Public Health (Epidemiology)

Health Disparities: Healthy Communities

Won S. Choi, PhD, MPH
Professor and Executive Director
MPH Program
Department of Preventive Medicine and Public Health

US measles cases reach highest number in nearly three decades, CDC says

By Debra Goldschmidt, CNN

Updated 9:51 PM ET, Thu May 30, 2019

Red wine's resveratrol decreases blood pressure in mice: Could it do the same in human heart patients?

By **Susan Scutti**, CNN

Updated 7:24 PM ET, Wed May 22, 2019

Red wine is not the answer

Bob Patton, a lecturer and alcohol researcher at the University of Surrey, pointed out that if you wanted to match the effective dosage found in the study, you would need to drink about 1,000 bottles of wine each day, "which is of course impossible."

Such a high dose was needed because resveratrol must be broken down to reach its target in the blood vessel wall, and it does not dissolve well, the study authors explained. Future drugs may require either altered, easy-to-dissolve resveratrol or synthetic compounds that mimic its beneficial effects.

Related Article: Even one alcoholic drink a day can raise risk of stroke, study says

Patton, who was not involved in the study, told Science Media Centre that "Excessive alcohol consumption is associated with increases in blood pressure, and this can lead to cardiovascular problems like heart attacks and strokes."

It's a good idea to reduce not increase your wine intake, he added: "Relaxing with a glass of red [wine] is one way to unwind at the end of the day, but on its own that is not going to help tackle hypertension; losing weight, taking regular exercise and lowering your stress levels are three of the best ways to do this."

Jan. 30, 2014

WELL

Low Vitamin D Tied to a Pregnancy Risk

Low vitamin D levels were associated with an increased risk for severe preeclampsia, a serious and sometimes fatal disorder of pregnancy.

By NICHOLAS BAKALAR

Jan. 04, 2005

VITAL SIGNS: PREVENTION

Hypertension Fight Starts Early

Diets rich in fruit, vegetables and low-fat dairy have been shown in some studies to help reduce blood pressure in adults. Now, a new study in the journal **Epidemiology** suggests that children may benefit as well. The researchers followed the health of a group of children, initially ages 3 to 6, for eight years. Their findings suggest that paying attention to what children eat can play an important role in decreasing their risk of hypertension in later years.

> ...A new study suggests that children may benefit from diets rich in fruit, vegetables and low-fat dairy....

By ERIC NAGOURNEY

Dec. 22, 2015

WELL

Can You Be 'Fat but Fit'?

Normal weight men, no matter what their level of fitness, were at lower risk of premature death than obese men in the highest one-quarter for fitness.

By NICHOLAS BAKALAR

Nov. 02, 2016

PHYS ED

Fitness Trackers Might Help Us Live Longer (if Only We Used Them)

Two new studies underscore the promise and perils of using activity trackers.

By GRETCHEN REYNOLDS

Dec. 17, 2012

WELL

Risks: Coffee Linked to Fewer Oral Cancer Deaths

A large study of 968,432 initially healthy men and women has found that drinking

The Ideal Subjects for a Salt Study? Maybe Prisoners.

Leading scientists propose to track salt's effects on health by controlling how much is given to inmate volunteers.

By Gina Kolata

June 4, 2018

Anthony Russo

Suppose you wanted to do a study of diet and nutrition, with thousands of participants randomly assigned to follow one meal plan or another for years as their health was monitored?

How to Increase Your Chances of Having a Long, Healthy Life

Chiara Zarmati

By Jane E. Brody

June 4, 2018

22

Where's the best place in America to live if you want to maximize your chances of living longer?

WELL

Risks: Coffee Linked to Fewer Oral Cancer Deaths

A large study of 968,432 initially healthy men and women has found that drinking coffee is associated with a reduced risk of death from oral cancers.

By NICHOLAS BAKALAR

WELL

Tylenol During Pregnancy Tied to Asthma in Children

Taking Tylenol (acetaminophen) during pregnancy is associated with a slight increase in the risk for asthma in offspring, a new study has found.

By NICHOLAS BAKALAR

WELL

Air Pollution Tied to Birth Defects

Exposure in the first two months of pregnancy to air pollution from traffic sharply increases the risk for neural tube defects, a new study has found.

> ...Exposure in the first two months of pregnancy to air pollution from traffic sharply increases the risk of neural tube defects, a new study has found....

By NICHOLAS BAKALAR

GLOBAL HEALTH

Lasting Merit Found in a Tuberculosis Vaccine Invented a Century Ago

BCG vaccine, used in many countries, protects for nearly twice as long as previously thought, scientists find.

By DONALD G. McNEIL Jr

Health Disparities

- What is health disparity? Definition?
- Do they exist?
- How do you know?
- What can you do about reducing health disparities?
  - Describe disparities
  - Identify causes/risk factors of disparities
  - Interventions – targeted / tailored, etc

Health Disparities – U.S.D.H.H.S

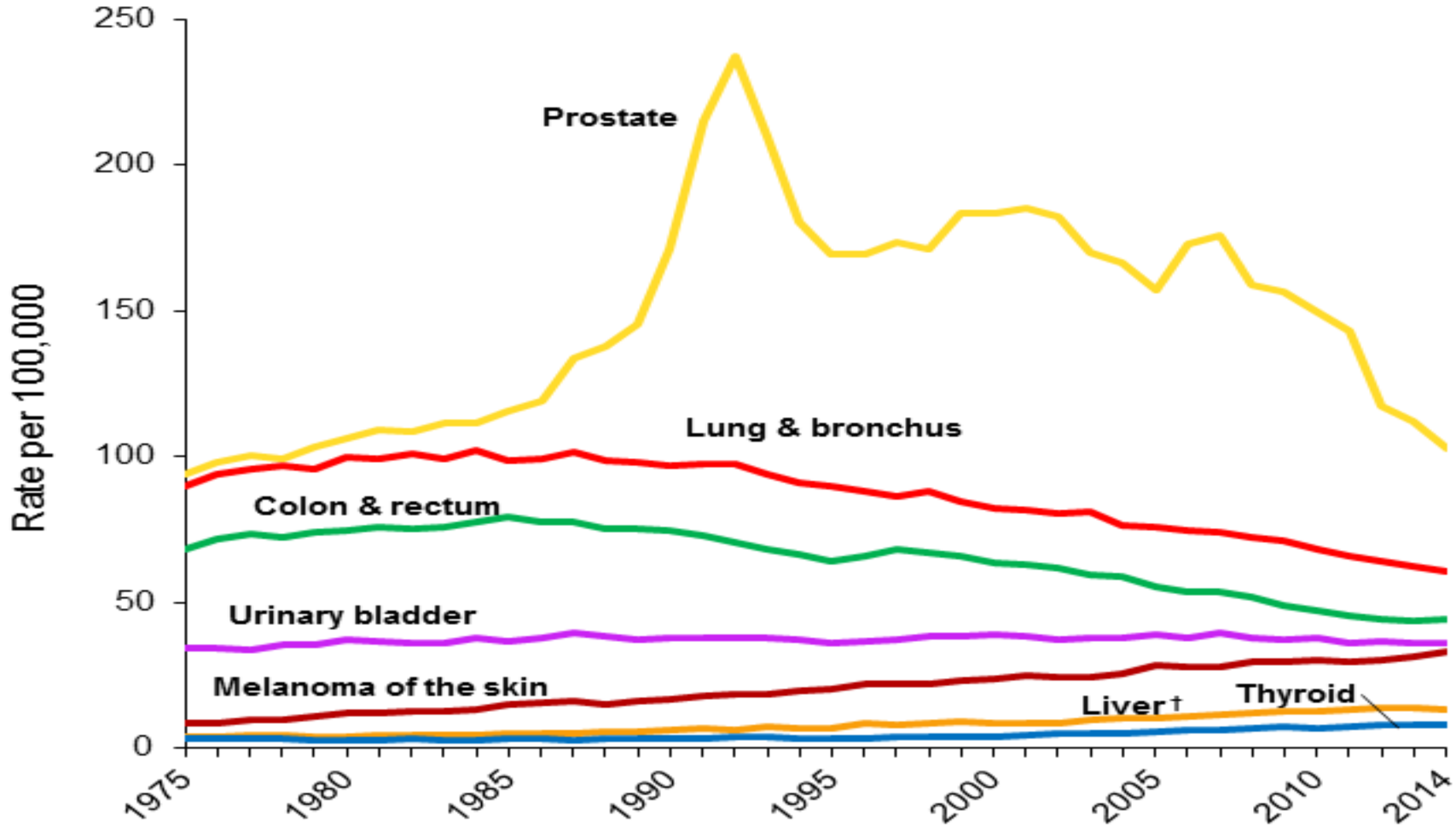
Differences in length and quality of life and rates and severity of disease and disability because of social position, race, ethnicity, gender, sexual orientation, education, or other factors.

Epidemiology

- Study of how disease is distributed in populations
- What factors influence or determine this distribution
- Application to control health problems

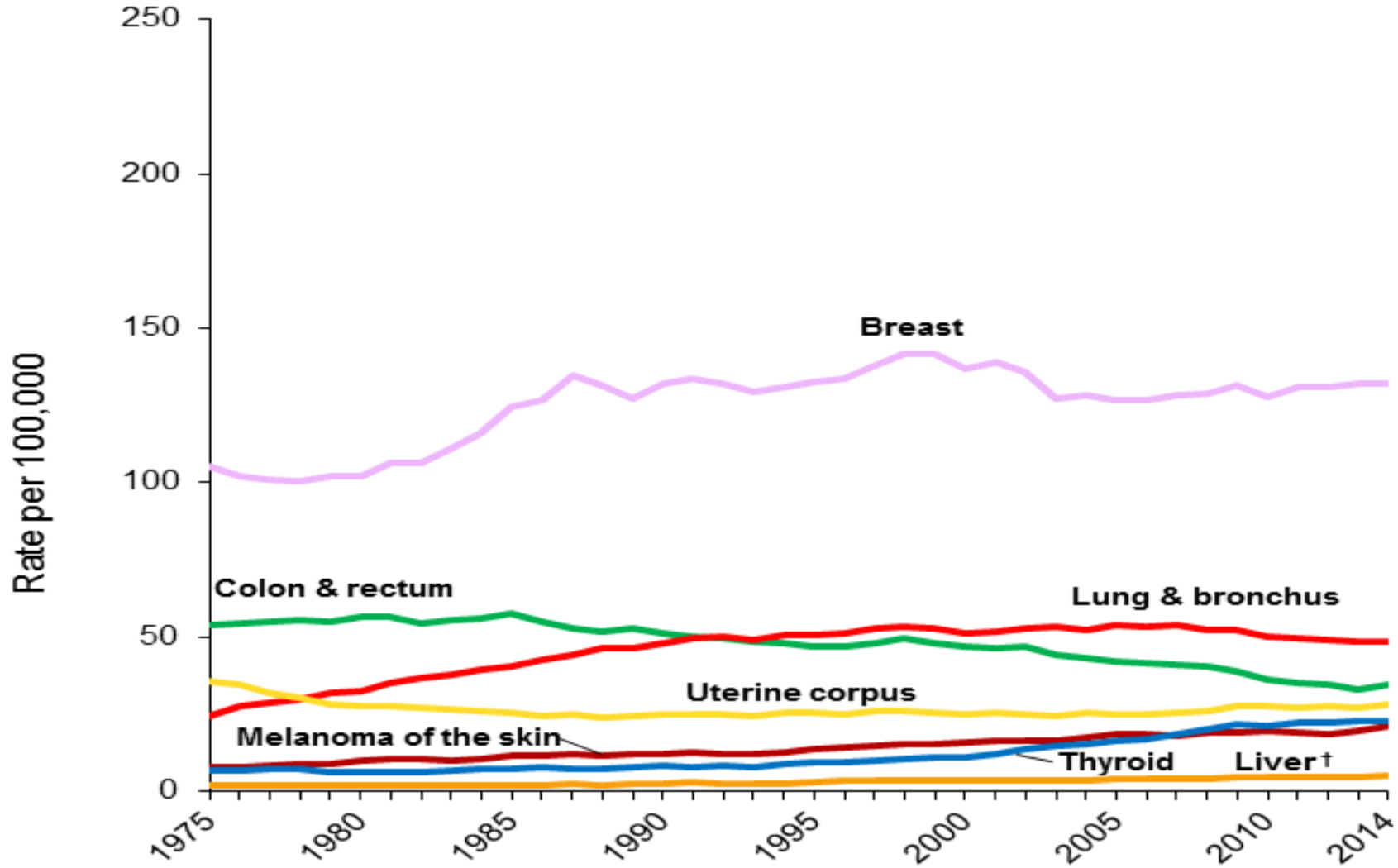
Incidence and Prevalence

Trends in Cancer Incidence Rates* Among Males, US, 1975-2014



*Age-adjusted to the 2000 US standard population and adjusted for delays in reporting. †Includes the intrahepatic bile duct.
Source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2017.

