

Chapter 1

The Role of Macrosocial Determinants in Shaping the Health of Populations

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1. Introduction

The roots of epidemiology, coincident with the origin of public health, lie in exploring how social conditions may influence health and how these conditions may be manipulated so as to improve the health of populations (Mc Leod, 2000; Halliday, 2000; Hamlin & Sheard, 1998). However, in the last half century, with the advent of antibiotics as treatments for infectious diseases, the shift from infectious disease to chronic disease considerations, and the focus on genetic determination of disease, epidemiologic inquiry has grown increasingly concerned not with the social determination of population health, but rather with the individual exposures or characteristics that influence individual risk of health and disease (March & Susser, 2006). It is the central tenet of this book that social factors that lie beyond the individual and that affect whole populations, factors that we term “macrosocial”, should remain central in our thinking about the production of health and disease, and that public health research and practice would be well served by an improved understanding of how these macrosocial factors shape population health. Setting the stage for the chapters to follow, in this introductory chapter we explore the challenges faced by most current inquiry concerned with the determination of health and argue that epidemiologic inquiry about macrosocial factors can help improve our understanding of population health and potentially guide the development of more effective public health interventions.

We note that this introduction, and this book, adopt very much an “epidemiologic” perspective. We mean this to refer to a central concern with the determination of health and disease and to inquiry aimed at understanding those factors that may influence health. Although the field formally constituted as “epidemiology” today is certainly most concerned with these questions, we do not mean to endorse an exclusive reliance on the methods of epidemiology and certainly do not intend to exclude the role of other disciplinary perspectives. As the chapters in this book amply illustrate, we suggest that disciplines such as economics, sociology, and health policy, among many others, play a central role in our understanding of the determination of health and of how those interested in the health of populations may fruitfully identify areas of intervention that can improve health.

2. Understanding the Determination of Health and Disease

The epidemiologic approach typically begins with interest in a particular disease or health indicator (e.g., diabetes or lung cancer). Concurrent with the identification of a disease, we rely on theory and prior research to identify a particular factor that may be associated with the disease. This factor is generally an individual “exposure” (e.g., a gene or mutation) or behavior (e.g., smoking). A study is then designed to determine whether there is an association between the particular factor of interest and the health outcome; once data is collected, statistical methods are employed to measure the association of interest while taking into account other possible alternate explanations.

If a rigorous epidemiologic study demonstrates an association that is biologically plausible and replicable in subsequent studies, we may venture to consider the factor in question a “cause” of disease and recommend an intervention to alter or eliminate this stated cause. Given that most modern epidemiologic research is concerned with individual behaviors or exposures, the recommended interventions are typically behavioral (e.g., smoking cessation) or pharmacologic (e.g., developing a drug to lower high cholesterol levels). This approach has arguably contributed to some of the most compelling public health success stories of the past half-century, including the identification of smoking as a risk factor for lung cancer and cardiovascular disease and low maternal folic acid intake as a risk factor for neonatal neural tube defect.

Nevertheless, there are clear conceptual and practical limitations to this dominant epidemiologic paradigm. A significant limitation is that the principal empiric tools for considering associations within study samples are best for research at the population level. Typical epidemiologic etiologic analysis calculates population rates and risk of disease and then estimates the relative rates and risks of disease in the presence and absence of a particular “exposure” of interest. While these absolute and relative rates and risks that are used to determine association are adequate representations of population-level disease occurrence, they tell us very little about individual risk of disease (Kleinbaum, Kupper, & Morgenstern, 1982; Rockhill, 2005). Statistical associations at the population level may be inconsistent with mechanisms (e.g., biological processes) occurring within individuals. This tension between epidemiologic methods of inference and individual risk is an intractable feature of epidemiologic inference based on population summary estimates and has contributed to three serious challenges facing public health inquiry today.

