Application of the HIA Framework to Projects in North America

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Intent of Seminar

To provide an introduction to HIA theory and practice, with real-world examples of HIAs completed across various sectors. It will also focus on recent developments in HIA methodology to facilitate a broader understanding of the process and its applications.

Lindsay McCallum, Ph.D. (Candidate) Declaration:

• Environmental Health Scientist and the Health Impact Assessment Lead at Intrinsik Corp.
• Currently completing doctoral research in the area of Health Impact Assessment (HIA) of major infrastructure projects at the University of Toronto.
• Research is focused on development and implementation of scientifically rigorous methodologies and assessment tools to facilitate the application of HIA within a variety of sectors.
What is Health?

- World Health Organization (WHO, 1948) definition of health:
  
  “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”

- The Ottawa Charter for Health Promotion (1986)

  “The ability of an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment”

- Health Impact Assessment is based on a holistic definition of health
The Determinants of Health

Public Health by Design (Modified from Whitehead and Dahlgren, 1991):

http://www.publichealthbydesign.com/resources/
I think I know what HIA is…?

- “Health Impact Assessment (HIA) is a combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population” (WHO, 1999)

- Very large scope – includes all “potential effects on health”

- Looks at health in terms of:
  - Physical health
  - Mental well-being
  - Social / Cultural determinants
  - Economic determinants
...but what does it actually DO?

- Provides a framework for assessment of health impacts
- Identifies both positive and negative effects
- Provides recommendations for mitigating negatives and enhancing positives
- Used to inform decision-making processes
- Can be conducted alone or in cooperation with other commonly applied types of assessments such as Environmental Assessment (EA) and Human Health Risk Assessment (HHRA)
When should an HIA be conducted?

At the planning stage:

- What is the best option?
- Where is the optimal site / how can this best be implemented?
- Focus on big picture and how to best tackle the issue in general

At the implementation / operational stage:

- How is this project impacting the local community?
- Is there anything that can be done to minimize impacts?
- Focus on local concerns and community involvement
HIA Around the Globe

• HIAs are conducted in many different countries
  – Developed and developing countries
• Currently under-utilized in Canada
• Different guidance documents for different countries
  – Some similarities but there is no universally “agreed upon” method

• HIA typically spearheaded largely in developed countries; however, HIA is used in developing nations, especially for large-scale extraction projects
Why bother?

• This is the most important question
  – Why should anyone bother to conduct an HIA?

• HIA has the ability to look at all facets of a policy/project and identify not only negative impacts but also benefits
  – This can help provide a more accurate picture of the overall ‘impact’
  – Includes health determinants not always considered in other types of assessment (e.g., Risk Assessment, Environmental Assessment)
  – Need a consistent set of “triggers” for HIA (more on this later…)

• Government, health officials and the public have taken an increasing interest in HIA

• Toronto Public Health created guidance in 2008 that has been used in several HIA initiatives
Steps of an HIA

1. **Screening**
   - Is an HIA necessary and an appropriate option?

2. **Scoping**
   - Identify key issues and engage stakeholders/public

3. **Assessment**
   - Conduct assessment (quantitative and/or qualitative)

4. **Recommendation**
   - Make recommendations based on assessment findings

5. **Reporting**
   - Disseminate information to stakeholders/public

6. **Evaluation**
   - Evaluate HIA process and impact

7. **Monitoring**
   - Monitor impact/recommendations (if applicable)
Okay, but what does it look like?

