

THE WORLD IS FAT

More people in the developing world are now overweight than hungry. How can the poorest countries fight obesity?

KEY CONCEPTS

- As globalization arrives in the Third World, so does the unhealthy Western diet. Over the past 20 years, poor people in developing countries have greatly increased their consumption of sweetened beverages, vegetable oils and animal-source foods (meat, poultry, fish, eggs and dairy products).
- People in the developing world are also adopting Western lifestyles that contribute to obesity.
- No country in modern times has successfully reduced its number of overweight citizens, but governments and aid programs are considering various interventions.

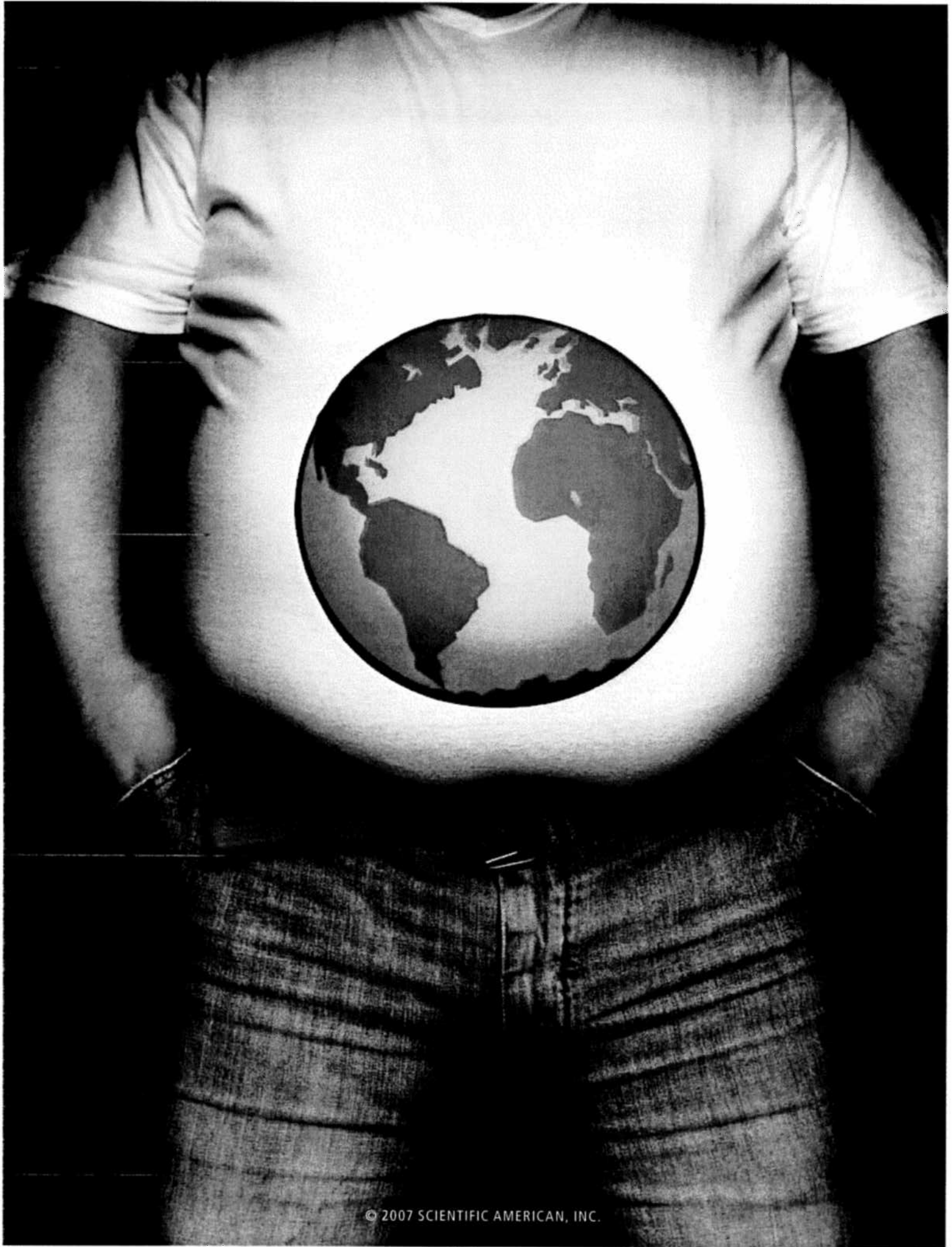
—The Editors

By Barry M. Popkin

Over the past 20 years a dramatic transition has altered the diet and health of hundreds of millions of people across the Third World. For most developing nations, obesity has emerged as a more serious health threat than hunger. In countries such as Mexico, Egypt and South Africa, more than half the adults are either overweight (possessing a body mass index, or BMI, of 25 or higher) or obese (possessing a BMI of 30 or higher). In virtually all of Latin America and much of the Middle East and North Africa, at least one out of four adults is overweight. Although undernutrition and famine remain significant problems in sub-Saharan Africa and South Asia, even desperately poor countries such as Nigeria and Uganda are wrestling with the dilemma of obesity. Worldwide, more than 1.3 billion people are overweight, whereas only about 800 million are

underweight—and these statistics are diverging rapidly.

The obesity rates in many developing countries now rival those in the U.S. and other high-income nations. What is more, the shift from undernutrition to overnutrition—often called the nutrition transition—has occurred in less than a generation. When I return to villages that I visited 15 years ago in India, China, Mexico and the Philippines, I see enormous changes: kids guzzle soft drinks and watch television, adults ride mopeds instead of walking and buy their food from supermarkets. In addition to adopting more sedentary lifestyles, people in the developing world are also consuming more caloric sweeteners, vegetable oils and animal-source foods (meat, poultry, fish, eggs and dairy products). The combination of lifestyle and dietary changes has paved the way for a public



