

# Tracking Health Disparities on the Local Level

Epidemiology, Planning and Evaluation Unit  
Public Health - Seattle & King County

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# Why measure local health disparities?

- Priority of Public Health - Seattle & King County:  
“Elimination of inequalities in health associated with socioeconomic status, race/ethnicity, gender and sexual orientation.”
- Disparities has been identified as an area of concern by King County residents (Communities Count survey)
- Even as health is improving for the population as a whole, many disparities persist or are growing
- Disparities may have a negative effect on the health of the entire community
- Local data is persuasive

# What we'll cover...

- Presentation is on
  - the tools we need to demonstrate disparities on the local level
  - examples of how we have used these tools to present local disparities
  - questions in need of technical assistance
- Discussion of the strategic use of data will be covered by other presenters

# Core Community Health Assessment at EPE

- Health surveillance
- Health status reports
- Customized health and health-related geographic information system (GIS) reports
- Leadership and technical assistance in community health assessment
- Conduct quantitative and qualitative research and evaluation and disseminate findings
- Develop, maintain and disseminate assessment software (Vista/PH)
- Acquisition and database management

# Objectives of Local Health Disparities Assessment

- Provide cogent, scientifically sound, accessible analyses demonstrating health disparities on the local level
- Increase the visibility of health disparities in our community, particularly those that are exceptional
- Provide support to communities and policymakers to create change

# Health disparities research and community health assessment

- Community health assessment entails descriptive epidemiological analyses
- Datasets and resources to do research on causal pathways of disparities and health outcomes are usually not available
- Research findings guide choosing SES measures and setting assessment priorities

# Data needed for tracking disparities

- Population-based, readily available, consistently updated
- Accurate demographics and measures of social determinants (e.g, age, race, sex, education level)
- Precise, high-quality geocodes
- Accurate health outcomes or risk factors
- Small area, detailed population estimates
- Ready access to census data

# Sources of data

- Vital events statistical files (e.g., births, deaths, abortions)
- Hospitalizations
- Random-digit-dial surveys, for example:
  - BRFSS
  - Communities Count
  - Ethnicity and Health
- U.S. Census



# Examples of “invisible” infrastructure:

## Three critical supports

- Geocoding
- Population estimates
- Data analysis (VistaPH)

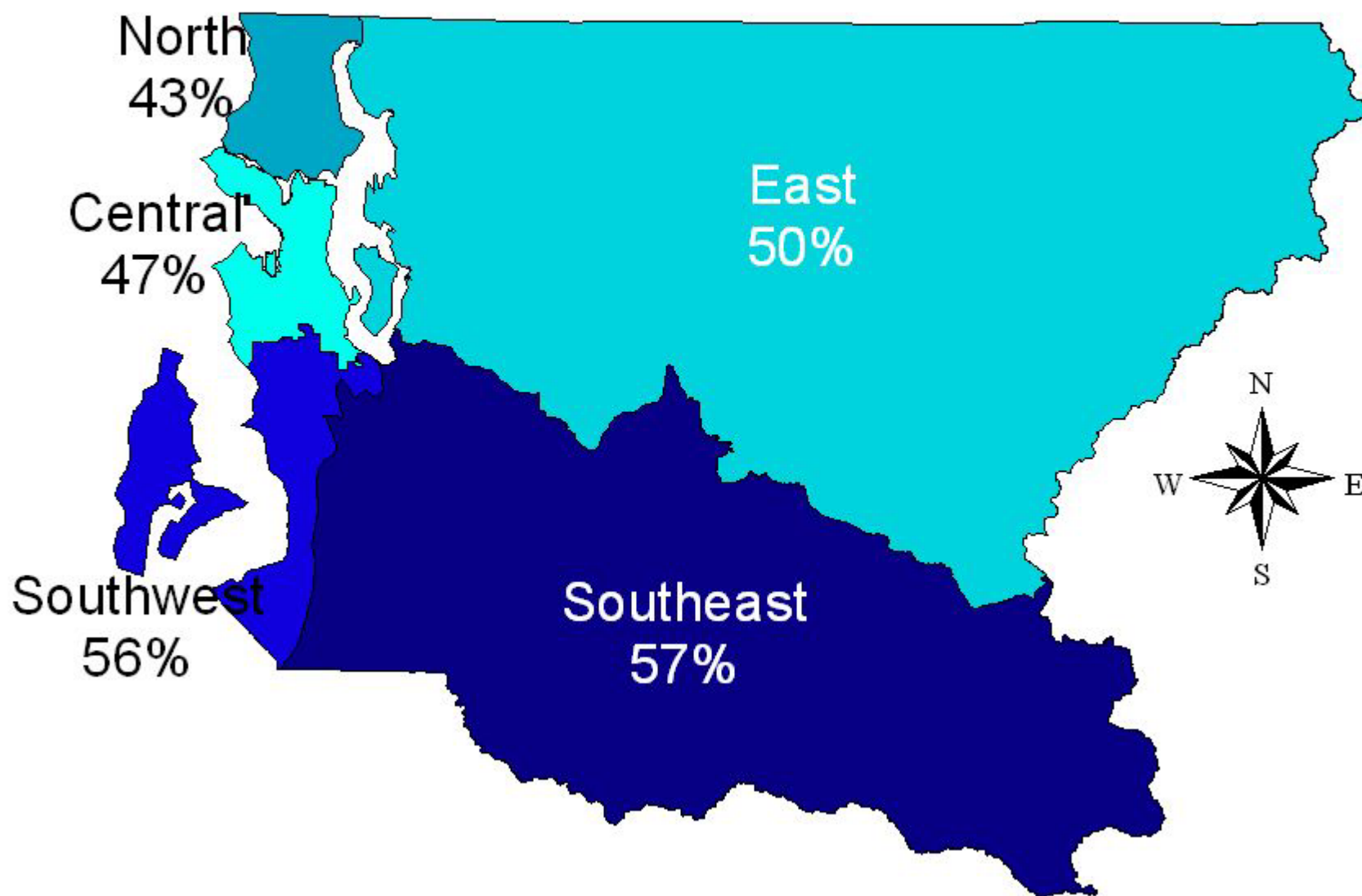
# Geocoding

- Places a point location on a map
- Allows assigning of spatial information to point source.
  - Address can be assigned census tract, block group, zip code, county, latitude and longitude
  - Can aggregate from lowest area to higher
    - Geocode data to block group; can aggregate up to Health Planning Area
  - Can use source information to append to data point (e.g. census poverty for given block group)

