

Parizeau, K. (2015). "Urban political ecologies of informal recyclers' health in Buenos Aires, Argentina." *Health & Place*, 33, pp. 67-74.
<https://doi.org/10.1016/j.healthplace.2015.02.007>

Urban political ecologies of informal recyclers' health in Buenos Aires, Argentina

Abstract

Buenos Aires' informal recyclers (*cartoneros*) confront multiple health hazards in their work. Based in a survey with (n = 397) informal recyclers, this study establishes that these workers experience uneven health landscapes as evidenced through their health outcomes, the social determinants of their health, and their living and working environments. I argue that the analytical framework of urban political ecology can provide insights to the ways that the urban environments where *cartoneros* live and work are socially-constructed phenomena, drawing on concepts of crisis, metabolism, and multi-scalar analyses.

Highlights

- *Cartoneros* were surveyed about their health and living / working environments.
- *Cartoneros* did not rate their health as highly as other Argentines.
- Their living and work environments were less healthy than others in Buenos Aires.
- Urban political ecology analysis reveals these environments as social phenomena.

Keywords

urban political ecology; Buenos Aires, Argentina; informal recycling; health

Introduction

Informal work tends to be precarious in numerous ways. Along with uncertain incomes and changing political climates, working conditions in the informal sector can be dangerous and unregulated. Informal recyclers (*cartoneros*) in Buenos Aires work under such adverse circumstances: they handle household, commercial, and industrial wastes on a regular basis. Because recyclable materials and reusable objects are not routinely source-separated from the waste stream, their recovery often requires that *cartoneros* open bags of mixed refuse and sort through the contents. In Buenos Aires, these workers sort through curbside trash 5 or 6 nights a week to find materials that can be sold or reused. This practice increased greatly after the Argentine economic crisis of 2001-2, and is now an important source of income for many low-income urbanites; the Buenos Aires municipal government estimated that approximately 5,000 people worked as *cartoneros* in 2008 (Gutman, 2008). Close contact with waste, heavy lifting, exposure to weather, and proximity to traffic are routine elements of informal recycling work in Buenos Aires, all of which can have negative health effects. In this paper, I employ an urban political ecology (UPE) analysis to better understand the dynamics of *cartoneros*' health in Buenos Aires in the late 2000s.

It is well established that informal recycling is associated with negative health outcomes, and studies from around the world reveal numerous health problems among these workers (Anzola et al 1998; Auer 1990; Castillo Berthier 1990; DaSilva et al 2005; Gunn and Ostos 1992; Hunt 2001; Gutberlet and Baeder 2008; Kungskulniti 1990; Ray et al 2004; Van Eerd 1997). Binion and Gutberlet's (2012) comprehensive review article compiles a typology of health risks that have been observed among informal recyclers, including chemical hazards, infection, ergonomic and

musculoskeletal damage, mechanical trauma, impacts on emotional well-being, and potential contamination of living environments by waste materials.

However, it is misleading to attribute the health problems experienced by informal recyclers exclusively to the hazards they encounter in their work. *Cartoneros'* uneven social and physical health environments are not the simply the result of work-based exposures to health hazards, but are the result of societal processes that differentially benefit and disadvantage different groups of people across the urban sphere (including increased economic inequality, the social exclusion of marginalized populations, and government policies that serve to entrench disparities). I argue that an urban political ecology lens reveals how *cartoneros'* living and working environments can be understood as a social determinant of health.

Urban political ecology and health

Urban political ecology (UPE) can provide a framework for conceptualizing the processes and outcomes that lead to the uneven health landscapes that informal recyclers navigate. This field of thought investigates “interwoven knots of social process, material metabolism and spatial form... to expose the processes that bring about highly uneven urban environments” (Swyngedouw and Heynen 2003, p.906). Contributions to this field often draw on the work of David Harvey, Henri Lefebvre, and Neil Smith in describing the urban as a process of social, political, cultural, and economic change that yields shifting and uneven spatial geographies (Keil 2003; Swyngedouw and Heynen 2003). Key aspects of UPE analyses include critical social theory, the concept of urban metabolism, and discussions of cyborgs in the urban environment – that is, subjects or objects that demonstrate a character of hybridity between the sociocultural and natural worlds (Keil 2003; Swyngedouw 2006; Grove 2009).

UPE analyses tend to focus on the sociopolitical constructions of circulations of water, pollutants, and other material flows that are both central to the functioning of cities and are representative of socionatural hybridity. Waste is one such hybrid: it has a dualistic character as both an environmental artefact (a product of once-natural resources that has become a threat to human health, landscape aesthetics, and sustainability) and a social relic (a visceral reminder of the cycles of production and consumption that led to the moment of divestment through disposal; see also Njeru 2006). Socionatural hybrids (or cyborgs) have their own momentum in urban metabolisms because they are imbued with cultural value (Swyngedouw 2006; Grove 2009); with respect to waste, cultural associations of filth and abjection have led to a management process centred on physical and mental distancing of waste products, as well as the undervaluation of potentially recoverable materials in the waste stream. The health threats inherent in managing waste are one of the fundamental reasons why it is distanced through both cultural means and managerial processes.

King (2010) comments on the potential synergies between health geographies and political ecology (although his is not an explicitly urban analysis), noting that both draw on ideas of place and landscape as well as an understanding of place as a socially-constructed and reconstructed phenomenon. In an analysis of the socioenvironmental aspects of the HIV/AIDS epidemic in South Africa, he suggests that political ecology adds important dimensions of political economy and power to investigations of health landscapes. An analysis of bodily well-being is consistent with UPE's focus on multi-scalar effects of the urbanization process, allowing for an investigation of the effects of sociopolitical change at the scale of the body (Debbané and Keil 2004; Prudham 2004). This focus on the individual scale is valuable not only in terms of analyzing health outcomes, but also because it allows for the consideration of agency when investigating the

working and living conditions of marginalized peoples (as is advocated by Evans 2002 and Li 2004).

