

Obesity—Addressing a Challenge for Public Health and Laboratory Medicine

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Few topics are of greater concern for public health, including the delivery of healthcare and the development of policy, than obesity and its myriad complications. Dramatic increases in the prevalence of obesity in high-income countries over the past 50 years (Fig. 1), and the increasing problem of obesity in low- and middle-income countries, are undisputed. The lifetime costs of a patient with obesity (compared with a patient with normal weight) underscore the societal impact of the problem (Fig. 2). However, causes of obesity and best strategies to reverse trends in prevalence of the disease are topics of much debate. The role of nutrition and genetics, impact of physical activity, neurohormonal drivers and mediators of obesity, and mechanisms that underpin the development of obesity-related complications all remain central to ongoing research. In this context, we believe that it is timely to devote this special issue of *Clinical Chemistry* to



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the problem of obesity and current research to inform strategies for addressing the problem.

While we have focused on issues of relevance to laboratory medicine, we have also taken a comprehensive and holistic approach to provide an overview of the challenges that obesity presents to the broader scientific community.

Ultimately, obesity is a systems problem, both caused by and affecting multiscale systems (1). In other words, obesity is a classic example of a major global problem that intimately involves biological, physiological, behavioral, social, environmental, economic, and policy factors. Therefore, properly interpreting and understanding biological or clinical measures requires an understanding of what is happening at other scales. For example, managing type 2 diabetes, one of the major sequela of obesity, is not simply about tracking blood glucose and HbA1c but appreciating the behavioral, social, and environmental obstacles to losing weight and improving glycemic control. Similarly, laboratory measurements are necessary to guide the patient and other decision makers on what to do about the systems around the patient.

The laboratory has a vital role in advancing knowledge regarding obesity and its complications, particularly through measurement of obesity-related biomarkers (2), and increasingly the use of metabolomics (3). Beyond pathophysiology and impact on the practice of laboratory medicine, the growing problem of obesity has major implications for public health and the delivery of healthcare. In this issue, some of those challenges are summarized



