Conceptualizing the social determination of health:

Insights from collaborative research in Latin America

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There is increasing recognition that collaborative scholarship that bridges the "North- South" divide opens exciting opportunities for innovatively creating new knowledge through mutually enriching partnerships that approach global dynamics from different perspectives. In an increasingly globalized world marked by growing power asymmetries, however, the tendency to uncritically apply conceptual and epistemological framings dominant in "Northern" settings has undervalued understandings that have emerged in Southern circumstances precisely in response to processes that have driven disparities. This working paper explores the collaboration between a group of Northern researchers at University of British Columbia (UBC) and Southern counterparts based at the Universidad Andina Simon Bolivar (UASB) in Ecuador, to define the conceptual enrichment to the collaborative research that occurred from adopting the Southern perspective. The article argues that "talking from the South**"** not only implies focus on *problems* experienced in this locale, but also calls for building on the strengths of the *theoretical-methodological reasoning* that has emerged in the "South".

To examine this question, we consider how the "critical epidemiology" approach that has been developed in Latin America to more explicitly address health equity concerns (Breilh, 2003) allows us to go beyond the essentially narrow framings of conventional lines of research

enquiry developed in the context of Western epidemiological traditions to address population health challenges. In pursuing this, we also challenge the World Health Organization's conceptualization of "social determinants of health" that is now receiving growing attention as a way to move beyond excessively bio-medical explanations of health. Instead we call for an approach that more systematically examines the critical *processes* that drive and reproduce health inequities – in other words, the "social determination of health". At the same time, however, we recognize the insights that empirical "causalist" analyses can stimulate, and accordingly consider the challenge and opportunity for adapting such methods within a more critical and comprehensive agenda.

To do this, we first explore the theoretical and conceptual underpinnings that drive analysis of health equity and their respective evolutions in Western and Latin American traditions. From there, we introduce how we have developed a long-standing (now decade long) international collaborative research program that now addresses five quite distinct population health problems and settings: i-health of healthcare workers; ii- food and health equity; iii- antibiotic resistance; iv- vector borne disease (dengue); and v. social circus with street youth to promote health equity. We then examine how this apparent diversity actually provides a rich basis for examining the critical processes of social determination of health that fundamentally lie at the root of this North-South collaboration, and how this in turn can stimulate innovative further enquiry. We conclude by reflecting on the broad epistemological challenges and opportunities that are presented in pursuing North-South collaborations.

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The Historical Paradigm Clash in Epidemiology

"Science as any other symbolic operation is ....a transformed, subordinated, transfigured and sometimes unrecognizable expression of the social and power relations of a society."

- *Bourdieu, 1989*

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As complexities of modern society evolved, the science of epidemiology was born as a method for systematically understanding threats to the health of populations as well as the approaches that held promise for addressing these factors. In its early stages in the 19th century, periodic outbreaks of illness accompanying the intensity of social transformations (e.g. industrialization, urbanization, colonial expansion) prompted its earliest framings, in the context of a public health movement addressing issues of social justice (Krieger & Birn, 1998). Ironically, the ability to more precisely identify risk prompted by the microbiological breakthrough of "germ theory" led to a move away from the intuitive but "unscientific" underpinnings of "miasma" theory that while lacking empirical precision had targeted general poor socio-environmental conditions as the subject for sanitation reforms that had yielded powerful results in improved health (Stuckler et al., 2010). This new science afforded a precision at a time of rapid processes of "modernization" in line with the expansion of industrial capitalism and colonial/imperial expansion. However, with the development of new quantitative tools and methods came a narrowing of vision, such that a chronicler of the evolution of epidemiology from its earliest days observed that "most modern epidemiologists still do studies in populations, but they do so in order to study decontextualized individual risk factors, rather than to study population factors in their social and historical context" (Pearce, 1996).

While such study has prompted the development of increasingly sophisticated and powerful statistical and design techniques for measuring associations of exposure and disease, such "success" served to marginalize interdisciplinary - let alone transdisciplinary and intercultural - approaches to understanding the causation of disease in populations. Recognizing the challenges that had tended to be ignored by mainstream "risk factor" epidemiology, new orientations to social epidemiology and population health began to emerge in the latter half of the twentieth century, cognizant of the intensifications of complexity-rooted effects and disparities that were being generated by ever intensified social changes.

