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ISSUES IN BRIEF

The Changing Shape of Malnutrition: Obesity in sub-Saharan Africa

Arianna Fogelman is a doctoral candidate in the Department of Anthropology at Boston University and was a 2009 Pardee Graduate Summer Fellow. She is currently conducting field research on the intersection of local foodways and global processes in a fishing village in northern Mozambique. An expanded version of this paper received an Honorable Mention for the 2009 Christine Wilson Award from Society for the Anthropology of Food and Nutrition, a section of the American Anthropological Association.

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Arianna Fogelman

Malnutrition in the developing world is changing, and these demographic and epidemiological shifts are in need of urgent attention. Specifically, "malnutrition" — improper or inadequate diet — is increasingly a function in the developing world not of undernutrition, but of overnutrition. Consuming significantly more calories than are expended, and a diet high in refined carbohydrates, fats, and sugars can alter enzyme levels, cause tissue abnormalities, and lead to organ malfunction. Being "obese " — clinically recognized as having a Body Mass Index (BMI) ≥ 30 — can increase an individual's risk of developing Type 2 diabetes, cardiovascular disease, hypertension, stroke and certain cancers (CDC 2009). This paper discusses the causes and consequences of overnutrition in sub-Saharan Africa, highlighting rural/urban connections, notions of personhood, and dietary conservatism as important factors in understanding and addressing the growing epidemic.

The "Nutrition Transition"

Why are people in developing countries becoming overnourished? The answer, according to nutrition expert Barry Popkin and a growing body of literature, is development itself. Individuals in developing countries are increasingly living in urban areas that facilitate a sedentary lifestyle — formal employment is low in energy output, daily errands are facilitated by motorized vehicles, and television provides a steady stream of idle entertainment. Though individuals in urban contexts typically require fewer calories than their rural counterparts, they often consume the same or even a greater number of calories. This is facilitated by the internationalization of food production, through which processed carbohydrates, meats, vegetable oils, and refined sugars have become increasingly available worldwide, and at drastically reduced prices. In 2003 a dietary fat content of 30 percent, the maximum recommended by the Food and Agriculture Association (FAO) for persons with a sedentary lifestyle, required a per capita Gross Domestic Product (GDP) of just $281.

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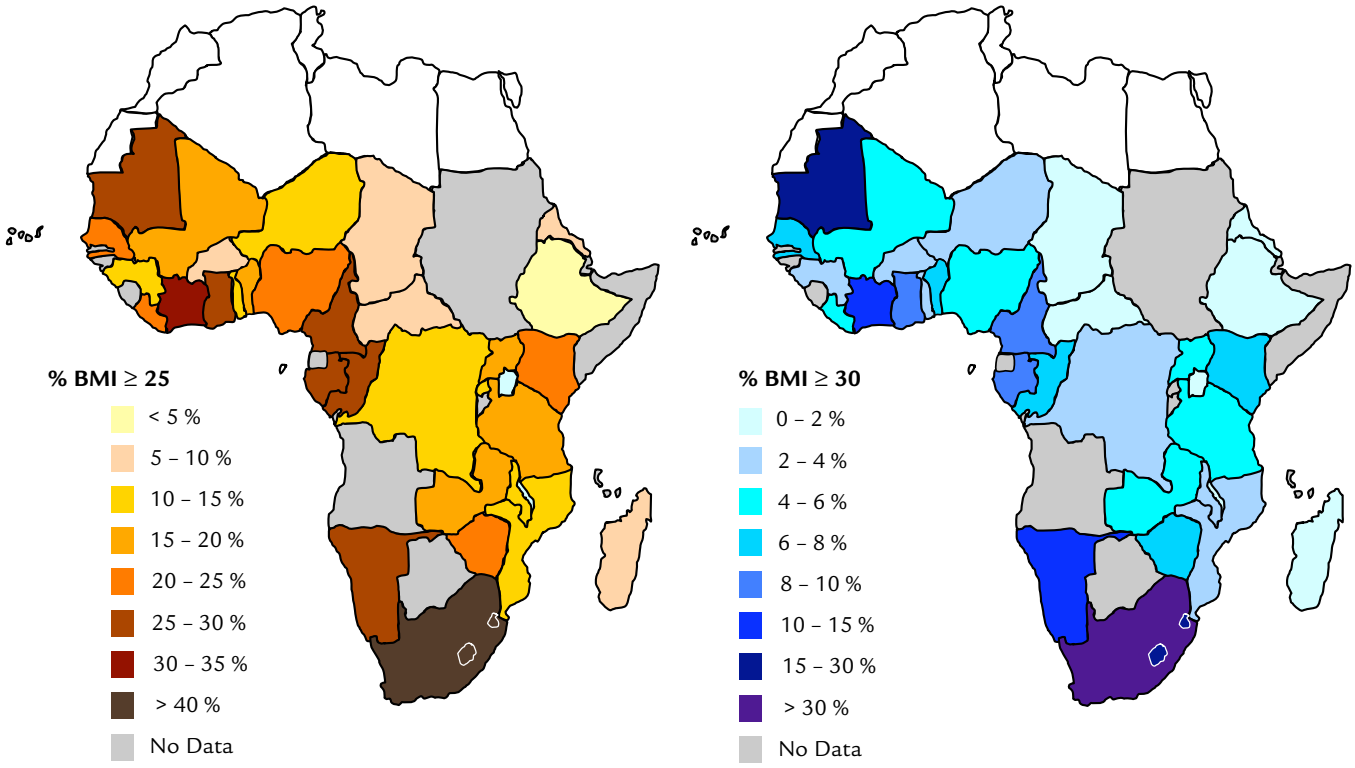
AFRICA 2060

