Population-Based Strategies to Improve Cardiovascular Health: Focus on Blood Pressure

Darwin R. Labarthe, MD, MPH, PhD
Department of Preventive Medicine
Population-based strategies

- Some questions (review)
- Two case examples –
  - Hypertension treatment
  - Sodium reduction
- Summing up – five main points
Some questions to start with:

(1) *What are you thinking when you think ‘population’?*
Some questions to start with:

(2) If you drew a picture of a ‘population-based strategy’ what would it look like?
Some questions to start with:

(3) *If blood pressure were the focus, what are some ‘population-based strategies’ that you could propose?*
Some questions to start with:

(4) What examples do you know of where a ‘population-based strategy’ has been implemented on the topic of blood pressure?
Some questions to start with:

(5) What have you learned from the experience of population-based strategies to improve cardiovascular health?
Some questions to start with:

(1) What are you thinking when you think ‘population’?
Some ways to think about ‘population’

- “Primordial prevention”: Strasser 1978
- “Mass” or “population” strategy vs “high-risk” strategy: Rose 1981, 1986
- Social determinants of health (HP 2020)
“Primordial prevention”: Strasser 1978

“Real grassroots prevention should start by preserving entire risk-factor-free societies from the penetration of risk factor epidemics. Here lies the possibility of averting one of tomorrow’s world health problems. I wish to propose the term of protoprophylaxis or primordial prevention.”

“In the high-risk preventive strategy we go out and identify those at the top end of the distribution and give them some preventive care... [But this strategy offers] only a limited answer to the community problem of heart disease.

“We are therefore driven to consider mass approaches, of which the simplest is to endeavour to lower the whole distribution of the risk variable by some measure in which all participate...

“Potentially far more effective, and ultimately the only acceptable answer, is the mass strategy...’

Living and working conditions may include:
- Psychosocial factors
- Employment status and occupational factors
- Socioeconomic status (income, education, occupation)
- The natural and built environments
- Public health services
- Health care services
Social determinants of health (HP 2020)
Some questions to start with:

(2) If you drew a picture of a ‘population-based strategy’ what would it look like?
The existing distribution of risk and events
The existing distribution of risk and events
The remedial high-risk strategy
The remedial population-wide strategy
The primordial strategy
The primordial strategy full-blown
Some questions to start with:

(3) *If blood pressure were the focus, what are some ‘population-based strategies’ that you could propose?*
Some answers from the IOM (2010):

Interventions directed at the general population –

- Promote weight loss among overweight persons
- Decrease sodium intake
- Increase potassium and intake of fruits and vegetables
- Consume a healthy diet
- Reduce excessive alcohol intake
- Increase physical activity
- Multiple dietary interventions
- Community and environmental interventions

Some answers from the IOM (2010):

Interventions directed at individuals with hypertension—

- Access to care
- Employer initiatives
- Community health workers

Some questions to start with:

(4) What examples do you know of where a ‘population-based strategy’ has been implemented on the topic of blood pressure?
Some past experience and recent programs

• The North Karelia Project

• The big three (US): Stanford, Minnesota, Pawtucket

• The Franklin County, Maine, Program
The North Karelia Project

Main features:

• 1972-1992
• Rural Finland – 180,000 population
• Highest known CHD death rate @ start
• Response to public demand
• Community ownership, integration with health care, sustained focus on risk factors among individuals.
• Multifaceted intervention
• Risk factor change monitored by serial surveys
• Control areas – Kuopio; all of Finland
## Interventions: North Karelia and elsewhere

<table>
<thead>
<tr>
<th>Strategies</th>
<th>North Karelia</th>
<th>Stanford 3-Community</th>
<th>Stanford 5-Cities</th>
<th>Minnesota</th>
<th>Pawtucket</th>
<th>Franklin Maine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community organization</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Mass media</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Environmental modifications</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Community groups</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Schools</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Worksites</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Groceries and restaurants</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Medical settings</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Professional education</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Health agencies collaboration</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Train local personnel</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Lay volunteer emphasis</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Self-management focus</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Group education</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Risk factor screening</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Individual counseling</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Referral for medical care</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Client risk factor tracking</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Active client follow-up</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Professional nursing staff</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Primary medical care integration</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

CVD = cardiovascular disease “+” indicates characteristic present, but does not imply equivalent intensity of intervention components.

