Challenges and Frontiers in Public Health and Prevention:
The Role of Science in Real World Practice

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LOS ANGELES COUNTY DEPARTMENT OF PUBLIC HEALTH
Overview

• Core functions of public health as they relate to prevention and health protection.
• Emerging public health needs and research questions.
• What is the role of science in real world public health practice?
• Trends and case examples of moving beyond traditional methods or approaches to study program/investment impacts.
• Public health perspective and where the discipline could be headed (e.g., policy analysis, health impact assessment, simulating outcomes in multi-sector work, implementation science?, complex systems science methods?)…
Los Angeles County Department of Public Health

• Vision
  – Healthy People in Healthy Communities

• Mission:
  – To protect health, prevent disease, and promote health and well-being

• Public Health stats:
  – Annual budget of over $850 million
  – 39 programs; 14 Health Centers
  – Nearly 4,000 staff members serving 9.8 million L.A. County residents
Major Public Health Responsibilities

✓ Preventing and controlling disease

✓ Promoting good health

✓ Promoting healthy and safe physical and social environments
Public Health in the Health Reform Era

• Landmark policy changes provide new opportunities for prevention:
  ✓ Expanded access to coverage
  ✓ No-cost preventive services
  ✓ Public health investments

• We must maximize those opportunities given the:
  – growth of our aging population;
  – persistence of health inequities; and
  – burden of chronic conditions.
# Trends in the Leading Causes of Death

Los Angeles County, 2001-2010

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>2001</th>
<th>2010</th>
<th>% Change from 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronary heart disease</td>
<td>220</td>
<td>138</td>
<td>-37%</td>
</tr>
<tr>
<td>Stroke</td>
<td>56</td>
<td>36</td>
<td>-36%</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>42</td>
<td>33</td>
<td>-21%</td>
</tr>
<tr>
<td>Emphysema</td>
<td>36</td>
<td>30</td>
<td>-17%</td>
</tr>
<tr>
<td>Alzheimer’s disease</td>
<td>12</td>
<td>25</td>
<td>108%</td>
</tr>
<tr>
<td>Pneumonia &amp; influenza</td>
<td>32</td>
<td>22</td>
<td>-31%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>24</td>
<td>21</td>
<td>-13%</td>
</tr>
<tr>
<td>Colorectal cancer</td>
<td>18</td>
<td>14</td>
<td>-22%</td>
</tr>
<tr>
<td>Chronic liver disease</td>
<td>12</td>
<td>12</td>
<td>0%</td>
</tr>
<tr>
<td>Breast cancer (female)</td>
<td>24</td>
<td>21</td>
<td>-13%</td>
</tr>
</tbody>
</table>

Source: Office of Health Assessment and Epidemiology, Los Angeles County Department of Public Health
Prevalence of Obesity and Diabetes Among Adults in Los Angeles County, 1997-2011

Year | Obesity (%) | Diabetes (%)
--- | --- | ---
97  | 14.3%      | 5.7%
98  | 16.7%      | 6.7%
99  | 18.9%      | 7.0%
00  | 20.9%      | 8.1%
01  | 22.2%      | 8.7%
02  | 23.6%      | 9.5%
# Economic burden of diabetes in Los Angeles County, 2007 and 2030

<table>
<thead>
<tr>
<th>Type</th>
<th>Estimated Population</th>
<th>LA County Total Costs*</th>
<th>In the U.S. Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2007</td>
<td>2030</td>
<td>2007</td>
</tr>
<tr>
<td>Diabetes</td>
<td>642,000</td>
<td>780,214</td>
<td>$6.4 bil</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$11.4 bil</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$170 bil</td>
</tr>
</tbody>
</table>

Projected population growth in LA County: 10.2 million (2007) to 11.7 million (2030); 7.4 million adults in 2007 vs. 8.9 million adults in 2030. Population projections accounted for migration, mortality, fertility trends, no natural catastrophes, etc.

* Estimated total costs include direct medical expenditures, lost productivity, and other indirect costs.