Despite the potential productivity of this theoretical approach to health and place, there have been few studies that interpret health outcomes using UPE as an analytic lens. Véron (2006) provides an UPE description of air pollution in Delhi, focusing on the impacts of various political actors and activities on local environmental conditions. Harper (2004) similarly argues that a political ecology perspective can provide insight to the unequal urban processes that lead to differential health impacts of air pollution in Houston, and provides two anecdotal accounts of the impacts of sociopolitical processes on individual health. Mulligan et al (2012) describe the policy development process in Putrajaya, Malaysia that led to rapid urban development and poor urban planning, contributing to an urban ecology conducive to breakouts of dengue fever. These studies establish the relationship between environments, macro-economic, and political / institutional contexts. Additionally, Collins (2010) makes a process-oriented contribution to UPE understandings of health through an analysis of the 2006 El Paso–Ciudad Juárez floods. This study maps the production of unequal environmental risks as the result of a dual movement of marginalization (the processes that degrade the socioenvironmental conditions of less powerful groups) and facilitation (the systemic ways in which more powerful groups of people avoid negative environmental risks and appropriate positive environmental benefits). The result of these interrelated processes is geographic and environmental inequality.

Because of the relative dearth of attention to urban political ecologies of health, there are still analytical insights from this field that have not been fully developed. In particular, UPE can offer insight to the ways that uneven health environments are socially-constructed phenomena in urban environments, and not just passive characteristics of city life. In this study, I develop an analytical framework based on three UPE concepts of relevance to place-based health research: crisis, metabolism, and multi-scalar perspectives.

1) Crisis:

Urban political ecologists highlight the ways that neoliberal capitalism and its inherent crises structure socionatural relations in cities (Swyngedouw and Heynen 2003). These crises can include macroeconomic financial crises (with impacts including recession, economic restructuring, and labour market shifts), as well as environmental crises precipitated by contemporary capitalism. Crisis is often used to rationalize changes made to policy, programming, and government services, all of which can have implications for both health and socionatural relations in urban environments.

2) Metabolism:

Metabolism is a central concept in UPE (Keil 2003, 2005, Swyngedouw and Heynen 2003). The metabolic processes of cities involve a multitude of flows, both physical and social: of food and goods into the city and waste out, of water and sewage effluent, of people along transit corridors, and so on. Solid waste is an integral part of human production and consumption processes, and represents a frontier between human and non-human systems. At times, waste products are re-circulated through socionatural metabolic systems via recycling, reuse, and composting activities. Our failures to adequately reintegrate wastes into production processes are a symptom of metabolic rift (Bellamy Foster 1999) and impending environmental crisis. The metabolism (uptake and reintegration into human and natural systems) of waste therefore represents a foundational relationship between people and their produced environments, and can have implications for public health in cities (Njeru 2006).

3) Multi-scalar analyses:

Urban Political Ecology (UPE) encourages a multi-scalar approach to understanding the production of uneven space (Swyngedouw and Heynen 2003; Debanné and Keil 2004). While certain scales feature prominently in this literature (notably, the municipal and national levels), there is currently little attention to the scale of the body in UPE literature. Applying an urban political ecology lens to health analyses provides an opportunity to focus on the ways that bodies interact with socionatural processes such as macroeconomic change, municipal policy, and regional environmental management.

In the following pages, I establish the uneven health outcomes and social determinants of health that characterize the living and working environments of Buenos Aires' *cartoneros*. I then develop a UPE framework based on the three core concepts listed above in order to provide further insight to the relationships between *cartoneros*' health and their urban environments in Buenos Aires, demonstrating that a UPE analytical lens enables an understanding of "environment" as a social determinant of health.

Methods

The research for this paper was conducted between 2007-9, and included a survey with 397 *cartoneros* who were approached while working on the city streets (the refusal rate for the survey was 17%, and respondents were compensated for their time). The survey included self-assessed health measures, socioeconomic indicators, as well as a broader set of questions about living and working conditions. I conducted follow-up interviews with 30 of these workers. Four local research assistants (all of whom had previous experience working with *cartoneros*) assisted with the data collection. The analysis also draws upon observations and key informant interviews carried out over three field work visits to Buenos Aires in 2007, 2009, and 2011.

Results: *Cartoneros*' health outcomes and social determinants of health

Self-assessed health status of cartoneros in Buenos Aires

Forty one percent of respondents reported that they had some kind of health problem at the time of the survey (the prompt used to supplement this question referred to illnesses, pains, or accidents). Table 1 lists the most frequently reported health problems, categorized according to those that may be work-related and those that are likely not connected to informal recycling.

Table 1: Lists of health problems reported in the survey

Health problems that may be connected to informal recycling practices	Injuries from traffic or train accidents, broken bones, cuts from glass and metal found in the trash, exhaustion and fatigue, burns, aches and pains (body aches, headaches, ear aches, and arthritis), respiratory problems (asthma and bronchitis), illnesses and infections (eye infections, coughs, colds, pneumonia, fevers), rashes.
Health problems that are likely not directly connected to informal recycling practices	Circulatory problems (heart problems, chest pains, high or low blood pressure), illnesses and infections (AIDS), digestive problems (stomach aches, Celiac disease, gall bladder problems, ulcers), allergies, tumours, sciatica, gout, diabetes, epilepsy, hernias, kidney problems, vision problems, hearing problems,

	dental problems, drug addiction, depression, memory loss, anemia, and undernourishment.
--	---

When asked about the kinds of dangerous materials that they found in their work, *cartoneros* said that they encountered biological hazards (e.g. diapers, feces, feminine hygiene products, blood/bandages, corpses, parts of human bodies, fetuses, catheters and other medical waste, old medicines, used condoms, dead animals, rotting food), chemical hazards (e.g. acids, insecticides, aerosol cans, batteries, fluorescent light tubes) and physical hazards (e.g. knives, guns, razor blades, scissors, scalpels, sewing needles). When asked about injuries sustained from contact with waste, 46% of respondents reported that they had cut themselves on a piece of metal, 58% of respondents reported that they had been cut with glass, and 10% reported that they had been stuck by a needle while working. The exposure to pollutants and disease agents in waste-picking practice are exacerbated by the fact that waste pickers rarely use protective equipment in their work. When asked to self-report the equipment that respondents regularly used while working, 29% reported that they used some type of protective equipment. However, we only directly observed 8% of respondents using any type of equipment when approached for the study, suggesting that actual rates of equipment use are lower than self-reported rates of regular use. Similarly, studies of informal recyclers from other parts of the Global South also report low rates of protective equipment use (Anzola et al 1998, Da Silva et al 2005, Gunn and Ostos 1992, Nguyen et al 2003).

