

# Lung Cancer Screening Trust and Health Disparities

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A Cancer Center Designated by the  
National Cancer Institute



**I have the following financial relationships to disclose:**

**Consultant for: Genentech (Community Advisory)**

**Board member of: LUNGeivity, American Cancer Society**

**- and -**

**I will not discuss off label use and/or investigational use in my presentation.**

## Potentials for Cancer Prevention

Cause	% cancer caused	Deaths in United States <sup>‡</sup>	Magnitude of possible reduction (%)	Period of time (years)	Evidence example
Smoking	33%	188,744	75%	10–20	Utah vs Kentucky
Overweight/obesity	20%	114,390	50%	2–20	Bariatric surgery
Hereditary factors (* )	16%	91,520	50%	2–10	Oophorectomy; MRI; Tamoxifen; Colonoscopy
Diet	5%	28,600	50%	5–20	Folate , colorectal cancer
Lack of exercise	5%	28,600	85%	5–20	Adolescent activity
Occupation	5%	28,600	50%	20–40	Asbestos
Viruses	5%	28,600	100%	20–40	Liver cancer, HPV vaccine
Alcohol	3%	17,200	50%	5–20	Regulation
UV and ionizing radiation	2%	11,400	50%	5–40	Medical exposures
Prescription drugs	1%	5,720	50%	2–10	Hormone therapy
Reproductive factors	3%	17,200	0	N/A	N/A
Pollution	2%	11,400	0	N/A	N/A

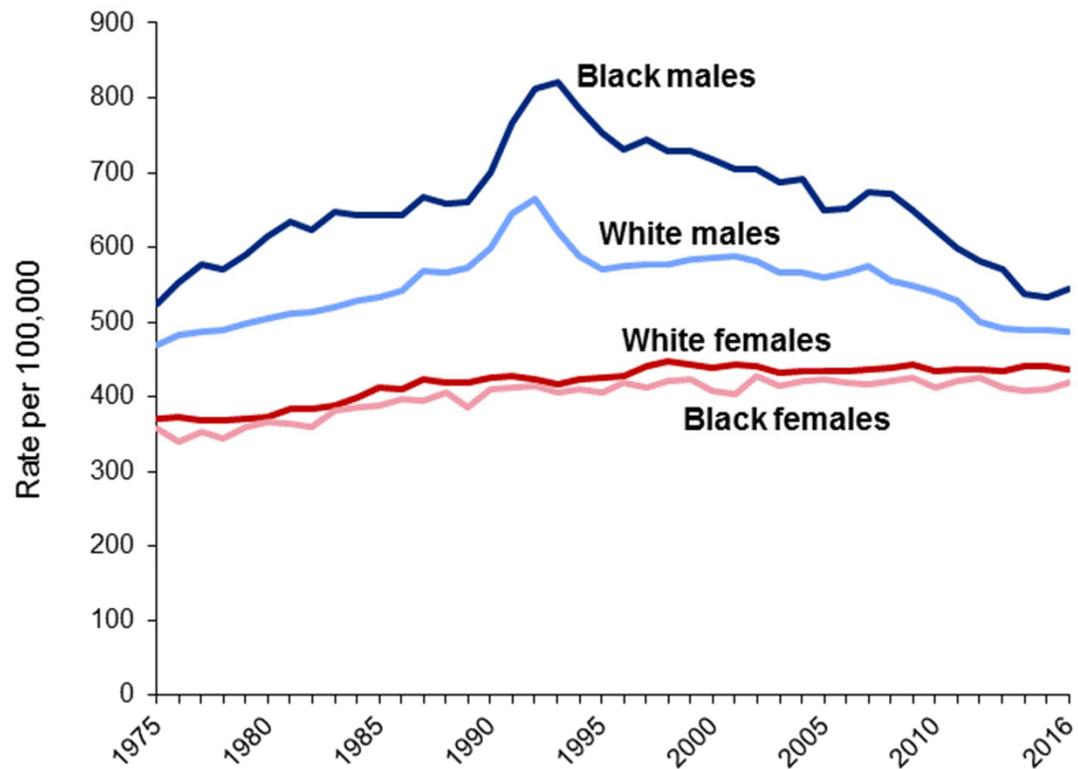
*We could reduce cancer deaths 60% by paying attention to known risk factors*

“Poverty as a carcinogen”, Samuel Broder, Dir NCI 1989

Modified from Colditz, *Sci Trans Med* 4:127,2012

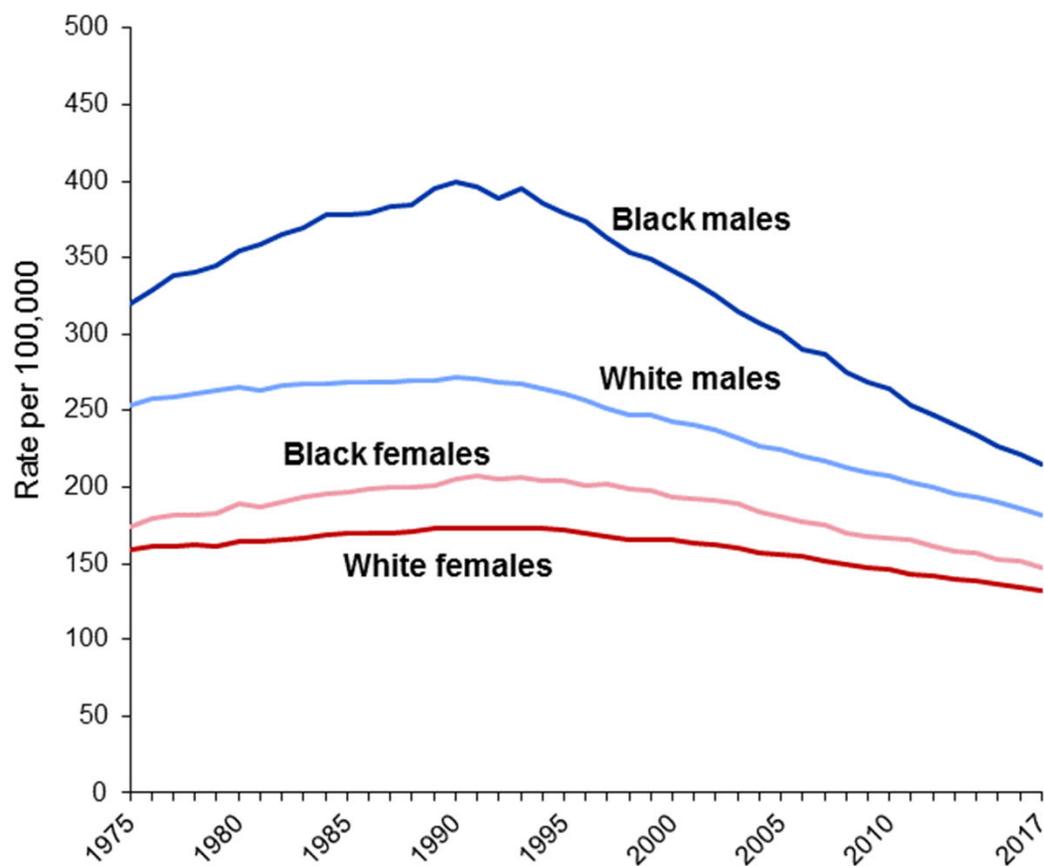
(\*) JNCI 89:287,1997  
JAMA 2016 315:68-76

## Trends in Cancer Incidence Rates\* by Sex and Race, US, 1975-2016



\*Age-adjusted to the 2000 US standard population. Incidence rates are adjusted for delays in reporting.  
Source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2019.

