Creative Thinking in Epidemiology

Discussion paper for workshops at

ENVIRON/UMass Amherst and U. Toronto/Cancer Care Ontario[1]

Version: 4 Sept. 2011 (with appendices downloadable from http://bit.ly/CTinEpi)

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During a session in the middle of the workshop, I give a brief introduction, then participants take turns, say 5 minutes each, to relate how the paper intersects with or stimulates their own thinking (while the author stays quiet, listening). I join in at the end. The emphasis is on participants teasing out their own thinking more than on digging into what the author thinks.

I work on the margins of epidemiology. My contributions to the topic of this workshop do not come from a position of expertise and deep experience. I am not someone who assembles and analyses epidemiological data, advises policy makers, secures research grants, or leads a research team. These limitations, however, also give me the freedom to raise questions and stimulate your responses without my having to provide the answers. I hope this discussion paper and the workshop as a whole succeed in turning my limitations into positive developments.

My background is in critical thinking about the life sciences in their social context. My primary appointment is directing a graduate program on "Critical and Creative Thinking," in which typically mid-career professionals move their work and lives in new directions. However, since 2007 I have taught a doctoral course for public policy and nursing students on "Epidemiological

[1] This workshop explores ways to open up new directions in epidemiological thinking and research. Participants will be introduced to tools and processes for individual reflection and group interaction designed to produce the insights and to deepen the people-connections valuable for seeing new paths and generating new opportunities. The workshop facilitator, Peter Taylor, directs the graduate programs in Critical and Creative Thinking and Science in a Changing World at the University of Massachusetts Boston and teaches a doctoral course on epidemiological thinking for non-specialists. His personal goals in leading this workshop are to learn more from epidemiologists about what shapes their practice in research and public health while developing his approaches to stimulating creativity and reflective practice among scientists.

thinking and population health." I took on this challenge after studying researchers who address the complexity of biological and social influences on the life course development of health and behavior. Through my research I had become acquainted with a range of methods, results, and controversies in social epidemiology and related fields. This experience made me want other non-specialists to become conversant with the issues; indeed, "Epidemiological thinking for non-specialists" was the course title the first time around. This said, I have drawn on the advice of many specialists as I chose the readings. Yet I did not try to channel their authority when teaching and serve as arbiter between competing approaches or perspectives. I was more interested in drawing students' attention to alternatives so they would be more critical or probing when they asked advice from biostatisticians and other specialists. I was quite open about joining with my students in employing strategies of reading that allowed us to extract take-home lessons even as we skimmed sections of readings that were too technical for us.

I offer the six contributions to follow in a similar spirit to my teaching of the epidemiology course: I am open to learning from epidemiological specialists who can provide a deeper account of the conceptual and practical issues in any case (and correct my presentation when necessary). At the same time, I want to draw attention to and invite discussion on contrasting approaches or perspectives so you can be more critical or probing when charting your paths ahead. *However, these six contributions by no means circumscribe the issues you might bring to the topic of creative thinking in epidemiology.* (See also Appendix 1 from June Roundtable)

Contribution 1. An image: To be interested in creative thinking in epidemiology is to accept that it is "*no longer possible to simply continue along previous lines"* (to quote a foreign participant in a past workshop). Now, it makes good sense to continue along previous lines—to apply the techniques we are skilled in, seek grants from the sources that have funded us, address the problems we are recognized as experts in, collaborate with colleagues who have worked well in a team before, acknowledge institutional constraints, and so on (see Appendix 1). Moreover, continuing along previous lines does not mean we do not change, but that change builds on what we are comfortable with. Yet, an interest in not *simply* continuing along previous lines means we seek perspectives, problems, tools, connections, and audiences that might trouble us—make us feel not so comfortable—when we do continue along previous lines.

Question in preparation for the workshop:

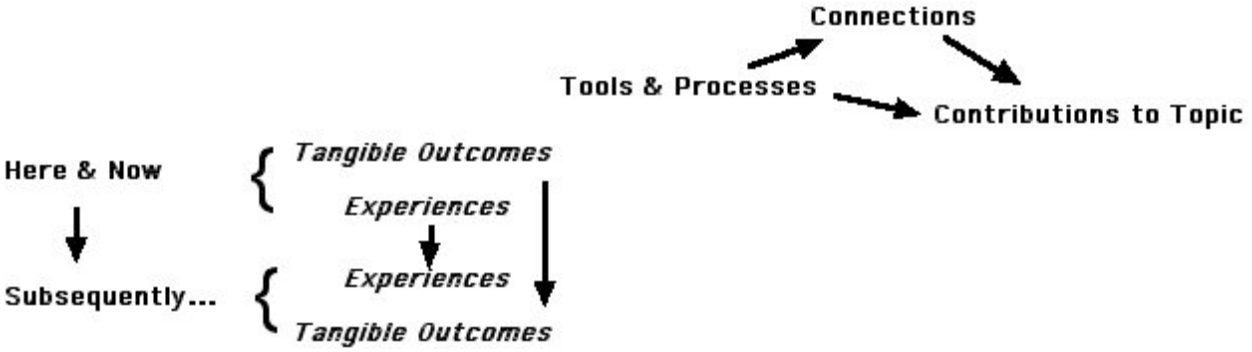
- What factors have influenced you in the past to shift your original direction of research or even your career (if this has happened to you)?