The question we used to assess functional mental health asked respondents if they had experienced anxiety, nervousness, or depression in the past year (adapted from Eriksson et al 2001). Survey prompts included allusions to insomnia and panic attacks. Thirty one percent said they had experienced at least one of these mental health issues in the past year, and mental health was significantly related to the presence of other health problems ($p = 0.00$)¹. Those with mental health problems also missed significantly more days of work for health reasons on average (26.87 days) compared to those who did not report mental health problems (13.10 days; $p = 0.04$)². Mental health is therefore an important aspect of overall health status among this population of workers.

When asked to rate their overall health, survey respondents gave the responses reported in Table 2.

Table 2: Self-reported health in Argentina

Health status	<i>Cartonero</i> survey (2007)	World Values Survey (2006)
Very good	11%	33%
Good	56%	46%
Neither good nor bad/regular	27%	19%
Poor	6%	3%
Very poor	0.5%	--
Don't know	0.1%	0.1%

The *cartonero* survey was designed to most closely reflect the wording used in the World Values Survey, and comparable results from this survey are listed in Table 2 (although the 2006 version of this instrument eliminated the “Very Poor” response category; valid $n = 1002$). A

¹ $\chi^2 (1) = 9.565$

² $t (87.924) = 2.039$

comparison of the results of these two studies indicates that a smaller proportion of *cartoneros* reported their health as very good compared to the broader respondent base in the Argentine version of the World Values Survey from the previous year, and a larger proportion of *cartoneros* reported their health as good, neither good nor bad, or poor. The greatest difference is in the top-ranked category of very good health, suggesting that *cartoneros* were less likely to report very good health. When combined, 79% of the World Values Survey sample reported good or very good health, compared to 67% of *cartoneros*.

Overall, it is apparent that *cartoneros* experience a number of health issues, many of which appear to be directly related to their working conditions. Importantly, comparisons to the self-reported health of a broader population in the World Values Survey suggest that *cartoneros* do not enjoy the same levels of health as other Argentines, indicating that these workers operate in a landscape of uneven health outcomes. Other studies have also observed unequal health outcomes across different socioeconomic groups in the city (Arrossi 1996; Alazraqui et al 2007), suggesting that health inequalities not only affect *cartoneros*, but other low-income residents of Greater Buenos Aires as well. The survey data also indicates that determinants of health (including income, education, housing, and health care access) are not equally distributed across the population of Buenos Aires, especially as they pertain to *cartoneros*.

Income and education

Informal recycling is relatively low-paying work. *Cartoneros'* average monthly income including non-recycling earnings was \$644.07 pesos (\$214.69 USD), and the monthly median income was \$534.56 pesos (\$178.18 USD). In contrast, collection truck drivers working for waste concessionaires in Buenos Aires are protected by a labour union, and cost the city between \$13-14,000 pesos per month (\$4,333-4,666 USD), including salary and benefits (Quinti 2009). According to the national statistical agency's (INDEC) Continuous Permanent Survey of Households data from the first trimester of 2007, the median monthly income of *cartoneros* as compared to the income of Argentines in all urban areas fell near the bottom of the fourth decile (\$500-\$630 pesos per month), indicating that at the time of the survey almost 70% of all Argentines with incomes earned more than *cartoneros*.

At the time of interview, 5% of survey respondents were attending school and 95% were not. Respondents were asked about the highest level of schooling they had attained. In Figure 1 below, these data are compared to INDEC statistics for the highest level of schooling attained by the population aged 15 years and older.

