Global Change and Public Health: Addressing the Ecological Determinants of Health

Panelist Discussion

CPHA Conference
June 11th, 2013
Background

Update of 1992 Position Paper
Overview of Work to Date

Position Paper

- First Amalgamated Draft completed
- Final version completed in Fall 2013
- Approve and publish in January 2014

Audience: Public Health Professionals and organizations, other health professionals, policy developers, politicians, partner organizations and the concerned general public.
Goals of the Paper

• Promote EDH approach
• Outline scientific evidence
• Address growing health inequity
• Provide plausible alternatives
• Provide tools for practitioners
• Provide actions for organizations
Introduction

Six Main Sections:

1. Ecosystems and Human Health
2. The State of the Earth’s Ecosystems
3. The Societal Forces Driving Change
4. Implications for Population Health
5. An Alternative, More Positive Future
6. The Role of Public Health

Also a Communications and Outreach Piece
Presenters

Part 1: Overview of the report

1. Ecosystems and Human Health and The State of the Earth’s Ecosystems – Trevor Hancock
2. The Societal Forces Driving Change – Margot Parkes
3. Implications for Population Health – Colin Soskolne
4. An Alternative, More Positive Future – George McKibbon
5. Communications and Outreach – Mitchell Beer

Part 2: Input from you
Scope of Paper

This Paper is…

• A succinct summary
• Practitioner driven
• A tentative guide

This Paper is not…

• A comprehensive report
• Politically driven
• A definitive solution

Speaker: Trevor Hancock
Purpose of Panelist Session

• Presentation of current content
• Audience driven discussion
• Focus on development of ‘Action Items’
Socio-Ecological Model for Public Health Action

Speaker: Trevor Hancock
PART 1: Ecosystem and Human Health
PART 1: Ecosystems and Human Health

NATURE VS. HUMAN NATURE:

• The earth as our Mother
• Humans as a form of cancer
• Imbalance
PART 1: Ecosystems and Human Health

Changing Attitudes

- Separation from Nature
- Dominance of Humans
- Fear of Nature
PART 1: Ecosystems and Human Health

Understanding Ecosystems

"Earth is a live planet that regulates its surface and atmosphere in the interests of its biosphere."

Aldo Leopold~

- Biophilia
- Stability
- Ecotoxicity & BioConcentration
PART 2:
The State of the Earth’s Ecosystems
PART 2: The State of the Earth’s Ecosystems

Nine Earth System Processes:  (Rockstrom et al)

- Climate Change
- Loss of Biodiversity
- Nitrogen & Phosphorus Cycle
- Ozone Depletion
- Ocean acidification
- Global freshwater use
- Changes in land use
- Chemical Pollution
- Atmospheric aerosol loading

Speaker: Trevor Hancock
Major ecological determinants

• Climate and atmospheric change
  – Climate change
  – Ozone depletion
  – Acid emissions

• Pollution and ecotoxicity
  – POPs
  – Air, water and soil pollution

• Resource depletion
  – Renewable
  – Non-renewable

• Loss of species

• Loss of ecosystem functions

Speaker: Trevor Hancock
PART 2: The State of the Earth’s Ecosystems

Boundaries

- Marginally Critical
- Close to Critical
- Critical

- Global freshwater use
- Changes in land use
- Phosphorus Cycle
- Ozone Depletion
- Ocean acidification
- Climate Change
- Loss of Biodiversity
- Nitrogen Cycle

Speaker: Trevor Hancock
**PART 2: The State of the Earth’s Ecosystems**

**Climate Change**

<table>
<thead>
<tr>
<th></th>
<th>1992</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CO₂</strong></td>
<td>22.6 Billion Tonnes</td>
<td>33.9 Billion Tonnes</td>
</tr>
<tr>
<td><strong>Average Temp</strong></td>
<td>14.15°C</td>
<td>14.53°C</td>
</tr>
<tr>
<td><strong>Arctic Summer Ice</strong></td>
<td>49% Below Long Term Average (2012)</td>
<td></td>
</tr>
</tbody>
</table>