Popkin and others in the public health and development fields refer to the shift in lifestyle, nutrition, and epidemiology that results from development, urbanization and globalization as the "nutrition transition." Such transformations occurred over the course of several centuries in Western countries, but are taking place at a much faster pace in the developing world (Popkin 2002: 111). The impact is most dramatic for women; the gender disparities are so prevalent that many BMI surveys do not include men, and those that do almost always find lower male obesity prevalence (Martorell 2002: 152-156).

Figure 1. Percent National Adult Female Population Overweight and Obese, 1998-2008



Data from WHO Global Database on Body Mass Index. Based on National surveys conducted between 1998 and 2008 in all cases except Central African Republic. Data represent only childbearing women in Central African Republic, Chad and Togo

Nutrition Transition in sub-Saharan Africa

Sub-Saharan Africa is the only world region still regularly impacted by acute nutritional emergencies. Assessing the extent of obesity may seem paltry in comparison. It is also difficult. Data are not standardized, and in most cases there are no data for men. Low obesity rates in comparison to other regions also means that sub-Saharan countries are generally shaded lightly on world maps. Resultant monocolor and barren representations makes it difficult to get a sense of the extent of obesity in Africa, and impossible to begin understanding demographic trends. This situation can be addressed by making use of the World Health Organization (WHO) Global Database on Body Mass Index. This web resource compiles the best available information on national and sub-national distributions of adult BMI across the world, including national surveys of female BMI for 33 of 47 sub-Saharan nations. Together, these data offer a preliminary glimpse of the contours of obesity in sub-Saharan Africa (Figure 1).