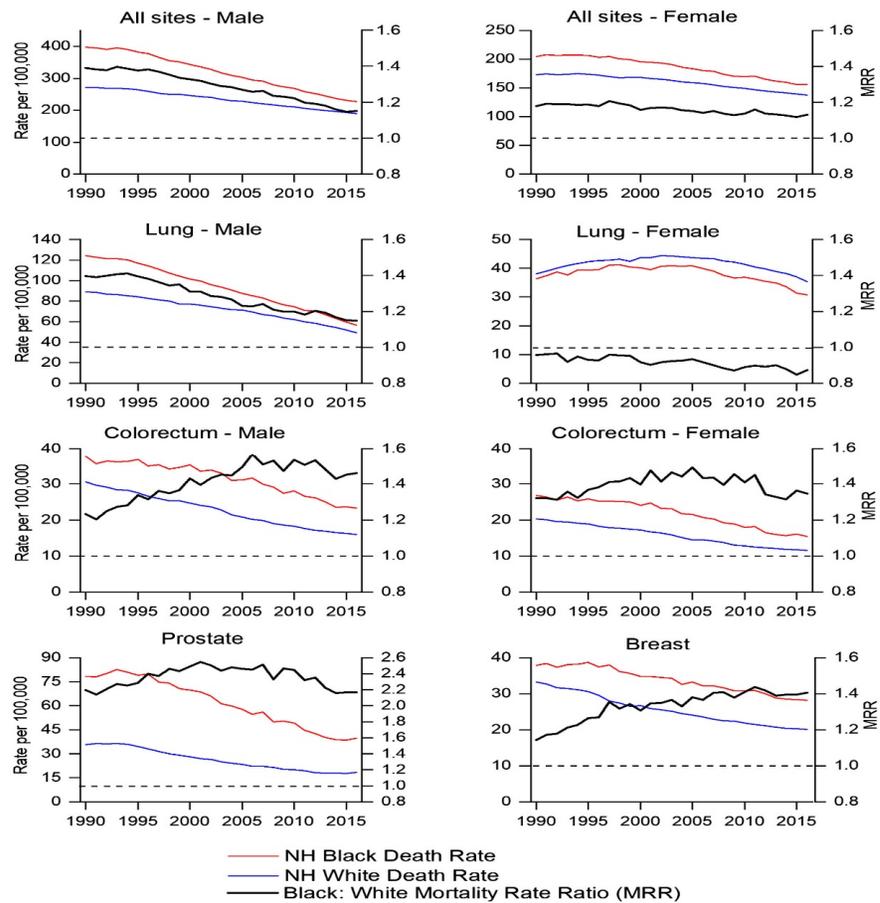
## Trends in Cancer Death Rates\* by Sex and Race, US, 1975-2017



\*Age-adjusted to the 2000 US standard population.

Source: National Center for Health Statistics, Centers for Disease Control and Prevention, 2019.

Cancer statistics for African Americans, 2019



# The Lung Cancer Burden

## Lung cancer incidence rate (2020)

- USA 69.3 (men) 51.7 (women)
- Virginia 69.0 (men) 50.6 (women)
- **Kentucky 111.3 (men) 77.8 (women)**

## Lung cancer mortality rate (2019)

- USA 49.3 (men) 33.2 (women)
- Virginia 50.5 (men) 32.6 (women)
- **Kentucky 80.8 (men) 50.6 (women)**

Note: All rates are per 100,000. Rates are age-adjusted to the 2000 U.S. Standard Million Population.

## Adult smoking rate (2020)

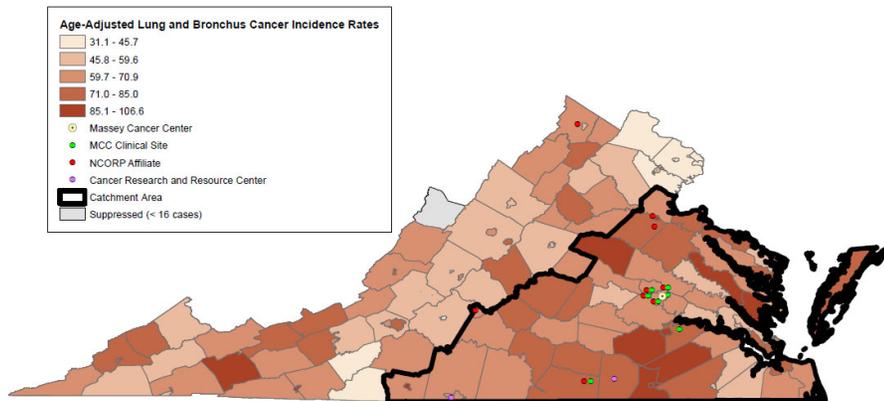
- USA 13.7%
- Virginia 14.9%
- **Kentucky 23.4%**



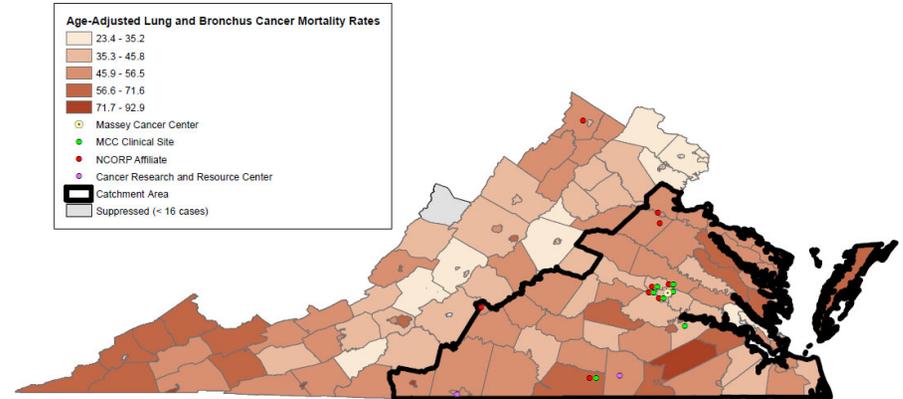
ACS (2019). *Cancer facts and figures – 2019*.  
Centers for Disease Control and Prevention (2019)