Speaker: Trevor Hancock
PART 2: The State of the Earth’s Ecosystems

Pollution and Ecotoxicity

Increase in PCB concentration from water to seal is 80,000,000 times

4.7 > Bioaccumulation of toxins in the marine food chain has long been recognized as a problem. The process illustrated here relates to polychlorinated biphenyls (PCBs), a typical environmental toxin. ©maribus (after Böhm, 1991)
PART 2: The State of the Earth’s Ecosystems

Pollution and Ecotoxicity – PFOS in polar bear

“PFOS is persistent, bioaccumulative and toxic to mammalian species.” - Environmental Directorate of the OECD, 2002

Perfluorooctane sulfonate levels in ppb
PART 2: The State of the Earth’s Ecosystems

Depletion of Renewable and Non-Renewable Resources

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Ecological Footprint</td>
<td>2.7 Hectares (Pop 5.3 Bill)</td>
<td>2.7 Hectares (Pop 6.7 Bill)</td>
</tr>
<tr>
<td>Biocapacity Ratio</td>
<td>1.18</td>
<td>1.51</td>
</tr>
</tbody>
</table>

Speaker: Trevor Hancock
PART 2: The State of the Earth’s Ecosystems

Loss of Habitat, Species, and Diversity

<table>
<thead>
<tr>
<th></th>
<th>1992</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLPI</td>
<td>0.82</td>
<td>0.72</td>
</tr>
<tr>
<td>Tropical LPI</td>
<td>0.55</td>
<td>0.4</td>
</tr>
<tr>
<td>Temperate LPI</td>
<td>1.22</td>
<td>1.29</td>
</tr>
</tbody>
</table>

Speaker: Trevor Hancock
PART 2: The State of the Earth’s Ecosystems

Trends of Indices Related to Population Health

- Daniel Rainham


Speaker: Trevor Hancock
PART 3: Societal Forces Driving Change

Speaker: Margot Parkes
PART 3: Societal Forces Driving Change

Four Main Categories

1. Population Growth
2. Economic Growth and Development
3. Technological Advances
4. Social Changes
PART 3: Societal Forces Driving Change

Population Growth Over the Past 20 Years (UNEP 2011)

- **Population Growth**: 5.5 Billion to 7 Billion
- **Urban Growth**: 50% Live in Cities
- **Mega Cities**: Doubled to 21
- **Population in Slums**: Risen to 825 Million
PART 3: Societal Forces Driving Change

Economic Growth Over the Past 20 Years (UNEP 2011)

- **International Trade**
  - $9 Trillion to $28 Trillion

- **GDP**
  - 75% Increase

- **Global Materials Extraction**
  - 41% Increase

- **Food Production**
  - 45% Increase
PART 3: Societal Forces Driving Change

A Note on Economic Growth

The concept of ‘doubling’/’halving’ times:

3% Economic Growth per year

= Doubling time of 23 years

80 year lifespan = 10.6 x current resources
PART 3: Societal Forces Driving Change

Technological Advancement Over the Past 20 Years (UNEP 2011)

- **Cell Phone Use**: 23000% Increase
- **Internet Use**: 29000% Increase
- **Air Transport**
  - Air Passenger: 100% Increase
  - Freight: 230% Increase
- **Plastic Production**: 130% Increase
PART 3: Societal Forces Driving Change
A Note on Technological Innovation:

Waves of Innovation

1st wave
Iron
Water power
Mechanisation
Textiles
Commerce

2nd wave
Steam power
Railroad
Steel
Cotton

3rd wave
Electricity
Chemicals
Internal combustion engine

4th wave
Petrochemicals
Electronics
Aviation
Space

5th wave
Sustainability
Radical resource productivity
Whole system design
Biomimicry
Green chemistry
Industrial ecology
Renewable energy
Green nanotechnology

6th wave
Digital Networks
Biotechnology
Software
Information technology

1785  1845  1900  1950  1990  2020
PART 3: Societal Forces Driving Change

Social Changes Over the Past 20 Years:

- **Inequity**: 100 wealthiest families could end poverty
- **Gender**: Women overtaken men in postsecondary enrollment (Canada)
- **Facebook**: 800 million users
PART 3: Societal Forces Driving Change

Changing Values:

• Per John Last (+ related discussions….)
• Recognize a problem (or opportunity) exists
• Identify causes (or drivers of change/values)
• Capacity to control causes (enhance +tive change)
• Sense of values that it is worthwhile/impt to act
• Political will (including ‘governance’ shifts)
PART 3: Societal Forces Driving Change

Potential transformation points (Silver Linings?)

