includes 90-70-90 targets for HPV vaccination, cervical cancer screening, and cervical cancer treatment:

of girls fully vaccinated with the HPV vaccine by the age of 15;

of women screened using a high-performance test by the age of 35, and again by the age of 45; and

of women identified with cervical disease receive treatment (90% of women with pre-cancer treated and 90% of women with invasive cancer managed).

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CLINICAL PRACTICE

Self-Collected Vaginal Specimens for HPV Testing: Recommendations From the Enduring Consensus Cervical Cancer Screening and Management Guidelines Committee

Wentzensen, Nicolas MD, PhD[1]; Massad, L. Stewart MD[2]; Clarke, Megan A. PhD[1]; Garcia, Francisco MD, MPH[3]; Smith, Robert PhD[4]; Murphy, Jeanne PhD, CNM[5]; Guido, Richard MD[6]; Reyes, Ana MS[7]; Phillips, Sarah MS[1]; Berman, Nancy MSN, ANP-BC, NCMP, FAANP[8]; Quinlan, Jeffrey MD[9]; Lind, Eileen NP[10]; Perkins, Rebecca B. MD[11]; Enduring Consensus Cervical Cancer Screening and Management Guidelines Committee

Author Information

Journal of Lower Genital Tract Disease ():10.1097/LGT.0000000000000885, February 21, 2025. | ***DOI:*** 10.1097/LGT.0000000000000885

HPV Vaccination Roundtable of the Southeast, 2024

MedPage Today, 2024

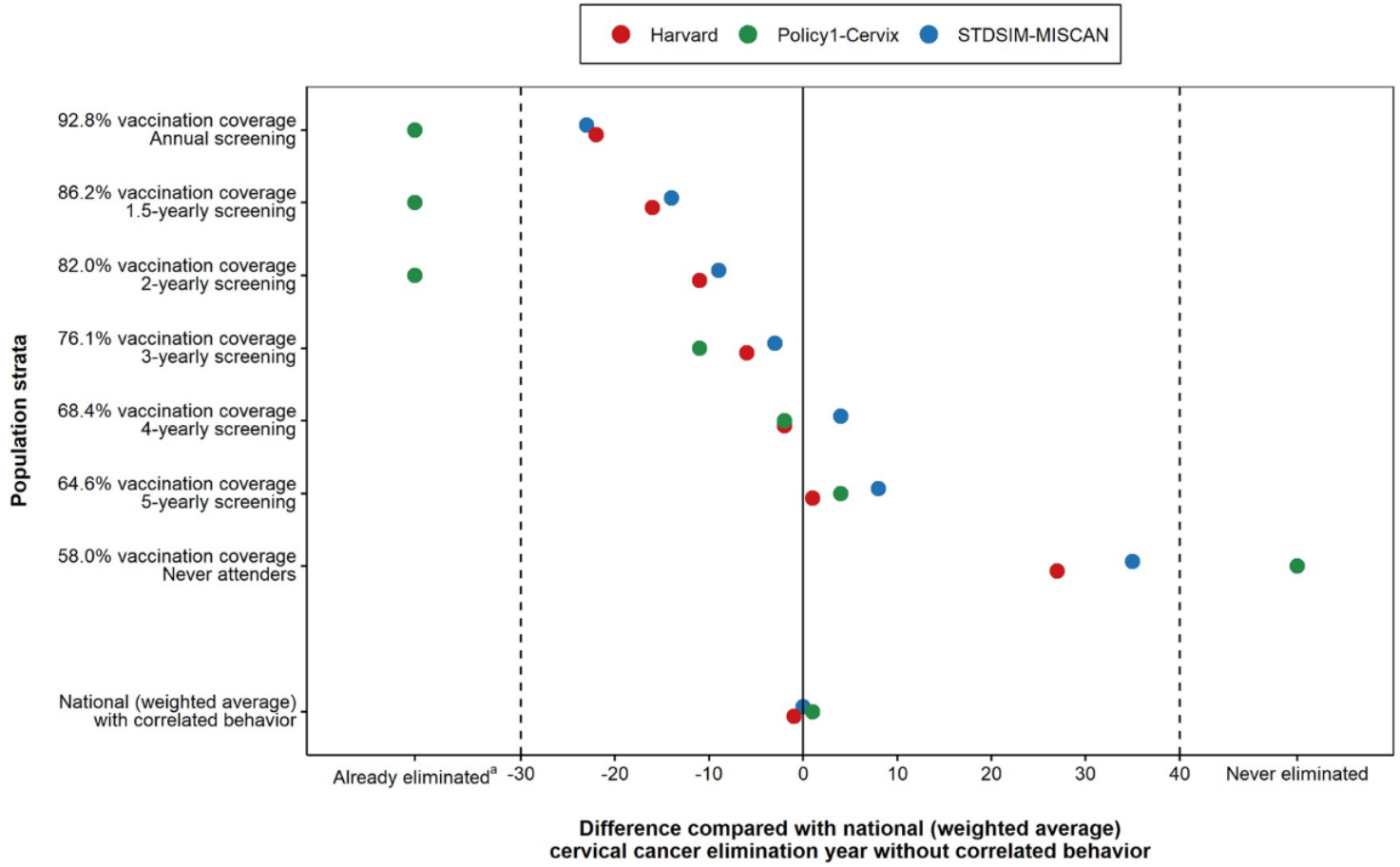
American Cancer Society

NATIONAL ROUNDTABLE ON CERVICAL CANCER

WIPE OUT cervical cancer ALABAMA

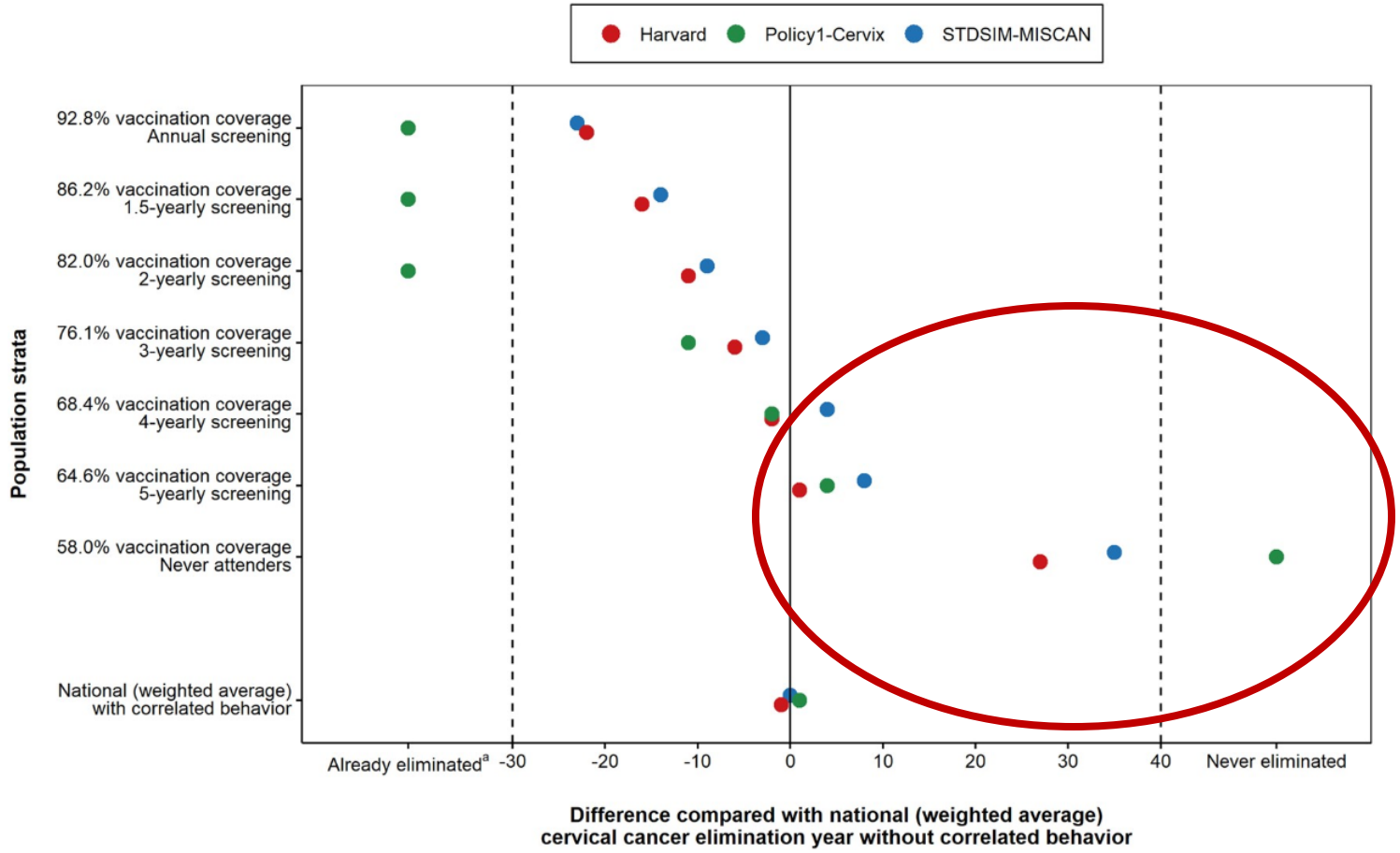
HPV VACCINATION ROUNDTABLE OF THE SOUTHEAST

A Case for Elimination in ALL People



Burger et al., *JNCI*, 2025

A Case for Elimination in ALL People



Burger et al., *JNCI*, 2025

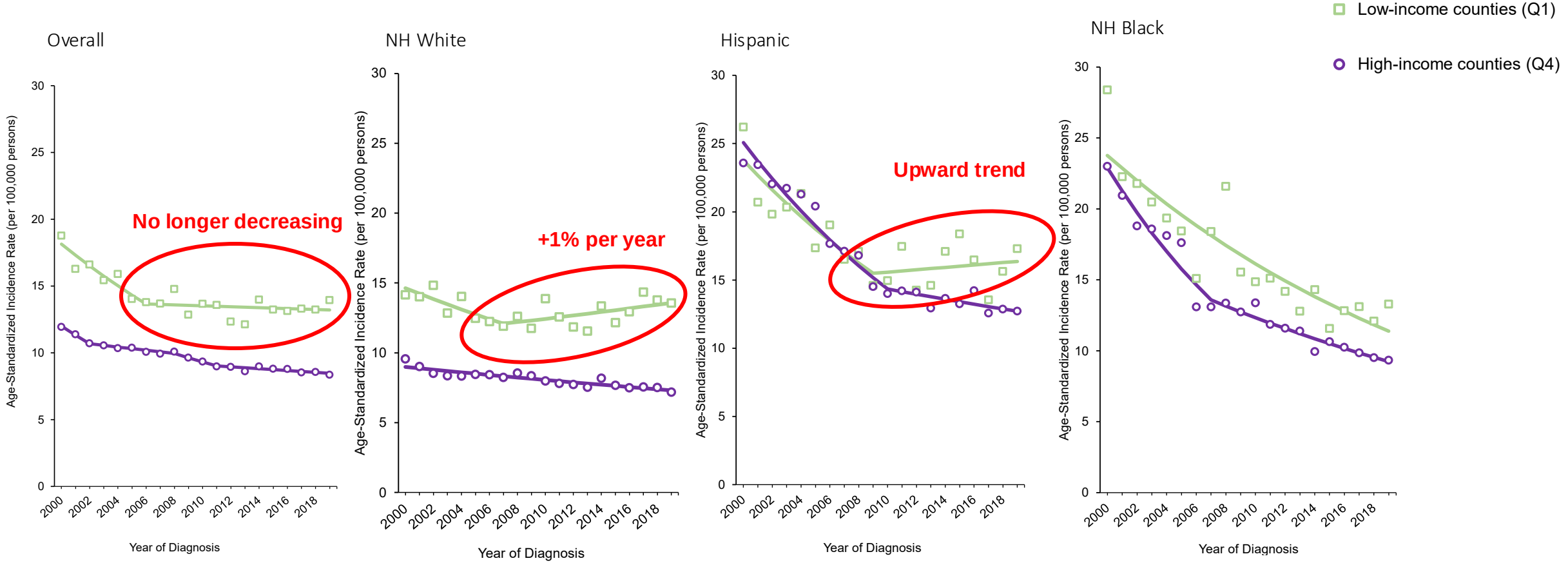
Differences in Rising Incidence

SHORT REPORT | Full Access

Recent trends in cervical cancer incidence, stage at diagnosis, and mortality according to county-level income in the United States, 2000–2019

Trisha L. Amboree, Haluk Damgacioglu, Kalyani Sonawane, Prajakta Adsul, Jane R. Montealegre, Ashish A. Deshmukh

First published: 25 January 2024 | https://doi.org/10.1002/ijc.34860 | Citations: 1



Amboree et al., *Int J Cancer*, 2024

Differences in Rising Advanced Stages

SHORT REPORT | Full Access

Recent trends in cervical cancer incidence, stage at diagnosis, and mortality according to county-level income in the United States, 2000–2019

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First published: 25 January 2024 | https://doi.org/10.1002/ijc.34860 | Citations: 1

Troubling increase of distant-stage diagnoses within low-income quartile

Race and ethnicity	Year	APC	(95%CI)
All	2004-2019	1.5%	-0.3% to 3.6%
NH White	2004-2019	**4.4% ***	1.7% to 7.5%
Hispanic	2004-2019	1.5%	-0.6% to 4.1%
NH Black	2004-2019	**-4.1% ***	-7.8% to -0.5%

* denotes statistical significance

Amboree et al., *Int J Cancer*, 2024

Differences in Cervical Cancer Mortality

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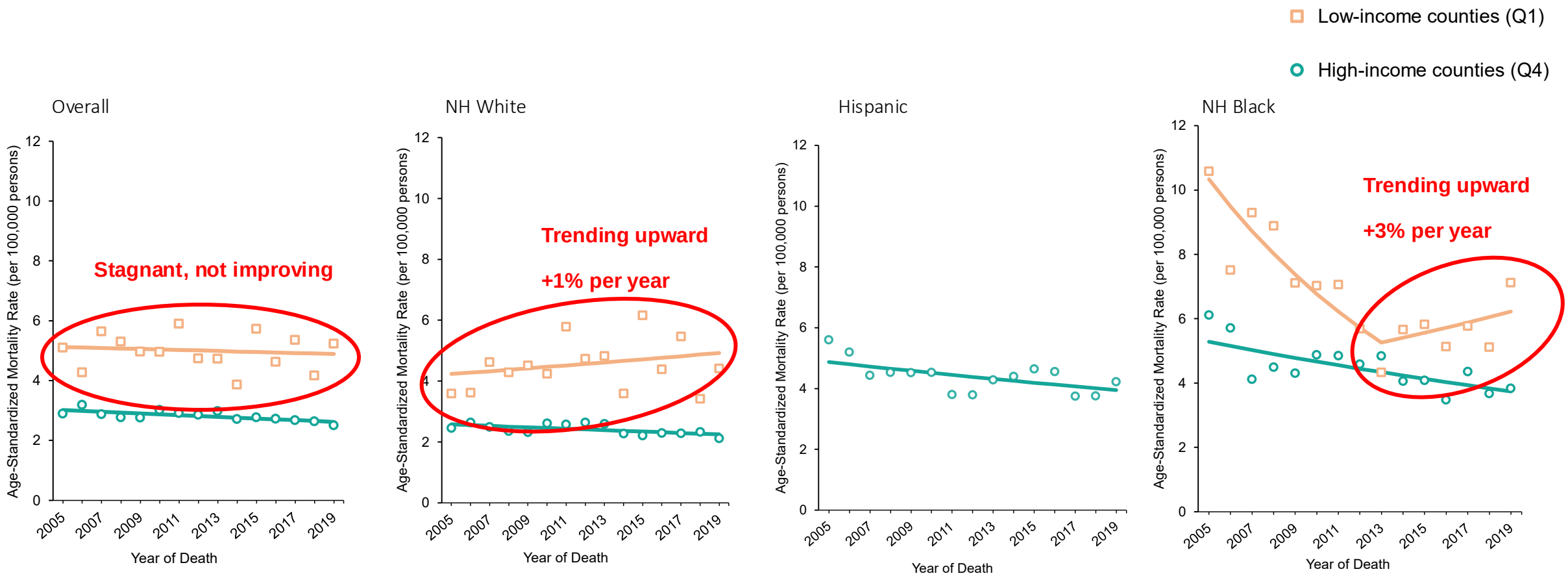
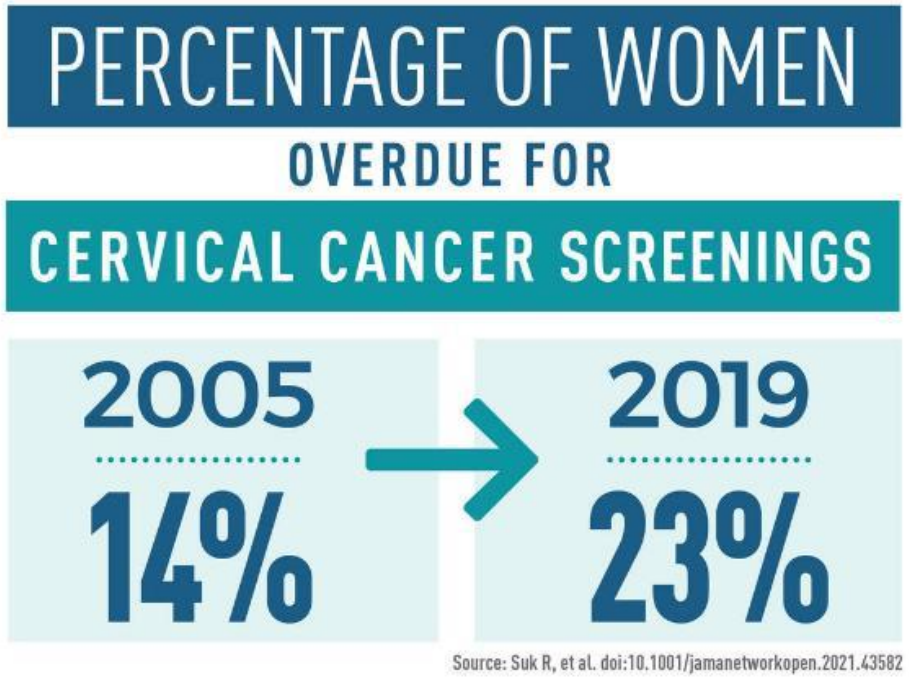


Amboree et al., *Int J Cancer*, 2024

Differences in Screening Uptake



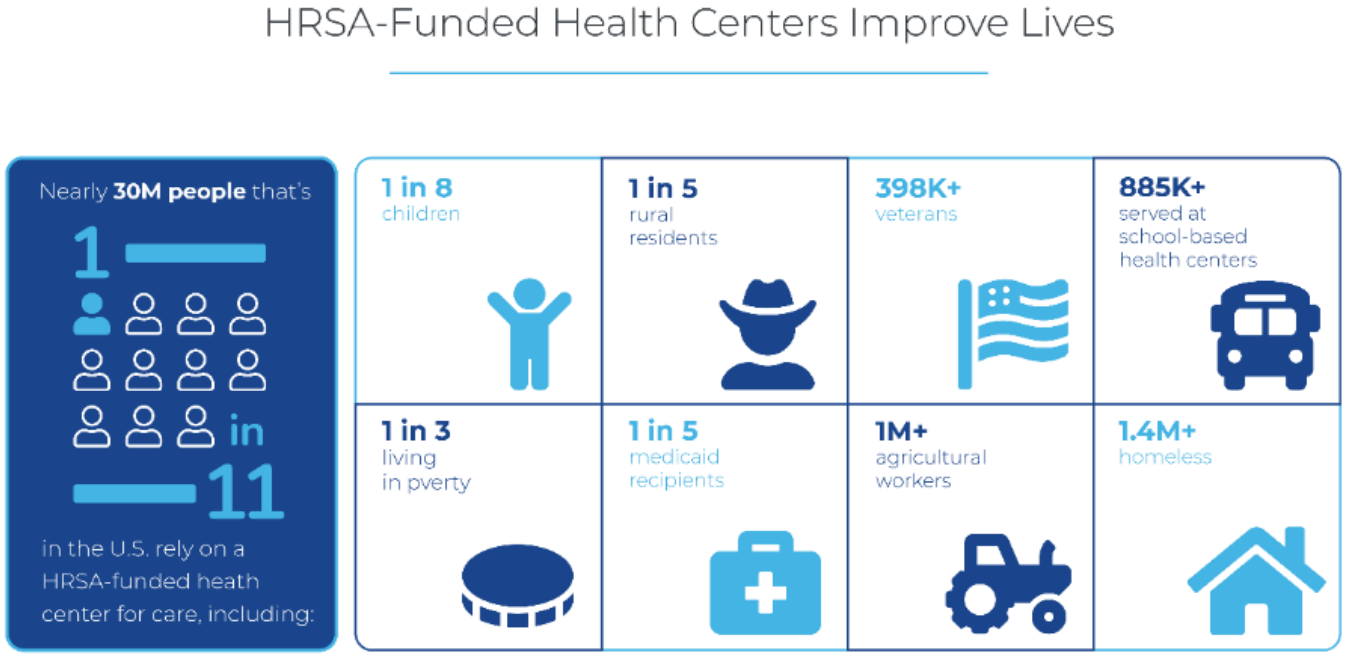
Suk et al., *JAMA Netw Open*, 2021

Predicted Probability of Overdue Screening

	Age 21-29y	Age 30-65y
Asian	36%	36%
Hispanic	31%	30%
NH Black	23%	21%
NH White	22%	21%
Other	28%	29%

