Chapter IV

The Geography of Health Risks

This book has so far provided an introduction to GIS in terms of its use as part of a community health program. Subsequent chapters will describe a selection of more detailed GIS techniques and approaches. This chapter can be considered as an interlude, an attempt to set the scene by painting a backcloth of risks facing many city neighborhoods and the pregnant women living in them. Of course, at the risk of repeating oneself, there have been whole books written about single risk factors, so the task of compressing all risks into a single chapter is extremely difficult. This is made even harder because many of the situations described are not directly related to pregnancy outcomes, but instead are classed as neighborhood risks, contributing to the overall vulnerability of a person living in these environments. Although some may question why not concentrate solely on pregnancy-related risks, a more holistic understanding of the social environment can help place context into data, a movement away from the earlier criticized “structural functionalism” approach (Litva & Eyles, 1995). At this point it might be worth briefly mentioning that debate continues within the field of medical geography as to the degree in which pure analytical approaches ignore the social relevance of actions (a political economy approach), or how an individual’s experience shapes his or her actions (Dorn & Laws, 1994). For a review of these critical literatures in association with infant mortality see Gesler, Bird, and Oljeski, (1997).

Although this is not the forum to extend this debate, I am sympathetic to many of the points raised. There is a danger of overreliance on a single variable within
a GIS analysis — indeed, we fall victim to that approach throughout this book. What must happen eventually is to combine both quantitative and qualitative approaches as we move through a general methodology of investigating health related problems, which includes identifying spatial patterns of the problem, finding which variables are associated with that pattern, and understanding how the process works, whether that is a biological or social pathway to an outcome.

That final stage is a complex undertaking, as vulnerability is a function of individual, behavioral, social, neighborhood, and environmental risks, many of which are inextricably linked and result in a negative health outcome (Anderson, 1952). If the reader remembers back to Chapter I, a benefit of geography is that it can act as an overview of disciplines, bringing together disparate data from multiple sources through the connection of space.

Some risks are common to a social cohort, a good example being smoking. The perils of smoking are well documented, not only in terms of what tobacco can do to a fetus, but in general individual and societal terms (Committee on Substance Abuse, 2001). Just one cigarette a day can increase the progression of atherosclerosis, while nicotine can cause the narrowing of arteries (American Heart Association, 2004). Health problems are not just restricted to the smoker, for example Gergen, Fowler, Maurer, Davis, and Overpeck (1998) found that environmental tobacco smoke (secondhand smoking) exposure increased the prevalence of asthma, wheezing, and chronic bronchitis in children aged 3 to 5 years. It therefore makes sense to stop smoking, but how is this achieved? Is it simply a matter of choice? Are publicly funded smoking cessation programs available? Is smoking actually a coping mechanism for other stresses in the neighborhood, such as violent crime? Is it a question of education; are these women not warned about the dangers of smoking, and similarly are children adequately educated about the risks in school? Even if the program participant is persuaded to stop smoking, what about secondhand smoke in the household? Many of these conditions are likely to show up as patterns on a map because they have a spatial setting; these outcomes are part of what could be called a spatial cohort. Also, several factors influencing the decision to smoke will be geographic: the state and its smoking cessation programs, the clinic and its pregnancy advice, the middle school and its classroom instruction, or the number (and location) of drug offences or violent crimes (if smoking is a coping mechanism).

Chapter II discussed the movement in public health to ecological studies which recognize that place can be as important as individual factors in explaining an outcome (Diez-Roux, 2001), and yet the use of GIS in understanding the geographic processes at work is still somewhat lacking. GIS allows us to bring these multiple layers of risk together as we search for the spatial connections of causation. For example, crime hot spots, such as drug arrests, can be overlaid onto prenatal risk hot spots. The crime patterns could be used to identify