Trends in Cancer Incidence Rates* Among Females, US, 1975-2014



*Age-adjusted to the 2000 US standard population and adjusted for delays in reporting. †Includes the intrahepatic bile duct.
Source: Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute, 2017.

Incidence Rate

$$\frac{\text{\# New Cases of Disease}}{\text{\# at Risk in Population}}$$

(in a given time period)

✕ 100 (percent population)

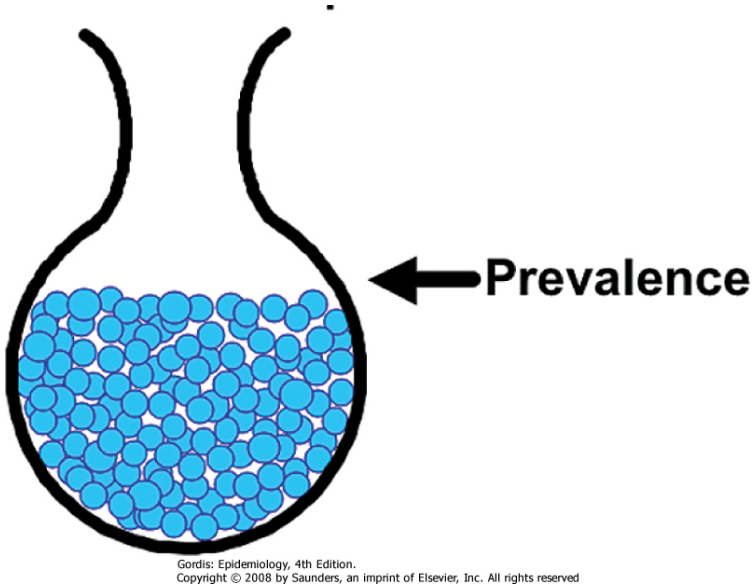
or 1,000 (per thousand)

or 10,000 (per ten thousand)

Incidence Rate

- Incidence is a measure of disease risk.
- A time period must be specified.
- Any individual included in the denominator must have the potential to become part of the numerator.

Prevalence

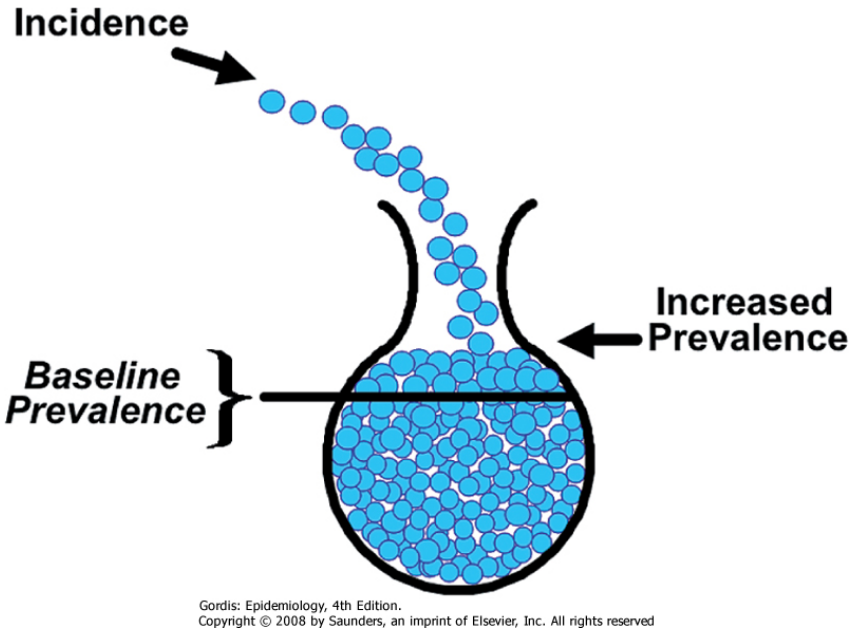


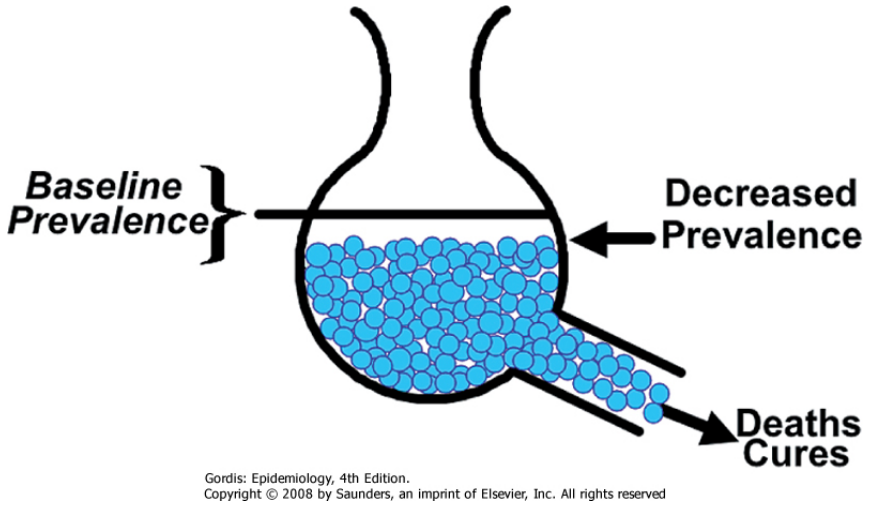
$$\frac{\text{\# of Cases (new and old) of a Disease Present in the Population at a Specified Time}}{\text{\# of Persons in the Population at that Specified Time}}$$

Prevalence

- Prevalence is a measure of the burden of a disease in the community.
- It is useful for health care planning, cost estimation, policy making.
- **NOT** a measure of disease risk.
- **NOT** useful in studying possible causal relations between an exposure and disease outcome.

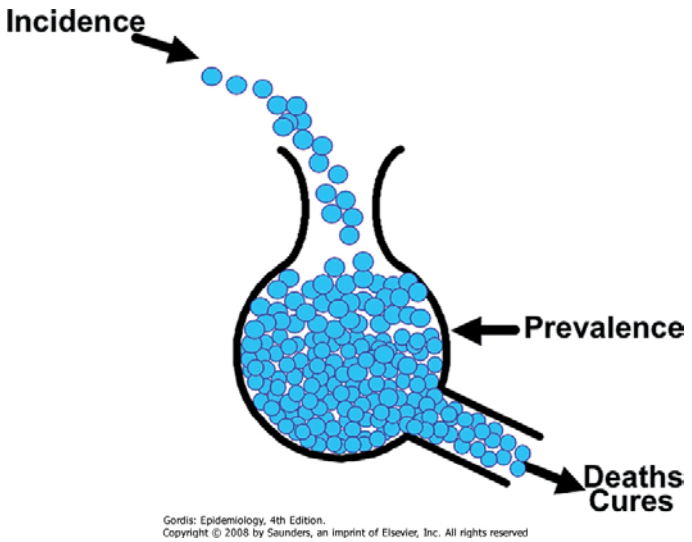
Relationship between Incidence and Prevalence

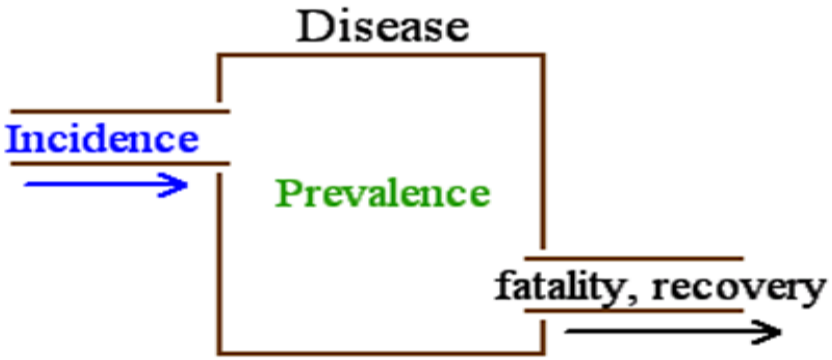




- If there are no cures or deaths and incidence increases, prevalence will increase
- If there are no new cases but cures and death continue, prevalence will decrease

Relationship between Incidence and Prevalence

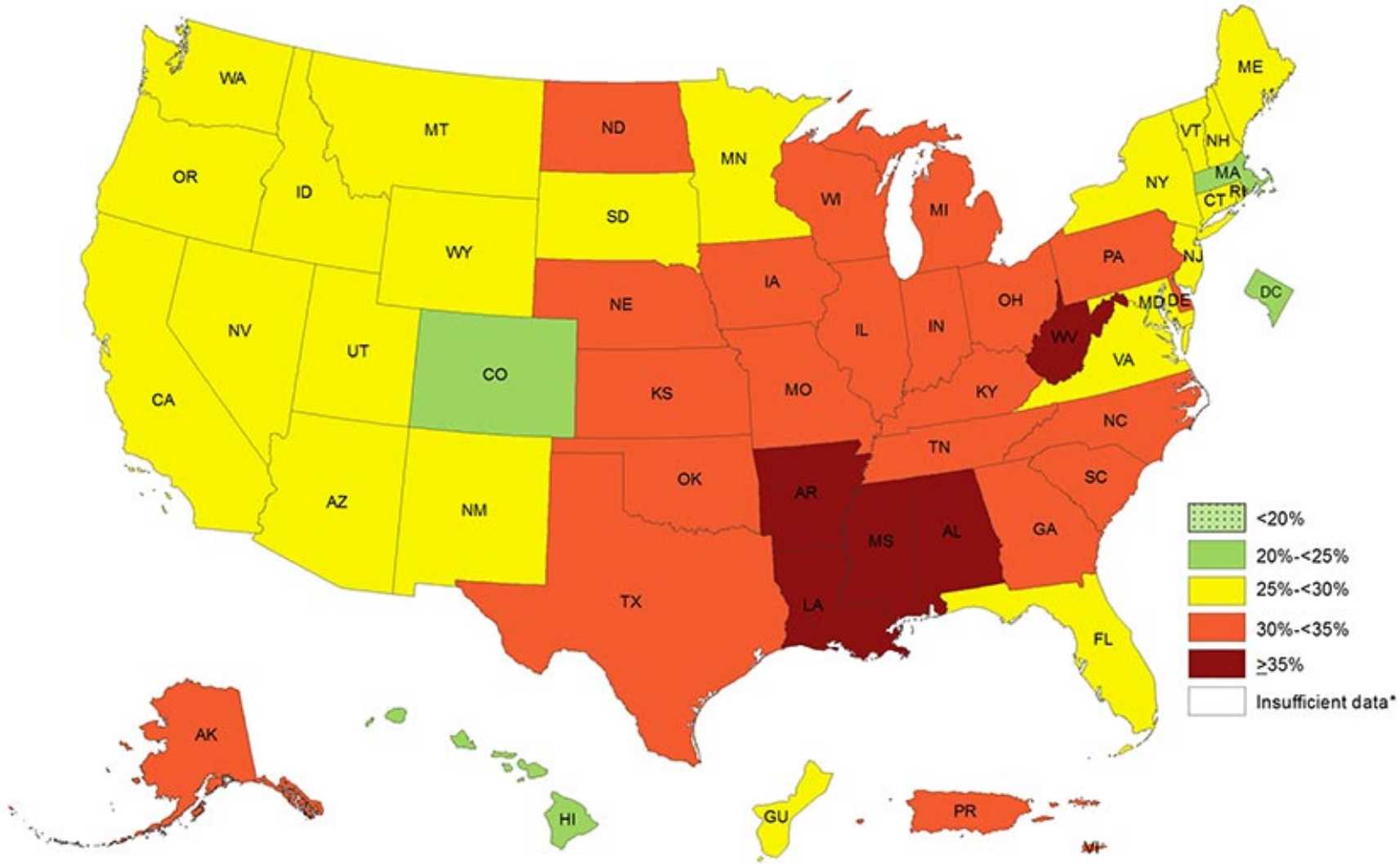




- Prevalence can be viewed as describing a pool of disease in a population.
- Incidence describes the input flow of new cases into the pool.
- Fatality and recovery reflects the output flow from the pool.