	Age 21-29y	Age 30-65y
Private	20%	20%
Public	28%	28%
Other	24%	23%
None	41%	41%

Settings servicing low-resourced populations



Lower screening uptake

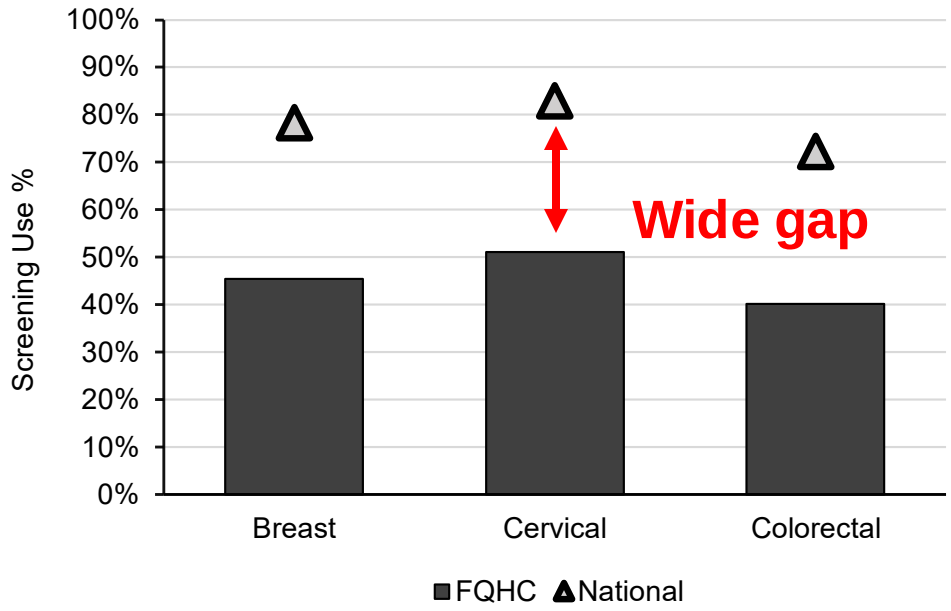
Original Investigation
April 29, 2024

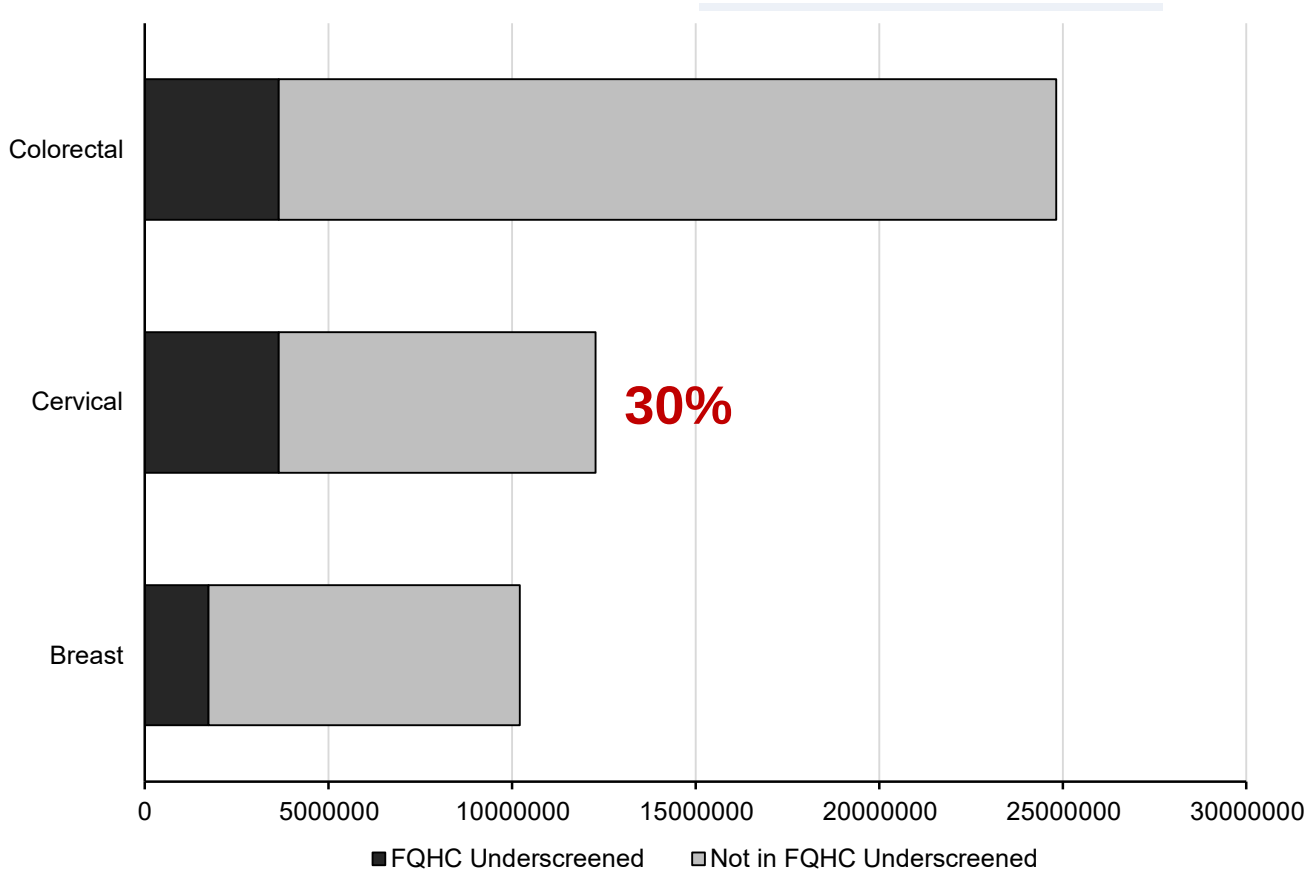
National Breast, Cervical, and Colorectal Cancer Screening Use in Federally Qualified Health Centers

Trisha L. Amboree, PhD[1]; Jane R. Montealegre, PhD[1]; Susan L. Parker, MPH[1]; Ashvita Garg, PhD[2,3]; Haluk Damgacioglu, PhD[2,3]; Kathleen M. Schmeler, MD[4]; Elizabeth Y. Chiao, MD[5,6]; Elizabeth G. Hill, PhD[2,3]; Kalyani Sonawane, PhD[2,3]; Ashish A. Deshmukh, PhD[2,3]; Prajakta Adsul, MBBS, MPH, PhD[7,8]

» Author Affiliations | Article Information

JAMA Intern Med. 2024;184(6):671-679. doi:10.1001/jamainternmed.2024.0693





Amboree et al., *JAMA Int Med*, 2024

Lower screening uptake

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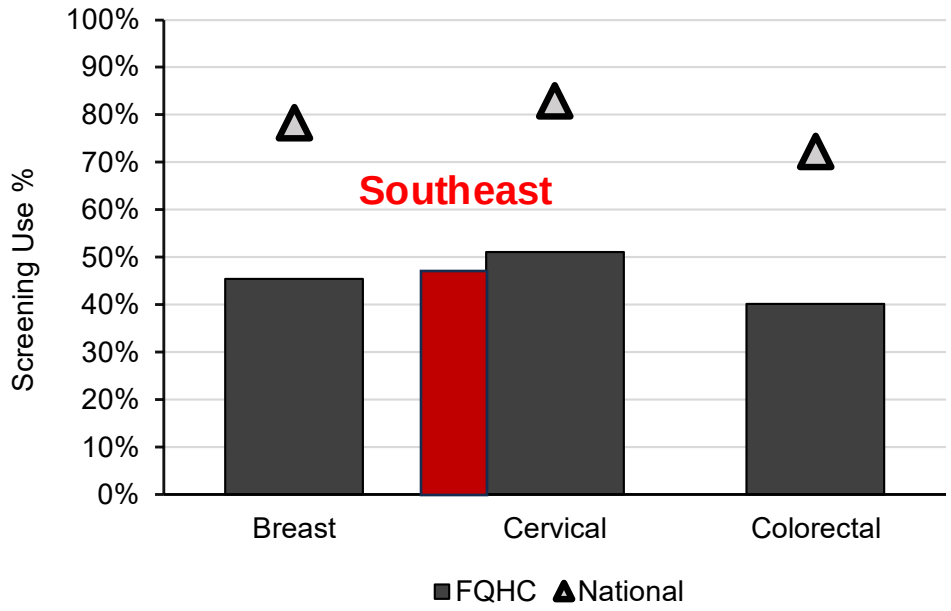
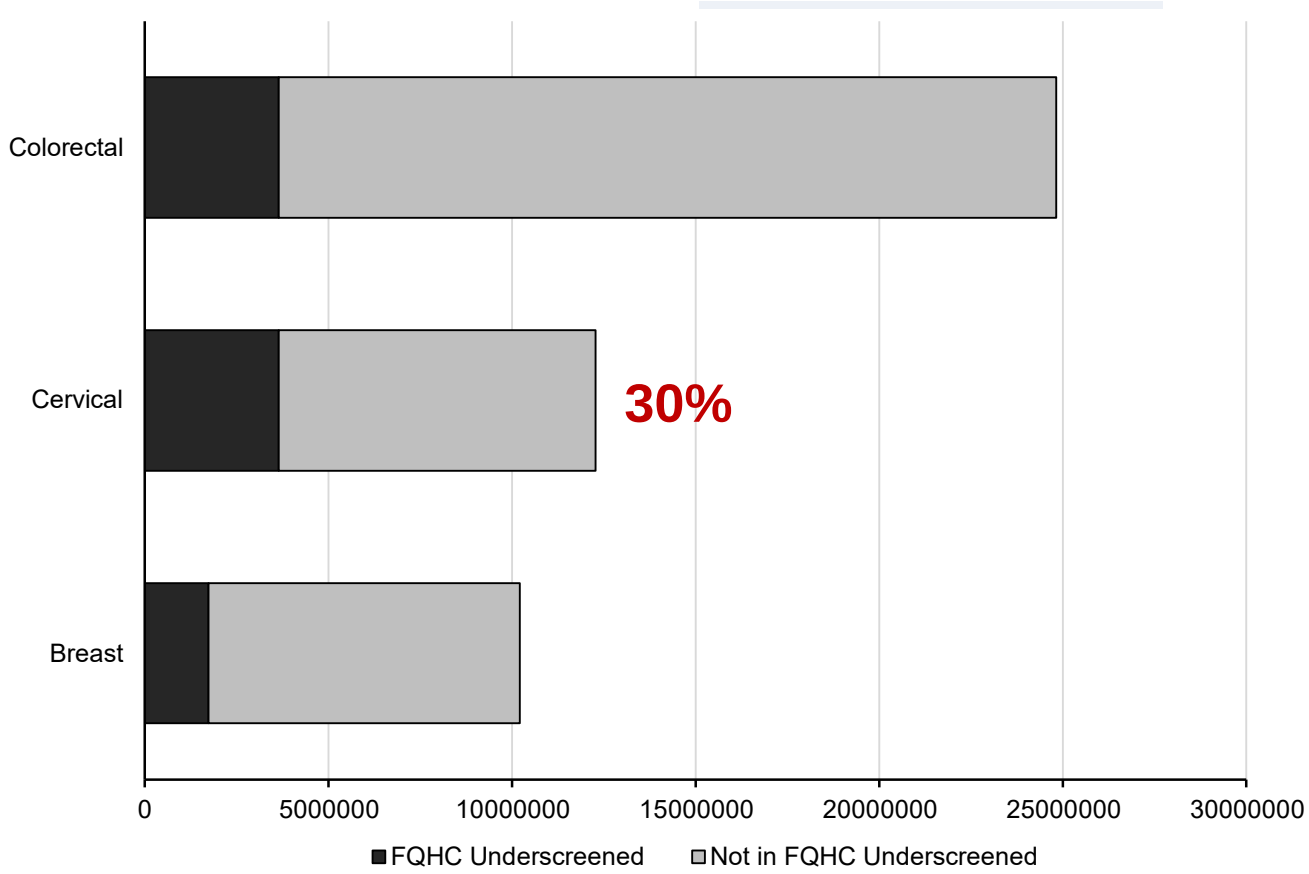
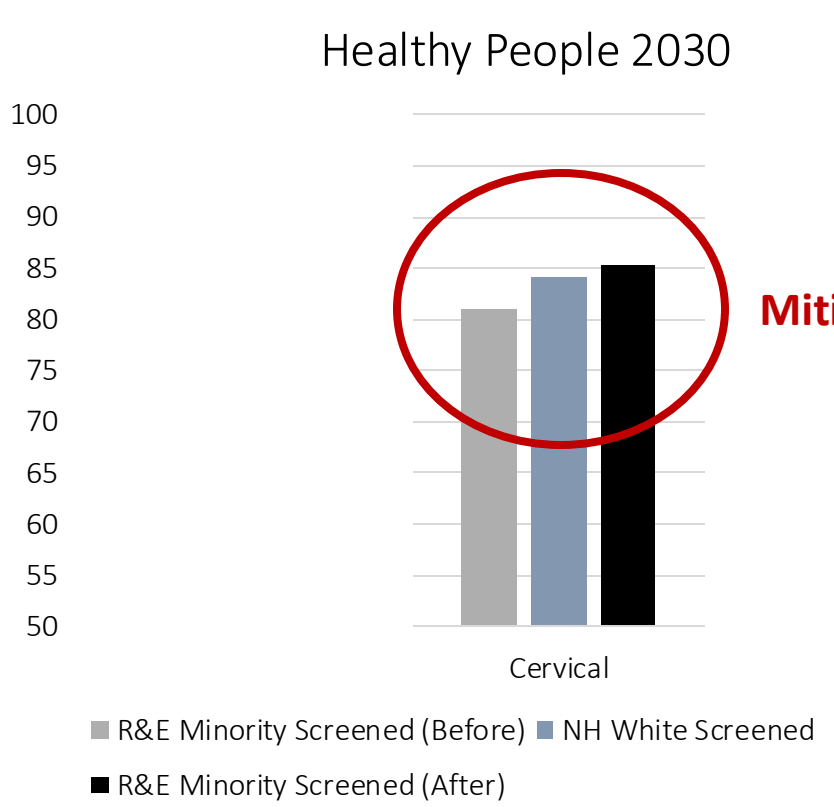




Amboree et al., *JAMA Int Med*, 2024

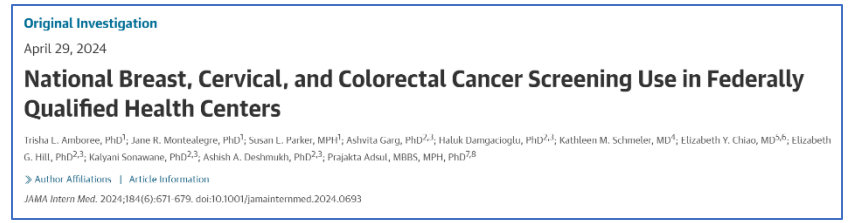
Scale Up Scenarios



Current	HP2030
51.0% →	79.2%

Mitigate racial/ethnic differences

Amboree et al., *JAMA Int Med*, 2024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A Case for Elimination in ALL People

Targeted improvements in low-resourced settings

- FQHCs
- Safety net health settings
- Rural and low-income areas

A Case for Elimination in ALL People

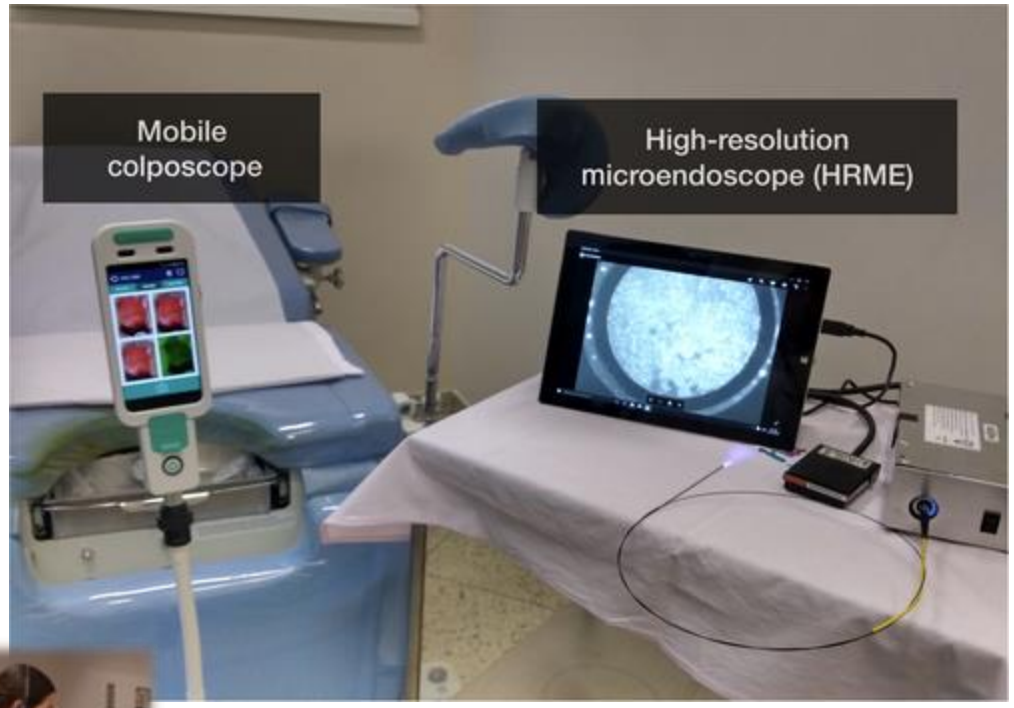
A Case for Elimination in ALL People

There is HOPE! We can do this!

There is HOPE! We can do this!

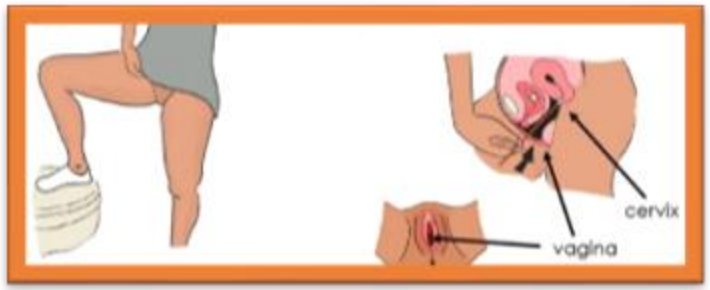
POC Testing,
Richards-Kortum Lab
Rice University

Pocket Colposcope
(Beta), Duke University
Global Health Institute



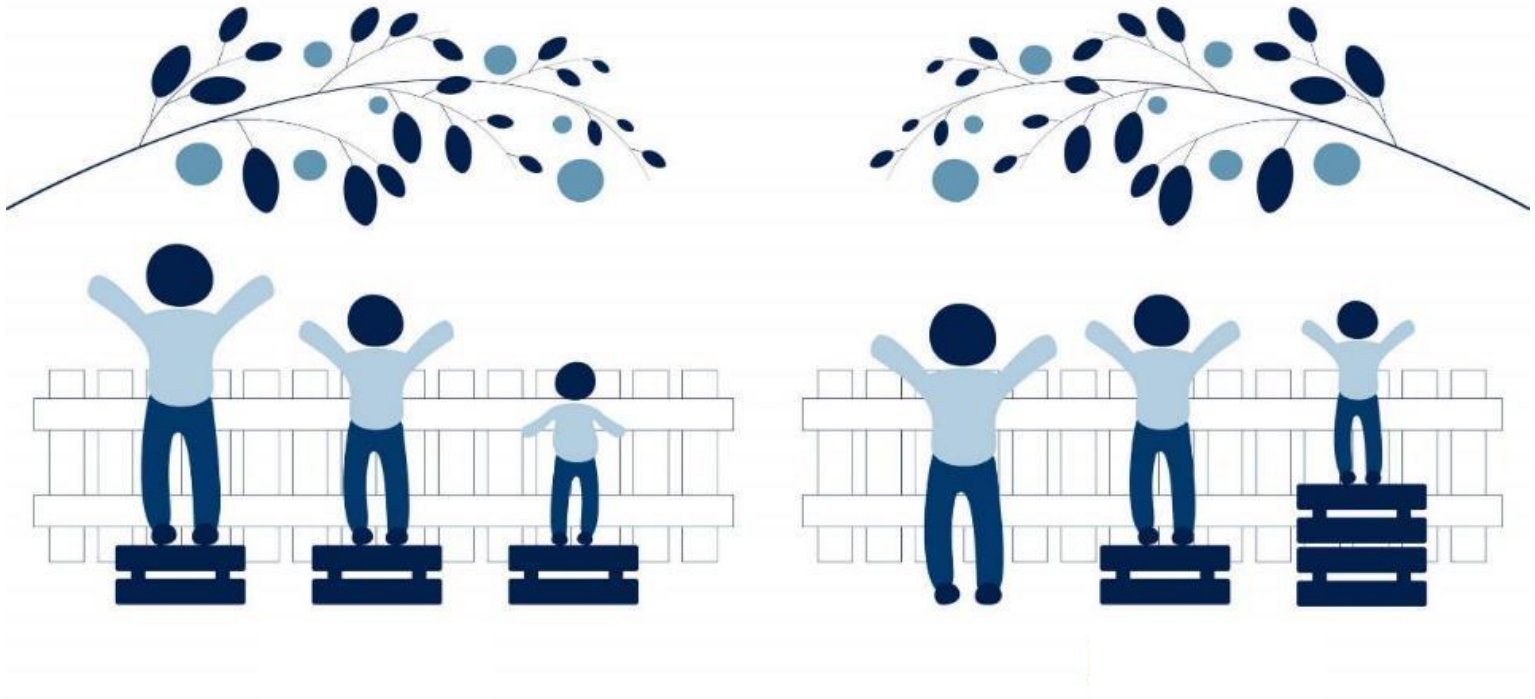
Drs. Rebecca Richards-Kortum and Kathleen Schmeler

Hunt et al, Int J Cancer, 2022



Self-collection

Patient Navigation



We **can** eliminate cervical cancer as a public health problem among **ALL** people!