# The Lung Cancer Burden in Virginia

Virginia Lung and Bronchus Cancer Incidence Rates by County



Virginia Lung and Bronchus Cancer Mortality Rates by County



Rates based on NCI Cancer Incidence Data (2012-2016)  
 Age-adjusted Incidence Rate represents an age-adjusted number of new cancer cases per 100,000 population per year.  
 \*Data have been suppressed to ensure confidentiality and stability of rate estimates. Counts are suppressed if fewer than 16 cases were reported in a specific category.  
 Map date: 4/30/2020

Rates based on NCI Cancer Mortality Data (2012-2016)  
 Age-adjusted Mortality Rate represents an age-adjusted number of cancer deaths per 100,000 population per year.  
 \*Data have been suppressed to ensure confidentiality and stability of rate estimates. Counts are suppressed if fewer than 16 cases were reported in a specific category.  
 Map date: 4/30/2020

# Impact of NLST

*The* NEW ENGLAND  
JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

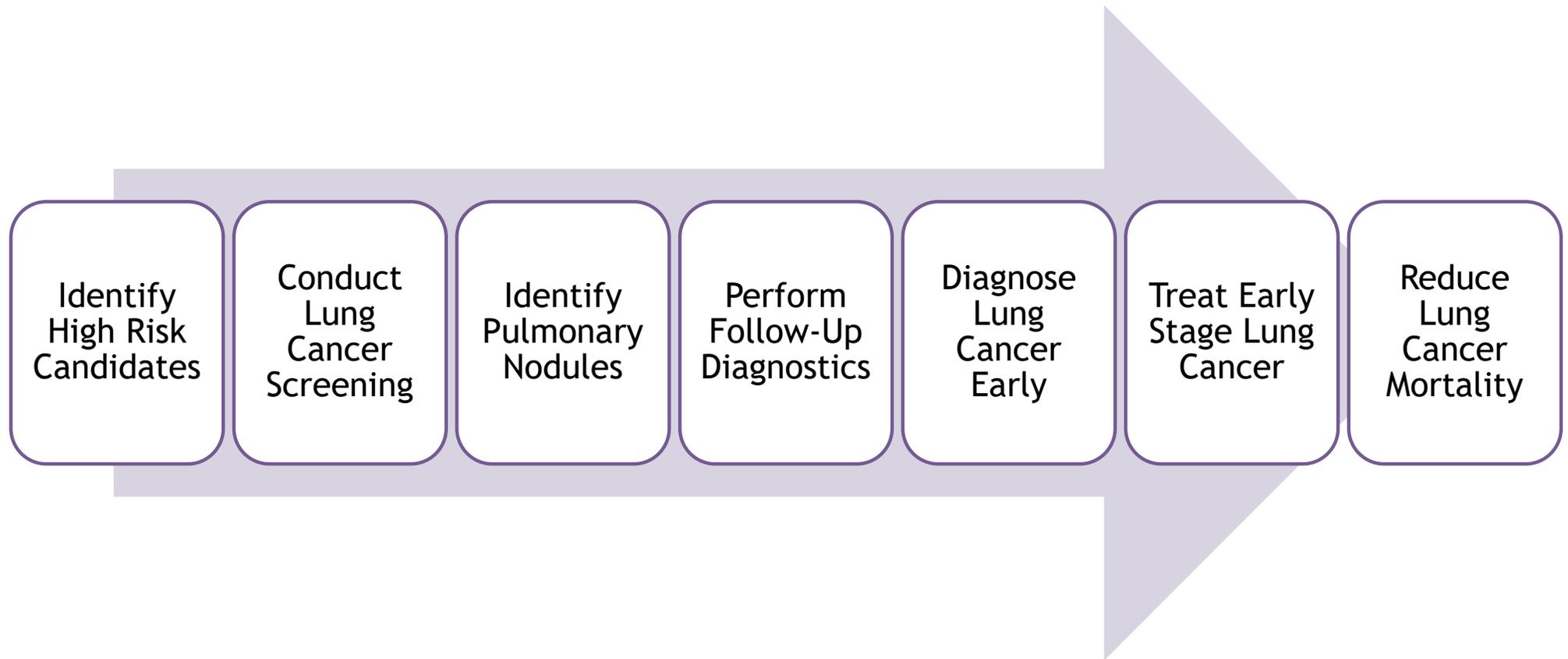
AUGUST 4, 2011

VOL. 365 NO. 5

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

The National Lung Screening Trial Research Team\*

# Rational Model of Lung Cancer Screening



# High Quality Lung Cancer Screening (The National Consensus)

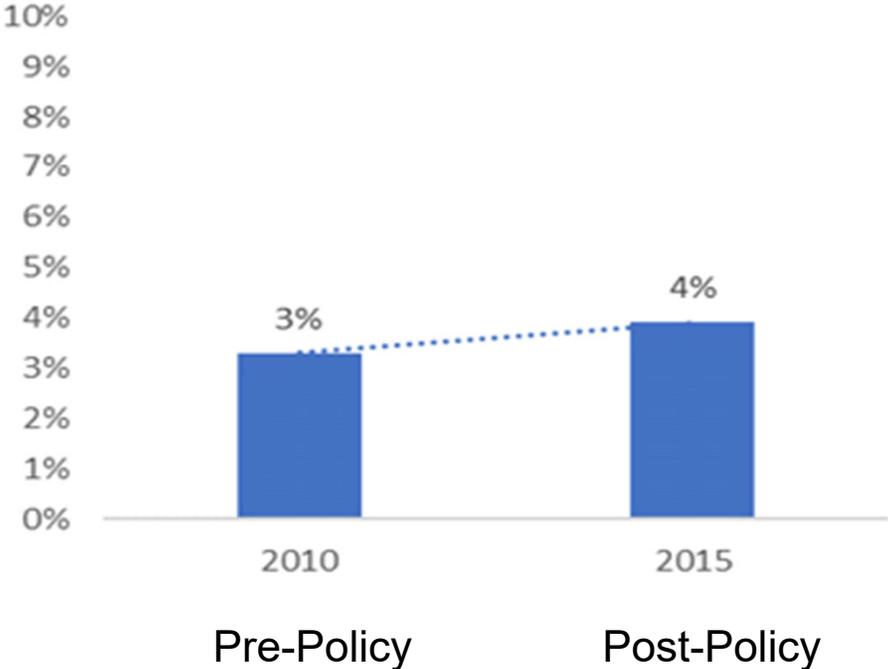


1. Who is offered LCS
2. How often and How Long to Screen
3. How the Scan is Performed
4. Lung Cancer Identification
5. Structured Reporting
6. Lung Nodule Management Algorithms
7. Smoking Cessation
8. Patient and Provider Education
9. Data Collection
10. Where is the Community ?

