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Overcoming obesity: An initial economic analysis



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Overcoming obesity: An initial economic analysis Executive summary

Discussion paper

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IN BRIEF Overcoming obesity: An initial economic analysis

Obesity is now a critical global issue, requiring a comprehensive intervention strategy rolled out at scale. More than 2.1 billion people—nearly 30 percent of the global population—are overweight or obese. That's nearly two and a half times the number who are undernourished. Obesity, which should be preventable, is now responsible for about 5 percent of all deaths worldwide. If its prevalence continues on its current trajectory, almost half of the world's adult population will be overweight or obese by 2030. This preliminary paper aims to start a global discussion on the components of a successful societal response. Among our main findings are:

- Based on existing evidence, any single intervention is likely to have only a small overall impact on its own. A systemic, sustained portfolio of initiatives, delivered at scale, is needed to address the health burden. Almost all the identified interventions are cost-effective for society—savings on health-care costs and higher productivity could outweigh the direct investment required to deliver the intervention when assessed over the full lifetime of target population. In the United Kingdom, such a program could reverse rising obesity, saving about \$1.2 billion a year for the National Health Service (NHS).
- Education and personal responsibility are critical elements of any program to reduce obesity, but not sufficient on their own. Additional interventions are needed that rely less on conscious choices by individuals and more on changes to the environment and societal norms. Such interventions "reset the defaults" to make healthy behaviors easier. They include reducing default portion sizes, changing marketing practices, and restructuring urban and education environments to facilitate physical activity.
- No individual sectors in society, whether they are governments, retailers, consumer-goods companies, restaurants, employers, media organizations, educators, health-care providers, or individuals, can address obesity on their own. Capturing the full potential impact requires engagement from as many sectors as possible. Successful precedents suggest that a combination of top-down corporate and government interventions with bottom-up community-led ones is required to change public-health outcomes. Moreover, some kind of coordination is likely to be required to capture potentially high-impact industry interventions, given that there are market share risks facing any first mover.
- Implementing an obesity abatement program at the required scale will not be easy. We see three important elements to consider: (1) deploy as many interventions as possible at scale and delivered effectively by the full range of sectors in society; (2) understand how to align incentives and build cooperation; and (3) do not focus unduly on prioritizing interventions because this can hamper constructive action.
- The evidence base on the clinical and behavioral interventions to reduce obesity is far from complete, and ongoing investment in research is imperative. However, in many cases this is proving a barrier to action. It need not be so. We should experiment with solutions and try them out rather than waiting for perfect proof of what works, especially in the many areas where interventions are low risk. We have enough knowledge to be taking more action than we currently are.

MGI has initially assessed the elements of a potential program for the United Kingdom, but we believe our findings are broadly applicable around the world. This discussion paper is intended as an initial contribution and thought starter on what it is likely to take to address rising obesity. Our hope is that this analysis will be built on in the future as the collective knowledge base, and therefore the ability to respond to this crisis, is expanded.

Addressing rising global obesity...

(5% of all deaths each year)



...will require a sustained portfolio of interventions delivered by a range of different sectors.



A portfolio of interventions could deliver £25bn benefit.

¹ combines prevalence of obese and overweight; ² based on regional historial trends; combines prevalence of obese and overweight



Executive summary

Almost everyone reading this discussion paper will disagree with some parts of it. That is because much of the global debate on obesity has become polarized and sometimes deeply antagonistic. But, even more importantly, disagreement about the way forward reflects the fact that obesity is a complex, systemic issue with no single or simple solution, and the fact that there is currently a lack of integrated assessments of those potential solutions. All of this is getting in the way of addressing rising obesity. This research tries to overcome hurdles by offering an independent view on the components of a potential strategy.

A strategy of sufficient scale is needed as obesity is now reaching crisis proportions. More than 2.1 billion people—close to 30 percent of the global population—today are overweight or obese.¹ That's nearly an estimated two and a half times the number of people in the world—adults and children—who are undernourished. And the obesity problem is getting worse, and rapidly. If the growth rate in the prevalence of obesity continues on its current trajectory, almost half of the world's adult population is projected to be overweight or obese by 2030.

