Public Health 3.0: Increased Demand for Data Driven Community Health Improvement
2017 CSTE Pre-Conference Workshop

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Community Health Assessment and Improvement Process

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National Drivers

- IRS requirements for tax-exempt hospitals every 3 years (n>3,000)
- National voluntary public health department accreditation every 5 years (PHAB) (n~2,400)
- Federally Qualified Health Centers (n>1,200)
Common Elements for the Community Health Improvement Process

1. Prepare and organize
2. Engage the community
3. Develop a goal or vision
4. Conduct community health assessment(s)
5. Prioritize health issues
6. Develop/implement community health improvement plan
7. Monitor process & short-, medium-term outcomes
8. Evaluate process, outcomes, and impact
Community Health Improvement Process

Organize

Assess → Prioritize and Plan → Implement

Data and Analytic Tools

Evaluate

Monitoring → Improved Health Status

Shared Ownership among Stakeholders
Ongoing Involvement of Community Members
Tax-exempt Hospitals Regulation

- Hospital organizations must conduct a community health needs assessment (CHNA) and adopt an implementation strategy for addressing “significant” community health needs at least once every three years.

- The hospital must solicit and take into account input from:
  - “At least one . . . governmental public health department;
  - Members of medically underserved, low-income, and minority populations in the community served . . . or individuals or organizations serving or representing [their] interests . . . ; and
  - Written comments received on the [hospital’s] most recently conducted CHNA and most recently adopted implementation strategy.”
Health needs may include “financial and other barriers to accessing care, preventing illness, ensuring adequate nutrition, or social, behavior and environmental factors that influence health in the community.”

In prioritizing significant health needs a hospital “may use any criteria . . . including, but not limited to, the burden, scope, severity, or urgency of the health need; the estimated feasibility and effectiveness of possible interventions; the health disparities associated with the need; or the importance the community places on addressing the need.”

CHNA’s for tax years beginning after 12/29/2015 must “include an impact evaluation of the actions taken by the hospital on significant health care needs it identified in its previous CHNA”.

Crossley M. 2015
Community Health Assessments

- **Data Driven Products**
  - **Secondary data analysis (already collected and analyzed data)**
    - Compare rates - peer communities, national & state averages, HP 2020
    - Examine trends
    - Identify most prevalent, severe and important outcomes and determinants

- **Community opinions**
  - Primary data (qualitative and quantitative)
  - Collected through key interviews, town halls, listening sessions, and surveys
  - Identify community’s prioritized set of outcomes and determinants

- **Assessment of health disparities**
IDENTIFYING HEALTH DISPARITIES
Identifying Disparities Requirements

- **PHAB Requirement**
  - Identify populations within their jurisdictions with an inequitable share of poor health outcomes...include at least one social determinant of health as a priority for community health improvement efforts in addition to other health priorities in the CHIP.

- **IRS CHNA Requirement**
  - The hospital must solicit and take into account input from “Members of medically underserved, low-income, and minority populations in the community served . . . or individuals or organizations serving or representing [their] interests.
  - Medically underserved include “populations experiencing health disparities or at risk of not receiving adequate medical care as a result of being uninsured or underinsured or due to geographic, language, financial, or other barriers”

* NAACHO Webinar 13 Choosing Strategies and Tactics  ** Crossley M. 2015
Identifying Disparities

- **Traditional Method**
  - National or State Data
    - Health outcomes or risk/protective factors
    - Race/ethnicity
    - Sex
    - Socio-economic status

- **CHI Methods**
  - Identifying Geographic Hot Spots
    - Surrogate Measure of Poverty
    - Geographic Disparities in Life Expectancy
Figure 1. Infant mortality rates, by race and Hispanic origin of mother: United States, 2005–2014

1Includes persons of Hispanic and non-Hispanic origin.

NOTES: For “All” and each race and Hispanic origin group, the decline in the rate for 2005–2014 is statistically significant (p < 0.05). Access data table for Figure 1 at: https://www.cdc.gov/nchs/data/databriefs/db279_table.pdf#1.