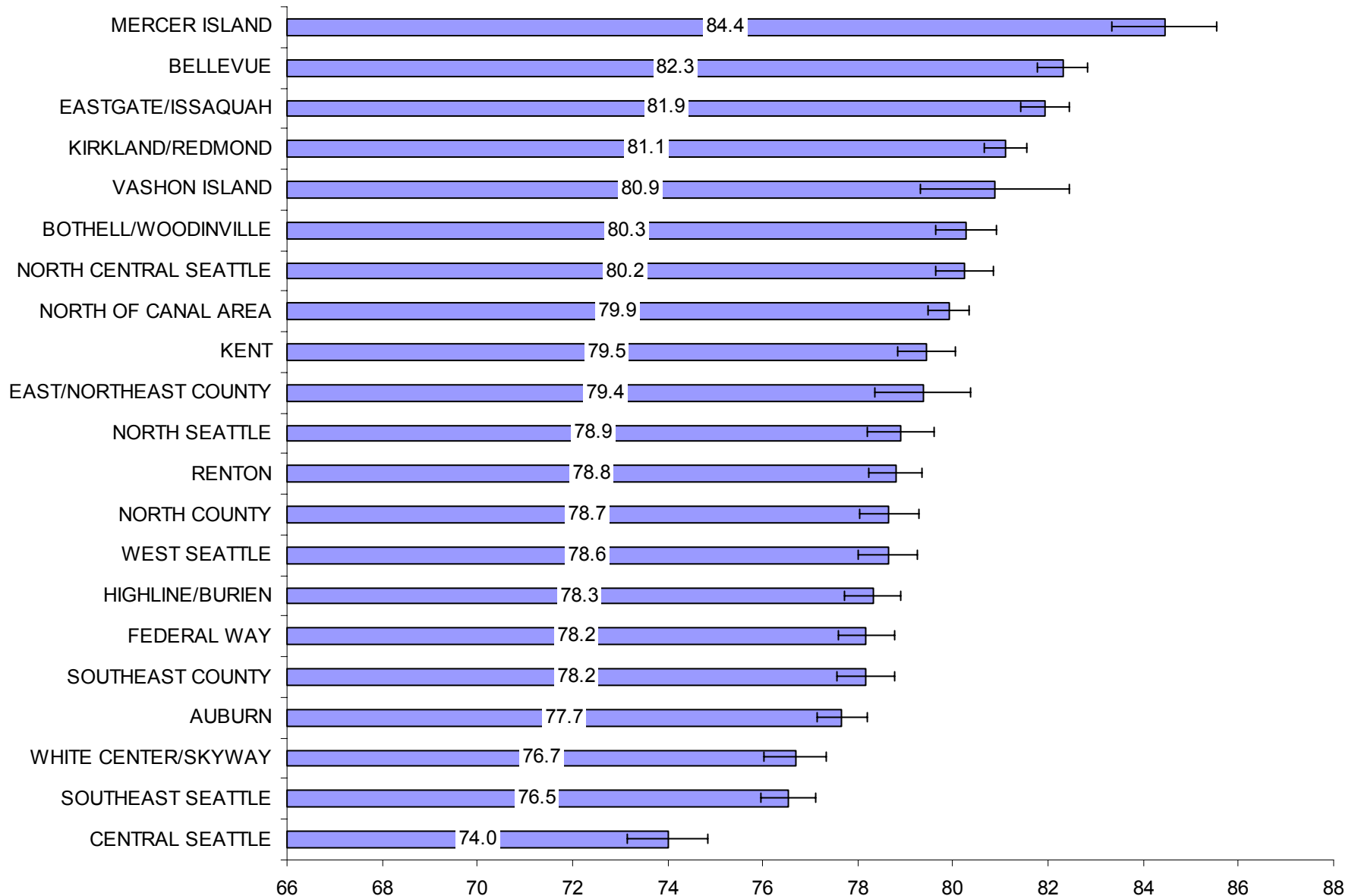
# Geocoding

- Geocoding matches address to an underlying street file
- Anatomy of an address: 121 E Main St
  - Street number (121) - directional (E, N, S, W) - street name - street type (Ave, St, Ct, etc)
  - Since a state or county may have more than one “Main St”; use a boundary to limit incorrect matches. Zip code is generally used.
- Match determined by comparison of
  - street number to street range
  - spelling of street name and directional
  - street type