First, as originally and most forcefully articulated by Geoffrey Rose (1985), there are clear limitations of the epidemiologic approach in informing our understanding of the determination of individual health. Rose noted that many of our attempts to improve health are aimed at improving the health of persons at the tail end of a distribution of risk. For example, all medical screening for risk factors essentially aims to identify and intervene with “high risk” persons. There is no

attempt to reduce risk in the rest of the population, which is considered to be at “low risk” (or at least not at “high risk”). This approach might well be rational if (a) we could identify who is likely to develop disease simply by assessing their disease risk and (b) risk were binary, i.e., either present or absent. However, the first of these requisite conditions is false since our available methods of assessing where an individual sits on a risk distribution tell us little about individual likelihood of a particular disease (Pepe, Janes, Longton, Leisenring, & Newcomb, 2004; Wald, Hackshaw, & Frost, 1999). The second of these conditions is also false since ultimately exposure to risk factors is more likely continuous, and arbitrary cutoffs define and determine “high” vs. “low risks”. Populations characterized by levels of risk that are just below the “high risk” cutoff are likely at much greater risk of an adverse health condition than are populations whose risk is much lower than the cutoff, though both would be identified as “low risk”.

Second, an increasingly worrisome practical limitation is the preponderance of epidemiologic scrutiny focusing on the pursuit of single risk factors for disease in individuals. It is well established that with very few exceptions disease causation is multifactorial. However, our persistent epidemiologic focus on identifying single risk factors for individual disease has contributed to conflicting results from state-of-the-science studies that explore one particular aspect of causation while neglecting others. Unfortunately, the ever-changing catalog of risk and protective factors for disease documented in epidemiologic studies (e.g., the recent very public debate about the role of postmenopausal estrogen therapy) has occasioned substantial public confusion about the methods and conclusions of epidemiology and suggests that the quest for individual risks of individual disease may well be a reductionistic approach that has outlived its usefulness. In addition, as etiologic inquiry has become progressively more concerned with individual disease determination, this inquiry has also increasingly focused on determinants of disease that are, at least for the foreseeable future, immutable. The study of factors that predispose individuals to risk has increasingly involved genetic factors, molecular markers, and exposure to behaviors and environmental toxins that are not readily alterable. Despite several scientists’ brash promises of genetic interventions (Varmus, 2006) and the dedication of enormous financial resources to genetic inquiry, thus far there has been little evidence that genetic manipulation is a realistic near-future goal.

Third, and relatedly, both the above limitations have contributed to a rather poor record of epidemiology and public health in eliciting genuine behavior changes that “address” the burden of individual risk behaviors. The past few decades offer several examples of behavior change interventions that were demonstrably efficacious in small and well-controlled trials but not effective when applied in the general population. For example, although several epidemiologic studies show that sexual behavior contributes to risk of sexually transmitted diseases (Kaestle, Halpern, Miller, & Ford, 2005), and controlled trials have achieved changes in sexual practices (DiClemente & Wingood, 1995), sexual risk behavior remains notoriously difficult to influence at the population level (Lyles et al., 2006; Herbst et al., 2006; Herbst et al., 2005). Comparably, the

recent obesity epidemic has made it all too clear that simply demonstrating associations between greater weight and disease (demonstrated in countless epidemiologic studies during the past twenty years) is not sufficient for improving dietary habits, particularly when individual dietary habits are constrained by lack of healthy food options or safe places to exercise (Fitzgibbon & Stolley, 2004).

Particularly in the instance of enjoyable behaviors, appeals based on epidemiologic observations hold very little sway. This, of course, is not surprising given that epidemiologic studies frequently provide conflicting evidence and focus on factors which are indeed difficult to change. In addition, epidemiologic studies all too often suggest that changing single risk factors may be all important for disease prevention. However, the epidemiologic equating of being in the tail end of the risk distribution with “risk” means that persons with a particular “risk factor” may well not develop disease and others without may well indeed do so, which flies in the face of the notion of multifactorial disease causation that is intuitively and readily understood by the general public. Ultimately, these limitations “stack the deck” against epidemiologically-informed recommendations that put the onus of change only on individuals and promote goals that are, in a practical sense, unattainable. Nothing short of a colossal effort, or a dramatically terrifying disease, is required to change individual behavior. It is worth remembering that only after decades of public health effort in the Western world have population smoking rates decreased, and it took the definitive infectious disease of our time, HIV/AIDS, to change population sexual risk behaviors.