# Lung Cancer Screening 2010 vs. 2015 (National Health Interview Survey)

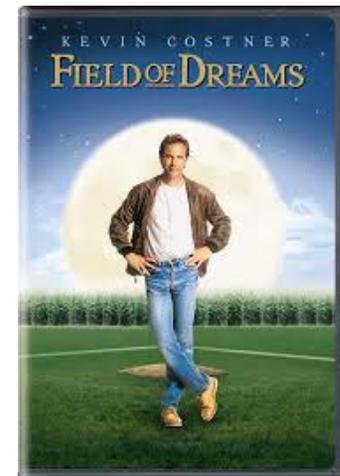
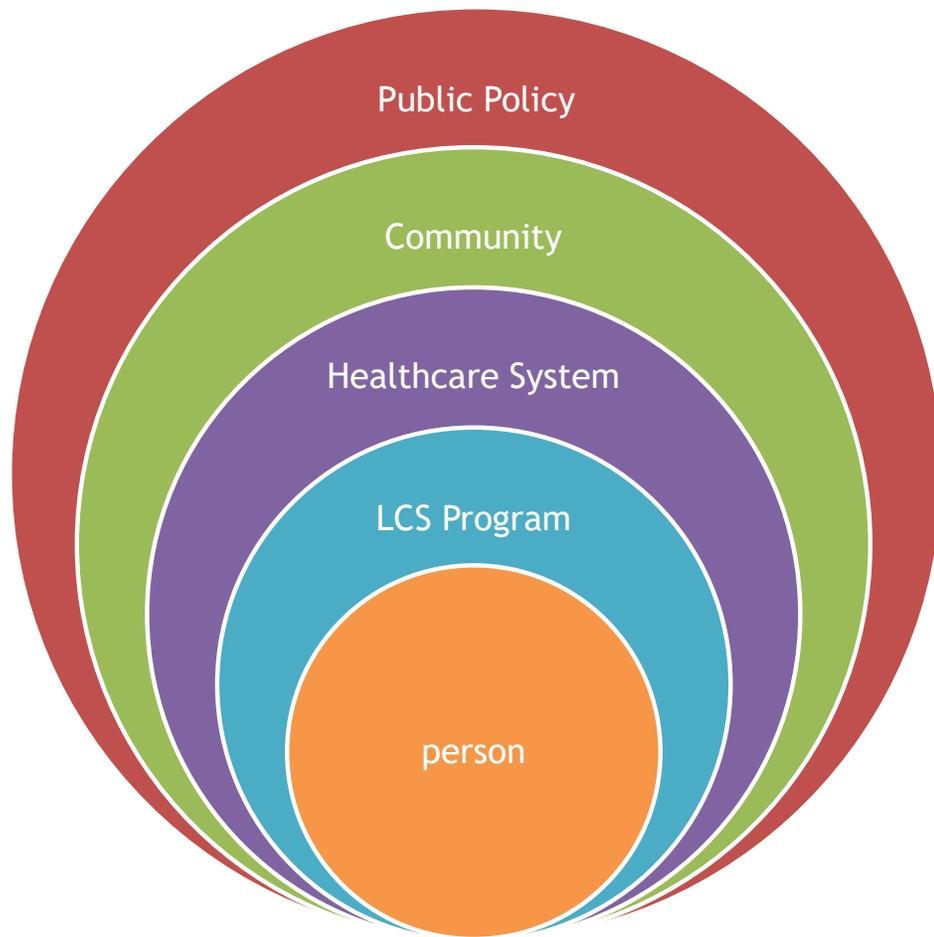


LDCT Screening rate among eligible (NHIS, N=2,347)



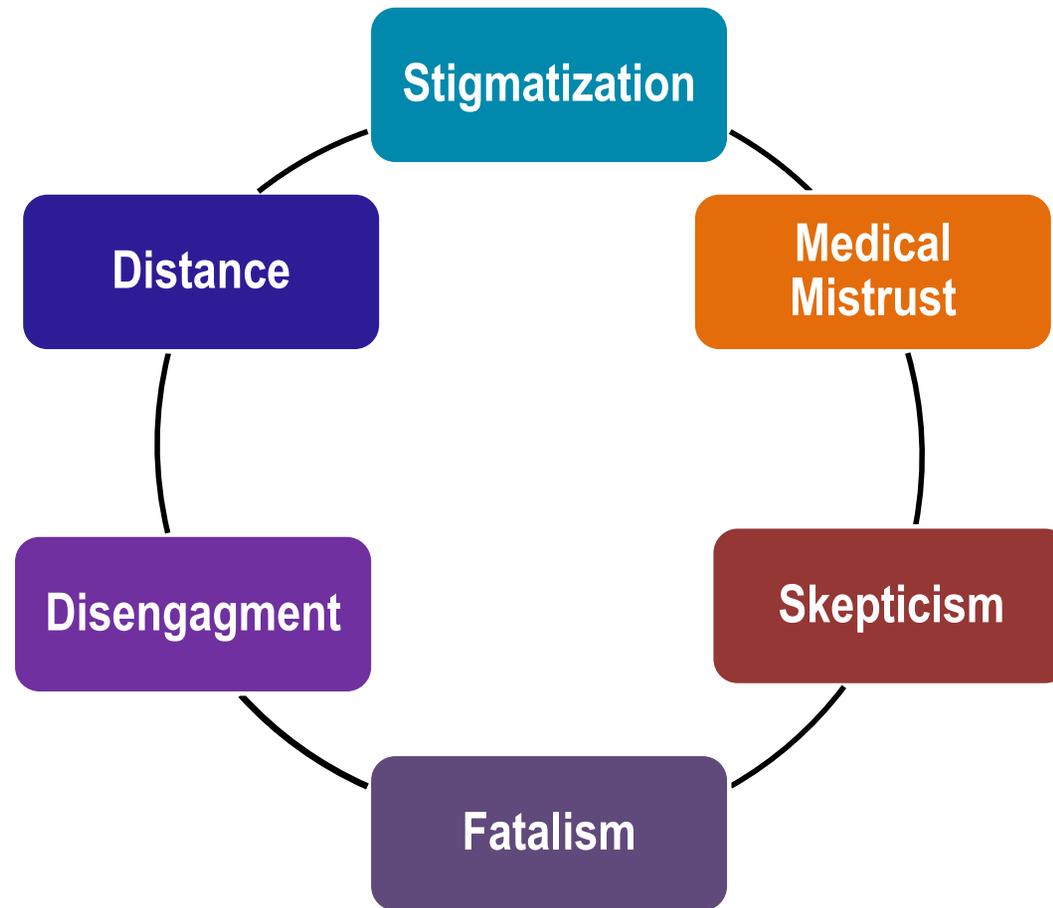
Jemal and Fedewa 2017

# Sometimes “if you build it, they will come” is Not Enough



Shuvr qd #R evwdfhv #w #K ljk #T xdlw | #DF V

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## LSC Program: Making it Routine May Mean Making it More Personal