This has huge personal, social, and economic costs. Obesity is responsible for around 5 percent of all global deaths.² The global economic impact from obesity is roughly \$2.0 trillion, or 2.8 percent of global GDP, roughly equivalent to the global impact from smoking or armed violence, war, and terrorism (Exhibit E1).

The toll of obesity on health-care systems alone is between 2 and 7 percent of all health-care spending in developed economies. That does not include the large cost of treating associated diseases, which takes the health-care cost toll up to 20 percent by some estimates. There is growing evidence, too, that the productivity of employees is being undermined by obesity, compromising the competitiveness of companies.

There has been a plethora of research projects on the scale of the problem and on individual interventions designed to address obesity. However, to date, there has been limited systematic cataloguing of possible interventions, or analysis of their relative cost-effectiveness and potential impact. Perhaps most importantly, there is a need for more holistic assessments of what an integrated strategy for overcoming obesity would look like. Our research draws on analysis of the impact of existing interventions, along with discussions with policy advisers, populationhealth academics, and industry representatives, to begin filling that gap. In developing the research, we have received thoughtful input from academics, policy makers, and businesses from many sectors.

¹ Under World Health Organization standards, overweight is defined as having a body mass index over 25. Obese is defined as having a body mass index over 30. Body mass index is mass divided by height squared.

² The World Health Organization estimates that 2.8 million global deaths a year are attributable to high BMI on a base of 59 million total global deaths per year.

Exhibit E1 Obesity is one of the top three global social burdens generated by human beings

Estimated annual global direct economic impact and investment to mitigate selected global burdens, 2012¹ GDP, \$ trillion



1 Based on 2010 disability-adjusted life years (DALY) data from the Global Burden of Disease database and 2012 economic indicators from the World Bank; excluding associated revenue or taxes; including lost productivity due to disability and death, direct cost, e.g., for health care, and direct investment to mitigate; GDP data on purchasing power parity basis.

2 Based on historical development between 1990 and 2010 of total global DALYs lost (Global Burden of Disease).

3 Includes military budget.

4 Includes functional illiteracy.5 Includes associated crime and imprisonment.

6 Includes associated crime and imprisonment.
 6 Includes sexually transmitted diseases. Excludes unwanted pregnancies.

7 Excludes lost time to access clean water source.

Excludes lost time to access clean water source

SOURCE: Literature review; World Health Organization Global Burden of Disease database; McKinsey Global Institute analysis

The McKinsey Global Institute (MGI) has studied 74 interventions to address obesity in 18 areas that are being discussed or piloted somewhere around the world (see Table E1 at the end of this executive summary). We conducted a meta-analysis of research available. Of the 74 interventions, we were able to gather sufficient evidence to estimate what might be the potential cost and impact of 44 interventions. On the basis of this analysis, we have developed a perspective on what it might take to start to reverse rising obesity prevalence in a developed market.

As a starting point for our research on this issue, we have assessed what might be needed in a potential program for the United Kingdom. In the near future, as part of ongoing research on this topic, we intend to present similar analyses for emerging markets, potentially starting with China and Mexico. We expect the potential scale and impact of the interventions to look different in emerging markets than in the United Kingdom. However, we expect our findings to be broadly applicable around the world.

We must stress that our analysis is by no means complete. We see our work on a potential program to address obesity as the equivalent of the 16th-century maps used by navigators. On those maps, some islands were missing and some continents were misshapen, but they were still helpful to the sailors of that era. We are sure that we have missed some interventions and have over- or underestimated the impact of others. But we hope that our work, like 16thcentury maps, is a useful guide and a starting point to be built on in years to come as we and others develop this analysis and gradually compile a more comprehensive evidence base on this topic. We have focused on understanding what it takes to address obesity by changing individuals' energy balance through adjustments in consumption or physical activity. However, we have not addressed some important questions that require considerable further research. These questions include the role of different nutrients in affecting satiety hormones and metabolism, and antibiotic disruption of the gut microbiome. As more clarity develops on these research areas, it is to be hoped that important insights about which interventions are likely to work and how to integrate them into a program to tackle obesity will emerge.