Prevalence[¶] of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2016[¶]

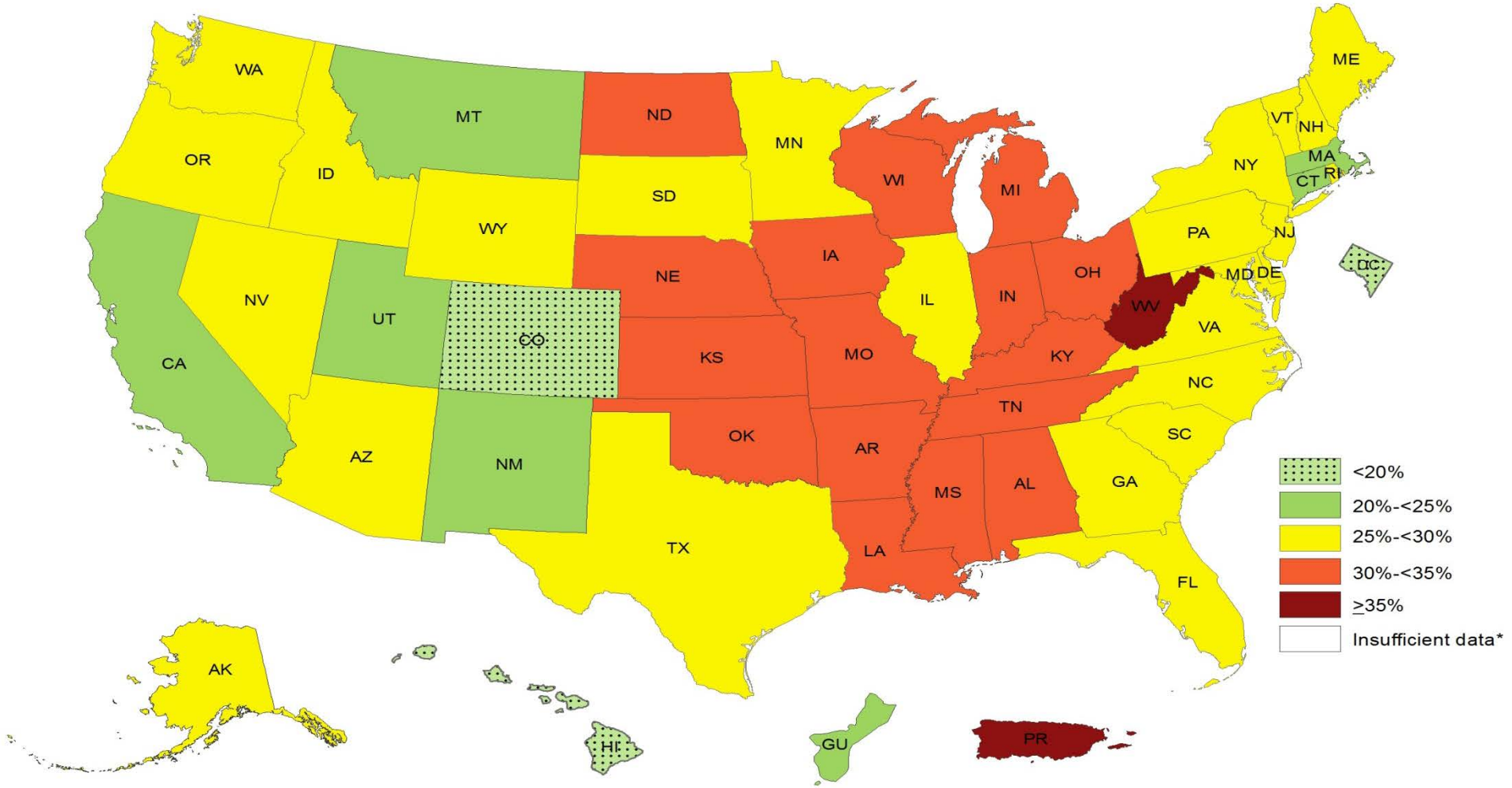
Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.



Source: Behavioral Risk Factor Surveillance System

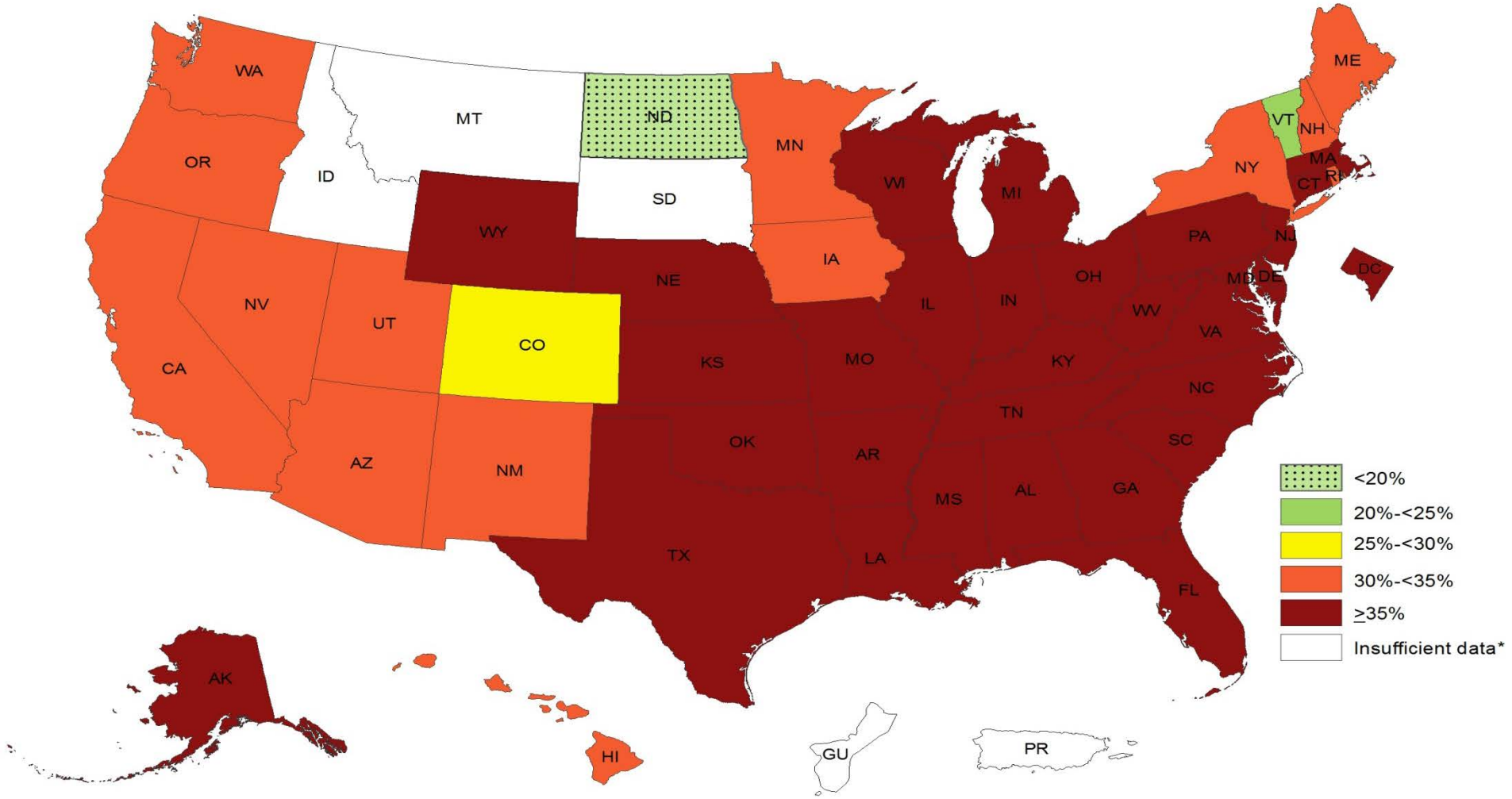
*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%

Prevalence of Self-Reported Obesity Among Non-Hispanic White Adults, by State and Territory, BRFSS, 2014-2016



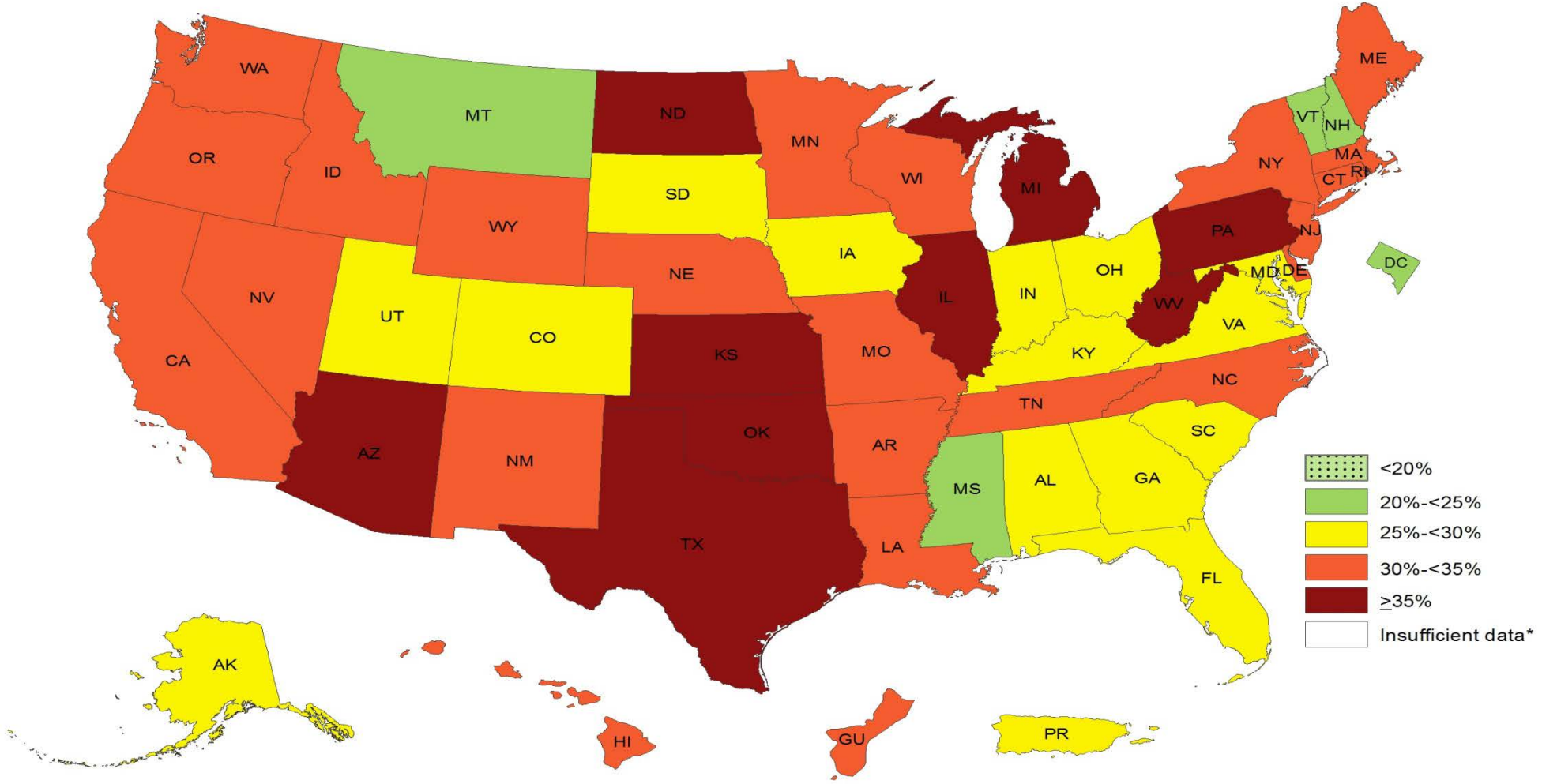
*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.

Prevalence of Self-Reported Obesity Among Non-Hispanic Black Adults, by State and Territory, BRFSS, 2014-2016



*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.