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- NIMHD 3R01MD013715-04S1
- CPRIT PP240017
- HCC Health Equity Scholars Award

Mentors
- Jane R. Montealegre, PhD, UT MDACC
- Ashish A. Deshmukh, PhD, MUSC HCC
- Kalyani Sonawane, PhD, MUSC HCC

Collaborators:
- Haluk Damgacioglu, PhD
- Susan L. Parker, MPH
- Elizabeth Y. Chiao, MD MPH
- Kathleen Schmeler, MD
- Ashvita Garg, PhD
- Itunu Sokale, MD DrPH
- Jennifer Lezama, MPH
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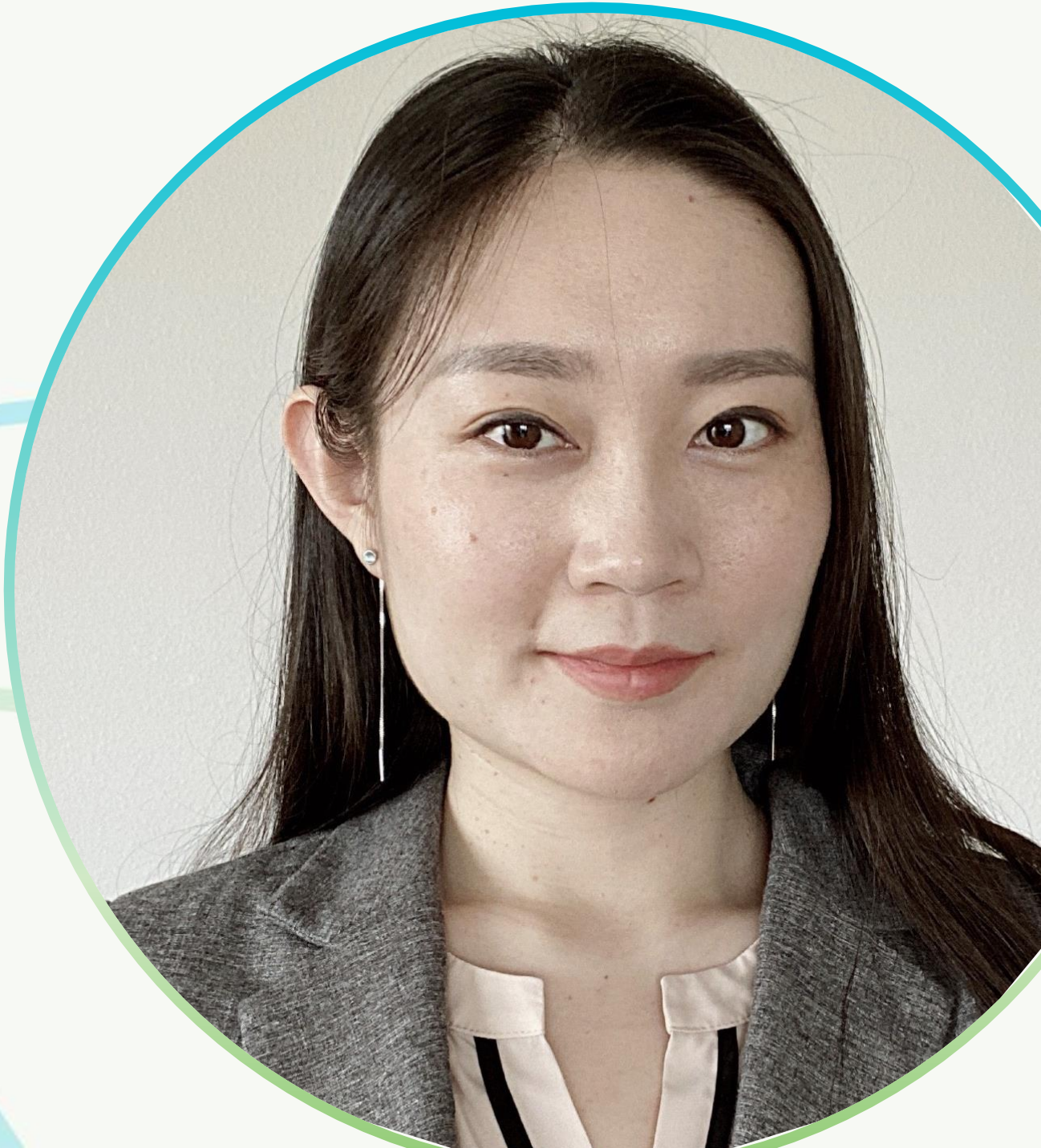
HPV VACCINATION ROUNDTABLE OF THE SOUTHEAST

Ran Zhao, PhD

SPEAKER

Researcher

University of Minnesota School of Public Health



State-level Disparities in Cervical Cancer Prevention and Outcomes

A modeling study

Presenter: Ran Zhao, PhD MPH
Department of Epidemiology and Community Health

SCHOOL OF PUBLIC HEALTH
UNIVERSITY OF MINNESOTA

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  - National Cancer Institute (U01- CA253912) as part of the Cancer Intervention and Surveillance Modeling Network (CISNET) (Supplement PI: Shalini Kulasingam)
  - American Cancer Society (PI: Shalini Kulasingam)
- The content is solely the responsibility of the authors and does not necessarily represent the official views of the funders
- No conflicts of interest

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Background

- Cervical cancer causes a significant economic burden in the US.
- Prophylactic interventions include
  - cervical cancer screening: targeting women aged 21-65 years old
  - HPV vaccination: targeting adolescents (age 9-14 years old) with possible catch-up in adulthood up to age 45 years old
- Both interventions are effective in reducing the CC disease burden

Yabroff KR, Mariotto A, Tangka F, et al. Annual Report to the Nation on the Status of Cancer, Part 2: Patient Economic Burden Associated With Cancer Care. *JNCI J Natl Cancer Inst*. 2021;113(12):1670-1682. doi:10.1093/jnci/djab192

Howlader N, Noone AM, Krapcho M, Miller D, Brest A, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2016, National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/csr/1975_2016/, based on November 2018 SEER data submission, posted to the SEER web site, April 2019.

Healthy People 2030 Initiatives

HPV vaccination

Status: Improving ⊕ Learn more about our data release schedule

Most Recent Data:
58.5 percent (2021)

Target:
80.0 percent

Desired Direction:
Increase desired

Baseline:
48.0 percent of adolescents aged 13 through 15 years received recommended doses of the HPV vaccine by 2018

Cervical cancer screening

Status: Little or no detectable change ⊡ Learn more about our data release schedule

Most Recent Data:
73.9 percent (2021) *

Target:
79.2 percent [1] *

Desired Direction:
Increase desired

Baseline:
75.0 percent of females aged 21 to 65 years received a cervical cancer screening based on the most recent guidelines in 2019 [2] *

* Age adjusted to the year 2000 standard population.

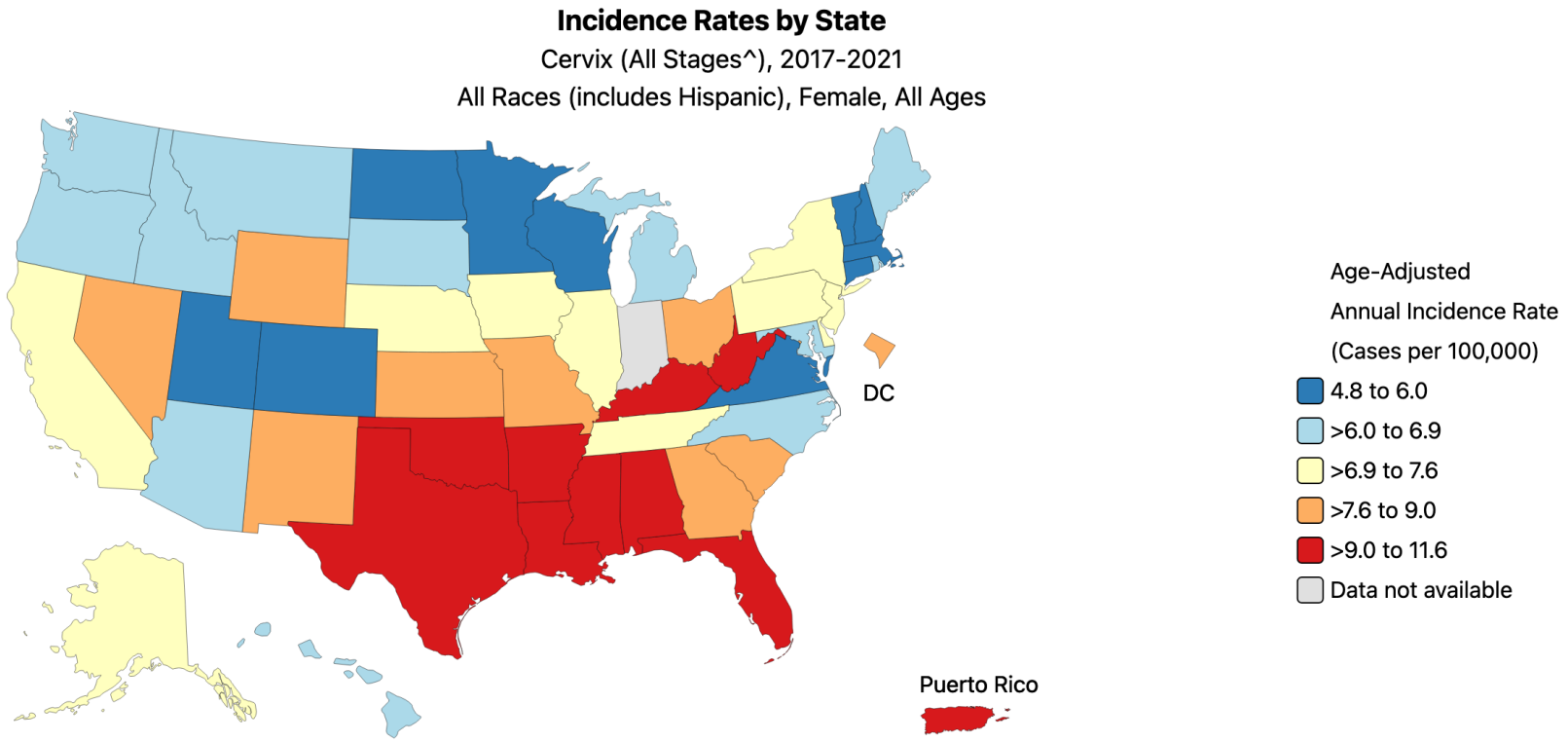
Available at:
https://odphp.health.gov/healthypeople/search?query=all%20objectives&f%5B0%5D=content_type%3Ahealthy_people_objective

Background

- American Cancer Society cervical cancer elimination goal: reduce cervical cancer incidence to 4 per 100,000 life-years
- Geographic disparities exist in terms of cervical cancer outcomes and prevention

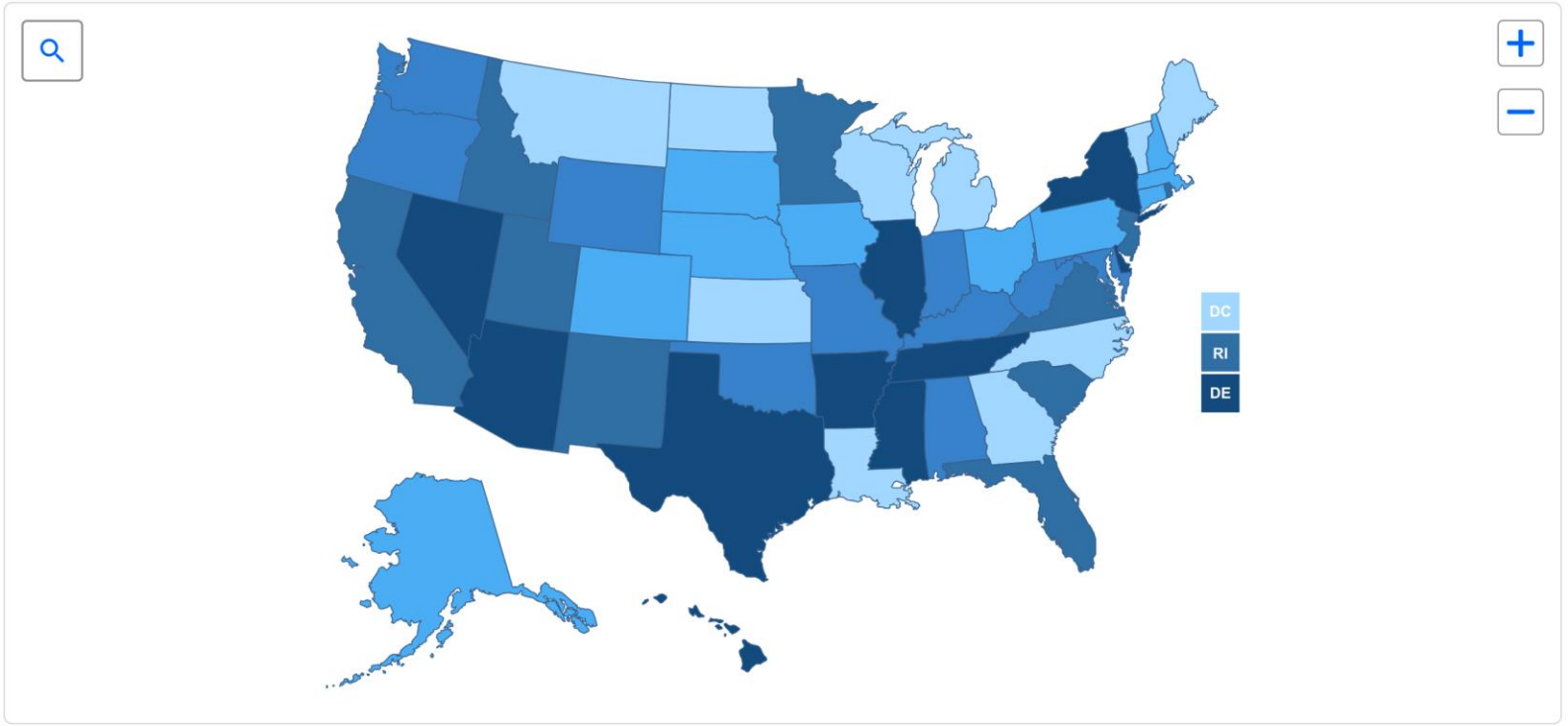
ACS Elimination Statement on HPV Cancers. https://www.cancer.org/content/dam/cancer-org/online-documents/en/pdf/flyers/acs-elimination-statement-on-hpv-cancers.pdf
Hirth J. Disparities in HPV vaccination rates and HPV prevalence in the United States: a review of the literature. Hum Vaccin Immunother. 2019;15:146-155. https://doi.org/10.1080/21645515.2018.1512453
Spencer JC, Brewer NT, Coyne-Beasley T, Trogdon JG, Weinberger M, Wheeler SB. Reducing poverty-related disparities in cervical cancer: the role of HPV vaccination. Cancer Epidemiol Biomarkers Prev. 2021;30:1895-1903. https://doi.org/10.1158/1055-9965.EPI-21-0307

Cervical Cancer Incidence



Link: https://statecancerprofiles.cancer.gov/map/map.withimage.php?00&state&001&057&00&2&01&0&1&5&0#results

Percentage of women ages 25-44 who reported receiving cervical cancer screening consistent with the USPSTF guidelines



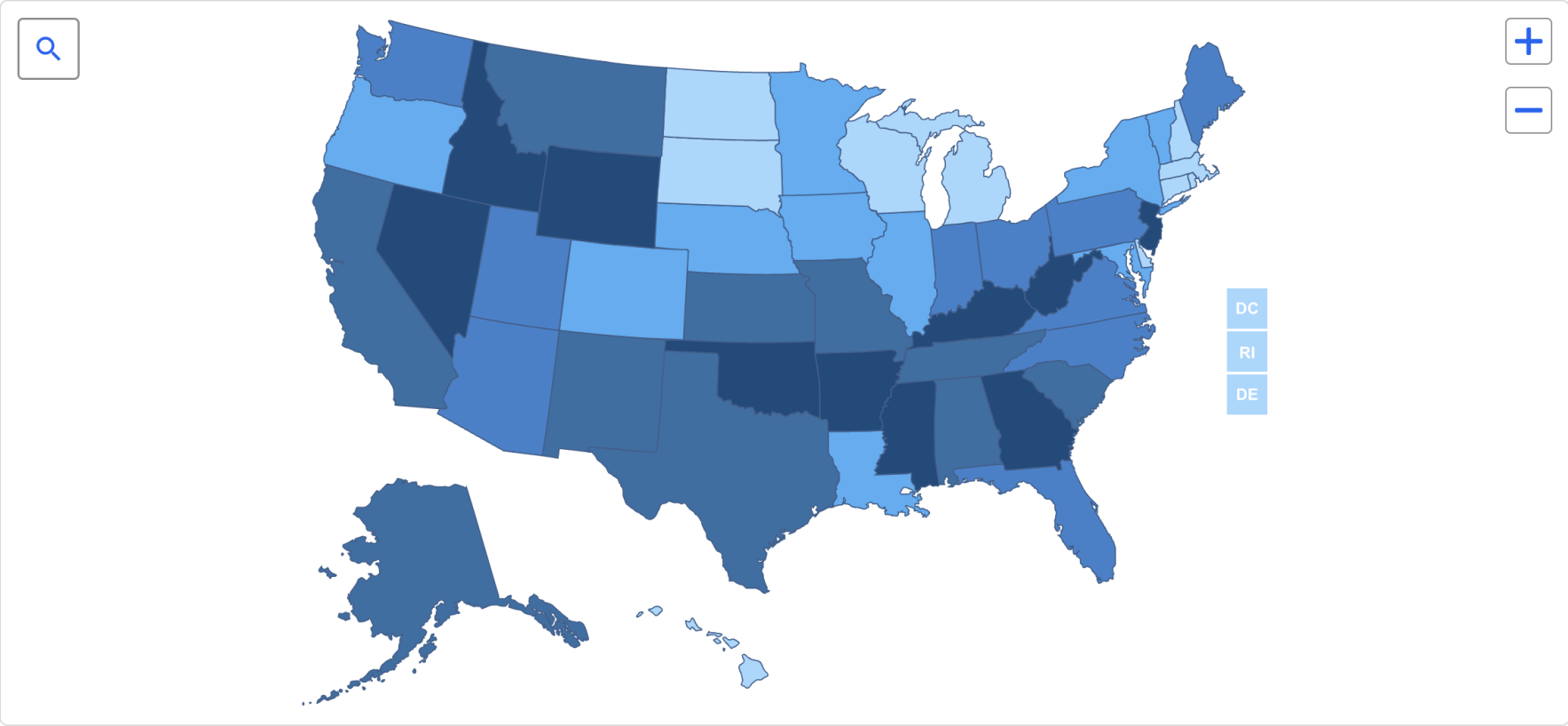
Data from CDC, Behavioral Risk Factor Surveillance System, 2022

>= 56.1% | 53.7% - 56.0% | 51.6% - 53.6% | 48.9% - 51.5% | <= 48.8%

• Data Unavailable

Link: https://www.americashealthrankings.org/explore/measures/cervical_cancer_screen_women