3. The Emergence of Social Epidemiology

A growing appreciation of the limitations of the individualization of epidemiologic thinking, coupled with a genuine abiding interest within public health in understanding the role that social factors play in determining health and disease, have contributed to a tremendous surge during the past fifteen years in research that takes a “social epidemiologic” approach (Kaplan, 2004). Social epidemiology emerged first from proponents of social medicine, who argued for greater consideration of social factors in disease determination (Galdston, 1947; Krieger, 2001) and subsequently went on to develop and implement studies on such social factors as gender (Perry, 1998), race/ethnicity (Baltrus, Lynch, Everson-Rose, Raghunathan, Kaplan, 2005) discrimination (Krieger, 2000; Williams, 1999), occupational conditions (Lallukka et al., 2006), socioeconomic status (Kanjilal et al., 2006) and education (Jacobsen & Thelle, 1988). Several books and papers considering social epidemiology as a discrete entity have traced its development (Berkman & Kawachi, 2000; Honjo, 2004; Krieger, 2001; Oakes & Kaufman, 2006), reviewed its methods (Berkman & Kawachi, 2000; Oakes & Kaufman, 2006) and examined the role of social factors as determinants of health (Marmot & Wilkinson, 2006). Formalizing the study of social factors within epidemiology has provided epidemiologists with an opportunity to reintroduce what likely should never have been absent from epidemiology’s domain.

This essay, and this book, clearly and explicitly are informed by a social epidemiologic perspective and a concern with social factors that influence health. However, we propose that social epidemiology as currently understood and implemented falls short of its promise. As social epidemiology has fought for legitimacy within epidemiology and public health, epidemiologists interested in social determination have published studies with increasing methodologic sophistication, including studies that mimic mainstream epidemiologic publications and methods. Therefore, studies have used ever more complex statistical techniques to examine how factors such as gender, race/ethnicity, income, and so forth may come to contribute to individual risk of disease. While this has achieved the goal of establishing social epidemiology's intellectual bona fides within the epidemiologic and public health research and practice community, social epidemiology has not done much better than other risk factor epidemiology in expanding beyond the individual-level risk of disease or in offering practicable insights. This is frequently discussed in the literature as a challenge inherent in the study of immutable social factors, such as race/ethnicity (Berkman, 2004; Bhopal, 1997).

It should be clear from our discussion here that we do not think that this challenge is unique to social epidemiology, but is rather a function of the larger problems that face epidemiology (i.e., the impracticality of evaluating individual risk factors using population based measures, the immutability of individual-level risk factors, and the attempt to isolate single causes of individual disease when the nature of causation is inherently much more complicated). However, we suggest that social epidemiology can do better and consider questions and adopt methods that overcome some of the key challenges facing epidemiologic inquiry today. Indeed, social epidemiology presents an opportunity to address both conceptual and practical limitations of an individual risk perspective and to suggest new and dynamic areas of inquiry. In particular, we argue that this can be achieved by the adoption of a population-level approach to examining the distal social factors and processes that influence health.

4. A Population Health Strategy

Margaret Thatcher famously suggested that "there is no such thing as society. There are [just] individual men and women". Our central premise is that the health of populations is as much derived from the connections between individuals and the social factors or processes to which a given population is exposed as it is a function of the aggregate persons within that population. We use the term "population health" to refer to the health of whole groups of persons, be they groups within neighborhoods, occupational class, or other levels of aggregation. Therefore, populations are not simply the sum of their individual parts, and subsequently, population health is not simply the sum of individual health. A corollary is that an individual, if she were part of another population, might have a rather different health profile, and a population (e.g., a neighborhood), if

comprised of alternate individuals and characterized by dissimilar local circumstances, might then have rather different population health.

If we accept the notion that population health is worthy of inquiry, we can then imagine solutions to the practical problems facing epidemiology. First, it follows that the epidemiologic methods that are better suited to population-level inference can be applied fruitfully to the study and improvement of population health (Rose, 1985). Second, group-level observations are not informed by the particular multifactorial causation of disease in a given individual and a population strategy avoids the flawed quest to identify single modifiable risk factors that provide (false) promises of improvement in individual risk of disease. Third, and centrally, a population strategy recognizes that population health is our ultimate goal and avoids futile attempts to change the behavior of individuals. Rather, a population strategy aims to improve population health generally, to shift the population disease curve by influencing the overall risk a population faces. From a very pragmatic point of view, this approach sidesteps the challenges discussed earlier that result in limited effectiveness of widespread attempts at individual behavior change. Therefore, a population approach might involve banning the use of escalators, increasing the likelihood that all able population members walk up an extra flight or two of stairs on a regular basis. This would be associated with lower risk of living a sedentary life for the whole population and therefore lower population rates of heart disease. Insofar as it is the aim of public health to improve the health of whole populations, the approach we propose here is congruent with this goal.

