Working in a remote region of South Africa more than 50 years ago, Sidney Kark practised what many today would think of as social epidemiology. His approach was refined and disseminated across the globe by his students in subsequent decades, thereby influencing the evolution of the modern discipline. Equally important, his commitment to the health of indigenous African populations makes him one of the earliest role models in global public health.

The paper reprinted here, *The Social Pathology of Syphilis in Africans*,1 is most obviously relevant to the current human immunodeficiency virus (HIV)/AIDS pandemic. There are striking parallels between the epidemic of syphilis Kark described in South Africa, and the current, devastating spread of HIV/AIDS across the continent. He was eerily prescient in his analysis of the social conditions of the region, and population mobility in particular, as providing fertile ground for the spread of sexually transmitted infections. Today, *The Social Pathology of Syphilis in Africans* resonates strongly with epidemiologists who carry on the challenge, foreshadowed by Kark in 1949, of understanding and intervening against the structural conditions which fuel the spread of HIV/AIDS.

Sidney Kark and the community-oriented primary care movement

Sidney Kark is perhaps best known in public health circles as a pioneer of the community-oriented primary health care model.2,3 This approach was originally developed by Sidney and his wife Emily Kark during the early 1940s, when they directed the Pholela Health Centre in rural KwaZulu-Natal, South Africa. Their work at Pholela emphasized the integration of preventative and curative services. Multidisciplinary teams of health care workers sought to identify and address the causes of illness in the socioeconomic conditions of the community, in the family, and in the individual.4,5

Epidemiology was a critical component of the community-oriented primary care model.6 The Pholela Health Centre used traditional epidemiological data collection tools, such as community surveys and reviews of clinical records, to help identify the most pressing health concerns of the population, to orient preventive and curative services towards these needs, and to assess the impact of various health service interventions.7,8 Kark developed new approaches for primary care surveillance, most notably the intensive, longitudinal monitoring of the health and socioeconomic conditions of a subset of local households. In this regard, Pholela was an important precursor of modern demographic monitoring systems for community-based health and population studies.9,10

The successes of the Pholela Health Centre were recognized in the 1945 report of the South African National Health Service Commission,11 which called for the establishment of a network of health centres, based on the Pholela model, as part of the foundation of a new national health system for the country. To support this network and assist in the training of staff across disciplines, Kark established the Institute of Family and

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Community Health in Durban, which included sections devoted to epidemiology and data management, and eventually supported some 40 health centres across the region. However, the initiative was short-lived. With the election of the right-wing National Party government in 1948, political and economic support for the Health Centre model, which primarily served African populations, evaporated quickly, and the Institute gradually disintegrated. The Karks and many of their colleagues continued to refine the community-oriented primary health care approach in Israel (where their son, Jeremy Kark, continues to be a leader in applying epidemiology to public health practice), and the US.

Remarkably, this brief experiment in a remote region of rural South Africa became the training ground for a number of South Africans who went on to have a profound influence on epidemiology and public health worldwide. These included John Cassel and Guy Steuart, both of whom worked with the Karks at Pholela, as well as Mervyn Susser, Zena Stein and Samuel Shapiro, who studied with Kark at the Institute of Family and Community Health. An American student, Jack Geiger, spent an extended period working with Kark, and would later become important in developing community health centres in the US. Part of the reason for the Karks considerable impact on epidemiology and public health was that the Pholela Health Centre represented one of the earliest systematic efforts to understand and meet the health needs of African populations. Although schools of tropical medicine had been born at the turn of the century, they originated from a concern with the health needs of colonial settlers and armies rather than of indigenous peoples, and carried residues of this concern with the health needs of colonial settlers and armies. Although schools of tropical medicine had been born at the turn of the century, they originated from a concern with the health needs of colonial settlers and armies rather than of indigenous peoples, and carried residues of this heritage well into the 20th century. This perspective is important to place the paper reprinted here in its appropriate context: as part of a larger body of work to describe, understand, and intervene against the determinants of disease in a majority population that was otherwise systematically discriminated against.