Prevalence of Self-Reported Obesity Among Hispanic Adults, by State and Territory, BRFSS, 2014-2016

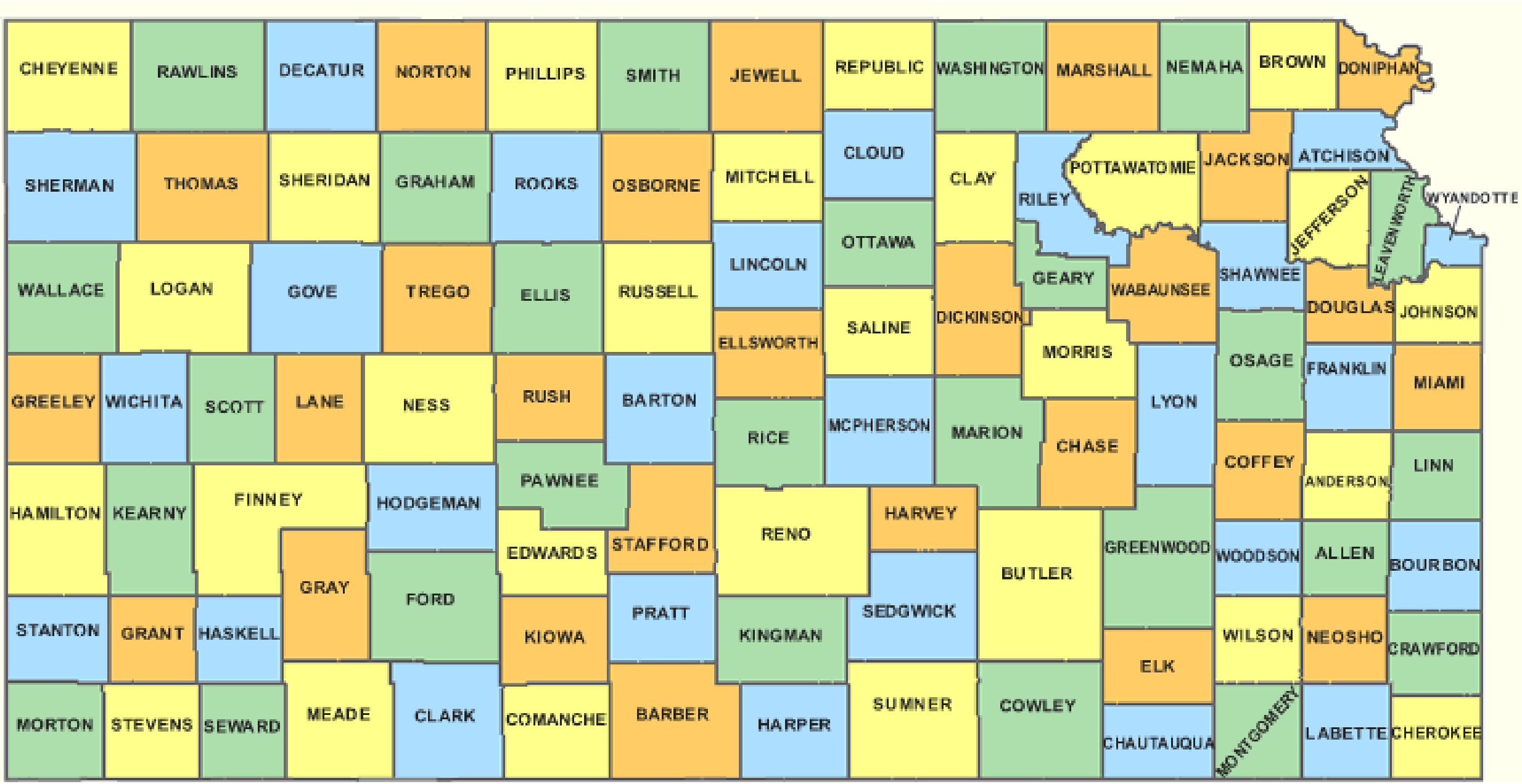


*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.

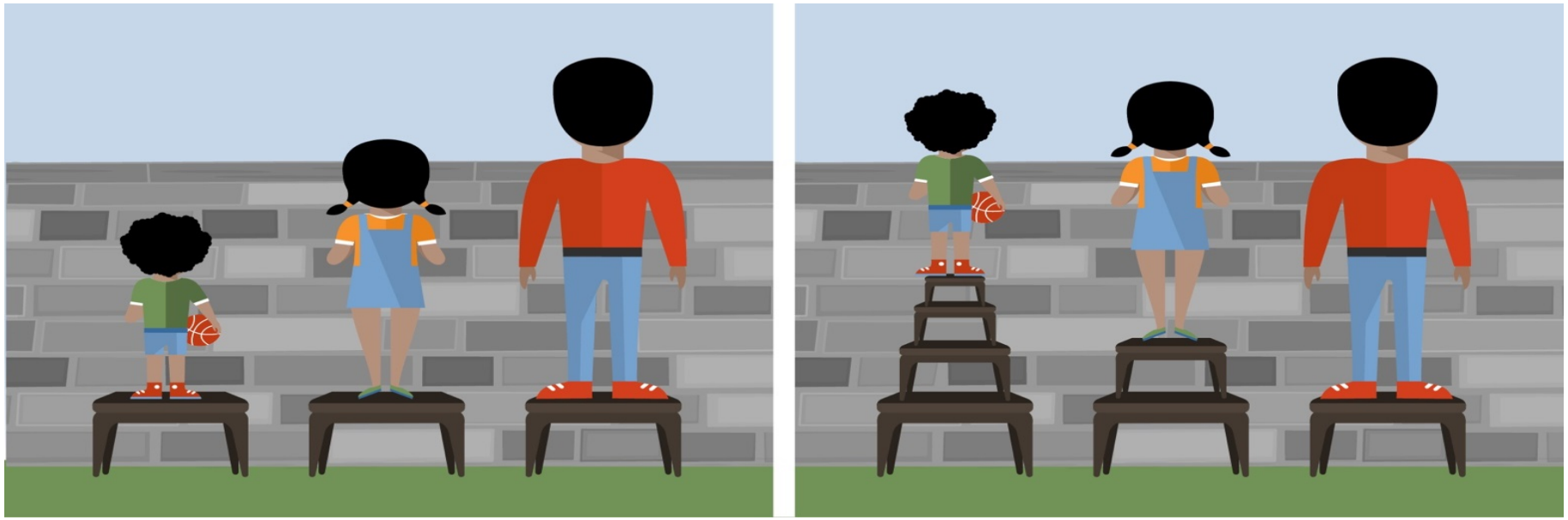
Relationship between Incidence and Prevalence

- Prevalence= Incidence X Duration of Disease
- Shorter duration of disease can
- be caused by:
  - **Worse death rate**
  - **Better cure rate**

Remember! Death rates and cure rates affect prevalence but not incidence


CHEYENNE
RAWLINS
DECATUR
NORTON
PHILLIPS
SMITH
JEWELL
REPUBLIC
WASHINGTON
MARSHALL
NEMAHA
BROWN
DONIPHAN
SHERMAN
THOMAS
SHERIDAN
GRAHAM
ROOKS
OSBORNE
MITCHELL
CLOUD
CLAY
RILEY
POTTAWATOMIE
JACKSON
ATCHISON
JEFFERSON
LEAVENWORTH
WYANDOTTE
WALLACE
LOGAN
GOVE
TREGO
ELLIS
RUSSELL
LINCOLN
OTTAWA
DICKINSON
GEARY
WABAUNSEE
SHAWNEE
DOUGLAS
JOHNSON
ELLSWORTH
SALINE
MORRIS
GREELEY
WICHITA
SCOTT
LANE
NESS
RUSH
BARTON
RICE
MCPHERSON
MARION
CHASE
LYON
OSAGE
FRANKLIN
MIAMI
PAWNEE
COFFEY
ANDERSON
LINN
HAMILTON
KEARNY
FINNEY
HODGEMAN
EDWARDS
STAFFORD
RENO
HARVEY
BUTLER
GREENWOOD
WOODSON
ALLEN
BOURBON
GRAY
FORD
STANTON
GRANT
HASKELL
KIOWA
PRATT
KINGMAN
SEDGWICK
WILSON
NEOSHO
CRAWFORD
ELK
MORTON
STEVENS
SEWARD
MEADE
CLARK
COMANCHE
BARBER
HARPER
SUMNER
COWLEY
CHAUTAUQUA
MONTGOMERY
LABETTE
CHEROKEE

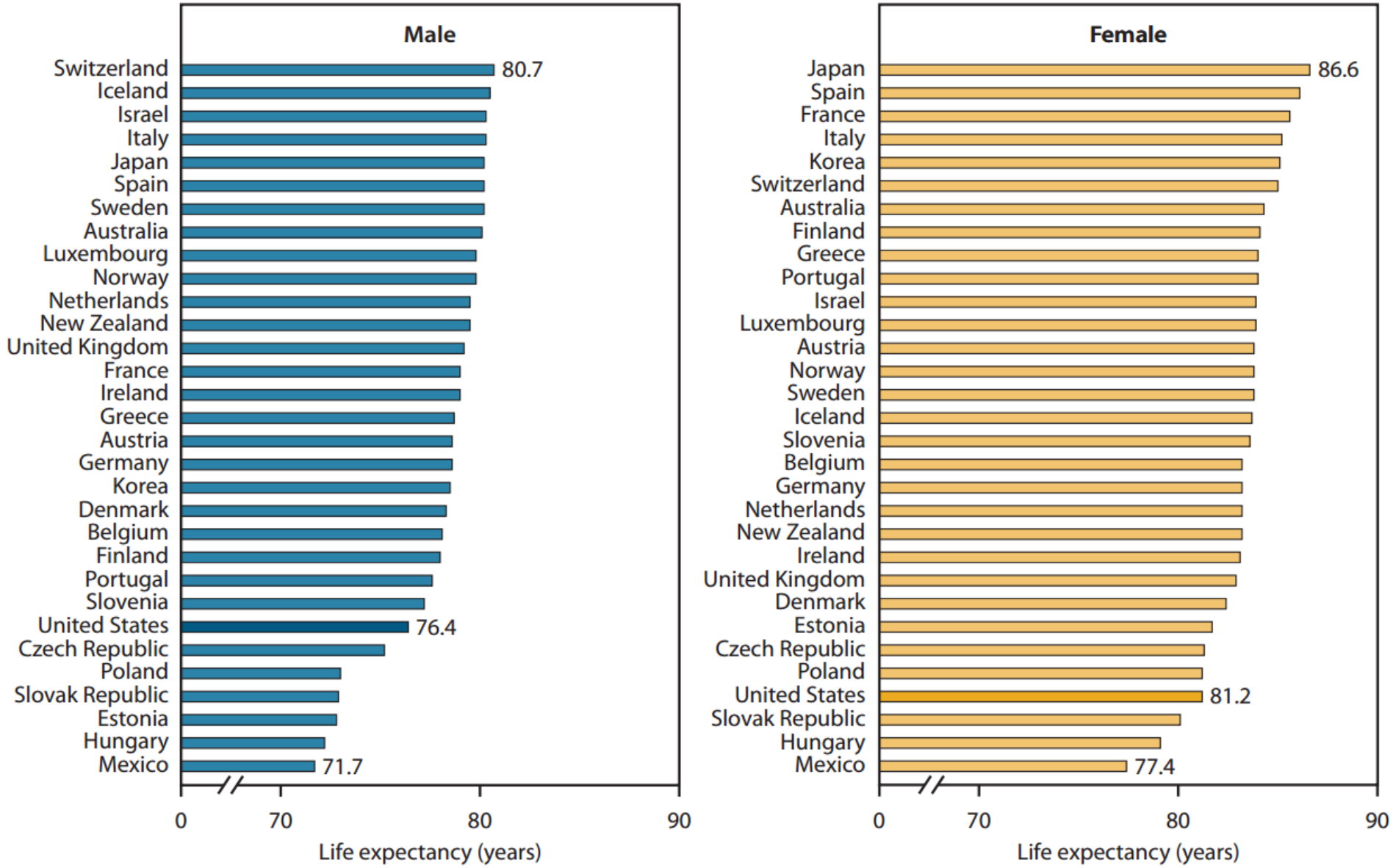
What health gaps are and why they matter

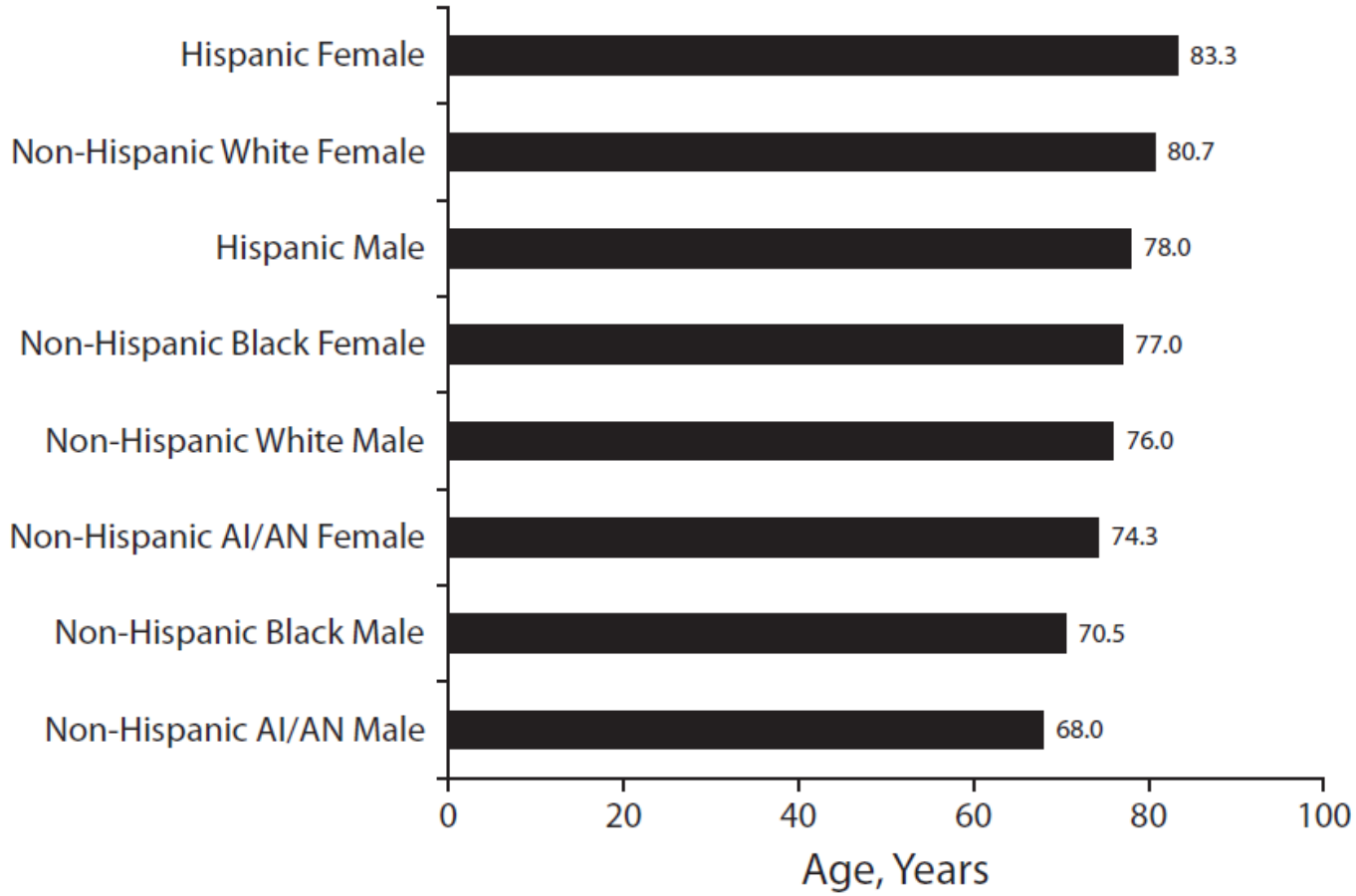


- Giving everyone a fair chance to be healthy does not necessarily mean offering the same resources to all, rather offering resources necessary for their good health.