North Karelia

Men, 35-64

Women, 35-64
The Big Three

- Stanford Five-City Project (1980-1986)
  75,000/city (2 intervention, 3 control); mass media only; BP reduced, CVD m/m unchanged
  cities of 25-40,000 – 80-115,000, 3 intervention, 3 control; individual communications, public events, TV; CVD m/m unchanged
- Pawtucket HHP (1984-1991)
  70,000/city (1 intervention, 1 control); screening, counseling, referral; CVD m/m unchanged
### Interventions: North Karelia and elsewhere

<table>
<thead>
<tr>
<th>Strategies</th>
<th>North Karelia</th>
<th>Stanford 3-Community</th>
<th>Stanford 5-Cities</th>
<th>Minnesota</th>
<th>Pawtucket</th>
<th>Franklin Maine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community organization</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Print only</td>
</tr>
<tr>
<td>Mass media</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Environmental modifications</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Community groups</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Schools</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Worksites</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Groceries and restaurants</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Medical settings</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Professional education</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Health agencies collaboration</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Train local personnel</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Lay volunteer emphasis</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Self-management focus</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Group education</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Risk factor screening</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Individual counseling</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Referral for medical care</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Client risk factor tracking</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Active client follow-up</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Professional nursing staff</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Primary medical care integration</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

CVD = cardiovascular disease “+” indicates characteristic present, but does not imply equivalent intensity of intervention components

The Big Three – net risk factor changes


<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Linear trend in women (per year)</th>
<th>Tests of net intervention effect in women</th>
<th>Linear trend in men (per year)</th>
<th>Tests of net intervention effect in men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current smoking, %</td>
<td>$-0.30 \pm 0.42$</td>
<td>$p = 0.48$</td>
<td>$-0.31 \pm 0.51$</td>
<td>$p = 0.54$</td>
</tr>
<tr>
<td>Systolic blood pressure, mm Hg</td>
<td>$-0.31 \pm 0.22$</td>
<td>$p = 0.17$</td>
<td>$-0.10 \pm 0.24$</td>
<td>$p = 0.68$</td>
</tr>
<tr>
<td>Diastolic blood pressure, mm Hg</td>
<td>$-0.23 \pm 0.16$</td>
<td>$p = 0.15$</td>
<td>$-0.09 \pm 0.23$</td>
<td>$p = 0.68$</td>
</tr>
<tr>
<td>Cholesterol, mg/dl</td>
<td>$+0.70 \pm 0.48$</td>
<td>$p = 0.15$</td>
<td>$-0.23 \pm 0.51$</td>
<td>$p = 0.66$</td>
</tr>
<tr>
<td>Body mass index, kg/m²</td>
<td>$-0.06 \pm 0.05$</td>
<td>$p = 0.19$</td>
<td>$+0.03 \pm 0.04$</td>
<td>$p = 0.46$</td>
</tr>
<tr>
<td>Log_{10} estimated 10-year coronary heart disease mortality risk</td>
<td>$-0.001 \pm 0.003$</td>
<td>$p = 0.85$</td>
<td>$-0.001 \pm 0.002$</td>
<td>$p = 0.64$</td>
</tr>
</tbody>
</table>
The Franklin County Health Program (FCHP)

Original Investigation

Community-Wide Cardiovascular Disease Prevention Programs and Health Outcomes in a Rural County, 1970-2010

N. Burgess Record, MD; Daniel K. Onion, MD, MPH; Roderick E. Prior, MD; David C. DIXON, MD; Sandra S. Record, RN; Fenwick L. Fowler, BA; Gerald R. Cayer, BS, MPH; Christopher I. Amos, PhD; Thomas A. Pearson, MD, PhD, MPH

JAMA, Jan 13, 2015
### Interventions: North Karelia and elsewhere

<table>
<thead>
<tr>
<th>Strategies</th>
<th>North Karelia</th>
<th>Stanford 3-Community</th>
<th>Stanford 5-Cities</th>
<th>Minnesota</th>
<th>Pawtucket</th>
<th>Franklin Maine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community organization</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Mass media</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Environmental modifications</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Community groups</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Schools</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Worksites</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Groceries and restaurants</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Medical settings</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Professional education</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Health agencies collaboration</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Train local personnel</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Lay volunteer emphasis</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Self-management focus</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Group education</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Risk factor screening</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Individual counseling</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Referral for medical care</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Client risk factor tracking</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Active client follow-up</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Professional nursing staff</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Primary medical care integration</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
</tbody>
</table>

CVD = cardiovascular disease “+” indicates characteristic present, but does not imply equivalent intensity of intervention components.