HPV vaccine coverage 2023 both genders

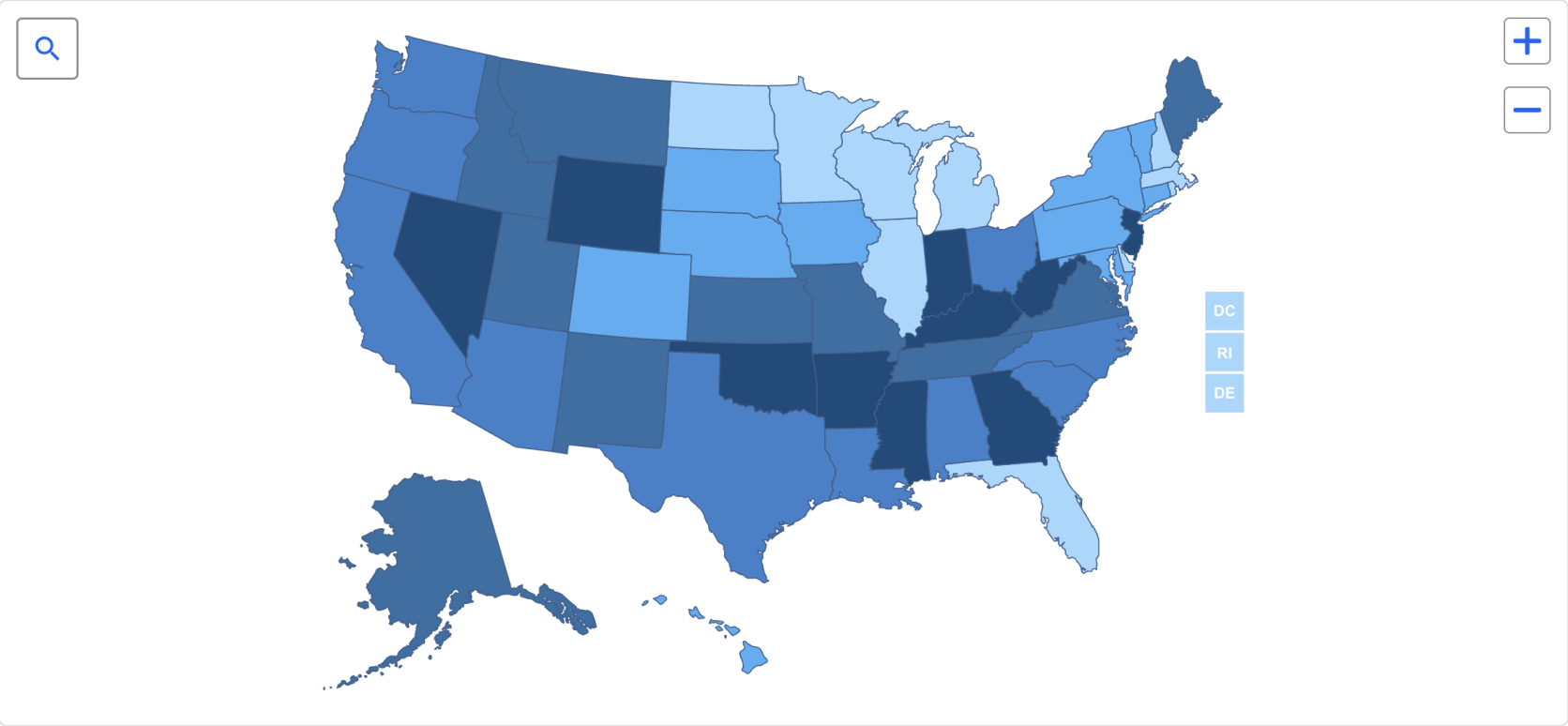


Data from CDC, National Immunization Survey-Teen, 2023

>= 69.9%	66.2% - 69.8%	61.2% - 66.1%	54.4% - 61.1%	<= 54.3%

https://www.americashealthrankings.org/explore/measures/Immunize_HPV

HPV vaccine coverage 2023 girls

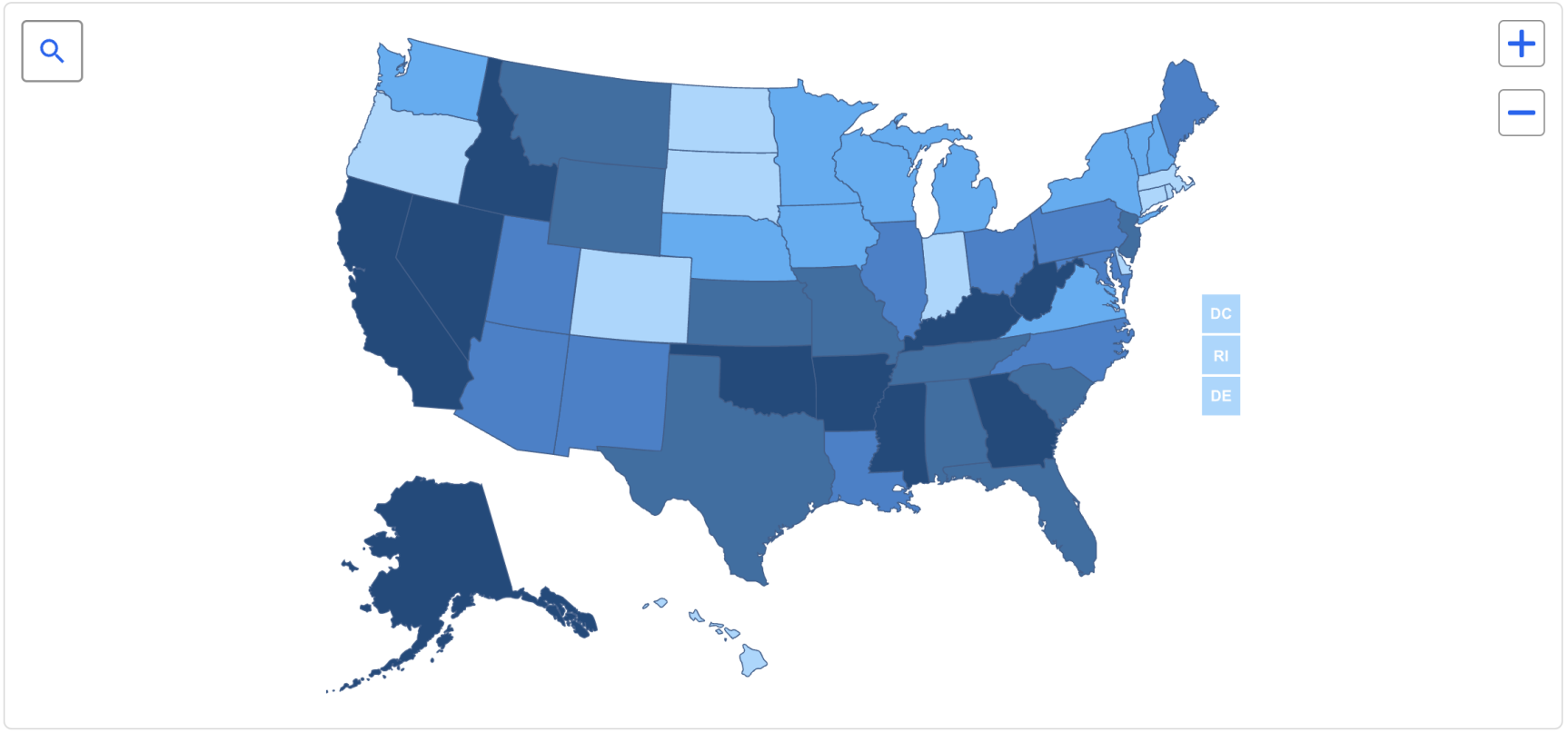


Data from CDC, National Immunization Survey-Teen, 2023

>= 72.3%	66.9% - 72.2%	61.2% - 66.8%	56.9% - 61.1%	<= 56.8%

https://www.americashealthrankings.org/explore/measures/Immunize_HPV

HPV vaccine coverage 2023 boys



Data from CDC, National Immunization Survey-Teen, 2023

>= 68.1%	65.7% - 68.0%	61.7% - 65.6%	52.4% - 61.6%	<= 52.3%

https://www.americashealthrankings.org/explore/measures/Immunize_HPV

Background

- The state-level variations may potentially impact the long-term reduction in cervical cancers and cancer deaths of the elimination efforts

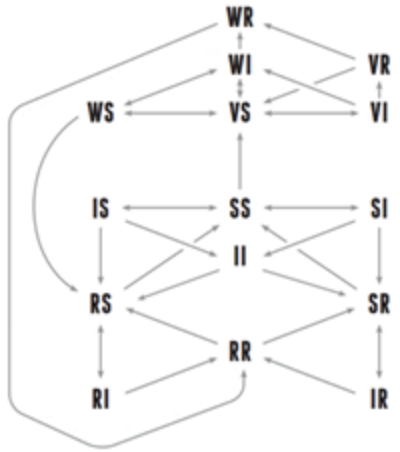
- Mathematical modeling can be used to project the effect of different interventions over time

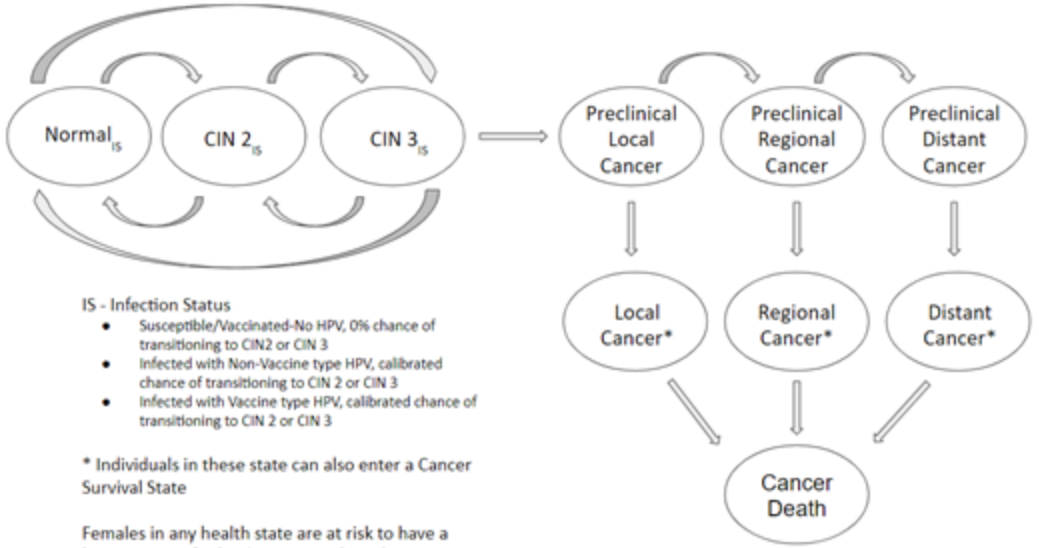
Model Overview

- CISNET Cervix Collaborative (C3) model
- Tailored to the 50 US states
- Used to simulate state variations in cervical cancer incidence and mortality and predict the impact of different assumptions about efforts to increase screening and vaccination uptake

Methods

- C3 state-level model of HPV and cervical cancer accounts for:
  - Transmission of HPV
  - Development of cervical cancer
  - Impact of screening
  - Impact of vaccination





IS - Infection Status

- Susceptible/Vaccinated-No HPV, 0% chance of transitioning to CIN2 or CIN 3
- Infected with Non-Vaccine type HPV, calibrated chance of transitioning to CIN 2 or CIN 3
- Infected with Vaccine type HPV, calibrated chance of transitioning to CIN 2 or CIN 3

* Individuals in these state can also enter a Cancer Survival State

Females in any health state are at risk to have a hysterectomy for benign reasons based on state level data

State-level Data

Demographic parameters

Population age structure: US population by age, state, and gender (American Community Survey)

Background mortality (United State Mortality Database)

Hysterectomy: age-specific hysterectomy rate for noncancerous conditions (National Hospital Discharge Survey Data)

State-level Data

Sexual behavior parameters

State-specific age of sexual debut (Durham et al.)

Durham DP, Ndeffo-Mbah ML, Skrip LA, Jones FK, Bauch CT, Galvani AP. National- and state-level impact and cost-effectiveness of nonavalent HPV vaccination in the United States. Proc Natl Acad Sci U S A. 2016 May 3;113(18):5107-12. doi: 10.1073/pnas.1515528113. Epub 2016 Apr 18. PMID: 27091978; PMCID: PMC4983834.

State-level Data

Screening and vaccination uptake

Cervical cancer screening (Behavioral Risk Factor Surveillance System)

HPV vaccination (National-Immunization Survey- Teen)

Analysis 1

Three example states: California, Taxes, New York

Intervention considered: HPV vaccination

Leading author: Dr. Fernando Alarid-Escudero

Collaborators: Valeria Gracia, MS, Marina Wolf, MD, Ran Zhao, PhD, Caleb W Easterly, BS, Jane J Kim, PhD, Karen Canfell, DPhil, Inge M C M de Kok, PhD, Ruanne V Barnabas, MB, ChB, PhD, Shalini Kulasingam, PhD

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OXFORD

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Article

State-level disparities in cervical cancer prevention and outcomes in the United States: a modeling study

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Abstract

Background: Despite human papillomavirus (HPV) vaccines' availability for over a decade, coverage across the United States varies. Although some states have tried to increase HPV vaccination coverage, most model-based analyses focus on national impacts. We evaluated hypothetical changes in HPV vaccination coverage at the national and state levels for California, New York, and Texas using a mathematical model.

Methods: We developed a new mathematical model of HPV transmission and cervical cancer, creating national- and state-level models, incorporating country- and state-specific vaccination coverage and cervical cancer incidence and mortality. We quantified the national- and state-level impact of increasing HPV vaccination coverage to 80% by 2025 or 2030 on cervical cancer outcomes and the time to elimination defined as less than 4 per 100 000 women.

Results: Increasing vaccination coverage to 80% in Texas over 10 years could reduce cervical cancer incidence by 50.9% (95% credible interval [CrI] = 46.6%-56.1%) by 2100, from 1.58 (CrI = 1.19-2.09) to 0.78 (CrI = 0.57-1.02) per 100 000 women. Similarly, New York could see a 27.3% (CrI = 23.9%-31.5%) reduction from 1.43 (CrI = 0.93-2.07) to 1.04 (CrI = 0.66-1.53) per 100 000 women, and California a 24.4% (CrI = 20.0%-30.0%) reduction from 1.01 (CrI = 0.66-1.44) to 0.76 (CrI = 0.50-1.09) per 100 000 women. Achieving 80% coverage in 5 years will provide slightly larger and sooner reductions. If the vaccination coverage levels in 2019 continue, cervical cancer elimination could occur nationally by 2051 (CrI = 2034-2064), but state timelines may vary by decades.

Conclusion: Targeting an HPV vaccination coverage of 80% by 2030 will disproportionately benefit states with low coverage and higher cervical cancer incidence. Geographically focused analyses can better inform priorities.

Simulated Scenarios

1

Status quo

States continue at the 2019 level of vaccination

2

Healthy People 5 years

80% vaccination of males and females ages 13-15, achieved in five years

3

Healthy People 10 years

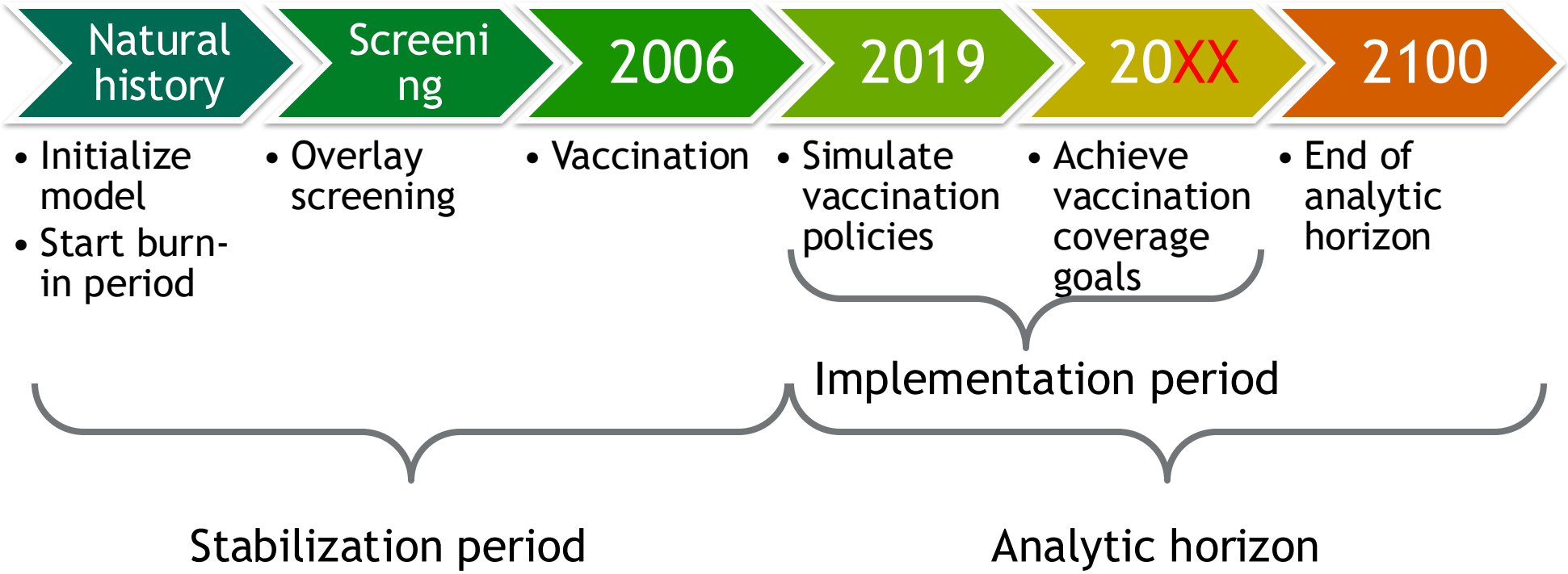
80% vaccination of males and females ages 13-15, achieved in ten years

4

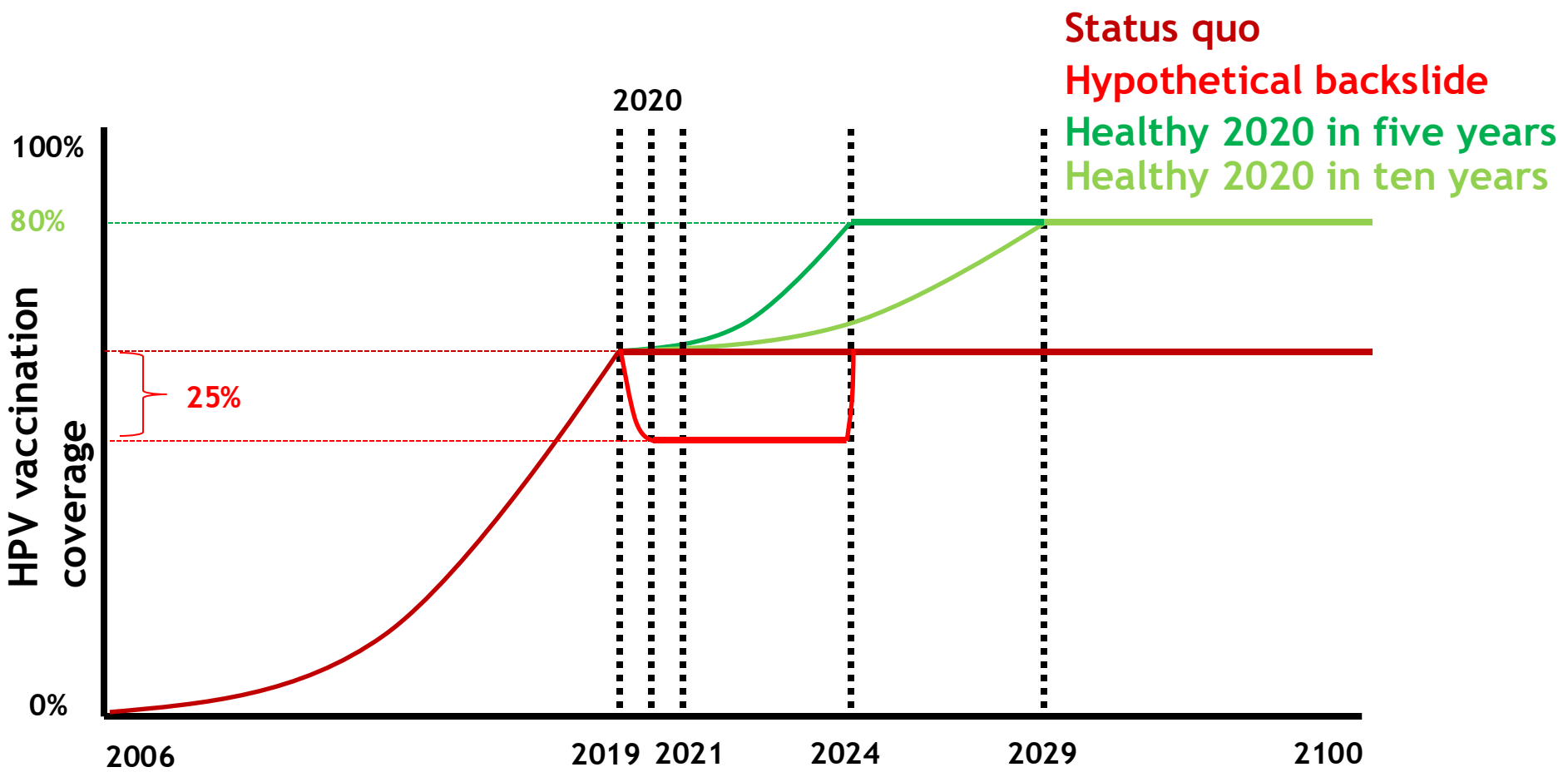
Hypothetical backslide

25% decrease in both vaccinations and screening from the status quo for five years due to the COVID-19 pandemic

Timeline


Natural history
Screening
2006
2019
20XX
2100
• Initialize model
• Start burn-in period
• Overlay screening
• Vaccination
• Simulate vaccination policies
• Achieve vaccination coverage goals
• End of analytic horizon
Implementation period
Stabilization period
Analytic horizon

Vaccination scenarios



Screening and Vaccination Assumptions for Status Quo Scenario

Table 1. Country and state-specific vaccination and screening coverage

Country or state	Vaccination coverage in 2019[a,25]		Screening coverage in 2020[a,26]
	At least 2 doses of HPV vaccine, boys aged 13-17 years	At least 2 doses of HPV vaccine, girls aged 13-17 years	Women aged 21-65 years who have had a Pap test in the past 3 years
United States	54.8%	60.7%	77.7%
California	54.5%	70.9%	79.3%
New York	57.1%	64.0%	79.8%
Texas	49.6%	54.2%	75.0%

[a] Vaccination coverage is defined as the proportion of boys or girls aged 13-17 years who have received at least 2 doses of the HPV vaccine. Screening coverage is defined as the proportion of women aged 21-65 years who have had a Pap test in the past 3 years. The denominator has been adjusted for women who had hysterectomy. HPV = human papillomavirus.

