So-called ‘diseases of lifestyle’ are playing a major role in epidemiological transitions in many developing countries. Stratifying, urbanizing, and ageing African populations face rising levels of non-communicable diseases (NCDs). This article examines the need for anthropological perspectives on the causes, prevention, and control of NCDs, such as diabetes and hypertension, in Africa. Anthropologists have been silent on these topics in African public health for a decade or more. Community-oriented field studies on structural and socio-cultural aspects of NCDs are urgently needed. There can be little doubt of the benefits to be gained from a multi-disciplinary approach to NCD study and intervention for developing countries. However, key institutions setting the research agenda are doing so without the input of anthropologists or social epidemiologists, and without an emphasis on social science capacity strengthening in African countries. (Ethn Dis. 2003;13[suppl2]:S2-149–S2-157)

Key Words: Non-Communicable Diseases, Cross-Cultural Comparisons, Anthropology, Africa South of the Sahara

EVOLVING HEALTH DEVELOPMENT PRIORITIES IN AFRICA

During the 1990s, it became apparent that non-communicable diseases (NCDs) were playing a much more prominent part in African population and health transitions than previously thought.1,2 By 1990, for example, at least half of all people suffering from diabetes (more than 25 million) lived in developing countries.3 In East Africa, increased rates of NCDs have been linked to social change and development, rapid urbanization, and overall population ageing.3,4 One source has concluded that in the United Republic of Tanzania, hypertension already plays an important underlying role in mortality, even in rural areas.5

Combating communicable diseases such as HIV/AIDS, malaria, and diarrhea, clearly must remain the top priority for improving the health of the world’s poorest citizens.6,7 Nevertheless, the reality is that rates of preventable NCDs in poor countries have been escalating rapidly. The 1990 Global Burden of Disease study predicted that within the next 20 years sub-Saharan Africa will experience greater increases in NCD morbidity and mortality than any other region of the world.2 This suggests that the globalization of consumption patterns and lifestyle changes is introducing a new and complex dimension into Africa’s poverty/disease/health development nexus which cannot reasonably remain un-addressed by the international health community.8,9

In response to these challenges, the international health community recently set an agenda for confronting NCDs in developing countries, and in the Africa region in particular.10–12 The aim is to enhance “the capacity of countries to reduce significantly the burden of NCDs and improve the quality of life and life expectancy . . . through the efficient prevention and control of NCDs.”12 This will be accomplished through:

1. improved epidemiological surveillance;
2. a major emphasis on community-based programs of risk reduction;
3. the dissemination of low-cost case management and NCD control; and
4. increased capacity of developing-country institutions to undertake research to inform decision making.

The question then arises: which of the various disciplinary resources in international health are best situated to contribute to accomplishing this agenda? This article argues for the early inclusion of anthropologists in its formation and attainment. The focus is on hypertension, heart disease, and diabetes as NCDs of escalating importance in the African context. It should be noted that these conditions are not the only non-communicable conditions of public health importance on the continent. Unipolar major depression, for example, is predicted to become the single largest cause of disability-adjusted life years (DALYs) lost globally, and to dramatically increase in importance in sub-Saharan Africa early in the twenty-first century.13 In contrast to mental health,14–16 however, hypertension and diabetes in Africa have been virtually unexamined by anthropologists and other social scientists.
The 1990 Global Burden of Disease study predicted that within the next 20 years sub-Saharan Africa will experience greater increases in NCD morbidity and mortality than any other region of the world.2

A LACK OF ENGAGEMENT IN THE AFRICAN CONTEXT

In the African context, key conceptual questions must be asked about the social and cultural determinants, management, meaning, and impact of emerging NCDs. A search of several online databases using combinations of MESH search terms such as “cross-cultural comparison,” “anthropology,” “hypertension,” “blood pressure,” and “diabetes,” yielded no significant research on social and cultural aspects of NCDs such as hypertension and diabetes in Africa for at least 10 years. To date, anthropologists who have engaged in the escalating discussion about globalization and health inequalities have failed to engage these issues as they pertain to common NCDs.17,18 Thus, this new agenda’s lack of a social science perspective, and, more specifically, an anthropological one, is not solely due to lack of interdisciplinary spirit on the part of agenda-setters.