Life Expectancy at Birth, by Country

Figure 1. Life expectancy at birth, by sex and country: Organisation for Economic Co-operation and Development (OECD) countries, 2013

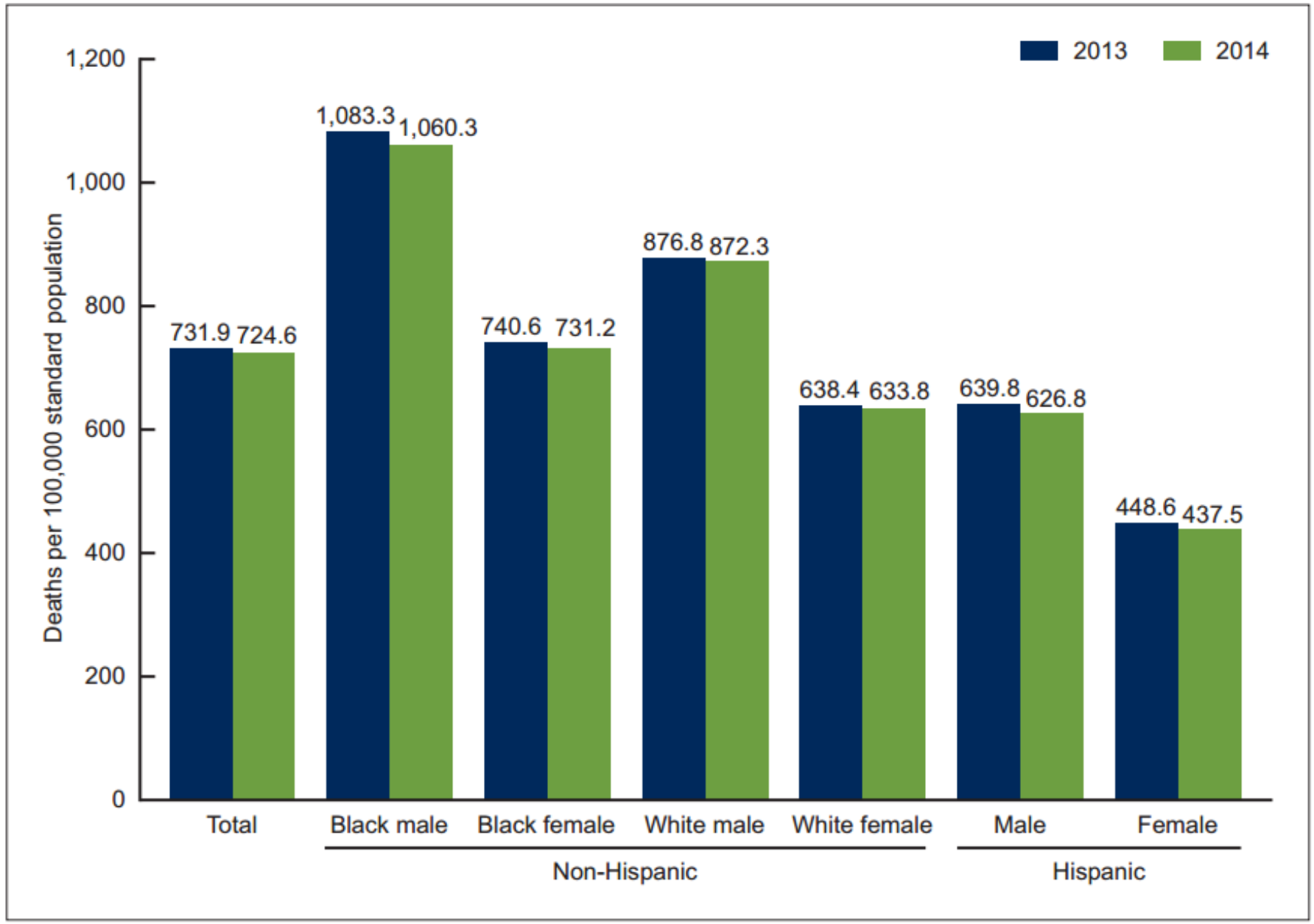




Note. AI/AN = American Indian/Alaska Native.

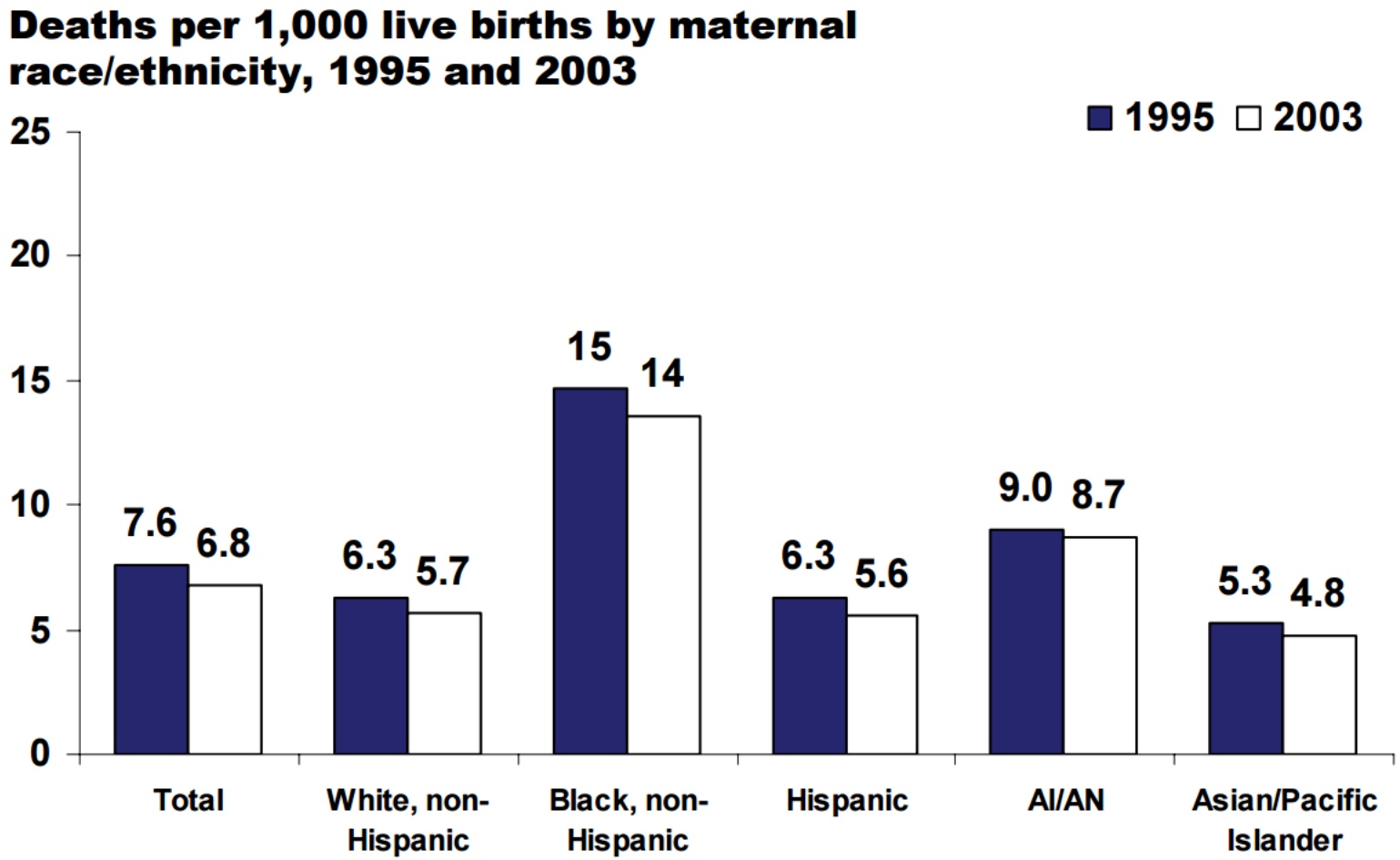
FIGURE 1—Life expectancy at birth by sex for the non-Hispanic American Indian and Alaska Native population in Contract Health Service Delivery Area counties, 2007–2009, and for the Hispanic, non-Hispanic White, and non-Hispanic Black populations in the United States, 2008.

Figure 2. Age-adjusted death rates for selected populations: United States, 2013 and 2014



SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

Chart 3-5. Infant mortality rates are still more than two times higher for blacks than for whites, despite a slight decline for all groups in the past eight years.



AI/AN = American Indian/Alaska Native.

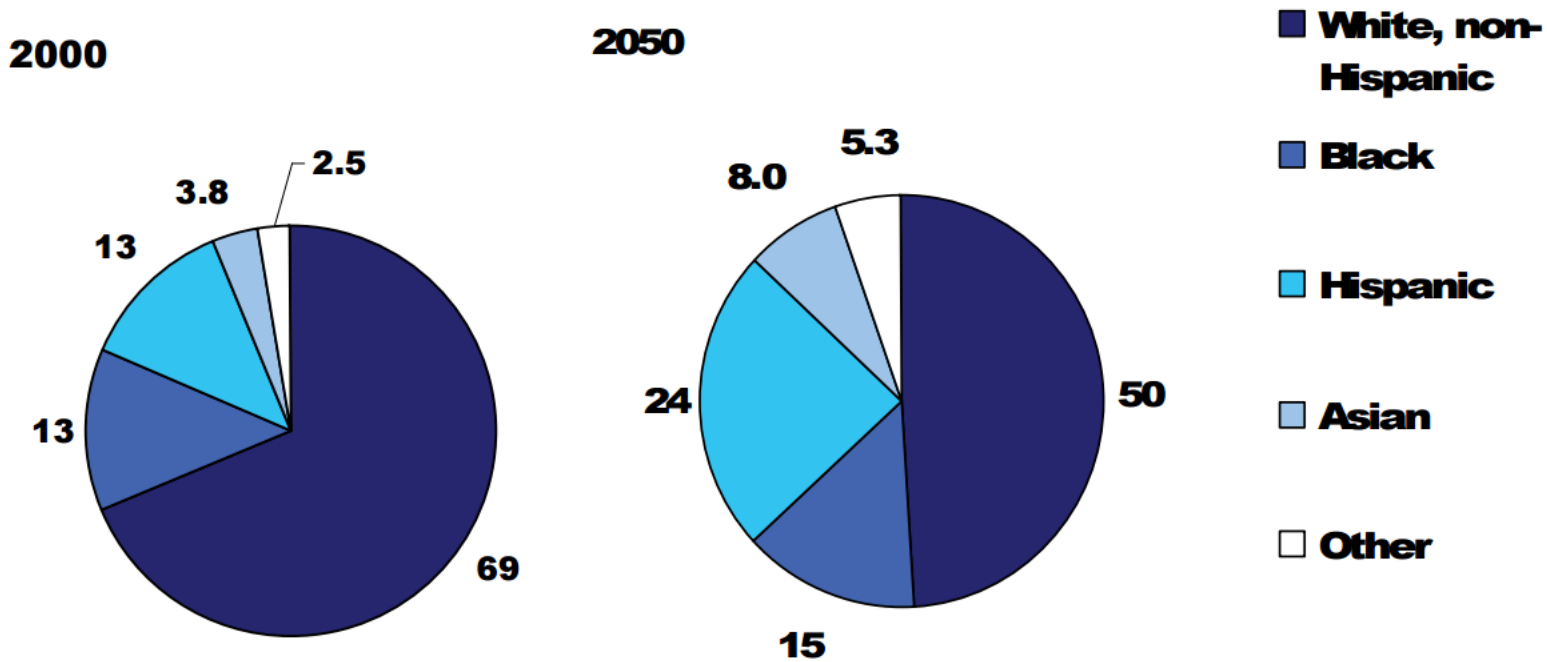
Note: Infant is defined as a child under one year of age.