Nevertheless such emergent "dissenting" tendencies were generally marginalized in Western centres, and very much in the shadow of the more hegemonic approaches that tended to dictate the basic theoretical and epistemological framings. However, alternative framings for more explicitly putting health equity at the core of the scientific endeavour were emerging in precisely the settings where marginalization and disparity were more intense. Specifically, in Latin America over the course of the Twentieth Century, the visible signs of extreme social and political authoritarianism and inequity, as well as the growing unfairness of the world economy, inspired a culture of social critique and a corresponding academic reform movement related to health research began to be entrenched in major public universities on Latin America. It was no coincidence that this tendency paralleled the innovative orientation to learning prompted by Paolo Freire's *Pedagogy of the Oppressed* in response to formalistic approaches to learning and in search of social justice in settings where the contradictions were most intense (Giroux, 1992). Such circumstances nurtured a profound social awareness among health scientists whose academic or public health roles placed them in direct contact with the devastating effects of

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hunger and poverty. This is the controversial trajectory under which epidemiology developed since the late 1970s, transforming from a basic *knowledge formation* built around certain processes to a *discipline* constructed around partially defined objects to becoming, finally, a *science* structured around clearly defined objects of study (Barata, 1995).

As various North American scholars noted, however, "two of the most significant developments in health scholarship and practice of our era - the social medicine and critical epidemiology movements in Latin America" (Briggs, 2005), remained largely unknown in the North, in spite of the pioneering "theoretical, methodological, and empirical advances" (Waitzkin, 2001) produced by their practitioners. In fact, there has been very limited direct interchange with the more counter-hegemonic expressions of Western epidemiology (Krieger, 2003). As such, the timing remains overripe for pursuing active collaborations, such as the collaboration in which we are engaged, as discussed below.

In Latin American academic environments, reflection about a new critical health theory has linked three crucial elements that are inherently interrelated: health as an *object*; health as a *methodological concept,* and health as a *field of action* (Almeida, 2001). As Breilh (2006) has elaborated, Latin American researchers have insisted that in order to develop a critical epidemiological paradigm it is necessary to intertwine three complementary transformations: first, the rethinking of health as a complex, multidimensional object, submitted to a dialectical process of determination; second, innovation of methodological categories and operations; and, third, a transformation of the practical projections and relations of mobilized social forces. These characteristics are shown in the third column of Table 1, in contrast to the traditional biomedical model and social determination of health model.

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Table 1 - Comparison of three main conceptual models according to understanding of health (as an "object"), methodological characteristics (shaded area), and research practice

ELEMENTS	TRADTIONAL LINEAR MODEL (BIOMEDICAL)	SOCIAL DETERMINANTS MODEL	CRITICAL SOCIAL DETERMINATION MODEL
Understanding of Health (as an "Object"), Including the Social Order, Character, Temporality and Social Space that Determines Health	Individual free prevails; linear causality, with health determined mainly by an individual's connections with factors in his or her immediate ahistorical environment.	Expanded notion of causality ("social reasons behind risk factors"); attention to history of policies and governance; social, political and cultural determinants; governance, with its institutions, policies and values	Dialectics of consumption and power relations; social and environmental relations in historical context, attributable to forms of consumption; acknowledges complexity and social multidimensionality (e.g. power of class, gender and ethnicity); and situates individuals/families within a dialectical between what is healthy and unhealthy
Cultural and Disciplinary Perspective	Uniculturality and unidisciplinarity or pragmatic interdisciplinarity	Uniculturality and pragmatic interdisciplinarity	Critical interculturality and transdisciplinarity
Criteria of Truth	Valid and reliable quantitative measurement	Positive multi-causal inferences	Transformation of civilization and socio-environmental relations
Position on Ethics of Practice	Reliability and validity of methods, safety procedures to protect individual participants	Reliability and validity of methods, safety procedures to protect individual, with optimization of governance	Ethical focus on the 4 "s" of healthy living (sustainability, sovereignty, solidarity and health/biosecurity [salud]); as well as ethics of cultural rights and the rights of nature
Theoretical Framework	Empirical positivism; or cultural relativism	Functional Neocausalism	Critical realism
Strategic Objective of The Research	Identify risk factors	Identify causal factors	Community-university partnerships that can work towards the 4 S's), by confronting the notion of capital accumulation as the guiding principle of social organization.
Social Relations in the Research	Academic separated from 'others' and from nature	Technocratic perspective within consensual institutional goals	Partnerships based on mutual respect and common goals
Participation in Knowledge Generation	Active academic researchers and passive community knowledge users	Institutionalization of mechanisms of accountability, budgeting and decision-making	Knowledge creation as a space for participation in a strategic historic movement to confront class, gender and ethno-cultural issues