## Prevalence of Overweight and Obesity by Region, Age 18 and Older, King County, 1997-2001 Average



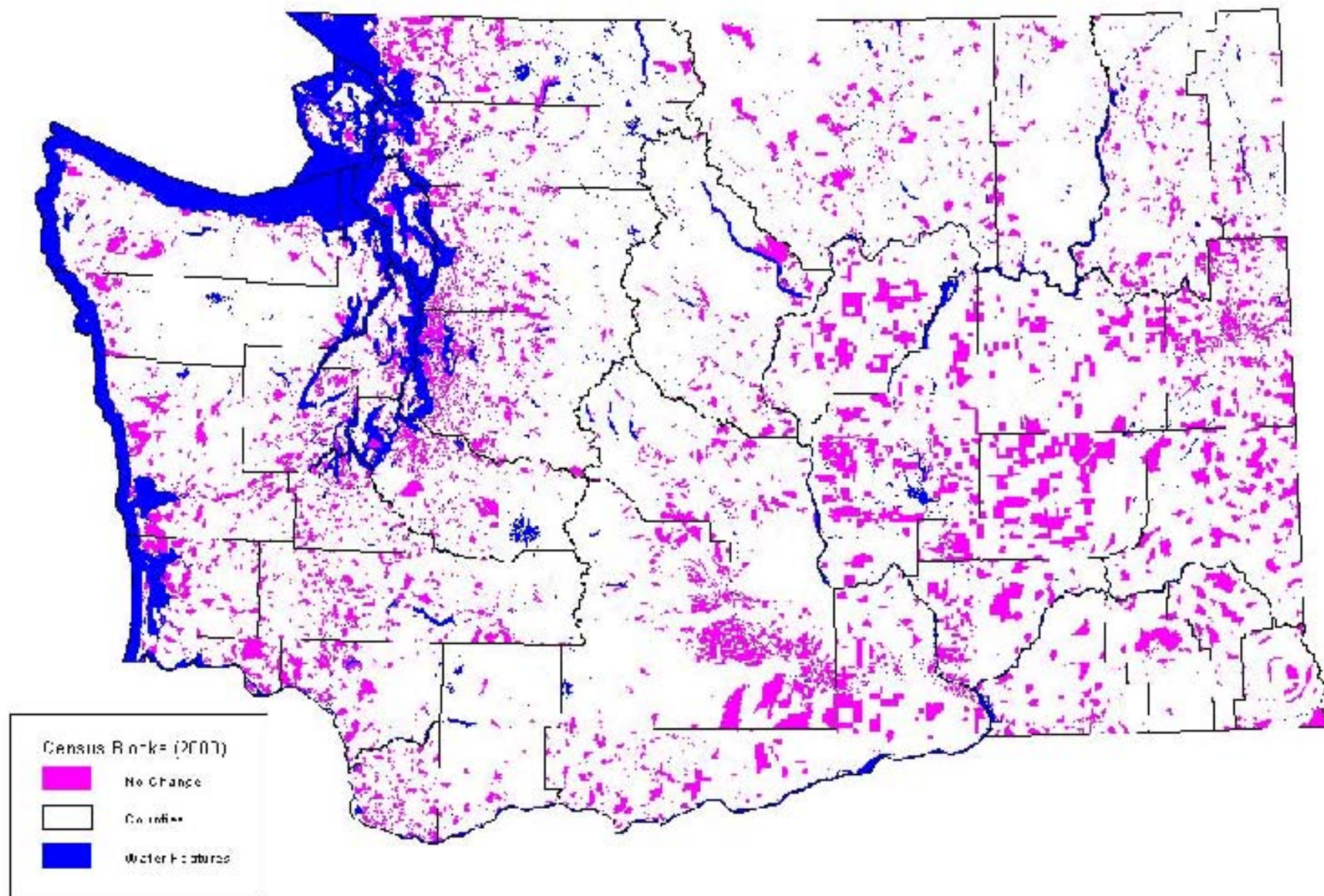
# Life expectancy at birth by Health Planning Area, King County, 3-year average, 1998-2000



# Population Estimates Challenges

- Census geography has changed from 1990 to 2000
- 2000 Census data on race must be bridged to single-race categories in a credible and defensible manner
- Inter- and post-censal estimates must be controlled to existing official ageXsexXcountyXyear estimates

## Areas where 1990 and 2000 Census Blocks have not changed



# Incompatibility of Race Categories in Numerator and Denominator Data

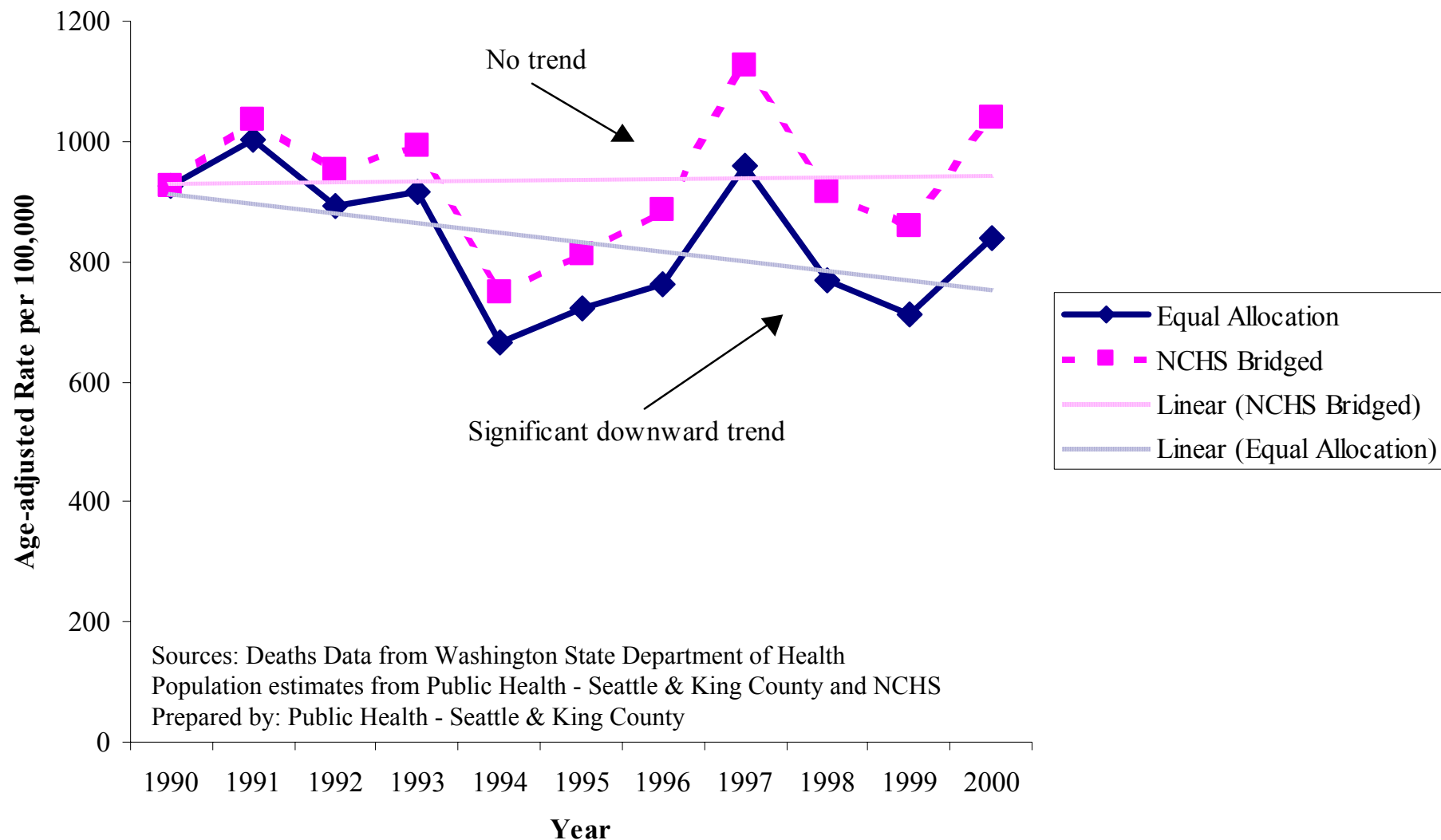
- In 2000 Census, more than one race can be indicated
- Until recently, choice was limited to one race on vital certificates and disease reports
- In order to calculate rates, race must be defined equivalently
- A method to provide a bridge from multiple-race Census to single-race estimates needs to be employed