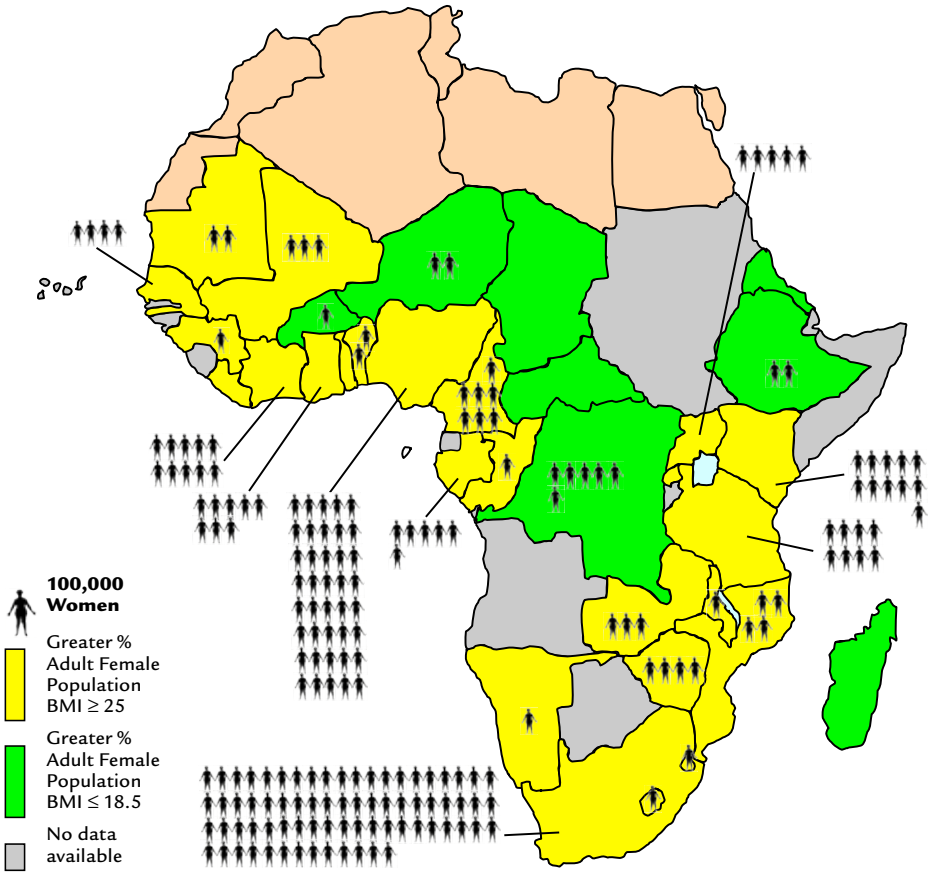
Despite the limitations, these data point unmistakably to the presence of obesity in sub-Saharan Africa. Using the WHO Global Database in combination with United Nations (UN) population data, it is possible to count over 20 million obese women in sub-Saharan Africa. This represents about 6.5 percent of the adult female population in the 32 countries for which data are available (Figure 2).

If one still doubts the gravity of overnutrition in sub-Saharan Africa, consider that in 25 of 33 countries, the percentage of the adult female population with a BMI ≥ 25 actually outnumbers the percentage that is underweight (≤ 18.5). This is also true of the region as a whole — 14.5 percent of the adult female population in these countries is underweight, while 19.75 percent is overweight (Figure 3).

Demographic Trends

As is clear from the maps and figures above, overnutrition is spread unevenly across sub-Saharan Africa. This is what we would expect according to Popkin's

Figure 2. Number of Adult Female Obese Women per Country (in hundred thousands)



Data from WHO Global Database on Body Mass Index and UN World Population Prospects: The 2008 Revision (Female population)

Figure 3. Percentage of Adult Female Population Underweight and Overweight

COUNTRY	%BMI ≤ 18.5	%BMI ≥ 25
Benin	10.7	**19.1**
Burkina Faso	**20.8**	9.3
Cameroon	6.7	**28.7**
C.A.R.	**15.3**	6.7
Chad	**20.3**	7.7
Congo	13.2	**25.6**
Côte d'Ivoire	5.8	**37.6**
D.R.C.	**18.5**	11.3
Eritrea	**37.3**	8.9
Ethiopia	**26.5**	4.4
Gabon	6.6	**29.5**
Ghana	9.3	**25.3**
Guinea	13.2	**14.3**
Kenya	12.3	**23.4**
Lesotho	5.7	**42.3**
Liberia	10	**20.5**
Madagascar	**19.2**	7.1
Malawi	9.2	**13.7**
Mali	13.5	**17.6**
Mauritania	13	**38.4**
Mozambique	8.6	**14.1**
Namibia	15.9	**28**
Niger	**19.2**	12.9
Nigeria	15.2	**20.5**
Rwanda	9.8	**11.5**
Senegal	18.2	**21.9**
South Africa	5.6	**56.2**
Swaziland	3.2	**50.4**
Tanzania	10.4	**17.7**
Togo	10.9	**11.5**
Uganda	12.1	**16.5**
Zambia	9.6	**19.2**
Zimbabwe	9.2	**25**
REGION	14.5	**19.75**

