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Social Epidemiology: An Integrative Research and Practice Strategy Applied to Homelessness

Julie Cwikel

ABSTRACT. Social epidemiology, a sub-type of epidemiology, provides social workers with methodological tools that can lead to informed treatment choices in dealing with complex social problems. This paper defines social epidemiology, delineates the types of research questions that can generate data applicable to social interventions, and briefly outlines some of the standard methods in use, using homelessness as an example. These include the development of empirically validated criteria for "caseness," determining incidence and prevalence and identifying the human population reservoir. The epidemiological triangle of host, agent and environmental risk factors is presented as a method of organizing available research on homelessness, and conceptualizing methods of treatment and prevention. Screening, and the evaluation of its validity using sensitivity and specificity are discussed. Finally, the use of relative risk ratios to quantify the importance of risk factors is suggested and demonstrated.

INTRODUCTION

A social worker facing a person with a problem or even a plethora of problems must have a schema to organize information that will

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lead to effective intervention. Theory and experience guide the manner in which client data are elicited, organized, and translated into the basis for intervention. Social work draws from psychology, sociology, anthropology and accumulated practice experience; however, organizing client data into a coherent intervention strategy still remains a challenging problem to the profession. Social epidemiology uses concepts matured in classical epidemiology to integrate intrapersonal, interpersonal, and environmental factors into a discrete model that points to methods of research and intervention. This article describes the discipline of social epidemiology, its major concepts and methods, and exemplifies their relevance using the pressing contemporary problem of homelessness.

Traditional epidemiological concepts have been associated with the prevention of disease and mortality, initially in the fight against infectious diseases and more recently with chronic illnesses such as heart disease, cancer, arthritis, and Alzheimer's disease. However, the utility of methods derived from epidemiology need not be limited to issues of health and illness proper. If social epidemiology is to have broad relevance in social work, it must be applicable to such populations as young and adult offenders, substance abusers, the working poor, the homeless, ethnic minorities with blocked social opportunities, and families broken by domestic violence. Effective work with any of these groups of clients requires both an individual and population perspective. Methods required to integrate the information from both perspectives and to transform these insights into practice can be found in social epidemiology. The ability to view a client's circumstances as indicative of a specific social problem rather than the expression of some isolated type of deviance is the essence of a systems-perspective on social problems (Meyer, 1983). Social epidemiology recognizes the multivariate etiology of health and social problems, expressed as host, agent and environmental risk factors, and thus shares conceptual approaches common to both the ecosystems perspective and general systems theory (Germain, 1978; Greif & Lynch, 1983; Meyer, 1983; Northen, 1987).

According to Meyer (1976) epidemiology should be as essential a source of information for social workers as it is for physicians. However, epidemiology is rarely taught in schools of social work, and its concepts and methods remain *lingua franca* only to those

who take advanced training in public health or selected combined programs in social work in health care (Coulter & Hancock, 1989; Siefert, Jayaratne, & Martin, 1992). However, social epidemiological concepts can be useful in all concentrations that include prevention, program planning, policy and research components.

DEFINING SOCIAL EPIDEMIOLOGY

Social epidemiology derives from the discipline of epidemiology, which is the study of patterns of well-being, health, disease and dysfunction in human populations and the factors that affect these patterns (Mauser & Bahn, 1974; Lilienfeld & Lilienfeld, 1980). Epidemiology, like social work, is both an integrative and eclectic discipline. Its tools are derived from other sciences including biostatistics, medicine, biology, public health, sociology and demography (Lilienfeld & Lilienfeld, 1980). Classical epidemiology developed in the investigation of infectious diseases such as cholera, smallpox, typhoid fever, scurvy, and pellagra (dietary Niacin deficiency). Health and illness are conceived as encompassing both social and physical pathology and well-being. Thus, epidemiology shares with social work the biopsychosocial model of disease etiology, in contrast with the traditional medical model.

The basic premise in epidemiology is that disease and conditions that affect the well-being of populations are more than random events; they have characteristic patterns by time, place and person. Thus, any population-based problem is *a priori* assumed to have multiple contributing causes, rather than be the result of a single factor. Symptoms, risk factors, social contacts, morbidity and mortality are described with quantitative methods, leading to the inference of etiological, causal linkages between conditions and outcomes.