Community collaborations - FCHP

**Figure 1: Franklin County Health-Related Initiatives & Responsible Organizations: 1960-2010.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Outreach Training</td>
<td>Community Health Education Department &amp; Major</td>
<td>Multifunctional Community Outreach and Service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-Specialty Group Practice</td>
<td>Hospital Associated Practices</td>
<td>Federally Qualified Health Centers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-Site Rural Practices</td>
<td>Data Tracking and Evidence-Based Care Guidance Systems</td>
<td>High Blood Pressure Screening, Coaching and Referral (SCORE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Franklin Cardiovascular Health Program</td>
<td>Cholesterol SCORE</td>
<td>Practice-Based Nurse Care Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsible Organizations:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University of Maine at Farmington</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Maine Community Action Agency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Franklin Memorial Hospital</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural Health Associates</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HealthReach Networks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-Institutional Collaboration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Listed and color-coded in the bottom-left quadrant of this chart are five organizations primarily responsible for origination and/or sustaining of the key health-related initiatives displayed across the timeline. Several initiatives resulted from and/or depended on multi-institutional collaboration (yellow).
Key program elements and chronology, FCHP

Figure 1. Franklin Cardiovascular Health Program Annual Encounters, Risk Factor Focus, and Locations: 1974-2010

- Risk factor focus: Hypertension, Cholesterol, Tobacco, Diet, Physical activity, Diabetes
- Program sites: Community, Workplace, School, Medical practices

Encounters were in-person contacts between program staff and individuals in the community. The beginning of each bar under the graph indicates the year in which the component was introduced.
Hypertension treatment and control, FCHP

*eFigure 2: Hypertension Treatment and Control: 1974-1978*

- **Proportion of Hypertensive Patients**

Data taken from Miller and Record, 1978 and Record, 1979 and reanalyzed for comparability. Chi square calculated on change of hypertension treatment and control over time.
Trends in mortality rates, CVD, FCHP

**eFigure 6. Age-Adjusted Cardiovascular Mortality Rates for Franklin County and Maine: 1960-2010**

Death rates for heart and cerebrovascular diseases for rolling 3-year periods for Franklin County and all of Maine, age-adjusted to the 1940 US Standard Population for comparability (see Data Analysis explanation) across the entire time period. The year shown is the mid-point of the 3-year rolling average. Error bars are 95% confidence limits.
Figure 4. Mortality Rates for Franklin County and Maine, 1960-2010

Age-adjusted total mortality rates. Data was summed to 3-year rolling averages. Age adjustment performed using 1940 standard US population. Error bars indicate 95% confidence intervals.
Some questions to start with:

(5) What have you learned from the experience of population-based strategies to improve cardiovascular health?
Lessons from the field

• What works best:
  *multi-level, multi-component interventions*

• Least likely to succeed:
  *insufficient scope, intensity, duration (‘incomplete dose’)*

• Greatest challenges:
  *evaluation, replication, attribution*
A current perspective on community-level intervention

American Heart Association Guide for Improving Cardiovascular Health at the Community Level, 2013 Update: A Scientific Statement for Public Health Practitioners, Healthcare Providers, and Health Policy Makers


on behalf of the American Heart Association Council on Epidemiology and Prevention

Circulation. 2013;127:1730-1753; originally published online March 21, 2013;
doi: 10.1161/CIR.0b013e31828f8a94

Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2013 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539
Two case examples

• Hypertension treatment

• Sodium reduction
Global Standardized Hypertension Treatment Initiative

http://www.cdc.gov/globalhealth/ncd/hypertension-toolkit.htm
Framework for the Medical Treatment of Hypertension in Latin America and the Caribbean

Presented by
The U.S. Centers for Disease Control and Prevention (CDC), in collaboration with the Pan American Health Organization (PAHO).
Executive Summary
The Global Standardized Hypertension Treatment Initiative presents this strategic Framework for action to reduce the global burden of hypertension – the leading risk factor contributing to the global burden of disease, affecting nearly 1 billion people worldwide. Three arms define the strategy for action:

• Identify and adopt a core set of medications for the treatment of hypertension;
• Understand and overcome the barriers to availability of these core medications; and
• Identify and implement key elements of care delivery systems to achieve effective and sustained hypertension control.
Executive Summary
The Initiative is conceived as advancing through 3 phases. Phase 1, already completed, has achieved the first action under each arm: identification of core medications; understanding of barriers to their availability; and identification of key elements of the needed care delivery systems. Phase 2 calls for the second action under each arm, as countries take up the Initiative. Phase 3 will comprise evaluation and dissemination of the efforts undertaken in Phase 2.