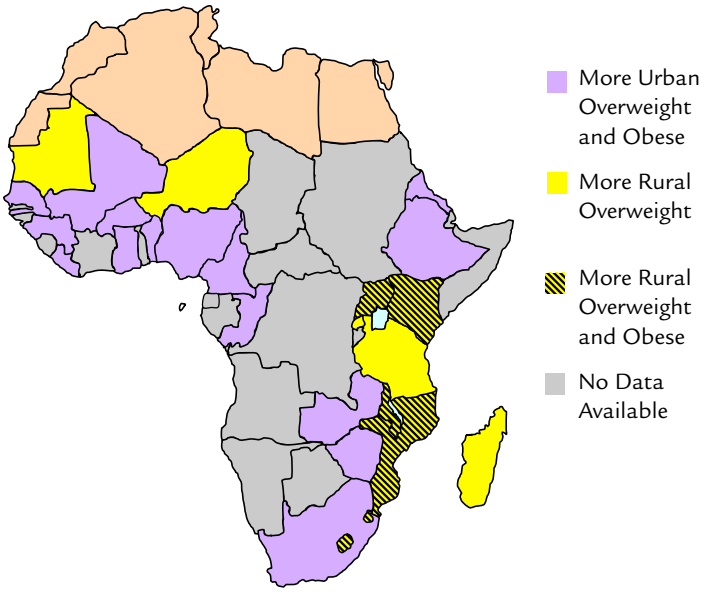
Data from WHO Global Database on Body Mass Index

hypothesis, as urbanization, level of development, and income varies between nations. But what becomes apparent when these disparities are examined more closely is that these factors do not strongly correlate with the percentage of each nation's female population that is obese. This suggests that Popkin's explanation of the "nutrition transition" may not be equally accurate for all areas of the globe, and that a consideration of additional factors is necessary for attending to overnutrition at the global level.

Urbanity and Obesity in sub-Saharan Africa

Take, for example, urbanity. If obesity were a product of urban living, then we could expect that a greater percentage of a national population living in urban areas, meaning greater numbers of people exposed to the stimuli of overnutrition, would correlate with a higher percentage of obesity at the national level. In fact, there is no statistical correlation between percent urban population and adult female obesity in sub-Saharan Africa. This holds true also when data are disaggregated along rural/urban lines, possible for 26 nations. A higher percentage urban population has only a slightly higher (though still weak) correlation with urban obesity than it does with rural obesity, and is a better predictor in rural than urban areas for BMI ≥ 25. While in all but one case (Mozambique) the percentage of the population that is overweight and obese is higher in urban areas, data suggest that there are higher numbers of rural overweight women 11 African nations, and rural obese women in six (Figure 4). Overnutrition is clearly not restricted to cityscapes.

Figure 4. Numbers of Rural & Urban Overweight and Obese Women



Data from WHO Global Database on Body Mass Index, UN World Population Prospects: The 2008 Revision (population)

To understand how overnutrition could become so prominent in regions far removed from supposed urban stimuli, it helps to consider that in much of Africa the urban/rural dichotomy is not strong, and by most accounts the two are intimately intertwined. Rural-urban migrants, for example, often maintain relationships with rural kin in order to secure interest in land and maintain relationships upon which they will depend in retirement or emergencies. Continuation of these connections entails sending remittances to rural relatives, which provides them money to purchase the same oils, refined sugars and fats available in urban areas (Prentice 2006). Rural residents with cash can also hire laborers to farm on their behalf, decreasing energy output in the same way nutrition transition literature predicts for urban employees, and creating jobs (and thus more access to cash) even in remote locales.

Just as rural living might lead to the same overnutrition stimuli as urban areas, city living can also mimic rural lifestyles. Consider that a majority of urban jobs in Africa are in the informal sector. This does not mean idle deskwork, but heavy lifting and laborious on-foot circulation. The urban African population largely travels by walking or minibuses that follow designated routes, often far from an individual's home or destination. Many urban residents further walk to and from fresh water sources, rather than turning a faucet in their own homestead, and urban farming is a growing trend. Per capita television ownership is still low, and electricity is unreliable. In sum, urbanity is not a sure indicator of low calorie expenditure, nor more broadly a clear predictor of overnutrition in sub-Saharan Africa, just as rural living does not guarantee immunity from overnutrition stimuli.