Translated and adapted from a more complex model in: Breilh J. *Estudio comparativo de los principales paradigmas sobre la determinación social de la salud y operacionalización de un modelo alternativo para investigación de modos de vivir saludables*.Quito: Report of Project TDSS-FUASB, 2014

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Figure 1 also provides a very brief synthesis of some of the fundamental methodological and health advocacy problems Latin American scholars have addressed.

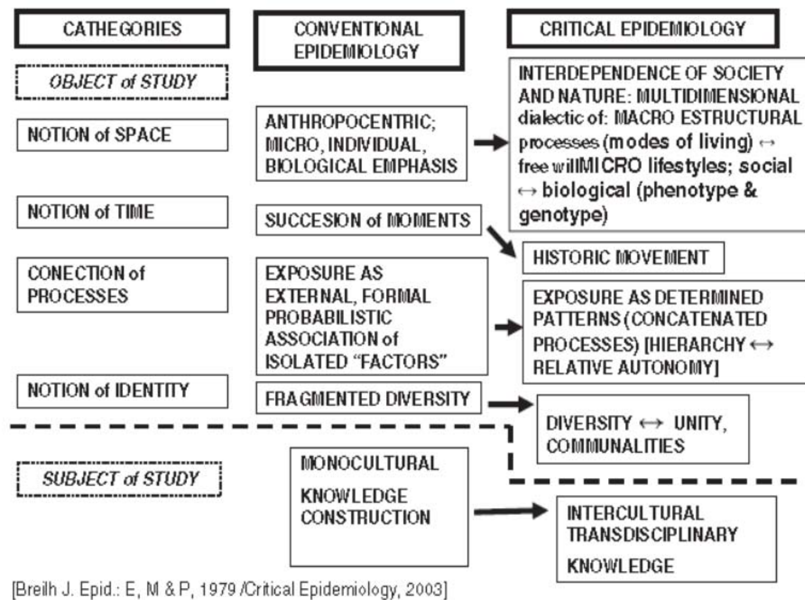

Figure 1 Latin American critical epidemiology: brief systematization of methodological contributions (70s to present)

The approaches summarized here have been developed in coherent expositions on "critical epidemiology" that have been circulated widely in Spanish and Portuguese editions (Breilh 2003, 2006), but not as yet in the English language. In summary, while functional (conservative) conceptions and applications of epidemiology have operated historically as an instrument of hegemony and conservative governance, alternative progressive paradigms are becoming an instrument of emancipatory understanding of science.

In a sweeping review of research conducted on health inequalities in Latin America and the Caribbean, Almeida-Filho and colleagues (2003) documented how such research has been more pronounced in this region, while observing that a preponderance of the work undertaken has been devoted to conceptual factors and macro-contextual analysis. In this regard, less attention has been devoted by critical epidemiologists to empirical studies at the level of health

challenges in specific populations or settings than has been the case in the emerging research in health disparities now developing in North American and European settings (James, 2009). As discussed below, with the offering by the Canadian Institutes for Health Research of programmatic grants to address health equity, two research programs were begun by UBC researchers to explicitly collaborate and learn from the new paradigms being developed by Southern partners. Health equity has been defined "the absence of systematic disparities in health or in the major social determinants of health, between social groups who have different levels of underlying social advantage/disadvantage—that is, different positions in a social hierarchy" (Braveman and Gruskin, 2003). The challenge undertaken by the UBC-UASB team is that of merging the theoretical richness of the social determination scholarship with practical approaches acquired in conducted health equity research.