• Examples of HIAs that have been conducted in various sectors around the world are briefly discussed below, including:

1. Waste Management Policy (UK)
2. Transportation Infrastructure (Canada)
3. Oil Drilling Project (USA)
EXAMPLE 1: Waste Management

- An HIA was commissioned for the Wales Regional Waste Plan to ensure that health was “considered and safeguarded”
- The HIA was intended to be strategic and largely qualitative since the waste management plan did not yet have technologies or sites selected
- The HIA included assessment of concerns voiced by the public during a series of open houses
EXAMPLE 1: Waste Management

• The potential human health impacts associated with the accumulation and decay of untreated waste include:

  – Emissions into the air, water and soil
  – Odour
  – Dust
  – An increase in pests and vermin
  – Detraction from the visual aesthetics
  – Impacts on green space
  – Impacts on flora and fauna
  – Fire hazard
  – Infectious and chronic diseases
EXAMPLE 1: Waste Management

- The report found that alternative waste facilities (landfill, incineration, composting, waste transfer and recycling) have similar positive and negative impacts including:

**POSITIVE IMPACTS FROM:**
- the collection and treatment of waste
- employment opportunities
- the stimulus to the wider local economy
- the minimization of potential climate change impacts (global warming) through reduction in the use of landfills and the associated production of greenhouse gases.

**NEGATIVE IMPACTS FROM:**
- odour
- noise
- pests
- dust and litter
- quality of life effects
- emissions given off by waste facilities into the air, water and soil (air, water and soil pollution)
- concern and worry about the potential negative health impacts.
EXAMPLE 1: Waste Management

• Overall, the report found that:

“the review of the evidence on health impacts shows that there is no single best solid waste management option from a public health perspective and that well designed, operated and regulated waste treatment facilities are likely to have mainly positive and little or no negative impacts on the health and wellbeing of local communities and waste facility employees.”
EXAMPLE 2: Transportation

Kirk Anderson, Pioneer Press

IF THESE IDIOTS
WOULD JUST TAKE
THE BUS, I COULD
BE HOME BY NOW

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Kirk Anderson, Pioneer Press
EXAMPLE 2: Transportation

- A Rapid HIA is currently underway to evaluate potential health impacts of High Occupancy Vehicle (HOV) and High Occupancy Toll (HOT) lanes in the City of Toronto and the GTA.

- Transportation policy has considered implementation of HOV and HOT lanes.

- HIA being conducted in a collaborative effort between Intrinsik and the University of Toronto.

(Waheed et al., 2016)
EXAMPLE 2: Transportation

**Built Environment**
- Transportation Investment
- Land Use

**Travel Behavior**
- Vehicle
- Transit
- Active

**Health Determinants**
- **EXPOSURE**
  - Traffic Volume and Speed
  - Air Quality
  - Noise and other Emissions

- **BEHAVIORAL**
  - Physical Activity, Social Interactions, etc.

**Health Outcomes**
- Accidents
- Respiratory Function
- Mental Health
- Chronic Disease Onset
- Health Care Costs

(Health & Community Design Lab, 2013)
EXAMPLE 2: Transportation

• Completed a comprehensive scoping workshop that included stakeholders from Toronto Public Health, Public Health Ontario, City of Toronto Transportation Planning, Ministry of Transportation Ontario, Metrolinx, and representatives from various NGOs and community groups.

• Specific determinants under consideration include:
  • Air quality
  • Traffic Congestion
  • Mobility
  • Accessibility – services/resources
  • Noise
  • Safety and security – traffic-related injury
  • Stress – mental health
  • Physical activity – active transport
  • Social capital / social cohesion
  • Health equity – equal access to transportation

• This HIA is being finalized – results to be released in 2016
EXAMPLE 3: Oil Drilling (Hermosa)

- Hermosa Beach is a small city located in LA County
  - Population = 20,000; Land area = 1.43 square miles

- Highly educated, affluent community with relatively young demographic
  - Average house price >$1,000,000 USD
EXAMPLE 3: Hermosa Beach HIA

• **THE ISSUE:** an election held to allow residents to decide whether to repeal existing ban on oil drilling within the City limits.

• Repealing the ban on oil drilling would allow the proposed oil drilling and production project to move forward.

