

Chapter 1

Placing Substance Abuse

Geographical Perspectives on Substance Use and Addiction

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Abstract This chapter discusses how the concept of place and related geographic methodologies has been used in understanding health and health care, and it suggests avenues of exploration for research on substance abuse. ‘Place’ provides a foundation for understanding how substance abuse behaviors, prevention, and treatment relate to place environments from the personal to the global scale. I describe three main areas of contribution: exploring geographic inequalities in health; understanding the associations between place environments and health; and analyzing disparities in health care access and location. Each of these topics is discussed, in turn, emphasizing important themes and recent developments in health/medical geography literature and their applicability to research on substance use and abuse.

Introduction

Substance abuse is one of the most pressing health issues in the US. Defined as a harmful pattern of use of substances, such as drugs or alcohol, substance abuse has captured the attention of public health researchers and policy-makers in the recent decades. Although much substance abuse research has focused on biomedical pathways, increasingly researchers are considering how peoples’ everyday environments and the political and cultural contexts in which they live influence the prevalence and consequences of substance abuse. Exploring how place environments relate to health is the very essence of health or medical geography. Until recently, however, the linkages between health geography and substance abuse were relatively unexplored. In this chapter, I argue that geographers can contribute to research on substance use and addiction by teasing out the connections between place environments and health

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and by utilizing geographic tools and methodologies to explore these associations. I draw upon recent work in health geography to sketch out current and future directions for substance abuse research.

In health geography, ‘environment’ is used in a very broad and all-encompassing way to refer to the ‘lived space’ outside the body. It includes nature, the built environment, human social networks and interactions, local services, amenities, and institutions. It exists in multiple and overlapping scales from the global and regional scales to the personal spaces of everyday life. Place, the concept that underpins geographical research on health, builds on but moves beyond the concept of environment (Kearns 1993). Places are lived environments. They are environments infused with the meanings that people bring to them. Agnew (1987) describes places as ‘meaningful environments’. The notion of place links the spaces of everyday life with peoples’ experiences, perceptions, and well-being. Medical geographers have used the lens of place to understand a wide range of health issues from women’s experiences of multiple sclerosis (Dyck 1995) to mental health care provision (Foley and Platzer 2006) to neighborhood quality and ill-health (Ellaway and MacIntyre 1998).

Place is not just an expression of social differentiation, but an integral part of it. Social interactions and activities are structured in place. The opportunities and hazards that exist in place shape people’s lives and livelihoods. Through local institution – schools, shops, recreational, and employment opportunities – places provide the material basis for everyday life. In addition, places are sites for environmental hazards, such as air and noise pollution, and social hazards, such as crime and racial or ethnic discrimination. Social interactions within places affect peoples’ senses of belonging and exclusion. People respond differently to places and have different susceptibilities to place characteristics. Responses and susceptibilities vary with age, gender, race, ethnicity, and class, and are often framed by local cultures and economies that are rooted in place. The intersection between place exposures and socially defined susceptibilities creates the geography of risk (Jerrett and Finkelstein 2005).

At the same time, people and social institutions engage in processes of place-making, shaping, and re-shaping the built environment and the social interactions within it. “People create places and places create people” (MacIntyre and Ellaway 2003). Places are contested. Place landscapes are imprinted with signs of powerful and not-so-powerful interests attempting to craft the environment to accommodate their interests. This politics of place has important effects on health and health care inequalities.

The concept of place provides a foundation for situating substance abuse research – for understanding how substance abuse behaviors, prevention, and treatment relate to place environments from the personal to the global scale. One can think of substance abuse as a specific health outcome that is shaped by the place context of daily life, including access to resources and services, the local availability and cost of substances, social networks and cultural norms, and specific settings in the local environment that either enhance or reduce the likelihood of substance abuse. In addition, the quality, quantity, and effectiveness of treatment and

prevention programs vary from place to place, reflecting political, social, and economic processes that intersect around a politics of place. Thus, ‘placing’ substance abuse research involves looking beyond individuals to examine substance abuse and treatment in context.

Alongside the increasing interest in place and health has been the rapid development of geographic tools and methods centered around geographic information systems (GIS), but encompassing a much wider array of tools for spatial and social analysis. In addition, vast quantities of geocoded environmental and social data are available, and the supply of geospatial data from sources ranging from government agencies to satellites to GPS-tracking devices is rapidly increasing. These data, and inventive new tools for analyzing such data, provide a strong foundation for innovative place-based health research.

This chapter discusses how place concepts and GIS-based tools have been used in understanding health and health care, and it suggests avenues of exploration for research on substance abuse. I describe three main areas of contribution: exploring geographic inequalities in health; understanding the associations between place environments and health; and analyzing disparities in health care access and location. Each of these topics is discussed, in turn, emphasizing important themes and recent developments as represented in health geographic literature. This is not meant to be an exhaustive review of the literature but rather a series of signposts to point the interested reader to newer directions.