Although occasionally mentioned in the social work literature (e.g., Kane, 1982; McClelland & Battle, 1984; Whitman & Hennelly, 1982), social epidemiology requires definition and differentiation from other sub-types of epidemiology (e.g., psychiatric or environmental epidemiology). Albrecht (1979) views social epidemiology as focused on practice rather than theory, within medical sociology. In accordance with this view, Lane (1987) states: "Social epidemiology brings the methods of sociology and epidemiology to bear

on the problems of the health and medical care system and of populations at risk of disease from the perspective of insiders to the health medical care system" (p. 135). While this is one approach to social epidemiology, a different emphasis was given by McClelland and Battle (1984):

social epidemiology: the systematic analysis of social problems, with identification of risk factors leading to protocols of action designed to reduce the incidence of the problem. (p. 215)

I propose a definition drawing on both approaches: *social epidemiology*—the systematic study of social conditions and problems and their risk factors and effects on the well-being, health and welfare of populations, using methods of the social sciences and epidemiology to develop interventions, social programs and policy that may reduce the extent, adverse impact or incidence of a health or social problem.

This definition emphasizes that social epidemiology recognizes that psychosocial factors may be both *antecedent risk factors* for adverse outcomes, and the *consequences or outcomes* of diseases or adverse health events (Cwikel, Fried, & Galinsky, 1990; Lane, 1987). For example, social isolation or lack of social integration has been shown to be a non-specific risk factor for a variety of illnesses including tuberculosis, schizophrenia, victims of multiple accidents, adverse pregnancy outcomes, and all-cause mortality (Berkman & Syme, 1979; Cassell, 1976; Dunham, 1961; Nuckolls, Cassell, & Kaplan, 1972; Tillman & Hobbs, 1949). However, social isolation may also be the outcome of a specific illness, particularly if it is stigmatizing, contagious, and/or results in considerable limitations in mobility or sociability (e.g., AIDS, stroke, depression).

RESEARCH QUESTIONS IN SOCIAL EPIDEMIOLOGY

Common to all investigations of social phenomena, there is a need to enumerate, and characterize the extent to which a health or social problem exists within a designated population at a specific period of time. This type of research is often called *descriptive epidemiology*. Once the phenomena has been described and enu-

merated, it is possible to proceed to research questions that are generated specifically from a social epidemiological perspective.

There are three general types of research questions that are raised in social epidemiology, and that distinguish it from classical epidemiology. They are: (1) What are the social, psychological or behavioral antecedents or risk factors of disease? (2) What are the social, psychological or behavioral co-factors and consequences of health and illness? (3) What is the epidemiology of specific social problems?

Each type of research question has spawned methods of inquiry that point towards specific types of interventions in social problems.

Social, Psychological and Behavioral Risk Factors for Disease

With the growing dominance of chronic disease as the cause of morbidity and mortality, the relative importance of social and psychological factors in the etiology of disease has increased (Glass, 1986; Lane, 1987). A combination of demographic, social and psychological factors can be relevant to the understanding of many diseases and health problems including high blood pressure, AIDS, anorexia nervosa or unintentional injury (Glass, 1986; Becker & Joseph, 1988; Molgaard et al., 1989; Cwikel & Fried, 1991). What is true for the diseases that are in today's limelight, was recognized also for decades with regard to tuberculosis, heart disease, lung cancer and psychiatric illness (Kaplan, Cassell, & Gore, 1977).

The key issue in these studies is the role of social and psychological factors in the *etiology* of disease. Therefore, in order to elucidate the causal chain, the method of choice is a prospective study design that follows a cohort of respondents over time and compares those who become ill or develop the condition, with members of the cohort who do not, in order to isolate risk factors. An example of this type of study is the oft-cited study by Berkman and Syme (1979) that showed that a low level of social network ties (the risk factor) was related to all-cause mortality (the adverse outcome) in a 9-year follow-up of Alameda county residents. In this study, lack of social integration was not shown to have a disease-specific effect, but rather a general deleterious effect on health and mortality.

Another method is the *retrospective case control design*, in which those with and without the condition are compared on the presence or absence of risk factors in the past. Alternatively, using cross-sec-

tional studies where the temporal relationship between variables is unequivocally established, etiology is elucidated using causal modeling procedures such as logistic regression, path analysis, or LIS-REL (maximum likelihood modeling).

Findings from this type of research may form the basis of screening and monitoring protocols that identify individuals or groups at high risk, so that more appropriate and cost-effective services may be tailored for them. In addition, with periodic monitoring of specific risk factors, it is possible to observe temporal trends in morbidity that may point to the need for services in the future.