Area-based Socioeconomic Measures

*Health Disparities by Census Tract Poverty*
Area-based SES


- MA and RI 1990 Data
  - Top 5 Leading Causes of Death and Cancer Sites, HIV, Homicide
  - Explored different area sizes and SES measures

- Results: Census Tract (CT) Poverty detected disparities
  - Missed by other measures (e.g., education, wealth, unemployment, SES indices) and geographic units (zip codes)
  - As large or larger than those by race/ethnicity
  - Within race/ethnic groups.

- Recommended CT % of residents living below federal poverty level for routine data analysis.
  - <5%, 5-9.9%, 10-19.9%, >20%
CSTE Pilot: Harvard Geocoding Project

- **CSTE Disparities Pilot Project**
  - 11 States and localities
  - Multiple health outcomes

- **CT > 20% in poverty**
  - Consistently associated with greatest disparities
  - Reflect confluence of neighborhood risk factors including unemployment, deteriorated housing, violent crime, material resource access, behavioral factors, access to care, and pollution.*

*Krieger et al. 2002.*
CSTE Pilot: New York City Example

Age-adjusted Mortality Rate by % in census tract who live below poverty, NYC, 2000

Death Rate per 1000

Percent below poverty in census tract

<5% 5-9% 10-19% 20-29% 30-39% 40+%
Age-adjusted Mortality Rate by % in census tract who live below poverty by race/ethnicity, NYC, 2000

CSTE Pilot: New York City Example

Hadler J 2013
Baltimore Poverty vs Life Expectancy

Joint Center for Political and Economic Studies 2012
Selecting Cost Effective and Impactful Community-level Interventions

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Division of Public Health Information Dissemination
CDC’s Center for Surveillance, Epidemiology and Library Services
Identifying Community Health Interventions

- **Community Specific Considerations**
  - Community support & engagement
  - Motivated/willing mandatory multi-sector partners

- **Scientific Evidence Considerations**
  - Potential public health impact & return on investment
  - Addresses health disparities/equity
  - Potential negative consequences

- **Practical Considerations**
  - Delivery Capacity
  - Sustainability
  - Available guides, TA resources, model programs
  - Available monitoring data
  - Adequate evaluation resources, expertise, data

Adapted from: [NACCHO Prioritizing Health Problems](https://www.naccho.org), Public Health Foundation. Priority Setting Matrix, HP2010 Toolkit
Intervention Levels of Evidence

- Evidence level ≠ expected magnitude of benefit (impact)
- Evidence level = degree of confidence that intervention will be beneficial

Evidence level resources
- Guide for Community Preventive Services (The Community Guide)
- County Health Rankings & Roadmaps: What Works for Health (CHR&R)
- Health Impact in Five Years (HI-5)
Definitions of Reach

- Potential Reach (0-100%): Percentage of the population who have access to the new or enhanced environment or system.
- Actual Reach (0-100%): Percentage of the population who receive or participate in the intervention.

For a few interventions:
- Potential Reach = Actual Reach (e.g., Smoke-free Indoor Air, Enhanced Physical Education in School)

For many interventions:
- Potential Reach > Actual Reach (e.g., Parks, Corner Stores, Farmers’ Markets)

Impact = Reach (actual) x Intensity x Effect

Source: Wasick et al. 2013
**Definition of Intensity**

- Strength or “dose” of the intervention
  - Frequency
  - Comprehensiveness
  - Duration

- **Which has higher intensity?**
  - Menu labeling in community fast food restaurants
  - Healthy free breakfast, snacks, and lunch in K=12 schools

**Impact = Reach (actual) x Intensity x Effect**

*Source: Wasick et al. 2013*
Definition of Effect

- Magnitude (and significance) of change on each associated health outcome (benefit) that was examined in existing scientific body of literature.