Analysis

Primary outcomes: cervical cancer incidence and mortality over time

Results: percent reduction in incidence and mortality compared to status quo at the end of the simulation

Results

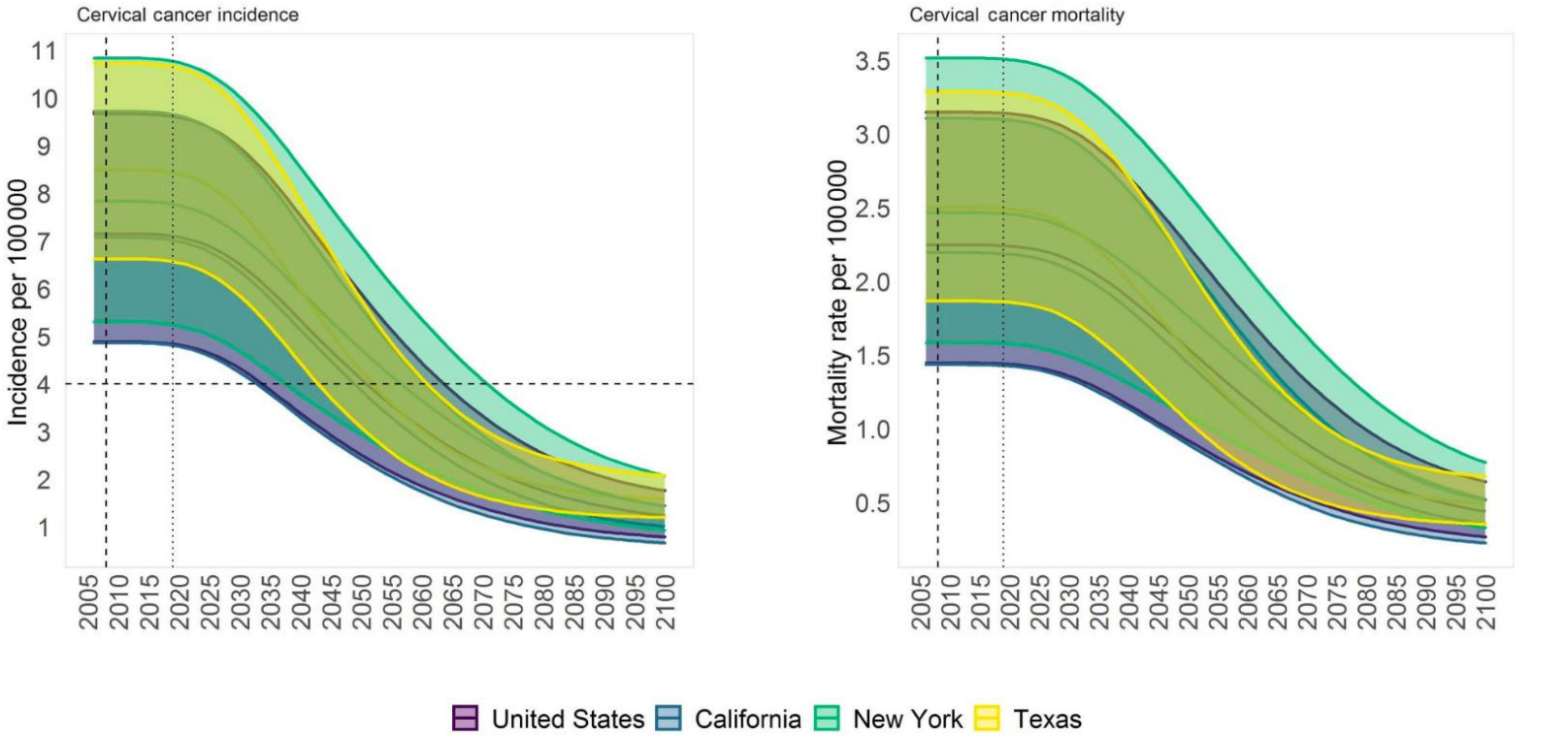


Figure 1. Cervical cancer incidence and mortality over time for the United States, California, New York, and Texas, assuming human papillomavirus vaccination coverage in 2019. The **vertical dashed line** denotes the US Food and Drug Administration approval of the human papillomavirus vaccine for women. The **vertical dotted line** denotes the beginning of the predicted outcomes. The **horizontal dashed line** in cervical cancer incidence at 4 per 100 000 represents the cervical cancer elimination goal. The **shaded area** shows the 95% posterior model-predictive credible interval (CrI) of the outcomes. The **solid lines** show the posterior model-predicted mean based on 1000 simulations using samples from the posterior distribution.

Results

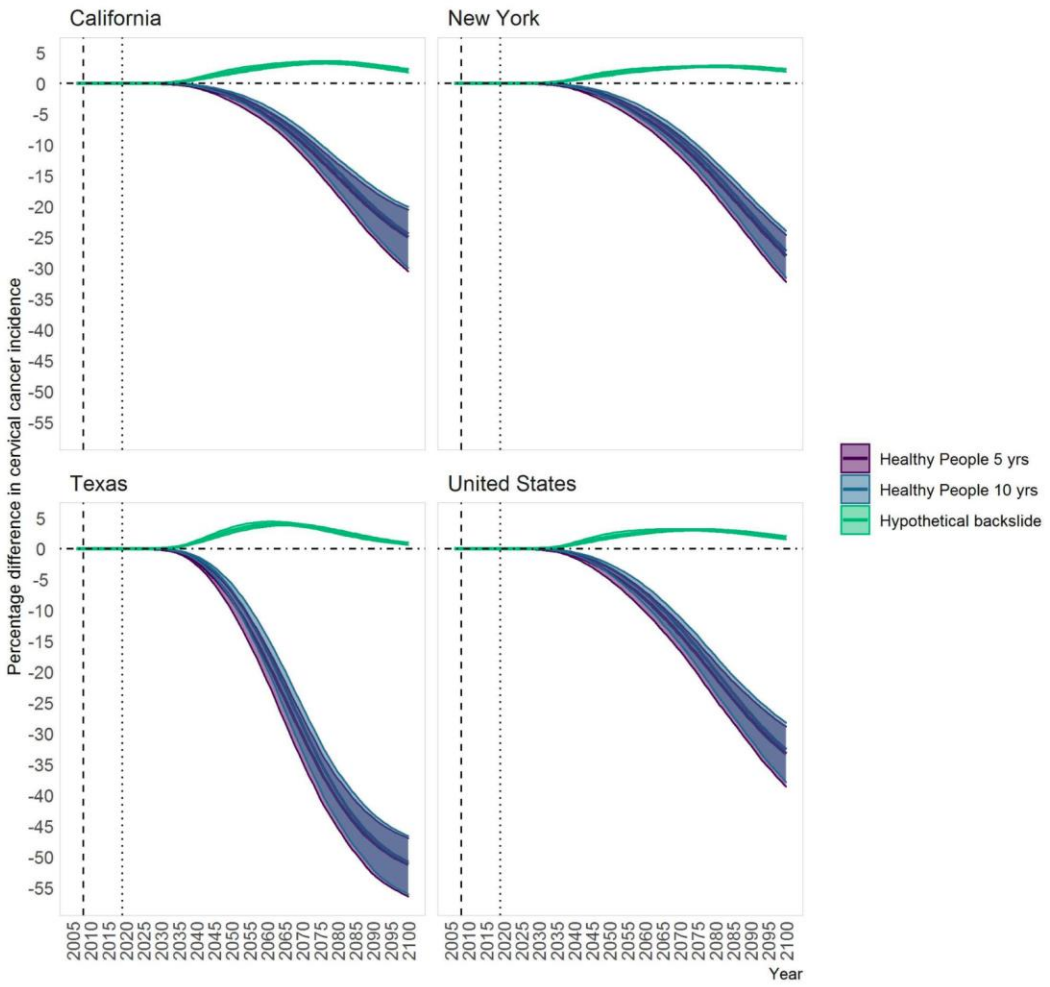


Figure 2. Percentage difference in cervical cancer incidence over time for different human papillomavirus vaccination coverage scenarios (ie, 25% reduction in vaccination coverage for 5 years [backslide] or reaching 80% vaccination coverage [Healthy People] in 5 or 10 years) relative to continuing with coverage in 2019 for the United States and 3 states. The **shaded area** shows the 95% posterior model-predictive credible interval of the outcomes. The **solid lines** show the posterior model-predicted mean based on 1000 simulations using samples from the posterior distribution.

Results

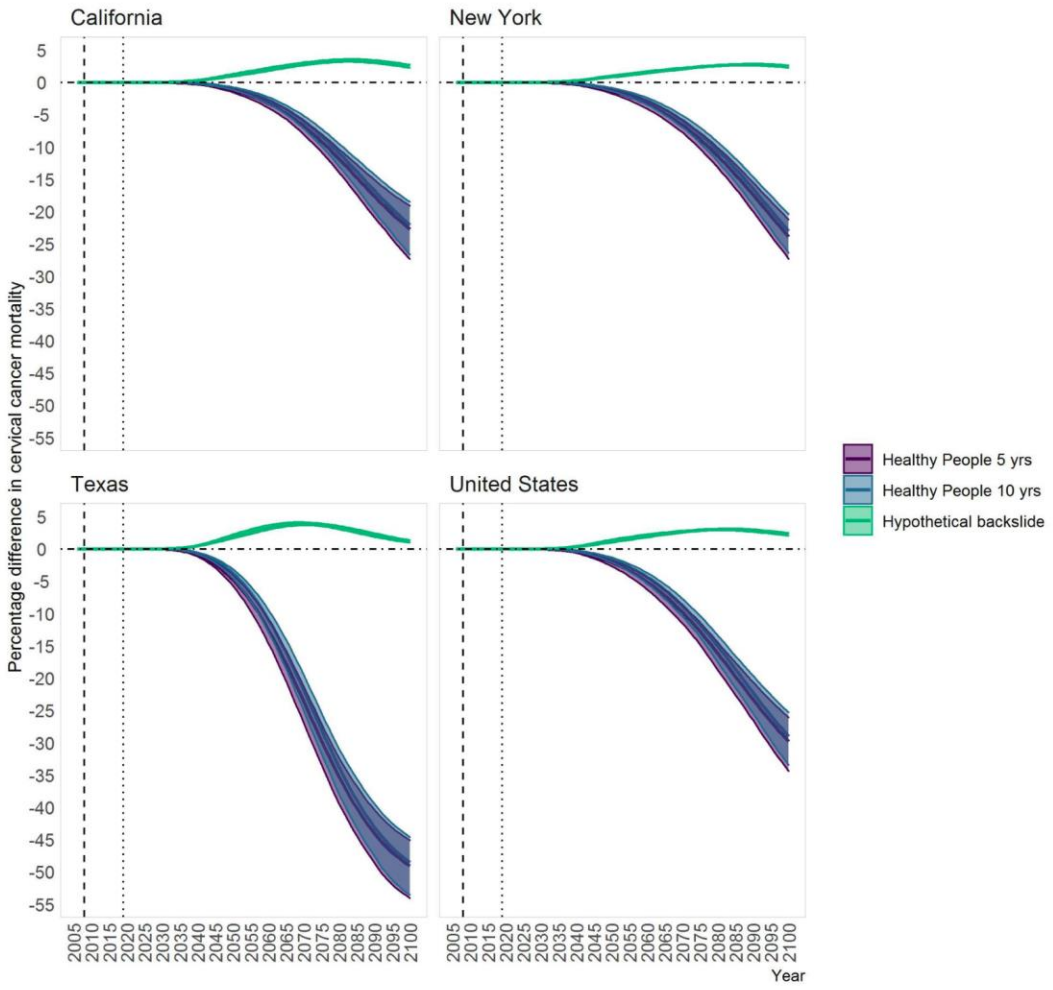


Figure 3. Percentage difference in cervical cancer mortality over time for different human papillomavirus vaccination coverage scenarios (ie, 25% reduction in vaccination coverage for 5 years [backslide] or reaching 80% vaccination coverage [Healthy People] in 5 or 10 years) relative to continuing with coverage in 2019 for the United States and 3 states. The **shaded area** shows the 95% posterior model-predictive credible interval of the outcomes. The **solid lines** show the posterior model-predicted mean based on 1000 simulations using samples from the posterior distribution.

Conclusion

- Achieving HPV vaccination coverage target of 80% by 2030 will disproportionately benefit states with low coverage and higher cervical cancer incidence
- Geographically focused analyses can better inform priorities

Current Work

All 50 states

Intervention considered: both cervical cancer screening and HPV vaccination

Leading author: Dr. Ran Zhao

Collaborators

CISNET -- Shalini Kulasingam, PhD, Fernando Alarid-Escudero, PhD Madalyn Nones, MPH; Inge M.C.M. de Kok, PhD; Jan A.C. Hontelez, PhD; Daniel D. de Bondt, MSc

ACS: Adair K Minihan, MPH; Priti Bandi, PhD; Debbie Saslow, PhD; Ahmedin Jemal

SCHOOL OF PUBLIC HEALTH
UNIVERSITY OF MINNESOTA

Disparities in Screening and Vaccination uptake

- HPV vaccination coverage in 2021 (states with the lowest coverage in female adolescents)

State	Female	Male	Region
Mississippi	35.2	32.8	Southeastern
Kentucky	50.0	67.0	Southeastern
Montana	50.9	58.6	Western
Wyoming	51.0	47.7	Western
Florida	53.5	53.4	Southeastern
Nevada	56.9	58.0	Western
Texas	57.1	50.0	Southern
Oklahoma	57.2	60.8	Southern
Arkansas	58.9	58.5	Southeastern
Alabama	60.0	68.5	Southeastern
Alaska	60.9	53.1	Western
Louisiana	63.1	69.3	Southeastern
South Carolina	63.2	67.4	Southeastern
Oregon	63.3	70.6	Western
New Jersey	63.31	51.04	Northeastern

- Cervical cancer screening uptake (states with the highest proportion of never-screeners among age 30-65 years old women)

State	Age 21-29	Age 30-65	Region
Illinois	36.1	35.3	Midwestern
Hawaii	36.4	30.6	Western
Texas	31.2	25.5	Southern
New Jersey	38.6	22.6	Northeastern
New York	38.2	22.1	Northeastern
Mississippi	18.2	22.0	Southeastern
Nevada	25.3	21.8	Western
Idaho	39.0	20.8	Western
Alaska	40.8	20.3	Western
Massachusetts	46.2	19.4	Northeastern
Oklahoma	31.9	19.0	Southern
Florida	31.7	18.8	Southeastern
Missouri	29.5	18.6	Southeastern
Virginia	36.1	18.3	Southeastern
Pennsylvania	29.7	17.6	Northeastern

Simulated Scenarios

1

Status quo

No additional efforts to increase HPV vaccination coverage or screening uptake

2

Increase in vaccination coverage only

80% (or 90%) vaccination in adolescents (both boys and girls) in 2030

3

Increase in screening uptake only

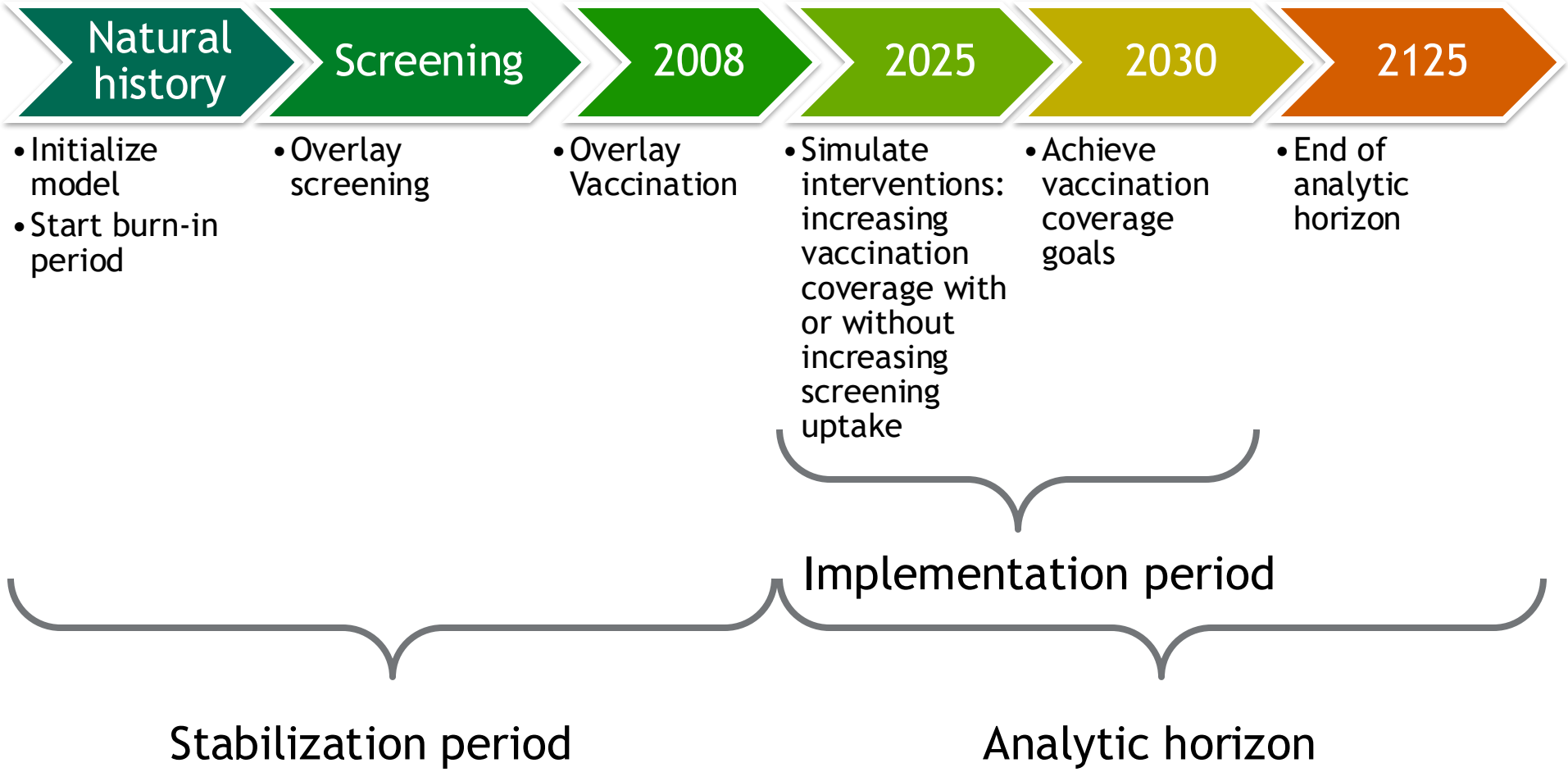
5% of the never-screeners would participate in screening using a self-collected primary HPV test every 5 years

4

Increase in both vaccination coverage and screening uptake

Combine scenarios 2 and 3

Timeline


Natural history
Screening
2008
2025
2030
2125
• Initialize model
• Start burn-in period
• Overlay screening
• Overlay Vaccination
• Simulate interventions: increasing vaccination coverage with or without increasing screening uptake
• Achieve vaccination coverage goals
• End of analytic horizon
Implementation period
Stabilization period
Analytic horizon

To be continued....

Presenter:

Dr. Ran Zhao

University of Minnesota School of Public Health

Department of Epidemiology and Community Health

Email: zhao0675@umn.edu

William (Sam) Greenfield, MD

SPEAKER

Professor

Obstetrics & Gynecology

University of Arkansas for Medical Sciences

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Cervical Cancer in Arkansas: A Public Health Perspective