Exploring Geographic Inequalities in Health

An important area where geographers can contribute to substance abuse research is by using visualization and spatial analysis methods to explore geographic inequalities. Maps have long been essential tools for understanding health issues. From John Snow’s well-known map of cholera in 1850’s London to today’s electronic atlases of disease distribution, maps can shed light on the etiology of health concerns, such as substance abuse, and provide a geographical foundation for health policy-making. Maps reveal the sharp geographic contours of health inequalities and the associations between health and environmental/place characteristics. While mapping continues to be important in health research, advances in GIS have shifted the emphasis from creation of static maps to a more exploratory process of spatial data visualization and analysis. Gatrell and Bailey (1996) describe three classes of spatial analysis and GIS tasks, which can enrich public health research and policy formulation: visualization, data exploration, and modeling.

Visualization refers to the creation of graphical and map displays of health data. Maps are a commonly used visual tool for exploring health data, and there are many interesting recent examples of mapping of substance abuse and related health issues. For example, a map of hepatitis C in Connecticut created by Trooskin et al. (2005) shows a highly uneven pattern with concentrations in the major urban areas of the state and in places where injection drug use is concentrated. A series of maps of

disaster-related stress in New Orleans following Hurricane Katrina (Curtis, Mills, and Leitner 2007) depicts the complex dimensions of vulnerability to natural disasters and the strong ties between poverty and vulnerability. Mapping has also been used to assist field research methodologies, such as capture–recapture methods for estimating hard-to-find populations (Kruse et al. 2003). Interactive, web-based mapping is becoming increasingly popular. Online, interactive health atlases, such as the Atlas of Cancer Mortality in the US (Bell et al. 2006), make health data accessible to a wider audience and communicate geographic variation. These online atlases are designed to facilitate data querying and exploration, so that the user controls, to some extent, the map output. Visualization also includes innovative forms of display, such as cartograms (Dorling, Barford, and Newman 2007), animated map sequences (Goovaerts 2006), and traffic light maps (red-green-yellow) for identifying priority areas for health care intervention (Boulos and Phillips 2004).

Figure 1.1 maps the uneven spatial distribution of recorded drug use among pregnant women in Brooklyn, NY, based on the mothers' residential location. The data come from vital statistics birth records of all women who gave birth in 1990. Use of drugs, such as cocaine, heroin, and marijuana, was recorded at or near the time of delivery. Although it is likely that a significant fraction of drug use is not recorded, if we assume that the rate of recording error is relatively uniform across the borough, then the map provides a general sense of the residential neighborhoods in which drug use among pregnant women is concentrated. Concentrations of high numbers of pregnant women with recorded drug use appear in northern and central Brooklyn. Roughly 60% of the cases occur in high-poverty neighborhoods, indicating a strong association between drug use and neighborhood disadvantage, as observed in a previous research (Galea 2004).

Spatial analysis methods can be used to 'add value' to mapped information by making patterns clearer and easier to identify. For example, one challenge in mapping substance use at a detailed geographical scale, such as census tract, is that the numbers of events may be quite small leading to high random variability. This is known as the 'small numbers problem'. In Fig. 1.1, the small numbers problem is evident in the patchy map pattern, with zero and non-zero values side-by-side. One way of handling this problem is to 'borrow strength' by incorporating data from neighboring areas via a smoothing process. Smoothing involves moving a small 'window' across the map and calculating the incidence or prevalence of health events within the window to provide an estimate of incidence within a small, localized area. There are many different methods for spatial smoothing (Langford 1994). One important method is kernel density estimation (Bailey and Gatrell 1995). This method has been employed in several health geographic studies, including estimating geographic variation in environmental risk (James, Matthews, and Nix 2004), visualizing spatial clusters of disease (Kingham, Gatrell, and Rowlingson 1996), and evaluating immigrants' spatial access to prenatal care (McLafferty and Grady 2005). For the drug use data of Brooklyn, Fig. 1.2 displays a contour map, created via kernel estimation, of the density of mothers (women per square mile) with recorded substance use in 1990. Areas of high concentration are clearly visible as 'peaks' on the map, and the irregular pattern, as evident in Fig. 1.1, has been smoothed to reveal the overarching geographic trend.