Source: T. J. Matthews and M. F. MacDorman, "Infant Mortality Statistics from the 2003 Period Linked Birth/Infant Death Data Set," *National Vital Statistics Reports,* May 3, 2006 54(16):1–29.

THE COMMONWEALTH FUND

U.S. population by 2050; the biggest increase will occur within the Hispanic population.

Projected percentage change in racial/ethnic composition of the United States population, 2000 to 2050



Note: Numbers add up to more than 100 percent because of rounding and because some categories are not mutually exclusive.

Note: "Other" includes the following categories: American Indian/Alaska Native, Native Hawaiian/other Pacific Islander, and two or more races.

Source: United States Census Bureau. U.S. Interim Projections by Age, Sex, Race and Hispanic Origin. 2004.

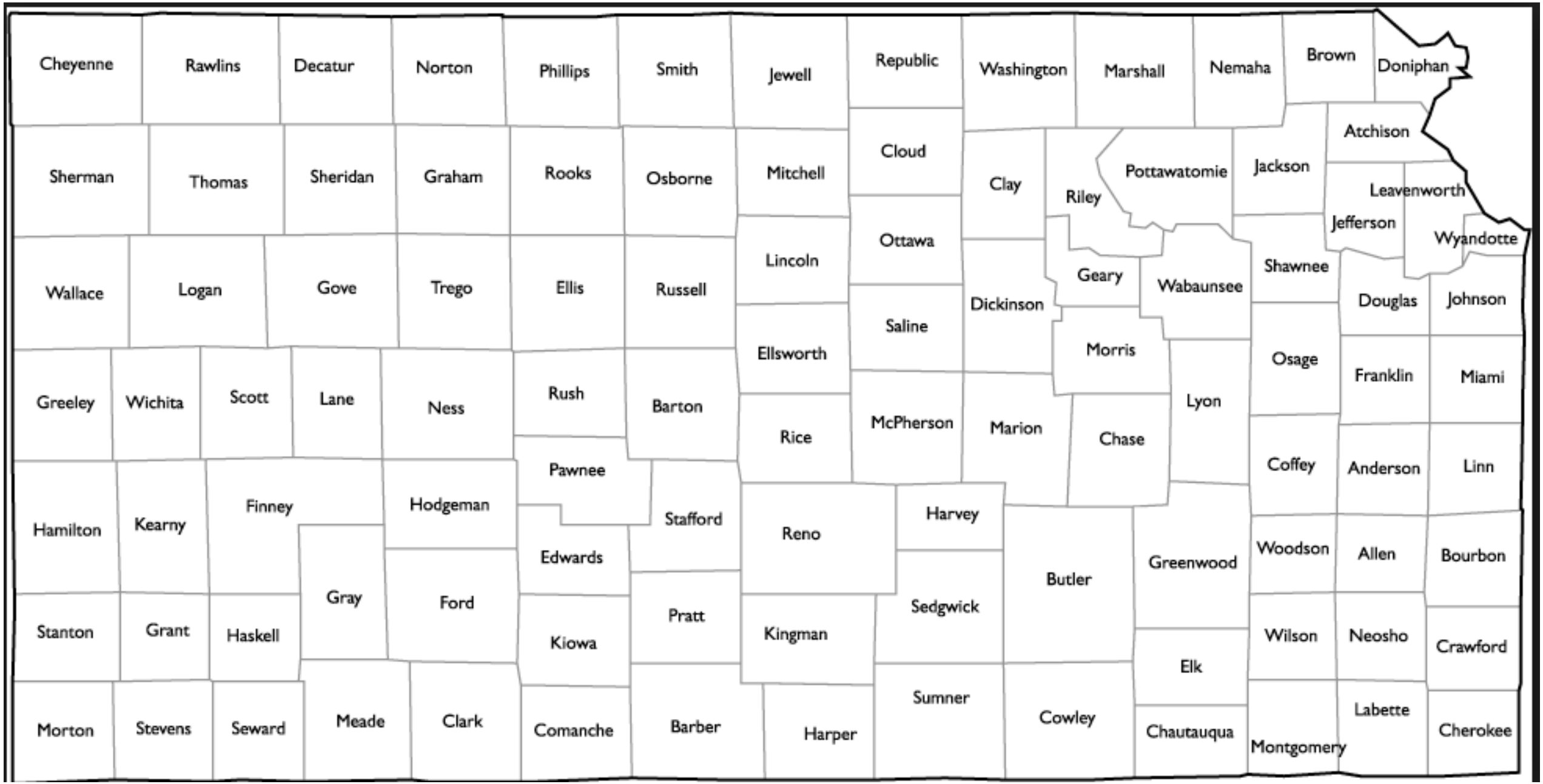
THE COMMONWEALTH FUND

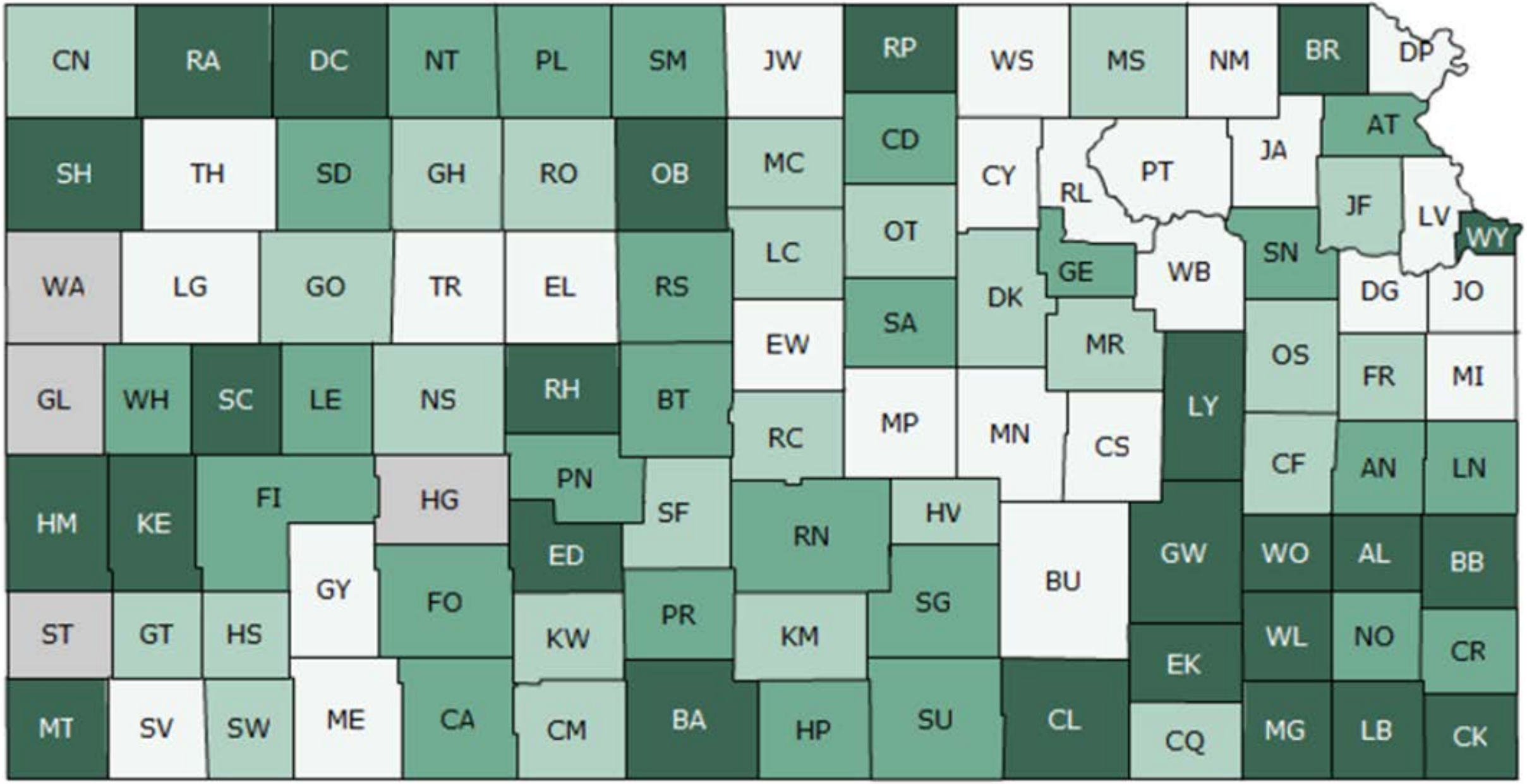
Kansas

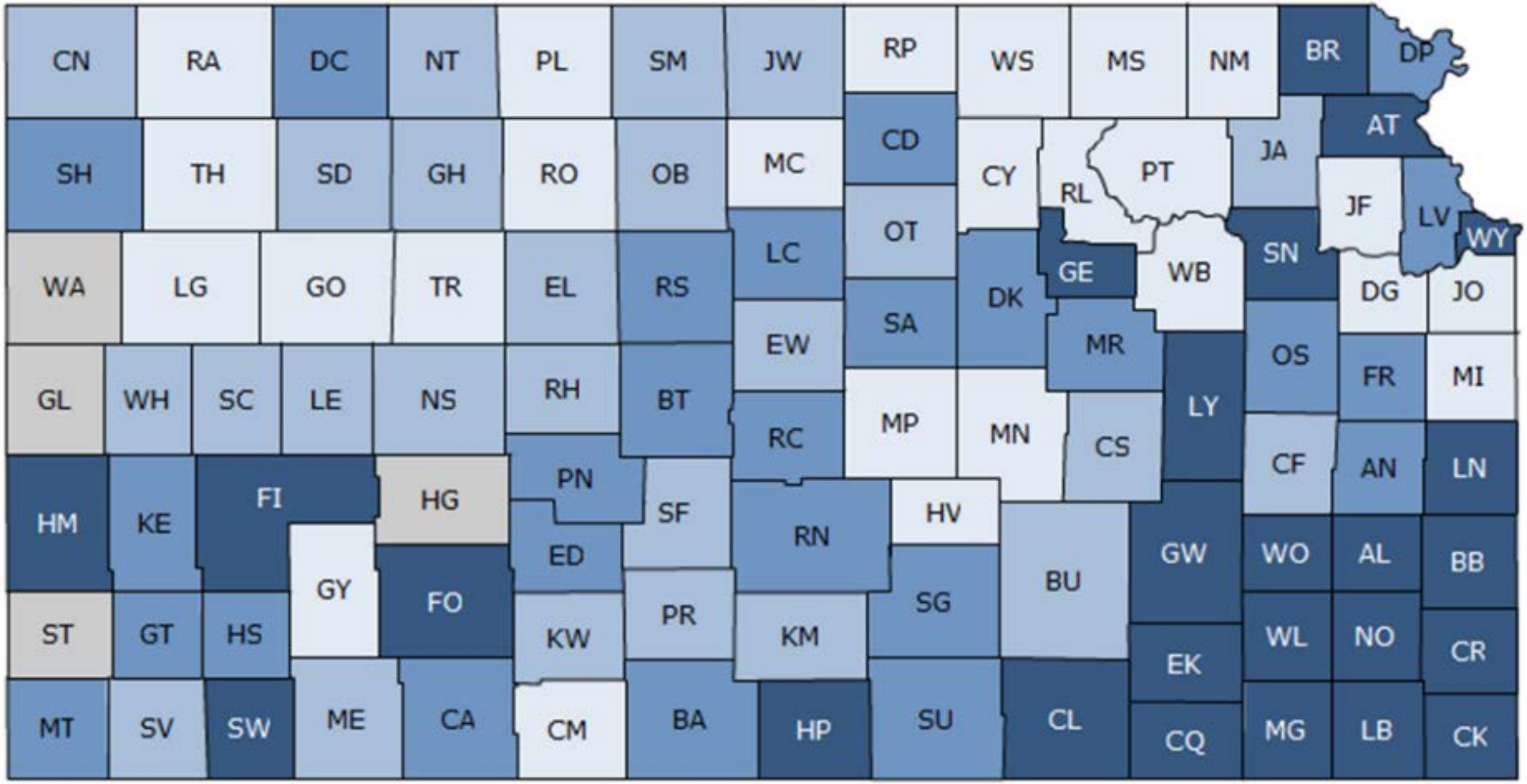
Health / Health Status

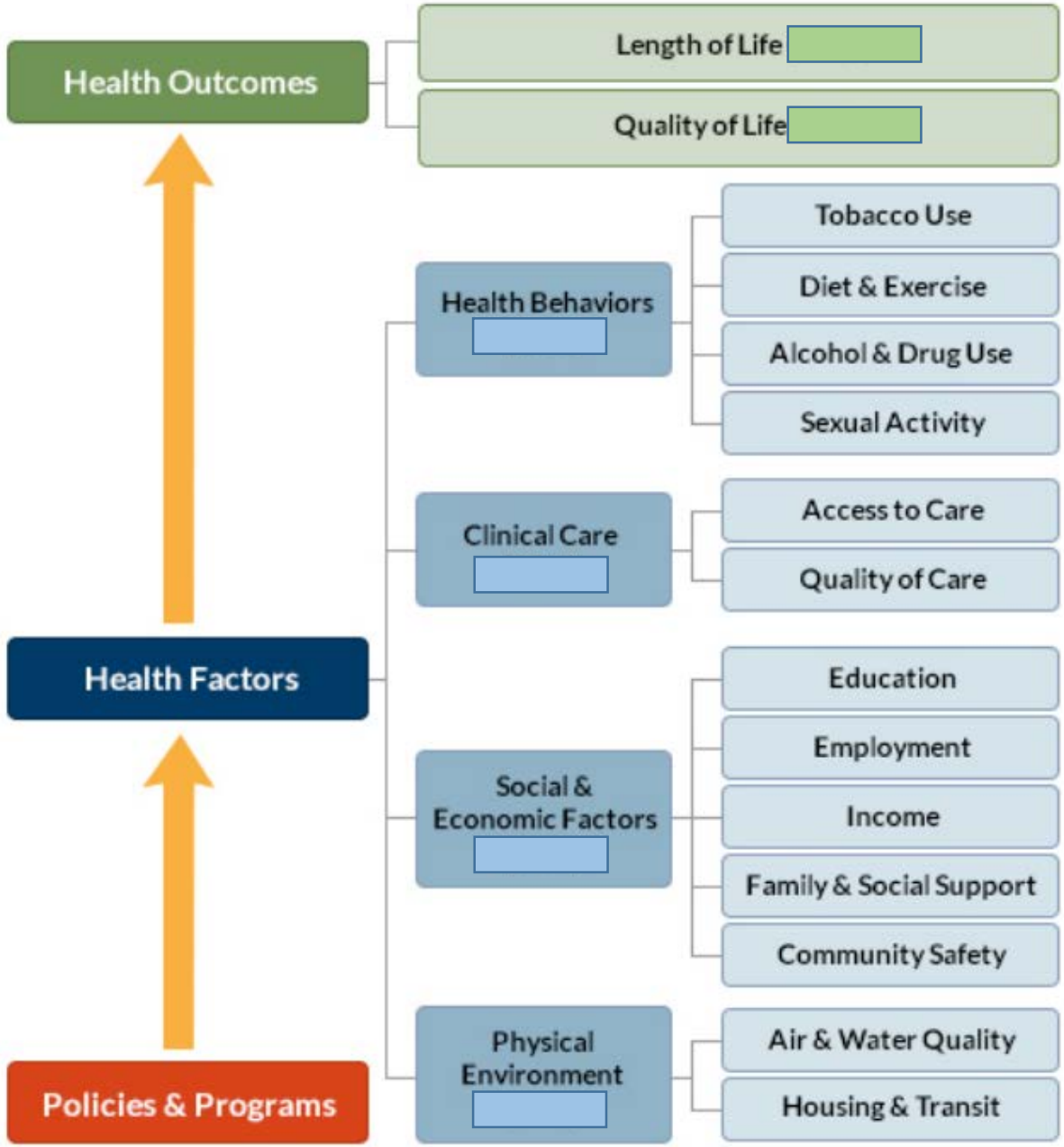
- How do you define health? – Health Outcomes
- What factors impact health and cause health disparities? – Health Factors

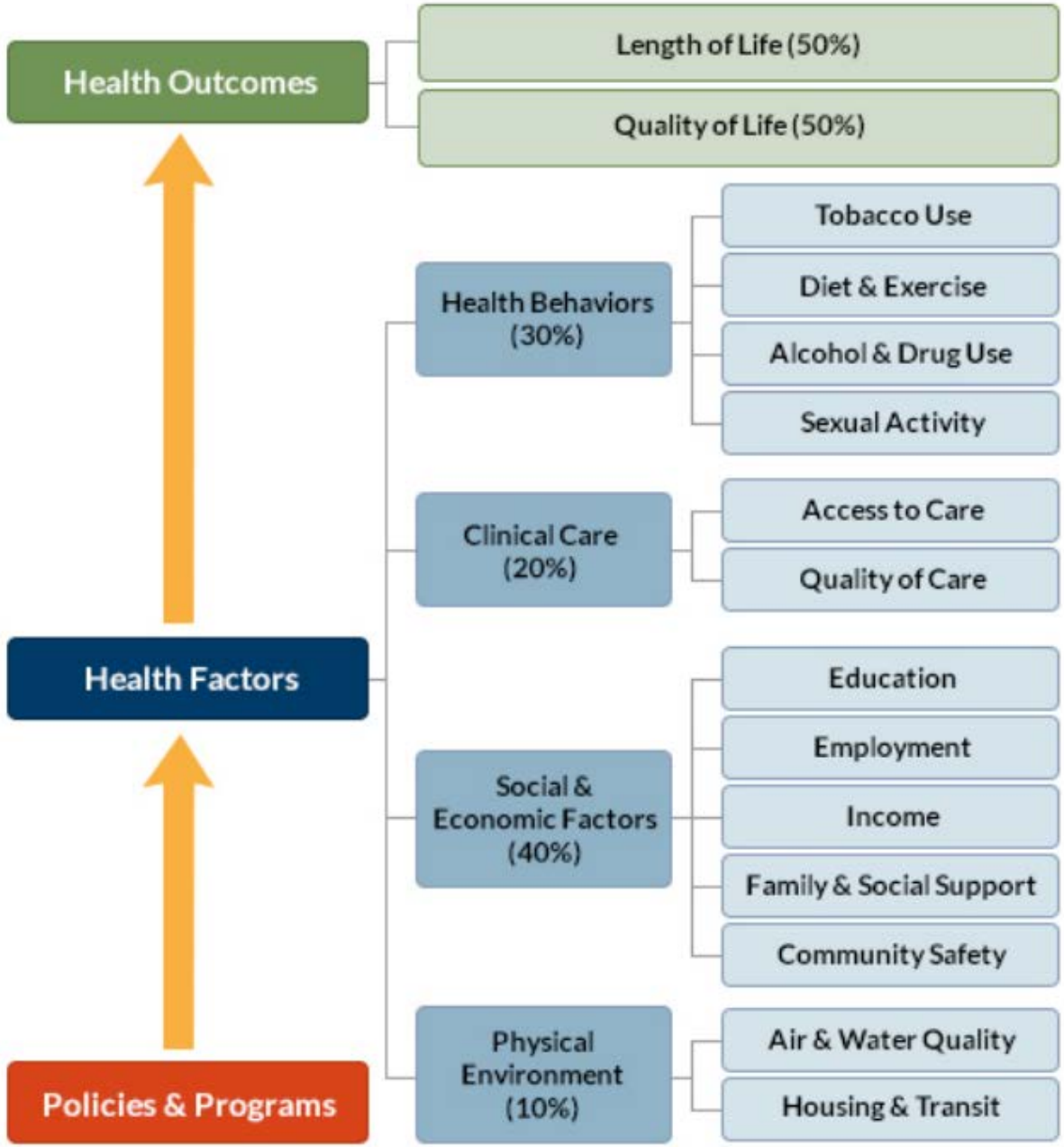
Health Outcomes	Health Factors / Risk Factors


Cheyenne
Rawlins
Decatur
Norton
Phillips
Smith
Jewell
Republic
Washington
Marshall
Nemaha
Brown
Doniphan
Sherman
Thomas
Sheridan
Graham
Rooks
Osborne
Mitchell
Cloud
Clay
Riley
Pottawatomie
Jackson
Atchison
Leavenworth
Jefferson
Wyandotte
Wallace
Logan
Gove
Trego
Ellis
Russell
Lincoln
Ottawa
Dickinson
Geary
Wabaunsee
Shawnee
Douglas
Johnson
Ellsworth
Saline
Morris
Greeley
Wichita
Scott
Lane
Ness
Rush
Barton
Rice
McPherson
Marion
Chase
Lyon
Osage
Franklin
Miami
Pawnee
Coffey
Anderson
Linn
Hamilton
Kearny
Finney
Hodgeman
Stafford
Reno
Harvey
Edwards
Butler
Greenwood