Source: Los Angeles County DPH; Multiple data sources used including data from Calif. Dept of Finance and CHIS.
Prevalence of Obesity Among 5th, 7th, and 9th Graders in Los Angeles County Public Schools, California Physical Fitness Testing, 1999-2010

Healthy People 2010 Goal (<5%)

Prevalence of Obesity

Projected obesity prevalence assuming linear trend
Obesity Prevalence Among 3 and 4 Year Olds in the WIC Program, Los Angeles County, 2003-2010

Source: PHFE WIC Program, LA County
# Cities/Communities in LA County with Lowest and Highest Childhood Obesity Rates, 2007

| Top 10* | | | |
| --- | --- | --- |
| City/Community Name | Obesity Prevalence (%) | Rank of Economic Hardship (1 - 127) | |
| Manhattan Beach | 3.4 | 1 | |
| Calabasas | 5.0 | 2 | |
| Hermosa Beach | 5.1 | 3 | |
| Agoura Hills | 5.3 | 4 | |
| Beverly Hills | 5.4 | 5 | |
| Malibu | 5.9 | 6 | |
| Palos Verdes Estates | 7.3 | 7 | |
| San Marino | 7.8 | 8 | |
| Rolling Hills Estates | 8.4 | 9 | |
| La Canada Flintridge | 8.5 | 10 | |
| **Average for 10 lowest** | **6.2%** | | |

| Bottom 10* | | | |
| --- | --- | --- |
| City/Community Name | Obesity Prevalence (%) | Rank of Economic Hardship (1 - 127) | |
| Walnut Park | 38.7 | 119 | |
| South El Monte | 34.5 | 118 | |
| Hawaiian Gardens | 33.4 | 117 | |
| East Los Angeles | 32.9 | 116 | |
| Vincent | 32.2 | 115 | |
| West Carson | 31.4 | 114 | |
| Commerce | 31.3 | 112 | |
| Alondra Park | 31.3 | 112 | |
| West Whittier- Los Nietos | 31.1 | 111 | |
| Florence-Graham | 31.0 | 110 | |
| **Average for 10 highest** | **32.8%** | | |

Health Factors

Health Outcomes

Mortality (50%)

Morbidity (50%)

Programs and Policies

Health behaviors (30%)

Clinical care (20%)

Social & economic factors (40%)

Physical environment (10%)

50%: Underlying Determinants of Health

- Tobacco use
- Diet & exercise
- Alcohol use
- Unsafe sex
- Access to care
- Quality of care
- Education
- Employment
- Income
- Family & social support
- Community safety
- Environmental quality
- Built environment
Framework for Action: General Model of Health & Improvement Strategies

**Health State**
- Well
- Dead

**Intervention Level**
- Society
  - Jobs, urban design, transportation, agriculture, criminal justice, and economic policy
  - Education
- Individual
  - School Health
  - Worksite Programs
  - Clinical Preventive Services
  - Hospital Systems
  - Disease Management
  - Assisted Living
  - Hospice

**Primary Care**
- P R I M A R Y  C A R E

**Tertiary Care**
- T E R T I A R Y  C A R E

Health Promotion and Protection, Many Sectors Play a Role

Community

Clinical care delivery system

Government agencies

Health Improvement Infrastructure

Employers and Businesses

Education Sector

Media

Adapted from *For the Public’s Health: The Role of Measurement in Action and Accountability*; Institute of Medicine, 2011
Reduced risk for heart disease and diabetes

- Regular physical activity
- Increased cardiovascular strength
- Decreased cholesterol
- Decreased blood pressure
- Decreased obesity
- Increased green space and walkability
- Air quality improvements

- Tobacco control ordinances
- Active transportation
- Community opportunities for physical activity
- Fluoridation
- Depression screening and treatment
- Smoking cessation programs
- Alcohol and drug abuse detection and brief intervention
- Early smoking cessation; uses stress reduction techniques
- Regular medical check-ups and age appropriate screenings
- Social support interventions
- Workplace wellness programs
- Heart healthy diet
- Decreased sodium
- Controls blood pressure & cholesterol with behavioral and Rx intervention

- Menu labeling
- School-based physical activity
- Economic and educational opportunities
- Safer communities
- Local farmer’s markets
- Health consumer information and protection

Increase green space and walkability

15
Growing Choose Health LA

In womb: September 2010 - March 2011
- Research & Development

Born: March 2011
- Launched website, social media and “Salt Shocker” campaign

1st Year: October 2011
- Launched “Sugar Pack” campaign
- “Eat, Move, Live LA” TV series
- Continued growing social media

2nd Year: October 2012
- Launched “Choose Less, Weigh Less” campaign
- Launched Healthy Holiday Tips campaign
- Created Nutrition Education Catalog

3rd Year:
- Will launch Restaurant program
- Will re-launch website
- Continue to Grow, Develop and Expand
The challenges and shifting paradigm in public health and prevention

• Is intervention A better than intervention B or control?
• Conclusions typically follow…implement intervention A rather than intervention B works better…

• Real world context…
• Interventions A, B, C, D, etc. all gets implemented in variable degrees in the community. Do they work? How do they work in concert? Difficult to disentangle intervention effects…

• Physical and social determinants of health do matter: how do we study them? Typically multi-sector collaborations.
The emerging disconnect between prevention framework, individual and population health, community needs, and current research

• Current body of health services and public health research based on comparisons, demonstrating efficacy, pre/post observations, surveillance data analysis, etc.