health catastrophe, with obesity leading to an explosive upsurge in diabetes, heart disease and other illnesses.

To combat this threat, we must look behind the vast social, economic and technological trends that are transforming the Third World. This examination reveals that many governments and industries are contributing to the growth in obesity by flooding developing countries with cheap sweeteners, oils and meat while doing nothing to promote the consumption of fruits and vegetables. Revamping agricultural subsidies and regulating food advertising may help alleviate the damage. But the effort will require new policy research, long-term funding commitments and a hefty amount of political will.

A Problem of the Poor

Mexico is perhaps the most striking example of a developing nation suffering from the obesity epidemic. In 1989 fewer than 10 percent of Mexicans were overweight. In fact, no one in the country even talked about obesity back then; the focus was on poverty and hunger. But national surveys conducted in 2006 found that 71 percent of Mexican women and 66 percent of Mex-

ican men were overweight or obese—figures that approximate those in the U.S. And the health effects are already becoming apparent. Diabetes was almost nonexistent in Mexico 15 years ago, but today almost one seventh of the country's people suffer from type 2 (adult-onset) diabetes, and the disease is spreading quickly.

How could such a radical change have taken place in less than 20 years? Proximity to the U.S. may have exacerbated the problem—many Mexicans are exposed to American culture and media, which could have influenced their dietary or lifestyle choices—but obesity has also burgeoned in countries that have much less contact with the U.S. The migration of people from the countryside to the cities may have also played a role. Studies of more than 157,000 women in 39 developing nations have shown that in nearly all the countries, women in urban areas are more likely to be overweight than women in rural areas. (Researchers have collected more data for women than for men in these studies because their focus was on reproductive health.) But the prevalence of obesity has grown in rural regions, too; for example, in Mexico, Colombia, Turkey, South Africa and



BRAZIL

Gross domestic product (GDP) per capita: \$8,800

Percentage of adults who are overweight or obese: 20.0 (1975) 36.7 (1997)

Supermarkets have proliferated across Brazil and other Latin American nations over the past two decades, leading to a large rise in the consumption of processed foods.