The region of Latin America and the Caribbean was selected as the initial focus for the Global Standardized Hypertension Treatment Initiative, with experts and stakeholders across the region contributing to the development of this Framework. The ultimate scope of the Initiative is global dissemination and adoption of this Framework.
The GSHTI

• Approach

To launch this Initiative, the U.S. Centers for Disease Control and Prevention (CDC) partnered with the Pan American Health Organization (PAHO) and a large group of experts and stakeholders from Latin American and the Caribbean (LAC) to develop this Framework for effective and sustained medical treatment of hypertension. The approach has comprised 5 essential steps:
The GSHTI

- Selection of a small number of key individuals from the LAC region (i.e., the Hypertension Treatment Prevention Review Group; HTPRG) to guide the planning of workshops to develop this Framework.
- Review of background information and literature regarding issues relevant to each arm of the Framework, including the following: a) hypertension management guidelines in use in the region and beyond; b) evaluation studies of guideline implementation and effectiveness; c) issues in securing availability of core medications at regional and national levels; and, d) current perspectives regarding health care delivery models, particularly issues relevant to improving care delivery systems;
- Convening of experts and stakeholders representing perspectives across the region in two consecutive workshops for intensive discussion on the following topics: core medications, medication availability, and key elements of health care delivery systems for effective and sustained hypertension control – including accounts of progress and successes in several countries;
The GSHTI

- Inviting from these experts their feedback and recommendations regarding the three arms of the Framework;
- Synthesis of the input from the background research, advice from the HTPRG, and the workshop discussions, to result in this Framework document.

Through accomplishment of these essential steps in Phase 1 of the Initiative, the groundwork would be laid for Phase 2, to implement the Framework as fully as practicable within Latin America and the Caribbean. This would potentially be followed by Phase 3, consisting of evaluation and broader global implementation.
Recommendations

Core Medications:

Discussions in the first workshop led to agreement on criteria for selection and a Core Set of Medications with one primary and one secondary choice in each of five medication classes (with the exception of calcium channel blockers [CCB] in which there was no secondary choice): diuretic (chlorthalidone, hydrochlorothiazide); angiotensin converting enzyme [ACE] inhibitor (lisinopril, enalapril); angiotensin receptor blocker [ARB] (losartan, valsartan); CCB (amlodipine, no secondary choice); and beta blocker (bisoprolol, metoprolol – extended release). Secondary choice medications would only be substituted when availability of the primary medication was not secured. Further recommendations addressed specific fixed combination medications, including “ideal combination therapy” considered desirable in principle but not currently available or insufficiently evaluated as to efficacy and safety.
Recommendations

Availability of Core Medications:
Workshop participants identified multiple factors that influence the availability of medications, including sustainable financing, effective procurement systems, coordination across multiple Ministries (such as health and finance), and various procedural issues. It was understood that such factors may weigh differently on availability of particular medications and in different countries or care delivery systems and must be assessed separately as part of Framework implementation in each situation. The PAHO Strategic Fund was discussed as a mechanism within the LAC to facilitate purchase of medications at favorable cost by national governments, and it was recommended that efforts be undertaken to incorporate the foregoing list of core medications into the Strategic Fund list.
Key Elements of Care Delivery Systems:
Workshop participants acknowledged that health care delivery systems differ in many important respects not only between countries but also within countries in the LAC, as elsewhere. Background information and descriptions of systems currently operating in the region underscored these differences. No single care model appeared adequately to characterize these systems. However, key elements of care delivery systems could be identified whose incorporation would be expected to make these systems more effective in delivering long-term, sustained hypertension control.
Recommendations

Key Elements of Care Delivery Systems:
Workshop participants discussed the following elements: 1) Strategic orientation (including prioritization of hypertension treatment within the system, consistent with needs of the community); 2) Conformity with agreed-upon hypertension management guidelines (including a protocol for treatment); 3) Utilization of case registries and information systems (including patient-tracking and feedback mechanisms); 4) Standardized core medications (including their system-wide, continuous availability); 5) Patient-centered care (including self-management interventions); 6) Primary care as the setting of leadership and management (including integration of hypertension treatment into the broader care system); and 7) Community representation and engagement (including utilization of community resources and non-traditional care settings).
The problem of uncontrolled hypertension is among the most prevalent and urgent of public health priorities in the LAC and globally.

A highly promising approach is being mobilized to achieve significant improvement in regional population health through a three-armed strategy for hypertension treatment and control.

