Author's response to reviews

Title: Modified Social Ecological Model: A tool to guide the assessment of the risks and risk contexts of HIV epidemics

Authors:

Stefan Baral (sbaral@jhsph.edu)
Carmen H Logie (clogie@ucalgary.ca)
Ashley Grosso (agrosso@jhsph.edu)
Andrea L Wirtz (awirtz@jhsph.edu)
Chris Beyrer (cbeyrer@jhsph.edu)

Version: 2  Date: 12 April 2013

Author's response to reviews: see over
April 11, 2013

Natalie Pafitis, Executive Editor
BMC Public Health
BioMed Central
236 Gray’s Inn Road
London WC1X 8HB
United Kingdom

RE: Revision and resubmission of a debate entitled: “Modified Social Ecological Model: A tool to guide the assessment of the risks and risk contexts of HIV epidemics”

Dear Dr. Pafitis and the BMC Public Health Editorial Committee:

Thank you for forwarding the reviewers’ feedback on our debate entitled: “Modified Social Ecological Model: A tool to guide the assessment of the risks and risk contexts of HIV epidemics”. We greatly appreciate the efforts of the reviewers and thank them for their time. We understand that changes were required to some fundamental aspects of our paper and we have edited it accordingly. We feel that the revisions suggested by the reviewers have greatly strengthened the manuscript. The revisions have been summarized and detailed below.

Reviewer 1

Comment 1. This is a very clearly written manuscript which advances conceptual analysis of social-structural drivers of HIV epidemics. The two case examples are aptly illustrative of the proposed model.

Response 1: Thank you for this encouraging feedback.

Comment 2. Unless the authors mean to be extremely specific about what such a model would entail (in which case the statement should be better specified), to my understanding there are several models that have at least been applied to advance conceptualization of the social-structural contexts of HIV transmission, some of which may merit referencing. It is at the authors’ discretion which of these references to address, but it seems at least some of the following are highly relevant.

Response 2: Thank you for this important comment. We now integrate all of the excellent articles you suggested. We also specified that we address individual transmission risks in order to inform epidemiological studies.

Comment 3. It seems that there is a higher order of evidence and confidence suggested as a requirement for individual factors than for the other levels. Why? Would one not wish to include what at a particular point in time may be tentative factors at the individual level and then assess them? Might this requirement (meta-analysis) to be included in the model limit its comprehensiveness and utility? Or perhaps, given the preponderance of individual factors studied in HIV research, there is a rationale for this level of evidence; if so, best to describe the rationale.

Response 3: This is a great point. We included a rationale for a higher order of evidence as a requirement for individual factors:
“These risks should be measured when there is biological or public health plausibility of being actual risk factors, ideally secondary to a rigorous systematic review with meta-analysis. While objective approaches to the synthesis of evidence for all levels of risk are preferred, in 2012, there is generally only sufficient levels of evidence for systematic reviews and meta-analysis of individual-level risk factors given the focus on this level of risk in the majority of epidemiological assessments of HIV.”

Comment 4: p. 8. "...well-designed programs aimed at higher order levels of risk will generally have a ripple-like effect...." This makes it sound too easy. Surely these are of central importance and may have an enabling effect; but often laws/policies are changed with very slow evolution of practices that become vestiges of such laws and which remain tremendous obstacles to prevention.

Response 4: We added a sentence discussing the slow pace of change of laws and policies and implementation difficulties “However, the implementation of laws and policies is often challenging, changes take place slowly, and obstacles to prevention remain (Blankenship, Friedman, Dworkin, & Mantell, 2006).”

Comment 5: p. 2. "These structural drivers do not directly cause...; rather they contextualize lower order risks...." Contextualize seems a rather weak descriptor.

Response 5: Thank you for this helpful comment. We changed “contextualize” to “mediate”.

Comment 6: Provide a key for the acronyms in figures 2 and 3.

Response 6: We provide a key for these figures.

Comment 7: In Figure 3 (but not Figure 2), several factors are repeated verbatim at different levels. Consider labeling them differently.

Comment 7: Thank you for pointing this out. We labeled Figure 3 differently in order to ensure no factors were repeated.

