State Perspectives of Population Health

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Outline

• 20th Century Population Health Improvement

• 21st Century Challenges

• Population Health Trends in South Carolina

• Population Health Approach
Mortality from all causes declined 54% between 1900 and 2010.
Control of Infectious Disease

Eradication of Smallpox

Rahima Banu – October 1975
Variola Major - Bangladesh

Ali Maow Maalin – October 1977
Variola Minor - Somalia

** Two laboratory acquired cases occurred in UK in 1978

Source: CDC
Control of SARS

Source: http://www.hkma.org/english/cme/onlinecme/cme200305main.htm
Decrease in Infant Mortality

FIGURE 1. Infant mortality rate,* by year — United States, 1915–1997

*Per 1000 live births.

Source: CDC
Control of Tobacco Use

Source: https://www.ahrq.gov/professionals/education/curriculum-tools/population-health/abrams.html
Decline in Rate of Lung Cancer

Source: https://www.ahrq.gov/professionals/education/curriculum-tools/population-health/abrams.html
Control of Coronary Heart Disease

Note: Due to changes in methodology, estimates are not comparable from 2005-2010 to 2011-2015
Source: SC Behavioral Risk Factor Surveillance System. Division of Surveillance, Office of Public Health Statistics and Information Services, SC DHEC
Youth Smoking (High School) South Carolina

Note: Survey conducted every odd year
Source: SC Youth Risk Behaviors Survey. SC Department of Education.
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“Americans have a longstanding pattern of poorer health...over the life course.”

Source: 2015 National Academy of Sciences
Higher Rates than Average of Peer Countries

- Infant mortality
- Low birth weight
- Adolescent pregnancy
- Sexually transmitted infections
- Injuries
- Heart disease
- Chronic lung disease
- Disability
- Obesity
- Diabetes
- Drug-related deaths

Comparison of Healthcare System Outcomes

### Exhibit ES-1. Overall Ranking

<table>
<thead>
<tr>
<th>Country Rankings</th>
<th>Country Rankings</th>
<th>Country Rankings</th>
<th>Country Rankings</th>
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<tbody>
<tr>
<td>1.00–2.33</td>
<td>2.34–4.66</td>
<td>4.67–7.00</td>
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<table>
<thead>
<tr>
<th>OVERALL RANKING (2010)</th>
<th>AUS</th>
<th>CAN</th>
<th>GER</th>
<th>NETH</th>
<th>NZ</th>
<th>UK</th>
<th>US</th>
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<tbody>
<tr>
<td>Quality Care</td>
<td>4</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
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<tr>
<td>Effective Care</td>
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<td>6</td>
<td>3</td>
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<tr>
<td>Safe Care</td>
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<td>5</td>
<td>3</td>
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<td>4</td>
<td>2</td>
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</tr>
<tr>
<td>Coordinated Care</td>
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<td>5</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
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<tr>
<td>Patient-Centered Care</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>4</td>
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<tr>
<td>Access</td>
<td>6.5</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>2</td>
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<td>Cost-Related Problem</td>
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<td>3.5</td>
<td>3.5</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>7</td>
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<tr>
<td>Timeliness of Care</td>
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<td>7</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Efficiency</td>
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<td>6</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>7</td>
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<tr>
<td>Equity</td>
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<td>5</td>
<td>3</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Long, Healthy, Productive Lives</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Health Expenditures/Capita, 2007</td>
<td>$3,357</td>
<td>$3,895</td>
<td>$3,588</td>
<td>$3,837*</td>
<td>$2,454</td>
<td>$2,992</td>
<td>$7,290</td>
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</tbody>
</table>

Note: * Estimate. Expenditures shown in $US PPP (purchasing power parity).
Source: Calculated by The Commonwealth Fund based on 2007 International Health Policy Survey; 2008 International Health Policy Survey of Sicker Adults; 2009 International Health Policy Survey of Primary Care Physicians; Commonwealth Fund Commission on a High Performance Health System National Scorecard; and Organization for Economic Cooperation and Development, OECD Health Data, 2009 (Paris: OECD, Nov. 2009).

An Aging Population

Source: https://www.slideshare.net/kingcobra2012/ib-ess-topic-3-human-population
Adverse Childhood Experiences Study

Source: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Violence Prevention
ACES can have lasting effects on....

- Health (obesity, diabetes, depression, suicide attempts, STDs, heart disease, cancer, stroke, COPD, broken bones)
- Behaviors (smoking, alcoholism, drug use)
- Life Potential (graduation rates, academic achievement, lost time from work)

Chronic Disease

Prevalence of Diagnosed and Projected Diagnosed Diabetes Cases in the United States, 1960-2050

SOURCE: https://aspe.hhs.gov/report/diabetes-national-plan-action/introduction. Data for 1960–1998 from the National Health Interview Survey, National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC) projected data for 2000–2050 from the Behavioral Risk Factor Surveillance System, Division of Diabetes Translation, CDC. (Note: The “Diagnosed cases” arrow refers to the section of the figure that includes diagnosed cases of diabetes versus the section that includes projected cases. The line graph and not the line arrow indicate the number of diagnosed cases.)
Emergent Infections and Antibiotic Resistance

Source: APHA
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South Carolina: 42\textsuperscript{nd} out of 50

Source: http://www.americashealthrankings.org/
# Leading Causes of Death in South Carolina, 2005 and 2015

