



Understanding place and health: A heuristic for using administrative data

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Received 7 March 2005; received in revised form 17 January 2006; accepted 19 January 2006

Abstract

The increasing availability, use and limitations of administrative data for place-based population health research, and a lack of theory development, created the context for the current paper. We developed a heuristic to interrogate administrative data sets and to help us develop explanatory pathways for linking place and health. Guided by a worked example, we argue that some items in administrative data sets lend themselves to multiple theories, creating problems of inference owing to the implications of using inductive versus deductive reasoning during the research process, and that certain types of theories are privileged when used administrative data bases.

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Keywords: Theory; Health and place; Administrative data

Introduction

Recently public health has witnessed a proliferation of studies investigating the relationship between various attributes of places and the health of their populations (Kawachi and Berkman, 2003; Pickett and Pearl, 2001; Tunstall et al., 2004). In search for answers to the difficult question “How does place shape and influence health status at a

population level?” researchers concerned with this issue are exploiting data from an increasingly vast array of administrative sources such as records provided by police, schools, social welfare agencies, park administrators, and day-care facilities, to name just a few (Sooman and Macintyre, 1995; Ellaway and Macintyre, 1996; Yen and Kaplan, 1999; Macintyre, 2000; Giles-Corti and Donovan, 2002; Cummins et al., 2005).

Using administrative data is a convenient way of undertaking research. First, population health data such as vital statistics and health services utilization data are widely collected and increasingly easy to access. Second, these data are particularly appealing

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for studies of health and place due to the ability to link them (albeit with difficulty) at multiple scales to other population sources of information such as socio-demographic data originating from censuses (usually using some common or compatible geocoding, like postal codes and census tracts, which may allow for re-aggregation to different scales). Given advances in computer capacity, many researchers now have a powerful arsenal for empirical research that has significantly enabled linkages between various data sources.

These data, however, have not turned out to be quite the panacea one might have expected. Studies of health and place are now increasingly fraught with the issue of what to do with this data. How exactly can we explain its relationship to health outcomes at an aggregate level, for instance? What data is missing, and why? How can we draw *specific* inferences from generic measures in secondary data? What problems arise when using secondary data for a purpose other than the one for which it was collected? This paper addresses precisely these issues. The use of administrative data bases in health and place research is inherently an inductive endeavour. Data is accessed, analyses are run, and explanations are sought. We propose a device that permits for a less purely inductive process to drive future research.

The largely inductive process encouraged by an over-reliance on analysis of administrative data has been discussed as problematic in the current social epidemiological literature (Pearce and Davey-Smith, 2003; Muntaner and Lynch, 1999; Krieger, 2004). For instance, both Pearce and Davey-Smith (2003) and Muntaner and Lynch (1999) point out that most ecological studies of income distribution and health have not been largely guided by theoretical propositions, but rather, have relied nearly exclusively on secondary data analysis alone. While these studies have brought about some statistical evidence that income inequality is positively associated with national mortality rates, the under-theorization of these studies have led to an enormous amount of post-hoc speculation as to exactly which mechanisms are responsible for the empirical results. As a result there has been little agreement as to the explanations for these patterns (that is, how they come about) or what they may mean for social policy. A purely inductive use of data, largely unguided by theory, is partly responsible for this confusion.

Given that data from secondary administrative sources normally provides only single indicators

(such as “race” or “SES”), research that borrows from these sources has to rely on these single indicator relationships, and thus, their use is limited. This hampers research if the goal is to go further than merely showing empirical associations and to explore the social mechanisms mediating between social phenomena and health outcomes. Krieger et al. (2005) note “race” in the United States as a flagrant example of this problem. They state that most public surveillance systems in the United States, if they have collected data on “race” at all, have not then collected data on other related socioeconomic factors, thus limiting our potential understanding of the relationship between economic and non-economic aspects of racial discrimination.