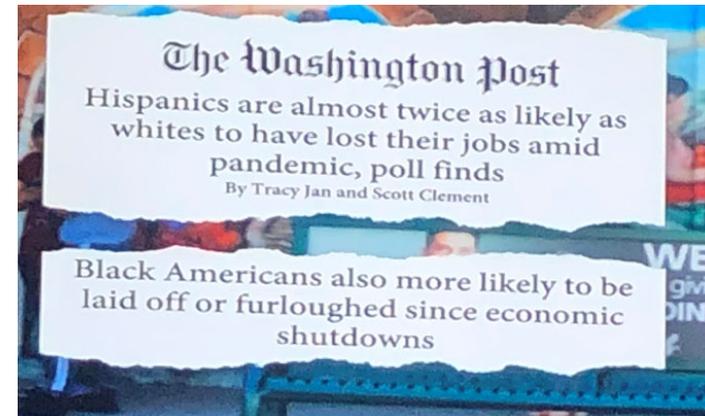
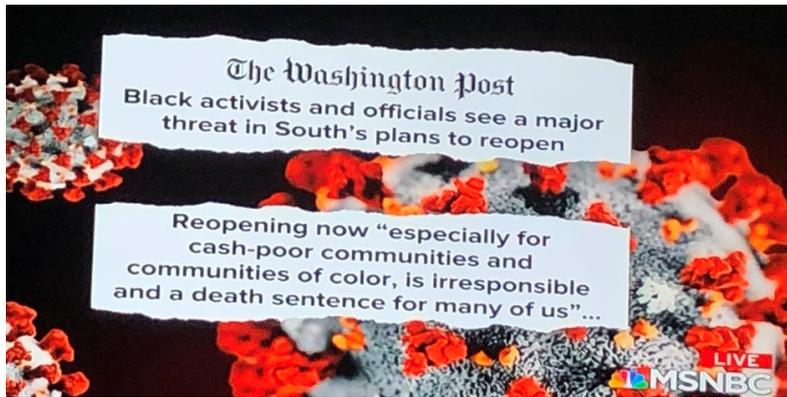


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# COVID-19 and Disparities (Community)



**Social Justice: 8:46(Community)**



# There's a Little Amy in All of Us (Community)

[Post Everything](#) Perspective

**Amy Cooper is the kind of white woman black families warn their children about**  
Amy Cooper said the quiet part out loud when she called the police on Christian Cooper

Michael Harriot



# Our Collective and Common History

**The New York Times** **U.S.**

WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH SPORTS OPINION

POLITICS EDUCATION BAY AREA CHICAGO

## Indian Tribe Wins Fight to Limit Research of Its DNA



Edmond Tilousi, 56, who can climb the eight miles to the rim of the Grand Canyon in three hours. [More Photos](#) »

By AMY HARMON  
Published: April 21, 2010

SUPAI, Ariz. — Seven years ago, the [Havasupai Indians](#), who live amid the turquoise waterfalls and red cliffs miles deep in the Grand Canyon, issued a “banishment order” to keep [Arizona State University](#) employees from setting foot on their reservation — an ancient punishment for what they regarded as a genetic-era betrayal.

**THE BALTIMORE SUN**

### 'Immortal' cells, moral issues

Case of Henrietta Lacks shows need for ethical component in health care reform

February 12, 2010 | By Ruth R. Faden

Much has been written and discussed recently about Henrietta Lacks, the African-American woman from Virginia whose cancer cells, collected for research 60 years ago — as she was being treated for the cervical cancer that took her life — inexplicably but astoundingly grew in the laboratory without end. The cells, named HeLa, have contributed to cancer therapies, the polio [vaccine](#) and a myriad of other biomedical advances.

Sadly, in 1951, tissue from patients destined exclusively for biomedical research — and not, for example, to diagnose or [treat](#) disease — was commonly taken without their consent, stored and used by scientists.

Jim Wilson/The New York Times

**The New York Times**

## Syphilis Victims in U.S. Study Went Untreated for 40 Years

By JEAN HELLER  
The Associated Press

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have serious doubts about the morality of the study, also say that it is too late to treat the syphilis in any surviving participants.

Doctors in the service say they are now rendering whatever other medical services they can give to the survivors

disease's

The Boston Globe

## Wellesley professor unearths a horror: Syphilis experiments in Guatemala

US apologizes for performing unethical study in 1940s

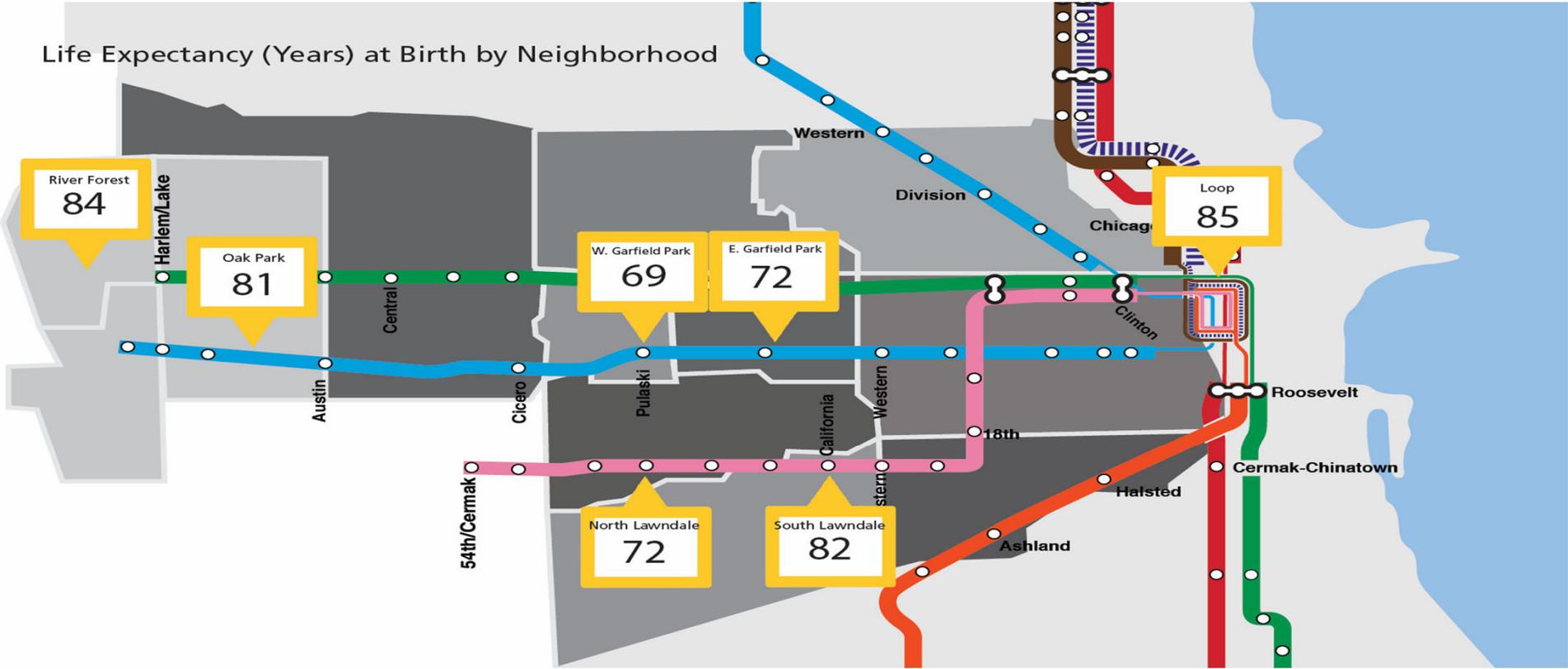
By Stephen Smith  
Globe Staff / October 2, 2010

Picking through musty files in a Pennsylvania archive, a Wellesley College professor made a heart-stopping discovery: US government scientists in the 1940s deliberately infected hundreds of Guatemalans with syphilis and gonorrhea in experiments conducted without the subjects' permission.