• A view of environment as a living system
• Ecological literacy: global – regional – local
• Returning to social-ecological context for health
• Linking social and ecological change
• Shift to green: Industry, Car-less, paper-less
• Linking with justice: Just, sustainable, healthy
PART 4: The Implications for Population Health
The CPHA Working Group is asking

“What control do we have over the ecological determinants of health, and how will changes in these affect our health? Have we so separated ourselves from nature that the disconnect that relies so heavily on technological solutions to save us from ourselves can be relied upon?”

Speaker: Colin Soskolne
PART 4: The Implications for Population Health

The primary factors that shape the health of Canadians are not medical treatments or lifestyle choices, but rather the living conditions they experience, including income and wealth distribution, employment, health and social services, education, food and housing. These conditions have come to be known as the social determinants of health. Under this framework, the ecological determinants, which are the upstream determinants of all that sustains life on Earth are not recognized at all. What are the ecological determinants of health?
PART 4: The Implications for Population Health

Global Geoclimatic System Changes

- Higher Mean Global Temperatures
  - Increased heat deaths

- Sea Level Rise
  - Inundation: Eco-refugees
  - Increased waterborne, foodborne, and vectorborne illness

- Wider Distribution of Insects
  - Increase in malaria, dengue, lyme disease etc...

- Drought, desertification and flooding
  - Crop failure

- Ecosystem Changes
  - Food security

- Extreme Weather Events
  - Social disruption and disasters

Speaker: Colin Soskolne
PART 4: The Implications for Population Health

Ozone Layer Depletion
- Increased UV Radiation
  - Skin cancer
  - Cataracts

Acid Emissions
- Ocean and freshwater acidification
  - Loss of key aquatic life
  - Damage to coral reefs
- Soil acidification
  - Agricultural and forest productivity

Speaker: Colin Soskolne
PART 4: The Implications for Population Health

Ecotoxicity

- POPs
- Heavy Metals
- Endocrine Disruption

- Human and animal health
- Human and animal health
- Human and animal health
- Biodiversity

Speaker: Colin Soskolne
PART 4: The Implications for Population Health

Resource Depletion

- Water
  - Drought
  - Conflict
- Oil
  - Energy Crisis
  - Conflict
- Fisheries
  - Hunger
  - Conflict
- Topsoil and flood lands
  - Food insecurity
- Forests
  - Flooding
  - Loss of Carbon Sinks,
- Minerals
  - Less nutritional foods

Speaker: Colin Soskolne
PART 4: The Implications for Population Health

Loss of Species and Biodiversity

- Crop Monoculture
  - Hunger
- Loss of Medically Valuable species
  - Fewer medicinals
- Weakened Web of Life
  - Loss of resiliency/imbalance
- Decline in nature’s services
  - Waste disposal

Speaker: Colin Soskolne
PART 5:
An Alternative, More Positive Future…
PART 5: An Alternative, More Positive Future

Three Scenarios:

• Scenario 1: Business as usual: ‘doing the same things’

• Scenario 2: Risk management: ‘doing the same things better’

• Scenario 3: Transition: ‘doing better things’
PART 5: An Alternative, More Positive Future

Scenario 1: Business as usual

- Increasing Social Inequality
- Reliance on Technological Solutions
- Declining Global Economy
- Faltering Public Health Systems
PART 5: An Alternative, More Positive Future

Scenario 2: Risk Management

- Governmental and intersectoral collaboration
- New monitoring, regulation, and evaluation
- Social inequity focus
- Only incremental change
PART 5: An Alternative, More Positive Future

Scenario 3: Transition

- Abandonment of economic growth model
- Integration and intersectoral engagement
- Synergy of community development, social justice, and ecological harmony
- Attention to ‘place’
PART 5: An Alternative, More Positive Future