Some of our initial findings are:

No single solution creates sufficient impact to reverse obesity: only a comprehensive, systemic program of multiple interventions is likely to be effective. Our analysis suggests that any single intervention is likely to have only a small impact at the aggregate level. Our research suggests that an ambitious, comprehensive, and sustained portfolio of initiatives by national and local governments, retailers, consumer-goods companies, restaurants, employers, media organizations, educators, health-care providers, and individuals is likely to be necessary to support broad behavioral change. These levers must address different population segments and deploy different mechanisms for impact. If the United Kingdom were to deploy all the interventions that we have been able to size at reasonable scale, the research finds that it could reverse rising obesity and bring about 20 percent of overweight and obese individuals-or roughly the population of Austria-back into the normal weight category within five to ten years (Exhibit E2). This would have an estimated economic benefit of around \$25 billion a year, including a saving of about \$1.2 billion a year for the UK NHS.



Exhibit E2

1 Impact is captured as million DALYs saved over full lifetime of 2014 UK population, taking into account health benefits accrued later in life SOURCE: Literature review; expert interviews; McKinsey Global Institute analysis

- Almost all of the interventions we analyzed are highly cost-effective from the viewpoint of society. "Cost-effective from the viewpoint of society" means that the health-care costs and productivity savings that accrue from reducing obesity outweigh the direct investment required to deliver the intervention when assessed over the full lifetime of the target population (Exhibit E3).³ Our analysis does not demonstrate the financial cost-benefit profile of the interventions to a specific entity such as a school, an employer, a retailer, or a food manufacturer. Nonetheless, in terms of the financial "bang for buck" that comes from delivering a positive impact on health, all interventions are attractive.
- Education and encouraging personal responsibility are necessary but not sufficient-restructuring the context that shapes physical activity and nutritional behavior is a vital part of any obesity program. Education and personal responsibility are critical elements of any program to reduce obesity, but they are not enough on their own. Our research suggests that additional interventions need to be in the mix that rely less on conscious choices by individuals and individual responsibility and more on changes to the environment and societal norms. These interventions reset the default and make healthy behavior easier and more normal, thereby relying less on individual willpower. Examples include reducing portion sizes of packaged foods and fast food, changing marketing practices, and changing physical activity curricula in schools. Such interventions rely less on individual willpower to go against the grain, making healthy lifestyles easier to achieve.

³ We assess cost-effectiveness based on World Health Organization definitions: investing less than one times per capita GDP to save a disability-adjusted life year (DALY) is highly costeffective, investing one to three times per capita GDP is cost-effective, and more than three times per capita GDP is not cost-effective.

Exhibit E₃

in a cost-effective way Cost-effectiveness and impact of



Sufficient evidence for weight change

Limited evidence for weight change

There is considerable scope to have high impact on obesity

1 Includes only non-overlapping levers in each category. Where two levers overlapped, such as plain and engaging labeling or gastric banding and bariatric surgery, the higher-impact lever was chosen

- 2 Impact and cost over lifetime of 2014 population; uses UK-specific cost-effectiveness calculated using GDP and World Health Organization methodology.
- 3 Based on the evidence rating system of the Oxford Centre for Evidence-Based Medicine.
- 4 All intervention impact modeling was subject to scalable assumptions on potential reach. Tax levers are also subject to scalability of levy incurred. In this case, MGI modeled a 10 percent tax on a set of high-sugar and high-fat food categories, based on empirical precedents and size of levy often studied. It is scalable, and impact would increase close to directly with increase in levy
- 5 Impact assessed here is only from reduced body mass index (BMI), not full health benefits of some interventions (e.g., cardiovascular health, mental health). For example, active transport health benefits are higher when all of these benefits are taken into account

NOTE: We do not include health-care payors because this is a less relevant intervention in the United Kingdom context. There are insufficient data to quantify urban-environment interventions.