• **THE PROJECT:** the proposed Oil Development Project consisted of drilling 30 oil wells on a 1.3-acre site located on existing City Maintenance Yard property.
EXAMPLE 3: Determinants of Health included in HIA

Through consultation with community members, the HIA identified six major categories and 18 determinants of health in relation to the proposed Project:

- Air Quality
- Water and Soil Quality
- Upset Conditions
- Noise and Light Emissions
- Traffic
- Community Livability
EXAMPLE 3: Decision-Making Framework

<table>
<thead>
<tr>
<th>Health Determinant</th>
<th>List the determinant being assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential Health Outcome</td>
<td>List potential health outcomes associated with each determinant</td>
</tr>
<tr>
<td>Pre-Mitigation Discussion</td>
<td>The discussion is limited to identification of the direction of the pre-mitigation impact (positive, negative, neutral or unknown) and identification of any potential issues that could arise if no mitigation measures were implemented.</td>
</tr>
<tr>
<td>EIR Mitigation</td>
<td>List mitigation measures from the Environmental Impact Report (EIR), where applicable</td>
</tr>
<tr>
<td>Geographic Extent</td>
<td>Localized or Community</td>
</tr>
<tr>
<td>Magnitude</td>
<td>Low, Medium, High, or Unknown</td>
</tr>
<tr>
<td>Adaptability</td>
<td>High, Medium, Low, or Unknown</td>
</tr>
<tr>
<td>Likelihood</td>
<td>Unlikely, Possible, or Probable</td>
</tr>
<tr>
<td>Post-Mitigation Health Effect</td>
<td>Negative, Positive, No substantial Effect, or Unknown</td>
</tr>
<tr>
<td>Comments or Additional Recommended Measures</td>
<td>None, or Additional Recommendations (specific and actionable)</td>
</tr>
</tbody>
</table>
EXAMPLE 3: Decision-Making Framework

Magnitude

Health Determinant

Adaptability

Likelihood

H = high; M = medium; L = low; U = unlikely; P = possible; R = probable

No Substantial Effect (Neutral)  Neutral/Positive  Positive/Negative  Positive/Negative
EXAMPLE 3: Overall Conclusion

Based on the proposed mitigation measures in the EIR and additional recommendations provided in the HIA, we do not believe that the Project will have a substantial effect on community health in Hermosa Beach.”

Series of recommendations included in a legally binding document drafted by the City (enforceable if project were to proceed)

Successful peer-review process led to a stronger and more defensible assessment.

City held an election in March 2015 where the residents voted not to lift the existing ban on oil drilling
HIA Research & Development

• Literature review and gap analysis identified several areas requiring additional research:
  
i. The nature of HIA triggers
  ii. Consistent scoping and stakeholder engagement approaches
  iii. Use of evidence and transparency of decision-making
  iv. Reproducibility of assessment methods
  v. Monitoring and evaluation protocols
  vi. Integration within existing regulatory frameworks.

• The US EPA conducted a review of HIA practice in the US and concluded: “there are considerable disparities in the quality and rigor of HIAs being conducted” (Rhodus et al., 2013).
HIA Research & Development

- Several new approaches and tools for conducting HIA in a more consistent and transparent manner were developed, including:
  
  ✓ An HIA Screening Tool
  
  ✓ A Systematic HIA Scoping Tool
  
  ✓ An Assessment Framework
  
  ✓ An Assessment Framework for Integration with EA
HIA Screening Tool

HIA Scoping Tool

1. Identify stakeholders and their roles
2. Initiate stakeholder engagement activities
3. Obtain/analyze stakeholder feedback
4. Review relevant project/policy information
5. Tier I: Review list of determinants and characterize potential health impacts (exclude non-applicable)
6. Tier II: Identify level of public concern/interest and data available for each determinant
7. Tier III: Determine priority level for each determinant using Priority Decision-Matrix
8. Tier IV: Create budget breakdown (based on priority) to determine final list of determinants to be included in HIA
9. Tier V: For final determinants, define key data sources, temporal & geographical boundaries, vulnerable groups and assessor(s)