It is therefore worth recognizing that administrative data sets were designed with an original purpose (e.g.: client tracking, forecasting, payment, accountability, legal requirements)¹ that is often quite different from our own research interests. This does not mean that administrative data are inadequate for research on health and place, but that we should be more critical about the extent to which our use of this data may privilege some types of explanations over others.

The increasing availability, use, and limitations of administrative data for place-based population health research created the context for the current paper. The problem of sorting out how to link existing data to understandings of the association between health and place emerged during a seminar between two research groups in two Canadian cities. Problems began to arise when we realised we had enormous amounts of rich and diverse “data”, but no theoretical framework within which to place it. How should we link, both conceptually and methodologically, such a huge and varied inventory of information? How might, for instance, proportion of library books borrowed per month, or proportion of speeding fines per head of population stack up against each other as measures of social cohesion? How might each explain health outcomes? Furthermore, if we intended to provide recommendations for the collection of new data,

¹In the case of Canadian administrative health services data, with which our author group is most familiar, the health services data bases are tools for tracking fee-for-service billings by hospitals and physicians to the single-payer, universal health insurance programs run by each of the provinces. Moreover, to the extent that it involves the use of data collected for other purposes, our discussion can be expanded to include secondary analyses of existing survey data.

how would we identify the gaps? What new data might be needed and why? Discussions within the public health literature appeared to be somewhat scant on this issue, partly because our understanding of how to move from theory to measurement is generally underdeveloped in this field.

Essentially these problems boil down to an extensive use of administrative data in the study of place and health, accompanied by an under-utilisation of theory in relation to health–place linkages. Theoretical considerations are critical as they describe the putative causal linkages between health and place, which in turn, tells us where, and perhaps how, we might best intervene. Given that few empirical research studies with a focus on health and place are explicit in their assumptions about causal mechanisms, or in their theoretical process, we have a limited capacity to explain how place affects health. This lack of clarity may lead to interventions and policies that are ineffective or inappropriate if they are based on etiologic research of this sort.

In striving towards a more self conscious and reflexive use of administrative data sources we turned to some of the basic lessons afforded to us by measurement theory in psychology and education, as well as the basic principles of variable operationalization used in the social sciences (Crocker and Algina, 1986). Applying these basic notions to the problem at hand, we adopted a heuristic to interrogate administrative data sets and to help us locate particular information (such as new secondary source materials regarding information about vandalism or traffic congestion in neighbourhoods for example), along an “explanation pathway” for linking place and health. Part of the role of the heuristic was to enable us to appraise the appropriateness of the items from administrative sources with regards to particular place-specific theories about health.

The aims of this paper, therefore, are: (1) to develop a heuristic that could help us understand how theory and administrative data can be better used when attempting to explain the links between health and place and (2) to illustrate the use of this heuristic device. We call this heuristic device a “template”, a guide and tool for researchers to help them critically examine their own research. Using the template as the guide, we seek to meet three objectives: (1) to demonstrate that some items yielding from administrative data sets lend themselves to more than one theoretical explanation; (2)

to examine some of the implications of using inductive versus deductive reasoning during the research process; and (3) to illustrate that certain types of theories are privileged by our use of administrative data bases.

Moving from theories about societies to indicators in neighbourhoods

A major problem arises when attempting to navigate through enormous amounts of administrative data to explain place and health phenomena. Some theories exist, and can be chosen from, to help elucidate the mechanisms linking place and health outcomes. On its own, however, data does not assist in choosing a theory, and indeed, as Poland et al. (1998) caution, data can be used as a veil for an ostensible “objectivity”. So, for instance, there is no unambiguous meaning for any one variable from an administrative data source. The feminist movement, for example, has taught us that “sex” is not simply a biological marker but also a marker of a social role. One would be hard-pressed to find data sets that do not record sex, but this does not mean that one could necessarily use this data to explain the social roles of women in society.