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Preamble

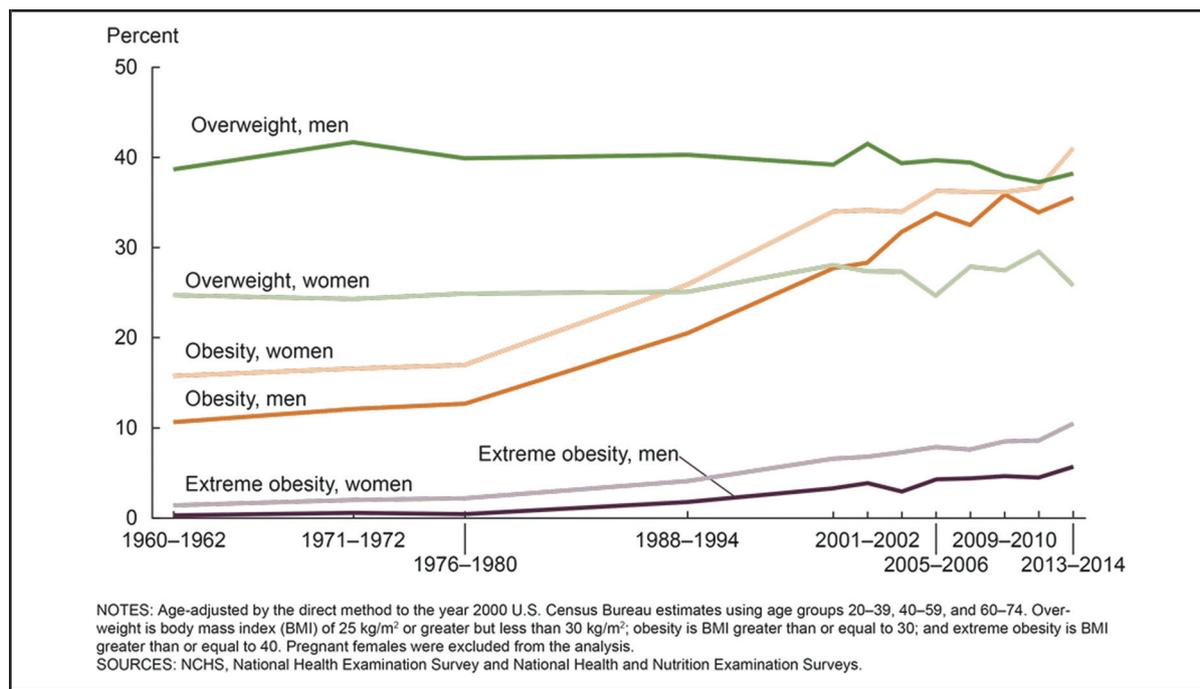


Fig. 1. Trends in adult overweight, obesity, and extreme obesity among men and women, ages 20-74 years in the US.
Reproduced from Fryar et al. (13).

by Philip James, who places obesity in its historical and global context (4), while John Cawley addresses the broader economic impacts (5). The medical consequences of obesity in terms of cardiovascular disease and diabetes are discussed throughout, and there is a more

focused review of the sometimes overlooked effects of obesity on cancer (6). We also present several reviews that focus on the management of obesity, including an overview of the impact of public health policies to prevent obesity and promote dietary change (7), and a more

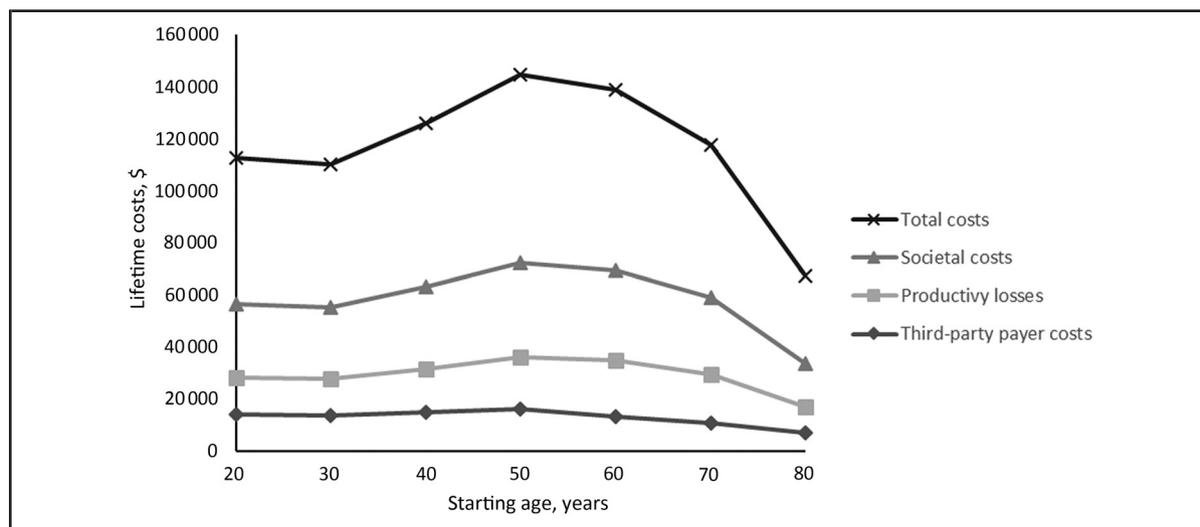


Fig. 2. Incremental net present value of lifetime direct medical costs, productivity losses, societal costs, and total costs for obesity vs. normal weight, based on starting age of obesity.
Data from Fallah-Fini et al. (14).

detailed consideration of the potential impact of a “sugar tax” (8). In relation to treatment, there are reviews that focus on dietary change (7), physical activity (9, 10), pharmacotherapy (11), and bariatric surgery (12).

We hope that the articles selected will provide the interested reader with a comprehensive and current overview of obesity and its consequences, something that will continue to have a major impact on public health, the planning and delivery of healthcare, and the practice of laboratory medicine for the foreseeable future.

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