2. Tools/processes and connections: Participants in a workshop can expect the processes of the workshop and the connections made among participants to add something unavailable from reading a paper on the same topic—otherwise, why have a workshop? The tools/processes and connections should help participants generate insights about the topic and help them learn from contributions that others make. When the topic is "Creative Thinking in Epidemiology" participants might also hope that the workshop tools/processes and connections can be carried over so that they continue to use them to help generate insights after the workshop and make changes in practice (i.e., not simply continue along previous lines). Indeed, my thinking about workshops and other "organized multi-person collaborative processes" (Taylor 2001) is that

a) the carry-over of tools/processes and connections should be valued as much as the contributions to the official workshop topic; and

b) in the carry over from the here and now of the workshop to what goes on subsequently, what is important is the positive experiences, not only the tangible products.

These considerations, which inform the program for the workshop, are summarized in the following schema.



With the goal of producing positive experiences, the workshop program is built around four principles:

a) Participants always bring a lot of knowledge about the topic, so allow that to be brought to surface and acknowledged;

b) What you really learn from a workshop or participatory experience is what you integrate with your own concerns;

c) There should be reflection on each phase that leads to one concrete product to take into next phase; and

d) The workshop should unfold according to the sequence of "4Rs," that is, a well-facilitated collaborative process keeps us listening actively to each other, fostering mutual Respect that allows Risks to be taken, elicits more insights than any one person came in with (Revelation), and engages us in carrying out and carrying on the plans we develop (Re-engagement). What we come out with is very likely to be larger and more durable than what any one person came in with; the more so, the more voices that are brought out by the process (Taylor et al. 2011).

These considerations also inform the program for the workshop. The 4Rs lies at the center of the following elaboration of the first schema.

Tangible & Experiential Objectives for a Workshop

<table>
<tr><td colspan="2"></td><td colspan="2">Process as Product</td><td>Product in Conventional Sense</td></tr>
<tr><td colspan="2"></td><td>Tools & Processes</td><td>Connections</td><td>Contributions to Topic</td></tr>
<tr><td rowspan="2">Here & Now</td><td>Tangible Outcomes</td><td>Learn or refresh tools.
Participate in processes.
Practice facilitating processes (optional).</td><td>Establish or thicken connections among participants.</td><td>Probe, clarify, expose open questions.
Insights about new directions for participants' research, writing, teaching, outreach.</td></tr>
<tr><td rowspan="2">Experiences</td><td colspan="3">Respect->Risk->Revelation --> Re-engagement
(through Learning, Interacting, Sharing, Connecting, Communing)</td></tr>
<tr><td rowspan="2">Subsequently...</td><td colspan="3">--> Enthusiasm, Hope, Resolve, Courage Sustained</td></tr>
<tr><td>Tangible Outcomes</td><td>Cultivating ourselves as participants, collaborators & question-openers.
Adopt, adapt, evaluate & develop tools & processes.</td><td>Connections maintained & developed.
Local (i.e., participants' current realms) kept in tension with trans-local connections.</td><td>Individuals move in the new directions.
Compilation of reflections throughout the workshop
---> Programmatic overview?</td></tr>
</table>

Question:

- What tools or processes and connections have you carried over from previous workshops or collaborations?

3. Epidemiological thinking in public discourse: We do not fully understand an idea until we are able to explain it to the common person—something to that effect was proposed by, I think, the geographer and anarchist Peter Kropotkin. In this spirit, epidemiologists might try using epidemiological thinking to clarify issues that arise in the media or public discourse. In addition to the deeper or perhaps revised understanding, epidemiologists could build from such exercises a basis for a more public role and that might lead eventually to greater support for epidemiology and public health. Some of my attempts at applying epidemiological thinking to issues in public discourse, which I have posted on a blog this last year are included in the second Appendix. They address unemployment, urban riots, voting restrictions, the Tucson massacre, and mammogram guidelines.