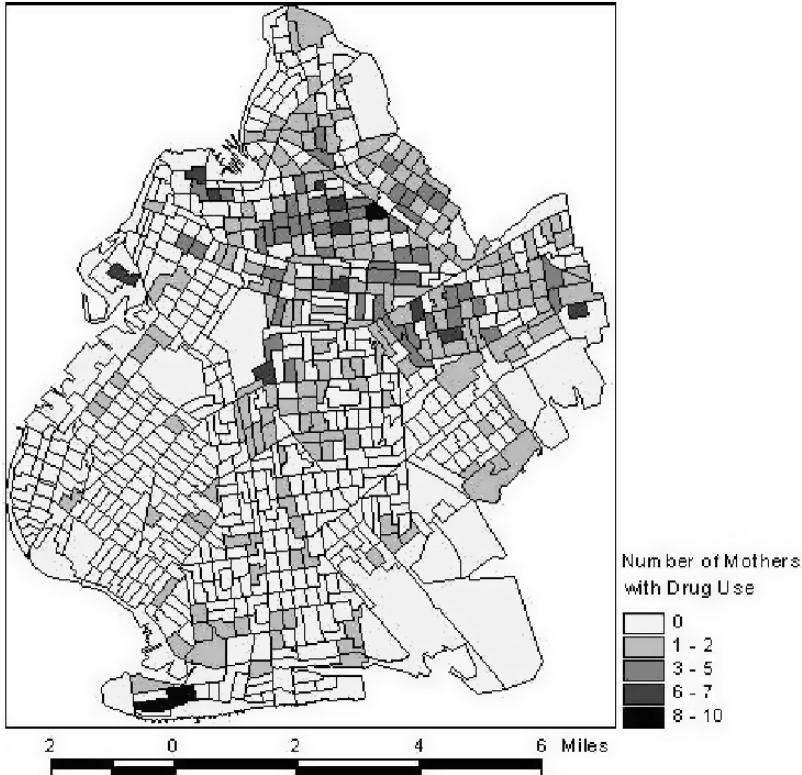


Fig. 1.1 Spatial distribution of recorded drug use among pregnant women in Brooklyn, NY, 1990

Spatial analysis tools also facilitate data exploration, helping us see patterns in data by detecting unusual clusters of health events. Spatial clusters are localized areas that contain an unusually high or low concentration of health events. Since the early 1990s, methods have been developed to scan maps searching for clusters of cases that are unusual geographically and statistically (Anselin 1995; Kulldorf 1997). From breast cancer (Sheehan et al. 2004) to birth defects (Rushton and Lolonis 1996) to hepatitis C (Trooskin et al. 2005), these methods have been widely used in exploring geographic variation in health, although they have not been widely used in examining substance abuse (an exception is Latkin, Glass, and Duncan 1998). More recent research extends these methods to address issues such as analyzing clustering in time and space (Avruskin et al. 2004), controlling for individual-level factors, such as age and socio-economic status, in evaluating clusters (Sheehan et al. 2004) and detecting clusters that are irregular in shape, such as those that might occur along roads or waterways (Aldstadt and Getis 2006; Yamada and Thill 2007). Recent studies compare the relative performance and strengths and weaknesses of different methods so that analysts can decide which method best fits a particular research or policy question (Kulldorf et al. 2006).

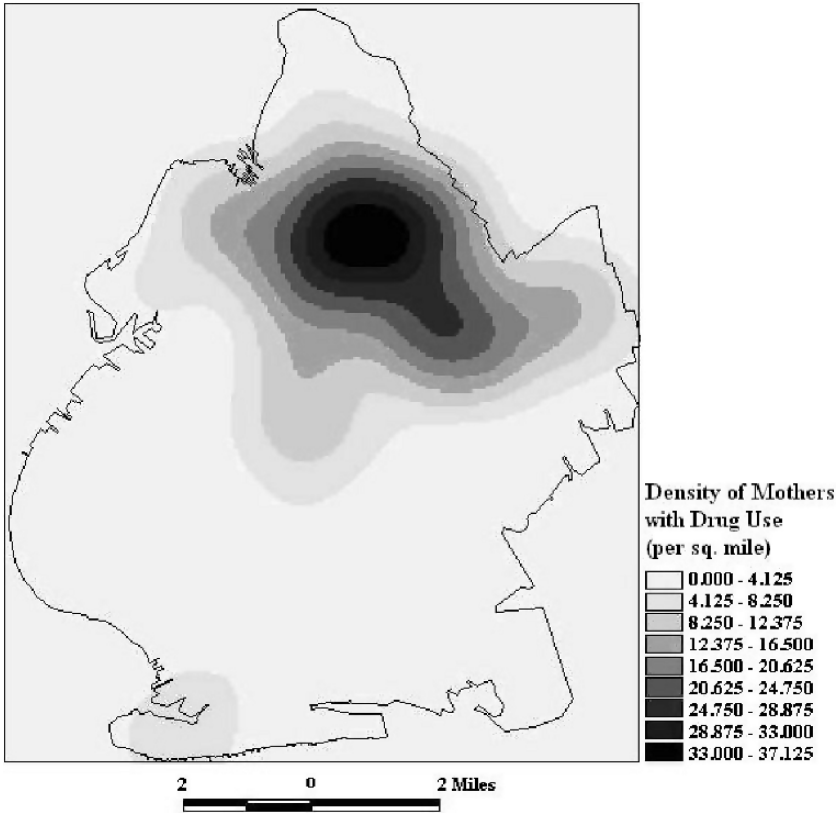


Fig. 1.2 Density map of mothers with drug use created using kernel estimation. Density refers to the number of mothers per square mile

Exploratory spatial analysis is also important for highlighting spatial processes that incorporate the time element – e.g., space–time geography. Spatial diffusion – movements of diseases and other phenomena through space and time – has long been an important topic in medical geography research. Studies on infectious diseases like measles and avian flu reveal the increasingly global exchanges of infectious agents as well as local flows and intensification (Cliff and Haggett 2004). Animated map sequences are highly effective in depicting the spread and retreat of infectious diseases. Although substance abuse is not an infectious disease in the strict sense of the word, many substance use issues undergo spatial diffusion processes as they shift from place to place across the landscape. An early study by Hunt and Chambers (1976) tracked the spatial diffusion of peak heroin use in the US as it moved over time from coastal to inland cities and hierarchically from large cities to smaller ones. In the UK, animated maps and GIS-based visualization were used to develop a system for forecasting the spatial diffusion of drug misuse (Ditton and Frischer 2001; Field et al. 2001). Analyzing changes in the spatial