# Population Estimate Method: Overview

- Choose race bridging method
- Compute block-level estimates for 1990 and 2000 for single census geography (1990)
- Build needed geographic unit (e.g., block group, ZIP code, school district) from 1990 block
- Aggregate block-level data to needed geographic unit
- Interpolate and adjust to available official estimates for larger geographic areas

# All Cause Mortality Rates in American Indian/Alaska Natives Using Population Estimates from Two Bridging Methods, King County, WA, 1990-2000



# Making Data Accessible: VISTA/PH Software

- computes rates of health events for defined populations
- user defines subpopulations (age, race, gender)
- user defines small areas and time periods
- computes simple rates and complex indicators
- determines statistical significance of variation in rates across areas and over time
- provides easy access to current population estimates and U.S. Census

# Vista/PH Analyzes a Wide Range of Data

- Birth and death statistical files
- Abortion statistical files
- Hospital discharges
- Communicable diseases
- Sexually transmitted diseases
- Tuberculosis
- Population estimates and projections
- Any user-provided file

# Benefits of Vista/PH

- Rapid, reproducible and reliable data analysis
- Ease of use: no special programming skills
- Facilitates exploratory data analysis and creative use of data
- Promotes standardization of analysis
  - disease coding
  - statistical testing
  - subpopulation and geographic definitions
- Easy linkage to Excel and MapInfo

Data Website

<https://www2.wa.gov/doh/chs2/vistaphw>

Data Collection Folder

USA\WA

Exit  
Help

ASSESSMENT TOPICS

STREAMS

LAUNCH

GEOGRAPHIC UNITS

Mortality Analysis Data Notes

☒ **Apply Comparability Ratios** [Help](#)

Find:  [Help](#)

NCHS ICD10 Causes. [Help](#)

#Diabetes mellitus {1.0082,.0011}

#Nutritional deficiencies {1.1636,.0165}

. Malnutrition {0.9782,.0151}

. Other nutritional deficiencies {6.2041,.5961}

#Meningitis

#Parkinson's

#Alzheimer's

Major cardiovascular

#. Diseases

.. Acute

.. Hypertension

.. Hypertension

.. Ischemic

... Acute

... Other

... Other chronic ischemic heart disease {1.0054,.0004}

.... Atherosclerotic cardiovascular disease {1.0488,.0016}

.... All other chronic ischemic heart disease {1.9935,.0004}

... Other heart diseases {0.9716,.0010}

.... Acute/sub-acute endocarditis {0.9964,.0137}

.... Dissecting aortic aneurysm/myocardial infarction {1.0295,.0160}

**Vista**

Diabetes mellitus  
ICD-10 codes: E10-E14  
ICD-9 codes: 250  
Comparability Ratio: 1.0082 SE: 0.0011

[OK](#)

Statistics

[Rates](#) ?

Crude

AA\_2000

AA\_other...

Age Specific...

YPLL\_65

YPLL\_85

[Trends](#) ?

[Trends for Rates](#)

[Trends for Age Components](#)

Races

Total  
White  
Black  
Nat. Am.  
Asian/Pac  
Hisp(ethn)

Sex

Total

Male

Female

Combine Years

1

[Reset](#)

[Help](#)

Years

1980  
1981  
1982  
1983  
1984  
1985  
1986  
1987  
1988  
1989  
1990  
1991  
1992  
1993  
1994  
1995  
1996  
1997  
1998  
1999  
2000  
2001  
2002

WA Counties

[State Total](#)

Adams	Lewis
Asotin	Lincoln
Benton	Mason
Chelan	Okanogan
Clallam	Pacific
Clark	Pend Oreille
Columbia	Pierce
Cowlitz	San Juan
Douglas	Skagit
Ferry	Skamania
Franklin	Snohomish
Garfield	Spokane
Grant	Stevens
Grays Harbor	Thurston
Island	Wahkiakum
Jefferson	Walla Walla
King	Whatcom
Kitsap	Whitman
Kittitas	Yakima
Klickitat	

Group (none) [Drop](#)