Reviewer: 2

Comment 1. Thank you for the opportunity to review the manuscript (debate) “Modified Social Ecological Model: A tool to guide the assessment of the risks and risk contexts of HIV epidemics.” This is a very nice, succinct review of risk embedded in social-ecological theory and contribution to an expanded model.

Response 1: Thank you for your encouraging feedback.

Comment 2. I would suggest that you mention the two case studies somewhere in the abstract. You could say that you demonstrate how the model can be fit to very different contexts.

Response 2: We now mention the two case studies in the abstract. “Case studies of HIV transmission among people who inject drugs and men who have sex with men demonstrate the use of the MSEM in different contexts.”
Comment 3. First sentence is missing some words “, such as parenteral and sexual transmission among, is necessary...”.

Response 3: We addressed the missing words.

Comment 4. A comma instead of period after “HIV interventions, While ...”

Response 4: We added this comma.

Comment 5. I don’t fully understand how you differentiate your work “to contextualize individual level risks with higher order levels of risk”, from other reviews like Poundstone et al (2004). Please flesh out your argument more, and explain in more detail how you link individual risk with higher orders both in the introduction and in each of the examples.

Response 5: We fleshed out the argument further:

“To adequately describe and address the complexity of an epidemic such as HIV, unique and granular models can be developed for specific populations to measure relevant risks and risk contexts. After a comprehensive review of the literature, we found no model designed to date that encapsulates individual HIV transmission risks in the context of social and structural drivers of the epidemic. Auerbach et al. (2011) developed a model to assess social and structural drivers of HIV to inform intervention development. Poundstone et al. (2004) presented a heuristic framework of the social epidemiology of HIV that highlights the social and structural determinants of the epidemic. Other models have examined ecological-level risk factors for HIV such as structural violence (Chakrapani, Newman, Shumugam, McLuckie, & Melwin, 2007; Lane et al., 2004) and social factors such as stigma and discrimination (Parker & Aggleton, 2003).

We build on past frameworks by a) examining multi-level risks and risk contexts for HIV infection and b) situating individual risks in the network, community, and public policy contexts as well as the epidemic stage. We developed the modified social ecological model (MSEM) to help visualize multi-level domains of HIV infection risks and guide the development of epidemiologic studies of HIV. We argue that data on risk factors and these multiple levels should be collected routinely as part of any epidemiologic study.”

Comment 6: You had mentioned both acquiring and transmitting disease in the background section, but this issue might be useful to raise again in the discussion section. “Individual factors...associated with vulnerability to illness or infection”. Consider adding some text about vulnerability to transmit infection as well. Of course, this has individual as well as higher order factors associated with it (stigma, access to care, adherence to ART, etc).

Response 6: We add additional text regarding vulnerability:

“Ultimately, defining and characterizing individual level risks of HIV transmission is imperative in better understanding the dynamics of an epidemic. However, it is the higher order social and structural level of risks that likely facilitate HIV transmission on a population level.”

Comment 7: I see the network level in a couple of different ways. One is the interconnected sexual network, or the people in direct risk of exposure and transmission. Then there is the social network, with can provide both increased risk and/or protective effects (norms, support, etc). Is there a better way to differentiate these two distinct networks within the framework?
Response 7: Thank you for this important point. We clarify what we mean in our discussion of networks:

“The network risk factors that drive the spread of HIV predominantly through moderation of these individual level risk factors are less appreciated. Networks of people who use drugs include social networks, injection networks of people with whom the person injects drugs, and sexual networks. Sexual/injection networks are more proximal in the exposure to HIV, though social networks may provide differential effects depending on the health literacy of members.”

Comment 8: One of your additions to the model is stage of epidemic. This is very interesting, and I suggest more discussion of this addition to the model in the text. Often you sneak this in at the end of the paragraph, but it should have its own paragraph (e.g. end of case study #1).