Importantly, we note that the improvement of population health is not at odds with the practical desire of improving the health of individuals. Rather, this conception suggests that individual health is so inextricably linked to the populations to which individuals belong that to think of ways only to improve individual health is ultimately a fallacy and a Sisyphean effort, a doomed and impractical attempt at improving health.

Clearly, different moral philosophical perspectives might find this perspective more, or less, appealing. A utilitarian might find the notion of populations as an undifferentiated grouping of individuals (each of whom, implicitly, are equally worthwhile) discomfiting, while this approach may be more congruent with a perspective that is primarily informed by considerations of social justice. Our argument is based strictly on an empiric conceptual and practical rationale; while we do think that there is ample philosophical reason to further buttress this argument, particularly with reference to health equity, a full discussion of the moral implications of a population health approach to epidemiologic thinking is beyond the scope of this brief introduction. We refer the reader to other published works for more on this issue (Bodenheimer, 2005; Brock, 1998; Edney, 2006; Kawachi, Kennedy, & Wilkinson, 1999; Menzel, 2003; Peter, 2001; Popay, 2006).

5. Macrosocial Determinants of Population Health

Thus, we suggest that social epidemiology can provide a conceptual lens and empiric methods for evaluating macrosocial determinants of population health. “Macrosocial” here refers to factors, such as culture, political systems, economics, and processes of migration or urbanization (all featured as chapter topics in this book), that are beyond the individual and are explicitly a function of population systems. Taking this perspective, social epidemiology would seek to understand the interconnections between and among the individuals that make up these systems and how these macrosocial factors shape the health of populations. Applying new epidemiologic methods and discipline to the study of macrosocial factors would serve to bring epidemiology back to the core concern that has long motivated public health, that is, discovering how we can improve social structures and circumstances to improve the health of populations.

Identifying macrosocial processes that influence population health can provide opportunities for interventions that influence the population distribution of risk and improve the health of whole populations, avoiding the “high risk” intervention trap into which much of our current individual risk thinking leads us. Improvements in motor vehicle safety, workplace safety, and family planning, as well as introduction of safer and healthier foods, were all recently suggested as among the greatest public health achievements of the twentieth century (Centers for Disease Control and Prevention, 1999), and all result from macrosocial interventions aimed at reducing population-level risk. An explicit focus on the macrosocial factors that underlie population health in the near future may permit us to identify, and effectively intervene on, the key determinants of population health of the twenty first century.

6. Conclusion and a Way Forward

A refocus of social epidemiologic methods and approaches to thinking about macrosocial determination of population health will not be easy. There are three likely key limitations to achieving such an end. First, with few exceptions, thinking about macrosocial factors as determinants of population health today is far from the core concern of most health researchers, including epidemiologists. Therefore, such a paradigm shift will require a substantial intellectual investment on our parts and will undoubtedly stretch our imaginations and practical capacities. Second, social epidemiologic methods are still nascent, and there is no question that a systematic consideration of macrosocial determinants of population health will require the refinement of our current methods, the development of new methods, and the judicious and careful interpretation of results from our studies. Researchers who are interested in the macrosocial determination of population health will have to make unimpeachable efforts to draw objective inferences using methods that are as robust as possible. Third, there is little doubt that change in public health, as in all human endeavors, comes slowly. We recognize

that the adoption of research questions such as the role of globalization in influencing population rates of heart disease is a substantial departure from the overwhelming majority of extant modern public health literature that influences and shapes the work we all do. In addition, given the importance of research funding in driving academic and public health inquiry, a conceptual shift predicated on thinking about the macrosocial determinants of population health would need to make substantial inroads into traditionally biomedical-oriented funding institutions to allow for the sustainable grounding of this work.

We have little doubt that with time researchers and public health practitioners will find suitable ingenuity and imagination to develop the field. In meeting all of these challenges, public health stands to benefit greatly from cross-disciplinary communication and collaboration. Insight from multiple disciplines, including economics, sociology, health policy, among many others, play a critical role in advancing understanding of population health and how to improve it. In the following sections, various authors will consider a range of macrosocial determinants that may influence population health, as well as key methodologic challenges this work faces today and in the future. Additionally, they will offer some insights into what the implications of considering macrosocial determinants might be for public health intervention. It is the intent of this book to provide a first step toward the systematic consideration of macrosocial determinants of population health. We hope that this work inspires theoretic and empiric innovation and investigation in this area.

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