In Africa, as elsewhere, confronting the context of risk in which NCDs are taking hold will be central to the success of the international health agenda as outlined above. Understanding the social and cultural basis of health, healing, and population change in Africa will be no less central to these public health challenges than it has been in the past.19,20 Contextual forces, such as history, political economy, gender, and cultural beliefs about the nature of good and ill health cut across everything from designing improved epidemiological surveillance of NCDs to health education and the design of cost-effective health services.

Experience from the North in NCD prevention has shown that expensive community-based initiatives for risk behavior modification have generally failed, or met with only modest success.21 This includes at least one intervention with a cross-cultural focus, which included the participation of target communities in design and control strategies.22 A variety of factors may account for the lack of significant measurable progress. However, those involved in community intervention studies have concluded that “they may have underestimated the complexity of community dynamics, the intricacies of formal, as well as informal, community structures, and countervailing societal and economic forces . . . Obviously, we need a much better understanding of community forces that influence change.”23 If this concern can be raised for community-based approaches in developed countries after decades of planning and effort (not to mention tens of millions of dollars in research funds), clearly it can be addressed at this comparatively early stage with respect to developing-country NCD initiatives.

Therefore, a multi-disciplinary effort that includes an anthropological perspective would seem an obvious course to adopt. Anthropologists should involve themselves in the early stages of this emerging effort rather than waiting to be called on to explain failures and unintended consequences of well-intentioned but imperfectly conceived programs, as has too often been the case in the past. The sub-fields of cultural, medical, nutritional, and demographic anthropology and human behavioral ecology can bring vital perspectives to both applied and theoretical problems in confronting the determinants of NCDs in Africa (Table 1), as they have for infectious diseases, including malaria, diarrhea, and HIV/AIDS.24-27 As one review of epidemiological and anthropological evidence on hypertension argued almost 20 years ago, “socio-cultural influences should be the predominant focus and concern of public health.”28 In the African context this call has yet to be answered.

Although it is beyond the scope of this article to include an extensive review of contributions made by social scientists, and anthropologists in particular, to NCD work in developing countries outside of sub-Saharan Africa, even a basic familiarity with these fields should be adequate to begin the dialogue. The remainder of this article begins such a discussion; it does not claim to be an extensive review, or to treat comprehensively any of the many com-

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<th>Table 1. Some areas amendable to anthropological research and intervention in NCDs in Africa</th>
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<tbody>
<tr>
<td>Culture change</td>
</tr>
<tr>
<td>Explanatory models of emerging chronic diseases</td>
</tr>
<tr>
<td>Belief systems and social structures affecting tobacco and alcohol use</td>
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<tr>
<td>Diet and obesity</td>
</tr>
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<td>Exercise</td>
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<td>Genetic, behavioral, and psychosocial adaptation</td>
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<tr>
<td>Health beliefs</td>
</tr>
<tr>
<td>Development of empirical and culturally appropriate ‘lifestyle’ and ‘stress’ concepts</td>
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<tr>
<td>Socio-economic status and poverty</td>
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<tr>
<td>Urbanization</td>
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<td>Cost-effective interventions</td>
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<td>Improved epidemiological surveillance of health education</td>
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<td>Patient-focused and home-/household-based programs of disease management and care</td>
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plex issues raised. (For a review of anthropological studies of hypertension, see Dressler’s recent contribution.29)

