

## Economic and Psychological Implications of the Obesity Epidemic

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The medical literature, lay press, and evening news all tell us that an unprecedented number of US adults and children are becoming obese. More than half of adults and more than 20% of children report that they are overweight or obese,<sup>1,2</sup> and the number of obese adults increased by 61% between 1991 and 2000.<sup>1</sup> In our community, Olmsted County, Minnesota, we found that the self-reported prevalence of overweight and obese individuals is 47.9% and 17.7%, respectively, among men and 30.7% and 17.2%, respectively, among women.<sup>3</sup> The problem is even worse than these figures indicate. Measured rates of obesity are more than 50% higher than rates based on self-report. Physical examination data from the National Health and Nutrition Examination Survey indicate that age-adjusted prevalence of obesity increased from 22.9% in 1988 through 1994 to 30.5% in 1999 through 2000.<sup>4</sup>

What these statistics do not convey is the fact that everyone, not just obese people, will be affected by the epidemic. The rising prevalence of obesity will increase the rates of diabetes, hypertension, cancer, heart disease, osteoarthritis, and other chronic diseases.<sup>5,6</sup> The obesity epidemic will increase health care costs,<sup>7,8</sup> and employers and government agencies will pass on at least some of these increases to consumers. Faced with inadequate resources to pay for all necessary care, consumers will concentrate on symptomatic care while neglecting disease prevention and risk factor control.<sup>9</sup> Failure to stay current with indicated preventive services and failure to control disease risk factors can only result in a spiral of unnecessary illness, health care costs, and disability—all widening the gap between the need for health care and the resources available to pay for it.

The individuals who develop the chronic diseases and disabilities associated with obesity will experience anxiety and depression,<sup>10</sup> but the negative psychological conse-

quences will extend beyond these people.<sup>11</sup> Patients who are disabled will turn to their nondisabled friends and relatives for financial assistance, forcing them to make unpleasant choices between purchasing a car, home, or vacation for themselves or purchasing health care and long-term care for their friends and relatives.

The negative consequences experienced by individuals will seriously affect both the health care industry and the other economic sectors that have no direct relationship to health care. Because health care institutions will be forced to deny requests for charity care from residents of the communities that they are expected to serve, their actions will be scrutinized and criticized.<sup>12</sup> Non-health care sectors of the economy will also be affected by the obesity epidemic. Increasing proportions of disposable income devoted to health care means manufacturing and service sectors can expect to see demand for their products decrease. Volunteer sectors can expect contributions to decrease for the same reason. The challenge of finding healthy workers will be a burden shared by all sectors.

These economic and health factors will increase poverty and disability rates. Some might hypothesize that poverty and disability will limit the magnitude of the obesity epidemic. However, the positive correlation between lower socioeconomic status and obesity<sup>13-15</sup> suggests that poverty is unlikely to stop the obesity epidemic in the near term: calories are cheap in the United States and food programs are available to help those who cannot afford to purchase food. At a fast-food restaurant, 1500 calories can be purchased for \$5; at a grocery store, 1500 calories cost even less. At a buffet, unlimited calories can be consumed for about \$7.50. Disabilities are also unlikely to stop the obesity epidemic. The patient's ability to feed himself or herself is sustained even after the patient loses the ability to get out of bed<sup>16</sup>; as the patient becomes immobile, the need for calories diminishes and the propensity to become obese worsens.

Although this dark scenario could become reality, we believe that it is avoidable if we act swiftly and decisively to confront the obesity epidemic. We suggest that action is necessary at 3 levels. First, although only 33% of obesity is heritable<sup>15</sup> and it is a mistake to assume that the creation of excess body mass is the only negative effect of behaviors that lead to obesity,<sup>17</sup> we must research the molecular biol-

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ogy of obesity in hopes of developing a better understanding of what leads a proportion of the population to become obese in an environment that requires almost no physical activity and provides calories in accordance with desire. Genetic and behavioral research would help us understand why some individuals who were once obese are able to achieve sustained weight loss whereas most others fail at this goal. The behavioral research agenda also includes developing better methods to increase the self-efficacy of obese and overweight individuals who are trying to lose weight.<sup>18</sup>

Second, we need to teach people how to avoid obesity. Although it is unclear whether the obesity epidemic is primarily due to an increase in the consumption of calories or a decline in physical activity, it is clear that obesity is fundamentally a result of energy imbalance: more calories are consumed than are burned.<sup>19</sup> On the basis of laboratory experiments and other data, the Institute of Medicine has concluded that 1 hour of daily moderate physical activity is required to prevent weight gain in adults and obesity in children.<sup>20</sup> Walking and jogging appear to contribute equally to cardiovascular fitness,<sup>21</sup> and walking during daily activities and for recreation is much more acceptable and achievable for many people.

Although data on the prevention of obesity are limited, the experiences of individuals who have successfully maintained weight loss are probably relevant. Population surveys indicate that 3 factors are associated with sustained, substantial weight loss: (1) adequate physical activity (an average of 450 minutes of physical activity a week with periods of at least moderately intense activity several times per week); (2) avoidance of calorie-dense foods that are high in fat and simple carbohydrates; and (3) use of multiple strategies to reinforce the maintenance of the desired physical activity and nutritional patterns.<sup>22</sup>

The third area in which action is necessary is suggested by the Institute of Medicine report, *Health and Behavior: The Interplay of Biological, Behavioral, and Societal Influences*<sup>23</sup>: we must create environments that make it possible and rewarding for individuals to avoid obesity in the first place and to maintain weight loss if they were obese at one time. We need to ensure that our communities allow people to move around by foot or bicycle as they go about their daily activities because this attribute of communities most strongly predicts the fitness of their residents.<sup>24</sup> We need to make low-calorie foods—fruits and vegetables and cereal products made with water rather than fats—available at prices that are competitive with high-fat, high-calorie foods. In all schools, we need to provide foods and beverages that meet our nutritional goals, and we need to ensure that students have adequate levels of physical education. We need to develop and implement programs that market

the benefits and pleasures of physical activity and low-calorie foods to offset the well-financed and highly sophisticated campaigns of the food, alcohol, spectator sport, and entertainment industries.

We also will need to counteract some natural urges. As the renowned exercise physiologist Per-Olaf Åstrand has observed (oral communication, March 25, 2002),

One can distinguish between juveniles and adults of mammalian species by their behavior; the juveniles are always looking for something to do and the adults are always looking for someplace to sit down. This behavior is adaptive because juveniles need to develop strength and coordination—which they can only do through physical activity—and adults need to conserve calories—which they do by sitting quietly.

It is also possible that humans are programmed to eat when anxious: in primeval times, anxiety frequently was caused by something that a person had to either flee or fight. Running out of calories in the middle of the flight or fight potentially meant the end of a person's genetic line.

It appears that the urge to sit down and eat something—in an environment in which individuals must run away from food and purchase physical activity—is driving the obesity epidemic among adults. Electronics, marketing, and diminishing opportunities for physical activity appear to be driving the obesity epidemic among youth.<sup>25</sup> Until we determine whether and how to overcome these forces with molecular biology, we need to use all the knowledge, skills, and conventions that we can muster to create social and physical environments that make possible and reward physical activity and nutritional restraint. Every physician needs to contribute to this effort because every physician is a member of a community somewhere and that community needs medical input. The future health, happiness, and economic well-being of society depend on it.

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