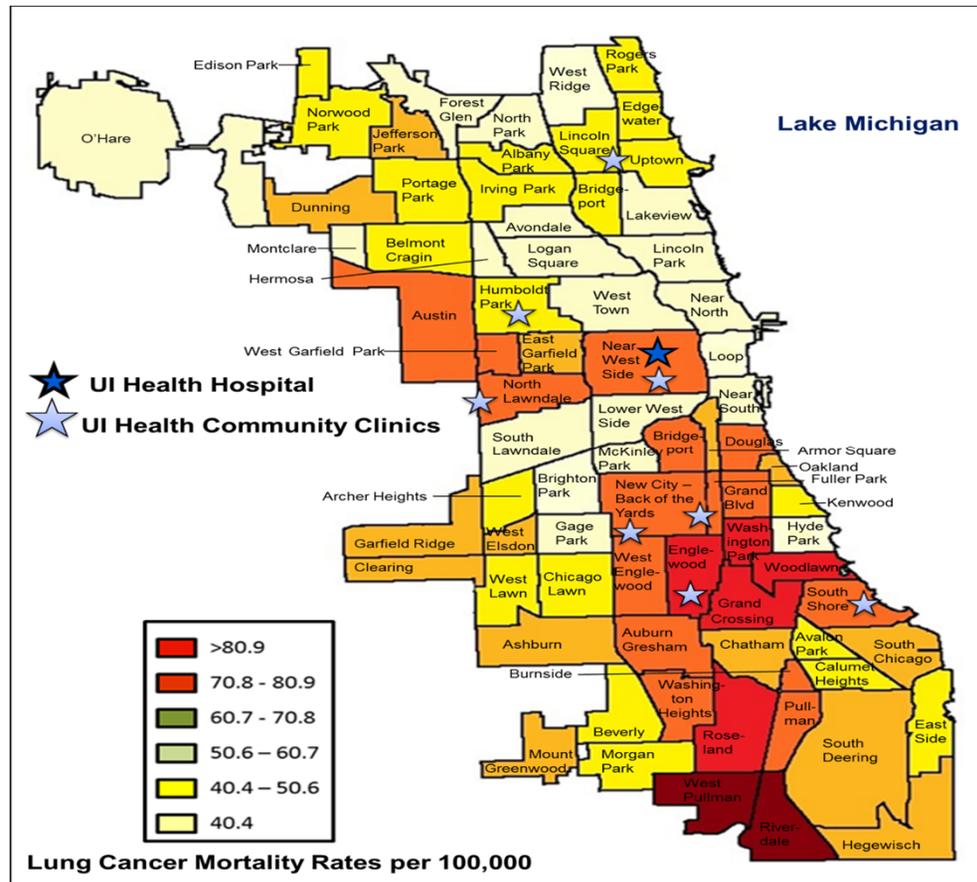
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# Social Determinants of Health: ZNA Matters