In order to move from theory to items, there are a number of conceptual steps that need to be taken. The template is therefore comprised of six different categories (taken from classic notions of operationalization) ranging from most abstract, at the left, to least abstract, at the right. These categories are as follows: grand theory, substantive theory, conceptual linkages, construct, indicator, and item. We use the example of Giddens’ structuration theory (Giddens, 1984), in relation to health and place research, to illustrate the categories of the template.

Grand theory (at the left-hand side of Fig. 1) refers to a theory describing the nature and structure of society in a broad and general sense. Merton (1968) referred to this as “a master conceptual scheme for deriving subsidiary theories”, and Skinner (1985) wrote of grand theory as being; “any theory that attempts an overall explanation of social life, history, or human experience”. Anthony Giddens’ structuration theory is an example of a grand theory. With his theory, Giddens seeks to explain the relationship between agency and structure. For Giddens, human agency and social structure are not two separate concepts or constructs, but are two ways of considering social action. There is a duality of structures so that on one side it is composed of

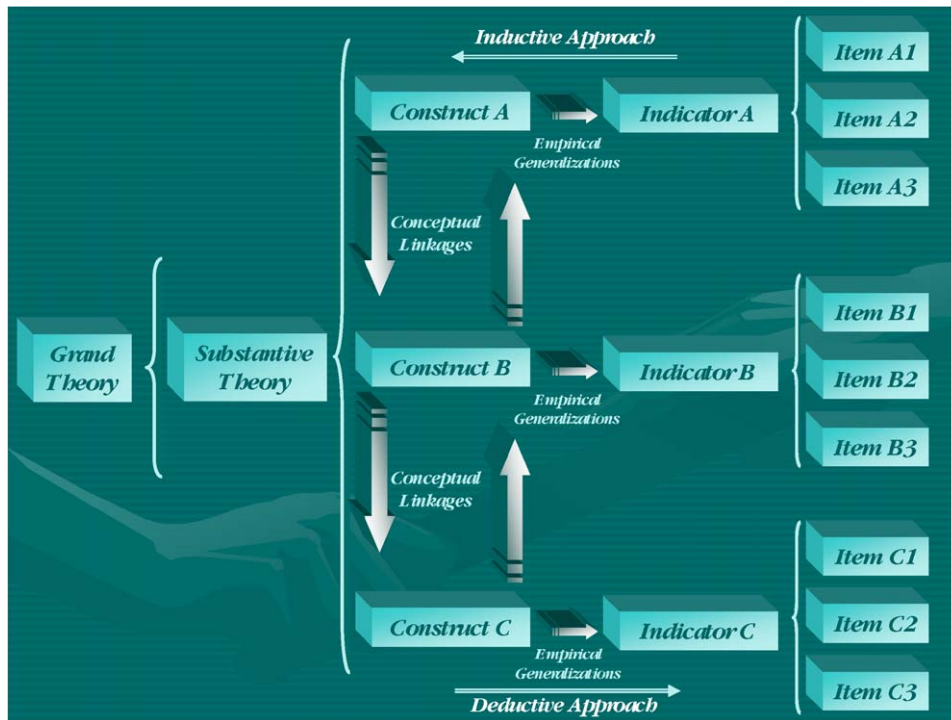


Fig. 1. The template.

situated actors who undertake social action and interaction. At the same time, it is also the rules, resources, and social relationships that are produced and reproduced in social interaction with agents. Structuration theory is thus concerned with the ways in which social systems are produced and reproduced.

Substantive theory, also known as middle-range theory (Merton, 1968), tends to focus on a particular subject area, and is less broad than grand theory. These theories are considered “special” theories, applicable to limited ranges of data (Wallace and Wolf, 1995), encompassing a more limited scope with a limited number of variables. These theories tend also to be testable in a direct manner. Examples of such theories include theories of stress and theories of behaviour change such as the Health Belief Model (Becker, 1974), to name but a few. In the case of Giddens, his theory of (self) identity is an example of a substantive theory.