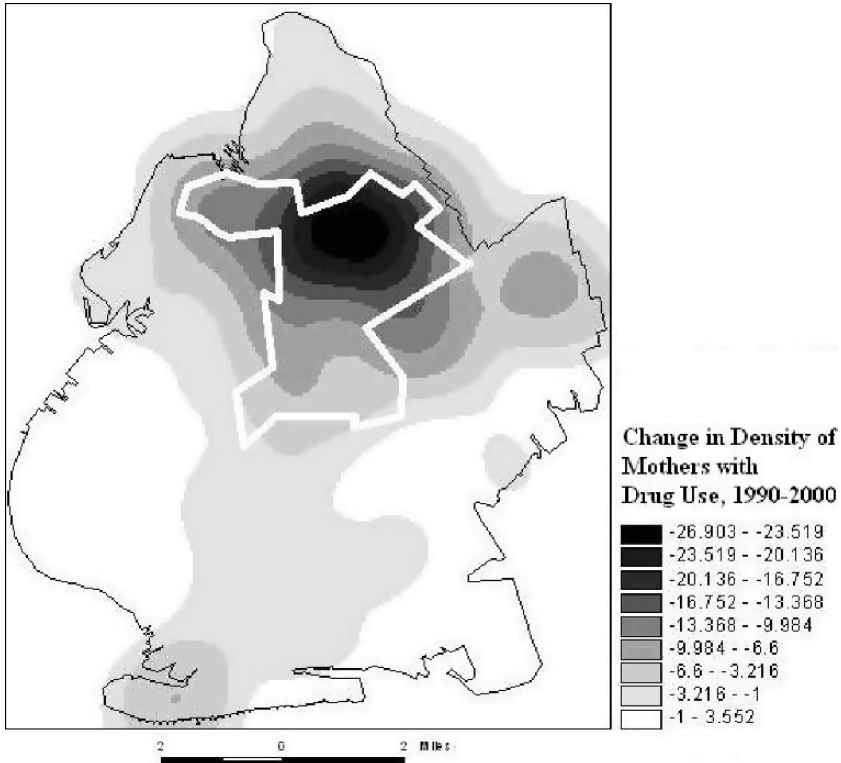


Fig. 1.3 Change in density of mothers with drug use, 1990–2000. The catchment area for the Healthy Start program is shown on the density map

patterns of drug activity over time is also valuable for studying the effects of policy changes on substance use. Fig. 1.3 illustrates the change in drug use among pregnant women in Brooklyn from 1990 to 2000. The map shows a substantial decline in drug use, especially in the areas that had the highest density of use in 1990. Superimposed on the change map is the eligibility area for the Healthy Start program, a program that provides prenatal services and education for needy pregnant women. The Healthy Start target area corresponds closely with the areas of drug use decline, suggesting that this geographically targeted program may have had a positive impact.

Exploring Geographic Inequalities: Software and Challenges

Developments in spatial analysis methods have been accompanied by great increases in the availability of computer software, some of which are free for download. Several of these have features that make them highly useful for exploring geographic data on health issues. GEODA, developed by Luc Anselin, provides a

wealth of spatial analysis tools, including linking and brushing of map and tabular data, calculating spatial disease incidence rates, analyzing spatial clustering, and spatial regression modeling (Anselin 2003). Another freely available software is SatScan, developed by Martin Kulldorf, which focuses on methods for analyzing the clustering of disease cases in space and time. There are also commercially available systems, such as Clusterseer, which include a variety of cluster detection methods and tools for spatiotemporal analysis.

Critical issues in exploring and visualizing health data include the accuracy and scale of data being represented. These kinds of analyses require geocoded health data, which includes a geographical reference (state, county, address). Such geocodes provide a foundation for mapping and exploratory spatial analysis in GIS. However, there are many sources of error and inaccuracy in geocoding processes (Cromley and McLafferty 2002). These errors may be geographically biased, which in turn bias the results of spatial analyses (Oliver et al. 2005). Furthermore, privacy and confidentiality restrictions often prevent the release of geocoded health data at a fine geographic scale. The geographic scale of health data limits the level of detail and accuracy in spatial analysis and visualization, and finer scale data enable more effective spatial analysis (Schuurman et al. 2007). However, many kinds of health data are only available at the county or state levels, which are not detailed enough to see patterns of clustering and local environmental associations. A number of different strategies have been proposed to preserve confidentiality while providing the sort of spatial detail and/or environmental associations that are necessary for geographically based health research (Kamel Boulos et al. 2005); however, these approaches have not been widely adopted in the health research community.

Geocoded data on substance use present some additional challenges. Privacy and confidentiality issues are paramount for substance use, and so data by residential address, block, or census tract are rarely made available to researchers. In addition, populations of substance users are often highly mobile and transient; some are homeless. Not only are geocoded data at a detailed scale difficult to come by, but also the residential address has little meaning or accuracy for those who are homeless or highly mobile. Field data collection about residential locations and movements through time and space is essential for understanding such populations (e.g., Walker, Mason, and Cheung 2006). Despite these concerns, geocoded information is essential for exploring geographic inequalities in substance use, and strategies that facilitate effective spatial analysis of both primary and secondary health data can enrich and enhance such geographically based research.