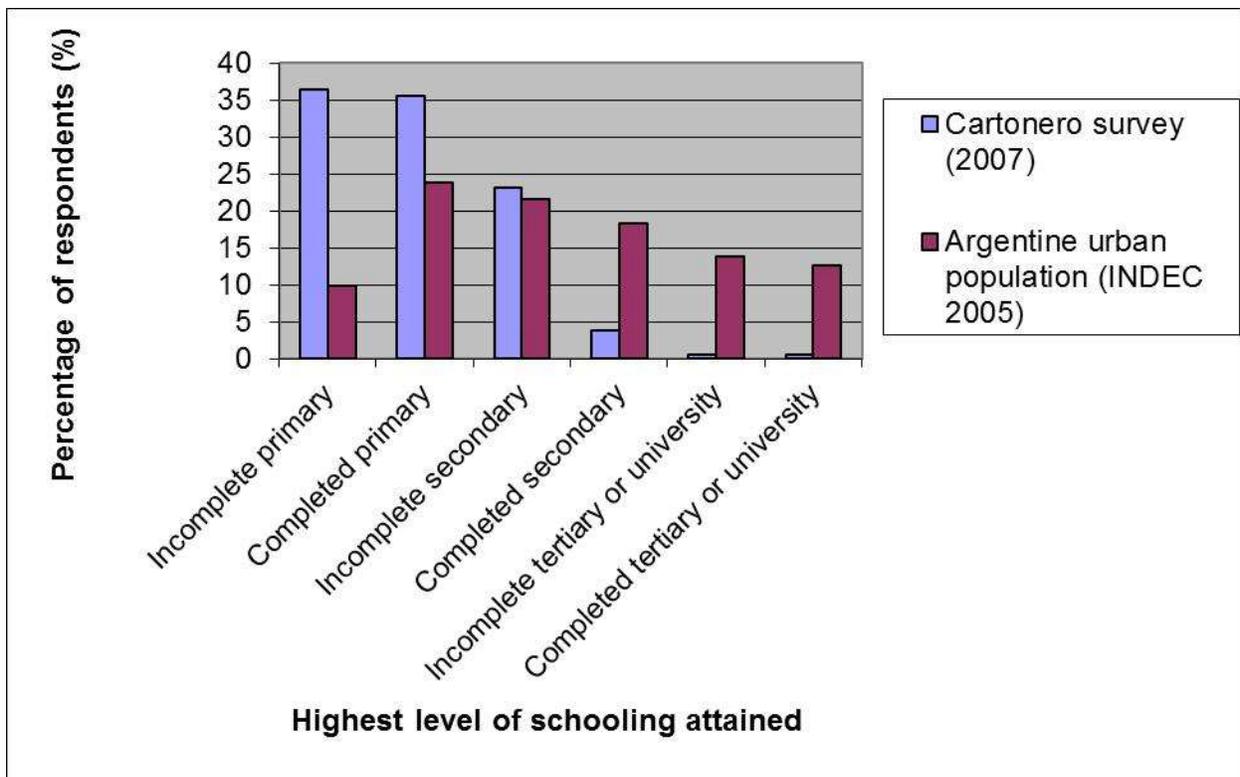


Figure 1: Comparison of educational achievement between survey population and the Argentine population

These data suggest that *cartoneros* as a group have relatively low levels of educational achievement when compared to the Argentine population. Using data from the Health, Well-Being, and Aging in Latin America and the Caribbean project, Noronha and Andrade (2005) found that health inequalities among the elderly in Buenos Aires were related to educational levels: those with better health had attained higher levels of education.

Housing conditions

In addition to the multiple exposures that waste pickers face in their work environments, many are also exposed to a number of environmental health risks in their homes. More than half of respondents (56%) reported that they sorted or classified the materials that they collected primarily in their homes, indicating that they brought materials from the waste stream into their living environments. Additionally, 65% of respondents reported that they burned materials for metal recovery or disposal of residual waste. Boadi and Kuitunen (2005) have found a significant association between burning waste and respiratory problems in both adults and children.

In addition to exposures brought into the home, *cartoneros'* housing and infrastructure may also pose health hazards. The vast majority of respondents reported living in either *casillas* or *casas materiales* (97%), both of which are structurally basic forms of housing common in low-income neighbourhoods. In comparison, only 22% of Greater Buenos Aires residents lived in these types of lower quality housing (INDEC 2005). These results suggest that *cartoneros* tended to live in more precarious types of housing than other residents of Greater Buenos Aires. In the Buenos Aires *cartonero* survey, 69% of housed respondents reported having running water in their home, compared to 87% of people in Greater Buenos Aires (INDEC 2001). Among survey respondents,

70% of *cartoneros* had waste collection service in their neighbourhood and 39% had sewage services, compared to 94% of residents of Greater Buenos Aires with waste collection and 55% with sewage services (ibid). In comparison to the relatively low level of access to sanitary services, *cartoneros* reported high access to electricity in their homes (99%), compared to 97% of residents in Greater Buenos Aires (ibid). Overall, *cartoneros* appear to have had less access to sanitary services and fixed infrastructure than other residents of Greater Buenos Aires. Similarly, Da Silva et al (2005) found that, compared to their neighbours, waste pickers in Pelotas, Brazil were more likely to have homes made of wood, and were less likely to have running water, toilets, and electricity in their homes.

Health care access

Access to health care services is a key determinant of health, and is often connected to socioeconomic status. Most survey respondents (97%) reported using the public health care system, and the remaining 3% had health care coverage through employment-based insurance (*obra social*) at the time of the survey; as informal recycling would not qualify a worker for access to an *obra social*, it can be assumed that these respondents were accessing the insurance afforded by other family members' occupations. According to the 2001 census, only 45% of residents of Greater Buenos Aires relied on the public health system as they did not have *obra social* health coverage, medical plans, or age-based group insurance (i.e. senior citizen care) – a much lower proportion than was observed among *cartoneros*.

Overall, the presence of a public health care system in Argentina means that *cartoneros* have access to health services, although they can be relatively basic in nature. In a survey of 130 *cartoneros* in 2002-3, Martín et al (2007) note that almost all their respondents were aware of a health care facility in their neighbourhood of residence. The *cartonero* survey revealed a very high level of vaccination among respondents (97%), a result of strong public health efforts in Argentina. However, the quality of the services *cartoneros* access may not be as high as those who participate in the more expensive private or insured health care streams. Furthermore, when asked about access to non-public health services, only 58% of *cartoneros* reported that they had ever visited a dentist, and only 22% had ever been to an optometrist or ophthalmologist. A higher proportion of respondents had visited a pharmacist – a common source of health information in Argentina – at some point (71%).

It is apparent that, in addition to health outcomes, the social factors that influence *cartoneros*' health (such as income, education, housing, and access to health services) are also unevenly distributed across the population of Buenos Aires. In the following section, I interpret the above-described health inequalities using an analysis based in three of the core concepts of UPE (crisis, metabolism, and multi-scalar perspectives). This analysis situates the health implications of informal recycling within a broader context of political, socioeconomic, and environmental change in Buenos Aires.

Discussion: An urban political ecology of informal recyclers' health in Buenos Aires

Crisis, inequality, and health in Argentina

The practice of informal recycling in Buenos Aires grew substantially following the economic crisis of 2001-2. In a one-year span between October 2001 and 2002, Schamber (2002) observed a five-fold increase in the number of *cartoneros* entering the city via the Alsina bridge from a neighbouring low-income community. People began working as informal recyclers due to increasing unemployment rates, and increased demand for domestic industrial inputs in the context of the devalued peso. The macroeconomic context of the crisis was therefore a proximal cause of

the increase in informal recycling in Buenos Aires, as well as an on-going influence on the material conditions of life for many low-income urbanites.