Conceptual linkages refer to the processes through which the concepts in the theory are related. These linkages are the explanations of the causal relationships that link together the numerous constructs in a theory. For example, to help explain the processes through which social practices and the social

structure are related, Giddens introduces the notion of the duality of structure, or what we could term recursivity. Giddens writes that the structural properties of social systems, such as rules, resources and social relations, are both the medium and the outcome of the social practices that they recursively organize. Individuals are thus constantly re-shaping the social structure of society through their social practices, and the social structure is then, in turn, re-structuring individuals’ social practices.

A *construct* is a hypothetical concept—a product of the informed scientific imagination of social scientists attempting to develop theories for explaining human behaviour (Crocker and Algina, 1986). Constructs acquire meaning according to the theory to which they refer and they can never be absolutely confirmed. So, for instance, a construct such as “structure” takes on various meanings when used within the confines of different theories. Structure, according to Giddens, is the rules and resources, recursively implicated in the reproduction of social systems. Structure in a Marxist theory, on the other hand, would refer more to class structure and the power relations among classes.

Indicators are empirical manifestations of the meaning of a construct, or ways of operationalizing

empirical analyses of constructs. Because constructs are theoretically derived, they can only be comprehended indirectly through the use of indicators. An example of an indicator, continuing with the Giddens example, is the notion of resources. For Giddens, resources are instantiations of the social structure and are of two kinds: authoritative resources, deriving from the co-ordination of the activity of human agents, and allocative resources which stem from control of material products or of aspects of the material world.

Finally, *items* are the stand-alone pieces of an indicator used in a specific measurement context. Items are thus the observable translations of an indicator. To conclude with the example provided by Giddens' structuration theory, an item reflecting allocative resources could be the number of parks in a neighbourhood.

Navigating the template

In testing the template with various examples, a number of important issues with regard to place and health research were raised. Firstly, any single item can be used as an indicator for elements of a variety of theories. This is what generally occurs when one uses an inductive process that entails moving from the singular to the general (i.e. from right to left in the template). An example would be research based on the items measuring income inequality in neighbourhoods, which could be explained with various grand or substantive theories (e.g., a neo-Marxist theory or a psycho-social theory). This inductive procedure is consistent with post hoc reasoning, whereby empirical results are discerned and only then fitted into a theoretical framework.

Second, beginning the research process from a single grand theory leads to more precise and conceptually relevant constructs and items, thus ensuring better consistency between the measures and the theory. This is the deductive process; moving from the general to the specific. An example of this could be the use of a neo-Marxist theory to explain the effects of income inequalities in neighbourhoods on health. One would seek to find indicators of exploitation and alienation in order to test such hypotheses. Finding the empirical data to match deductive theories, however, can be quite challenging.

Third, any one construct can lead researchers to choose a variety of items, as well as theories. This is exemplified when one moves from the middle of the

template out either to the right or the left. Social capital is an excellent example of such a construct, originating from diverse theories such as "anomie" of Emile Durkheim (1961), "practice theory" of Pierre Bourdieu (1986, 1992) and the "social capital theory" of Robert Putnam (1993a, b). The items stemming from such theories, respectively, might be suicide rates across neighbourhoods, the degree to which people do things for each other in their neighbourhood, and the % of people who trust their neighbours in a given neighbourhood. Thus, the point of entry into the template matters. Although the template itself can accommodate a variety of thinking processes, (this includes different epistemological positions), the point of entry shapes the thinking process and ultimately how the research is framed and how replicable the conclusions will be.

Fourth, when using the template it also became evident to us that the ways in which most administrative population data sets have been constructed leads to items that privilege certain types of theories. Researchers often use existing administrative data sets as creating new ones is extremely costly to generate and research funds are rarely available to permit such extensive data collection. The theoretical perspective that then becomes "standard" is that of the institutions financially able to conduct these surveys (for instance, the RAND corporation in the USA and the Canadian government in Canada). This is shaping our science as we are limited by the theoretical thrusts of the items at our disposal. These limitations need to be more explicitly dealt with.