A core set of safe and effective medications for the treatment of hypertension in the LAC has been identified.

Regional experts consider the identification of a core set of hypertensive medications to be a sound approach toward overcoming recognized barriers and securing the availability of affordable medications on the scale needed to have wide public health impact.
Conclusions

• Key elements have been identified around which to strengthen health systems for sustained control of hypertension, as well as management of other major chronic diseases.
• Successful completion of the Phase 1 of this Initiative sets the stage for its implementation in the LAC and identification of other regions of the world prepared to undertake similar planning.
Charge to IOM Committee

- Dietary intake of sodium and the primary sources of sodium in the US population overall and by life stage, gender, and ethnicity.
Charge to IOM Committee

- **Functions of sodium in foods** and how these functions relate to product development, consumer preferences and health, e.g., the extent to which tastes drive product development and consumption.
Charge to IOM Committee

- Understandings about the *physiology of taste and sensitivity*, and their interface with consumer behavior and taste preferences.
Charge to IOM Committee

- *Potential of food technology* to develop innovative alternatives to current sodium usage in processed foods, taking into account the physiology of taste as well as consumer behaviors and preferences.
Charge to IOM Committee

- **Factors that could affect sodium reduction strategies**, e.g., the role of taste in product development, adaptability related to salt taste and sensitivity, age of intervention, marketing strategies that may affect sodium intake, co-variance of consumption of certain foods.
Charge to IOM Committee

- Potential *unanticipated consequences*, e.g., considerations focused on iodized salt and iodine deficiency.
Charge to IOM Committee

- Sodium reduction efforts in other countries, including cost-effectiveness of interventions.
Charge to IOM Committee

- *Policy levers* such as regulation (including labeling), investment of public monies, education, incentives, support for local capacity, health professional role, industry codes of conduct, research, monitoring progress (accountability), and leadership.
Charge to IOM Committee

- Options for public-private partnerships in the context of fostering creative and innovative approaches and programs ranging from basic and consumer research to planning for and implementing sodium reduction in diverse populations.
Findings – 1: Adverse health effects

“...excess sodium intake is strongly associated with elevated blood pressure, a serious public health concern related to increased risk of heart disease, stroke, congestive heart failure, and renal disease.”
Findings – 2: Excess dietary intake

“The current level of sodium added to the food supply—by food manufacturers, foodservice operators, and restaurants—is simply too high to be “safe” for consumers.”
Findings – 3: Individual change limited

“...instructing consumers to select lower-sodium foods and making available reduced-sodium “niche” products cannot result in intakes consistent with the *Dietary Guidelines for Americans.*”
IOM Recommendations

- **Primary Strategy**
  - *FDA should expeditiously initiate a process to set mandatory national standards for the sodium content of foods*
  - Applies to processed and restaurant foods
  - Utilize generally recognized as safe (GRAS) status of salt

- **Interim Strategy**
  - Food industry should voluntarily act to reduce the sodium content of foods in advance of the implementation of mandatory standards
IOM Recommendations

**Supporting Strategies**
- Government agencies, public health organizations, consumer organizations, and food industry should carry out activities to support the reduction of sodium in food supply
- Revise daily value for sodium
- Re-evaluate sodium claims/disclosures on foods
- Label foods sold to restaurants
- Food procurement standards
- Innovative restaurant initiatives
IOM Recommendations

• **Supporting Strategies, cont.**
  - Government agencies, public health organizations, consumer organizations, health professionals, the health insurance industry, food industry, and public-private partnerships should conduct **augmenting activities to support consumers in reducing sodium intake**
  - HHS create nationwide campaign to reduce sodium intake
  - Continuation and expansion of existing efforts
  - Federal agencies should ensure and enhance **monitoring and surveillance** relative to sodium intake measurement, salt taste preference, and sodium content of foods, and should ensure sustained and timely release of data in user-friendly formats
Summing up – main points:

• Population-based strategies are supported by a strong rationale; they are designed, when fully deployed, to reach the whole population; and they may be either primordial or remedial in approach.
• Multiple, diverse population-based strategies could be devised to improve cardiovascular health.
• Past experience and recent programs document substantial and widespread activity in applying population-based strategies, with valuable lessons learned.
• Hypertension treatment and sodium reduction represent leading, and contrasting, population-based strategies.
• What’s next?

*It’s up to you --- the WHFEL Cohort of 2015*
Population-Based Strategies to Improve Cardiovascular Health: Focus on Blood Pressure

Darwin R. Labarthe, MD, MPH, PhD
Department of Preventive Medicine