The spread of syphilis in South Africa

Syphilis had emerged as a major public health concern in South Africa with the rapid industrial expansion and socioeconomic changes of the late 19th century. In addition to its high prevalence in the urban centres of Kimberley, Johannesburg and Durban, syphilis had become increasingly common in rural African ‘homelands’, including the Pholela region where Kark worked. By the mid-20th century, a host of racially-driven behavioural and genetic explanations were commonly cited to explain the distribution and rapid spread of syphilis across South Africa. In The Social Pathology of Syphilis in Africans, Kark argues instead that it was the enforced migrant labour system—a ‘social pathology’—that was fundamentally responsible for the epidemic spread of syphilis through South Africa.

Kark draws on a range of sources in his analysis of the factors driving the syphilis epidemic. Tracing the historical origins of the socioeconomic conditions facing black South Africans, he describes how the migrant labour system was actively created to meet economic demands, and institutionalized by legislation during the 20th century. Under this system, African men moved from rural homes to urban industrial centres for employment, returning to visit their families only periodically. The resulting gender imbalances are demonstrated in both urban and rural communities using census data, supplemented by evidence of male absenteeism from anthropologists working in rural areas. Finally, Kark incorporates behavioural and epidemiological perspectives to link these demographic imbalances to the spread of syphilis. He proposes that the circumstances of male migrants living in industrial centres led them to engage in alcohol consumption and sexual relations while away from their homes and families. Using data from rural Pholela, he suggests that most women with syphilis were infected through contact with their husbands, while most men were infected through contacts away from home.

Population mobility and the HIV epidemic

Kark’s analysis of the South African syphilis epidemic was probably accurate, and anticipates the spread of the HIV/AIDS epidemic throughout sub-Saharan Africa some 40 years later. Today, it is widely accepted that population mobility, and labour migration in particular, has played an important role in the spread of HIV/AIDS, particularly in South Africa. Within many countries, both the highest rates and the first occurrences of HIV infection are typically observed in trading centres and along transport routes. Social research has documented a variety of different types of population movement, including short-term and seasonal mobility as well as long-term migration, and their general associations with high-risk sexual behaviours. Epidemiological studies of highly mobile groups, such as truck drivers, itinerant traders, and seasonal labourers, have associated individual mobility with increased risk of HIV infection. In addition, there is ecological evidence to suggest that both within and between countries, higher levels of population mobility are associated with increased prevalence of HIV.

But despite the considerable body of descriptive literature from the past decade documenting the general relationship between population movement and HIV/AIDS, there are still relatively few epidemiological data on how different types of population mobility act to increase both individual and community vulnerability to HIV. Over half a century after Kark’s work, the social and behavioural mechanisms that create this association are only gradually becoming better understood.

One important recent contribution to our understanding of how migration and other forms of mobility facilitate the spread of sexually transmitted infections comes from advances in thinking about the structure of sexual networks and disease transmission. From this perspective, the association between mobility and HIV, in individuals as well as in populations, is the result of the particular characteristics of the sexual networks in which mobile individuals participate. Other, related approaches describe the population dissemination of disease by its spread from ‘core’ high-risk groups through various ‘bridge’ populations, which may include mobile groups. These perspectives have driven important advances in conceptualizing how HIV and other infectious diseases move through populations, and continuing to link these approaches to empirical data on the social and sexual networks of highly mobile groups represents an important direction for future research.
Levels of social organization in spread of HIV/AIDS

In thinking about how an enforced social change had generated the conditions for an epidemic, and the implication that social change could also be used to improve health, Kark went well beyond many contemporary descriptive writings on HIV/AIDS. His distinction between the different levels of social organization at which the syphilis epidemic could be understood and intervened against, remains a lesson of fundamental importance. He juxtaposes individual and societal-level factors as separate types of determinants, with his analysis pointing to the latter as the driving force behind the epidemic.

This part of Kark’s message for the case of syphilis has been acknowledged in contemporary approaches to the HIV/AIDS epidemic. The notion that the spread and impact of HIV/AIDS is exacerbated by particular macro-level conditions is widely recognized. For example, few would disagree that systematic social and economic discrimination hampers women’s ability to avoid exposure to high-risk situations; that poverty places access to important interventions, both preventative and therapeutic, beyond the reach of those in need; that social upheaval within countries reduces the ability of governments or civil society to respond effectively to local epidemics; or that stigmatization and the denial of human rights of the HIV-infected, and even denial of the existence of HIV itself, scuttles ongoing prevention efforts. However, the question of how to best respond to these macro-level barriers remains at issue.