Our Research Program: Promoting health equity in diverse settings

Our North-South collaboration began in the context of a 6-year capacity-building project (2004 to 2011) in an academic partnership linking a small group of UBC researchers with a consortium of Ecuadorian universities to strengthen institutional capacities for applying a transdisciplinary ecosystem approach to health that integrates a focus on social determination of health (Spiegel et al 2011). From this work together we were able to build a common vision and foundation for initiating a program of research, with the goal of pursuing a critical epidemiology approach (i.e. the *theoretical-methodological reasoning* emergent in the "South" described in the introduction) that could be strengthened by insights derived from Western epidemiological approaches while retaining focus on the goal of contributing to capacities for strengthening health equity. The selected research areas were, first and foremost, chosen to correspond to *problems* endemic to

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the Ecuadorian context and integrally connected to Ecuador's accelerated integration into neo-liberal domination (Breilh & Tilleria, 2009) that were identified in partnership with affected populations. Secondly, the projects that were developed built on the Canadian researchers' particular areas of empirical expertise. The Canadian-Ecuadorean collaborative projects that emerged are described below:

1. Health of healthcare workers

Under severe pressures to control public sector spending as a result of terms dictated by international financial institutions, Ecuador's funding for the health sector plunged to be the lowest in the Americas at the beginning of the new millennium. Associated with this was deterioration in the conditions of human health resources, a neglected health system component that received growing attention with its selection as the theme of the 2006 World Health Report. In response to such neglect in Canada, co-author AY had championed a research program focusing on the health of health workers which explicitly brought together infection control with occupational health following the outbreak of SARS in 2002 (earning recognition as a CMAJ-CIHR 2011 research of the year award for the team of Yassi and Bryce – Dr. Elizabeth Bryce being the infection control expert and Dr. Yassi the occupational health researcher). The Bryce-Yassi team had previously worked with colleagues in Ecuador to develop guidance documents and launched capacity building and various workplace initiatives (Lavoie et al. 2010).

A specific area of health concern for health workers globally, and especially in low and middle-income countries with a relatively high prevalence and incidence rate of tuberculosis (TB) in the general population, is the emergence of multiple and extremely drug resistant TB

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(MDR-TB and XDR-TB). Co-author Yassi had led the development of new international guidelines for health workers that have been adopted by the World Health Organization, International Labour Organization and UNAIDS (WHO-ILO, 2010 (fix)), and is leading a CIHR-funded research program (*Promoting Health Equity by Addressing the Needs of Health Workers: A Collaborative, International Research Program*) where all co-authors, along with a myriad of other researchers from the North and South, are involved to improve working conditions for health workers, including the implementation of these guidelines. As the Ecuadorian government has sought to strengthen the public health system in response to years of neglect, the opportunity for improving working conditions emerged as an area to be addressed.

Meanwhile, as President of the Ecuadorian Academy of Medicine, co-author JB was called upon to examine the circumstances of work intensification to which Ecuadorian health professionals are being subjected, introducing a line of enquiry into not just the environmental exposures being experienced, but to the patterns of work organization themselves. In the context of this background, specific projects being undertaken in our research program include a project to strengthen occupational health and infection control and another to identify the causes of stress in medical practitioners.

2. Food and health equity

Ecuador is country where food production is of critical importance in relation to i) a large agro-industrial export sector associated with ecological impacts; ii) a large number of small producers, particularly in indigenous populations, whose way of life has been under threat by changing food distribution patterns; and iii) pressures on healthy eating associated with poverty, transition to

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processed foods, and introduction of contaminants into the food supply. As a result, this area was identified a priority domain for our team's attention, and we linked this focus with food system and health concerns being experienced in Canada to provide an opportunity to explore interconnections in a global food system. To better understand ways to promote health equity in response to dominant processes associated with producing, distributing and consuming food globally pursue this, we assembled Canadian and Ecuadorian teams of researchers and knowledge users to stimulate thinking about strategies for advancing research on global, national and local scales when faced with complexity, through a five-year research program led by co-author JS (*Food systems and health equity in an era of globalization: Think, Eat and Grow Green Globally [TEG3]*).

We initiated our program by conducting a comprehensive meta-narrative synthesis of published English and Spanish language literature that has confirmed that cross-cultural perspectives can stimulate new insights that may otherwise not be appreciated – and deepen understanding of systemic relationships. While strong proportions of literature in both languages cite "food" and "health" explicitly invoke "security", identification of "sovereignty" is 4-fold greater in Spanish while of growing interest in English. Social class influence on nutritious food access is increasingly noted to be of particular health equity importance; and sustainability concerns related to climate change and contaminants (framed as "bio-security" in Spanish) such as agro-toxins (referred to as pesticides in English), animal antibiotic use or GMOs are noted by knowledge users in both settings as requiring more attention. In the context of this background, the specific projects being undertaken in our research program include, first, a comparative study of productive, human health and environmental efficiency of conventional versus agro-