Characteristics of the three scenarios:

<table>
<thead>
<tr>
<th>Scenario 1: Business as Usual</th>
<th>Scenario 2: Risk Management</th>
<th>Scenario 3: Transition</th>
</tr>
</thead>
<tbody>
<tr>
<td>You know what you know</td>
<td>There are things you know you don’t know</td>
<td>There are things you don’t know don’t know</td>
</tr>
<tr>
<td>You are working in your policy/legislative mandate</td>
<td>You are working with other departments/professions on shared policy/legislative mandates/programs</td>
<td>You are working with a host of other departments/professions/stakeholders on shared concerns where policy/legislative mandates may not exist</td>
</tr>
<tr>
<td>You are delivering a program</td>
<td>You are working with risk based/actuarial concerns</td>
<td>You are working on matters beyond the &quot;tipping point&quot;</td>
</tr>
<tr>
<td>Program delivery by linear measurement and a defined narrative</td>
<td>Program delivery involves increasing inability to predict rare events and broken narratives exist where rare events are concerned</td>
<td>You are working with asymmetries</td>
</tr>
<tr>
<td>Fragility</td>
<td>Resilient/robust</td>
<td>Antifragile: engaging emergence (Holman 2011)[1]</td>
</tr>
<tr>
<td>Forecasting certainty</td>
<td>Increasing forecasting uncertainty</td>
<td>Alternative futures definition as a function of partnerships and action plans</td>
</tr>
<tr>
<td>Working with theory of general application</td>
<td>Working with theory and place</td>
<td>Working with place and developing theory</td>
</tr>
<tr>
<td>Doing the same things</td>
<td>Doing the same things better</td>
<td>Doing better things</td>
</tr>
<tr>
<td>Attention to theory</td>
<td>Attention to theory and social cultural and equity diversity</td>
<td>Working with cultural and equity diversity</td>
</tr>
</tbody>
</table>


Rumsfeld, Donald (2002)

Slavoj Žižek (2009)
PART 5: An Alternative, More Positive Future

Reflection:

• Three scenarios based on existing movements
• Importance of integration/communications
• Relevance of aboriginal values/attention to ‘place’
• Precedents at all levels
PART 6: The Role of Public Health

We will come back to this…
Communications and Outreach
Communications and Outreach

Reaching out to public health professionals:

• As a *direct audience* to build recognition of the ecological determinants of health

• As *community leaders* with the ability to
  • *Raise public awareness*
  • *Build momentum for local action*
Communications and Outreach

The point of reference: *Frontline Health*

What’s your Story

Assessing Health and Health Equity Impact

Frontline Health Atlas
Communications and Outreach

The point of reference: *Frontline Health*

Your ZIP Code shouldn’t predict how long you’ll live.

[www.calendow.org](http://www.calendow.org)

**ZIP CODE**
90002
LIFE EXPECTANCY

73

**ZIP CODE**
94301
LIFE EXPECTANCY

86
Communications and Outreach

Basic campaign elements

- **Website**
- **Social media release for Working Group report**
  - **Twitter**
  - **Facebook**
  - **Blog as the fulcrum**
- **Opinion leader campaign**
Communications and Outreach

Blog as the fulcrum

- Facebook
- Twitter
- Linkedin
- Other Outbound
- Website
- Downloadable Resource

Graphic: Smarter Shift
Communications and Outreach

Communications toolbox

- Funding proposal
- *Input from CPHA members*

Photo: Tanemori (Hatena Ftolife) [CC-BY-2.1-jp] via Wikimedia Commons
DISCUSSION OF PAPER/FACILITATED QUESTIONS
Questions

1). What should be the role of public health professionals and organizations in addressing the ecological determinants of health? (At any level in Canada)

2). What are the first steps to action in your agency or community and what are the barriers?

3). What would you need to get started? What are the best ways to get information to you and others that will stimulate action?

4). Further questions or comments?
THANK YOU!!!

Next steps:

- Collect and amalgamate feedback
- Draft ‘Part 6: The Role of Public Health’
- Incorporate feedback into re-drafting of entire paper

Please send feedback/content to:

dschwirtz@cpha.ca