Both of these suggestions—precision of conceptualization and measurement and attention to political economic context—require new attention to data and new ways of working. The Whitehall II data are a British national treasure. There is no US equivalent. On the other hand, in the United States, a number of longitudinal socioeconomic surveys are available. Several have data on function, health, and mortality. The cross-sectional National Health Interview Survey has been enriched with modules on wealth and other material resources. The Survey of Asset and Health Dynamics among the Oldest Old has been used in an imaginative analysis that considers the contributions to functional health of childhood antecedents, as well as spousal health, income, and wealth, while taking into account chronic conditions, cohort, gender, and race/ethnicity.[18] There is synergistic power in the readily available technology for geocoding and data-set linkage. Collaborations between epidemiologists and social scientists should produce conceptual synergism as well. A more difficult task is to make sure that our data can inform and shape macrolevel social and economic policy to the degree that the microlevel burden of inequality is lifted in such everyday activities as walking, bending, and carrying. □

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Annotation: Hospital, Heal Thyself

Hospitals have been an efficient place to disseminate contagion for as long as they have existed. The latest headlines regarding so-called flesh-eating bacteria—group A streptococci—scarcely rival the horror associated with the 19th-century maternity ward epidemics of childbed fever due to the same pathogen, which was being passed from mother to mother on the hands of physicians.[1] During the measles resurgence of the late 1980s, emergency rooms in urban areas facilitated disease transmission.[2] Despite sporadic cases of Ebola virus infection in the community surrounding Kikwit, Zaire, it was only after the first hemorrhagic patient was cared for at a general hospital that Ebola reached epidemic dimensions.[3] The hospital as "amplifier" has been a chronic problem. Yet if hospital settings are sometimes conducive to making people sick, they also have the potential to heal themselves. The article by Redd and Susser in this issue of the Journal[4] demonstrates the value of hospital-based operational research in addressing current challenges to the health care system. Focusing on the toll that the resurgence of tuberculosis takes on an urban emergency room, the authors use data readily accessible to emergency room clinicians to derive an algorithm that selects patients in need of isolation and spares a substantial portion of others from costly isolation. Faced with infectious diseases emergent and reemergent in an era of increasing economic constraints, hospitals should be well equipped to find creative solutions to new public health challenges. Hospitals are often replete with information—computerized or not—about patients' histories, clinical presentations, and outcomes, yet these data are rarely used to address population concerns. In 1997, hospitals may no longer be able to afford to remain data rich and analysis poor.

Economic factors are a driving force in much recent decision making at the hospital level. Patient isolation, although expensive, reduces the likelihood of in-hospital transmission of pathogens, so any algorithm that restricts the number of patients qualifying for isolation must lead to transmission rates that remain acceptable by community standards. Redd and Susser provide an example of how analytic methods applied to easily available data allow for respecting economic concerns without compromising the public interest. Since the public in question—

Editor's Note. See related article by Redd and Susser (p 1543) in this issue.

patients presenting to a public emergency room with possible tuberculosis—represents one of the most vulnerable populations, it is important to note that respecting the interests of these patients is not incompatible with addressing cost containment. This may be increasingly challenging, though, since public hospitals were providing a "good buy" in terms of health care per dollar charged long before other types of facilities got into the cost-cutting business, leaving public hospitals with limited margins to reduce operating costs compared with competing facilities.[5] Redd and Susser point out the importance of disease prevalence in determining the performance characteristics of any screening algorithm. According to Bayes' theorem, the predictive value of a screening test varies according to the prevalence of disease in a population. The same factors cited by the authors as contributing to the resurgence of tuberculosis—homelessness, immigration, and the human immunodeficiency virus (HIV) epidemic—are not static, and major changes in these influences could alter the probability that a given emergency room patient has tuberculosis.

Although the authors appropriately challenge readers to apply epidemiological methods to similar concerns, emergency care providers and others who take them up on this offer should adhere to basic epidemiological principles in designing their studies. An individual hospital, while brimming with relevant existing data, can be a problematic unit to study if the persons, place, and time under evaluation are not generalizable to the facility's future conditions. Changes in which persons seek care at a given facility can potentially compromise results of facility-based studies. Even if the prevalence of tuberculosis in the community remains stable, shifts can occur in the prevalence of tuberculosis among patients using a particular emergency room. The health care facilities that high-risk patients use can shift, as changing Medicaid programs drive patients to different providers.

The prevalence of tuberculosis among emergency room patients is apt to change over time, and not simply because of tuberculosis control measures. The algorithm described in Redd and Susser's paper assesses the occurrence of tuberculosis among persons presenting to an emergency room who are suspected of having tuberculosis. Since other respiratory infections can present similar clinical pictures, the prevalence of tuberculosis is affected by the incidence of other respiratory infections—many of which have marked seasonal variation. Thus, a facility-based study conducted in the summer months may not provide data generalizable to isolation procedures during winter months. Design of operational research should address appropriate time intervals to avoid this problem as Redd and Susser did by collecting data over an entire calendar year.

One would suspect that consideration of "place" would be trivial in the design of facility-based operational research. Yet the various mergers and acquisitions among health care institutions, and the shifts of many hospital services to community-based ambulatory centers, suggest caution is also needed in this area. Will the facility under study this year represent next year's hospital? Clearly, operational research cannot control for all eventualities, but when important changes occur in the institution—for example, in services provided or catchment population—operational protocols developed on the basis of good data from the past should be revisited to assure their continued applicability.

Computerized databases are permitting easier access to patient-level data, and harsh economic realities give an institution a major incentive to exploit these data. The skills needed to analyze such information are basic ones. Both patients and providers can potentially benefit from exploration of these data as a guide to improving individual clinical management and operational procedures. □

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