Lastly, we realised that the template could help illustrate the gaps in knowledge, both conceptual and empirical, with regards to the links between place and health. Sometimes we were puzzled about how to fill in a column of the template, meaning that the conceptual process, whether it is from theory to item, or from item to theory, had not been explicitly developed in the literature that we referred to when navigating the template. Overall then we deemed that the template, when used, would enable researchers to better interrogate their data and to use data to investigate theoretical propositions.

The template: an example

In this section, we provide a worked example of the template to illustrate the issues raised in the earlier section of this paper. In this example our

GRAND THEORY	SUBSTANTIVE THEORY	CONCEPTUAL LINKAGE	CONSTRUCT	INDICATOR	ITEM
Communitarianism	Putnam's social capital theory	The nature and extent of one's social relationships and associated norms of reciprocity; social capital is connected to health outcomes via some variation of a direct social support mechanism.	Social capital	Norms Trust Participation	<ul style="list-style-type: none"> • % of residents in a neighbourhood who say they trust their neighbours • % of residents in a neighbourhood who indicate taking part in community organisations
Bourdieu's practice theory of the distribution of power in society		Power in society is mobilized and reinforced through three important forms of capital; social, economic and cultural. Differential health outcomes would come about due to unequal access to economic, social and cultural capital.	Social capital	Network size Shared material resources Shared information	<ul style="list-style-type: none"> • How many people do you know well, and turn to for help, in your neighbourhood? • To what degree do people share information about things such as jobs and childcare in your neighbourhood? • To what degree would people share material resources such as household objects with each other in your neighbourhood?

Fig. 2. Example of navigating the template using social capital as an example.

exercise begins in the construct column of the template, but could as well start from any other point. Beginning with the construct column of the template, and using the example of social capital in neighbourhoods, we demonstrate that the same construct can be produced from at least two different theories, and thus yield two entirely different contents (Fig. 2).

Social capital

Social capital has gained enormous popularity in the public health and epidemiology literatures (Kawachi et al., 1997; Lomas, 1998; Kennedy et al., 1998; Kawachi, 1999; Veenstra and Lomas, 1999; Veenstra, 2000; Lynch et al., 2000; Macinko and Starfield, 2001; Navarro, 2002; Pearce and Davey-Smith, 2003; Szreter and Woolcock, 2004). According to Szreter and Woolcock's recent essay (2004), since 1997 three predominant rival views regarding the relationship between social capital and health outcomes have developed in the public health literature; the "social support" perspective, the "economic and social inequality thesis", and the "access to resources" or "political economy" position. Each of these positions has been cham-

pioned by different protagonists who have debated the issue with vigour in the literature. For the purposes of this example, however, we will focus on just one of these definitions of social capital.

The first of these perspectives, (what Szreter and Woolcock refer to as the "social support school"), and the one that a recent citation analysis has shown to be most dominant in the public health literature on social capital (Moore et al., 2005), is that of Robert Putnam (1993a, b). According to Putnam, social capital means "features of social organizations, such as networks, norms, and social trust that facilitate action and cooperation for mutual benefit" (Putnam, 1995, p. 67). Social capital enables individuals to gain access to resources by engaging with others in order to pursue leisure, familial, ethnic or other political interests. Social capital can thus be viewed as the level of associational involvement and participatory behaviour in a community (Portes, 1998). Importantly, Putnam equates social capital with a level of "civicness" within aggregates. Thus, his notion of social capital has been used in numerous studies within the field of public health in reference to its collective dimension, that is, its potential to account for group-level influences on individual health

(Kawachi et al., 2004). Indicators of this definition of social capital could include newspaper reading, membership in voluntary associations and expressions of trust in political authorities.