William Greenfield, MD

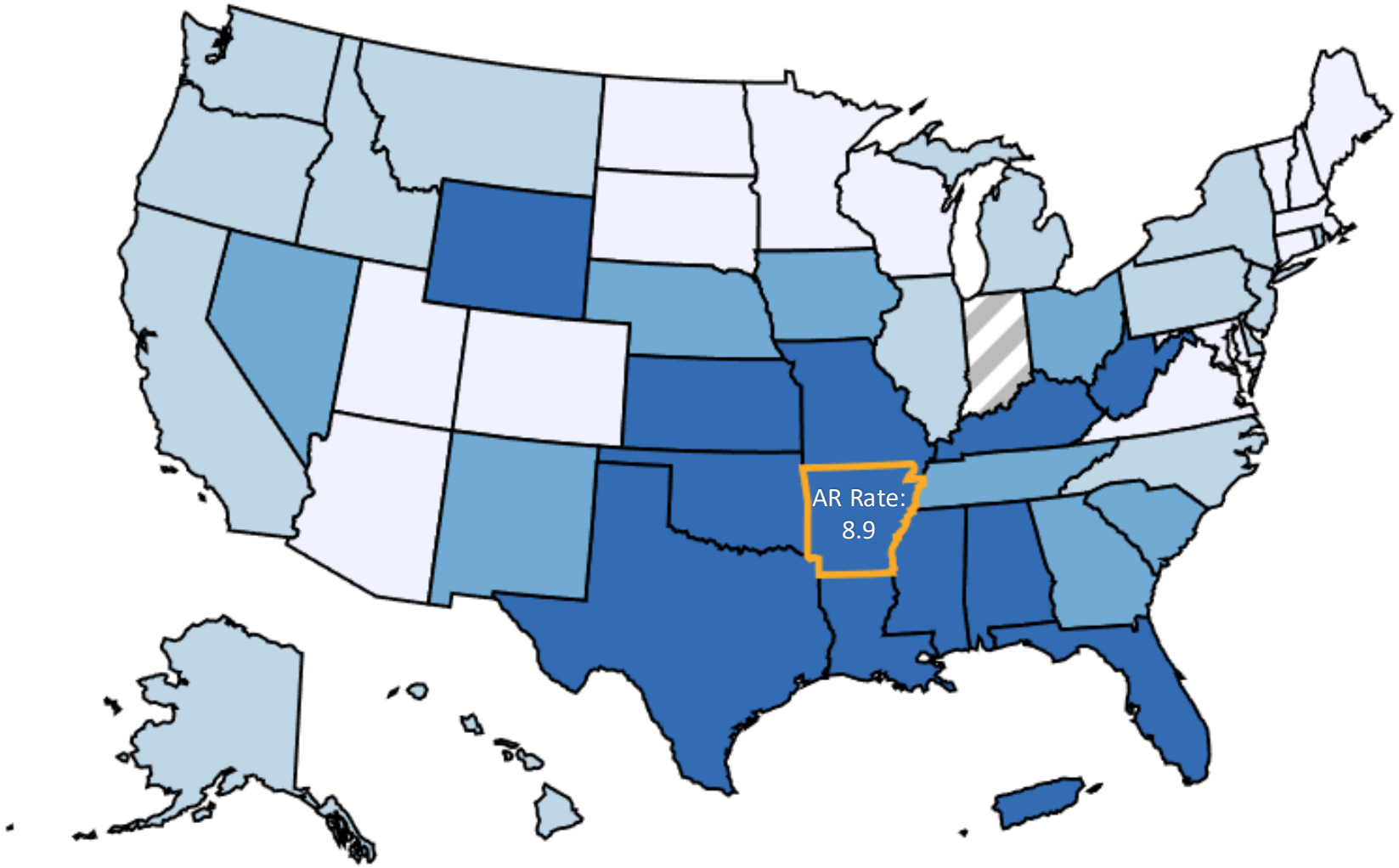
Professor

Obstetrics & Gynecology

University of Arkansas for Medical Sciences

March 5,2025

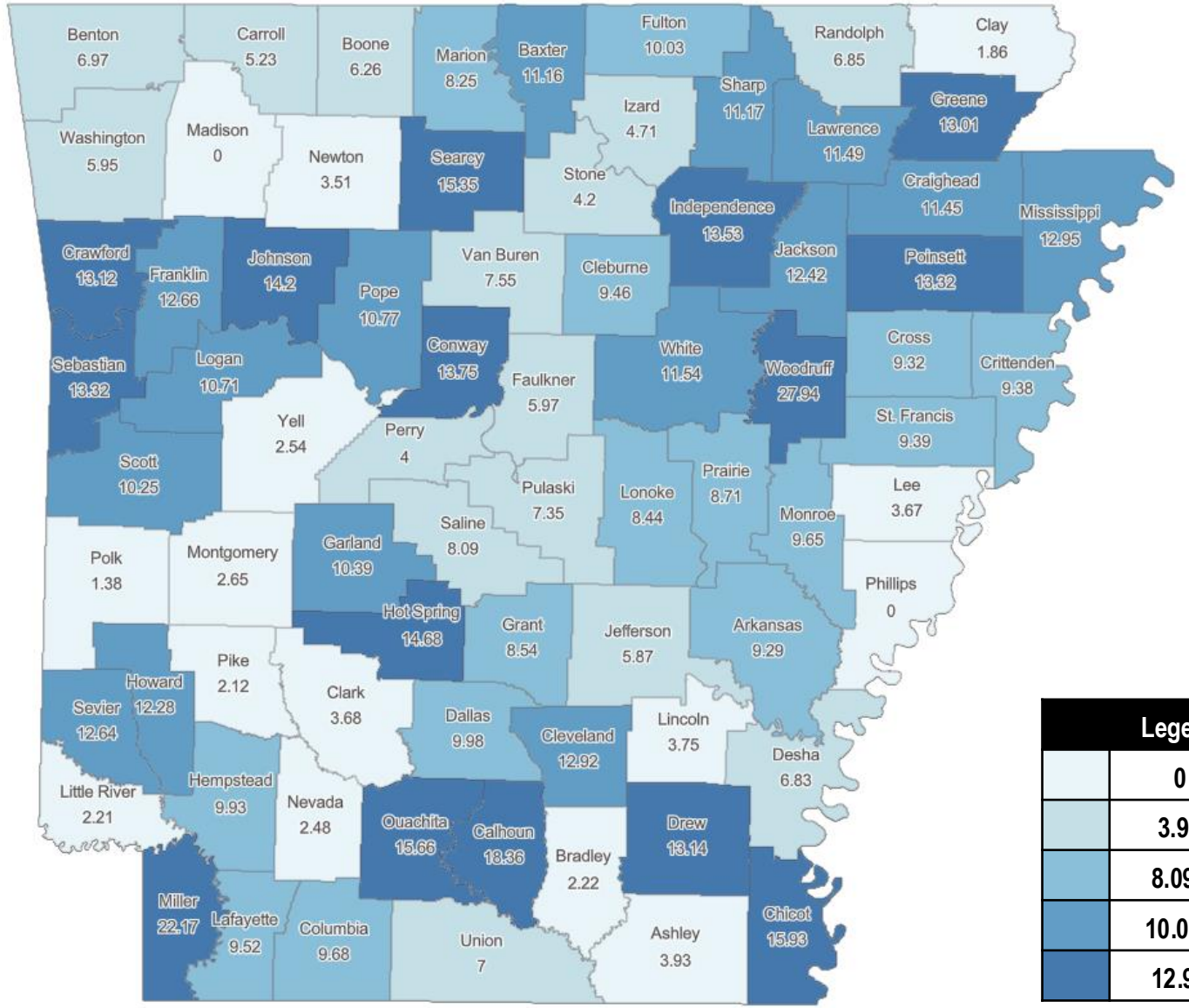
Map of HPV-associated cervical cancer incidence rate among females, US, 2017 – 2021



US Rate:
7.1

Legend	
	4.6 – 6.1
	6.2 – 6.9
	7.1 – 7.8
	7.9 – 11.0
	Data unavailable

Map of HPV-Associated Cervical Cancer Age-Adjusted Incidence Rate by County, Arkansas, 2017-2021

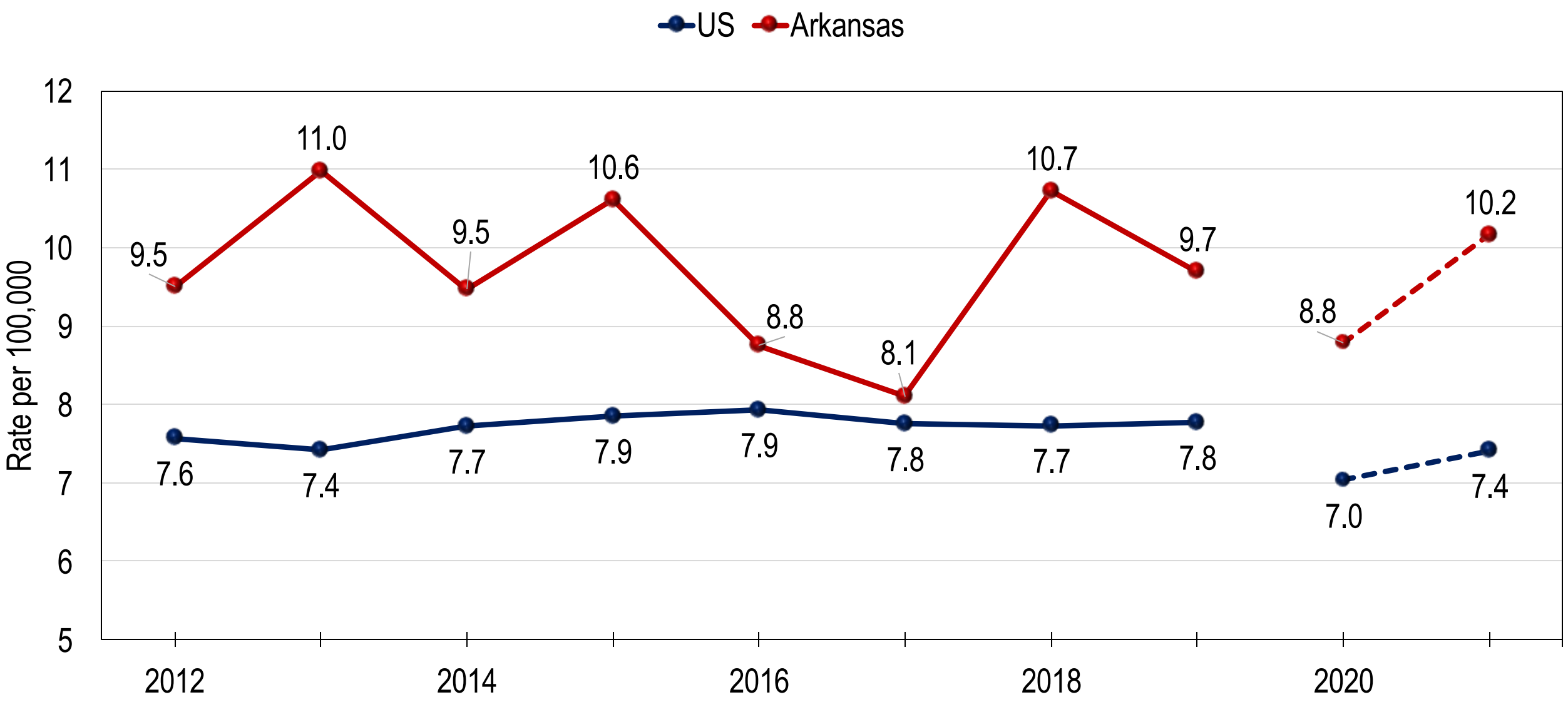


State Rate: 8.96

Legend
0 – 3.90
3.91 – 8.08
8.09 – 10.00
10.01 – 12.90
12.91 – 27.9

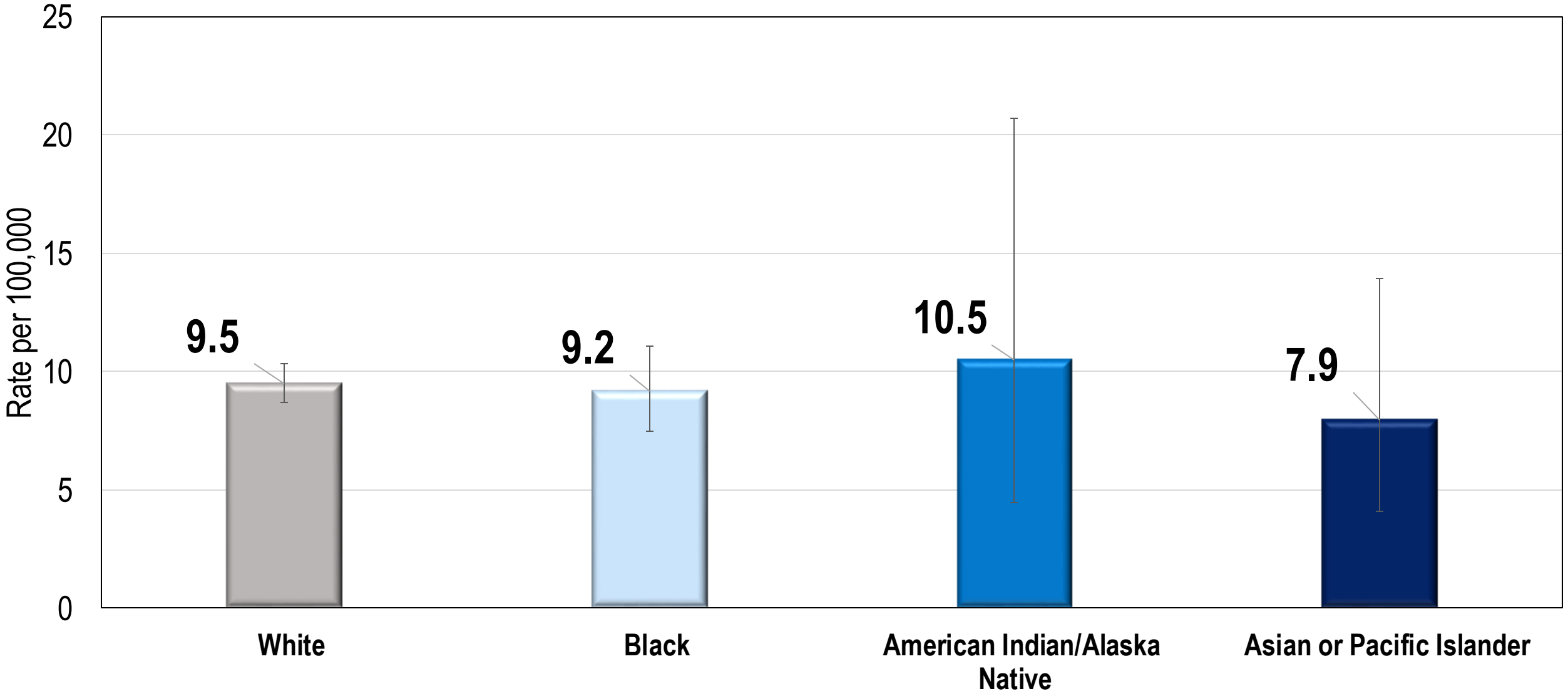
Map created by: Daniela Ramirez Aguilar, MPH
Sources: SEER*Stat, NPCR and SEER Database

Cervical Cancer Age-Adjusted Incidence Trend Rate, US and Arkansas, 2001 – 2021



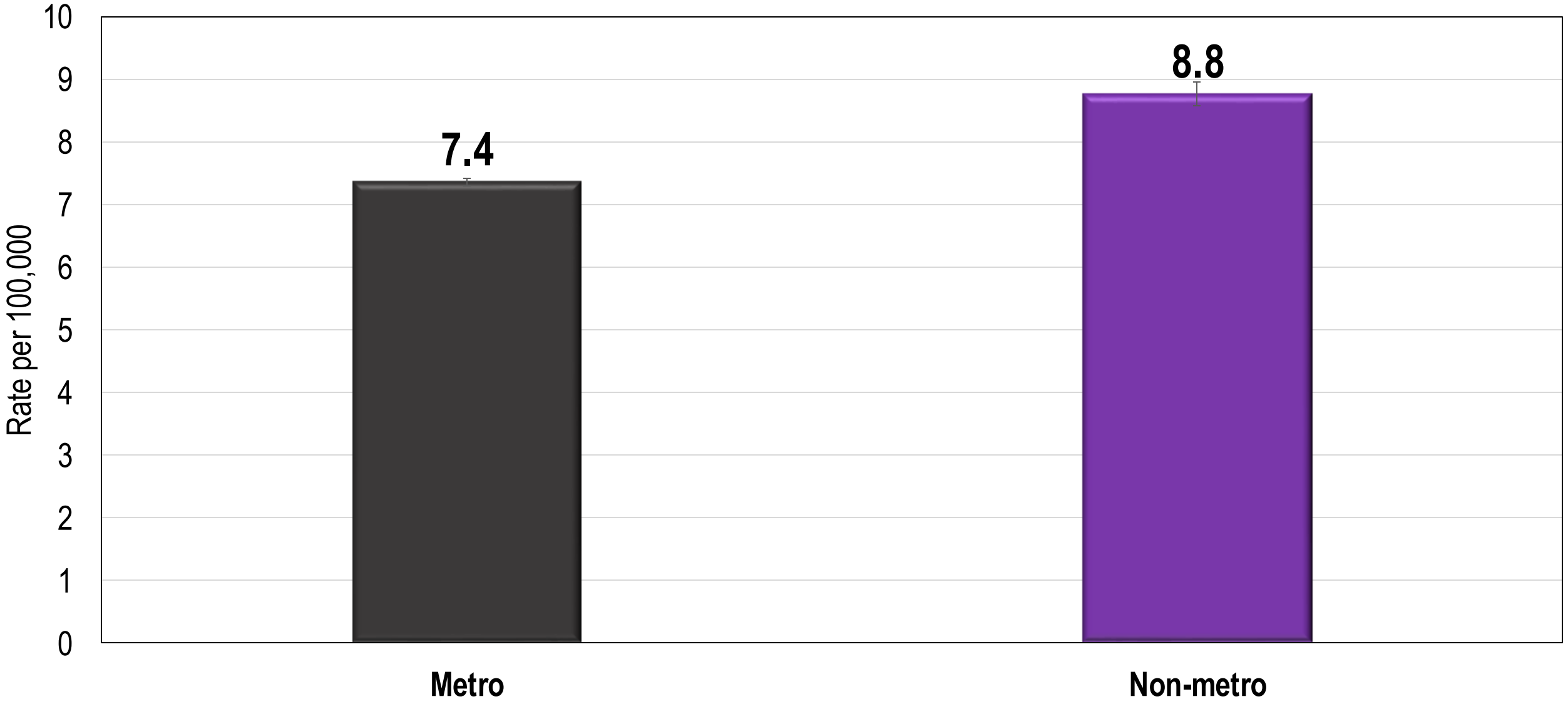
Sources: SEER*Stat, NPCR and SEER Database

Cervical Cancer Age-Adjusted Incidence Rate by Race, Arkansas, 2017 – 2021



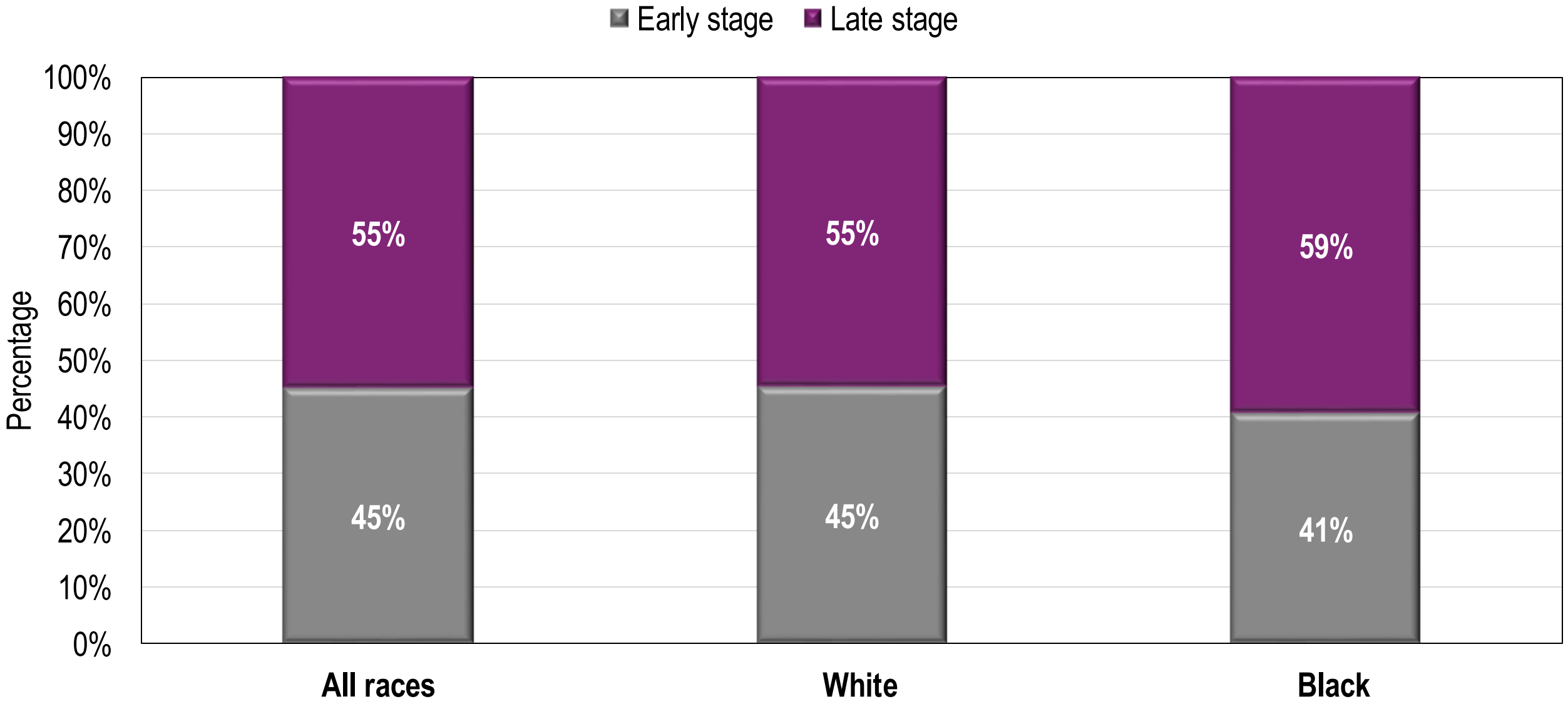
Sources: SEER*Stat, NPCR and SEER Database

Cervical Cancer Age-Adjusted Incidence Rate by Rural Urban Continuum Codes, Arkansas, 2017 – 2021



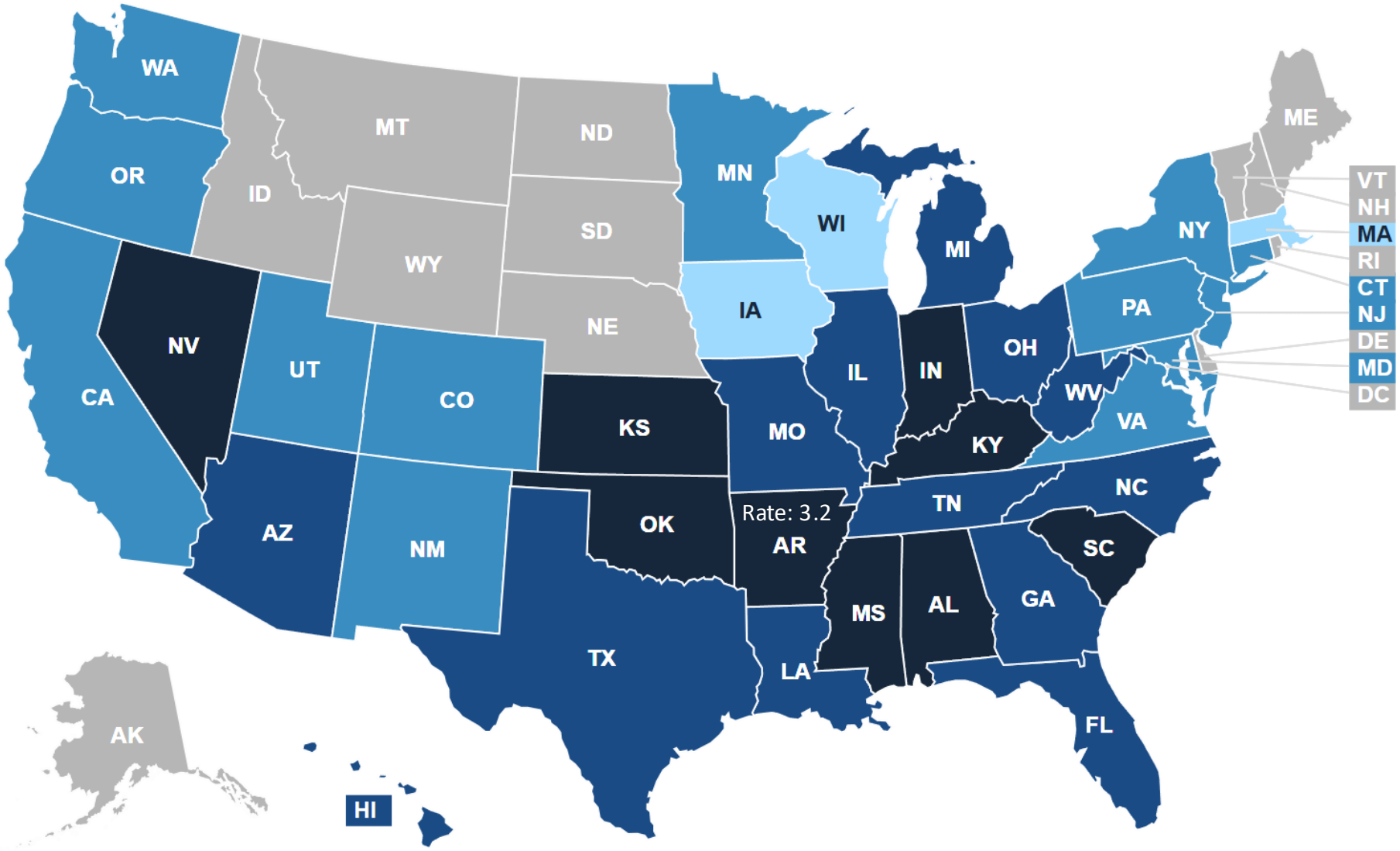
Sources: SEER*Stat, NPCR and SEER Database. Metro denotes urban counties, and non-metro denotes rural counties.