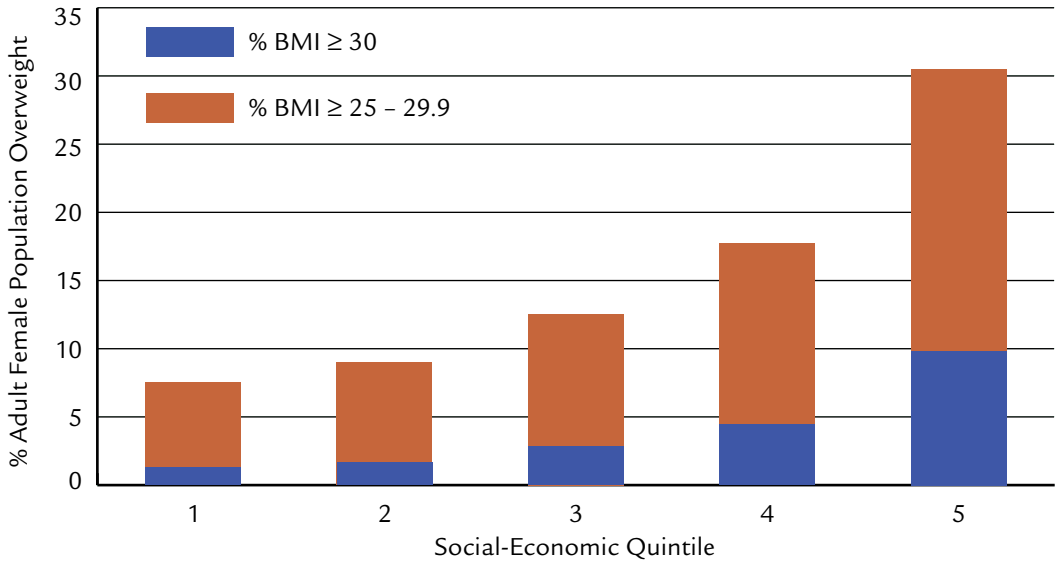
Development and Obesity in sub-Saharan Africa

Development, another of Popkin's nutrition transition factors, also has little clear significance for obesity in sub-Saharan Africa. While more statistically significant than the urbanity/obesity link, the correlation of national HDI (Human Development Index) and overnutrition is weak. Of note, Madagascar, with only a "medium" HDI rank, but at 0.533 among the highest HDI values in sub-Saharan Africa, has one of the lowest levels of adult female obesity in the region (one percent), while Côte d'Ivoire with a "low" HDI rank of 0.432 has one of sub-Saharan Africa's highest adult female obesity rates (11.6 percent). This is consistent with global trends that show no obvious relationships between HDI and national weight distribution profile (Low et.al. 2009).

But one element of the multivariable HDI does appear to be more important in understanding overnutrition trends than others — income. In the 24 sub-Saharan countries for which BMI data are disaggregated by socio-economic status (SES) quintile, SES correlates strongly with obesity in 21 nations. The correlation is weak for two more (Burkina Faso and Niger), and absent for only one (Ethiopia). The relationship of SES and obesity, plotted in Figure 5, shows Quintile 1 representing the poorest 20 percent of each nation's population, and Quintile 5 the richest 20 percent. That the correlation holds, independent of GDP per capita, signals that relative, within-nation class standing is an important overnutrition stimulus.

This correlation is not restricted to Africa. In a review of 144 studies, Sobal and Stunkard (1989) found a strong direct relationship between SES and obesity in developing countries, and a strong inverse relationship for women in developed countries. Put simply — in poor nations obesity is associated with high SES, and in rich nations with low SES. Popkin hypothesizes that the pairing of obesity and poverty is a result of increased awareness of the negative consequences of obesity and improved food technologies that make healthier foods available, at least for the wealthy, in developed countries (2002: 117-118). As poorer nations develop economically, he suggests, their obesity rates will also skew toward the poor. Reports of eating disorders and the mushrooming of athletic facilities in developing countries are signs that these changes might already be on the horizon.

Figure 5. Percent of the sub-Saharan Population in each Socio-Economic Quintile with a BMI ≥ 25 (data weighted by national population)



Data from Who Global Database on BMI for the nations of: Benin, Burkina Faso, Cameroon, Congo, DRC, Ethiopia, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Senegal, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe; and UN World Population Prospects: The 2008 Revision