Because of its predominance in the public health field we first entered the template in the “construct” column with the Putnam view of social capital. Working towards the right of the template, we would seek out indicators of norms, trust, and participation within neighbourhoods. This could be further operationalized with items such as the percentage of residents in a neighbourhood who say they trust their neighbours, or the percentage of residents in a neighbourhood who indicate taking part in community organisations.

Moving towards the left of the template from the construct column, the conceptual linkage is defined simply as the nature and extent of one’s social relationships and associated norms of reciprocity; social capital is connected to health outcomes via some variation of a direct social support mechanism (Szreter and Woolcock, 2004) within groups in a community. The substantive theory is Putnam’s theory of social capital, where social capital is defined as a major resource, if not the resource, for ensuring safety, good schooling, health and quality of life through cooperative local action for mutual benefit (Navarro, 2002). The grand theory related to Putnam’s conceptualisation of social capital is communitarianism (Navarro, 2002; Moore et al., 2005). Communitarianism, as a group of related but distinct philosophies, began in the late 20th century and opposed aspects of liberalism and capitalism while advocating phenomena such as civil society. Community is the central concept of communitarianism, supported often by traditional concepts of the family, values and education. Communitarians, according to Navarro, consider that the state should play a minor redistributive role and indeed, a limited role in society’s functioning overall, giving primacy instead to town-hall assemblies, families, and community groups for the operation of society.

We then approached the template from a second perspective, that of Bourdieu (Bourdieu, 1986, 1992). Bourdieu’s alternative interpretation of social capital has, to date, been virtually absent in the literature with respect to neighbourhood studies until recently (Carpiano, 2006). Bourdieu’s conceptualisation of social capital should be of particular interest to neighbourhood researchers concerned with issues of inequity as he developed the concept in reflecting on how social class and other forms of

inequality are socially reproduced (Carpiano, 2006). Bourdieu defines social capital as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance or recognition” (Bourdieu, 1986, p. 248). He focuses on the benefits that accrue to individuals by virtue of participation in groups and on the deliberate construction of sociability for the purpose of creating this resource. The volume of social capital in an individual’s neighbourhood thus depends on the size of the network that he/she can mobilize and the volume of capital possessed by each of the individuals to whom he/she is connected. This network of relationships is thus the product of investment strategies which transforms contingent relationships, such as those of people in neighbourhoods, into durable obligations subjectively felt (such as feelings of gratitude, respect, friendship, etc.) (Bourdieu, 1986). This definition can be partitioned into two: the social relationship itself that allows individuals to gain access to the resources of those they associate with and, the amount and quality of these resources. It differs from the Putnam approach in that it forces us to consider not only the existence of community social networks, but also the resources held by the network and individuals’ abilities to draw on these resources. It also emphasises the differential access that individuals have to resources; i.e., social capital is not equally distributed across communities.

Given that the Bourdieusian perspective is two-pronged, based on both the size of the network as well as the volume of capital possessed by the individuals to whom one is connected, items reflecting these indicators could be items regarding the number of people in one’s social network as well as items that seek to evaluate the shared capital of others, such as shared information about jobs, childcare, and other local resources, shared material resources such as sharing of household items; kitchen-related objects, garden supplies, as well as sharing of human resources such as baby-sitting, bringing in each other’s mail, watering plants, etc.

Moving from the left of the construct column, the conceptual linkage is that power in society is mobilized and reinforced through three important forms of capital, social, economic and cultural. Differential health outcomes come about due to unequal access to these forms of capital. There is no specific substantive theory associated with Bourdieu’s notion of social capital as he tended not to

focus on particular subject areas. The conceptualisation of social capital described here is derived from his grand theory entitled practice theory. This theory seeks to understand why practices come to be unequally distributed among groups in society through the examination of the distribution of power in society. It may well be that researchers in public health in general, and in place and health in particular, have had some difficulty adopting Bourdieu's notion of social capital since there is little substantive theory associated with his grand theory, and thus the operationalization of Bourdieu's basic ideas is rendered more difficult.