Understanding the Place Contexts of Substance Use

Geographers can also make important contributions toward understanding substance use and its impacts. There is growing recognition in substance use literature about the significance of contextual/environmental factors – how social, cultural, and place

characteristics affect both the incidence and intensity of substance use and its effects on individuals, families, and neighborhoods. In a recent article, Galea, Nandi, and Vlahov (2004) advocate a 'social epidemiology' framework that emphasizes social context – social networks and interactions – as a determinant of substance use. Focusing on injection drug use, Rhodes et al. (2005) look even more broadly at the 'social production' of HIV risk. They call for research investigating risk environments, "the social situations, structure and places in which risk is produced" (p. 1027). These innovative new directions intersect with the intellectual traditions in health geography emphasizing place and health. Themes within this broad area include analyzing how place environments at varying scales affect health; how individuals and groups negotiate place environments; and how place environments are constructed and re-constructed in influencing health.

The ties between place environments and health have been a central theme in medical/health geography since its inception. The classic emphasis on disease ecology has given way to a more critically informed perspective that seeks to understand the intricate ties between local, national, and global processes of health and well-being. This work acknowledges both the positive impacts of place on health and healing, especially the notion of places as therapeutic landscapes (Gesler 1992; Williams 1998), and the negative impacts associated with environmental hazards and material deprivation (MacIntyre, Ellaway, and Cummins 2002; Wakefield et al. 2001). An important theme in current research is to identify the pathways through which contextual/place factors affect health. This requires delineating salient attributes of places and determining the linkages with health for diverse populations. Research on obesity, for example, looks at features such as neighborhood walkability and the local availability and prices of healthy foods (Moon et al. 2007); studies of mental health show that neighborhood deprivation and access to health care are key determinants of hospitalization for psychiatric disorders (Almog et al. 2004). The multifactorial nature of most health issues and the varying individual responses to place make this a challenging but important area for research in health geography.

Current research highlights the importance of geographic scale in studies of health and place. Contextual factors operate at varying scales from the household and neighborhood scales of daily life to the national and global scales of political and economic processes. Health geographers have used multilevel modeling to explore the statistical associations between place characteristics at different scales and health outcomes (Duncan, Jones, and Moon 1998). Research on topics ranging from limiting long-term illness (Gould and Jones 1996) to low birthweight (Grady 2006) suggests that, after controlling for individual risk factors, place characteristics have significant associations with health risks and behaviors. Despite these important contributions, much of the research in this area has glossed over issues of scale linked to model specification. Multilevel studies often focus on the local or neighborhood scale as representing contextual effects. In defining contextual variables to represent the local scale, researchers typically utilize pre-defined areal units such as census tracts, zip codes, and states, which may have little relationship to health-related exposures and interactions. Such areal units "are

particularly sacred once they have become established, even though they later may become serious obstacles to solution of contemporary problems” (Abler, Adams, and Gould 1971).

More relevant for health research than pre-defined areal units are activity spaces – the areas in which people interact and conduct everyday activities. Figure 1.4 shows the daily activity space for a hypothetical single mother in a large city. The mother’s activity space links home, day care, work and shopping, and extends well beyond the bounds of her home census tract. Individual activity spaces are complex and vary by age, gender, race/ethnicity, and a host of individual characteristics, thus complicating the efforts to define appropriate areal units for multilevel analysis (Gesler and Meade 1988; O’Campo 2005). Even low-income populations have been found to have highly complex and relatively extensive activity spaces that do not conform well to pre-defined census boundaries (Matthews et al. 2006). Similar findings have been uncovered for homeless individuals. A study of homeless individuals in the Skid Row area of Los Angeles documented frequent trips outside the area for the purposes of maintaining friendship and family ties and obtaining social services (Wolch, Rahimian, and Koegel 1993).

Researchers have proposed several strategies for defining local areal units that better represent activity patterns and social interactions for multilevel studies. One is to ‘build’ socially homogeneous zones that approximate socially defined neighborhood areas (Cockings and Martin 2005). Zones can be created based on social and geographical criteria, and the impacts on research findings of alternative zone definitions can be easily investigated. Others have advocated using GIS to represent activity spaces based on travel patterns between home, work, and other activities. Sherman et al. (2005) discuss several GIS-based methods for characterizing activity spaces. Time is also important in people’s daily activity patterns. A time–space prism is a three-dimensional representation of people’s movement patterns through space and time. Sophisticated methods are being developed for visualizing such patterns with the use of aquarium diagrams and for analyzing the sorts of time–space constraints that emerge from these complex activity patterns (Kwan 1999). Finally, GPS technologies make it possible to monitor individual movement patterns directly through time and space (Elgethun et al. 2003). Such monitoring raises thorny questions about privacy and confidentiality, however, and analyzing the vast quantities of real-time data poses significant challenges.