A HOLISTIC APPROACH IS REQUIRED

Social anthropologists and social epidemiologists adopt a ‘holistic’ approach to phenomena under study, believing that the wider cultural, social, political, economic, and historical context surrounding the rise of any disease is important to its full understanding. Medical and demographic anthropologists usually include local disease ecologies and demographic conditions, as well as major determinants of health (such as social and economic stratification), in this holistic view. Social, cultural, political, and economic forces are also woven into the health system itself, encompassing the relationship between patients, families, and medical practitioners, whether they be ‘modern’ or ‘traditional’.20,30,31

Many epidemiologists and anthropologists would see the rise of NCDs as rooted in health transitions, and share the basic premise that such transitions are shaped locally by rates of fertility change, the distribution of risk factors, and by the health system’s responsiveness.32 Risk, a malleable concept in epidemiology,33 is usually defined in terms of variables associated with individual vulnerability. Many social scientists have criticized this as conceptual reductionism, terming it the ‘epidemiological fallacy.’ Epidemiologists studying determinants of cardiovascular disease in Europe and North America are increasingly adopting analytical techniques that allow for multiple and hierarchical levels of variation (such as multi-level modeling). This is an implicit acknowledgment of the need to redress reductionistic concepts of risk, and represents approaches to quantitative data to do so.

A more anthropological or social epidemiological concept of risk,34 by contrast, would encompass structural and social vulnerabilities, as well as biological and behavioral ones. Within such a health transition perspective, anthropologists would draw a wide circle around the notion of ‘risk’ and ‘risk factors.’ In particular, they would explore how the rise of NCD risk reflects the changing social and economic position of certain groups and individuals relative to other members of society. In this model of risk, structural, environmental, and individual forces would all receive consideration in the design of NCD intervention and policy. This holistic ‘upstream’ view, which is fundamental to public health, has yet to be widely applied to NCD work in Africa.

Early cross-cultural comparisons of blood pressure and socioeconomic status, for example, suggested that risk could fruitfully be explored through examining variables such as ‘level of engagement with cash economies,’ or ‘levels of economic competition’.35 As one study of social status and blood pressure in the Caribbean concluded, “linkages and interactions between the macro and micro need to be incorporated systematically into the rapprochement of political-economic and human biology.”36

Expressed another way, anthropologists should seek to understand how globalization, local economic development, and urbanization, change the basic conditions of day-to-day life for certain groups in society. These factors influence such mundane practices as what people eat, how they get exercise, and what non-food substances they use—all of which affect risks of developing conditions such as hypertension, diabetes, or heart disease, as well as affecting how people respond to falling ill. In the study of HIV/AIDS in Africa, this approach has sometimes been called ‘ecological’ or ‘environmental’.37,38 Ecology also serves as a ‘master’ metaphor for some current directions in social epidemiological theory.39 With the concept of culture being the only major exception, the foregoing summation of an anthropological approach to NCD (albeit greatly simplified) concurs with recent theoretical frameworks for globalization as well as health and social epidemiology.

Culture is often evoked as a reason for the failure of interventions, or as an obstacle to their success; however, even in contemporary theoretical frameworks, the concept fails even to gain a mention.39,40 Without the more active engagement of anthropologists in the area of public health praxis, the culture concept—a key element of context—will remain under-theorized, a ghost in the machine that will hamper professional understanding of the manifestations of conditions of interest, and ways to address their root causes. A brief example follows.

RISK AND AFRICAN ‘MALADAPTATION’

Implicit theories of culture pervade the epidemiological literature. Most of those familiar with contemporary research on AIDS, in particular, are at least sensitive to this concern. There is a strand of the AIDS literature that is both relevant to NCDs and illustrative of the need for anthropological engagement; this strand concerns ideas about culture change and adaptation to modernity.41 The example may be apt, given that AIDS is not only a chronic disease, it has often been portrayed (like some NCDs) by both international health experts and local populations in Africa as ‘a disease of development.’41,42