Percentage of Cervical Cancer by Stage and Race, Arkansas, 2017 – 2021



Sources: SEER*Stat, NPCR and SEER Database

Map Overview of Cervical Cancer Mortality Rate Among Females, US, 2021

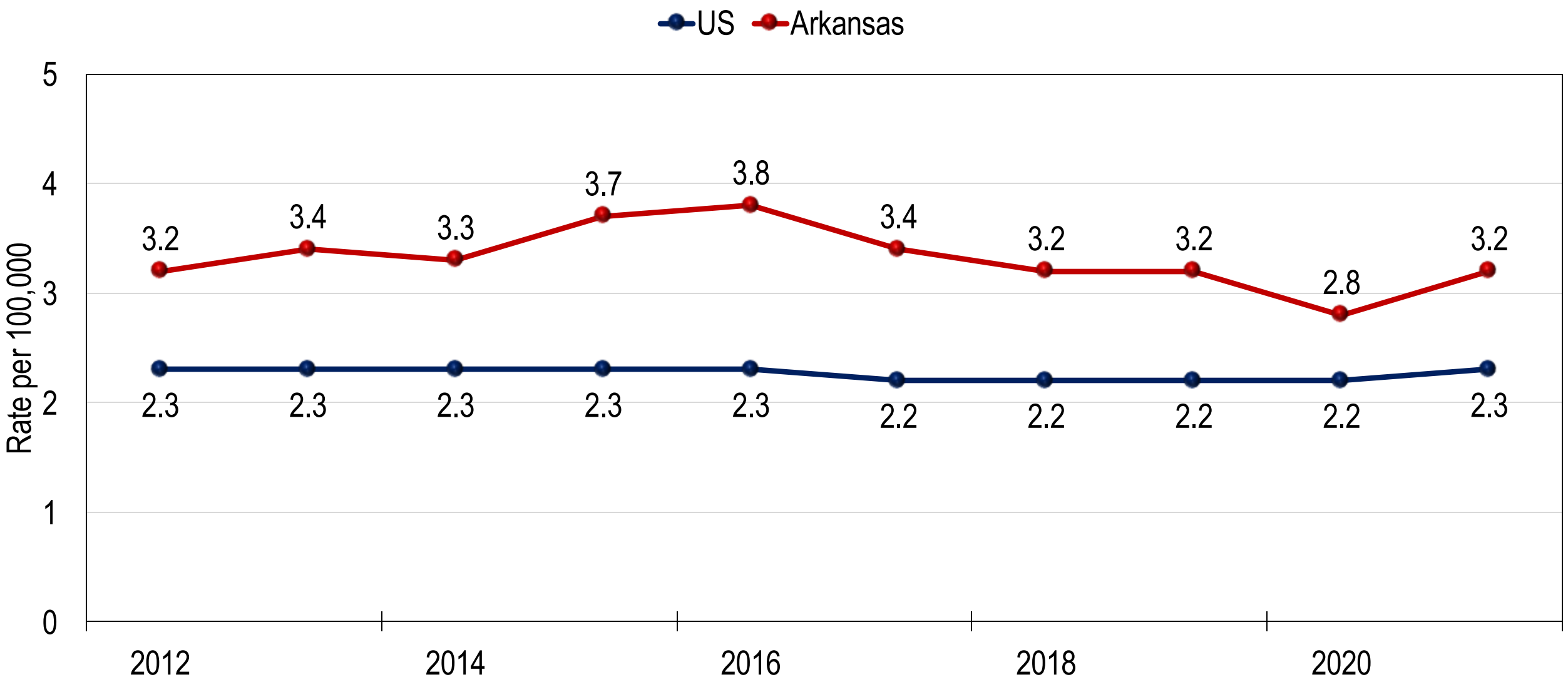


US Rate: 2.3

Legend	
	1.1 – 1.3
	1.5 – 2.1
	2.2 – 2.8
	2.9 – 3.7
	N/a

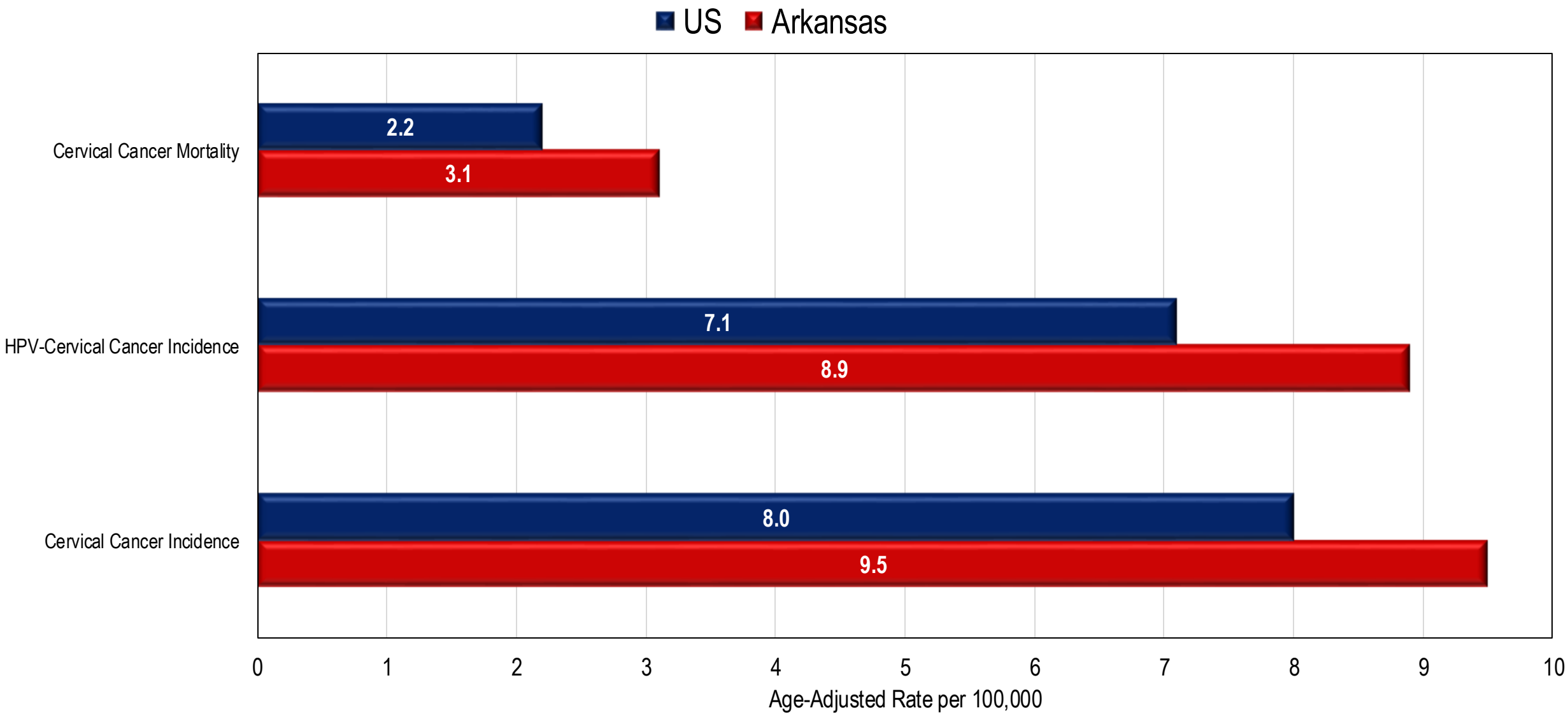
Source: https://www.kff.org/other/state-indicator/cervical-cancer-death-rate/

Cervical Cancer Age-Adjusted Mortality Trend Rate, US and Arkansas, 2012 – 2021

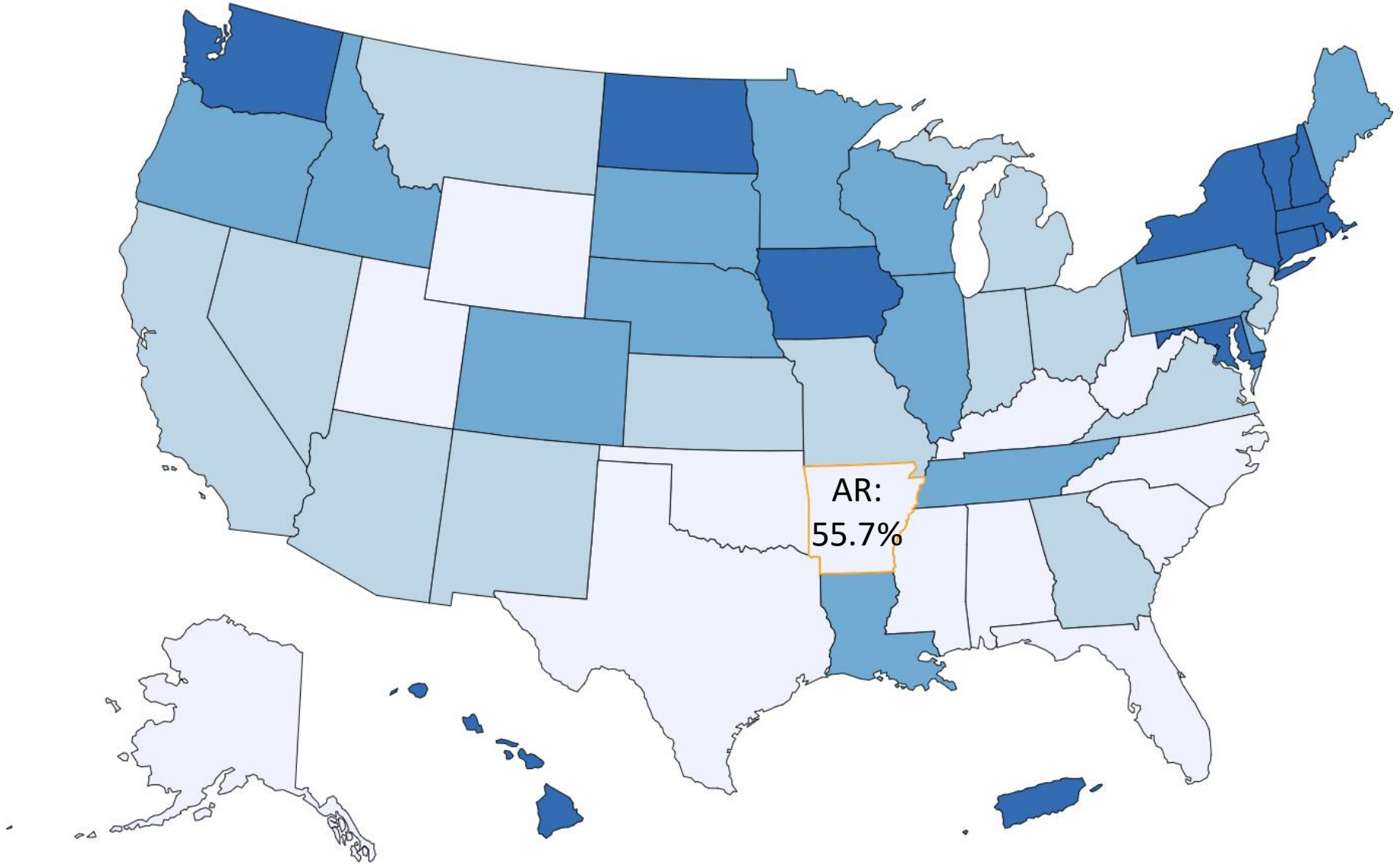


Source: CDC WONDER

Comparison overview of incidence and mortality, US and Arkansas, 2017-2021



Percentage of male and female adolescents (aged 13-17 years) who were reported being up-to-date with HPV vaccinations, US, 2022

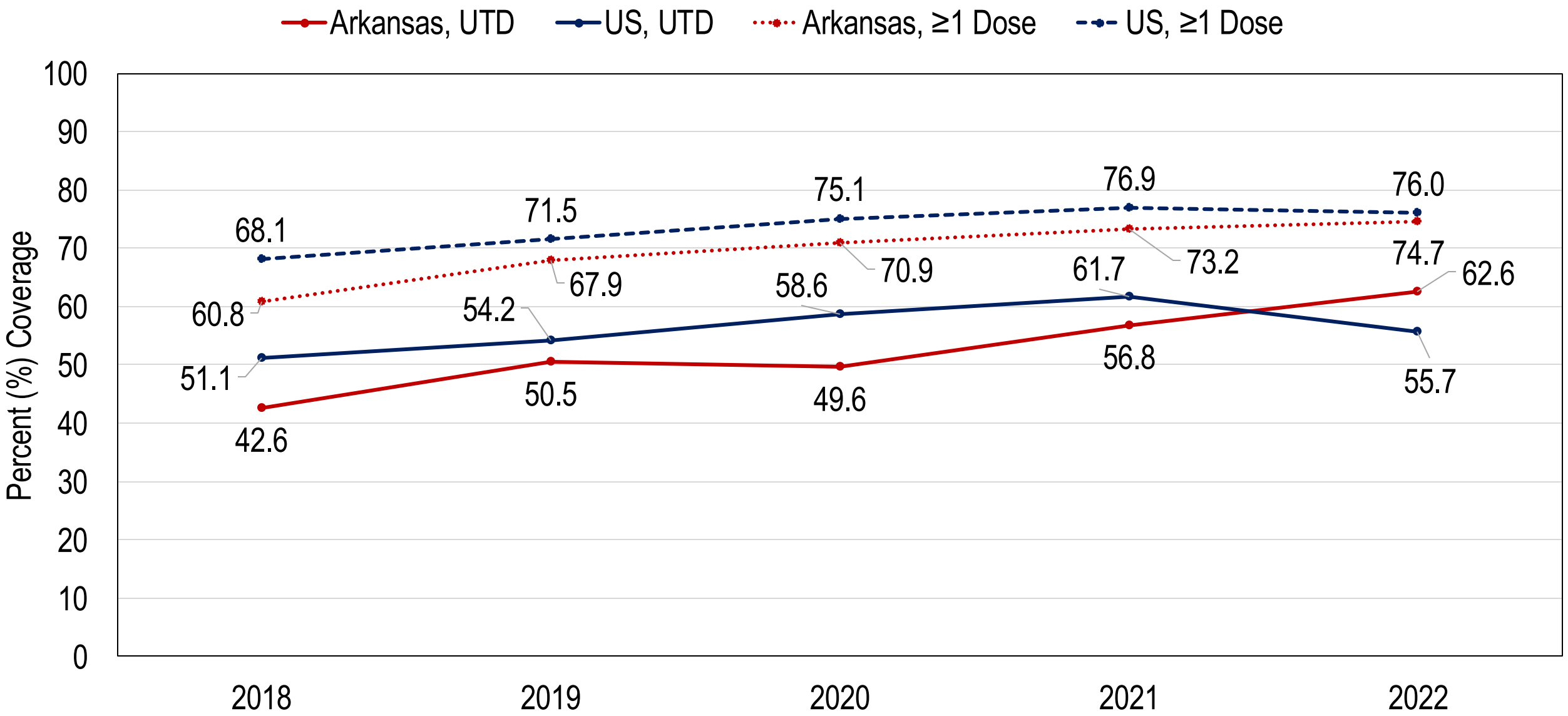


US: 62.6%

Legend	
	38.5 – 59.2
	59.5 – 63.7
	64.4 – 69.0
	70.3 – 85.2

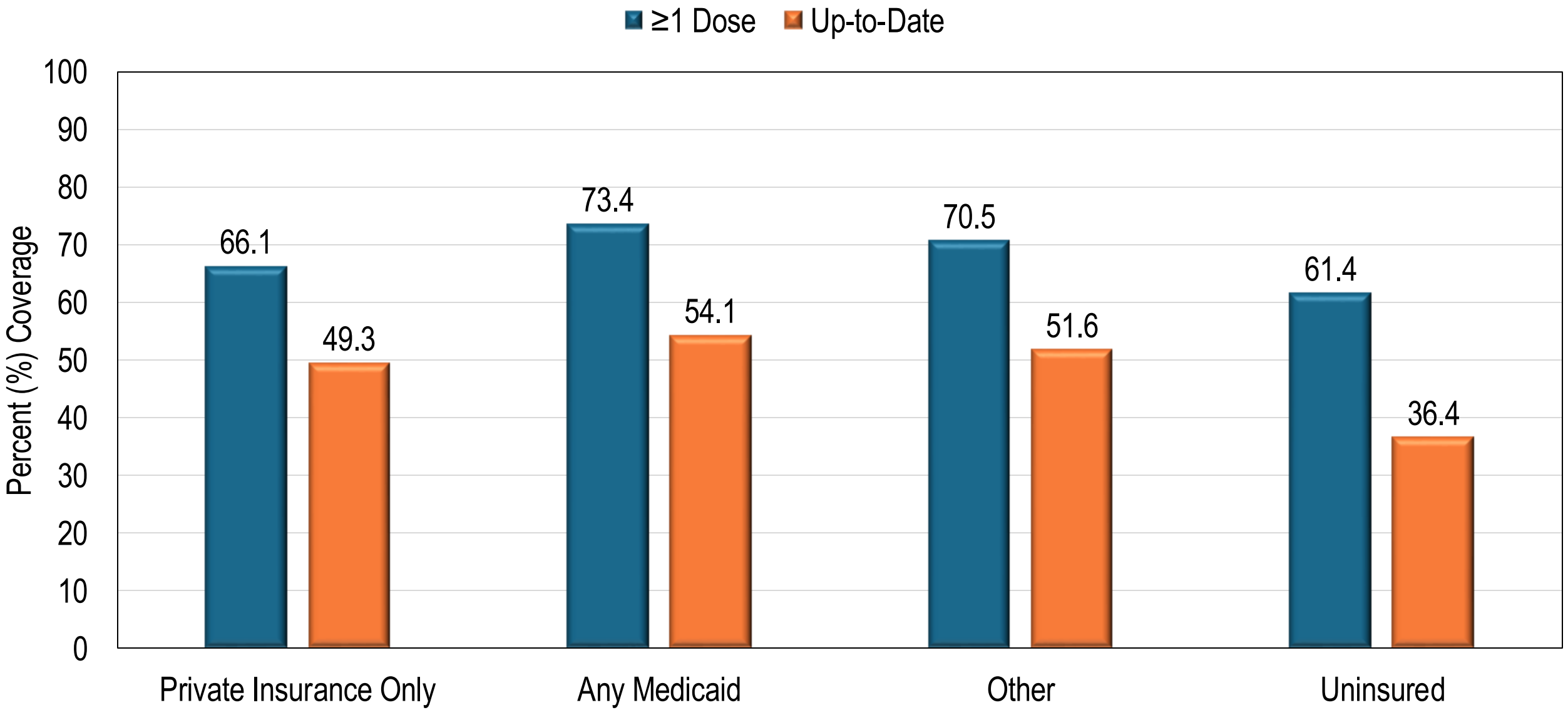
Source: https://gis.cdc.gov/Cancer/USCS/#/HPVVaccination/

Estimated coverage percent of HPV vaccination among males and females (ages 13-17) by dose and year, US and Arkansas, 2018-2022