ecological agriculture.I n this project, we will be conducting comprehensive (ecosystemic) assessment of costs and benefits of agro-industrial versus agro-ecological methods for export-oriented production. Secondly, a project will examine the Child Food Provision Centres program for promoting nutrition of vulnerable populations while promoting agro-ecological production methods through reengineering of public food procurement. We are currently developing a research protocol (under the TEG3 Research Programs) with several Ecuadorian ministries, to take advantage of newly established procurement programs that are creating the opportunity to boost food production and enhance an environmentally sensitive, healthy and socially equitable agricultural model by supporting local agro-ecological farming organizations, capable of supplying food to a network of "infant wellbeing and nutrition centers" (CIVBs - target children under 3 years of age) operated by the Ministry of Economic and Social Inclusion (MIES) in partnership with the National Procurement Institute – INCOP. The initiative being developed enables local foods to be provided by local producers who apply agro-ecological methods, which operates in Coastal tropical and semi tropical areas of the El Oro, Guayas and Azuay Provinces (UROCAL - Regional Union of Agricultural Producers of the Coast); and in the Northern Andean mountainous agricultural areas (CODEMIA - Sustainable Water and Ecosystems Management Consortium). The feasibility of scaling up this approach will explicitly be considered in this research, taking into consideration other factors which could serve as barriers to its expansion in promotion of more hegemonic patterns of food distribution and consumption.

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3. Antibiotic resistance

With the underfunding of health care generally and neoliberalism's related discouragement of a comprehensive primary care, there has been a strong tendency for self-medication by vulnerable populations who are themselves suffering a burden of disease associated with their conditions of poverty (marginalization having contributed to very high poverty rates in Ecuador over the course of the 1990s and early 2000's). This has led to widespread misuse of antibiotics that are contributing to the emergence of antimicrobial resistance, aggravated by health vulnerabilities aggravated by poverty and poor living conditions. Having initiated work on this challenge (Muñoz et al. 2012) in the course of the collaborative training program that we conducted, our team received funding for piloting community-based (*An Ecosystem Approach to Antimicrobial Stewardship: An Ecuadorian- Canadian Collaboration to Design, Implement and Evaluate a Community-based Intervention*) research to address these issues.

We found that an Aboriginal "cosmo-vision" or worldview of what constitutes adequate evidence is not the same as a Western worldview that places highest value on quantitative evidence. From our Western perspective we tend to believe that the "gold standard" for measuring success in the area of antibiotic resistance is either reduced morbidity and mortality related to drug-resistant bacterial infections, or detection of less resistance and fewer resistant strains in routine microbiological testing, or reduced use of 2nd and 3rd line antibiotics. But what these "golden" measures still fail to capture are the noxious structural processes that result from the hierarchical dynamics between the corporate elite and the people. There is an implied definition of what constitutes success, which is a narrow one limited to immediate outcomes or effects, essentially the symptoms, of a much larger scale problem. Instead concepts such as

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wellness, good living or Sumak Kawsay (in Kitchua), that come from the wisdom of an Aboriginal world view, carry strikingly different implied definitions of success. Success is instead measured in terms of healthy and sustainable relationships between living organisms, with a focus on process, mutual respect, and reverence for the autonomy of others – factors that address the root of the structural problem, locally, nationally and internationally.

On a foundation of this Aboriginal definition of success our design of an intervention with potential for improved health equity is looking significantly different from the typical randomized controlled trial. In fact, the carrying out of a study that is based purely on a Western definition of success would constitute ongoing contempt for Aboriginal sovereignty. It would also fail to follow basic principles of public health, namely the need to look at the problem from a broad population level, addressing the questions of “why does this population have a different rate of this disease that other populations,” and not simply “why does this patient have this disease at this time” (i.e. the clinical approach). Population level prevention of disease can occur only when we address the driving forces behind the symptom being observed – in other words, adopting a social determination perspective.