Social, Psychological and Behavioral Co-Factors and Consequences of Health and Illness

The second type of question that a social epidemiologist might ask is: What are the psychosocial or behavioral syndromes that are concurrent with or are the result of specific disease outcomes? An example of this type of investigation can be found in the various psychological and behavioral patterns associated with coronary heart disease, e.g., smoking, diet, Type A, control of hostility and anger (Houston & Snyder, 1988). Here, the focus is not only on who the person is, but what they do during or after the occurrence of a disease or health problem. These investigations have led to behavioral change programs to reduce the risk factors associated with coronary heart disease (e.g., Benfari, 1981; Ornish, Scherwitz, & Doody, 1983).

There is no better current example of the intimate relationship between behavior and disease than in the behavior that precedes, accompanies and results from infection with HIV-AIDS. The primary means of control of the AIDS epidemic is the modification of sexual, reproductive, and addictive behaviors, among seropositives, high-risk groups who are not yet infected, and among the general public (Archer, 1989; Becker & Joseph, 1988; Cates & Bowen, 1989; Judson, 1989). However, identifying the high-risk behavior is not a guarantee that behavior change is possible.

As Bandura (1990) has suggested, behavior change programs for sexual behavior or any other behavior that constitutes a major part of one's lifestyle must include: information about risks, social skills required to translate knowledge into action, enhanced self-efficacy

so that the skills may be used in high-pressure, high-risk situations, and the enlistment of social supports to reinforce behavior change. Coates and colleagues (1989), for example, applied knowledge of AIDS-related behaviors in an intervention program among HIV seropositives. The study found that stress reduction training led to reductions in the number of sexual partners, but not necessarily in immune function.

The Epidemiology of Social Problems

Based on the results of research findings outlined above, we are now in a position to explore the demographic, social, psychological, behavioral, medical, and genetic/familial antecedents, co-factors and outcomes of specific social issues and problems that concern social workers. Social epidemiology has investigated the distribution of family violence, child abuse, substance abuse, unintended pregnancy, accidental injury and mortality, and the factors that influence the distribution of these problems in society (McClelland & Battle, 1984). In the remainder of the paper, homelessness is used as an example of a social problem that has increasingly garnered the attention of the social work community (see *Issues of Social Work*, November, 1989 and *Social Work Research and Abstracts*, December, 1989, March, 1990) and exemplifies the unique contribution that social epidemiology can make to social work practice. Homelessness illustrates the value of social epidemiology, precisely because it is not a recognized medical disease, despite its clear association with a variety of physical and mental health conditions. Reduction of the extent of homelessness will only be through concerted efforts of social workers together with other professionals.

SOCIAL EPIDEMIOLOGY APPLIED: EXAMPLE OF HOMELESSNESS

The first task of any epidemiologist is to define the problem, enumerate it among the general population and among specific subpopulations. Once this has been established, it is then possible to

ask questions regarding the etiology of homelessness which can lead to intervention strategies:

1. What are the risk factors for the development of homelessness?
2. What are the behavioral and psychological states that are associated and are the result of homelessness?
3. When the answers to questions 1 and 2 have been formulated, to what interventions, programs and policies does this lead?

Empirical Definitions and "Caseness"

Indicating the presence or absence of a social condition requires that social workers use specific definitions that lend themselves to empirical validation. Use of the terms "bag ladies" and "street people," while often understood colloquially, do not allow the exact enumeration and description of a population in need of services. The definition of homelessness used by Rossi (1987) is perhaps the most generally acceptable: "without customary access to a conventional dwelling or residence" and homeless persons as "persons staying in shelters or found in accessible nondwelling unit places (streets, alleys, basements) etc., and who did not rent or own a conventional dwelling, room or apartment" (p. 76). The advantage of this definition is that it includes both those residing in shelters, and outside of shelters, while excluding those who have access to housing, however marginal and tenuous (Susser, Conover, & Struening, 1989).

The acceptance among researchers and practitioners of one concise description allows social workers to designate what constitutes a "case." Case finding is imperative in order to estimate what is the current extent of homelessness, whether it has changed over time, and whether subgroups such as homeless families, or runaway teens have increased.