Reassessing *The* Nutrition Transition

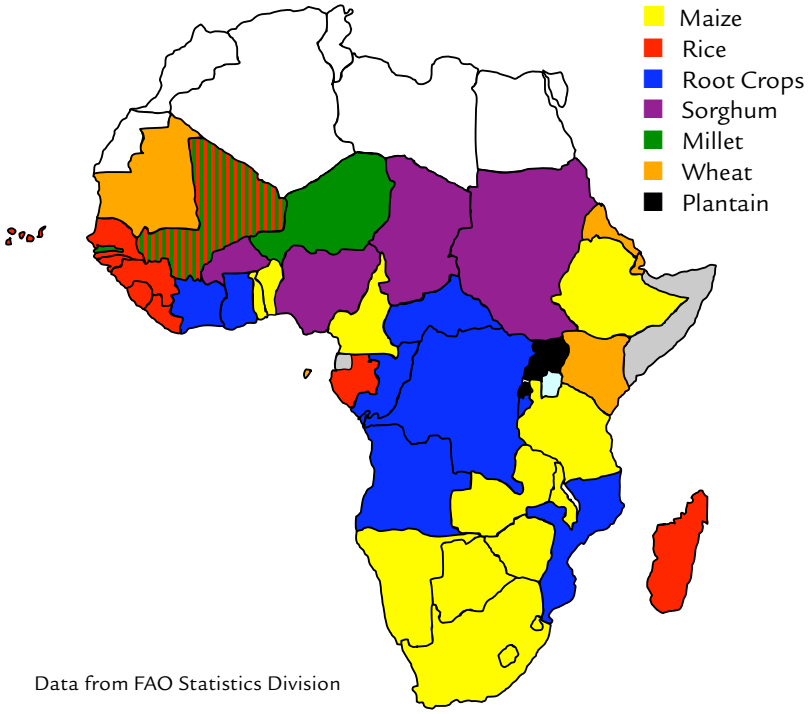
But a unilineal nutrition transition, correlated with development and trail blazed by Western nations, is far from clear. While the obesity levels in developing nations can be used to place them into categories sequenced according to the experience of Western nations, there may be reason to suspect that these similarities are superficial. Instead of different snapshots along a continuum, we may be looking at alternative paths, developed in accordance with specific histories, environments, and cultures.

The Meaning of Largess

By way of example, let us reconsider the correlation of obesity with wealth in developing nations. A positive view of largess is widespread in developing countries. Many researchers attribute this fact to scarcity — where food supplies are low and energy expenditure is high, obesity becomes a sign of prosperity. As food security becomes more predictable, the favorable interpretation of obesity can thus be expected to wane. In like manner we can look functionally at children as one of few forms of social security in Africa; thus, larger female size is a valuable sign of fertility. Along with an end to food scarcity, then, diversified retirement options and improved state welfare are expected to lead to decreased levels of obesity, at least for the better off.

All too often such adaptational aspects of obesity are stressed alone, without considering the more conscious and deliberate elements of consumption behavior (Gremillion 2005). In other words, while there may be some connection between scarcity, fertility, and the origins of positive obesity perceptions, removal of the original stimulus does not guarantee associated behaviors will dissipate. Cultural change is rarely so predictable. The approval of largess in Africa is steeped in cultural values and symbolism. Specifically, we must look to the importance of patronage relationships through which wealthier persons help to meet the needs of family and friends. Being a large person signals the ability to "feed" others, symbolically and literally, and is thus viewed positively. Among those who are fed through such relationships, largess signals that they are well cared for. Emaciation, indicating inability to help others and failures in social relationships, is therefore an "ugly" and shameful state. "Big is beautiful" is thus as much a moral as an aesthetic evaluation. These cultural connotations of weight are unlikely to dissipate without major reformations in sense of personhood as enmeshed in social relationships. We cannot by default expect obesity trends in Africa to decline simply because they have elsewhere.

Figure 6. Dominant Staple Food



Data from FAO Statistics Division

Dietary Conservatism

In his outline of the nutrition transition in developing countries, Popkin also proposes that as income increases, diet becomes both more diverse and inclusive of obesity stimuli. He specifies that elevated income leads to increased consumption of meat, eggs and sweets and that "inferior" grains are replaced in urban areas with the more refined "polished" grains of wheat and rice (2002: 118, 123). Each of these transformations contributes, in Popkin's formulation, to elevated levels of obesity. There is, however, little support for these trends in Africa. FAO statistics on dietary diversity, measured by the number of items that make up at least one percent of the national diet,

show no correlation with GDP, and GDP PPP (Price Purchasing Parity) correlates only weakly with per capita consumption of meat, sugar and eggs. Multiple studies in fact suggest that those with the economic capacity to adopt new food styles regularly show preference for traditional diet (Lentz 1999: 16, 23). Obesity further correlates only weakly with sugar consumption in Africa, and is null for meat and egg consumption. This makes the connection of increased income with dietary change, and dietary change with obesity, difficult to support.

