Tracking Health Disparities on the Local Level

Epidemiology, Planning and Evaluation Unit
Public Health - Seattle & King County
May 2003
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

North: 43%
Central: 47%
Southwest: 56%
East: 50%
Southeast: 57%
Life expectancy at birth by Health Planning Area, King County, 3-year average, 1998-2000

- Mercer Island: 84.4
- Bellevue: 82.3
- Eastgate/Issaquah: 81.9
- Kirkland/Redmond: 81.1
- Vashon Island: 80.9
- Bothell/Woodinville: 80.3
- North Central Seattle: 80.2
- North of Canal Area: 79.9
- Kent: 79.5
- East/Northeast County: 79.4
- North Seattle: 78.9
- Renton: 78.8
- North County: 78.7
- West Seattle: 78.6
- Highline/Burien: 78.3
- Federal Way: 78.2
- Southeast County: 78.2
- Auburn: 77.7
- White Center/Skyway: 76.7
- Southeast Seattle: 76.5
- Central Seattle: 74.0

Areas listed from highest to lowest life expectancy.
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

Sources: Deaths Data from Washington State Department of Health
Population estimates from Public Health - Seattle & King County and NCHS
Prepared by: Public Health - Seattle & King County
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
Mortality Rates, 1998-2000 Combined, King County, #Diabetes mellitus

RATE = Deaths per 100,000, age-adjusted to year 2000 US population.

<table>
<thead>
<tr>
<th>RACE</th>
<th>RATE</th>
<th>PER</th>
<th>LB</th>
<th>UB</th>
<th>AVECNT</th>
<th>AVEPOP</th>
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<tbody>
<tr>
<td>Total</td>
<td>20.8</td>
<td>100,000</td>
<td>19.5</td>
<td>22.2</td>
<td>314.2</td>
<td>1719757.0</td>
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<td>White</td>
<td>19.0</td>
<td>100,000</td>
<td>17.7</td>
<td>20.5</td>
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<tr>
<td>Black</td>
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<td>100,000</td>
<td>53.8</td>
<td>80.3</td>
<td>37.1</td>
<td>106832.0</td>
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<tr>
<td>NatAm</td>
<td>30.8</td>
<td>100,000</td>
<td>14.0</td>
<td>66.3</td>
<td>3.3</td>
<td>19943.0</td>
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<tr>
<td>Asian</td>
<td>19.3</td>
<td>100,000</td>
<td>14.9</td>
<td>24.7</td>
<td>23.1</td>
<td>204468.0</td>
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<tr>
<td>Hisp</td>
<td>64.1</td>
<td>100,000</td>
<td>35.9</td>
<td>107.5</td>
<td>6.7</td>
<td>39065.0</td>
</tr>
</tbody>
</table>

Data Sources:
1991-2000 Population Estimates: EPE Unit, Public Health-Seattle & King County
Bridging method: Fractional allocation adjusted to OFM and NCHS county
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

- >20% Under FPL*: 9 times the rate of the low-poverty area
- 5%:-20% Under FPL*: 6 times the rate of the low-poverty area
- <5% Under FPL*: Lower rates

*Rates in all three poverty groupings are statistically significantly declining. FPL is 100% of the Federal Poverty Level.
<table>
<thead>
<tr>
<th>Rank</th>
<th>Age&lt;1</th>
<th>Age 1-14</th>
<th>Age 15-24</th>
<th>Age 25-44</th>
<th>Age 45-64</th>
<th>Age 65+</th>
<th>All Ages*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>All Causes</td>
<td>All Causes</td>
<td>All Causes</td>
<td>All Causes</td>
<td>All Causes</td>
<td>All Causes</td>
<td>All Causes</td>
</tr>
<tr>
<td>2nd</td>
<td>Unint Inj.</td>
<td>Unint Inj.</td>
<td>Suicide</td>
<td>Unint. Inj.</td>
<td>All Cancer</td>
<td>Heart Dis.</td>
<td>Heart Dis.</td>
</tr>
<tr>
<td>3rd</td>
<td>Homicide</td>
<td>All Cancer</td>
<td>Unint. Inj.</td>
<td>Stroke</td>
<td>Stroke</td>
<td>COPD</td>
<td>COPD</td>
</tr>
<tr>
<td>5th</td>
<td>Heart Dis.</td>
<td>Stroke</td>
<td>AIDS</td>
<td>Diabetes</td>
<td>Unint. Inj.</td>
<td>Diabetes</td>
<td>AIDS</td>
</tr>
<tr>
<td>7th</td>
<td>Cirrhosis</td>
<td>Stroke</td>
<td>Heart Dis.</td>
<td>Pneu./Inf.</td>
<td>Diabetes</td>
<td>Unint. Inj.</td>
<td>Septicemia</td>
</tr>
<tr>
<td>8th</td>
<td>Stroke</td>
<td>Suicide</td>
<td>All Causes</td>
<td>AIDS</td>
<td>Arthero.</td>
<td>Arthero.</td>
<td>Arthero.</td>
</tr>
<tr>
<td>9th</td>
<td>Pneu./Inf.</td>
<td>COPD</td>
<td>Diabetes</td>
<td>Pneu./Inf.</td>
<td>Septicemia</td>
<td>Septicemia</td>
<td>Septicemia</td>
</tr>
<tr>
<td>10th</td>
<td>Diabetes</td>
<td>Pneu./Inf.</td>
<td>Pneu./Inf.</td>
<td>Septicemia</td>
<td>Septicemia</td>
<td>Septicemia</td>
<td></td>
</tr>
</tbody>
</table>

=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

<table>
<thead>
<tr>
<th>Cause of Death/Age Group</th>
<th>Rate Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIDS/age 45-64</td>
<td>15.1</td>
</tr>
<tr>
<td>Vir. Hep./age 25-44</td>
<td>12.5</td>
</tr>
<tr>
<td>Homicide/age 45-64</td>
<td>12.1</td>
</tr>
<tr>
<td>AIDS/age 65+</td>
<td>10.0</td>
</tr>
<tr>
<td>AIDS/age 25-44</td>
<td>9.5</td>
</tr>
<tr>
<td>Pneu. &amp; Inf./age 25-44</td>
<td>8.2</td>
</tr>
<tr>
<td>Chr. Liver Dis./age 25-44</td>
<td>6.9</td>
</tr>
<tr>
<td>Vir. Hep./age 45-64</td>
<td>6.7</td>
</tr>
<tr>
<td>Homicide/age 65+</td>
<td>6.5</td>
</tr>
</tbody>
</table>

* 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

Rate per 1,000 Live Births

- African American
- Native American
- White
- Hispanic
- Asian
Age-Adjusted Diabetes Death Rate Among the Largest U.S. Counties and King Co., 1994-1996

- King County, WA
- Dallas County, TX
- Wayne County, MI
- Dade County, FL
- Kings County, NY
- Orange County, CA
- San Diego County, CA
- Maricopa County, AZ
- Harris County, TX
- Cook County, IL
- Los Angeles County, CA

Rate Per 100,000

- African Am.
- White
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.