The oversimplification of African adaptation to modern life was evident in the models of epidemiological risk and control that dominated the scientific understanding of AIDS for nearly a decade.43 These models were based upon naive assumptions about African sexual beliefs and practices. In this regard, epidemiologists tended to portray risk in 2 different ways: as either a matter of indi-
Anthropologists and historians were quick to point out that this latter formulation of epidemiological risk and vulnerability was antiquated. Since the colonial era, 'culture' in the village context was seen as a reactionary set of beliefs hindering development, holding people back from becoming modern.66-69 Culture was also viewed as a reservoir of medical misconceptions, making communities resistant to healthful change. However, when Africans made the jump to 'modern' settings, such as cities and industries, medical researchers perversely denigrated or pitied them for having 'abandoned' or 'lost' their culture, a state that rendered them more vulnerable to disease.58

Since at least the mid-1900s, Africans were seen, in an epidemiological context, as being stranded in a conceptual no-man's land between modernity and tradition without a clear set of principles that might protect them from the unhealthy risks of living in cities and participating in wage labor economies.47,50,51 As an extension of this simple view of adaptation, concepts such as 'urban' vs 'rural,' or 'modern/Western' vs 'traditional,' were juxtaposed as if they were clear-cut dichotomous variables, when they were not.52

These concepts persisted into the era of AIDS research and control, covering too much conceptual territory with too little sociological rigor. They have played such a predominant role in Western studies of change in population health in Africa, that African clinicians and epidemiologists have begun to apply them to NCDs. "If one considers ecological urbanity as a continuum from rural to urban, the information obtained therefrom supports the thesis that [chronic heart disease] is a function of Westernization or social sophistication."53 If left unchallenged, these views may become embedded in the conventional epidemiological wisdom about NCDs among Africans (or Americans of African descent54), as they did in the case of AIDS.

It is dangerous to apply a naïve maladaptationist cultural theory to research on NCDs and risk in health transitions in Africa because, as seen with the study of AIDS, such a theory neglects to include a thorough assessment of social structures and meaning. These are issues that have proved central to understanding health and illness in Western settings. In the case of AIDS, these issues have been explored most extensively in health transition,19 or 'culture and political economy,' approaches.55-57

This is not to say that studies of adaptation and modernization should be excluded from the agenda; however, they must be framed with theoretical rigor. Within anthropology, the subfield of human behavioral ecology, for example, can help refine the concept of adaptation as it relates to modern settings and NCD risk. Propositions that "the anthropological evidence . . . [suggests] . . . that human maladaptations in affluent society are due to a dissonance between the modern culture and the evolutionary legacy"28 may, thereby, be framed as testable hypotheses and investigated as such. When reinforced by careful ethnographic research, concepts of modernization, stress, and adaptation, have offered useful insights into NCDs in the Americas and Samoa.29 Such approaches could be extended to research in sub-Saharan Africa.

APPLICATIONS OF ANTHROPOLOGY TO NCD PREVENTION AND CONTROL

A cultural and political economy approach is central to understanding the root conditions of NCD transitions and structural risk in Africa; however, anthropology can also contribute to NCD prevention and control. Some familiar concerns about anthropology in public health are that 'traditional' ethnographic research takes too long, rarely points to clear therapeutic or preventive interventions, and is usually too culturally or geographically specific to be generalizable. Again, the experience of anthropological involvement in confronting AIDS should lay most of these concerns to rest.58-63 Further, as research on NCDs from non-African settings has demonstrated, anthropologists can collaborate effectively, both in model building and hypothesis generation, and in the design and evaluation of interventions. Researchers in the Americas have produced a growing literature on cultural and contextual aspects of NCD-related belief and behavior. A great deal of this work has been conducted among disadvantaged or marginalized populations, including American Indians in the United States, Canada, and the Caribbean.22,29,36,64-80