Response 8: Due to space limitations we don’t include a full paragraph on epidemic stage at the end of each case study. However we further detail what we mean by epidemic stage in the discussion:

“Ultimately it is the stage of the epidemic within the social and sexual network, community, and country that will determine the risk of disease acquisition for the individual (Beyrer, 2007; Wellings et al., 2006). No behavior, policy or law, community determinant, network attribute, or individual characteristic can create infectious disease; rather these can only create conditions which either increase or decrease the probability of acquisition or onward transmission of an already prevalent disease. The stage of the epidemic can be quantified in several ways including HIV incidence and HIV prevalence. In the context of populations with high prevalence of HIV, mean and total community viral load has been used as a marker of population-level transmission of HIV. Thus, the risk associated with any individual practice such as unprotected anal intercourse should be interpreted within the context of the stage of the epidemic as the risk of this practice should be considered as high-risk only in the context of a high burden of HIV infection and viral load.”

Comment 9: Relatedly, many of the issues your raise can span levels – this might be useful to highlight as well. For example in Poundstone they use dotted lines to illustrate the porous nature.

Response 9: Thank you for this very helpful point. We now clarify in the discussion: “Factors can span levels and therefore the divisions between levels may be understood as porous.” We discuss the porous nature of these levels in the summary as well.

Comment 10: Paragraph#5 in discussion: I don’t understand the sentence “...MSM have a higher baseline risk secondary to the lack of scientifically...”

Response 10: We reworded this sentence.

Comment 11: The writing is dense in these case studies – you include some wonderful references and quickly explain many of the risk factors, but it is hard to follow. In the network paragraph, many of your examples seem to span the range of “network”: population mobility (individual?), HIV/STI prevalence (epidemic level?), drug costs (community?). A careful consideration of these risk factors, and an in-depth consideration may clarify some of these issues.

Response 11: We reworked each case study in order to clarify the multi-levels.

Comment 12: Case study #2: The issue of spanning bounds and infectious disease process (risk of acquisition/transmission) arises again. Take sexual position: correlates of receptive anal sex may be an individual level risk, but then the partnering is ultimately a dyadic process (requiring of an insertive partner). There may also be cultural norms around who is a top/bottom (community level).
Response 12: Thank you for this important point. We clarify these that these factors that span bounds in Case Study 2:

“The porous nature of these levels should also be considered; while receptive anal sex (individual risk) poses higher HIV infection rates this in fact occurs in a dyadic process (network) influenced by socio-cultural norms (community).”

Comment 13: Summary: Here I see a sentence “...and there is interaction between each level and factors within levels”. Consider expanding this issue. And possibly discuss the unique challenges of conceptualizing a model for infectious disease processes.

Response 13: We discuss the unique challenges of conceptualizing the model for infectious diseases due to the porous nature of the levels.

Comment 14: Overall, I enjoyed reading this paper. It will be very useful for students and researchers/public health practitioners considering prevention interventions.

Response 14: Thank you for the positive comments.

Reviewer: 3

Comment 1. Whilst one understands the need for brevity, there is a notable lack in the review of the extensive literatures in these fields that address the micro, meso and macro dimensions of the HIV epidemic. A more complete literature review would be welcomed.

Response 1: As described in our response to Reviewer 1, we add substantially more literature.

Comment 2. I’m concerned too that the paper does not offer a significant progression of the argument that explanations for risk and exposure require multi-level understanding of contextual factors. This has a long history in the social science of the epidemic, and although this is a neat account of the theoretical framework, it does not develop further our understanding of these factors. The authors need to more clearly state how this paper progresses the field.

Response 2: We now clarify that this paper is targeted towards epidemiology to inform a move beyond individual focused research, we completely reworked both the discussion as well as the summary to clarify this point.

Comment 3. Finally, one of the recommendations of the paper - that every epidemiological study should characterise social and structural factors - is challenging given that this is not a paradigm within this discipline. Operationalization of this, in the absence of complementary social and behavioural research, is difficult and not explained by the authors. This, and other policy implications of adopting this approach, need to be more clearly stated.

Response 3: We completely rewrote the summary in order to clarify the importance and policy implications of this approach.
We hope that we have addressed all of the concerns, and that the manuscript is now suitable for publication. We would like to thank you for your continued interest in our study. Please do not hesitate to contact me if you have any questions or comments.

Sincerely,

Carmen Logie, MSW, PhD