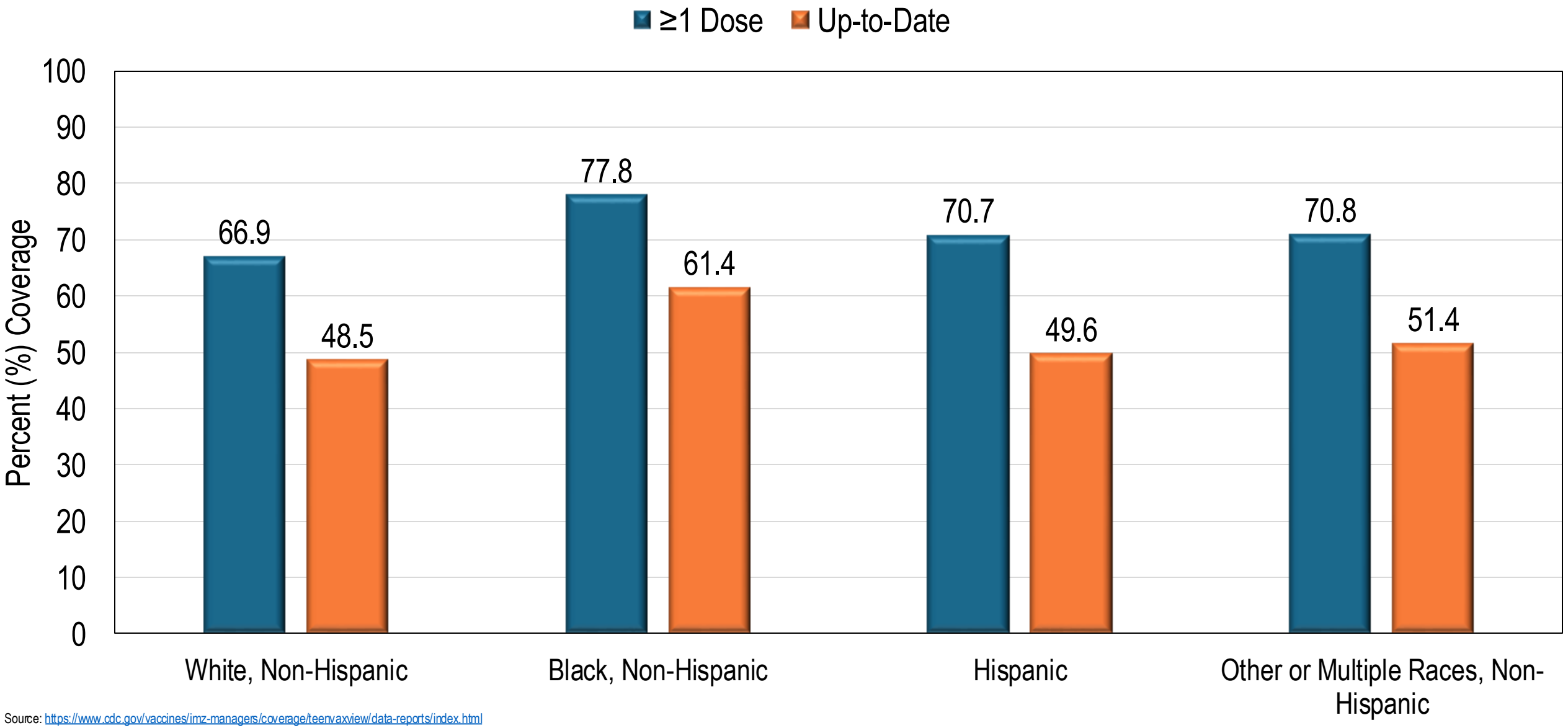
Source: https://www.cdc.gov/vaccines/imz-managers/coverage/teenvaxview/data-reports/index.html

Estimated coverage percent of HPV vaccination among males and females (ages 13-17) by dose and insurance coverage, Arkansas, 2018-2022



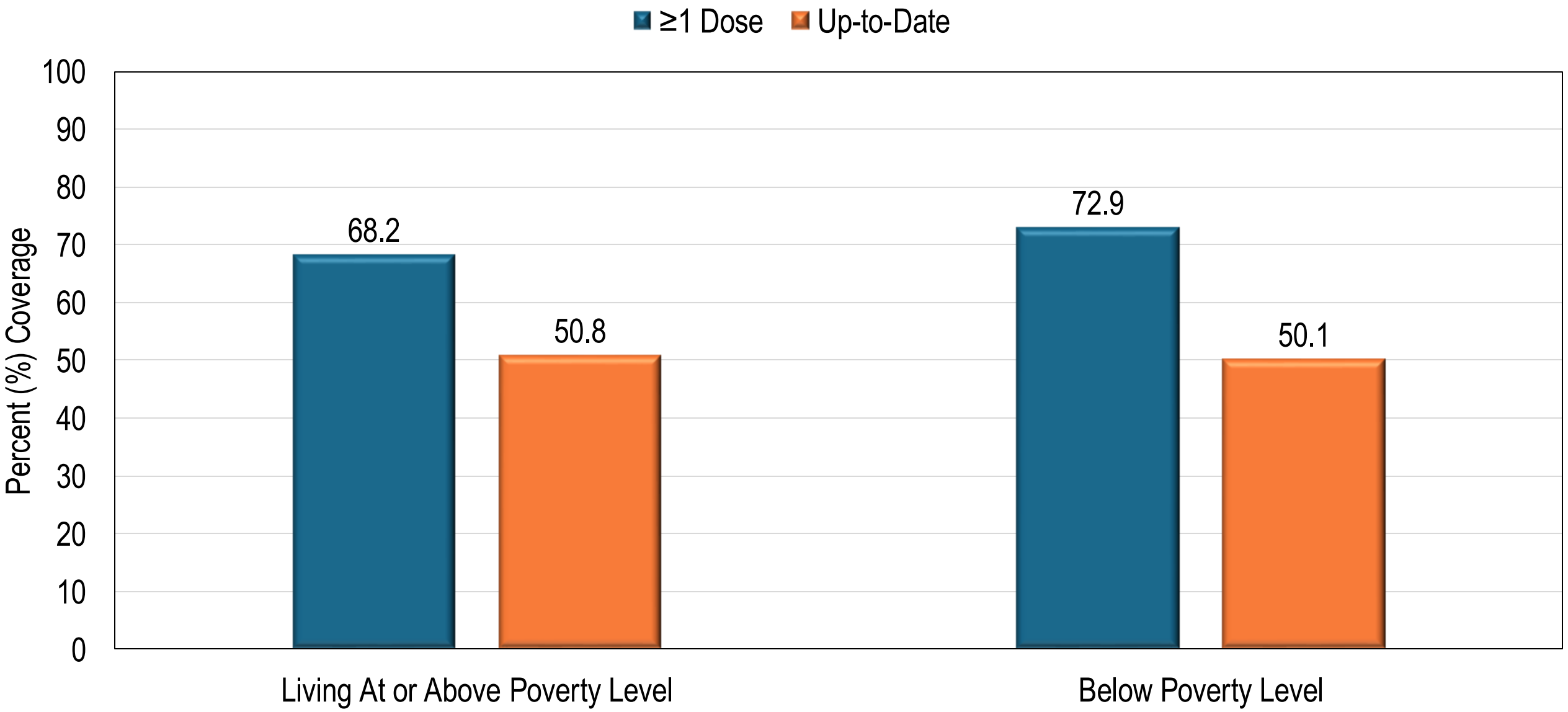
Source: https://www.cdc.gov/vaccines/imz-managers/coverage/teenvaxview/data-reports/index.html

Estimated coverage percent of HPV vaccination among males and females (ages 13-17) by dose, race, and ethnicity, Arkansas, 2018-2022



Source: https://www.cdc.gov/vaccines/imz-managers/coverage/teenvaxview/data-reports/index.html

Estimated coverage percent of HPV vaccination among males and females (ages 13-17) by dose and poverty level, Arkansas, 2018-2022



BreastCare

Our Mission

To increase the rate of early detection of breast and cervical cancer and reduce the morbidity and mortality rates of breast and cervical cancer among women in Arkansas by lowering barriers to screening that result from lack of information, financial means, or access to quality services.

Eligibility Requirements

- Arkansas resident
- 21-64 years old for cervical cancer services
- 40-64 years old for breast services
- Under 40 years old with breast symptoms
- Household income at or below 250% of the federal poverty level (FPL)
- Uninsured
- Underinsured requiring diagnostic testing AND meets the criteria for financial barrier

Available Services

- Clinical Breast Exam (CBE)
- Mammogram
- Breast MRI
- Diagnostic Testing
- Treatment services (Based on certain criteria, referral needed to Regional Care Coordinator)
- Pelvic Exam
- Pap Testing
- Human Papillomavirus (HPV) Testing
- Patient Navigation

Tele Colposcopy

UAMS Expands Access to Cervical Cancer Testing in Arkansas

By David Robinson

Chuck Hitt, M.D., (left) and Gordon Low, an advanced practice nurse, are leading a telecolposcopy program to help rural Arkansas women.

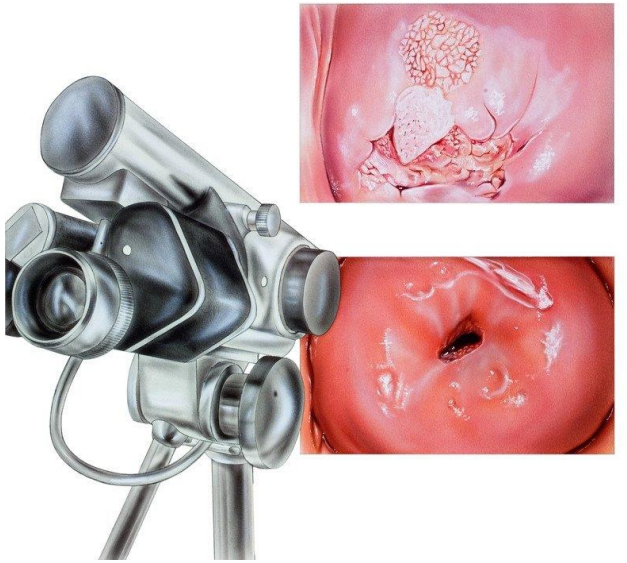
Application of a Telecolposcopy Program in Rural Settings

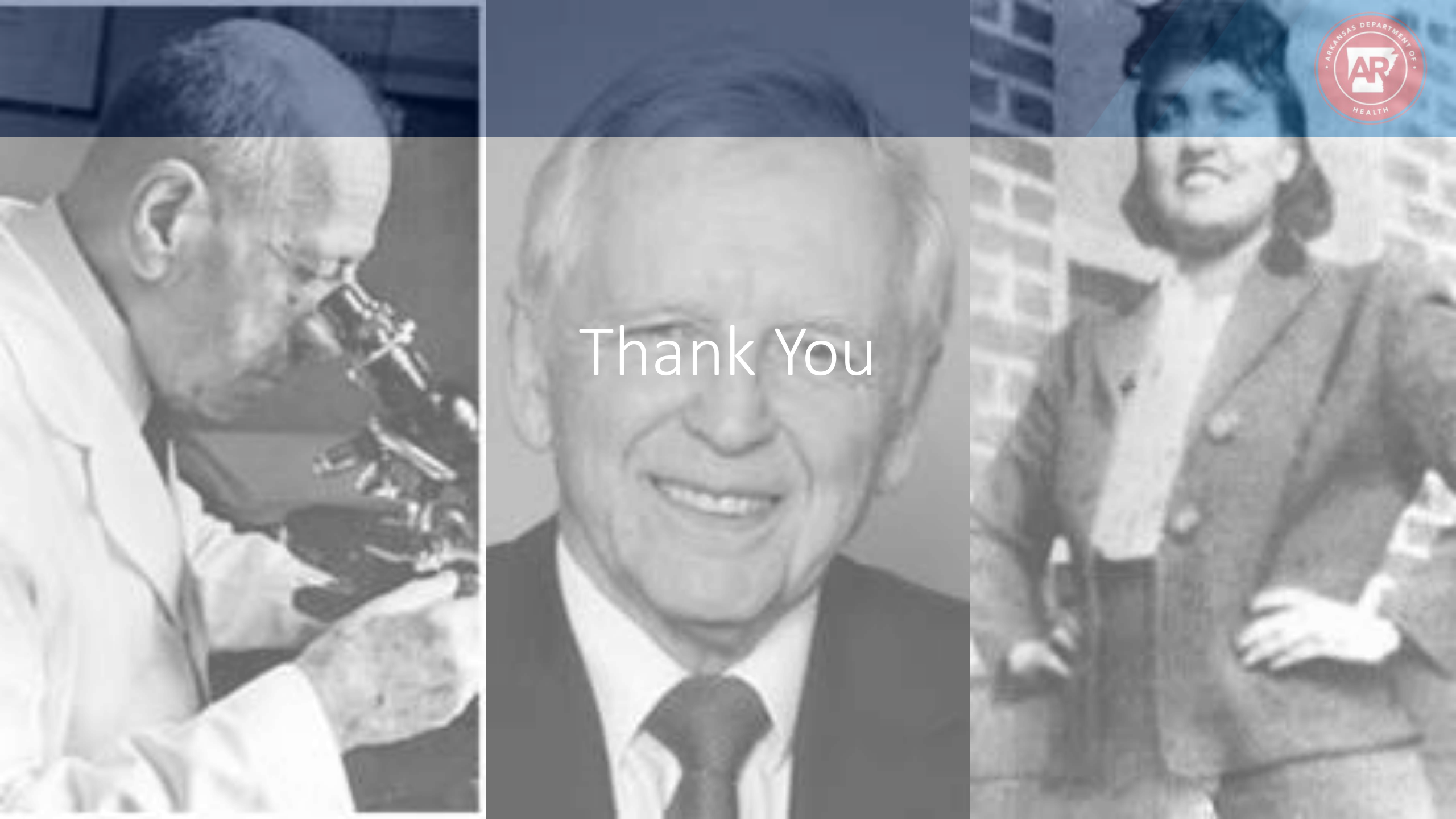
Wilbur C. Hitt, MD, FACOG,[1] Gordon M. Low, MSN, APN,[1] Christian E. Lynch, MPH,[1] C. Heath Gauss, MS,[2] Everett F. Magann, MD,[1] Curtis L. Lowery, MD,[1] and Hari Eswaran, PhD[1]

Departments of [1]Obstetrics and Gynecology and [2]Biostatistics, University of Arkansas for Medical Sciences, Little Rock, Arkansas.

Introduction

Increasingly across the United States, where an individual lives can often determine their level of access to healthcare. Currently, 49% of the 3,107 counties in the United States, in which 9.5 million Americans reside, do not have a single obstetrician/gynecologist.[1] This is especially true in rural states, where access to specialty care is limited due to the





Thank You

Moderated Discussion

Eve McDavid
CEO and Founder, Mission-Driven Tech

Trisha Amboree, PhD
Assistant Professor, Department of Public Health Sciences, Medical University of South Carolina

Ran Zhao, PhD
Researcher, University of Minnesota School of Public Health

William (Sam) Greenfield, MD
Professor, Obstetrics & Gynecology, University of Arkansas for Medical Sciences

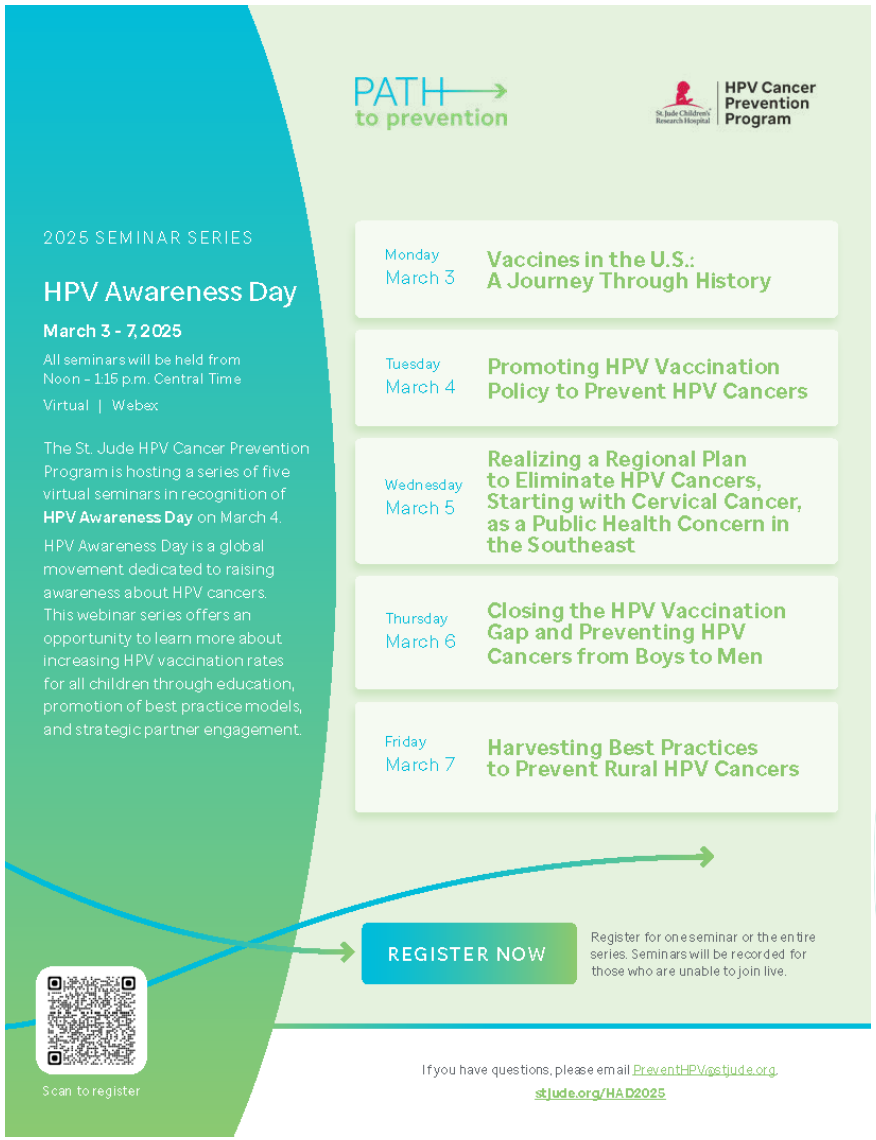
Closing Remarks

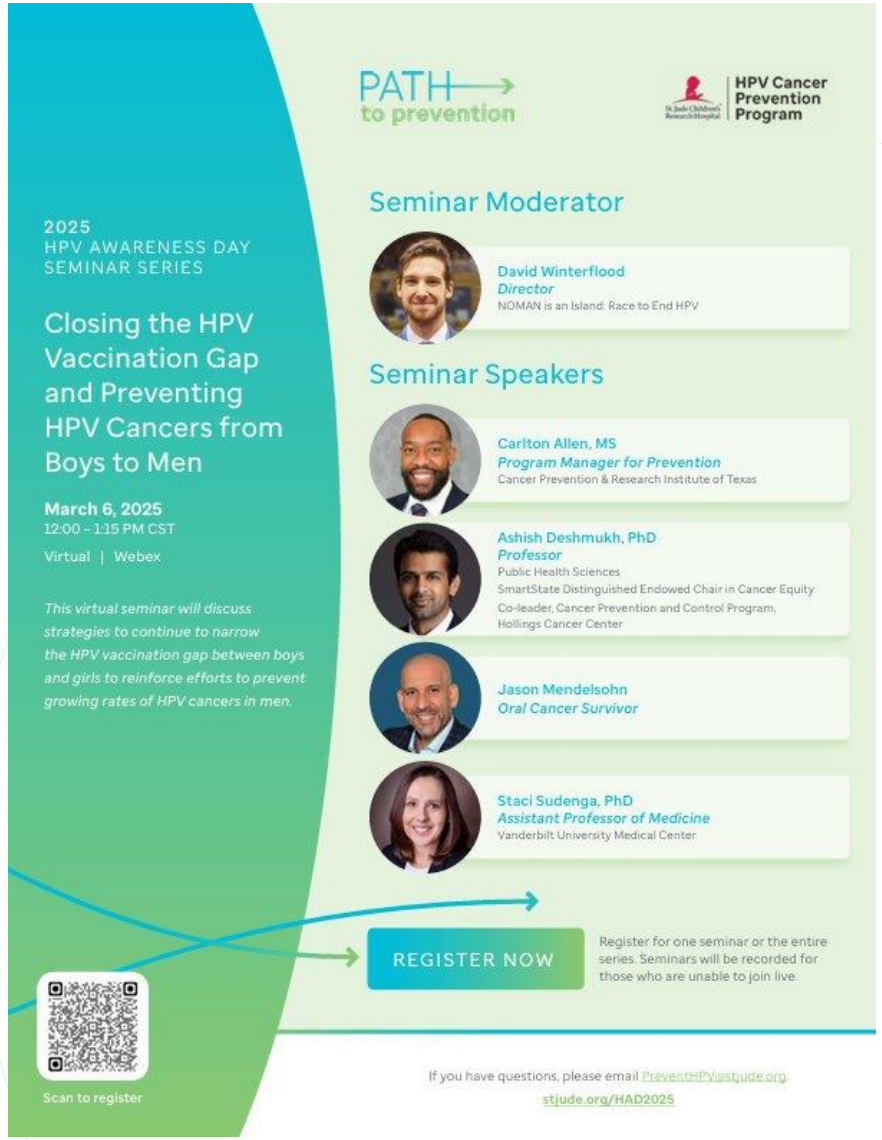
Seminar Evaluation, March 5

Thank you for joining us! Please take a brief moment to complete an evaluation of today's seminar. Your feedback is important to us and will be used to plan future offerings.

Upcoming HPV Awareness Day Seminars

Register at stjude.org/HAD2025





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PATH to prevention

ENOUGH Book Club

Science Alone Can't Do It: Stories & the Fight Against Cervical Cancer

Wednesday, April 30
Noon - 1:15 PM Central Time

Be part of the movement to eliminate cervical cancer. Together, we can say "enough."

Spots are limited. RSVP today!

Join the HPV Vaccination Roundtable of the Southeast

With participation from organizations and leaders throughout the Southeast, we will support each other's efforts to improve HPV vaccination coverage and prevent HPV cancers. Join the Southeast Roundtable by completing a brief membership form.

Check out the Southeast Roundtable resources at stjude.org/southeast-roundtable.

One Less Worry Campaign 2025

Mobile Colposcopy: *Bringing Change to a State Colposcopy Program*

WIPE OUT cervical cancer ALABAMA

American Cancer Society

NATIONAL ROUNDTABLE ON CERVICAL CANCER

Thank you for joining us today!

Email PreventHPV@stjude.org with any questions!