The challenges of enumerating a population that has no fixed address or membership in organized social institutions are manifold (Rossi, Wright, Fisher, & Willis, 1987; Susser, Conover, & Struening, 1989). Johnson (1989) suggested that by using multi-stage, random sampling strategies that include different locations where homeless persons congregate, it is possible to arrive at a representative sample.

Two methods of enumeration are used in epidemiology: *prevalence*, the number of cases of homelessness in a defined population at any given time, and *incidence*, the number of new cases of homelessness that occur in a given time period in a defined population. Data has been collected about the extent of homelessness, both at the local community level and at the national level in the United States (Burt & Cohen, 1988). Extrapolating from the various local studies reviewed, Rossi (1989) conservatively estimated the prevalence of national homelessness at some 300,000 persons each night. The National Academy of Sciences estimated that on any given night, some 100,000 children under the age of 18 were homeless, excluding those who have been forcibly ejected from their parents' home (Institute of Medicine, 1988). These are termed point (in time) prevalence estimates.

Generally, both prevalence and incidence rates are expressed as the number of cases of a certain type that occur in a designated period, such as x per 100,000 persons, per year. Based on 1984 U.S. Bureau of Census population statistics, the current estimated prevalence rate is calculated at 120 persons per 100,000, or 1.2 per 1000, per year (U.S. Bureau of the Census, 1990, series, P-25). This is a *period prevalence rate*.

Social epidemiologists ask not only about the number of cases, but the duration of the condition, in order to estimate prevalence. For example, a statewide epidemiologic survey in Ohio found that nearly 75% of the approximately 1000 homeless persons sampled reported being homeless for one year or less (Roth & Bean, 1986). Similarly, in Birmingham, Alabama, the median number of weeks homeless was 20 weeks, approximately 5 months, suggesting that many newly homeless persons find their way to the street each year (La Gory, Ritchey, & Mullis, 1990). Similarly, close to one-half of the homeless respondents in a nation-wide survey drawn from the larger cities, reported having been homeless for less than 12 months, although those with neither a history of chemical dependency nor mental illness, were most likely to report homelessness for periods of 3 months or less (Cohen & Burt, 1990). Thus, it appears that a large portion of the homeless of today are new cases, with the incidence of homelessness higher among those without specific drug or psychiatric disabilities.

RISK FACTORS FOR HOMELESSNESS: THE EPIDEMIOLOGICAL TRIANGLE

One of the basic premises in epidemiology is that no social or health condition can be expected to be the function of a single factor. The epidemiological triangle stipulates a combination of host, agent, and environmental risk factors that interact to increase the risk of a noxious outcome. The Appendix shows the agent, host, and environmental factors of both classical epidemiology and social epidemiology. As Lilienfeld and Lilienfeld (1980) have remarked, different disciplines concentrate on different sets of factors within the triangle. For example, those engaged in urban planning would be concerned with factors indicative of city conditions. A psychiatric epidemiologist, on the other hand, might be concerned with familial markers of psychiatric illness and a history of psychiatric hospitalization. While a social worker need not understand all the other disciplines, the ability to conceptualize and integrate data from other professions using the same set of concepts, stimulates both multi-disciplinary teamwork and communication between professionals.

1. *Host risk factors* both describe the person in terms of demographic features such as age, sex, and educational achievement, and include those factors that influence their likelihood of exposure (such as occupation or living circumstances), susceptibility (current states of health, fatigue or strain) or host resistance (prior experience, positive health behaviors, use of health services, personality traits). A social worker interviewing a homeless resident of a shelter might elicit information about the following host factors: demographic descriptors, history of substance abuse or psychiatric diagnosis, employment status, current relationships with significant others, current relationships with family of origin and recent housing history. The risk factors that are frequently mentioned in current research on the homeless are outlined in Table 1.

2. The *agent* is the necessary, but not always sufficient, cause of the condition. Physical agents including natural disasters such as floods, fires, hurricanes, and wars, may suddenly leave persons without a roof over their heads. However, in some cases, the agent is a part of the social environment, such as the landlord who brings

TABLE 1
Host, agent and environmental factors in homelessness

Host Factors

- sex composition (about 75% male, 25% female)
- single mothers with children
- age up to 60
- unemployed
- very low or no income
- chronic physical disorders
- history of mental hospitalization
- history of drug/alcohol abuse
- social isolation/lack of adult social supports
- history of family violence among homeless families
- history of criminal convictions and incarceration
- multiproblem, dual diagnosis
- history of occasional homelessness