Connections between this crisis, addiction, and other mental health issues have been documented in Buenos Aires: in a 2002 survey of 1,000 people, 53.3% of respondents reported that the people they knew drank more alcohol in order to escape from their problems in the time of crisis (Munné 2005). The years of crisis were also associated with increased psychotropic drug use in low-income neighbourhoods (Epele 2010), as well as a 20% increase in mental health consultations in Buenos Aires in 2002 (Pisanelli 2003). It is therefore plausible that economic crisis and its fallout may have precipitated personal health crises for a diversity of individuals in Buenos Aires, including *cartoneros*.

Furthermore, the economic crisis of 2001-2 led to the weakening of the national health care system, including reduced access to medicines and health services among the poor (Bernztein and Drake 2009), decreased health benefit provision for the elderly (Montero-Odasso et al 2004), widespread loss of employment-based health insurance coverage (Iriart et al 2002), and decreased job security among health services providers (ibid). These changes to the health care system were seeded in long processes of neoliberal health care reform throughout the 1990s that saw the introduction of multi-national corporations into the health service economy and the withdrawal of the state from social service provision (Iriart et al 2002; Iriart and Waitzkin 2006). Global financial institutions such as the World Bank, the International Monetary Fund, the Inter-American Development Bank, and the World Trade Organization have all been implicated in the active weakening of the Argentine health care system (Iriart et al 2002; Cavagnero 2008), and President Nestór Kirchner continued to pursue the health sector reforms prescribed by these institutions in the post-crisis years (Iriart and Waitzkin 2006). As described above, *cartoneros* have also experienced the impact of these health system changes, particularly in their decreasing access to employment-related health insurance over time.

The moment of economic crisis also led to government interventions that have supported informal recyclers in Buenos Aires. The city government passed a law legalizing informal recycling in January 2003, and created a municipal program to liaise with *cartoneros* and provide them with free work equipment (e.g. gloves and reflective vests), increased access to public vaccinations, and a government registration card (this effort was intended to increase the social legitimacy of this work, but has also led to concerns of social surveillance among some informal recyclers). Some of these health efforts have continued beyond the crisis years. For example, as recently as 2013 the Buenos Aires government continued to offer vaccinations against tetanus, diphtheria, and hepatitis B for registered informal recyclers (Buenos Aires City Government 2013). These are admirable efforts that demonstrate on-going government concern for the health of informal recyclers. However, the low rates of equipment use among surveyed *cartoneros* was primarily due to reported discomfort, impediment of the work, or lack of perceived usefulness associated with equipment (74%), rather than lack of access (31%; multiple answers were allowed to this question). These data suggest that the hazards associated with waste contact are inherent to informal recycling work as practiced in Buenos Aires, and that the provision of equipment is not sufficient to fully address this health threat.

Metabolism of waste

In the case of Buenos Aires, the labour of *cartoneros* is an important part of the metabolism of the city's waste products and the circulation of materials for reuse and recycling. The substantial increase in informal recycling in Buenos Aires following the crisis of 2001-2 has led to large-scale recycling of items previously considered waste. These materials now circulate through the city and

the economy instead of ending up in landfills. Pardo et al (2007) estimate that *cartoneros* are responsible for the diversion of 11% of the waste stream in Buenos Aires. The municipal government is currently acting to semi-formalize this new metabolism by providing designated informal recycler co-operatives with partial economic support and exclusive access to parts of the city in order to carry out their work (Author 2013). In part, the municipal support of semi-formalization has been in response to external pressures for the city to reduce its waste production; for example, because they were producing increasing amounts of waste (well above predictions in municipal plans), the municipality was required to negotiate a 20% increase in its payment for treatment and final disposition of its waste in a neighbouring province in 2008, and also was required to pay for the construction of two new landfills (La Nación staff 2008). In effect, these new arrangements were in response to an environmental crisis caused by increasing waste production. While the semi-formalization system does somewhat support the livelihood of a subset of *cartoneros*, and while this initiative is paired with attempts to increase source separation of recyclable materials in order to limit *cartoneros*' contact with the waste stream, these efforts are also ensconcing a metabolism of recyclable materials based on semi-formal waste work with very little labour protection and an exclusionary enrollment system that does not enfranchise all *cartoneros*. It is possible that semi-formalization may reduce the amount of waste sent to landfill, but plans for this program have been largely focused on high-visibility areas of the city (i.e. commercial and highly-touristed areas; Author 2013).

Additionally, systemic reliance on informal recycling has implications for the health of workers. Despite multiple (mostly unsuccessful) municipal attempts to increase source separation of materials (Gutman 2007), at the time of research, most survey respondents (95%) were sorting through mixed trash to find re-sellable materials, and so a reliance on informal recycling as a means of waste diversion has required extensive contact with hazards in the waste stream. The municipality has estimated that only 20% of residents were separating their waste in the areas where formalization was focused (Buenos Aires City Government 2010). Therefore, most informal recyclers (whether a part of the formalization plans or not) have had to sort through mixed trash in order to find re-sellable materials, and will likely have to continue doing so under the semi-formalized metabolism of recyclable materials in Buenos Aires.

Multi-scalar analysis: bodies in the city

Results from the *cartonero* survey reveal the bodily impacts of this work, including exposure to hazards in the waste stream (including disease vectors and injurious objects), exposure to weather and traffic, and the strain of intense physical labour. These impacts are exacerbated by the institutional context of informal recycling in Buenos Aires: *cartoneros*' reliance on non-source separated materials has led to regular contact with waste and the hazards it contains, the marginal social status of these workers has led to precarious working conditions on city streets, and the informality of their work has restricted *cartoneros*' health care options. The social and economic macro-contexts of informal recycling work therefore have repercussions for the bodily scale of workers' health.