# Lung Cancer Mortality Rates in Chicago

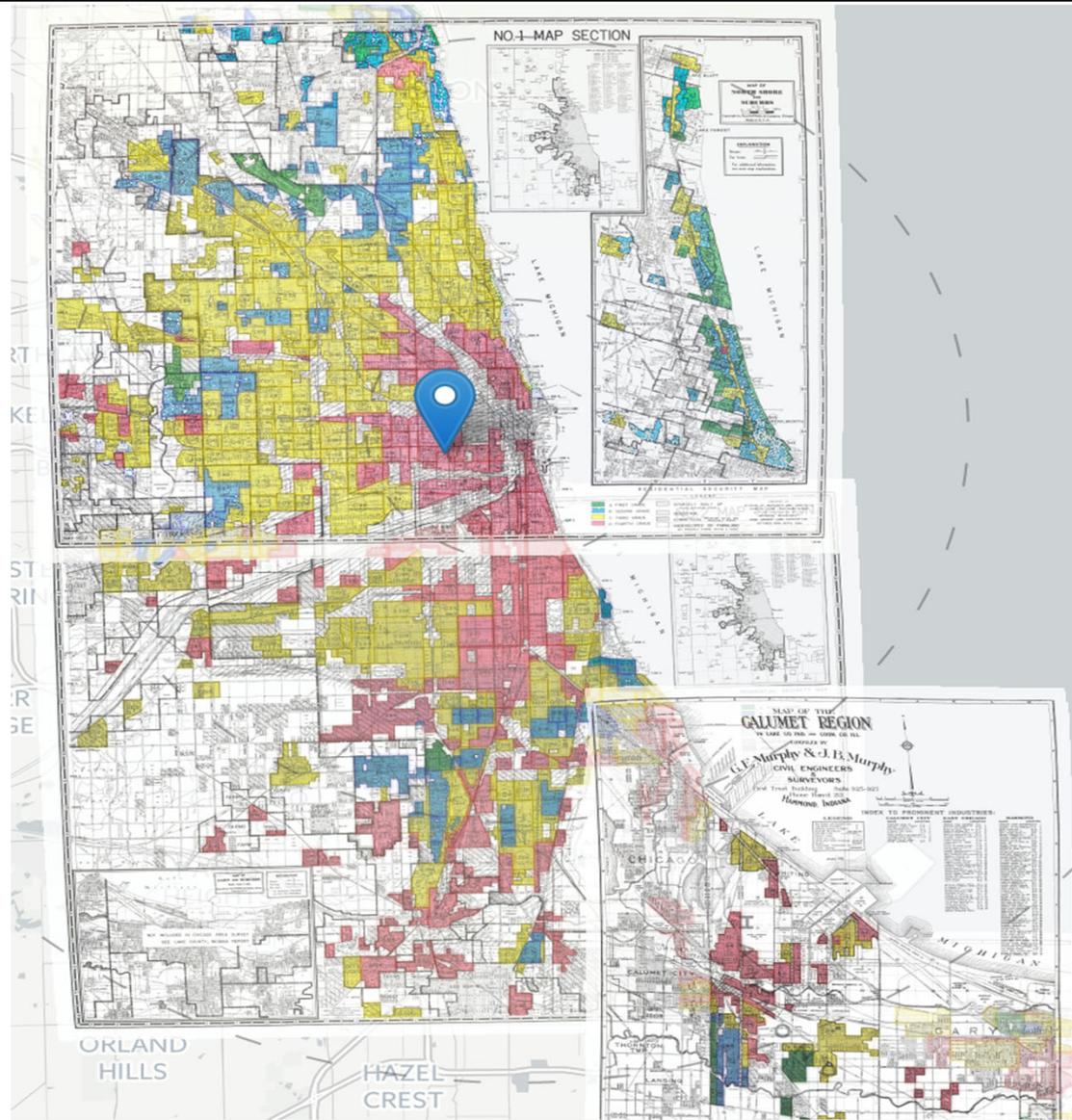


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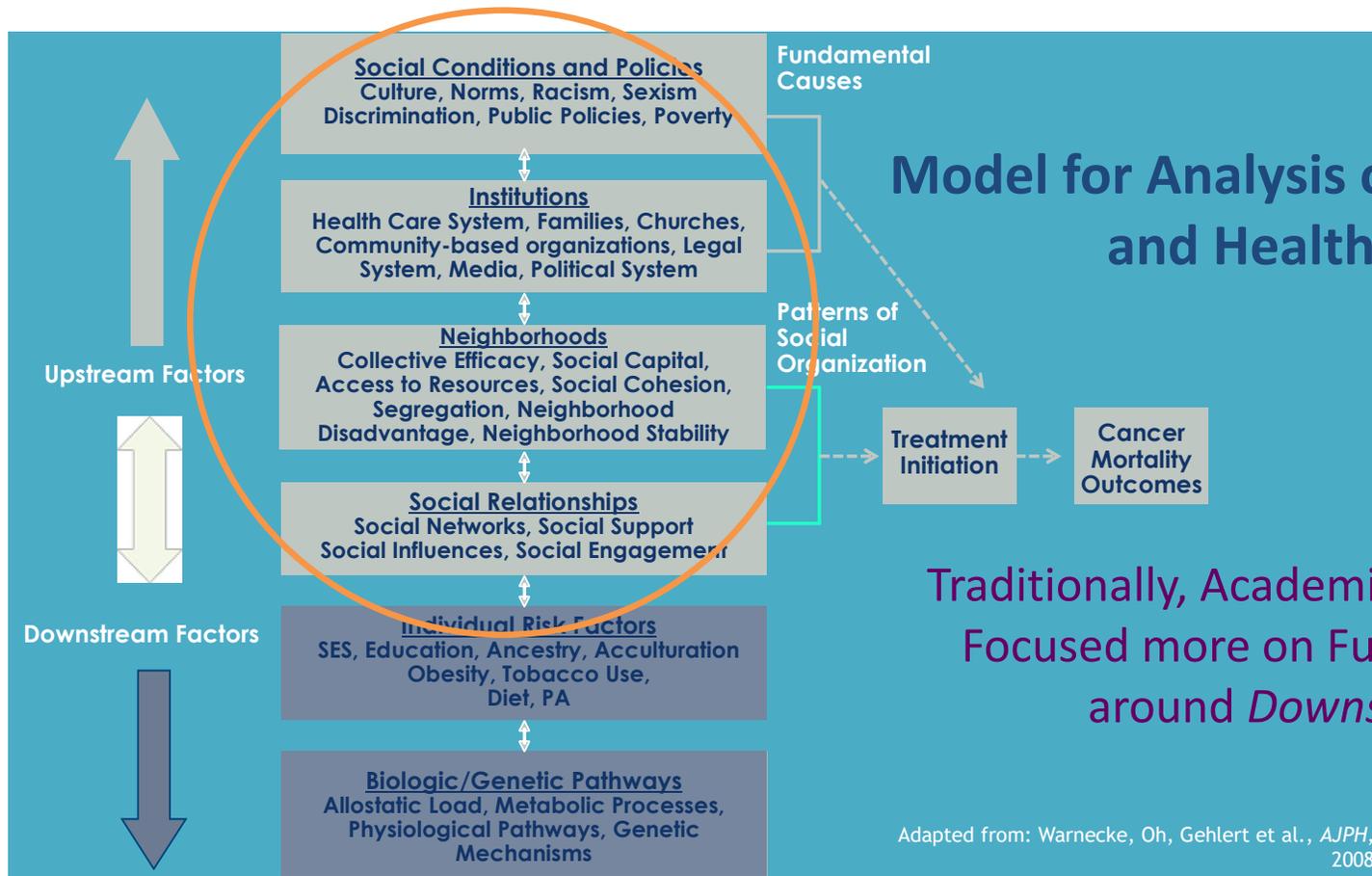
## RED-LINING (Restrictive Covenant)

Home Owner's Loan Corporation  
(1933-1935)

- 4 - Tiered assessment
- Measured sale and rental demand, % ownership, social status of population, utilities, schools, churches, business, transportation
- GRADES
  - A - Green “hot spots”
  - B - Blue “developed”
  - C - Yellow “aged”
  - D - Red “undesirable population”