# Vista/PH Output

by Soletd, 05-06-2003 18:15:52 Vista/PH Version 10.8.14						
Mortality Rates, 1998-2000 Combined, King County, #Diabetes mellitus						
RATE = Deaths per 100,000, age-adjusted to year 2000 US population.						
RACE	RATE	PER	LB	UB	AVECNT	AVEPOP
Total	20.8	100,000	19.5	22.2	314.2	1719757.0
White	19.0	100,000	17.7	20.5	250.7	1388514.0
Black	65.9	100,000	53.8	80.3	37.1	106832.0
NatArr	30.8	100,000	14.0	66.3	3.3	19943.0
Asian	19.3	100,000	14.9	24.7	23.1	204468.0
Hisp	64.1	100,000	35.9	107.5	6.7	39065.0
Data Sources:						
Death Certificate Data: Washington State Department of Health, Center for						
1991-2000 Population Estimates: EPE Unit, Public Health-Seattle & King						
Bridging method: Fractional allocation adjusted to OFM and NCHS county						
1980-1989 Population Estimates are unofficial, based on estimates by the						

# Availability of SES markers can be uneven

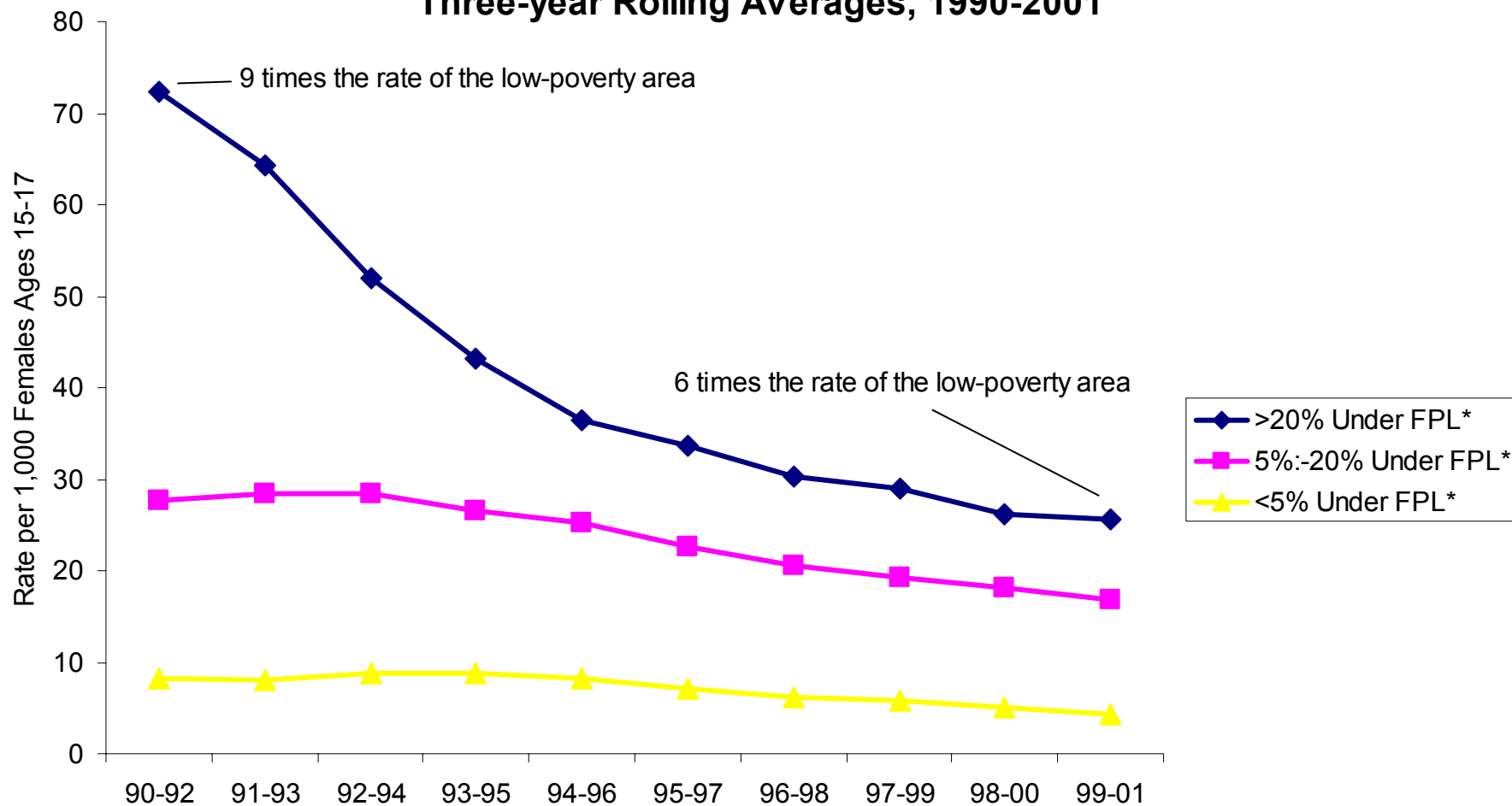
- Hospitalization datasets lack race variable
- Vital statistics (e.g., births and deaths) lack individual income measures
- Denominators may not provide education level
- Must have BOTH numerator and denominator information to do analysis
- Patterns are strong enough that a variety of measures can be used
- Choice is driven by what's available and strategic aims



# “Neighborhood” poverty level

- Group census tracts by percent living below the Federal Poverty Level:
  - >20%, 5% to 19%, <5% below FPL
- Aggregate numerator and denominator to these groupings
- Research (N. Krieger, 4/02) suggests this measure is
  - Most sensitive to capturing social inequality
  - Available over time and across regions
  - Easily understood


**Figure 9. Rate of Births to Females Ages 15-17 by  
Neighborhood Poverty Level, King County,  
Three-year Rolling Averages, 1990-2001**



\*Rates in all three poverty groupings are statistically significantly declining. FPL is 100% of the Federal Poverty Level.