SOURCE: Literature review; expert interviews; McKinsey Global Institute analysis

Capturing the full potential impact is likely to require commitment from government, employers, educators, retailers, restaurants, and food and beverage manufacturers, and a combination of top-down corporate and government interventions and bottom-up community-based ones. Our obesity abatement analysis and empirical examples of successful packages of interventions suggest that improvements in public health only result from a comprehensive package of interventions delivered by a wide range of societal sectors including a critical "community-owned" element. Delivering such a package requires engagement from all relevant societal sectors. Moreover, some kind of coordination is likely to be required to capture potentially highimpact industry interventions. Any single company that opts for a particular intervention unilaterally runs the risk of harming its competitive position; unanimous action avoids that risk. In some cases, however, coordination among industry players may be illegal under antitrust constraints. New forms

of cross-industry collaboration and support from government have the best chance of overcoming these challenges.

Implementing an obesity abatement program of the scale required will not be easy. A challenge of this magnitude requires an ambitious set of solutions—and the diffuse range of the many sectors of society relevant to this issue makes it even harder to achieve progress. We need to improve our ability to motivate action across such a diverse set of sectors. We believe that research and trial and error in how to deliver a cross-societal response is as important as research in the specific intervention areas discussed in this paper. We see four imperatives if progress is to be made:

- 1. As many interventions as possible must be delivered to have significant impact. A holistic approach by the public, private, and third sectors is the best way forward. A program that succeeds in reversing obesity prevalence is likely to require as many interventions as possible to be deployed at scale and with high-quality delivery, our research finds. Deploying a comprehensive set of interventions would need the full set of societal sectors we have identified—local and national government, health-care payors and providers, schools, employers, food and beverage manufacturers, retailers, restaurants, and food-service providers—to play a role. Coordination will be crucial. Today, government efforts to tackle the obesity issue seem too fragmented to be effective. In the United Kingdom, 15 central government departments; all local authorities with responsibility for health, education, and local planning; 16 EU directorates-general; and a wide range of nongovernmental organizations all have a significant impact on the major intervention areas that we have identified.
- 2. Understanding how to align incentives and build cooperation is critical to success. Some attempts to overcome obesity failed because they did not align with the incentives of the required participants. An example of this was the attempt by Michael Bloomberg to ban supersize beverages when he was mayor of New York. This change was blocked in the courts after extensive lobbying and legal action by the soft drink and retail industries. Other initiatives such as EPODE, which originated in France, and the Healthy Weight Commitment Foundation in the United States are leading the way in delivering integrated responses to the issue. If society is to succeed in tackling obesity, it will be necessary to find ways to build on such initiatives, to overcome misaligned incentives, and to coordinate action across a diverse set of societal sectors. The same is true of many of the public-health and environmental challenges facing us in the 21st century. In the case of regulation to reduce the incidence of smoking, it was not possible to align incentives; in the case of obesity, we believe that it might be possible.
- 3. Government, health-care systems, and private and social-sector organizations and entities should not focus overly on prioritizing interventions because this could hamper constructive action. As we have said, only a holistic, broad, and multipronged approach can be successful in reversing the obesity crisis. Interventions in the hands of all relevant societal sectors need to be deployed. Prioritization based on potential impact, cost-effectiveness, and feasibility is always important when making investment decisions. However, in the case of obesity, focusing unduly on priority interventions could be unhelpful given the need for a holistic response. A

search for the "best" interventions or a single solution could delay action and displace responsibility. Given the seriousness of the obesity issue, the aim should be to do as much as possible as soon as possible.