Example:

- A 20% increase in tobacco unit price would be associated with a 3.6% median reduction in the proportion of adults who use tobacco.
Estimated Energy Expenditures for School-Based Policies and Active Living: Systematic Review and Comparative Assessment

Minutes of physical activity resulting from school-based policies and built environment changes (85 articles)

- Access to parks (1 minute)
- Modified recess (5 minutes more than traditional recess)
- Modified playgrounds (6 minutes)
- Standardized Physical Education (PE) (6 minutes > traditional PE)
- Afterschool activity programs (10 minutes)
- Renovate parks (12 minutes)
- Walk/bike to school (16 minutes)
- Classroom activity breaks (19 minutes)
- Mandatory physical education (23 minutes)

NEW RESOURCE FOR IDENTIFYING HIGH IMPACT, COST EFFECTIVE INTERVENTIONS
The new CDC population health initiative to improve health in 5 years or less

Office of the Associate Director for Policy
Division of Community Health
Centers for Disease Control and Prevention
Initial List Identification Methods

- Earned the highest evidence rating from:
  - County Health Rankings and Roadmaps What Works for Health site (n=144 “Scientifically Supported”)
  - The Guide to Community Preventive Services (n=120 “Recommended”)

- Excluded Clinical Interventions
- Excluded duplicate interventions
- CDC experts proposed additional consideration
HI-5 Intervention Selection Methods

Initial list assessed against the following criteria:

1. **Health outcome**: Highest level of evidence one or more health outcomes.

2. **Measurable improvement in 5 years**: Demonstrated with available measure of health outcomes or widely accepted interim measure causally linked to health (e.g., smoking).

3. **Saturation**: Interventions excluded if implemented in more than half (>50%) of states. This threshold was later changed to >85%.

4. **Cost data**: Economic evidence showing cost savings or cost-effectiveness.
HI-5 Intervention Selection Methods

- Additional exclusion criteria:
  - Evidence of potential harm not easily addressed.
  - Additional information assessed: Estimated total potential morbidity or mortality reductions at scale.
  - Demonstrated effective in addressing disparities.
Initial Interventions Mapped to Health Pyramid

Social Determinants of Health
- Directly addresses upstream factors (e.g., education, housing)

Changing Context
- Policy, system or environmental change to influence behaviors

Total & Subpopulations
- High Risk Populations

Wrap Around Services
- High touch, programs to meet complex needs of vulnerable populations

Clinical Interventions
- Counseling and Education

Directly addresses upstream factors (e.g., education, housing)

* Intervention improves additional outcomes including educational attainment, employment, housing stability, social competency and crime prevention

Early Child Home Visitation Programs*
Supportive Housing Programs (Housing First)*
Multidimensional Treatment Foster Care*

Access to Clean Syringes
Activity programs for older adults
Breastfeeding promotion programs
Safe Routes to School
School-based physical activity
School-based violence prevention
Pregnancy peer support program
Unit price increase for alcohol
Unit price for tobacco products
Universal motorcycle helmets
Worksite multi-component obesity programs

Early Childhood Education*
Public Transportation Systems*
Clean Diesel Technology Fleet Transition*
House Rehabilitation Loans and Grants*
Indoor Smoke Free Policies*
State and local EITC programs*
Subsequent Applied Criteria

- **Health outcome evidence criteria:**
  - Community Guide Review

  - **Systematic review or individual studies include:**
    - 3 experimental studies (RCTs) or 3 quasi-experimental studies with matched concurrent comparisons
      - Strong designs
      - Statistically significant positive findings

- **Level of Implementation**
  - Included interventions implemented through policy
  - Excluded interventions implemented through programs
High Impact, Cost Effective Interventions Mapped to the Health Pyramid

- Counseling and Education
- Clinical Interventions
- Long Lasting Protective Interventions

Counseling and Education

- Clinical Interventions
- Long Lasting Protective Interventions

Changing the Context
Making the healthy choice the easy choice

Social Determinants of Health

HI-5

- School-Based Programs to Increase Physical Activity
- School-Based Violence Prevention
- Safe Routes to School
- Motorcycle Injury Prevention
- Tobacco Control Interventions
- Access to Clean Syringes
- Pricing Strategies for Alcohol Products
- Multi-Component Worksite Obesity Prevention

- High Risk Populations
- Changing Context
- Total & Subpopulations

Directly addresses upstream factors (e.g., education, housing)