## HIA SCOPING TOOL: Systematic Prioritization of Health Determinants

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Potential Impact on Health</th>
<th>Public Concern/Interest</th>
<th>Data Availability</th>
<th>Priority</th>
<th>Priority Deviation and Justification (if required)</th>
<th>Assessment Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>---</td>
<td>Very High</td>
<td>Substantial</td>
<td>1A</td>
<td></td>
<td>$5,000</td>
</tr>
<tr>
<td>Accidents / Spills / Injury</td>
<td>+++</td>
<td>Medium</td>
<td>Substantial</td>
<td>2A</td>
<td>1A (request of local MOH)</td>
<td>$10,000</td>
</tr>
<tr>
<td>Air quality (pollutants, dust, smog etc)</td>
<td>+++</td>
<td>Low</td>
<td>Substantial</td>
<td>2A</td>
<td></td>
<td>$5,000</td>
</tr>
<tr>
<td>Litter and waste disposal</td>
<td>++</td>
<td>High</td>
<td>Substantial</td>
<td>2A</td>
<td></td>
<td>$2,000</td>
</tr>
<tr>
<td>Availability of land resources, including</td>
<td>+++</td>
<td>Very High</td>
<td>Partial</td>
<td>2B</td>
<td></td>
<td>$1,000</td>
</tr>
<tr>
<td>Groundwater quality</td>
<td>--</td>
<td>Very High</td>
<td>Very Limited</td>
<td>2C</td>
<td></td>
<td>$1,000</td>
</tr>
<tr>
<td>Greenhouse gas (GHG) emissions</td>
<td>++</td>
<td>Very High</td>
<td>None</td>
<td>2D</td>
<td></td>
<td>$5,000</td>
</tr>
<tr>
<td>Other (Specify)</td>
<td>---</td>
<td>Low</td>
<td>None</td>
<td>2D</td>
<td></td>
<td>$8,000</td>
</tr>
<tr>
<td>Changes in built environment</td>
<td>--</td>
<td>Medium</td>
<td>Partial</td>
<td>3B</td>
<td></td>
<td>$1,000</td>
</tr>
<tr>
<td>Changes in road structure</td>
<td>-</td>
<td>Very High</td>
<td>Partial</td>
<td>3B</td>
<td></td>
<td>$5,000</td>
</tr>
<tr>
<td>Visual impact (aesthetic)</td>
<td>--</td>
<td>Medium</td>
<td>Partial</td>
<td>3B</td>
<td></td>
<td>$5,000</td>
</tr>
<tr>
<td>Availability of water resources (use/process requirements)</td>
<td>=</td>
<td>Very High</td>
<td>Substantial</td>
<td>4A</td>
<td></td>
<td>$3,000</td>
</tr>
<tr>
<td>Electromagnetic Fields (EMF)</td>
<td>+</td>
<td>Very Low</td>
<td>Substantial</td>
<td>4A</td>
<td></td>
<td>$2,000</td>
</tr>
<tr>
<td>Traffic volume and safety</td>
<td>+</td>
<td>Medium</td>
<td>Very Limited</td>
<td>4C</td>
<td></td>
<td>$4,000</td>
</tr>
<tr>
<td>Noise levels</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odour</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence of vermin/vectors</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil quality</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface water quality</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Assessment Framework for EA

Characterizing Effects
Assessment Framework for EA

Determining Significance
Assessment Framework for EA

Health Impact Assessment

Developing Conclusions
Final Thoughts

- The practice of HIA is based on a holistic model of health; including consideration of physical, social and mental health and well-being

- HIA has been applied to various sectors to inform the decision-making process

- Methods in HIA remain inconsistent, leading to HIA being underutilized as a vehicle for assessing health

- Research and development on HIA focused on development of new methods and tools to make HIA more consistent and transparent

- Overall, HIA facilitates consideration of health in proposed policies and projects and is able to mitigate negatives and enhance positives
References


THANK YOU

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