4. While investment in research should continue, society should also engage in trial and error. Given the scale of the obesity crisis and its economic impact, investment in research, innovation, and experimentation is relatively low. For instance, the United Kingdom invests less than \$1 billion a year in prevention activities such as weight-management programs and publichealth campaigns. To put that in perspective, that is only about 1 percent of the social cost of obesity in the United Kingdom. More investment is required, especially in understanding the effectiveness of intervention measures when they are applied as part of a comprehensive program. But society should also be prepared to experiment with possible interventions. In many intervention areas, impact data from high-quality, randomized control trials are not possible to gather. So, rather than waiting for such data, the relevant sectors of society should be pragmatic with a bias toward action, especially where the risks of intervening are low, using trial and error to flesh out their understanding of potential solutions.

The science on obesity and research into how to reverse this growing health burden is by no means complete. Society needs to know more about this complex systemic issue and its causes in order to mount a genuine, sustained, and aggressive challenge. This discussion paper is just a start. We intend to continue to try to capture an even greater range of interventions and update our data with the latest efforts on the ground and research as it is completed. Moreover, we hope that this analysis will help prompt further debate, and most critically, further action.

We reiterate, this analysis is just a 16th-century map, and it will benefit from continued input, research, and debate. We invite contributions to our ongoing research. In particular, we would like to hear about other possible interventions, better and updated data on the impact of interventions, and further insights about overcoming the major barriers to delivering high impact in a large-scale, integrated response. We also welcome challenge and input on our analysis and approach. Please send any comments to obesity@mckinsey.com.

In Chapter 1 of this discussion paper, we survey current worldwide trends in obesity and the diseases linked to it, such as type 2 diabetes. In Chapter 2, we discuss 18 groups of obesity interventions, under which we have classified 44 selected interventions, and introduce our obesity abatement cost-effectiveness analysis and some of its major findings. Finally, in Chapter 3, we review some of the elements of how society might mount a response to obesity, and what it is going to take to deliver it.

Table E174 interventions across 18 groups

Highlighted interventions were assessed for potential scaled impact and cost-effectiveness. Those not assessed either did not have sufficient quality data or were not relevant in the context of the United Kingdom (our pilot geography for this analysis)