Questions:

- How would you revise or rework the blog posts in the Appendix if you were using epidemiological thinking to explain the issues to the common person?
- What issues, in population health or in wider public discourse, have you tried to explain to the common person?

4. Wider discussion among researchers: As mentioned in the introduction, my Epidemiological Thinking course (http://ppol753.wikispaces.umb.edu) is designed with a view to more non-specialists becoming conversant with the methods, results, and controversies in social epidemiology and related fields. I envisage a form of *epidemiological literacy* in which specialists can be drawn into conversation or collaboration by other researchers who appreciate epidemiological concepts even if they lack the technical skills to analyze the data themselves. Indeed, I hope my course engages students who would either avoid a biostatistically oriented epidemiology course or would lose their grip on most of the technical details after struggling through such a course.

The third Appendix consists of extracts from the course syllabus and accompanying wikipages: the key ideas for each session; my initial notes to students; and references to the readings. As I hope is evident, the course as a whole aims to cultivate skills and dispositions of critical thinking and of life-long, cooperative learning facilitated by the resources of the internet. The use of controversies follows an idea central to critical thinking that we understand ideas better by holding them in tension with alternatives.

Questions:

- How would you convey a sequence of basic ideas in thinking like epidemiologists?
- How would you adjust this sequence for thinking like social epidemiologists who pay attention to possible social influences on the development and unequal distribution of diseases and behaviors in populations?
- What revisions would you recommend to the readings chosen and to the notes in the appendix that connect the idea to the readings? (Feel free to use the web link to contribute these suggestions.)

5. Alternatives to some statistical conventions: As I have developed my ability to read the epidemiological literature and explain the methods and controversies over methods to others, I have taken note of approaches or perspectives that depart from statistical conventions. The fourth Appendix includes some items from my mixed grab bag of alternatives. There is no grand theory linking them. Readers might have objections to some of the alternatives and the thinking behind them, but they might also be stimulated to explore their implications further. It does not matter if you end up sticking with the conventional approaches; the alternatives are offered here in the spirit of critical thinking, namely, that we understand ideas better by holding them in tension with alternatives.

Question:

- What conventions of statistical practice frustrate you and what alternatives have you considered?

6. Agent-oriented epidemiology: A further widening of the range of agents building knowledge about epidemiology and population health (*from http://wp.me/pPWGi-hX)*

Under the life-course perspective that has developed in social and psychological epidemiology since the 1990s, researchers seek to reconstruct the complex causal processes that generate specific diseases and behavioral attributes (Kendler et al. 2005, Kuh and Ben-Shlomo 2004). However, some prominent social epidemiologists are becoming skeptical about the availability of the kinds of data and analyses needed to separate the effects of diverse biological and social factors that operate on a range of temporal and spatial scales and build up over a person's life course (Davey-Smith 2007), or more generally, to "to identify modifiable causes of disease that can be utilized to leverage improved population health" (Davey-Smith 2008a, b; but see Lynch 2007). Grounds for such skepticism are amplified by the possibility of heterogeneity, that is, when similar responses of different individual (e.g., genetic) types are observed, researchers need not assume that similar conjunctions of risk or protective factors have been involved in producing those responses.

This state of play leads me to emphasize the possibility of an agent-oriented focus, in which researchers depart from the traditional emphasis on exposures impinging on subjects and, instead, elucidate people's resilience and reorganization of their lives and communities in response to social changes (Sampson et al. 1997). Although the patterns exposed by those studies might not extrapolate readily over time, place, and scale, they can provide a point of departure for research and policy engagements in the next situation studied. An agent-oriented epidemiologist would need to be conversant with studies of resilience and reorganization in communities, but also train in participant observation and qualitative methods for research on population health changes that arise through grassroots and professional initiatives and grow into loosely-knit social movements, e.g., around innovations in short-term therapy for depression (e.g., Griffin and Tyrell 2003, White and Denborough 1998).

I am interested in conversations with others who wish to examine the epidemiological significance of an agent-oriented focus.

Question:

- What variants of what I call an agent-oriented focus are already evident in your own areas of research and policy?

Appendices (downloadable from http://bit.ly/CTinEpi)

1. Notes from Luncheon Roundtable at 3rd North American Congress of Epidemiology: "Not continuing along previous lines: Exploring how new directions emerge in epidemiological research"

2. Epidemiological thinking in public discourse

3. Epidemiological Thinking and Population Health: An Open Source-like Curriculum

4. Alternatives to some statistical conventions

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