Cartoneros also express multi-scalar understandings of their health outcomes. In the survey, we asked respondents to compare their current health status to their health before starting to work as a *cartonero*, as well as their perceived reasons for any change: 18% said that their health was better or much better, 54% said it was the same, and 27% said it was worse or much worse. Those who reported that their health was worse or much worse since they started working as a *cartonero* cited explicit hazards of the work (i.e. exposure to contaminants or dangerous objects in the trash, exposure to weather, pains and injuries associated with heavy lifting, exhaustion,

psychological pressures associated with the precariousness and stigma of informal recycling, etc.), as well as broader health issues associated with aging and the passage of time. Those who reported that their health was better or much better than before they started working as a *cartonero* cited the physical benefits of increased exertion, the psychological benefits of having access to work and of leaving the home environment for work purposes, the socioeconomic benefits of being able to afford food, housing, goods, etc., as well as access to work that is less dangerous than previous jobs held by the respondent (for example, one respondent spoke of previous work at a tannery that involved extensive exposure to noxious chemicals; other commonly-reported previous jobs included construction work (35% of survey respondents) and factory work (11%), both of which could involve substantial health hazards). These explanations given by the 18% of respondents who contended that their health has improved suggest that there may be health-protective benefits to informal recycling work, and that work, in whatever form it may take, can help to alleviate the negative health effects of poverty and the stresses that attend low-income life. Kungskulniti (1990) similarly observed that informal recyclers were healthier than their unemployed counterparts living in the same low-income neighbourhoods. It is therefore possible that work (even relatively unhealthy informal recycling work) and the economic benefits it provides may have health protective effects (Wilson et al 2006), particularly for low-income informal workers like *cartoneros*. *Cartoneros'* understanding of their health dynamics is therefore interpreted through both the bodily scale of work-related hazards as well as the broader context of their socioeconomic environments (and particularly the spectre of unemployment, which can lead to stress and deprivation).

Multi-scalar understandings of health are also evident in *cartoneros'* suggestions of interventions for improving their health (n = 186), as listed in Table 3.

Table 3: *Cartoneros'* suggestions for improving health from the survey

Suggestion for improving health (open-ended question)	Response rate (multiple answers allowed)
Be given other work, or stop doing this work	68%
Make changes to health care access (e.g. go to the doctor more often, provide <i>obras sociales</i> for cartoneros, improve public health care services and wait times)	31%
Make behavioural changes (e.g. eat better, smoke less, drink less, sleep more, exercise more, dress for the weather, reduce anxiety)	24%
Make changes to the ways that <i>cartoneo</i> is practiced (e.g. have residents separate recyclable materials, provision of safer means of transportation, provision of more or better equipment)	4%
Improve housing situation	1%

These suggestions reveal multiple potential scales and sites of intervention, including the individual (via behavioural change); institutional changes to informal recycling practices, health care systems, and housing conditions; and shifts in labour markets in order to provide new employment opportunities. The prevalence of the expressed desire to exit *cartoneo* emphasizes an important point: the goal should not be to institutionalize this unhealthy form of material recovery (as the municipality's semi-formalization of informal recycling does), but rather to improve it where possible (as suggested by 4% of respondents), and ultimately enable people to avoid this

dangerous line of work (Furedy 1997). While allusions to behavioural changes reveal that some respondents are aware of the effects of their lifestyle choices on their health, the common reference to the limitations of the health care system points to structural issues in the medical infrastructure of the country that also impinge upon *cartoneros*' health, and likely the health of other low-income Argentines as well. The suggestions made by respondents and the analysis of *cartoneros*' determinants of health as compared to others indicate *cartoneros*' awareness of the high levels of material and social inequality in Argentine society, as well as the multi-scalar dynamics of their own health.

Conclusions

This paper has presented an overview of *cartoneros*' health outcomes and their determinants of health relative to other residents of Buenos Aires. The social and economic status of *cartoneros* (as evidenced through their health status and its social determinants) is more marginal than that of most other residents of Greater Buenos Aires. Furthermore, *cartoneros* experience numerous environmental health threats in the places where they live and work, and they also have relatively poor access to health-related resources such as income, education, housing, and health care services. These observations indicate that *cartoneros* live and work in uneven social and environmental contexts within the City of Buenos Aires.

An urban political ecology analysis of *cartoneros*' health outcomes reveals the significance of crisis in forming these uneven health landscapes. The Argentine economic crisis of 2001-2 precipitated by international neoliberal policies led to the large-scale entry of economically disenfranchised urbanites into this line of work, and the environmental crisis caused by regional unavailability of new landfill sites has contributed to the municipal efforts to institutionalize informal recycling as a long-term waste management solution. The particular metabolism of recyclable waste that has emerged in Buenos Aires requires informal workers to regularly expose themselves to environmental hazards in the trash and on the city streets, while earning relatively little income and living in conditions that can be non-conducive to health. *Cartoneros* describe their health outcomes as the results of multi-scalar dynamics of social, economic, and environmental processes. This analysis also reveals that the uneven health geographies experienced by *cartoneros* as compared to other residents of the Greater Buenos Aires region are connected to national level retrenchment of health services, differing levels of housing and sanitation infrastructure across the region, as well as poverty-related inaccessibility of social resources (such as education). Most *cartoneros* understand the health implications of their work, and 68% believe that leaving informal recycling work would be good for their health; however, the economic, political, and social macro-contexts of Buenos Aires' urban dynamics make it difficult to leave the working and living environments that impact their health.

Urban political ecology can thus provide insights to the production of urban environments in Buenos Aires, and particularly the emergence of *cartoneros*' uneven health landscapes. This theoretical perspective reveals that the unhealthy environmental conditions of informal recycling work are more than just contextual aspects of *cartoneros*' occupational health; rather, these environments are socially determined by multi-scalar processes of economic change, government interventions, and the cultural distancing of waste and those who work with it. An analytical approach based in urban political ecology demonstrates that "environment" can be a social determinant of health, and that uneven health landscapes result from complex socio-natural processes that differentially advantage and disadvantage urban dwellers. A UPE lens can also inform power relations between different actors, and reveal tensions between their agendas. In the context of informal recycling in Buenos Aires, it is clear that national-level decisions about health

care funding and macro-economic policy have impacted the work and health of *cartoneros*. It is also apparent that the shifting priorities of local government have influenced the policy and governance mechanisms used to address informal recycling at the municipal scale. The economic crisis of 2001-2 precipitated a supportive policy climate that legalized informal recycling, and provided work equipment and vaccinations for *cartoneros*. The environmental crisis of insufficient landfill space later led to the introduction of semi-formalization: a plan that will benefit some *cartoneros*, but exclude others. At other moments, the political drive to beautify and sanitize public spaces in the city has led to antipathy and repressive municipal policies toward *cartoneros* (as described in Author 2015). These power dynamics have implications for the recovery and circulation of recyclable materials, and thus the urban metabolism of waste products in Buenos Aires.