1. Active transport	Urban redesign: walking	Government authorities redesign urban planning to facilitate and encourage walking
	Urban redesign: cycling	Government authorities redesign urban planning to facilitate and encourage cycling
	Disincentivize driving	Government authorities redesign tariffs, pedestrianization, and parking laws, and improve the quality of public transport
2. Health-care payors	Payor material incentive: general	Health-care payors provide material incentives for better health outcomes such as reduced payments
	Payor material incentive: facilitative	Health-care payors provide material incentives that facilitate healthy behavior (e.g., free gym membership or subsidized healthy food)
	Payor personal tracking and measurement support	Health-care payors provide personal tracking and measurement technical support for healthy behavior and improved health outcomes
	Parental diet and exercise education	Health-care payors provide parental education
3. Healthy meals	Free compulsory school meals for all	Government provides free compulsory school meals and improves health quality
	Subsidized compulsory school meals for all	Government subsidizes compulsory school meals and improves health quality
	Free healthy meals in the workplace	Employers provide free healthy meals
	Supermarket targeted promotions	Grocery retailers promote healthy eating through campaigns and recipes
	Lower-calorie options in the workplace	Employers introduce healthy options in canteens but do not remove existing options
4. High-calorie	Supermarket layout: space	Grocery retailers allocate greater share of space to healthier products and categories
food and drink availability	Supermarket layout: prominence	Grocery retailers allocate greater prominence (aisle ends, checkout counters, store entry) to healthier products
	Reduced access to high-calorie food in schools: regulated	Government bans vending machines and snack shops in schools
	Reduced access to high-calorie food in schools: self-regulated	Schools voluntarily ban vending machines and snack shops
	Reduced access to high-calorie food in the workplace	Employers remove vending machines and easy access to high-calorie foods
	School canteen layout	Schools place healthier canteen areas (e.g., vegetables, fruit, and salad) more prominently
	Workplace canteen layout	Employers place healthier canteen areas (e.g., vegetables, fruit, and salad) more prominently
5. Labeling	Calorie/nutrition "plain" labeling on package: regulated	Government mandates nutritional labeling on all packaged foods
	Calorie/nutrition "plain" labeling on package: self-regulated	Industry self-regulates nutritional labeling on all packaged foods
	Calorie/nutrition "engaging" labeling on package: regulated	Government mandates front-of-pack "engaging" format nutritional information (e.g., traffic-ligh labels) on all packaged foods
	Calorie/nutrition "engaging" labeling on package: self-regulated	Industry self-regulates front-of-pack and "engaging" format nutritional information (e.g., traffic- light labels) on all packaged foods
	Portion-size "engaging" labeling on package: regulated	Government mandates "engaging" portions information on each package in a clearly communicated way
	Portion-size "engaging" labeling on package: self- regulated	Industry self-regulates "engaging" portions information on the front of the package in a clearly communicated way
	Nutrition labeling in restaurants: regulated	Government mandates labeling on menus and shelf choices in fast-food restaurants
	Nutrition labeling in restaurants: self-regulated	Fast-food restaurants label menus and make shelf choices
	Nutrition "plain" labeling: workplace	Employers provide workplace canteen nutritional labeling
	Nutrition "engaging" labeling: workplace	Employers provide "engaging" workplace canteen nutritional labeling (e.g., traffic-light labels)
	Aggregate meal calorie labeling: workplace	Employers provide aggregated nutritional content and traffic-light labels at checkout
	Aggregate meal calorie labeling: restaurants	Fast-food restaurants provide aggregated nutritional content and traffic-light labels at checko
	Aggregate basket calorie labeling: retailers	Retailers provide traffic-light rating of basket contents at checkout
6. Media restrictions	Media restriction on high-calorie food advertising on all supports: regulated	Government restricts advertising of high-calorie foods on all advertising supports
	Media restriction on high-calorie advertising on TV: regulated	Government restricts advertising of high-calorie foods on TV from 6 a.m. to 9 p.m.
	Media restriction: self-regulated	Food and beverage industry voluntary restricts high-calorie food advertising (e.g., to children)
7. Parental education	Parental education: pre-schoolchildren	Government authorities provide educational program (e.g., 12-week course) to parents of pre-schoolchildren covering nutrition and parental feeding styles, and providing opportunities for physical activity
	Parental education: schoolchildren	Government authorities provide educational program (e.g., 12-week course) to parents of schoolchildren covering nutrition and parental feeding styles, and providing opportunities for physical activity
8. Pharma- ceuticals	Over-the-counter pharmaceuticals	Provision of non-prescription weight-loss drugs
	Prescription pharmaceuticals	Medical prescription of weight-loss drugs

Table E1 (continued)

74 interventions across 18 groups

Highlighted interventions were assessed for potential scaled impact and cost-effectiveness. Those not assessed either did not have sufficient quality data or were not relevant in the context of the United Kingdom (our pilot geography for this analysis)

Description Description 10. Price promotions Price promotion reconfiguration: regulated price promotion reconfiguration: voluntary Renove extra-large single-seve portions from packaged food ranges and re- price promotion reconfiguration: voluntary Food producers restrict promotional activity (e.g., two-for-one) of hig periodicing 11. Public-health Campadings Comprehensive public-health campagin (e.g., TV, radio, out-ch-home advertising) Renove extra-large single-seve portions from packaged food and it description 12. Reformulation New "better for you" products Introducing prove product ranges with improved nutritional profile, and advert for advertising a			
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wellness health indicators		Weight management around childbirth	Health-care system provides weight-management advice as part of pre- and postnatal care
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key health indicators		Workplace individual challenge incentive schemes	Employers provide individual challenge activities to encourage physical activity and improved key health indicators
Employer material (financial) incentive Employers provide material incentives for improved key health indicators (e. insurance premiums, gym membership, prizes)		Employer material (financial) incentive	Employers provide material incentives for improved key health indicators (e.g., discounts on insurance premiums, gym membership, prizes)



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