Agent

- eviction from housing
- being laid off/unemployment
- estrangement from family or current relationship
- family violence
- loss of welfare or social security benefits
- natural disasters (fires, floods, hurricanes, earthquakes)
- release from institutional care/incarceration

Environmental Factors

- inadequate supply of low-cost housing
- over-restrictive rent control policy
- worsening economic conditions that increase the numbers of persons living at or below the poverty line
- destruction of welfare or SRO hotels in urban areas
- urban renewal or gentrification of older, low-rent areas
- deinstitutionalization policy
- administrative discontinuities in welfare payments
- mass immigration to urban areas of low income persons
- shortages of unskilled jobs

the eviction or building condemnation notice, the caretaker who, through sudden death or incapacitation, is unavailable to a disabled person, or the boss delivering the pink slip that heralds an episode of unemployment that may exhaust meager financial reserves.

These types of events are likely to trigger an episode of homelessness only in those who lack the personal, social, or financial resources to find alternative housing. This group constitutes the *human population reservoir* at high risk of homelessness. At best, they have a tenuous hold on low quality housing (Rossi, 1989). Rossi (1989) terms this segment of the population the "extremely poor" and discusses their vulnerability:

For the extremely poor, with no reserves of savings, no safety net of entitlements, and no credit cards, losing a few days' wages or catching a severe cold can mean losing a job, going without adequate food, or getting evicted. Events of this sort can trigger an episode of homelessness. (p. 9)

Systematic identification of the agent of homelessness, whether among mothers of young children, those who suffer from chronic illness or the elderly, can pinpoint which events or transitions lead to homelessness. If, for example, many homeless are found to have been just released from hospital or have recently lost a job, this would suggest where intervention programs should be focused.

3. *Environmental factors* render the environment conducive to deleterious effects of the agent on the host. They might include: a minimal supply of low-cost rental housing, due to either reductions in federal spending or urban renewal that had destroyed older one-room rental housing (Reamer, 1989; Rossi, 1989), or natural disasters such as fires or floods that deplete housing in urban areas, or rent-control restrictions that act to protect only those favored few who find or inherit rent-controlled housing (Bassuk & Rosenberg, 1988). In addition, environmental changes such as the influx of immigrants to urban centers, rising unemployment due to economic recession, and health and social policies such as deinstitutionalization may exacerbate conditions that precede bouts of homelessness.

THE SOCIAL EPIDEMIOLOGY OF HOMELESSNESS AND INDICATIONS FOR SOCIAL WORK INTERVENTION

Use of the host-agent-environment model lends itself to the conceptualization of modes of prevention, treatment and curtailment of the noxious effects of homelessness. Traditional advances in public health were made by three methods:

1. eradication of the agent (such as the eradication of the small-pox virus), or separating the agent from susceptible hosts (e.g., quarantine of infected individuals)
2. increasing host resistance to the agent or decreasing exposure or susceptibility (e.g., immunization, or buffering from adverse events)
3. reinforcement of elements in the environment that kept the agent in abeyance (improved housing, sanitation, clean air and water supplies)

Conceived in this fashion, social epidemiology suggests different strategies of prevention and treatment, on both the individual and policy level. While some of the agents of homelessness can be curtailed, it is quite unlikely that the agents of homelessness will be eradicated entirely. However, it is possible to build up the resistance of vulnerable persons or hosts and reinforce the elements in the social environment that keep the agent from creating homelessness. It is also possible to create a buffer for susceptible hosts, such as supervised or subsidized housing for those most vulnerable to homelessness. One might both reinforce the employable skills of a homeless individual, and ensure that they had eligibility to social security and medical benefits by repairing the tatters of the "safety net" of entitlements.

Changes in the environment may include encouraging the building and maintenance of low-cost housing, increasing the supply of unskilled jobs that are available, and developing referral mechanisms to half-way houses and sheltered houses for those with chronic health problems or substance dependency. This might be done by affecting change on the local, regional or national level of social policy.

Screening and Its Evaluation

Another method in social epidemiology that is derived from an analysis of risk factors is *screening for the risk of homelessness*. A large proportion of homeless persons have once been hospitalized, incarcerated or residents of chemical dependency treatment programs. Rossi, reviewing his own work among the homeless in Chicago and other studies, found that some 40% of homeless persons have been incarcerated at one time (Rossi, 1989, p. 165). About one quarter of the homeless in the studies reviewed had been in a mental hospital, and approximately one third had been in a detoxification unit for either alcohol or drug abuse. Cohen and Burt (1990) estimated that 43% of those who use shelters and soup kitchen have a history of either hospitalization for mental illness, or a history of treatment for chemical dependency. Bassuk and Rosenberg (1988) found that homeless mothers had, earlier, often turned to battered women shelters in coping with abusive relationships with men. Thus, many persons end up homeless after discharge from some type of institutionalization or care in a sheltered environment.