Woodson
Allen
Bourbon
Gray
Ford
Pratt
Sedgwick
Stanton
Grant
Haskell
Kiowa
Kingman
Wilson
Neosho
Crawford
Meade
Clark
Elk
Morton
Stevens
Seward
Comanche
Barber
Harper
Sumner
Cowley
Chautauqua
Montgomery
Labette
Cherokee


CN
RA
DC
NT
PL
SM
JW
RP
WS
MS
NM
BR
DP
SH
TH
SD
GH
RO
OB
MC
CD
CY
RL
PT
JA
AT
JF
LV
WY
WA
LG
GO
TR
EL
RS
LC
OT
GE
WB
SN
DG
JO
EW
SA
DK
MR
OS
GL
WH
SC
LE
NS
RH
BT
RC
MP
MN
CS
LY
FR
MI
HM
KE
FI
HG
PN
SF
RN
HV
CF
AN
LN
ED
BU
GW
WO
AL
BB
GY
FO
PR
SG
ST
GT
HS
KW
KM
EK
WL
NO
CR
MT
SV
SW
ME
CA
CM
BA
HP
SU
CL
CQ
MG
LB
CK


CN
RA
DC
NT
PL
SM
JW
RP
WS
MS
NM
BR
DP
SH
TH
SD
GH
RO
OB
MC
CD
CY
RL
PT
JA
AT
JF
LV
WY
WA
LG
GO
TR
EL
RS
LC
OT
GE
WB
SN
DG
JO
EW
SA
DK
MR
OS
GL
WH
SC
LE
NS
RH
BT
RC
MP
MN
CS
LY
FR
MI
HM
KE
FI
HG
PN
SF
RN
HV
CF
AN
LN
ED
GW
WO
AL
BB
GY
FO
PR
SG
BU
ST
GT
HS
KW
KM
EK
WL
NO
CR
MT
SV
SW
ME
CA
CM
BA
HP
SU
CL
CQ
MG
LB
CK


Health Outcomes
Length of Life
Quality of Life
Health Factors
Health Behaviors
Tobacco Use
Diet & Exercise
Alcohol & Drug Use
Sexual Activity
Clinical Care
Access to Care
Quality of Care
Social & Economic Factors
Education
Employment
Income
Family & Social Support
Community Safety
Physical Environment
Air & Water Quality
Housing & Transit
Policies & Programs


Health Outcomes
Length of Life (50%)
Quality of Life (50%)
Health Factors
Health Behaviors (30%)
Tobacco Use
Diet & Exercise
Alcohol & Drug Use
Sexual Activity
Clinical Care (20%)
Access to Care
Quality of Care
Social & Economic Factors (40%)
Education
Employment
Income
Family & Social Support
Community Safety
Physical Environment (10%)
Air & Water Quality
Housing & Transit
Policies & Programs

Section 1: Health Status

1.1 Would you say that in general your health is —? (80)

Please read:

1 Excellent
2 Very good
3 Good
4 Fair

Or

5 Poor

Do not read:

