Methods to evaluate a community’s cardiovascular health for “25 x 25”

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Overview

• What is a community’s cardiovascular health
  – Chow IJE 2009

• Community – level risk factors examples and concepts

• Methods developed through the EPOCH studies for PURE
  – Chow PLoS One 2010 – EPOCH 1
Location matters

CHD death rates per 10,000 standardized by single years of age of men ages 40 - 59 free from evidence of CVD at entry. Keys, A et al Prev Med 1984;13:
Differences in Life Expectancy within a small area in London

Travelling east from Westminster, each tube stop represents nearly one year of life expectancy lost.

1 Source: London Health Observatory based on Office for National Statistics data
Causal pathway

Environmental Influences

Individual behaviors
  e.g. physical activity, smoking, diet

Individual biological risk factors
  e.g. obesity, cholesterol, diabetes

Heart Disease
Environmental factors linked to Heart disease

**Community**
- Clean indoor air regulation
- Tobacco taxes/ price
- Regulating age of youth smoking
- Tobacco cessation support programs
- Social/ cultural norms

**Individual Biological RFs**
- Smoking
- Blood pressure
- Overweight/ obesity
- Diabetes
- Cholesterol
- Stress/ anxiety/ depression

**Individual Behavioral RFs**

**Physical Activity**
- Walkability of built environment
- Safety from crime/ traffic
- Places for walking
- Access to facilities
- Land use mix

**Nutrition and diet**
- Food policy
- Access/ availability of healthy choices – eg fruits/ veg
- Exposure to unhealthy choices – eg fast food/ vendor machines/ large portion size

**Others**
- Social networks
- Social capital
- Universal health care/ Access to health care
- Poverty
- Air pollution

*CK Chow IJE 2009*
Environmental influences on 3 important determinants of Heart Disease

- Tobacco
- Nutrition
- Physical activity
Prevalence of tobacco use in males
Policy and Social acceptability

Easier to SMOKE here

Easier to QUIT here

Source: Saloojee 1995

Year

Cigarette consumption per adult (in packs)

Real Price

Consumption per adult

Year
Ease of access
Cigarette pack labeling

Promotional label “triple filter charcoal technology”

Quality label “20 class A cigarettes”

Small Health Warning label

General Labels
Nutrition and diet
Access and availability
Culture: what constitutes an enjoyable meal?

Fast food: American style

Fast food: Japanese style
“Value for money”

1/3 of the cost
Similar amount of Calories
More fat
Less nutritious
& Less likely to fill you up
Changing the food environment

Meals and Vending machines
North American Schools

Junk food banned in schools
Jamie Oliver campaign in UK
Physical Activity
Why do people not take exercise?

- **Access to leisure facilities**
  - Those with access to recreational resources more likely to take physical activity (Diez Roux et al., 2007)

- **Fear of crime**
  - Objectively measured and perceived experience of crime associated with less exercise (McGinn et al., 2008)

- **Quality of the environment**
  - Objectively measured and perceived quality of the built environment associated with more exercise (McGinn et al., 2008)
‘Walkability’

Accessibility of locations, traffic and pedestrian safety, crime rate, neighborhood aesthetics all key determinant of physical activity
Instruments to evaluate the built environment

• Systematic Pedestrian and Cycling Environment Scan (SPACES) (Pikora et al, 2002)
• Irvine-Minnesota Inventory (Day et al, 2006)
• Built environment site survey checklist (BESSC) (Weich et al, 2001)
• Walkability Index (Frank et al, 2009)
• Neighborhood Walkability Scale (NEWS) (Saelens et al, 2006)
EPOCH – Environmental Profile of a Community’s Health

Overview
An Instrument to Measure Environmental Determinants of Cardiovascular Health
Goal of EPOCH

To collect information on environmental factors that may influence cardiovascular health across the PURE communities
Domains assessed in EPOCH

- Tobacco Environment
- Social & Economic
- Physical activity Environment
- Nutrition/ Food Policy
Data collection Instruments

• **EPOCH 1**: Objective environmental audit tool

• **EPOCH 2**: Survey of resident’s perceptions of their community
EPOCH 1: Audit of Communities

- Community demographics
- Observation walk
- Photographic assessment
- Geographic Information
- Tobacco store assessment
- Grocery store assessment
- Restaurant assessment
- Pharmacy assessment

- Location, connectedness, facilities
- Advertisements, amenities, built environ.
- Built environ
- Location of facilities & health services
- Advertising, health promotion, brand variety, cost

- Fruit/veg availability, cost, basic grocery cost
- Menu, health promotion
- Availability, cost of CV + other basic drugs
Sugary Drinks

