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Bananas, pesticides and health in southwestern Ecuador: A scalar narrative approach to targeting public health responses

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ABSTRACT

Public health responses to agricultural pesticide exposure are often informed by ethnographic or other qualitative studies of pesticide risk perception. In addition to highlighting the importance of structural determinants of exposure, such studies can identify the specific scales at which pesticide-exposed individuals locate responsibility for their health issues, with implications for study and intervention design. In this study, an ethnographic approach was employed to map scalar features within explanatory narratives of pesticides and health in Ecuador's banana-producing El Oro province. Unstructured observation, 14 key informant interviews and 15 in-depth semi-structured interviews were carried out during 8 months of fieldwork in 2011–2013. Analysis of interview data was informed by human geographic literature on the social construction of scale. *Individual*-focused narratives of some participants highlighted characteristics such as carelessness and ignorance, leading to suggestions for educational interventions. More structural explanations invoked *farm*-scale processes, such as uncontrolled aerial fumigations on plantations owned by elites. Organization into *cooperatives* helped to protect small-scale farmers from 'deadly' banana markets, which in turn were linked to the Ecuadorian *nation-state* and actors in the *banana-consuming world*. These scalar elements interacted in complex ways that appear linked to social class, as more well-off individuals frequently attributed the health problems of other (poorer) people to individual behaviours, while providing more structural explanations of their own difficulties. Such individualizing narratives may help to stabilize inequitable social structures. Research implications of this study include the possibility of using scale-focused qualitative research to generate theory and candidate levels for multi-level models. Equity implications include a need for public health researchers planning interventions to engage with scale-linked inequities, such as disparities within nation-states. Finally, the prominence of the global North in explanatory narratives is a useful reminder that 'structural factors' prominently include inequities related to the legacies of colonialism.

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1. Pesticides, structural factors and qualitative health research

Responses to agricultural pesticide exposure, in the global South and elsewhere, are generally divided between individual behaviour-focused and 'structural' approaches. As an example of the former, a risk perception study funded by the pesticide giant Syngenta stated that '[t]he problem is whether it will be possible to change farmers' attitudes to improve the way they use pesticides' (Matthews, 2008, p. 845). Educational interventions, however, have been strongly criticized for their limited effectiveness when compared to upstream interventions in the workplace, or national or international pesticide-control policies (Konradsen et al., 2003; Murray and Taylor, 2000). Dangerous practices have been repeatedly observed among farmers and workers with ostensibly good knowledge of pesticides and their health effects (Galt, 2013), and increasing numbers of studies support structural intervention strategies. This recognition reflects public health's broader engagement with structural factors, defined by Shannon et al. (2014) as 'factors that are external to the individual and operate outside the locus of control of individuals' (p. 175). Multi-level modelling and neighbourhood effects research respond directly to the challenge of understanding structural factors (O'Campo, 2003). For example, Cole et al. (2011) modelled individual/household and community determinants of pesticide-related health outcomes in the Ecuadorian Andes and found a significant effect of community-level poverty. In this and numerous other studies,

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explicit attention to structural determinants often involves political and economic explanations for health problems. Increasingly sophisticated scholarship goes well beyond simplistic 'proximal/distal' distinctions in showing health to be affected by forces and actors from the genetic to the global (Krieger, 2008).

Structural approaches appear to have informed a growing number of qualitative pesticide risk perception studies, often carried out to inform larger research and intervention projects cognizant of political and economic causes of pesticide risks. By employing ethnographic and other in-depth methods to the question of how pesticide-exposed people understand the risks to their health, these risk perception studies have also shown that political and economic factors affect pesticide risk *perception* (e.g. Aragón et al., 2001; Barraza et al., 2011; Hunt et al., 1999; Mera-Orces, 2001; Orozco et al., 2009; Ríos-González et al., 2013; Salazar et al., 2004). Such studies show the embeddedness of pesticide risk perception in social realities such as relationships with nature, gender roles and poverty. Links between structure and risk perception are especially evident in a study on highland Ecuadorian potato production, where pesticide exposure was attributed by employers to worker carelessness, and suicide using pesticides to insanity (Mera-Orces, 2001). Workers, in contrast, characterized pesticide exposure as an occupational hazard, and suicide as an act of desperation. Research in southern Mexico similarly found attribution of responsibility for pesticide exposure to depend on position in the labour process, with landless workers, small farmers and owners of large farms tending to attribute blame differently (Rios-Gonzalez et al., 2013).