7 Don’t know / Not sure
9 Refused

Health Data

- Sources of data
- Issues with county level data
- Method of data collection

2016 COUNTY HEALTH RANKINGS: DATA SOURCES AND YEARS OF DATA

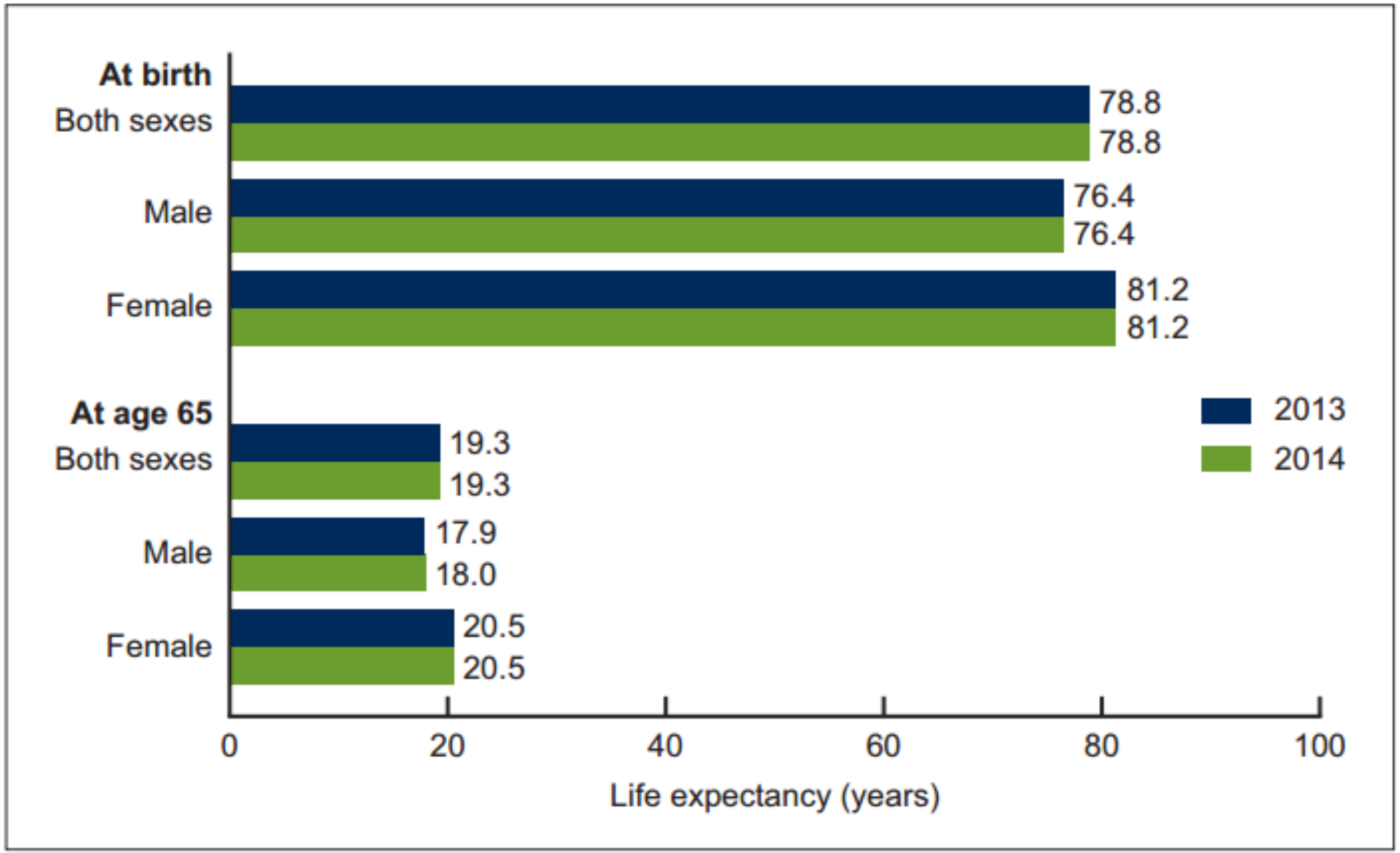
	Measure	Data Source	Years of Data
HEALTH OUTCOMES			
Length of Life	Premature death	National Center for Health Statistics – Mortality files	2011-2013
Quality of Life	Poor or fair health	Behavioral Risk Factor Surveillance System	2014
	Poor physical health days	Behavioral Risk Factor Surveillance System	2014
	Poor mental health days	Behavioral Risk Factor Surveillance System	2014
	Low birthweight	National Center for Health Statistics – Natality files	2007-2013
HEALTH FACTORS			
HEALTH BEHAVIORS			
Tobacco Use	Adult smoking	Behavioral Risk Factor Surveillance System	2014
Diet and Exercise	Adult obesity	CDC Diabetes Interactive Atlas	2012
	Food environment index	USDA Food Environment Atlas, Map the Meal Gap	2013
	Physical inactivity	CDC Diabetes Interactive Atlas	2012
	Access to exercise opportunities	Business Analyst, Delorme map data, ESRI, & US Census Tigerline Files	2010 & 2014
Alcohol and Drug Use	Excessive drinking	Behavioral Risk Factor Surveillance System	2014
	Alcohol-impaired driving deaths	Fatality Analysis Reporting System	2010-2014
Sexual Activity	Sexually transmitted infections	National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention	2013
	Teen births	National Center for Health Statistics - Natality files	2007-2013

Health Data

- https://www.cdc.gov/nchs/
- http://www.cdc.gov/brfss/
- http://www.nhtsa.gov/FARS

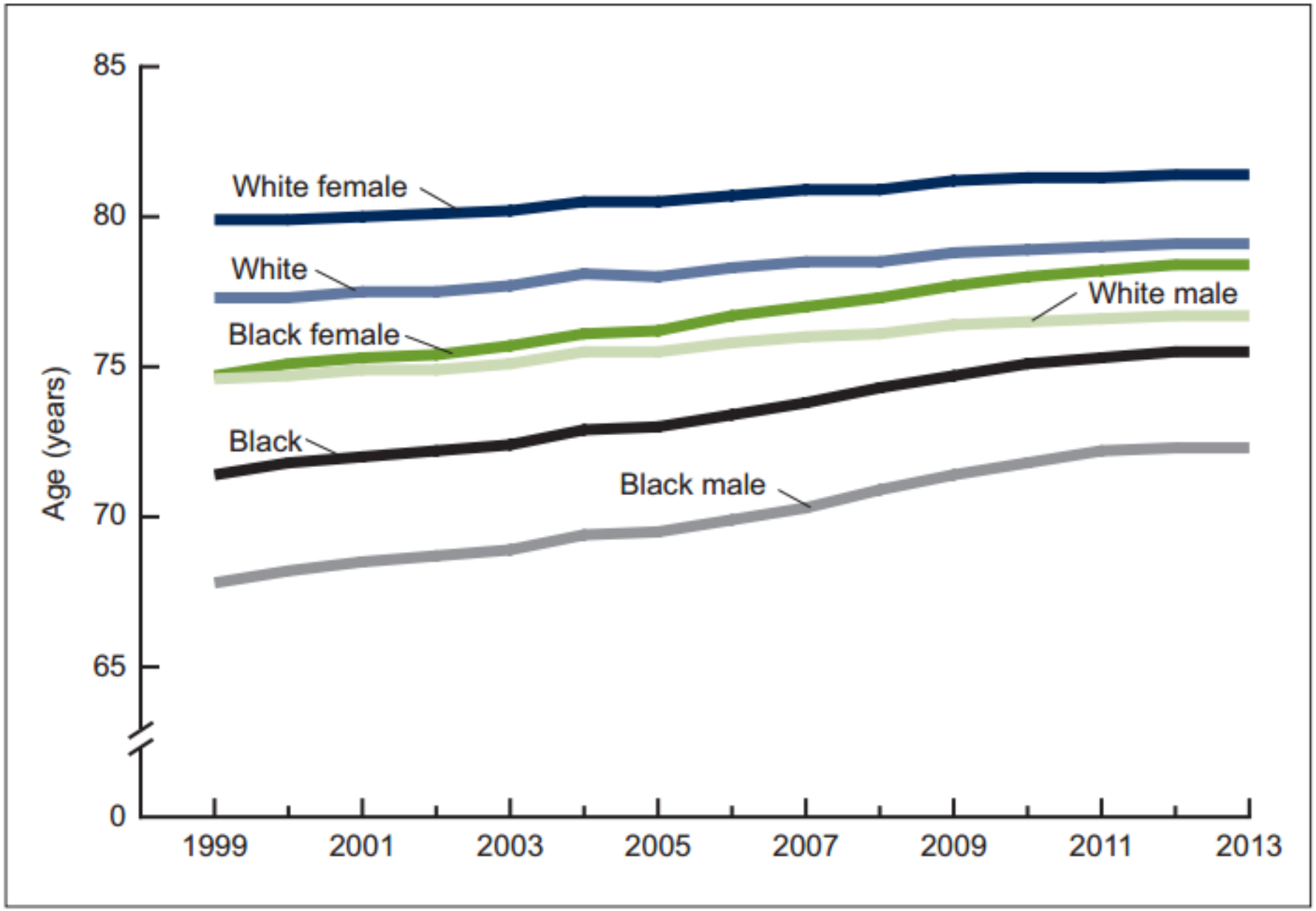
Premature Death

Figure 1. Life expectancy at selected ages, by sex: United States, 2013 and 2014



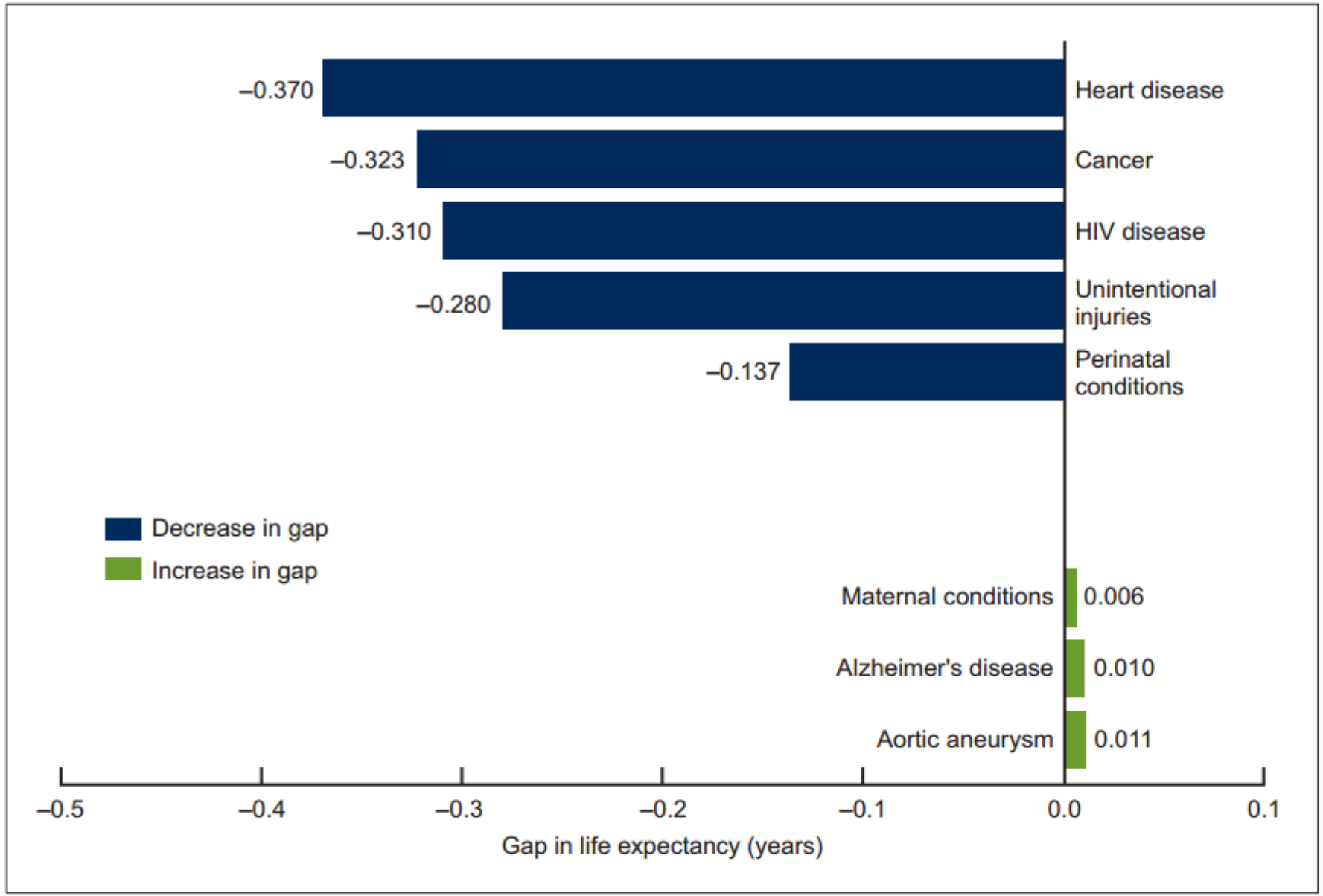
SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

Figure 1. Life expectancy, by race and sex: United States, 1999–2013



SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

Figure 3. Contribution of leading causes of death to decrease in life expectancy gap between black and white populations: United States, 1999–2013



SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

Ranked Measures from the County Health Rankings, 2010-2016

Construct		Focus Area	Weight	Measure
Health Outcomes	Mortality		50%	Premature death
	Morbidity		50%	Poor or fair health
				Poor physical health days
				Poor mental health days
				Low birthweight
	Health Behaviors	Tobacco use	10%	Adult smoking
		Diet and exercise	10%	Adult obesity
				Food environment index
				Physical inactivity
				Access to exercise opportunities
		Alcohol use	5%	Moter vehicle crash death rate
				Alcohol-imparied driving deaths
				Excessive drinking
		Sexual activity	5%	Sexually transmitted infections
				Teen birth rate
	Clinical Care	Access to care	10%	Uninsured
				Primary care providers
				Dentists
				Mental Health Providers
		Quality of care	10%	Preventable hospital stays
				Diabetic monitoring
				Hospice use
				Mammography screening