Research by Mason, Cheung, and Walker (2004) highlights the importance of place-based activity spaces and social networks for substance abuse research. For a sample of adolescents in Washington DC, the authors collected data on daily activity locations and perceptions of safety and risk in everyday environments. These data were entered into GIS and used to characterize the balance of risk and protective factors in individual respondents’ local environments. A highly individualized ‘risk profile’ was generated providing key understandings for development of individualized substance use prevention programs and policy-making. This research is important not only in the detailed characterization of activity spaces but also in its efforts to describe and model risky and protective attributes of those spaces in relation to individual perceptions, meanings, and needs.

Place and Substance Use: Networks, Interactions, and Adjustments

Although characteristics of local activity spaces are clearly significant for health, the social interactions that occur in and beyond such spaces are equally important. Social capital – the advantages that accrue to individuals from social interactions – and resources are a central focus of health-related research in the social sciences (Diez-Roux 2001, Putnam 2000). Historically, social networks were strongly place-based, rooted in local activity spaces; however increasingly, these networks extend across regional and national borders, facilitated by advances in telecommunications technology. Social networks play a central role in substance abuse, and recent studies focus on understanding the connections between place environments, social networks, and substance abuse. Wylie, Shah, and Jolly (2007) describe how local meeting places can facilitate social interactions that increase the risk of substance abuse. Rothenberg et al. (2005) find that social networks for persons at risk of HIV infection are often tightly clustered in space. Although these studies highlight the importance of localized, place-based social interactions, some kinds of substance use networks that extend via phone and Internet may also be relevant.

Much research on place effects privileges the local scale, but the influences on health often extend to scales beyond the local neighborhood. Regional economies and cultures affect access to jobs, services, and social support with implications for health status. Health policies are framed at the state and national scales; access to health care is often constrained by health maintenance organizations and insurers that have complex geographical webs of influence. These linkages are often considered in studies of health care, but their effects on individual health outcomes are less well understood.

It is also important to conceptualize the relationships between place and health over longer time scales, e.g., by looking at changes over time in individual life histories, and at changes in place characteristics and individual responses to them. The effects of migration on health have been studied in a variety of contexts and in relation to the process of acculturation (Elliott and Gillie 1995). Migration imposes physical and emotional stresses, and place characteristics of host communities affect how people adjust to the displacement of migration. Substance users often circulate between residential neighborhoods and treatment facilities, and the physical and social distances between these sites have implications for treatment success. Understanding how clients negotiate safety and risk in these linked place environments is an important topic for substance abuse research.

Other kinds of place adjustment are also relevant for research on substance abuse. Illness affects how people negotiate space, and people in turn modify their place environments in their efforts to cope with the experience of illness (Dyck 1995). A qualitative study of people diagnosed with HIV shows how the spaces of daily life changed with the progression of the disease (Wilton 1996). Rather than becoming more diminished as the disease progressed, people's worlds went through cycles of

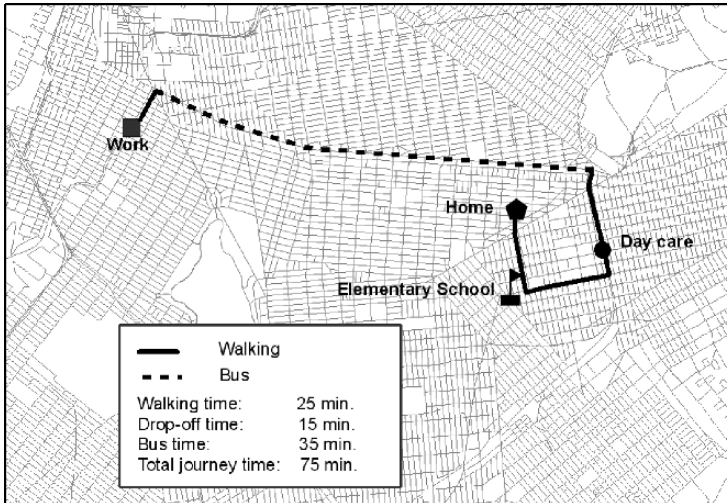


Fig. 1.4 Daily activity space for a single mother involves dropping children off at school and day care and taking the bus to work

expansion and contraction in response to illness. Health issues including addiction impact people's lives and the lives of people around them, thus altering the spaces of everyday life.

Understanding the dynamic relationships between place and health calls for innovative research methods that integrate understandings of place characteristics, social networks, human experiences and behaviors, and health outcomes. Mixed methodologies – methods that combine both qualitative and quantitative data collection and analysis – are especially important. A promising strategy is to link qualitative data, such as photographs, diaries, narratives, and oral histories, with more traditional maps and GIS data to paint a rich picture of spatial and social variation (Curtis, Mills, and Leitner 2007; Matthews, Detwiler, and Burton 2006).

In summary, GIS and other more qualitative geographic methods are greatly advancing how place characteristics are measured and how their associations with health are assessed. However, many challenges remain. One is to determine the appropriate metrics for measuring socio-environmental characteristics, metrics that need to represent environmental features and qualities that are meaningful for health. Another is to incorporate varying individual responses to those characteristics to reflect differences in vulnerability related to age, class, gender, and so on. Finally, perhaps the greatest challenge is to tease out the pathways through space and time by which places affect health and vice versa. This requires integrating geographical, social, and biological forms of understanding – a daunting but exciting challenge that will occupy health research well into the next century.