We worked with indigenous communities to assist them to address their concerns about water quality. Several knowledge-attitude and practice studies in specific populations in Ecuador were completed and, working closely with indigenous colleagues, we developed an intercultural community booklet on appropriate antibiotic use, field tested with two separate groups of Community Health Workers and revised accordingly. We collected data on antibiotic use from 2008-2011, developed some possible intervention ideas at the level of the pharmacy dispensary,

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physician practices, community health promoters, and government programs, strengthened relationship with experts on antibiotic use in animals, and collaborated with another organization in Ecuador, ReAct, in evaluation of the effectiveness of their arts-based methods to improving antibiotic stewardship. As the monitoring system for antibiotic use in Ecuador could use considerable strengthening, one of the leaders of this field in Ecuador has come to UBC to begin a doctoral program to strengthen his ability to lead the development and implementation of such a system.

4. Vector borne disease (dengue)

Amid conditions of poverty and poor infrastructure, dengue fever has grown to be a major health concern across Latin America and the Caribbean as part of a global pandemic that is being aggravated by climate change influences making previously unaffected areas vulnerable. In Ecuador, effects have been especially felt in coastal areas marked by pronounced urban and peri-urban expansion. Building again from work initiated under our academic training program, our author team has been conducting research (*Meeting capacity-building and scaling-up challenges to sustainably prevent and control dengue in Machala, Ecuador*) on the application of an eco-bio-social approach to prevent and control the disease as part of a network of similar projects funded by the WHO's Tropical Disease Research Program. While this program especially focuses on community participation and intersectorality to address an issue where no effective vaccine or treatment exists, but despite the recognition that social factors are critical to understanding and addressing the disease, the analysis of social factors that has been generally applied has been relatively shallow.

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In the context of this background, we are focusing attention on deepening the analysis of the processes of social determination that have been lacking in the efforts to apply a more transdisciplinary approach, so that a more focused approach to interventions can be applied. In conducting the Phase 1 Situation Analysis for this project, we created a Social Insertion Index [INSOC] [Breilh 1979, 1990, 2010] and Housing Quality Index [HQI]) by coding responses from a randomized survey of 2000 families in 20 Machala clusters conducted. To consider the value of this methodological approach we are comparing insights gained from using these indices with observation using the impressionistic social class designations of other studies. Initial results indicate that a greater validity of INSOC in providing an evidence-based means for examining the social ecology (stratified as "high", "medium" and "low") was revealed when associations with education (often considered as a proxy for class in the absence of other information) was analyzed. Education was consistently associated ($p<.001$) with INSOC, while that based purely on "perceived" class showed no consistent pattern. Distinct relationships by INSOC social class designations (in contrast to impressionistic categorization) were then also observed with regard to housing quality and the type of water containers at greatest risk for dengue infestation. We will be looking at how such analysis can be extended to be applied to the 2011 Ecuador census data which provides sufficient data to construct INSOC variables. Using this, we will then delineate the kinds of interventions that can benefit from this more sensitive approach to social characterization

Reinforced by a "risk factor" epidemiological approach to considering points of intervention, there has been a bias to target more proximal behaviour modification options that can affect exposure to patterns of risk, rather that look more critically at the processes

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contributing to circumstances of vulnerability. To ensure that medium and long term options that could have great impact are considered, in this study we will examine a wider range of pathways to health equity, together with considerations affected the feasibility of their implementation.

5. Social Circus

Recognizing the alienation and circumstances of oppression that can be systematically reinforced in a polarized class society marked by increased commodification of social experience, we have initiated research into the potential of social circus to engage youth and improve their health and welfare. A 3-year grant from CIHRwas obtained to apply mixed research methods to improve understanding of the micro (individual), mezzo (community) and macro (social system) impacts of the extensive social circus programs now underway in marginalized communities in Ecuador.

There is increasing consensus that new approaches are needed to empower individuals and communities to confront ever-more-daunting global health challenges, and there is growing interest in strategies that engage "the head, hands and heart". Social circus projects have been rapidly expanding over the last 15 years, especially following the establishment of *Cirque du Soleil's* social circus program *"Cirque du Monde"* now offered to marginalized communities in over 80 communities across 25 countries worldwide (Cirque du Soleil). Social circus proponents claim an array of health benefits, noting that engaging in circus arts help people express their creativity while demanding perseverance and discipline that can have beneficial effects on their mental and physical health, and on the health of their communities (Bolton, 2004; Sugarman,

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2003) . However, there is very little scholarly research addressing the complexities of social circus, let alone critically evaluating impact on health - and health equity - in at-risk populations. Moreover, debates related to community health and the arts more generally, including concerns about colonial practices, “appropriation” (Schneider, 2003; Rogers 2006), spectacle and exploitation in vulnerable communities (Gilbert and Tompkins, 1996; Bhaba, 1994), have yet to be thoroughly explored with respect to circus arts.