The use of the social capital construct in the template demonstrates two things. First, the theoretical perspective from which a researcher conceptualises a construct has important implications for the secondary data sought. Obviously the data sought for a project seeking to understand the role of social capital on health and place using a Putnam perspective would differ from that of a project seeking to understand the potential links between Bourdieu's notion of social capital in relation to health and place.

Second, it becomes clearer as to why the Putnam perspective is favoured over that of Bourdieu when examining the type of data available in already existing large administrative data sets. The ready availability of measures of social capital such as social mistrust, lack of helpfulness, association membership and civic participation in existing data bases such as the US General Social Survey (1986–1990), The World Values Survey (1990–1991), the UN Human Development Report (1993) and the Canadian National Population Health Survey (1995), as well as proxy measures of social capital such as volunteerism, community attachment and electoral participation, has clearly abetted in feeding the dominance of Putnam's view of social capital in the public health literature at the expense of a Bourdieusian account of social capital.

Discussion

The specific objectives of this manuscript were three-fold: (1) to demonstrate that some items yielding from administrative data sets lend themselves to more than one theory; (2) to provide examples of the implications of using inductive versus deductive reasoning during the research process; and (3) to illustrate that certain types of

theories are privileged by our use of administrative data bases.

We have argued that items in administrative data sets are rarely theoretically neutral and that they can be used to reflect any number of theories, depending on the logical coherence of the process linking items to theory. However, we also discussed how the theoretical origins of the items are not the subject of empirical papers, and thus, it is left up to conjecture from which theoretical framework the items originate.

Second, we discuss the advantages and disadvantages of using inductive or deductive processes when using the template. It seems that when moving from items to theory (induction) researchers can more easily make use of items from administrative data for building explanations, but in doing so, they are more vulnerable to over-interpreting the data, that is, they have not proven empirically that any theory has been corroborated. We suggest, therefore, that an inductive use of administrative data should be linked to the implementation of rigorous methodological criteria in order to avoid the trap of reifying the implicit theory underlying the data set. Conversely, when moving from theory to item (deduction), researchers may find that the number of available items that can be used validly is reduced and that they have to make much more explicit how items constitute proxies for the (unmeasured) indicators of interest. Third, we argued that since no administrative data base is entirely theoretically neutral, certain theories can come to be privileged when using such data bases—Putnam's social capital theory in the case of social capital being a case in point.

Overall, we feel that use of the template sharpens our thinking about the mechanisms linking place and health and that it would be best utilized at the design phase of projects on place and health. It is also apparent that researchers can start from anywhere within the template, that is, at the theory, construct or item categories, depending on what their interests are and the resources that they have at their disposal. If one has administrative data bases at one's disposal, and wants to work backwards to develop coherence with a theoretical framework, it is as valid as working from a particular theoretical position and seeking to find valid items.

Importantly, however, particularly when moving deductively (from left to right) with the template (although it may also be the case when using it

inductively, from right to left), researchers may become convinced that the comparative convenience of administrative data sets no longer holds and may favour primary data collection, including the use of qualitative methods. Researchers may find that there are logical inconsistencies when trying to unite particular theoretical positions with available data. The use of primary data can only render the research process more conceptually and logically satisfying, as well as permitting others to replicate, refute, and confirm such endeavours.

At a more general level the arguments put forward in this paper are consonant with the position of population health researchers who have suggested that we should not treat administrative data sets as scientifically or politically neutral entities (Krieger, 1992; Tesh, 1996). These researchers argue that the content and nature of administrative data sets reflect the purpose underlying their development, as well as prevailing theories of society and disease causation. Even national censuses, ostensibly collected partially for research purposes, carry with them a considerable amount of conceptual and theoretical baggage, despite their apparent neutrality (Curtis, 2001). As noted by Curtis, “the practical interest guiding the configuration of social relations as population will shape both the ways in which they are categorized and the kinds of administrative spaces in which they are placed” (p. 27). The ramifications of this are critical for veracity in health and place research. If we use administrative data sets for primary investigation of health and place issues we should be aware that the theoretical positions taken by the originators of these data sets may be different from our own positions, and therefore, that the data may not “fit” with the explanations that we seek.