Explanatory Models and Qualitative Research on the Experience of NCD

One of the most common ways anthropology has been used to improve the design of NCD care in non-African settings has been the application of Kleinman's concept of 'explanatory models.'71 The study of explanatory models, or 'cognitive domains,' of illness has been part of medical anthropology since the 1980s. These terms refer to concise statements of illness beliefs, from both professional and lay sources, collected using ethnographic or qualitative methods. They have been proposed as standard techniques for clinical NCD work in the United States82,83 and standard methods for utilizing them to conduct comparative work in international health have been developed.84

Despite their widespread application, we know almost nothing about local concepts and self-perceptions of NCDs such as hypertension and diabetes among Africans, or about explana-
tory models and beliefs regarding etiology. Nor do we have information about how gender informs the experience of these illnesses; treatment seeking in the context of plural healthcare systems; concepts and practices of local providers; and long-term household or family impact and coping strategies.

The study of explanatory beliefs about NCD causes and care also offers opportunities for addressing the patient/practitioner relationship. This will be important to both improving clinical medical services, and to working with traditional healers, who are often in a better position than clinicians to provide more psycho-social support in the NCD context. In an era of rapid development and social change, cultural meanings and behavioral patterns associated with good health, as well with ill health and disease management also will change. Indeed, anthropologists have documented ways in which the most fundamental ideas about the human body are informed by cultural values, thereby changing over time.

Development of Lifestyle and Stress Concepts

The concepts of ‘lifestyle’ and ‘stress,’ like those of culture and risk, are poorly operationalized in the developing country NCD literature of the maladaptive viewpoint, and so are of limited utility. As with ‘culture,’ the lifestyle concept often functions as a catch-all category for a set of risk factors assumed to be interconnected, and to relate to some imagined scale of modernity. Political economy and powerlessness cut these ideas implicitly; we need to make these concepts more explicit, empirical, and measurable. These risk factors include urban residence, strained social or kinship networks, lower levels of physical activity, greater likelihood of cigarette smoking, or consumption of fatty food. Since 1963, anthropologists in South Africa have demonstrated that a simple notion of lifestyle is unlikely to prove fruitful for the understanding of variations in blood pressure. More nuanced understandings of adaptive strategies and coping in the complex world of South African apartheid were required.

Dressler and colleagues have developed the lifestyle concept in research on socioeconomic and cultural dimensions of hypertension in the Americas. This has entailed the measurement of ‘lifestyle incongruity,’ a model in which individual differences in social and psychological characteristics are related to large-scale processes. Their aim is to connect upstream forces with downstream outcomes in a way that is both biologically and sociologically plausible.

As an extension of concepts of changing lifestyle and stress, social cohesion is also relevant in assessing risk of NCDs in rapidly changing developing country settings. A breakdown of perceived levels of social cohesion may relate to both NCDs, and to an increased sense of vulnerability to forces beyond the individual’s control. For example, social class differences in blood pressure among Jamaicans were mediated by perceived levels of social support for men, and by economic stress for women.

The exact pathways by which stress, lifestyle incongruity, lack of social cohesion, or relative powerlessness, might lead to the development of chronic diseases are not understood. Concepts such as ‘aloastasis’ and ‘aloastic load’ refer in a general sense to the toll taken on specific bodily systems due to chronic over- or under-stimulation. Such attempts to locate and measure the ways in which social and cultural stresses can be directly linked to pathological outcomes, even to pinpoint the physiological processes that mediate between body systems and environment in this way, need a great deal of theoretical development to be both physiologically and sociologically plausible. Nevertheless, there are tantalizing findings from research on the physiological and adrenocortical responses to chronic stress, and to change in social status, among both humans, and non-human primates. While not of immediate impact for primary prevention or control, these areas of research may soon point to pathways that mediate physical responses to stress in conditions of relative and absolute deprivation. This, in turn, might some day help to explain how NCDs can become burdening diseases of the poor, as well as the rich.