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2015</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Heart Disease</td>
<td>Chronic Lower Respiratory Disease</td>
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<tr>
<td>2</td>
<td>Cancer</td>
<td>Stroke</td>
</tr>
<tr>
<td>3</td>
<td>Stroke</td>
<td>Chronic Lower Respiratory Disease</td>
</tr>
<tr>
<td>4</td>
<td>Unintentional Injuries</td>
<td>Unintentional Injuries</td>
</tr>
<tr>
<td>5</td>
<td>Chronic Lower Respiratory Disease</td>
<td>Stroke</td>
</tr>
<tr>
<td>6</td>
<td>Alzheimer’s Disease</td>
<td>Alzheimer’s Disease</td>
</tr>
<tr>
<td>7</td>
<td>Diabetes</td>
<td>Diabetes</td>
</tr>
</tbody>
</table>
Heart Disease Deaths

Age-adjusted mortality rate per 100,000 population

Year

Heart Disease Deaths

White

Black

All races

Source: Division of Biostatistics, Office of Public Health Statistics and Information Services, SC DHEC
Cancer Deaths

Age-adjusted mortality rate per 100,000 population

Year


White
Black
All races

Source: Division of Biostatistics, Office of Public Health Statistics and Information Services, SC DHEC
Chronic Lower Respiratory Disease Deaths


Age-adjusted mortality rate per 100,000 population

White
Black
All races

Source: Division of Biostatistics, Office of Public Health Statistics and Information Services, SC DHEC
Injury Deaths

Age-adjusted mortality rate per 100,000 population

Year


Source: Division of Biostatistics, Office of Public Health Statistics and Information Services, SC DHEC
Overdose Deaths

Age-adjusted mortality rate per 100,000 population

Source: Division of Biostatistics, Office of Public Health Statistics and Information Services, SC DHEC
Black Homicide
White Suicide
All Races Suicide
All Races Homicide
Black Suicide
White Homicide

Age-adjusted mortality rate per 100,000 population

Source: Division of Biostatistics, Office of Public Health Statistics and Information Services, SC DHEC
Stroke Deaths

- Age-adjusted rate per 100,000 standard population

Source: Division of Biostatistics, Office of Public Health Statistics and Information Services, SC DHEC
Alzheimer's Disease Deaths

Age-adjusted mortality rate per 100,000 population


- White
- Black
- All races

Source: Division of Biostatistics, Office of Public Health Statistics and Information Services, SC DHEC
Diabetes Deaths

Age-adjusted mortality rate per 100,000 population

Year

Diabetes Deaths

White

Black

All races

Source: Division of Biostatistics, Office of Public Health Statistics and Information Services, SC DHEC
Notes: Due to changes in methodology, estimates are not comparable from 2005-2010 to 2011-2015
Source: SC Behavioral Risk Factor Surveillance System. Division of Surveillance, Office of Public Health Statistics and Information Services, SC DHEC
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Relative Contribution of Factors that Affect Health

- Social and Economic Factors: 40%
- Health Behaviors: 30%
- Medical: 20%
- Environment: 10%
Figure 1. A Model of Population Health

Note: Measures of population health in the Triple Aim measurement menu in Table 1 appear in bold text in Figure 1.

Effect of Population Level Interventions

Opportunities

- Projected savings by 2023 with modest improvement in prevention and treatment of chronic disease
  - Could avoid 40 million cases
  - Cut treatment costs $220 billion
  - Increase GDP $900 billion

- ROI = $5.60 for every $1.80 invested in proven community-based prevention program

- Challenge – Identify evidence-based programs shown to be cost-effective

Source: Chatterjee et al, Checkup Time: Chronic Disease and Wellness in America, Milken Institute, Jan 29, 2014, Trust for America’s Health, Bending the Obesity Cost Curve, January 2012, http://healthyamericans.org/assets/files/TFAH%202012ObesityBrief06.pdf
Collaborative Community Health Improvement

• Collaborative Health Assessment – SHA/CHA
  • Primary causes of illness, injury and premature death
  • Patterns of health determinants

• Collaborative Health Improvement – SHIP/CHIP
  • Plan
  • Develop interventions and measure progress
  • Quality Improvement approach
Health in All Policies

- Food Access
- Housing
- Transportation
- Education
- Public Safety
- Economic Development
- Criminal Justice
- Community Design
- Water System

Health
Impact of North Carolina’s Motorcycle Helmet Law on Hospital Admissions and Charges for Traumatic Brain Injuries

• Compared North Carolina motorcycle related brain injury cases with three states (Florida, South Carolina, Pennsylvania) that had repealed their motorcycle helmet law

• North Carolina’s law prevented 190-226 hospitalizations for TBI in 2011
  • Averted hospital charges to taxpayer-funded sources of $9.5 million - $11.6 million
  • Total averted hospital charges were $25.3 million - $31.0 million.

NC Medical Journal, 2015
Create Accountable Care Communities

• Assess and track health outcomes
  • Population
  • Hot spotting
  • Quality
• Prioritize and focus on key health issues
  • Collective Impact
• Create clinical-community linkages
  • Community health workers
  • Care coordination
• Team-based clinical care
  • Team extends to community partners
Develop partnerships to:

- Create policies, systems and environmental changes that support healthy behaviors.
- Fill gaps in needed services.
- Involve patient, family, and community in strategic planning and improvement activities.
Collective Impact

- Common Agenda
- Shared Measurement
- Mutually Reinforcing Activities
- Continuous Communications
- Backbone Support
Isolated Interventions

Aligned Efforts and Resources
SC Birth Outcomes Initiative

- Active coalition - DHHS, SC Hospital Association, DHEC, March of Dimes, and many partners
- Reduced Early Elective Deliveries
- Post-partum LARC Insertion
- Safe Sleep
- Perinatal Regionalization
- Breastfeeding Friendly
  - Milk Bank
The Power of Collaboration

• BOI was launched in 2011
• From 2005–2007 to 2012–2014, infant mortality rates declined in a total of 33 states and the District of Columbia
• Declines of more than 20.0% were observed in Connecticut, South Carolina, Colorado, and D.C.
Thank You!