A final note concerns the importance of including the perspectives of low-income urbanites when theorizing the production of urban space. The insights that *cartoneros* themselves have provided to this analysis of their health and their socionatural environments reinforces the need to incorporate them into the research, programs, and policies that impact their lives, work, and health.

Bibliography

Alazraqui, M., E. Mota, H. Spinelli, and C. Guevel. 2007. "Desigualdades en salud y desigualdades sociales: un abordaje epidemiológico en un municipio urbano de Argentina." Revista Panamericana de Salud Pública, 21(1), p.1-10.

Anzola, M.G., A.R. Petrucci, G.P. Alvarez, R.L. Emery. 1998. Proyecto de Investigación Incidencia de las Condiciones Ambientales en la Salud del Trabajador Ciruja del Volcadero Municipal de Paraná. Facultad de Trabajo Social, Universidad Nacional de Entre Ríos: Paraná, Argentina.

Arrossi, S. 1996. "Inequality and health in the metropolitan area of Buenos Aires." Environment and Urbanization, 8(2), p.43-70.

Auer, C. 1990. "Health status of children living in a squatter area of Manila, Philippines, with particular emphasis on intestinal parasitoses." Southeast Asian Journal of Tropical Medicine and Public Health, 21(2); pp.289-300.

Bellamy Foster, J. 1999. "Marx's Theory of Metabolic Rift: Classical Foundations for Environmental Sociology." The American Journal of Sociology, 105(2); pp.366-405.

Bernztein, R. and I. Drake. 2009. "Neumonía de la comunidad en niños: impacto sanitario y costos del tratamiento en el primer nivel de atención público de la Argentina." Archivos argentinos de pediatría, 107(2); pp.101-110.

Binion, E. and J. Gutberlet. 2012. "The effects of handling solid waste on the wellbeing of informal and organized recyclers: a review of the literature." International Journal of Occupational and Environmental Health, 18(1); pp.43-52.

Boadi, K.O. y M. Kuitunen. 2005. "Environmental and Health Impacts of Household Solid Waste Handling and Disposal Practices in Third World Cities: The Case of the Accra Metropolitan Area, Ghana." Journal of Environmental Health, 68(4), pp.32-36.

Buenos Aires City Government. 2013. "Campana de vacunación para Recuperadores Urbanos de CABA." Accessed online at http://estatico.buenosaires.gov.ar/areas/salud/jornadas_hospitales/recuperadores.pdf.

Buenos Aires City Government. 2010. "Recuperadores Urbanos." Accessed online at www.buenosaires.gov.ar/areas/med_ambiente.

Castillo Berthier, H. 1990. La Sociedad de la Basura: Caciquismo Urbano en la Ciudad de México. Segunda Edición. Universidad Autónoma de México: México.

Cavagnero, E. 2008. "Health sector reforms in Argentina and the performance of the health financing system." Health Policy, 88; pp.88-99.

- Collins, T. W. 2010. "Marginalization, facilitation, and the production of unequal risk: the 2006 Paso del Norte floods." Antipode, 42(2), pp.258-288.
- Da Silva, M.C., A.G. Fassa, C.E. Siqueira, y D. Kriebel. 2005. "World at work: Brazilian ragpickers." Occupational and Environmental Medicine, 62, p.736-740.
- Debanné, A. and R. Keil. 2004. "Multiple Disconnections: Environmental Justice and Urban Water in Canada and South Africa." Space and Polity, 8(2); pp.209–225.
- Epele, M.E. 2010. "Memory, Forgetting, and Economic Crisis: Drug Use and Social Fragmentation in an Argentine Shantytown." Medical Anthropology Quarterly, 24(1); pp.22-41.
- Eriksson, I., A.L. Undén, and S. Elofsson. 2001. "Self-rated health. Comparisons between three different measures. Results from a population study." International Journal of Epidemiology, 30; pp.326-333.
- Evans, P. 2002. "Looking for agents of urban livability in a globalized political economy," in Evans, P. (ed). Livable Cities? Urban struggles for livelihood and sustainability. Berkley: University of California Press, pp.1-30.
- Furedy, C. 1997. "Reflections on some dilemmas concerning waste pickers and waste recovery." Urban Waste Expertise Programme, WASTE: Netherlands; pp.1-7.
- Grove, K. 2009. "Rethinking the nature of urban environmental politics: Security, subjectivity, and the non-human." Geoforum, 40; pp.207–216.
- Gunn, S. and Z. Ostos. 1992. "Dilemmas in tackling child labour: The case of scavenger children in the Philippines." International Labour Review, 131(6), p.629-646.
- Gutberlet, J. and A.M. Baeder. 2008. "Informal recycling and occupational health in Santo André, Brazil." International Journal of Environmental Health Research, 18(1), p.1-15.
- Gutman, D. 2007, June 7. "Medio ambiente: Instalan contenedores diferenciados para residuos humedos y secos." Clarín. Accessed online at www.clarin.com.
- Gutman D, 2008, 27 November. "Presentacion del Ministro Juan Pablo Piccardo en la legislatura: Sumar a los cartoneros al plan de reciclado oficial costará \$ 102 millones." Clarín Accessed online at <http://www.clarin.com>.
- Harper, J. 2004. "Breathless in Houston: A political ecology of health approach to understanding environmental health concerns." Medical Anthropology, 23; pp.295-326.
- Hunt, C. 2001. "A review of the health hazards associated with the occupation of waste picking for children." International Journal of Adolescent Medicine and Health, 13(3), p.177-189.
- INDEC (Instituto Nacional de Estadística y Censos, Argentina). 2001. Censo Nacional de Población, Hogares y Viviendas. Accessed online at www.indec.mecon.ar.