Policy, system or environmental change to influence behaviors

High touch, coordinated programs to meet complex needs of vulnerable populations

Social Determinants of Health

HI-5

- Early Childhood Education*
- Public Transportation Systems*
- Clean Diesel Technology Fleet Transition*
- Housing Choice Vouchers*
- House Rehabilitation Loans and Grants*
- Indoor Smoke Free Policies*
- State and local EITC programs*

Breastfeeding promotion programs
Comprehensive Tobacco Control
Mass Reach health communications for tobacco
Multicomponent school-based obesity prevention
Safe Routes to School
School-Based violence prevention
Pregnancy peer support program
Worksite multi-component obesity programs
Activity programs for older adults

Multidimensional Treatment Foster Care*
Supportive Housing Programs (Housing First)*
Early Child Home Visitation Programs*

*Health Plus Interventions: Additional outcomes include increased educational attainment, employment, housing stability, social competency and crime prevention
HI-5 INTERVENTION EXAMPLES
Safe Routes to School

**CHR&R What Works for Health** – Scientifically Supported

- There is *strong evidence* that Safe Routes to Schools (SRTS) increases the number of students walking or biking to school

- Active travel to school is associated with healthier body composition and cardio fitness levels

- SRTS has been shown to reduce the incidence of pedestrian crashes

- Replacing automotive trips with biking and walking can reduce vehicle miles traveled (VMT) and emissions at relatively low cost
Safe Routes to School Goals

- Increase physical activity
- Improve unsafe walking conditions
- Improve poor air quality by reducing vehicle emissions

National Center for Safe Routes to School: Improving Health, Safety and Transportation
Elements of SRTS Programs

• Education
• Encouragement
• Enforcement
• Engineering
• Evaluation
Safe Routes to School Federal Funding

- 2005 Federal transportation bill, SAFETEA-LU, provided at least $1 million/year for SRTS programs through 2009

- Moving Ahead for Progress in the 21st Century (MAP-21) Legislation passed in 2012

- Established new program: Transportation Alternatives

- SRTS activities eligible to compete for funding

- State Departments of Transportation administer funds

National Center for Safe Routes to School: Improving Health, Safety and Transportation
CA Assembly Bill 1475 established the SRTS Program in 2000.
- As of 2007, 570 funded projects with total cost of over $190 million.

2008 Economic Analysis
- The effectiveness of the program in reducing crashes, injuries and fatalities involving children in the vicinity of the projects;
- The impact of the program on levels of walking and bicycling to school; and
- The benefits of the program in comparison with other highway safety programs.

<table>
<thead>
<tr>
<th>Change in walking/biking</th>
<th>Change relative to control areas</th>
<th>Cost of program ($ millions)</th>
<th>Benefit per year ($ millions)</th>
<th>Cost per collision reduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same as control areas</td>
<td>No effective difference</td>
<td>$28.9</td>
<td>$0</td>
<td>n/a</td>
</tr>
<tr>
<td>10% increase</td>
<td>7% decrease</td>
<td>$28.9</td>
<td>$8.33</td>
<td>$282,779</td>
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<tr>
<td>25% increase</td>
<td>18% decrease</td>
<td>$28.9</td>
<td>$21.43</td>
<td>$109,970</td>
</tr>
<tr>
<td>50% increase</td>
<td>32% decrease</td>
<td>$28.9</td>
<td>$38.09</td>
<td>$61,858</td>
</tr>
<tr>
<td>100% increase</td>
<td>49% decrease</td>
<td>$28.9</td>
<td>$58.33</td>
<td>$40,397</td>
</tr>
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</table>
Smoke Free Multi-Unit Housing

Public Health Issue:

- Each year, among non-smokers second-hand smoke (SHS) exposure causes:
  - ~ 34,000 heart disease-related deaths
  - > 8,000 deaths from stroke
  - > 7,300 lung cancer deaths*

- SHS spread from units, common areas, decks
  - Air vents, hallways, electrical outlets, ceiling cracks, holes in walls