# Social Determinants of Health

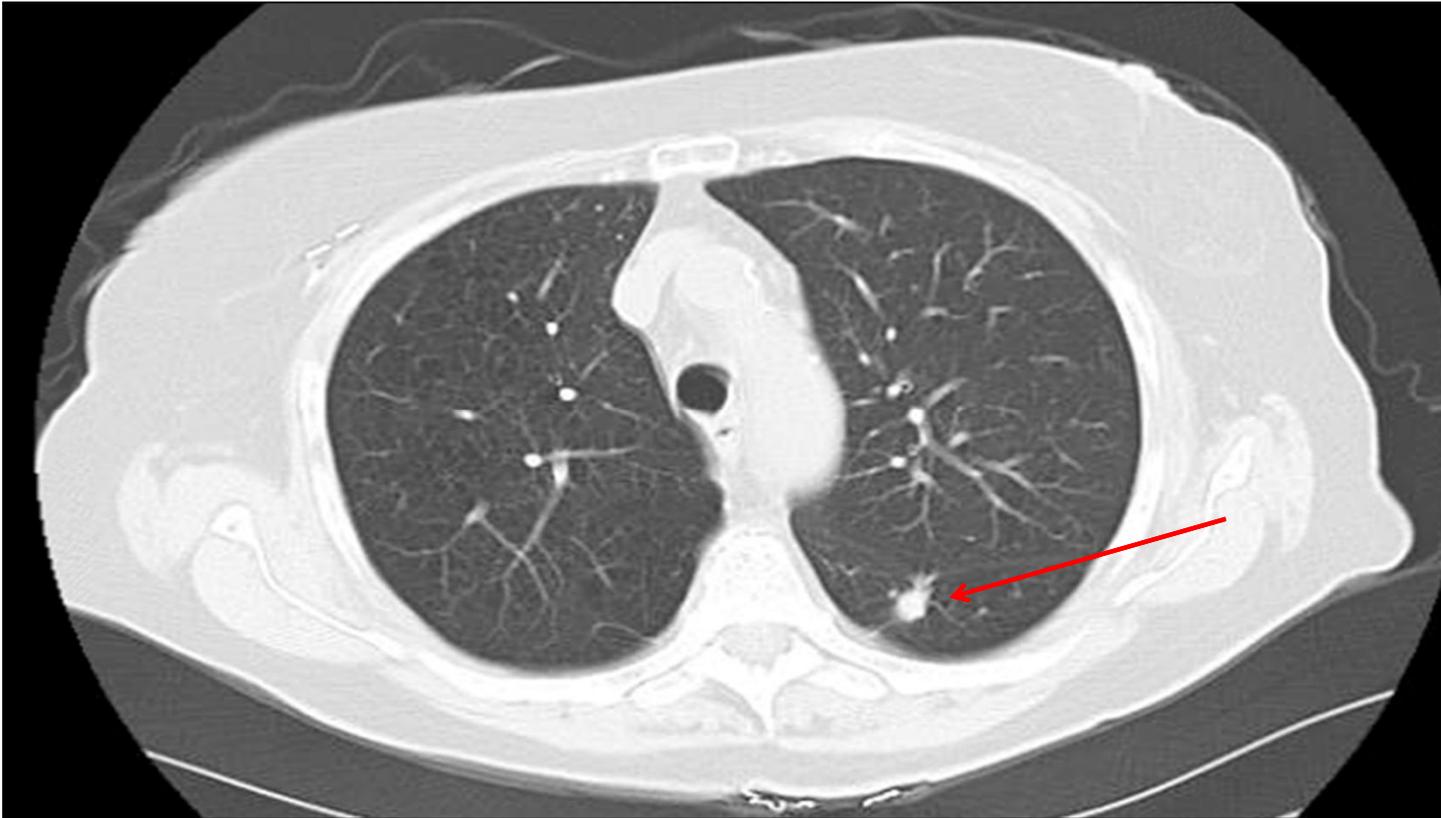


## Model for Analysis of Population Health and Health Disparities

Traditionally, Academic Cancer Centers have Focused more on Fundamental Research around *Downstream* Factors

Adapted from: Warnecke, Oh, Gehlert et al., *AJPH*, 2008

## ABNORMAL LUNG CT (NODULE)



# A geographic information system-based method for estimating cancer rates in non-census defined geographical areas

Cancer Causes & Control

October 2017, Volume 28, Issue 10, pp 1095–1104

Vincent L. Freeman, Emma E. Boylan, Oksana Pugach, Sara L. Mclafferty, Katherine Y. Tossas-Milligan, Karriem S. Watson, Robert A. Winn

# Zoning #53

## Mile Square Site: Englewood Community Areas Represented

- Englewood
- West Englewood
- Greater Grand Crossing

## Demographic data

Population: 49,263

Male: 22,226  
Female: 26,037

### Ethnic Breakdown

Black: 71.63%

Hispanic: 21.56%

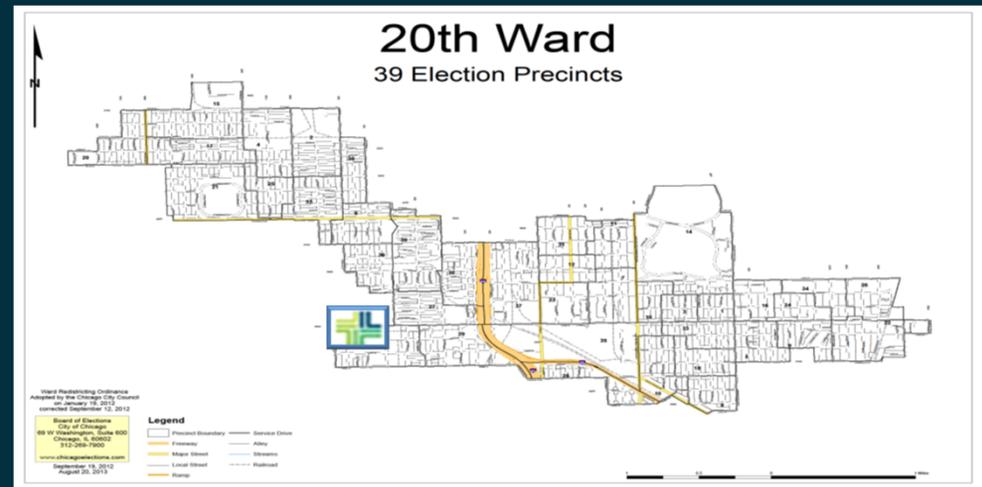
White: 4.19%

Asian: 1.25%

## Uninsured Rate

Englewood	West Englewood	Greater Grand Crossing	City	State
20.6%	25.2%	20.1%	19.6%	14%

## Ward Map



# Z dug #53 #

## INCIDENCE

	Englewood	Greater Grand Crossing	West Englewood	National	State
Lung	<b>108.6</b>	87.0	91.9	65.0	71.5
Breast	149.5	149.9	135.4	119.8	126.4
Prostate	203.4	199.5	<b>226.1</b>	143.8	153.9
Colorectal	54.9	63.4	61.4	43.9	50.2
Head and Neck	12.9	<b>17.5</b>	<b>17.8</b>	11.2	11.6
Cervical	<b>16.4</b>	<b>20.3</b>	<b>18.8</b>	7.8	8.4

## MORTALITY

	Englewood	Greater Grand Crossing	West Englewood	National	State
Lung	<b>76.8</b>	<b>77.5</b>	66.3	50.6	51.8
Breast	32.9	29.1	<b>39.2</b>	22.9	23.6
Prostate	<b>57.7</b>	<b>70.3</b>	<b>75.0</b>	23.5	24.3
Colorectal	<b>30.2</b>	<b>31.5</b>	24.4	17.0	18.1

# Big Data & Omics (That Matter)

## GENOMICS

- ✓ Somatic Tumor DNA
- Germline DNA
- cfDNA
- RNA Seq
- Epigenetics

## PHENOMICS

- Tumor type
- Histology
- Demographics
- Vital status
- Medications
- Treatment Outcomes

## COMMUNITYOMICS

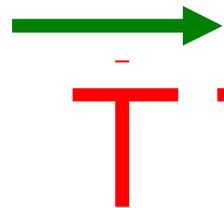
- Context
- Built Environment
- Obesogenic Env
- Structural Stress
- Violence

**INTEGRATED**

# Data to Drive Discoveries

# The Discovery-Delivery Disconnect

Discovery



Delivery

Discovery-Delivery Disconnect

# UICC v. NLST



Pasquinelli, et. al. JAMA Oncol. 2018;4(9):1291-1293. Outcomes From a Minority-Based Lung Cancer Screening Program vs the National Lung Screening Trial

	NLST (N=26,455)	UIC (N=500)
African American	5%	70%
Current Smokers	48%	73%
Positive LDCT (Lung RADS 3 or 4)	14%	25%
LC Detection Rate	1%	3%



# Addressing Disparities in LCS: Conclusion



1. NLST/NELSON (Promise of Reducing Lung Cancer through Screening)
2. The Implementation of Lung Cancer Screening (Remains one of the Biggest Challenges)
3. Appropriate Community Engagement (Matters, Multi-Level Efforts are Needed)
4. Individual Attachment/"Connectedness" (Is Critical)
5. Field of Dream "Myth"
6. Impact vs. Eradication of Lung Cancer

# It's Time to Stop Playing





# Questions