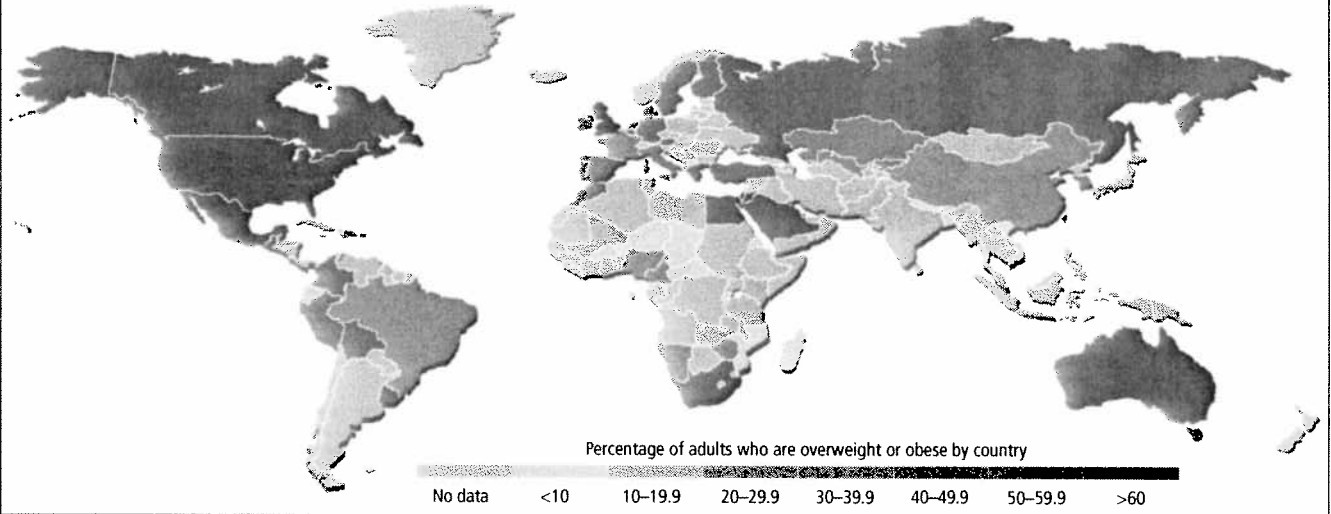
AP/GETTY IMAGES (photograph)

[AN INTERNATIONAL TREND]

OBESITY SPREADS ACROSS THE GLOBE

People who are overweight (possessing a body mass index, or BMI, of 25 or higher) or obese (a BMI of 30 or higher) are now just as common in many developing countries as they are in the U.S., Canada and Europe. In large

parts of Latin America, North Africa and the Middle East, the problem has triggered an upsurge in diabetes, heart disease and other illnesses. Obesity rates are also rising quickly in China, India and other Asian nations.



Jordan, more than half the rural women are overweight.

A better explanation lies in the connection between obesity and poverty. In the developing world, obesity has become predominantly a problem of the poor, just as it is in the U.S. In all countries with a gross domestic product greater than \$2,500 per capita—which includes most developing nations outside of sub-Saharan Africa—obesity rates are higher for poor women than for those with higher socioeconomic status. As average incomes in these countries have risen, farm laborers and the urban poor have adopted modern habits associated with obesity, such as watching television and shopping in supermarkets, but still do not have access to education, healthier foods or recreational activities that would help them control their weight.

Compounding the tragedy is the fact that obese people in the Third World may be more likely to develop diabetes or high blood pressure than obese individuals of European descent. Scientists have long hypothesized that Latin American, African and South Asian populations may carry a disproportionate number of “thrifty genes” that evolved to help them survive times of famine by enabling them to store fat more efficiently. Unfortunately, when a person with these genes becomes overweight, body fat tends to accumulate around the heart and liver, increasing the risk of diabetes and cardiovascular problems. In China, where obesity levels are

climbing rapidly, nearly one third of the population suffers from high blood pressure. Moreover, I have found in my surveys that only a small fraction of Chinese with hypertension receive treatment for the condition. Whereas Western countries can afford to monitor and provide drugs for diabetic and hypertensive patients, the illnesses go mostly untreated in the developing world, and so health complications appear early on.