As Christ and Hayden (1989) have noted, persons who are hospitalized in either acute-care hospitals or psychiatric hospitals may find that their domiciliary arrangements unravel while they are away. They suggest a system of screening for risk of homelessness among users of institutional services. However, it is not sufficient to screen for homelessness only among those released from acute-care hospitals, since it has been shown that release from institutional care of all types can result in homelessness. It is incumbent on all institutional services to screen those being released for the resources required to prevent homelessness, as part of discharge planning. Such a screening tool might include the following items:

1. No admitting residence or address or tenuous residential status (e.g., additional adult in a family).
2. Inadequate financial resources to cover rent or some type of shelter.
3. No available friends or family who are willing to provide shelter in the community.
4. Multiple diagnosed problems including health, mental health, chemical dependency and limitations in functional capacity.

A follow-up of persons deinstitutionalized would indicate which persons did, in fact, become homeless and which did not. This information is of utmost importance in the planning of aftercare and rehabilitation services.

Kane (1982) has noted that social workers have tended to use a rather fuzzy concept of risk, and often propose screening tools without empirically testing their validity to detect the condition of concern. The standard methods used in epidemiology include the calculation of sensitivity and specificity. The *sensitivity* of a screening test indicates the ability of a test to detect a person who is in fact a case (the true positives over all those judged positives) and the *specificity* shows the ability of a test to indicate when a person is not a case (true negatives over all those judged negative). See Table 2 for an example of how the validity of such a screening test could be tested.

The rate at which false positives (and false negatives) are tolerable is a matter of professional judgment. In the case of screening for homelessness, if data collected seemed to indicate that the person would be homeless and as a result the person was referred to an after-care residential program, the negative impact is probably small. The problem becomes more severe when the consequences of having false-positive test results can bring devastating personal consequences. This is the case in having a false-positive test result for HIV-AIDS infection. In this case, the number of false positives should be as small as possible.

Quantifying Risk

How are risk factors in fact isolated and given priority for intervention? One commonly used method is the use of *relative risk ratios*. Relative risk is the incidence rate of the problem among those with a specific risk factor over the incidence rate among those without the risk factor.

Prospective research designs, either cohort studies or clinical trials can yield relative risks, while case-control studies (i.e., retrospective) yield odds ratios which approximate relative risks (Fleiss, 1981; Sackett, Haynes, & Tugwell, 1985). Either method allows the differentiation between risk factors that significantly increase the

TABLE 2
Testing the Validity of a Screening Test
Example of Screening for Homelessness

Screening Test Results	Follow-up Outcome	
	homeless (outcome +)	housed (outcome -)
homelessness indicated (test positive)	a true positives	b false positives
homelessness not indicated (test negative)	c false negatives	d true negatives

Total Sample = $a + b + c + d$, where a, b, c, d, are the numbers of persons who fall in each category at follow-up.

Prevalence of

Homelessness = $a + c / a + b + c + d$

sensitivity = $a / a + c$ = ability to identify true positives, the ability of the test to indicate the condition among those who develop homelessness. When sensitivity is low, many false positives.

specificity = $d / b + d$ = ability to identify true negatives, the ability of the test to indicate that they will not be homeless and the result is that they are indeed housed. When specificity is low, many false negatives.

(adapted from Lilienfeld & Lilienfeld, 1980; Sackett, Haynes & Tugwell, 1985)

risk of the adverse outcome and those which do not increase risk significantly.

These ratios express the rate of the problem in those with the risk factor to those without. Table 3 shows how different types of studies can yield quantitative estimates of risk that help to determine the relative importance of various risk factors in a given study.