Such ethnographic studies can generate hypotheses to help target quantitative studies, flesh out their results, and facilitate more effective community-based interventions (Behague, 2008; Janes et al., 1986). They can also provide a valuable corrective to top-down or paternalistic public health strategies (Trostle, 2005), helping to illustrate the cultural and political and economic logic behind allegedly 'unscientific' health beliefs (e.g. Briggs, 2004). Yet in applying qualitative methods to the challenge of pesticide exposure, with its acknowledged multi-scalar roots, research to date has largely missed the opportunity to document the bottom-up scalar reasoning of individuals experiencing the exposures in question. Barraza et al.'s (2011) ethnographic study in a Costa Rican banana region, for example, is among the most structure-conscious of such qualitative pesticide risk perception approaches, recommending public, non-profit and private-sector collaboration to go 'far beyond' educational-behavioural pesticide safety intervention approaches' (Barraza et al., 2011, p. 716). The paper further highlights 'community, regional and national' levels and 'multi-national' actors in discussing the etiology of, and appropriate solutions to, pesticide exposures (p. 716). This scalar discussion appears to represent the authors' political and economic assessment, however, rather than that of study participants. Other studies similarly refer in passing to 'international macroeconomic policies' (Aragón et al., 2001, p. 300) and 'macroeconomic forces' (Mera-Orces, 2001, p. 38) in explaining pesticide exposures, but do not root such macro-scale references in the words of study participants.

Qualitative pesticide risk perception studies thus frequently draw on scalar terminology in explaining structural health determinants, but have not yet examined how structural factors are divided up in scalar terms by the people experiencing the health impacts in question. In this paper, I map the scales at which pesticide-exposed residents of Ecuador's banana-producing El Oro province locate causes of, and appropriate responses to, pesticide exposures and other health problems. I draw on 'social construction of scale' approaches in human geography (Marston et al., 2005), showing how they can complement perceptive structural, political economic or multi-level responses to health issues using scale-focused input from those experiencing those issues most directly.

2. Theories of scale and health

Health research on structural influences – pesticide-focused or otherwise – has, to this point, emphasized the scales at which health determinants are *actually* located. It has had less to say on what different actors stand to gain or lose by *portraying* – 'socially constructing' – different scales as more or less important in the causation of health problems. Though 'illness narratives' work in anthropology (Farmer and Good, 1991) has documented social struggles in which individual-focused explanations of health problems are countered by more structural narratives, specific scalar features of structure-focused accounts in this body of work have been left largely unexamined (although see Briggs, 2004 on multi-scalar resistance to individualizing cholera-blame narratives in Venezuela). However, as human geographers have demonstrated, 'scale politics' – struggles to define how the world is, or should be, divided up in scalar terms – have major ramifications in terms of equity and power relationships (Smith, 1992; Herod, 2010). Swyngedouw (1997, p. 139) explains that 'Scalar narratives … provide the metaphors for the construction of "explanatory" discourses … scale-related explanations define and suggest different ideological and political positions'. Harris (2011), for example, found that individual responsibility for environmental protection was often privileged in narratives recounted by Turkish citizens and environmental activists, resonating with the individual-focused political climate accompanying Turkey's entry into the European Union. Masuda et al. (2012), similarly, found chronic disease prevention strategies in three Canadian provinces to deploy individual or 'collectivist' accounts of responsibility for improving health, roughly corresponding to provincial ideological climates.

Several studies have also examined the scale politics involved in contesting scientific credibility and public health priorities. Edge and Eyles (2014) documented how an alleged lack of laboratory-scale evidence allows scientists and regulators to dismiss the possibility of ecosystem-scale effects of the endocrine disruptor bisphenol-A. The laboratory scale also features prominently in the 'rescaling' of global concerns such as deforestation and urbanization into a perceived need for laboratory research by U.S. emerging disease researchers in the 1990s (King, 2004). Anderson (2014) description of such 'scale making in biomedicine' (p. 372), in addition, problematizes global health's tendency to gloss over messy political legacies of colonialism. Such a glossing over allows the portrayal of scientific knowledge on HIV/AIDS as 'global' and therefore authoritative to justify global health interventions in the lives of 'local' people around the world (Campbell et al., 2012). The relevance of such scalar considerations for pesticide exposure reduction is further highlighted by Harrison's (2006) analysis of pesticide drift activism in California, in which the scale where responsibility for pesticide exposure was located determined where public sector responses were targeted (individual decisions of farmers, for example, as opposed to the state's regulatory apparatus). As such analyses illustrate, scalar arguments – featuring individuals, laboratories, ecosystems, states, 'the local' or 'the global' – help to determine which responses are considered appropriate for specific health problems.

3. Methods

3.1. Setting

I employed an ethnographic approach to document scalar features in narratives of health and illness voiced by pesticide-exposed

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