Locus of Control and NCDs

A common hypothesis is that those who perceive the cause and course of their illness to lie beyond their personal influence may adhere poorly to treatment; however, the theory was tested cross-culturally in the area of diabetes with inconclusive results. This notion of ‘locus of control’ has been applied in clinical anthropology in the United States, and in cross-cultural research on both diabetes and hypertension. A group in Yugoslavia, for example, worked to strengthen the sense of social support for elderly people with hypertension. They identified culturally relevant institutions upon which to style their efforts, and the resulting self-help groups met with some success. This approach may be an extremely important one in the African context. Many cultural theories of disease causation in Africa locate the etiology of sickness, at least in part, as beyond individual control. Thus, at a simple level, one may hypothesize that in social settings where illness causation is strongly associated with the malevolent actions of others it may be difficult to motivate wide-scale preventive behaviors or to sustain participation in treatment plans or self-care initiatives.

Nutritional Anthropology

Research on diet and nutrition are obviously crucial to an NCD prevention and control agenda in Africa. Maladaptationists are correct insofar as they perceive that contemporary views on
NCD-related risks are connected to the past. In order to make this more than a platitudinous observation, anthropologists can observe and analyze the changes in the uses and cultural perceptions of salt, sugar, tobacco, fat, and alcohol.\textsuperscript{95} They can also probe the very meanings of modern consumption and commodities,\textsuperscript{88} specifically in relation to NCDs. ‘Traditional’ notions of body image and associations among fatness, fertility, health, and wealth, for example, are virtual stereotypes in Africa. These need to be unpacked in specific contemporary settings with regard to ideas about the life course, marriage, advertising, and mass media, and the effects of wealth upon individual behavior.\textsuperscript{96} A richer understanding of this social/cultural biological nexus complements a culture and political economy approach and can clearly inform programs of primary prevention.

\textbf{CAPACITY IS SCARCE, BUT OPPORTUNITIES EXIST TO STRENGTHEN IT}

The Global Forum for Health Research is committed to addressing what it has termed the ‘90/10’ imbalance in resources for research on health issues: 90\% of global resources are spent on investigating problems affecting 10\% of the world’s population. The successes met by these efforts should not merely be directed at issues, but also at the specific strategies for researching them through a range of disciplinary perspectives, including anthropology and other social sciences. Social sciences, and the strengthening of developing country capacity, not only in the areas of demography, epidemiology, and information technology/data systems, but also in bio-and social statistics, anthropology, sociology, and economics.

The needs are too great to be met by this channel alone, and those responsible for supporting social research capacity development focused on the leading infectious diseases should consider carefully the looming needs for these perspectives in coming health transitions in Africa.

\textbf{CONCLUSIONS}

While socio-cultural issues will clearly affect NCD control, social science perspectives have been absent from both policy statements and action plans. In the new domain of NCD control in the ‘tropical disease’ context, the emphasis on community action should be matched with a commensurate commitment to explore the complexities of community life. Local researchers and practitioners should be at the forefront of these efforts.

It is hoped that the public health community concerned with the prevention and control of NCDs in Africa will be quick to embrace the involvement of anthropologists and other social scientists. Without the full partnership of anthropologists, sociologists, geographers, historians, social demographers, and micro-economists, efforts to confront NCDs run the risk of repeating past mistakes.

\textbf{ACKNOWLEDGMENTS}

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I am also grateful to the members of the AMMP and ANSA Teams (members identified at www.ncl.ac.edu/ammp/teamset.html and www.ncl.edu/hopit/hopit-ansa.htm), and to the community members who have participated in the AMMP and ANSA projects. This publication is, in part, an output of the Adult Morbidity and Mortality Project of the Tanzanian Ministry of Health, funded by the UK Department for International Development (DFID), and implemented in partnership with the University of Newcastle upon Tyne. The views expressed are not necessarily those of DFID. Funding for the Action on Non-Communicable Disease in Sub-Saharan Africa (ANSA) project is from the European Union.
REFERENCES


ANTHROPOLOGY AND NCDs IN AFRICA - Setel