Social circus can be seen as part of the increasing interest in art-for-social-change, wherein arts-based practices have indeed been transformative, as noted by artists and educators like Brecht (1950), Freire (1982) and Boal (1979). Canada has cutting-edge practitioners in the use of performing arts, such as theatre and dance, to address social determinants and promoting community health. As Fraser and al Sayah concluded, however, rarely do studies identify theoretical underpinnings of the research (2011) and even more rarely do studies take a critical perspective to confront issues of power.

The question of exactly *how* arts can contribute to health promotion (Cox et al., 2010), and, indeed, to global health equity (Boydell et al., 2012) has increasingly been posed, however, not yet explicitly with respect to circus. Ecuador, a country with a rich tradition of art-for-social change, began working with *Cirque du Soleil* only in 2011, to implement a government-sponsored social circus program, to promote healthy social policy. Ecuador’s Vice President, with a particular interest in humour and the arts, made this one of his flagship programs run as a national public program, reaching many thousands of participants. The program focuses on street youth, but also includes programs for children from marginalized populations To begin to fill

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this important gap, we are integrating the arts and humanities, with social and health sciences to explore the influence of social class, sex, gender, age, disability, ethnicity and setting. In studying if roles are stereotyped and participation mitigated by sex and gender, for example, we will examine how physical contact in such activities as partner acrobatics alter gender relations within the community and what this may mean for mental and physical health; we will explore how individuals with mental and physical disabilities are integrated. Moreover, we will consider the power differentials in these social circus programs, and we will be developing a much-needed theoretical approach to understanding *how* circus arts can contribute to health equity, and indeed be transformative.

Critical Processes of Social Determination of Health

A common theme in the various research initiatives that are presented above is the persistence of hegemonic neoliberal socio-political pressures that have driven disparity in Ecuador by promoting patterns of accumulation that disadvantage marginalized populations and undermine their resilience - but have at the same time stimulated the development of counter-hegemonic responses:

i) measures to improve health workers' health in response to deteriorating conditions prompted by marginalization of investment in health care;
ii) measures to counter the development of anti-microbial resistance in response to inappropriate use of antibiotics driven by short-term profit-seeking behaviours;
iii) more effective and sustainable responses to threat of vector-borne disease amid conditions of poverty in socially marginalized communities;

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iv) improved nutrition and agro-ecological production in response to trends to commodification driven by a neo-liberal food system narrowing options;

v) social circus projects to build self-esteem, skills and social networks amongst street youth and other marginalized groups.

These themes lend themselves to applying the critical epidemiology perspective Latin American contributors have developed, as was described above. Applying this orientation to recognize the circumstances that systematically dictate exposures to sets of determinants, Breilh (1979) invoked a “modes of life” perspective as a structured and dynamic dimension of the ‘epidemiological profile' which articulates class, ethnic and gender power relations, which condition living structured patterns within specific collectivities. Furthering the themes developed in the Latin American “collective health” school that stress the importance of collective determination over free will and individual life styles, Breilh's work assumed inequity power relations as a nodal category in epidemiology. In line with such orientations, scholarship such as that o*f* Cesar Victora (1992, 1997) has demonstrated the feasibility and power of linking socially determined inequity to the understanding of its empirical evidence (inequality), with the powerful tool of refined mathematical analysis.

Table 2 provides an overview of how this approach demarcates from the essentially narrower scope provided by alternative framings of health, such as conventional bio-medical approaches that emphasize consideration of proximal factors such as direct exposures and responses or social determinants models that tend to isolate risk factors associated with identified determinants. Rather, the social determination approach highlights the consideration and analysis of systemic factors that drive, promote and reinforce disparities, while at the same

time directly considering the resistant (liberatory) forces capable of countering negative (i.e. destructive) health impacts.