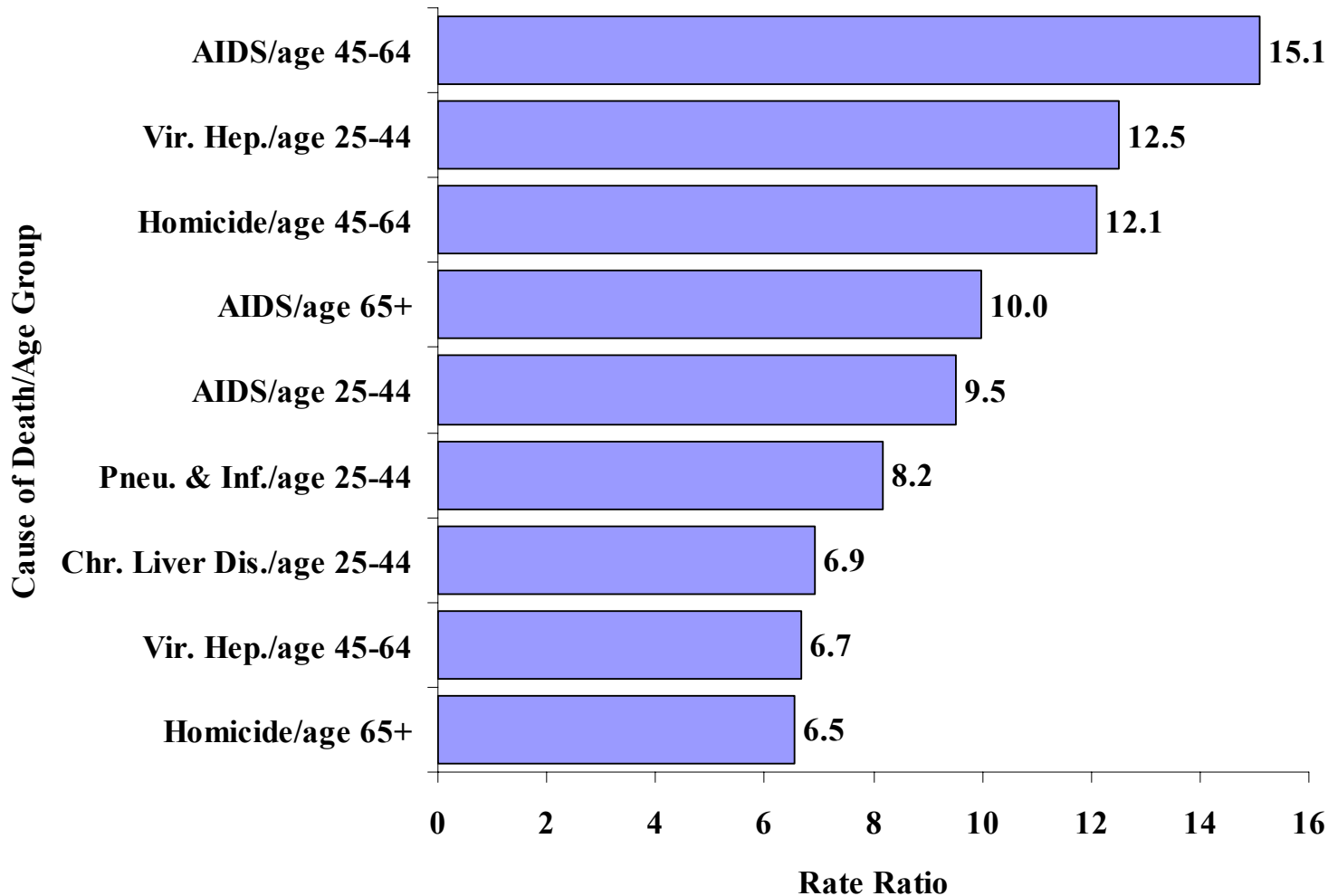
# Causes of Death Showing SES Gradient King County, 1989-1998 Average

Rank	Age<1	Age 1-14	Age 15-24	Age 25-44	Age 45-64	Age 65+	All Ages*
	All Causes	All Causes	All Causes	All Causes	All Causes	All Causes	All Causes
1st		Unint Inj.	Unint Inj.	Unint. Inj	All Cancer	Heart Dis.	Heart Dis.
2nd			Suicide	AIDS	Heart Dis.	Cancer	Cancer
3rd			Homicide	All Cancer	Unint. Inj	Stroke	Stroke
4th				Suicide	Diabetes	COPD	COPD
5th				Heart Dis.	Stroke	Pneu./Inf.	Unint. Inj.
6th				Homicide	AIDS	Diabetes	Pneu./Inf.
7th				Cirrhosis	Cirrhosis	Unint Inj.	Diabetes
8th				Stroke	Suicide	Alz. Dis.	AIDS
9th				Pneu./Inf.	COPD	Arthero.	Suicide
10th				Diabetes	Pneu./Inf.	Septicemia	Alz. Dis.

 =cause of death in which age-specific rate in high poverty areas exceeds age-specific rate in medium poverty area which exceeds age-specific rate in low poverty areas.

\*all ages category compares age-adjusted death rates (U.S. 2000 population standard)