For example, chronically mentally ill persons released from a state psychiatric hospital were followed for a year, after first classifying them as either stably housed, occasionally homeless or pre-

TABLE 3
Calculation of Relative Risks (RR) and Odds Ratios (OR)

Exposure to Risk Factor for Homelessness	Homeless Outcome	
	yes	no
yes	a	b
no	c	d

If sampling is based on exposure, as in a randomized controlled trial, or a cohort study, then use relative risk to test the impact of the risk factor:

$$a / a + b$$

$$-----$$

$$c / c + d$$

If sampling is based on outcome, as in a case-control study, then compute odds ratio: ad/bc

(Adapted from Sackett, Haynes & Tugwell, 1985)

dominantly homeless (Drake, Wallach, & Hoffman, 1989). The housing status was a significant risk factor in predicting rehospitalization. Based on their data, it is possible to show that the RR (relative risks) for rehospitalization are 1.29 times for those occasionally homeless, and 2.14 the rate for those who are homeless, using the stably housed as the index group.

An example of data that lends itself to the use of odds ratios, is the case-control study of homeless mothers compared to very low income mothers (Bassuk & Rosenberg, 1988). Table 4 shows their data recalculated in order to yield an odds ratio. The odds ratio of becoming homeless if you are a mother with a history of psychiatric hospitalization or treatment is 3.3 times the rate compared with mothers without this history.

DISCUSSION

Although some may conceive of social epidemiology as a methodology suitable only for primary prevention in social work (Whit-

TABLE 4

Example of the Possible Relationship Between Psychiatric History
and Homelessness: Odds Ratio

Risk Factor: Psychiatric Hospitalization or Diagnosis	Cases Homeless Mothers		Controls Housed Mothers		Total
With	13	a	8	b	21
Without	36	c	73	d	109
Total	49		81		130
	a x d		949		
	-----		---		
	b x c		288		
			= 3.3		

The odds of a low-income mother with a psychiatric history becoming homeless are 3.3 times higher than the odds of low-income mothers who do not have this history, chi-square = 5.08, $p < .05$.

(Data from Bassuk & Rosenberg, 1988)

man & Hennelly, 1982; Northen, 1988), it provides valuable tools for the practitioners engaged in all levels of prevention, including secondary and tertiary prevention. Social epidemiology aggregates data from groups of individuals and analyses them in such a way as to highlight risk factors for adverse health and social conditions. This analysis can be used to inform intervention with any focus, be it an individual client, a family or a community. When client information is compared with aggregate data on persons with a common problem, patterns emerge that put individual deviance into perspective (Northen, 1988). Furthermore, the aggregation of data is more common now with the proliferation of information technology in the human services, which stores client information in data bases. However, the appropriate integration of client data with population data still remains a problematic area for many practitioners. The epidemiological triangle provides a conceptual schema to organize client variables, conditions and circumstances in relation to known population risk factors.

One of the criticisms leveled against social epidemiology is that it is "atheoretical" (Albrecht, 1979). While it is accurate to say that it is both an applied method of research and a specific body of knowledge, there is a good fit between social epidemiological concepts and general systems theory and ecosystem theory. Other mid-range theories can guide how data is collected, analyzed and translated into intervention programs. For example, theories that have been drawn on in investigations of the origins of homelessness include "culture of poverty" (Bassuk & Rosenberg, 1988), social network theory (Shinn, Knickman, & Weitzman, 1991) and the stress and social resources model (La Gory, Ritchey, & Mullis, 1990). Other theoretical approaches have been suggested as guides to outreach and treatment methods such as symbolic-interaction (Blankertz et al., 1990), empowerment (Cohen, 1989) and social disaffiliation (Malloy, Christ, & Hohloch, 1990). Aside from implicit assumptions about health and illness that stem from public health theory, social epidemiologists are comfortable using theoretical knowledge that is appropriate to the issue at hand.

On the individual level, programs can be tailored to meet special health, mental health, job training, detoxification, and counseling needs of the homeless. For example, it is clear from accumulated clinical experience and from more recent program evaluations, that one proven strategy to prevent homelessness among the chronically mentally ill, is to provide a comprehensive, residential after-care program (Lipton, Nutt, & Sabatini, 1988; Lamb & Lamb, 1990). Some professions have incorporated teaching and research about homelessness into their curriculum in order to involve students in treatment and the development of services (Rothman, 1988; Weinreb & Walsh, 1990). What emerges from the social epidemiological analysis of homelessness is that while host factors may increase vulnerability to homelessness, it is the rising incidence of extreme poverty that is the major cause of contemporary homelessness. When diminished financial resources interact with a very tight low-cost housing market, unemployment, reductions in social welfare spending, then the most vulnerable segments of the society: those who have suffered from mental, physical or functional disabilities, who have histories of substance abuse and incarceration, and who have inadequate social resources, end up on the streets. To be with-

out basic shelter, one of the most stressful and traumatic of experiences, is an increasingly common experience to men, women and children in our society.