- Ancaster, ON
- Hamilton Downtown, ON
- Hamilton, ON
- Urban Columbia
- Shenyang, China
# EPOCH I - Direct community observation

<table>
<thead>
<tr>
<th>16a) Advertisements</th>
<th>Tally of Advertisements</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Cigarette/tobacco product</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ii) Signs that prohibit smoking</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>ii) Health promotion (smoking cessation)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>iv) Health promotion (alcohol cessation)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>v) Junk food</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>vi) Sweet drink (eg Coke, juices, sports drink)</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>vii) Non-commercial Health promo (diet)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>viii) Commercial Health promo (diet)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ix) Non-commercial Health promo (Phys Act)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>x) Commercial Health promo (Phys Act)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>xi) Alcoholic drinks</td>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>
EPOCH 2 – Perceived Environment

What participants observe in their community

Their awareness of local laws, regulations, and health programs

Their opinions about behaviors and laws

Tobacco  Nutrition & Physical activity  Social  Home & Work
EPOCH 2 - Survey of community members

22. In the last 6 months have you seen **any junk food/ unhealthy snack food advertisements** in the following media in your community? (Junk food/ unhealthy snack food generally are snack foods of low nutritional value. e.g. (give country-specific examples of snacks))

<table>
<thead>
<tr>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>On Posters (e.g. Billboards, pasted or painted on walls, visible on the sides of taxis, buses etc.)</td>
</tr>
<tr>
<td></td>
<td>TV/ radio</td>
</tr>
<tr>
<td></td>
<td>Newspapers/ magazines</td>
</tr>
<tr>
<td></td>
<td>Sponsorship of sporting, music or other cultural events</td>
</tr>
<tr>
<td></td>
<td>Products such as umbrellas, ashtrays, clothing</td>
</tr>
</tbody>
</table>

=4 out of 5
Tool development

Photo analysis

Traffic signals, Planted trees,

Complete sidewalks, well maintained buildings

Street lights, street benches
Health Claims and Promotion of Healthfulness

- Health Claims (e.g. “free of trans fat”)
  - Location
  - Content

- Promotion of Healthfulness
  - Wholesomeness of ingredients
  - Image(s) of ingredients
  - Nutrition content claims
  - Summary of nutrient information
  - “Healthy Line” from a brand
  - Free of artificial colours, flavours and preservatives

Tool development
Reliability of EPOCH instruments

Environmental Profile of a Community’s Health (EPOCH): An Instrument to Measure Environmental Determinants of Cardiovascular Health in Five Countries

Clara K. Chow¹,², Karen Lock³, Manisha Madhavan¹, Daniel J. Corsi¹, Anna B. Gilmore³,⁴, S. V. Subramanian⁹, Wei Li⁵, Sumathi Swaminathan⁶, Patricio Lopez-Jaramillo⁷, Alvaro Avezum⁸, Scott A. Lear⁹, Gilles Dagenais¹¹, Koon Teo¹, Martin McKee³, Salim Yusuf¹

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Environmental Profile of a Community’s Health (EPOCH): An Econometric Assessment of Measures of the Community Environment Based on Individual Perception

Daniel J. Corsi¹, S. V. Subramanian², Martin McKee³, Wei Li⁴, Sumathi Swaminathan⁵, Patricio Lopez-Jaramillo⁶, Alvaro Avezum⁷, Scott A. Lear⁸, Gilles Dagenais⁹, Sumathy Rangarajan¹, Koon Teo¹, Salim Yusuf¹, Clara K. Chow¹⁰

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High Scoring for Walkability

Score= 91.67

Low Scoring for walkability

Score=56.00
Face validity: Junk food advertising (EPOCH1) and BMI

![Graph showing the relationship between junk food advertisements and BMI. The graph includes a regression line with 95% confidence intervals, mean BMI values, and data points. The x-axis represents junk food advertisements in EPOCH 1, and the y-axis represents BMI. The graph suggests a positive correlation between junk food advertising and BMI.]
Face validity: Junk food advertising (EPOCH2) and BMI
Summary

• Social and physical environments influence health
• Measuring and monitoring a community’s health can enable us to identify interventions that can improve our community’s cardiovascular health
• Changing an environment can beneficially change risk factor levels – exemplified by success of anti-smoking legislation
• “The efforts of individuals are likely to be effective when they are working with the societal trends” Geoffrey Rose
Average caloric consumption varies by country.
Sweet drink advertising (EPOCH1) and BMI

![Graph showing the relationship between sweet drink advertisements and BMI. The graph includes a scatter plot with data points, a fitted line, and shaded confidence interval. The x-axis represents sweet drink advertisements, and the y-axis represents BMI.]