INDEC (Instituto Nacional de Estadística y Censos, Argentina). 2005. Encuesta Permanente de Hogares Continua. Accessed online at www.indec.mecon.ar.

INDEC (Instituto Nacional de Estadística y Censos, Argentina). 2007. Encuesta Permanente de Hogares Continua. Accessed online at www.indec.mecon.ar.

Iriart, C. and H. Waitzkin. 2006. "Argentina: No lesson learned." International Journal of Health Services, 36(1); pp.177-196.

Iriart, C., H. Waitzkin, and C. Trotta. 2002. "Global Policies, Health Care System and Social Movements in Latin America: A Lesson from Argentina." Global Social Policy, 2(3); pp.245–259.

Keil, R. 2003. "Urban Political Ecology." Urban Geography, 24(8); pp.723–738.

King, B. 2010. "Political ecologies of health." Progress in Human Geography, 34(1); pp. 38-55.

Kungskulniti, N. 1990. "Report: Public health aspects of a solid waste scavenger community In Thailand." Waste Management and Research, 8(2); pp.167-171.

La Nación staff. 2008, 29 August. "La ciudad pagará un 20% más por el tratamiento de residuos; el gobierno porteño financiará la construcción de dos rellenos sanitarios." La Nación. Accessed online at <http://www.lanacion.com>

Li, T. 2004. "Environment, indigeneity and transnationalism," in Peet, R. and M. Watts (eds). Liberation Ecologies (second edition). London: Routledge; pp.339-370.

Martín, I, C. Ruggerio, M. Miño, P. Flores, and M. Walter. 2007. "Vulnerabilidad y Riesgos de los recuperadores de residuos de la Ciudad Autónoma de Buenos Aires." In Schamber, P.J. and F.M. Suárez (eds.), Recicloscopio: Miradas sobre recuperadores urbanos de residuos de América Latina. Prometeo Libros: Los Polvorines; Universidad Nacional de General Sarmiento: Lanús; Universidad de Lanús, Lanús, Argentina, p.285-302.

Montero-Odasso, M., P. Przygoda, N. Redondo, J. Adamson, and R. Kaplan. 2004. "Health Care for Older Persons in Argentina: A Country Profile." Journal of the American Geriatrics Society, 52; pp.1761-1765.

Mulligan, K., S.J. Elliott, and C. Schuster-Wallace. 2012. "The place of health and the health of place: Dengue fever and urban governance in Putrajaya, Malaysia." Health & Place, 18; pp.613-620.

Munné, M.I. 2005. "Alcohol and the economic crisis in Argentina: recent findings." Society for the Study of Addiction, 100; pp.1790-1799.

Nguyen, H., C. Chalin, T. Lam, and V. Maclaren. 2003. Health & Social Needs of Waste Pickers in Vietnam. Research paper: University of Toronto, Waste Econ program. Accessed online at ots.utoronto.ca/users/WasteEcon/hn.pdf.

- Njeru, J. 2006. "The urban political ecology of plastic bag waste problem in Nairobi, Kenya." Geoforum, 37; pp.1046-1058.
- Noronha K.V.M.S. and M.V. Andrade. 2005. "Desigualdades sociais em saúde e na utilização dos serviços de saúde entre os idosos na América Latina." Revista Panamericana de Salud Pública, 17(5/6), p.410–8.
- Pardo, R. H., F. Cariboni, A. Risso, M. Pugliese, C. L. Belistri and M. E. Abdala. 2007. "El circuito de recuperación de materiales reciclables en la Ciudad de Buenos Aires." Asociación Argentina Uruguaya de Economía Ecológica, San Miguel de Tucumán.
- Parizeau, K. 2015. "Re-representing the city: Waste and public space in Buenos Aires, Argentina in the late 2000s." Environment and Planning A, 47(2), 284-299.
- Parizeau, K. 2013. "Formalization beckons: a baseline of informal recycling work in Buenos Aires, 2007–2011." Environment and Urbanization, 22(2), 501–521.
- Pisanelli, H. 2003. Estudio Sobre Salud Mental de Psicólogos y Psiquiatras de Buenos Aires. Buenos Aires: Gobierno de la Ciudad de Buenos Aires.
- Prudham, S. 2004. "Poisoning the well: neoliberalism and the contamination of municipal water in Walkerton, Ontario." Geoforum, 35; pp.343-359.
- Quinti, D.F. 2009, August 29. "Quieren pagar un 17% menos por la recolección de basura." Clarín. Accessed online at www.clarin.com.
- Ray, M.R., G. Mukherjee, S. Roychowdhury, and T. Lahiri. 2004. "Respiratory and general health impairments of ragpickers in India: a study in Delhi." International Archives of Occupational and Environmental Health, 77, p.595-598.
- Schamber, P.J. 2002. "Registro observacional de Cartoneros sobre Puentes zona sur – Capital Federal 2000, 2001 y 2002." Universidad Nacional de Lanús, mimeo.
- Swyngedouw, E. 2006. "Metabolic urbanization: The making of cyborg cities," in Heynen, N., E. Swyngedouw, and M. Kaika (eds). In the Nature of Cities : Urban Political Ecology and the Politics of Urban Metabolism. New York NY: Routledge, pp.21-39.
- Swyngedouw, E. and N. Heynen. 2003. "Urban political ecology, justice and the politics of scale." Antipode, 34(4); pp.898-918.
- Van Eerd, M. 1997. "The Occupational Health Aspects of Waste Collection and Recycling: An inventory study in India." UWEP Working Document 4, Part II. <http://www.waste.nl>.
- Verón, R. 2006. "Remaking urban environments: the political ecology of air pollution in Delhi." Environment and Planning A, 38; pp.2093-2109.

Wilson, D.C., C. Velis and C. Cheeseman. 2006. "Role of informal sector recycling in waste management in developing countries." Habitat International, 30; pp.797-808.

World Values Survey. 2006. Accessed online at www.worldvaluessurvey.org.