- U.S. residents of multi-unit housing (MUH)**
  - ~ 70 of 80 million in MUH without smoke-free policies
  - ~ 45% higher cotinine levels among children living in MUH

- Public Housing**
  - 88% MUH
  - 52% are older adults & disabled residents; 43% are children

* HHS 2014  **King et al. 2013
Smoke-free Policies: Indoor Air

Scientifically Supported (evidence-based) Intervention

- Community Guide Systematic Review*
  - 82 studies
  - Strong evidence of effectiveness

- Expected Health Benefits
  - 50% reduction in proportion of people exposed to SHS
  - 3.8 percentage point increase in smoking cessation
  - 5.1% reduction in CVD-related hospital admissions
  - 20.1% reduction in asthma-related hospital admissions

- Economic Analysis
  - No adverse impact: restaurants, bars, businesses catering to tourists
  - Health care savings $700 - $1,297 per person
  - $18M annual cost savings for MUH in CA
    - Cleaning; Repairs; Maintenance

## Estimated Annual Cost-Savings: Subsidized & Public Housing*

<table>
<thead>
<tr>
<th>Cost Type</th>
<th>Subsidized Housing</th>
<th>Public Housing</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHS-Related Health Care</td>
<td>$341 million</td>
<td>$101 million</td>
</tr>
<tr>
<td>Renovation Costs</td>
<td>$108 million</td>
<td>$32 million</td>
</tr>
<tr>
<td>Smoking-Attributable Fires</td>
<td>$72 million</td>
<td>$21 million</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$521 million</strong></td>
<td><strong>$154 million</strong></td>
</tr>
</tbody>
</table>

*King et al. 2013*
System introduction or expansion
- Available for use by the general public
- Run on a scheduled timetable
- Include buses, trains, trams, or rapid transit

Short-term effects
- Increase of 8–33 minutes of walking/day
- 1/60th traffic fatalities per 100 million passenger-miles compared to automobiles
- Reduced air pollution

Economic Evidence
- $354.86 per capita annual health benefits based on increasing household ridership from 10% to 20%
HI-5 EXCLUDED HIGH IMPACT PH PROGRAM: EARLY CHILDHOOD HOME VISITING PROGRAM
Early Childhood Home Visiting Programs

- Starts in pregnancy
- Continues until child is 2 – 5 years old
- Multiple model programs: nurses, social workers, paraprofessionals, lay workers from within the community, or others
HRSA Federal Home Visiting Program

- **2016 Program**
  - 17 Evidence-based Models; 6 Promising Approaches under evaluation
  - 145,500 parents and children in 825 counties in all 50 states
  - Funding increased $100 million (2010) to $800 million in 2016

- **Grantee Reporting Requirements**
  - Improvements in maternal, newborn, and child health
  - Prevention of child injuries, child abuse, neglect, or maltreatment and reductions of emergency room visits;
  - Improvements in school readiness and child academic achievement;
  - Reductions in crime or domestic violence; improvements in family economic self-sufficiency

- **Implementation Resources:**
  - Home Visiting Evidence of Effectiveness (HOMEVEE)
  - Maternal and Child Health: Home Visiting
Home Visiting: Return On Investment

Estimated range: $5.3 - $9.56 return on investment to society for every dollar invested in Nurse-Family Partnership.

Source: RAND Corporation Analyses of the Nurse-Family Partnership Program (2008)
Tips for Choosing Most Impactful Interventions

- Choose interventions with strong evidence where “impact” is easy to quantify:
  - Impact = Reach x Intensity x Effect

- Complete Streets
- Safe Routes to School
- Enhanced PE
**Tips for Choosing Most Impactful Interventions**

- Consider interventions or interventions combinations:
  - Generate measurable short term and longer term health outcomes (smoke free multi-unit housing)
  - Concurrently address geographic disparities/vulnerable pops and population-wide prevention interventions addressing high risk behaviors or root causes (e.g., SDOHs)
  - Take a life course approach
  - Generate ancillary benefits that will attract multi-sector partners (education, transportation, economic growth, etc.)
Maximizing Measurable Outcomes: Early Childhood