A Dietary Disaster

One of the biggest contributors to the obesity epidemic in the Third World is the recent popularity of sweetened beverages. For most of our evolutionary history, the only beverages humans consumed were breast milk after birth and water after weaning. Because water has no calories, the human body did not evolve to reduce food intake to compensate for beverage consumption. As a result, when people drink any beverage except water their total calorie consumption rises, because they usually continue to eat the same amount of food. Although humans have been drinking wine, beer, fruit juice and milk from domesticated animals for thousands of years, the proportion of calories coming from beverages has been relatively small until the past 50 years, when Coca-Cola, Pepsi and other soft drinks began spreading across the globe.


For physicists, a calorie is the amount of heat energy needed to raise the temperature of one gram of water by one degree Celsius. The calo-

[THE AUTHOR]



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GEORGE REISECK; SOURCE: BARRY M. POPKIN, University of North Carolina at Chapel Hill (map); SARA D. DAVIS AP Photo (Popkin)

EGYPT

GDP per capita:
\$4,200

Percentage of adults
who are overweight or obese:
59.1 (1998)

In Egypt the obesity problem is particularly severe for urban women. Poor Egyptians have adopted modern habits that exacerbate obesity, such as television watching.

rie unit on a food packaging label, though, is equal to 1,000 heat-energy calories, so it is often called a kilocalorie, or kcal for short. Daily energy requirements vary depending on age, weight and activity levels, but most nutritionists recommend a range of 1,800 to 2,200 kcal for women and 2,000 to 2,500 kcal for men. When a person consumes a surplus of 3,500 kcal above his or her requirements, this extra amount will usually produce a weight gain of about 0.45 kilogram (one pound). Researchers estimate that putting sweeteners into beverages added about 137 kcal to the average American's daily diet between 1977 and 2006. Over a year this surplus can cause a weight gain of about 6.4 kilograms (14.2 pounds). In Third World countries, consumption of sweeteners is rapidly catching up to American levels; for example, the average Mexican now consumes more than 350 kcal from beverages every day.

The growing presence of supermarkets in the developing world has greatly increased the availability of both sweetened beverages and processed foods. In country after country, companies such as Wal-Mart, Carrefour and Ahold have opened giant stores offering a wide variety of cheap snacks and soft drinks. In Latin America the proportion of all food expenditures spent in supermarkets jumped from 15 percent in 1990 to 60 percent in 2000 and is still rising briskly. Scientists have not yet quantified the impact of replacing traditional village markets with megastores, but the few studies available suggest that the new way of shopping encourages the consumption of processed

foods, particularly products with added sugar.

Another key contributor to obesity is the widespread shift to energy-dense foods that has occurred in many developing nations. The human body regulates appetite based on the volume of food consumed rather than the number of calories in a meal. This adaptation was useful in regions where large seasonal swings in rainfall and temperature affected food production; during the times of plenty, people could load up on calorie-rich meats and vegetable oils, building up their weight to survive subsequent periods of famine. In recent years, however, the consumption of energy-dense vegetable oils—soybean oil, palm oil, corn oil and dozens of variations—has skyrocketed in the developing world. In China, for example, the average daily intake of vegetable oils rose from 14.8 grams per person in 1989 to 35.1 grams per person in 2004, adding an extra 183 kcal to the population's daily diet. Similar increases have taken place in the Middle East, Africa, and parts of South and Southeast Asia. My research has shown that technological advances in the production and processing of oilseeds have made vegetable oil a relatively cheap option for poor families; in China, the poor spend a larger share of their food expenditures on vegetable oil than the rich do.