Intervening beyond the individual

Kark highlights the different forms of intervention which could be deployed to address the spread of syphilis, noting that if it is the structural conditions of society, rather than individual deviant behaviours, that are primarily responsible for the spread of disease, then interventions which focus exclusively on individuals—such as ‘attempts to inculcate a re-orientation towards a healthy sexual and family life’ (ref. 1, p. 83)—are unlikely to have a substantial population-level impact. Instead, he prescribes changes to dominant structural conditions: in this case, the establishment of urban residences for the families of male workers, which could have been accomplished through removal of the various legislative barriers to the free movement of Africans under apartheid.

Today, the importance of distinguishing between varying levels of social organization in intervening against the spread of HIV/AIDS is only gradually gaining recognition. Already there are several examples of effective multi-level interventions, including the most successful national responses to the spread of HIV/AIDS. For instance, the cases of Uganda and Thailand, where epidemic levels of HIV infection have decreased in recent years, are frequently used as ‘success stories’ documenting the programmatic impact of individual-level behaviour change interventions. While the discrete causes of these successes are often difficult to identify, both of these national examples are likely to be as attributable to societal-level changes in social norms and conditions (particularly through political leadership in addressing HIV/AIDS, and/or legislative interventions to address the critical structural determinants of local HIV dynamics) as to the widespread implementation of individual-level interventions.

Similarly, Brazil’s national response to the epidemic demonstrated the fundamental importance of social change in preventing the spread of HIV, as much of the widely discussed ‘Brazilian experience’ has been attributed to structural changes and social movements which extend well beyond the scope of individual behaviour change programmes.

Even when the importance of societal causes are recognized, epidemiologists rarely consider the structural determinants of disease as mutable properties, like individual-level risk factors, suitable for intervention. In the current era of HIV/AIDS, perhaps the closest parallel to Kark’s societal thinking in this regard is seen in the writings of Jonathan Mann. Like Kark, Mann recognized the shortcomings of traditional approaches to viewing individual behaviours as being solely, or even primarily, responsible for the dissemination of sexually transmitted infections, and opted instead for a view of disease which emphasized social and economic contexts in shaping individual, community and societal vulnerabilities. Importantly, Mann saw ‘societal risk factors’ (like Kark’s ‘social pathologies’), and discrimination against the HIV-infected in particular, as fundamentally changeable elements of society. For both Kark and Mann, recognizing that the apparently immutable structural conditions of populations were in fact actively created through time was a vital part of demonstrating that certain aspects of society—whether migrant labour systems or processes of stigma and discrimination—can and must be altered to stem the spread of disease.

Surprisingly, the potential of structural interventions for HIV prevention has received only limited attention to date. Much of the response to the HIV epidemic has focused exclusively on altering individual-level determinants of disease transmission (by increasing condom use, decreasing numbers of sexual partners, etc.). But in practice, many such individual-level interventions have only had limited impact at the population level: in some settings, the epidemic appears to have run its ‘natural’ course in spite of individual-level interventions. In the framework discussed by Kark (and refined by many others since), the shortcomings of individual-level interventions in stemming the spread of HIV through populations may be explained in part, by the possibility that they fail to address the most important societal determinants of the HIV epidemic.

This neglect of structural interventions may result from confusion among scientists and policy makers about the levels of social organization involved in the dissemination of HIV, as well as from difficulties in viewing social and economic conditions as inherently dynamic and amenable to intervention. In addition to the types of discrete structural interventions discussed previously, innovative possibilities for population-level prevention interventions are being recognized with the emergence of HIV treatment initiatives for the developing world. While such possibilities are largely hypothetical, identifying and evaluating these and other interventions to address the macro-level social and economic conditions which facilitate the spread of HIV/AIDS is among the most critical challenges facing epidemiologists fighting the HIV pandemic.

References