As Rossi's (1989) analysis showed, social security programs have been successful in separating the elderly from the ranks of the extreme poor, and hence the homeless. Similar steps are needed to extricate high risk adults, and young parents and their children from this harsh reality. A nation-wide effort is needed to re-weave the tattered safety net of public welfare programs in order to extricate the chronically mentally ill, substance abusers, the unemployed, and single parents from the vagaries of extreme poverty and its unenviable outcome, homelessness.

Social workers have a unique role to play in raising these issues in the appropriate national forums. In doing so, they must join forces with physicians, nurses, urban planners, and sociologists, to shape health and social policy. While a social worker need not understand all the other disciplines, the ability to conceptualize and integrate data from other professions and the use of a common set of concepts and methods stimulates both multi-disciplinary teamwork and communication between professionals. Sclar (1990) calls for a multi-disciplinary coalition to encourage a change in housing policy that will provide an adequate supply of low-cost housing. Dluhy (1990) has shown in a Florida study that a consensus exists between community leaders and managers of programs serving the homeless, on the need for construction and rehabilitation of low-cost housing, and that pressure on federal and municipal policy-makers is required to achieve that end. Dattalo (1991) offers some specific recommendations on how to redirect public funds for this purpose. Using social epidemiology, social workers can apply their knowledge to generate the will and determination among decision makers to make the necessary changes to provide homes for those who need them.

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APPENDIX

Determinants of Health and Disease in Classical and Social Epidemiology (examples in parentheses)

I. Host Factors; influences exposure, susceptibility:

1. Age
2. Sex
3. Genetics (Tay-Sachs, sickle-cell anemia, cystic fibrosis)
4. Ethnic Group, life-style group
5. Physiological state (fatigue, tension, pregnancy, puberty)
6. Marital status, type of household
7. Religion
8. Prior immunologic experience (active-prior infection, immunization) (passive-maternal antibodies)
9. Prior exposure or experience (prior coping with similar stressor, directly or vicariously)
10. Concurrent or pre-existing disease, including mental health
11. Concurrent or pre-existing life stresses
12. Behavior: preventive health behavior, maintenance of positive health habits, compliance to medical regimens, sexual behavior, drug use habits, patterns of social interaction, occupation, travel, risk-taking behaviors, personal hygiene, eating habits, leisure time activities
13. Psychological State and Personality Traits: Type A/Type B, locus of control, health locus of control, subjective health rating, anxiety level, perceptions of risk from agents (i.e., drugs, foods, sexual behavior)
14. Use of health services, screening, continuity of care, choice of health care provider, iatrogenic disease

II. Agent; etiological factors, varying by dose, exposure:

1. Nutritional: excesses (calories, cholesterol); deficiencies (vitamin, protein)
2. Chemical agents: poisons (toxic wastes, air or water pollution, pesticides), allergens (pollen, insect bites), food additives (MSG, preservatives), drugs (aspirin in children, alcohol, narcotics)
3. Physical agents: ionizing radiation, mechanical hazards at work and home, motor vehicle accidents, fires, frostbite, sunlight, floods, earthquakes, hurricanes, firearms
4. Infectious Agents: metazoa, protozoa, bacteria, fungi, rickettsia, viruses (HIV)
5. Health and social policy: scarce resources, lack of health insurance, strikes of health care professionals, abortion laws, lack of adequate low income housing, laws relating to gun control, maximum speed limit, drinking age, age of retirement, laws governing drugs

III. Environment Factors

1. Physical environment
2. Changes in environment, migration, immigration, changing time zones, institutionalization, leaving home
3. Biological environment: human population: density, crowding, social isolation, flora, fauna (pets, arthropod vectors)
4. Psychosocial environment: class-life opportunities; occupation, environmental stress, burnout, unemployment, urbanization, rapid political or social change, disasters and war
5. Political situation: cutbacks in federal funding of health, social educational programs, priorities in research, market forces on health care system (DRGs)
6. Technology and the environment: high technology medical intervention, capacity for treatment of premature infants and artificial prolongation of life, introduction of computers and information technology

(adapted from Lilienfeld & Lilienfeld, 1980, p. 47; Brilliant, 1985, p. 52)