Analyzing Disparities in Health Care

Analyzing geographic disparities in health care location and access is another area where geographers can contribute to substance abuse research. Analysis of health care provision has been an important theme in health geography for several decades, and increasingly researchers are drawing upon place concepts to understand inequalities in the availability of health care and people's access to such care. The vast majority of research in this area has focused on formal health care provided by public and private institutions, although informal health care, provided by individuals, families, and friends, has begun to attract research attention. A consistent finding in geographic research on formal health care is the uneven and unequal geographic distribution of health services. Both the quantity and quality of services vary from place to place at scales ranging from the local to the global. In many countries and regions, the spatial distribution of health services follows an inverse care pattern in which the availability and quality of services is inversely related to the need for services (Joseph and Phillips 1984). Ironically, places where the need for health care is greatest are often less likely to have access to high quality care. Such inequalities differ according to the scale of analysis. A recent study of mental health services in London identified a relatively equitable distribution of services at the borough scale, but significant inequalities at the local level (Foley and Platzer 2007).

Geographic analyses of health care emphasize the effects of distance on health care access and use. The choice of health service providers and the frequency of service use are strongly influenced by distance: people are less likely to use services located far from home. This distance decay effect arises because of the time and cost of traveling long distances and people's lack of knowledge about and familiarity with services located far from home. Researchers have documented distance decay for diverse health services in a wide range of settings (Joseph and Phillips 1984). For substance abuse services, distance and travel time pose significant barriers to service utilization, recidivism, and aftercare (Schmitt, Phibbs, and Piette 2003). The frictional effect of distance varies with service characteristics, such as the size and quality of services offered, and with individual and household characteristics, such as age, income, and access to transportation (Haynes et al. 1999). People whose mobility is constrained by low income, disability, age or lack of transportation are typically more reliant than others on services close to home (Allard, Tolman, and Rosen 2003; Ricketts et al. 2001). In exploring geographical access, we need to take into account the full range of barriers that vulnerable populations face in obtaining health care, including lack of social support and economic, cultural, and time-space constraints (Young 1999).

Some health services, such as those for substance abusers, carry a stigma that confounds traditional notions of distance decay. Clients may be reluctant to use services in their own neighborhoods fearing public recognition and stigmatization (Parr 1997). Yet using services outside the neighborhood involves added travel time and cost, which discourage service utilization. Exploring the interactions between proximity, stigma, service utilization, and treatment effectiveness is an important topic for substance abuse research.

The role of distance provides a foundation for investigating geographic inequalities in access to health care and the match between service needs and resources. The gravity model, which posits that patients choose health service facilities based on a trade-off between distance and service attractiveness, continues to be important in these efforts (Yang, Goerge and Mullner 2006). Gravity models have been used to predict catchment areas for new health facilities and to estimate the impacts on travel patterns when existing health facilities close their doors. Recent work on the association between alcohol outlets and problem drinking cites gravity-like attraction as a mechanism linking problem drinkers with specific alcohol outlets (Gruenewald 2007). In the past decade, gravity models have been enhanced in a number of ways, including the use of more accurate, network measures of distance or travel time; refinements in specifying 'attraction' factors for health services; and developments in model calibration. An interesting gravity-based approach to modeling spatial access to health care is the two-step floating catchment method (Wang and Luo). A floating 'window' is moved across the map, and the ratio between service needs and the local availability of services is computed within the window providing a local indicator of service access (Fig. 1.5).

Social, economic, and political processes that affect the uneven spatial distribution of health services from the global to the local scales have also attracted attention from health geographers. These studies point out the importance of national health care policies and modes of provision in influencing the locations of health care providers and the quantity and quality of services offered. National policies such as the neoliberal 'reterritorialization' of health care in New Zealand – an effort by the central government to reassert the importance and power of local citizens in local health care decision-making, alter the balance between local and national control over health care (Prince, Kearns, and Craig 2006). At the local scale, economic and political forces embedded in local places shape the changing delivery of health care. The economic viability of health care providers is closely tied to the economic and demographic health of the communities in which they are located. Major providers such as large hospitals are a significant economic force in many communities, wielding political and economic power that extends beyond their role in providing health care. At the same time, voluntary organizations, health insurance companies, and regulatory agencies exert control over health institutions, leading to shifting and complex webs of interaction. Community groups have become more vocal in challenging decisions made by health care institutions and policy-makers, adding another voice to policy debate. These processes play out differently in different places, and place landscapes are crucial for health care evolution and policy development (Mohan 2002).