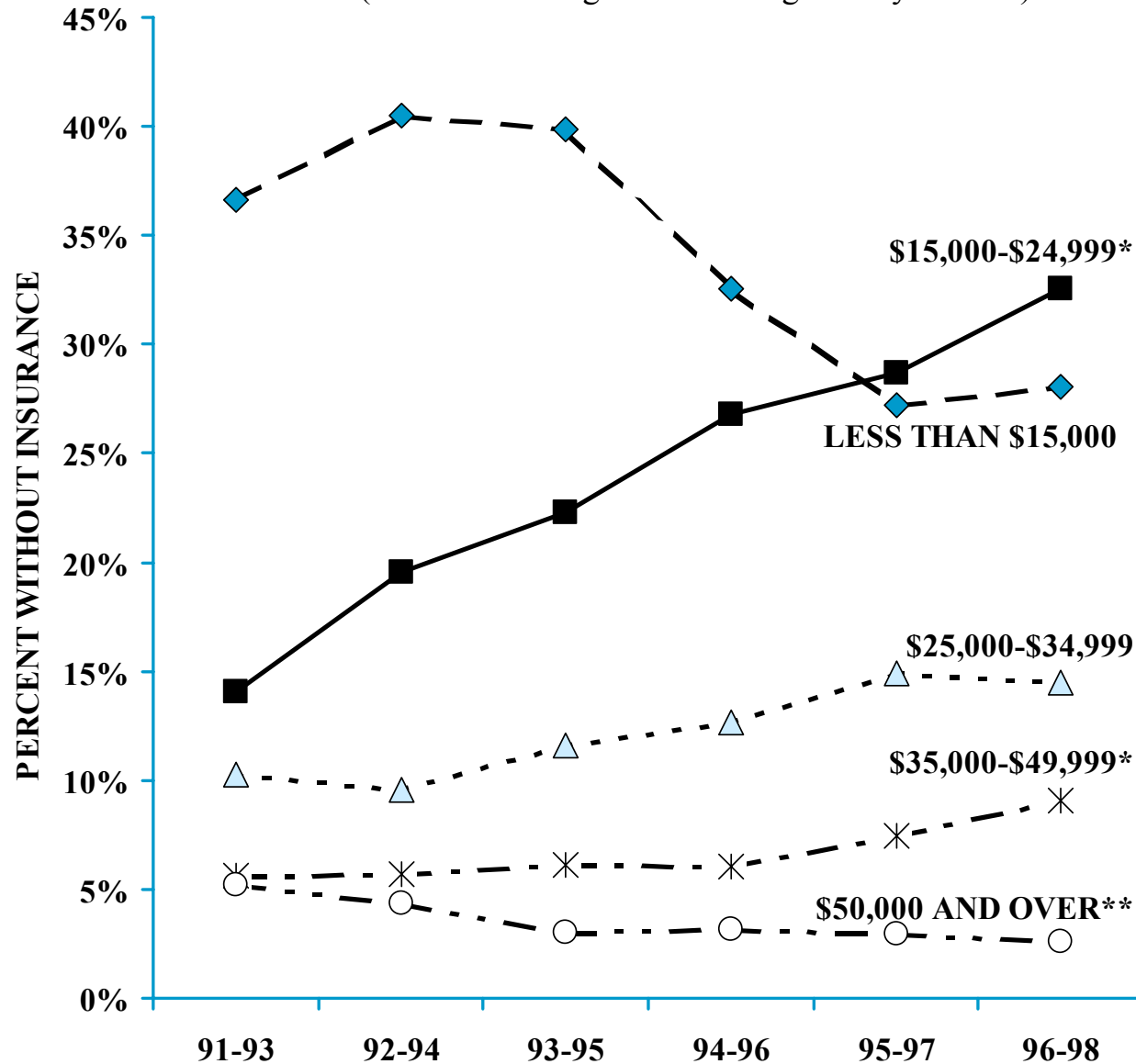
# Ten Highest Mortality Rate Ratios\* Of High-to-Low Poverty Areas King County, 1989-1998 Average



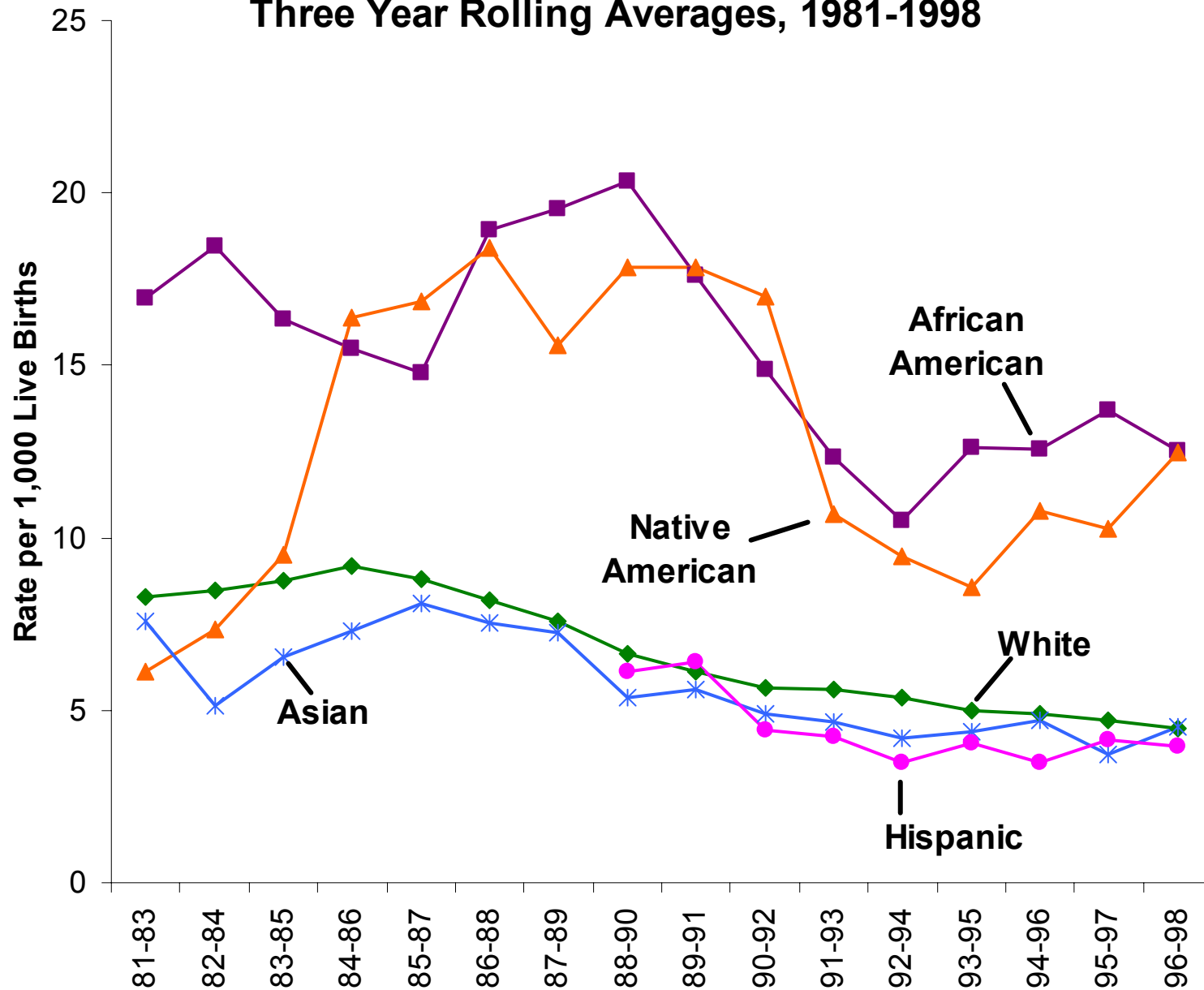
\* With a significant difference between high- and low-poverty areas