The third major change in the developing world's diet is the surge in consumption of animal-source foods. Over the past 20 years most of the growth in the world's production of meat, poultry, fish, eggs and milk has come from developing nations. Latin Americans are eating more beef, Chinese are devouring more pork and

REUTERS (photograph)

Indians are consuming more dairy products. In China the consumption of animal-source foods more than tripled in rural areas and almost quadrupled in urban areas between 1989 and 1997. By 2020 developing countries are expected to produce nearly two thirds of the world's meat and half its milk. In addition to raising obesity rates, the intake of all this energy-dense animal-source food threatens to boost the prevalence of heart disease in the Third World by injecting excessive saturated fat into the average diet.

People in the developing world are not only converting to the unhealthy Western diet; they are starting to work, travel and entertain themselves in ways that worsen that diet's effects. When I lived in Asia in the 1970s, only small quantities of electricity reached rural areas, roads were unpaved and farming was the only option for employment. What is more, farming in Asian countries was a backbreaking task: transplanting rice, weeding, hoeing, spreading fertilizer and harvesting were all done by hand. Difficult manual labor was also the norm for people living in the urban slums of Old Delhi in India, where I lived for a year.

Today, however, the various components of modern infrastructure—roads, factories, media access, and so on—are reaching into even the remotest corners of the Third World. Many farmers in Asia and Latin America now use tractors

to plow the soil and trucks to carry their produce to market. In China the portion of the population working in jobs with very light activity requirements has grown from 44 percent in 1989 to 66 percent in 2004. In 1989 few Chinese owned a television; today televisions are ubiquitous in the country, with more than half of households owning a color set. Because the shift to a more sedentary lifestyle decreases one's energy requirements, excess calories accumulate faster. In our studies in China, my colleagues and I have shown that all the observed lifestyle changes—increased television use, reduced walking and biking, and less strenuous labor at home and in the workplace—have led to significant gains in weight.

The Big Picture

The overarching trend that is encouraging all these changes in diet and lifestyle is globalization—the freer movement of capital, technology, goods and services across the world. For example, the ability of huge retailers to open mega-stores in developing countries has brought all the health effects of modern food processing, both positive and negative, to new populations. Global media companies have enhanced the attraction of television by offering entertaining programs to regions that formerly received only boring government-produced broadcasts. Fur-

The shift from undernutrition to overnutrition has occurred in less than a generation.



MEXICO

GDP per capita:
\$10,700

Percentage of adults who are overweight or obese:
61.9 (2000)
69.3 (2006)

One of the biggest contributors to obesity in Mexico is the consumption of soft drinks. Almost one seventh of the country's people suffer from type 2 (adult-onset) diabetes.

EUUSAPCO/REBUCO-AP Photo (photograph)

It may be difficult to gather support for a fight against obesity, which is still widely viewed as a sign of sloth and gluttony.



CHINA

GDP per capita:
\$7,700

Percentage of adults who are
overweight or obese:
12.9 (1991) 27.3 (2004)

The booming Chinese economy has increased average incomes, enabling the country's people to boost their intake of calorie-rich foods while shifting to a more sedentary lifestyle.

thermore, international agencies such as the World Bank have promoted agricultural changes that have encouraged the proliferation of unhealthy diets in the developing world.

The long-held philosophy of agricultural experts is that once a country produces enough grains and tubers, it should massively subsidize its livestock, poultry and fish industries. The result has been a major reduction in the prices of animal-source foods. The wholesale price of beef (in real dollars) on the world market declined from about \$530 per 100 kilograms in the early 1970s to about \$150 per 100 kilograms in the mid-1990s. The drop in the cost of vegetable oils and animal-source foods, combined with the recent increases in personal incomes in China, India and other developing nations, has led to a consumer revolution. People are rapidly abandoning their traditional low-fat, high-fiber diets and switching to meals of calorie-rich fats, sweeteners and refined carbohydrates.