- Voluntary SF Policies in all Apartment Complexes – Population-wide Prevention
- County-wide Certified Baby Friendly Hospitals – Population-wide Prevention
- Earned Income Tax Credit – High Risk Vulnerable Population SDOH
Evidence-based Intervention Resources

- Intervention Effectiveness:
  - Health Impact in 5 Years (HI-5)
  - Guide to Community Preventive Services (The Community Guide)
  - County Health Rankings and Roadmaps: What Works for Health

- Cost Effectiveness
  - Washington State Institute for Public Policy
Exercise 2

☐ Come to consensus on

1. Up to 3 priority focus areas using the county-level outcome and determinants data
2. The most appropriate intervention or combination of interventions for at least one priority focus areas using the CT poverty map and intervention guide.

1. What did you choose for focus areas and why?
2. What interventions did you choose?
3. How will you convince the Hospital Board to fund them with your data?
Questions?

For more information please contact Centers for Disease Control and Prevention

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Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov Web: www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
National Health Assessment and Improvement Planning Resources


- Association of State and Territorial Health Officials. Accreditation Resources [www.astho.org/Programs/Accreditation-and-Performance/Accreditation/Preparing-for-Accreditation/](http://www.astho.org/Programs/Accreditation-and-Performance/Accreditation/Preparing-for-Accreditation/)


- National Association of County and City Health Officials. Mobilizing for Action through Planning and Partnerships (MAPP) [http://www.naccho.org/topics/infrastructure/mapp/framework](http://www.naccho.org/topics/infrastructure/mapp/framework)

- National Association of County and City Health Officials. CHA/CHIP Resource Center [http://www.naccho.org/topics/infrastructure/CHAIP/chachip-online-resource-center.cfm](http://www.naccho.org/topics/infrastructure/CHAIP/chachip-online-resource-center.cfm)

Selected State Health Assessment and Improvement Planning Resources

- Minnesota Department of Health. Local Public Health Assessment and Planning
  [http://www.health.state.mn.us/lphap/](http://www.health.state.mn.us/lphap/)


- North Carolina Division of Public Health Office of Healthy Carolinians and Health Education and the State Center for Health Statistics. Community Health Assessment Guide Book

- New York State Department of Health. 2010-2013 Community Health Assessment Guidance
Federally Sponsored Secondary Data

- **American Fact Finder** (U.S. Census Bureau) - An interactive database that is searchable for data from multiple data sources.

- **CDC Division for Heart Disease and Stroke Prevention’s Data Trends & Maps** (CDC) - Online tool to search for and view health indicators related to heart disease and stroke prevention.

- **CDC Wonder** (CDC) - Wide-ranging Online Data for Epidemiologic Research. Access statistical research data published by CDC; Public-use data sets about deaths, cancer incidence, HIV and AIDS, tuberculosis, vaccinations, births, census data and many other topics are available for query.

- **CMS Community Utilization & Quality Indicators** (CMS) - CMS has assembled measures from Medicare claims data at the state level and for 306 Hospital Referral Regions.

- **Community Health Status Indicators** (HRSA, CDC, NLM, PHF) - This web-based tool provides local public health agencies access to county health status profiles for improving community health by identifying resources and setting priorities.

- **County Health Rankings** (RWJF and University of WI) - This interactive website provides access to 50 state reports with rankings of each county within each state according to its health outcomes and health determinants.

- **Health Indicators Warehouse (HIW)** [www.healthindicators.gov](http://www.healthindicators.gov) is a user-friendly web-accessible database of pre-tabulated national, state, and local health indicators, reflecting multiple dimensions of population health, health care, and health determinants.

- **Quick Health Data Online** (HHS Office of Women’s Health) - This system provides state- and county-level data for all 50 states, the District of Columbia, and US territories and possessions.

- **US Food Environment Atlas** (USDA) - Presents a spatial overview of a community's ability to access healthy food.

- **WISQARS (Web-based Injury Statistics Query and Reporting System)** (CDC) - An interactive database system that provides customized reports of injury-related data.