Thus, for substance abuse services, the history and politics of place are critically important in affecting geographic variation. The stigma associated with substance abuse creates a distinct place politics similar to that observed for other types of unwanted services, such as mental health facilities and hazardous environmental sites. NIMBY (Not In My Back Yard) politics lead communities to oppose location of facilities in their neighborhoods (Takahashi 1998), and there are hierarchies and levels of community opposition that reflect local cultural constructions of

Spatial Accessibility by 2-step FCA Method

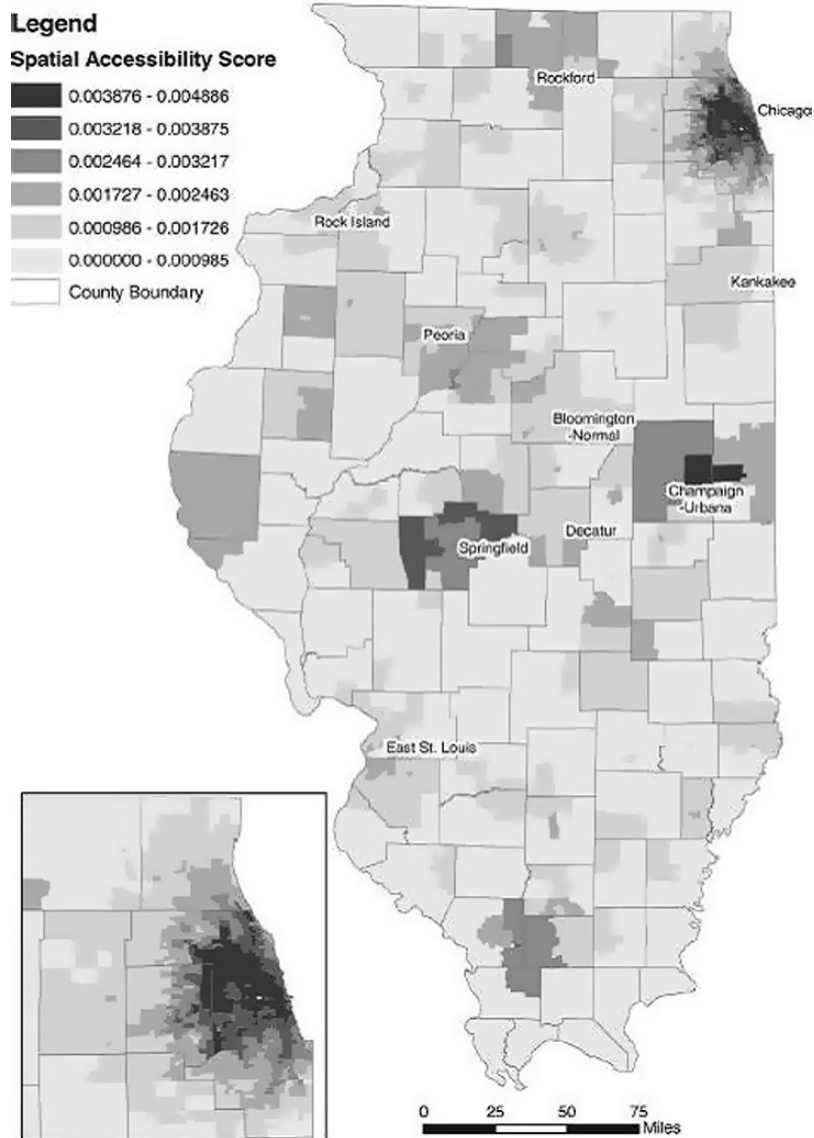


Fig. 1.5 Spatial accessibility to health care in Illinois based on the two-step floating catchment area method. Reprinted from Wang and Luo (2005)

difference (Wilton 2000). In many cases, inequalities in political power are manifest in the spatial concentration of such facilities in ‘service-dependent ghettos’ in inner city neighborhoods (Dear and Wolch 1987). In a recent article, Tempalski (2007) describes the uneven spatial distribution of syringe exchange programs across metropolitan areas in the US, a landscape where some large cities have no syringe exchange programs and other cities are relatively well served. From the War on Drugs to local NIMBY politics, she dissects the national, state, and local processes of opposition and acceptance that have denied services in some cities and ensured their availability in others. This kind of research is essential for understanding not only which populations in which places have access to harm reduction services, but also why.

Conclusion

‘Placing’ research on substance abuse involves looking beyond the individual to consider the social and geographical contexts that affect this important issue, and how people and institutions experience and modify place environments. I have identified three broad areas where insights and perspectives from health/medical geography can contribute to substance abuse research: exploring the uneven geography of substance abuse at a range of spatial scales; understanding how and why substance abuse occurs, particularly the role of place-based contextual factors; and finally, analyzing health care location and access. Each of these topics requires a mix of research tools and perspectives, from GIS-based mapping and visualization to qualitative analyses of place perceptions and experiences and the politics of policy formulation. The geographical lens encompasses diverse perspectives that when triangulated together can generate rich understandings of the ties between place environments and substance abuse. The chapters in this book illustrate the range of topics and methodologies that comprise a geographical perspective.

In conclusion, our capacity to describe and understand place environments has increased dramatically in the past several decades. This change is in large part linked to advances in geospatial technologies and methods, specifically GIS and spatial analysis, but more importantly, it is tied to new concepts and understandings about the social construction of place environments and how people experience them. These approaches have great potential for addressing substance abuse issues. Achieving this potential requires collaboration between geographers and substance abuse researchers, between social scientists and biomedical scientists – an intellectual marriage that will facilitate and enhance place-based understandings of substance abuse and its broader impacts.