Likewise, urbanization appears to have little to do with the adoption of "polished" grains. Figure 6 maps the primary staple food for most sub-Saharan nations. The figure shows patterns based on regional historic and environmental conditions, not urbanization. Of the four countries with more than 50 percent urban population, Liberia indeed boasts a "polished" staple (rice). But South Africa, Cameroon (maize), and Congo (cassava) do not. Further, one of Africa's least urbanized nations, Eritrea, does have a polished staple (wheat). There is, further, little evidence of a connection of polished staples and obesity. Of the five counties with the highest rates of obesity, one has a predominant staple of wheat (Mauritania), but three eat primarily maize (South Africa, Lesotho, Swaziland) and one tubers (Côte d'Ivoire). The assumption that African diets will change with increased income and urbanity, then, is unfounded, and assuming dietary change to be a main causative factor of obesity could lead to inappropriate public health campaigns and intervention programs.

Conclusion: Addressing sub-Saharan Africa's Obesity Epidemic

While obesity in sub-Saharan Africa has not yet reached pandemic proportions, the potential for such an event is clearly present. As more people have the financial means to purchase larger quantities of food (traditional or otherwise), and to share such purchases with others, the number of overweight and obese persons will increase. If traditional positive connotations of largess are maintained, and there is no reason to believe they won't be, we can expect dramatic and potentially grave consequences. The health outcomes that accompany weight gain could quickly overwhelm African health infrastructure, the costs of which could be devastating. Considering these circumstances, WHO writes that obesity prevention "is not only crucial, but also the only sensible approach to planning public health policies in developing countries" (2000: 79).

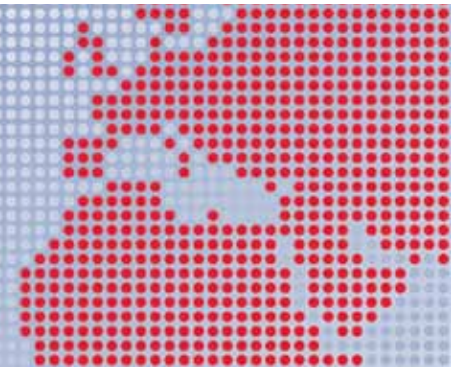
Failed application of the purportedly universal nutrition transition framework for making sense of obesity trends in sub-Saharan Africa makes clear that relying on the experience and trajectory of developed countries for orientation is not useful. Unraveling the demographic profile and cultural context of obesity in Africa is necessary if the situation is to be properly addressed. Much information is still needed to identify and assess the relationship between risk factors. In addition to universally reliable and comparable national statistics on BMI, disaggregate and behavioral data are needed to understand obesity stimuli — calorie consumption, dietary composition, energy expenditure, residency patterns, income allocation, etc. Not discussed here, some researchers suggest that health-related obesity consequences vary by ethnicity, and that the impact of activity level on health/body size correlations has been underestimated. Crucially, specific dimensions of health consequences for African populations must be understood before obesity intervention programs are designed.

In Western countries there is a positive association of thinness with self-control. Related, there is a negative association of obesity with laziness (de Garine and Pollock 1995). There may therefore be a tendency for Western researchers to look at obesity in Africa as a form of moral failing, particularly when so many persons on the sub-continent are undernourished. Issues that evoke repugnance or for which the public does not feel an ethical compulsion to assist are not typically the attractors of international aid. What is clear from the above analysis

The Frederick S. Pardee Center
for the Study of the Longer-Range Future

Boston University
Pardee House
67 Bay State Road
Boston, MA 02215 USA

pardee@bu.edu
617-358-4000 (tel.)
617-358-4001 (fax)
www.bu.edu/pardee



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is that we cannot allow such ethnocentric thinking to bias the direction of public policy and that a contextualized and culturally-informed attempt at stemming excessive weight gain is a necessary start. Left unchecked by African policymakers and international agencies, diabetes, hypertension, heart disease and related illnesses could soar, compromising development gains and overwhelming African healthcare infrastructure with the double burden of communicable and non-communicable diseases. The effects could be devastating. The future of malnutrition in Africa is heavy, indeed.

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