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Table 2 - Comparison of the three basic paradigms with respect to how they might be applied to our research areas

Health Framing / Research Area	Conventional bio-medical approach	Social determinants approach	Social determination approach
2. Health of HealthCare Workers *- intervention study to strengthen infection control and occupational health in hospitals* *- study of stress in physicians*	Analysis of data on incidence of injuries and disease or prevalence of associated exposures; and identification of remedial measures to curtail exposures or overt stressors	Assess causes, including organizational and administrative factors, that influence greater or lesser health effects; e.g. capacity-building needs related to infection control or system accreditation; consider workloads and working conditions underlying stress; and building capacity as needed to address needs.	Critical assessment of empowerment as it relates to the hierarchical relations with the healthcare sector, including policies that predispose patterns of effects as well as global economic driving forces underlying understaffing and underfunding of public hospitals; and building awareness as well as skills to mobilize grassroots response to these socio-political factors.
2. Food and Health Equity *- comparative study of productive, human health and environmental efficiency of conventional versus agro-ecological agriculture* *- CIBVs food for promoting nutrition of vulnerable populations while promoting agro-ecological production methods*	Studies of associations linking nutrition and contaminants with health, and patterns that reinforce this; links to health promotion to reinforce healthy behaviours	Analysis of factors that produce disparities in health according to social gradients; consideration of factors that can influence these causes; particular attention to food security as a circumstance of minimal conditions to be met socially to ensure adequate health.	Consideration and analysis of systemic factors that drive, promote and reinforce disparities, e.g. considering the dynamic influence of food sovereignty in response to hegemonic commodification of food forces to go beyond attention to food security as a state to be achieved. Investigation into transformations of food itself associated with drivers for transforming production and consumption patterns.
3. Antibiotic Stewardship *- Reducing anti-microbial resistance*	Develop new drugs to keep pace with drugs becoming resistant to existing antibiotics	Design, implement and evaluate education campaign to promote hand hygiene and decrease misuse of antibiotics	Raise awareness about the social disparities related to the infectious diseases and their transmission; respect indigenous beliefs and values in combatting the symptoms of minor infections
4.Vector-Borne Disease (dengue) *- the importance of social referencing (INSOC) for policy development* *- the consideration of intervention points with greater health impact*	Identify patterns of disease and factors associated with presence of the vector (*aedes aegypti*)	Identify social and infrastructural factors associated with presence of vectors and disease, with emphasis on transforming behaviours and activities associated with higher prevalence and incidence.	Consideration and analysis of systemic factors that drive, promote and reinforce disparities, e.g. examining patterns of social class associated with vulnerability to higher incidence and patterns of development that exacerbate or reduce this; together with empowerment of those who are negatively affected so that sustainable improvement can be achieved.
5. Impact of Social Circus	Measures of physical fitness and circus skills developed	Measures of self-esteem and self-rated mental and physical health	Analysis of social inclusion and social democracy generated by program

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Building on a sound institutional and academic platform that bridges Northern and Southern traditions, we seek to emphasize a democratic projection of science in support of an alternative public health movement (Breilh 2006) and conform to ethical principles that directly consider the application of knowledge for the benefit of those involved in its production (Yassi et al, 2013). In doing so, many have learned that the knowledge of the people, their ancestral and present wisdom, is much more than a resource of sophisticated ethno-medical, and therapeutic knowledge. New, hard epidemiology has also much to learn from them, about integral notions of space, sustainable relations between nature and mankind, a healthy conception of time, a harmonious management of the planets energies and about a fair, equitable and protective construction of social relations. Therefore, it is not surprising, to observe the proximity in meanings of the indigenous kichwa word 'sumak kawsay' (good living) which has been established a central concept within the new Ecuadorian constitution adopted through popular processes in 2008 with our academic conceptions of 'healthy mode of life'.

Conclusion

In providing a perspective on the development of Latin American critical ('Social') epidemiology in the *International Journal of Epidemiology* Breilh (2008) called for "an opportunity to form fraternal partnerships on the intercultural road to a better world, where only an epidemiology of dignity and happiness will make sense", in response to " the menacing forces producing our unhealthy societies".

The failure to have adequately embraced insights emerging from all corners of the globe speaks to particular benefits that this can bring to world knowledge, particularly of constructs such as

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health equity that have stimulated creative thinking in line with the dialectics of resistance and response emergent in precisely in those areas that have been inadequately represented in English-language literature which currently occupies the position of "lingua franca" internationally. Prominent Brazilian epidemiologist Cesar Victora even conjectured that strategies to break the under-representation of such contributions from the "South" are themselves needed.

In this working paper, we suggest that there is much to gain from pursuing collaborations that concurrently promote the strengths of design and methodology that have been spawned by conventional Western epidemiology with the epistemological and theoretical insights that have been developed from the Latin American collective health experience.

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