# Lack of Health Insurance by Annual Household Income, King County, 1991-1998

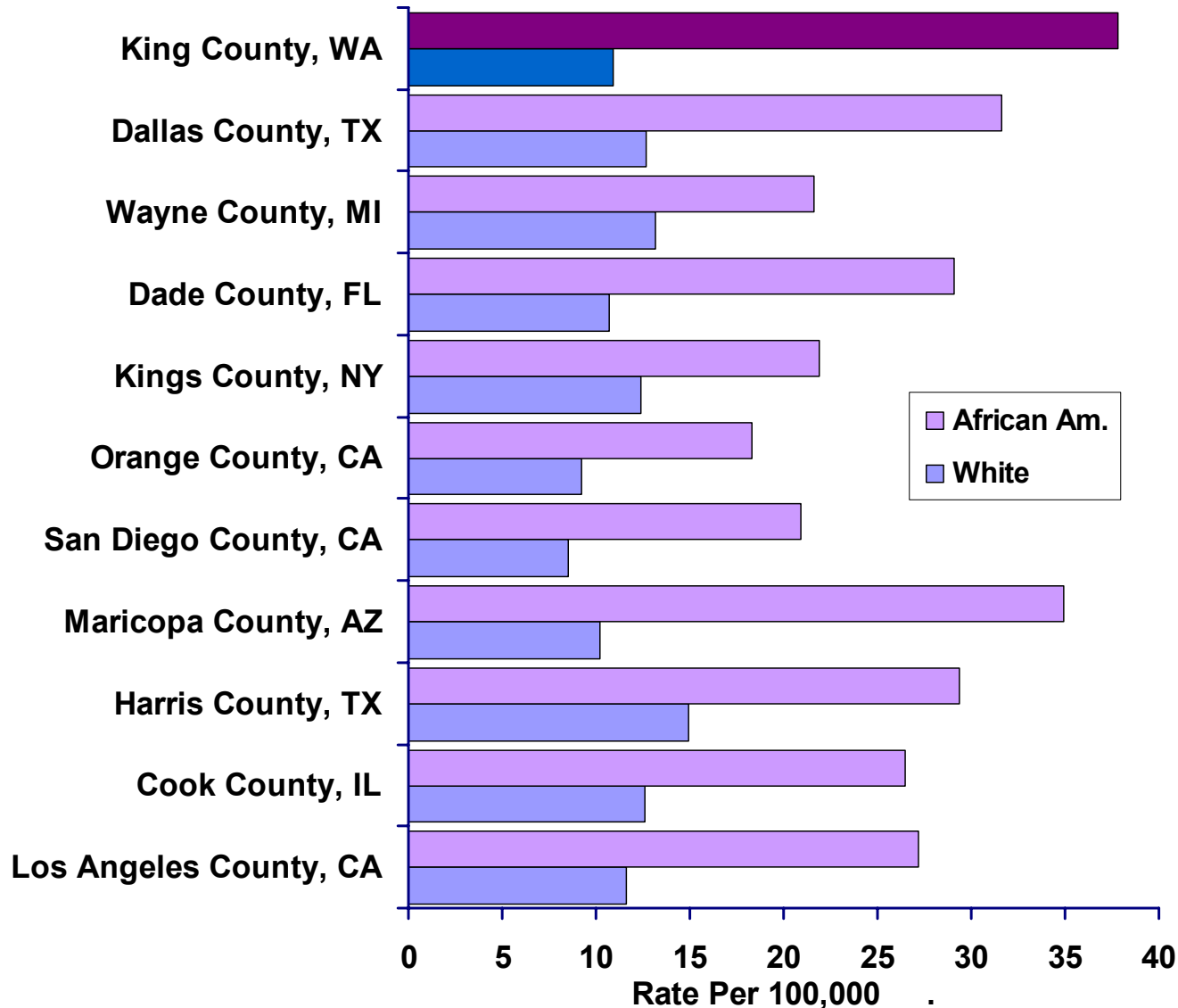
(source: Washington State/King County BRFSS)



# Infant Mortality Rates by Race/Ethnicity King County Three Year Rolling Averages, 1981-1998



# Age-Adjusted Diabetes Death Rate Among the Largest U.S. Counties and King Co., 1994-1996



# Some Data Limitations and Considerations

- Race
  - small numbers in some groups make estimates unstable or raise validity issues
  - Asian/PI combines disparate groups
  - misclassification and under-reporting weaken observed associations or bias results high or low
- Income/poverty
  - Area-based measures do not differentiate between individual and neighborhood effects
  - Income is self-reported; many survey respondents decline to answer income questions
- Other
  - incomplete data to measure disparities (e.g., intercensal population estimates by educational attainment)



# Questions and technical assistance needs

- Do population estimates contribute variance to rates?  
How can this be quantified?
- For race, should elevations be compared to the lowest group, majority group, or the total population?
- Are there more effective ways to present data?
- Are there other SES measures we should employ (e.g., educational attainment)?
- Need for an automated system for calculating confidence intervals for small area census data
- Need for regular updates of population estimates
- We invite your engagement in these areas.