• Reality in practice – multi-sector work, multidisciplinary interventions, concurrent or multi-staggered program start-ups, no true baseline (dynamic); RCT, for example, is a gold standard for demonstrating efficacy but not necessarily easily translated to application or field implementation of programs or interventions.

• Policy and system level changes more common in practice and require forecasting and complex systems simulation to inform decision-makers.

• Science isn’t seen as absolute in the real world – there are a number of geo-socio/political considerations. Assets and resiliency factors matter.

• The importance of context, cost-benefits, larger picture of “coordination of investments” in the community, community assets.

• The importance of addressing sustainability, documenting the change in landscape – “mainstreaming an approach once proven and the infrastructure laid down.”
Future directions?
Possible paths to take…

- Develop new methods to study collective impacts.

- Dissemination, implementation and improvement science methods in health services offer some options. Perhaps branching out beyond traditional sectors of healthcare or public health.

- Better integration and use of economic analyses.

- Use of pragmatic trails, taking advantage of randomization in an applied setting.

- Policy analysis/assessments including use of health impact assessments, time series analysis, static as well as complex systems science simulation modeling (e.g., ABM).
Example: Health Impact Assessments
“The Health Impact Project”
Health Impact Assessment

A systematic process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program or project on the health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects.

National Research Council, 2011
# Health Impact Assessment

<table>
<thead>
<tr>
<th>HIA Step</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Screening</td>
<td>Determines the need and value of an HIA</td>
</tr>
<tr>
<td>Scoping</td>
<td>Determines which health impacts to evaluate, methods for analysis, and a workplan</td>
</tr>
</tbody>
</table>
| Assessment     | Provides:  
1) a profile of existing health conditions  
2) evaluation of potential health impacts                                                                 |
| Recommendations| Provide strategies to manage identified adverse health impacts and maximize benefits to health                                                |
| Reporting      | Includes:  
1) development of the HIA report  
2) communication of findings & recommendations                                                                 |
| Monitoring     | Tracks:  
1) impacts on decision-making processes and the decision  
2) impacts of the decision on health determinant                                                                 |
Health Impact Assessment

• When to conduct an HIA?
  – Have a proposed (discrete) decision
  – When health could be affected, but is not already being considered
The Potential Costs and Benefits of Providing Free Public Transportation Passes to Students in Los Angeles County
Potential Benefits of Providing Free Transit Passes to Students – Plausible Pathways to Better Health and Social Outcomes

1. Free transit passes provided to students
   - Increased available funds for schools
   - Increased student attendance
   - Increased freedom and mobility for students
   - Decreased citations, arrests, and court referrals
   - Increased disposable income for families
   - Decreased traffic and congestion

2. Increased quality of schools
   - Increased student engagement and educational attainment
   - Decreased student and family stress

3. Improved health knowledge and behaviors
   - Increased ability to find quality work
   - Decreased sexually transmitted infections, and teen pregnancy
   - Decreased substance abuse
   - Decreased criminal activity and violence
   - Improved financial stability

4. Improved physical and mental health
   - Decreased incarceration
   - Strong, vibrant, resilient communities
   - Improved neighborhood conditions

5. Reduced greenhouse gases and emissions
Moving Forward: Challenges & Opportunities

— Federal, state, local funding opportunities, foundation priorities are shifting (e.g., First 5 LA and TCE).

— ACA with focus on clinical-community linkages (e.g., the LAC+USC Wellness Center model).

— Opportunities for changes in training and workforce development.

— Emerging work in policy, system and environmental change interventions.
Emerging priorities...

“Understanding the collective impact of various investments to prevent childhood obesity is a more powerful and realistic paradigm for social progress than the typical model of isolated impact used to address social problems independently. While understanding the outcomes related to individual interventions remains an important aspect of evaluating program success, focusing on individual efforts causes one to lose sight of the effects of all investments combined. Assessing collective impact will help paint a picture of how all efforts are affecting the larger issue...”
Q&A

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