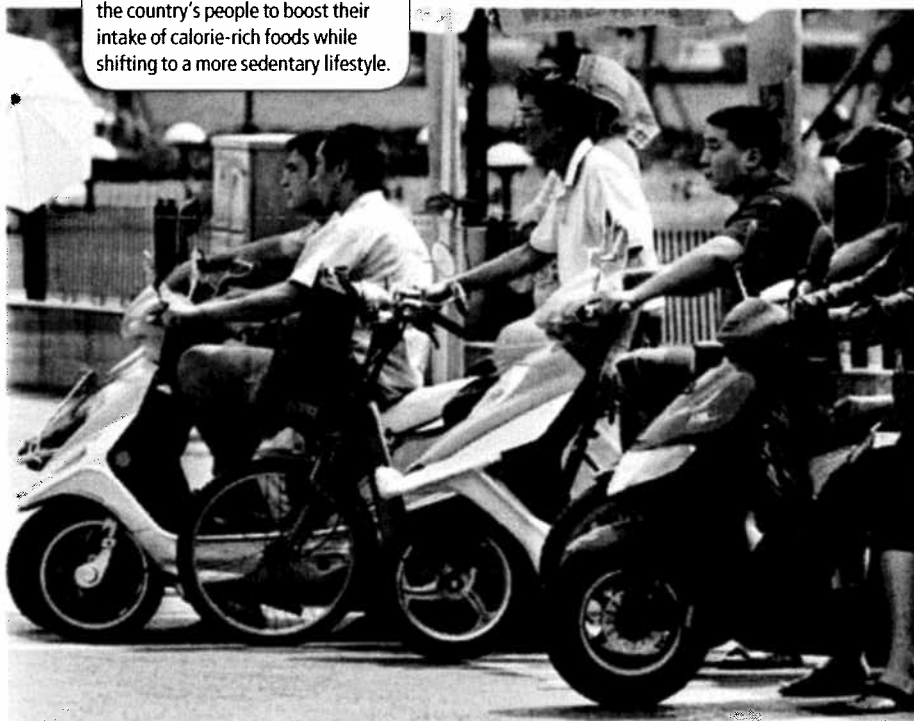
What can we do to counter such a sweeping and deadly transition? No country in modern times has succeeded in reducing the number of its citizens who are overweight or obese. In fact, the obesity epidemic is accelerating in the U.S. and many other nations. The world is getting fatter, and the annual rates of increase are higher today than they were 15 years ago.

Representatives of the food industry have long insisted that governments should not re-

strict an individual's dietary choices. Their solution is to teach people how to control their diets and become more physically active. Even most health professionals in the U.S. and abroad focus on the narrow, short-term need to educate children and their parents. But this strategy ignores the vast social, technological and structural changes that are pushing millions of people into debilitating lives of obesity. If left unchecked, the nutrition transition will cause horrendous increases in illness and devastating reductions in life expectancy.

In the developing world, most government and private aid programs still focus on fighting hunger and infectious diseases. These efforts can backfire, though; national hunger programs in Mexico and Chile may have increased obesity levels among some recipients of their food aid. For example, the Mexican program called Oportunidades (formerly named PROGRESA) has improved the growth rates of children in the families it has enrolled but has also exacerbated obesity among the urban women receiving its cash payments and food supplements. In response, the managers of the program are now considering halting the distribution of fortified milk to adult women and providing vitamin supplements instead.

It may be difficult for politicians or development officials to gather support for a fight against obesity, which is still widely viewed as



EUGENE HOSHIKO/AP Photo (left); XIE HUIJIAN/AP Photo/Xinhua (right)

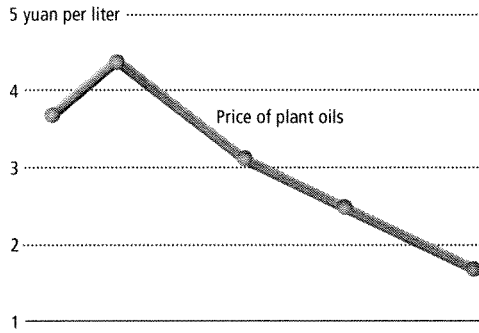
a sign of sloth and gluttony rather than as a consequence of global changes. Nevertheless, this new threat demands action. Nongovernmental organizations such as the Bill & Melinda Gates Foundation, which strives to improve public health and reduce poverty around the world, must address the obesity epidemic before it is too late. Unless strong preventive policies are undertaken, the medical costs of illnesses caused by obesity could bring down the economies of China, India and many other developing countries. China already spends more than 6 percent of its gross domestic product on nutrition-related chronic diseases, and this expense is projected to increase steeply over the next 20 years.