This project also highlighted the importance of revisiting the relationship between theory and method. It is artificial to separate discussions of methodology from those of theory use. In fact, what our experience using the template demonstrates is that the data that we use, and the way we use it, always presupposes a theory, either explicitly or implicitly. In this context, method may be viewed as the underlying logic that allows researchers to operationalize theory into items. A “good” method would be viewed as one that reduces the disconnects between findings and explanatory power. The deductive part of this logic ensures that as one moves from general theory to detailed items one confers theoretical meaning to the data. The

inductive part reverses the flow and seeks to construct meaning empirically. The two types of inferences are obviously intimately linked, one could say intertwined. If a theory is weak, its constructs may be lacking in meaning. This, in turn, could lead to faulty indicators and, in turn, to items that produce invalid data, i.e. data not representing “reality” as idealized by theory. Conversely, even if the deductive flow is coherent this does not ensure that the inductive reconstruction of theory will be adequate.

The tightening of logical links between construct and item ensures maximum validity and hence maximizes the chances of obtaining precise ones. However, in the case of administrative data, the comprehensiveness of the item domain is disrupted. Missing items lead to incomplete indicators that measure constructs poorly and hence lead, further up the induction chain, to either faulty theoretical conclusions (if the lack of comprehensiveness of the item domain is not recognized) or inconclusive results. The template could help to ensure logical consistency in both directions.

A final caveat in using the template in health and place research is worthy of mention. The social, economic or physical processes through which attributes of places may shape health are likely to be *scale dependent*. The “meaning” of social capital, as an “indicator” of some causal process linking it to health, for example, may be very different at the neighbourhood level than it is at the level of a metropolitan area. It is essential, therefore, that theoretical propositions about the relationship between place and health take account of the scale-dependent nature of the questions they are asking about place and health. This requires a significant transformation of the nature of inquiry from what is done in studies that treat places as “containers” of factors potentially related to health. It requires the simultaneous theorization of social process and geographic scale.

A second scale-related issue in relation to place and health is due to the constraints imposed on researchers by the geographic boundaries used by producers of the administrative data they are using. Of course this constraint can pose difficulties because the data may not be at the correct scale for the questions being asked (unable to account, empirically, for scale effects), but also the irreconcilable boundaries may make it impossible to characterize places using aggregate data from different policy sectors, for example; crime, education, health,

voting, census, etc. More often than not, the choice of boundaries then is made based on feasibility—the data source with the most flexible aggregation boundaries becomes the means for defining boundaries.

We hope that this discussion, and the template itself, may assist in increasing the clarity with which people engage in place and health research, particularly when using administrative data bases. The use of the template, however, does not have to be restricted to just this area of research, as its applicability could be widened to any endeavour where large-scale data collection is involved.

Acknowledgments

This research was made possible through a Canadian Population Health Initiative Grant (R0010049). The first author is extremely pleased and grateful for the input from members of the FCAR Health promotion group in Montreal who showed enormous enthusiasm for the basic ideas for this paper and who helped improve its content at an early stage of its development. During the course of this research the second author was supported by a New Investigator Award from the Canadian Institutes of Health Research (CIHR) and a Scholar Award from the Alberta Heritage Foundation for Medical Research (AHFMR). Alan Shiell and Penny Hawe are Senior Scholars of the Alberta Heritage Foundation for Medical Research. Thanks are also due to José Carlos Suarez Herrera for his skills at visualizing the template found in Fig. 1. Finally, thanks are due to Thomas Schlich, Thomas Abel and two excellent anonymous reviewers for thoughtful comments on a later version of this paper.

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