Government interventions will also be necessary. We could begin by restructuring the massive agricultural subsidies that encourage the production of meat, poultry and dairy products. Instead of giving billions of dollars to giant agribusinesses growing grain for livestock, the U.S. and other high-income nations could direct some of that money to farmers cultivating fruits and vegetables. This reform could help people in developing countries by adjusting prices on the world market. Making meat more expensive and vegetables cheaper would provide an incentive for healthier food choices. New farm policies should also promote the global consumption of whole grains, which have more fiber, vitamins and minerals than refined carbohydrates.

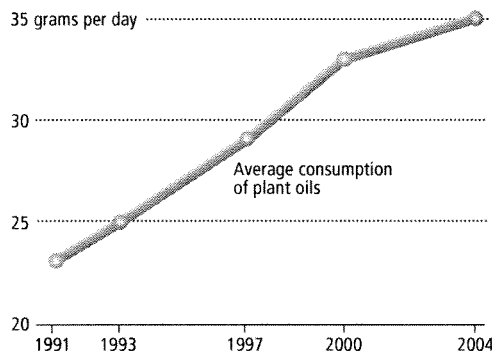
Revamping subsidies will not be as effective for discouraging the consumption of sweetened foods and beverages, because the cost of sweeteners represents just a small fraction of the price of such products. An alternative might be to tax all caloric sweeteners (including sugar, high-fructose corn syrup and concentrated fruit juice) at a relatively high rate—say, a nickel per gram. In Mexico, which has one of the highest consumption rates of soft drinks in the Third World, I am working with the Ministry of Health to devise taxes on these and other high-calorie beverages. I am also working with the Chinese government on testing a tax on vegetable oil in selected provinces. We have found that taxing dietary fat can cut the total calorie intake while increasing protein consumption among the poor in China because they substitute healthier foods for the fats. The impact would be even more positive if the revenues from the tax were spent on encouraging better nutrition.

Researchers and development experts have

AS THE PRICE OF VEGETABLE OILS HAS DROPPED IN CHINA ...



... THE COUNTRY'S CONSUMPTION OF THESE CALORIE-RICH FOODS HAS CLIMBED.



proposed dozens of similar policies, but they must be designed to meet the specific needs of each country. One particularly intriguing proposal is to ban advertisements for sweetened foods and beverages from children's television or perhaps from all media. At the same time, we cannot forget that many people in developing nations still suffer from hunger. We must design aid programs that can meet the needs of the hungry without increasing obesity in those countries. Conversely, we must ensure that policies designed to fight obesity—such as reducing the consumption of vegetable oils and animal-source foods—do not hurt the undernourished. Fortunately, some options for fighting overnutrition will be just as helpful for combating undernutrition. For example, the promotion of breastfeeding and the increased intake of fruits and vegetables would alleviate both conditions.

Stemming the tide of obesity in the Third World is a tall order. More policy research is needed to determine the best ways to influence dietary choices in developing countries. Ever since our species arose, we have strived for a tastier diet and a more sedentary way of life. Now we need to reverse those tendencies if we are to create a healthier world. ■

FALLING PRICES for vegetable oils have fostered unhealthy diets in the Third World. In China, a steep drop in the prices of rapeseed, soybean and peanut oils has allowed even the poorest people to increase their intake of these calorie-rich foods.

➔ MORE TO EXPLORE

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More information about the Nutrition Transition research program is available at www.nutrans.org