PLANET FAT

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Why we get fat, why we should not feel guilty and what we can do about it

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To Mila and Elena

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Foreword

Do you know the feeling of being full to the brim after having a meal? Wanting to unbutton those trousers and let that belly bloat out? And do you remember the thought of regretting that you had eaten too much? Wishing you had at least avoided that extra helping or that second slice of cake? You have probably heard that the reason for our eating behaviour is related to humans' evolutionary tendency to store as much energy as possible. In a harsh environment, this made it easier to survive.

Throughout human history we have always been subject to the rules of natural evolution. A significant change in the environment, often driven by geological and meteorological events, would lead to adaptation on our part. There may have been some deaths, but the fittest would have survived and passed on their adapted and superior (within that environment) DNA to new generations. The growth rate of the world's population in the 8000 years from the beginning of the

agricultural revolution to the rise of the Roman Empire is estimated to have been less than 0.05% per year, from about 5 million to about 200-400 million people. It took almost another 2000 years for the world's population to reach one billion, around 1800 AD.

Then, with the Industrial Revolution, there was a huge acceleration: the second billion was reached in just 130 years (1930), the third billion in 30 years (1960), the fourth billion in 15 years (1974) and the fifth billion in just 13 years (1987). The environment has become less harsh, medicine has made enormous advances, and food availability has gone from periodic scarcity to perpetual abundance. It seems that in the last few centuries we have managed to take away from Mother Nature any possibility of correcting and adapting our bodies to the changing environment. And suddenly we no longer seem fit to live in it. We become overweight, obese and ill.

In 2022, the world's population reached a record 8 billion. 8 billion people sharing the planet, using up its resources and starting to worry about when they are going to run out. We are now at the mercy of our intellect fighting our own stupidity; and the question is: will intellect outsmart stupidity, or will we stress the environment to the point of no return for our species?

Personally, I choose to be optimistic. I choose to believe that our ability to learn, our resilience, our intelligence will prevail. The way up may not be easy; we will probably have to face more eye-openers such as pandemics, natural disasters, wars, which will increasingly be seen as unacceptable affronts to our lives and our civilisation; but I believe that we will react and act to save ourselves and the generations to come.

The learning process starts with recognising risks, then accepting them and then tackling them. But the process is slow. While individual learning can be extremely fast, group learning is more complicated. Consider smoking. The negative health effects of smoking were denied for decades by both tobacco companies and smokers. Interventions to ban smoking in public places and the sale of cigarettes to children were fought as nonsense. Years later, we may

not have reduced the number of smokers to zero, but you will not find a sane person who does not know that smoke is bad for health. Or take climate change. Everyone has heard about climate change and its dangers. Some believe it is a true observation backed up by scientific data, some doubt the predictions, some deny it and dismiss it as a conspiracy and panic-mongering. The important thing is that we have taken the first step: humanity has identified a risk. Now we will learn more and more about it. The general belief of the moment will change one way or another, based on the discussions, on the science, on the politics, and that will lead to action. Whether it will be the right action or whether it will be taken in time, nobody can say. But we are following the process that we have always followed. And so far that process has got us where we are. It has helped us to survive, not as individuals, for many have been sacrificed along the way, but as a species.

Ultimately, the environment we live in has a powerful effect on us. It affects what we do, how we behave, what we eat, how we think. And sometimes it influences our behaviour, despite our rational awareness that that particular behaviour is not good for us.

To return to the subject of this book, fear not: if I could magically transport you to an environment with limited food availability and no processed foods, you would never hear of overweight, obesity, type 2 diabetes and metabolic syndrome.

The aim of this book is to create a better understanding of the importance of health span for individuals and society; a better understanding of the factors that lead to morbidity and disease, and of the tools we have in our hands to live long and healthy lives. We may not be able to change the environment or our DNA, but we can certainly strengthen our ability to make the right choices. Not an easy task, but the only side of the equation we can really work on as individuals.

The other pandemic

The World Health Organization (WHO) website has charts that show the top 10 causes of death in the world by country.[1] Looking at the global chart, we can see that the absolute number of people dying from cardiovascular disease has increased significantly over the last 20 years, becoming the leading cause of death worldwide. It is estimated that in 2019, 18 million people died of coronary heart disease, accounting for 32% of all global deaths, followed by cancer, which claims a further 16% of lives.

It may sound macabre, but this trend is actually partly good news. If you look at these graphs more closely, you can see that as soon as a country moves above the threshold of absolute poverty and manages to get access to basic hygiene and basic health care, cardiovascular disease becomes the leading cause of death, replacing communicable diseases, hunger and neonatal conditions. People who die of cardiovascular disease are generally people who have had the

chance to live longer, because most forms of cardiovascular disease are chronic conditions associated with ageing, and eventually we have to die of something. The problem is not that we die of cardiovascular disease, but that we live with it for decades.

Over the past century, an increasing proportion of the world's elderly population has been living with one or more chronic diseases, such as cardiovascular disease, diabetes and chronic obstructive pulmonary disease (COPD). Medical interventions have significantly delayed deaths from chronic diseases, but often do not cure them. As a result, life expectancy has increased. However, this has not been accompanied by a corresponding increase in health span, i.e. the number of disease-free years. Moreover, improved overall survival has allowed more diseases to become chronic, such as several types of cancer, HIV/AIDS, mental disorders (such as depression, schizophrenia and dementia), visual impairment and arthritis.[2]

While the development of medical intervention is undoubtedly a positive aspect of civilisation, the widening gap between life expectancy and health span has enormous consequences for our economy. Not only do the costs of providing treatment grow exponentially, but the growing proportion of the population with chronic illnesses affects labour force participation (whether directly or through family carers), productivity and job turnover, not to mention the personal suffering of those affected.

Clearly, efforts to bring health span closer to life span, and thus delay the onset of chronic disease, must be a priority for society (Scenario C in Figure 1); instead, the opposite trend has been observed over the last 5 decades: the onset of chronic disease appears to be occurring earlier in life.

The reason for this negative trend is that, although age remains the most important risk factor for chronic diseases, lifestyle choices such as smoking, harmful alcohol consumption, diet and lack of physical activity also play an important role. In particular, numerous studies have repeatedly shown the link between overweight, obesity, physical inactivity and chronic diseases. When we consider that the

prevalence of overweight and obesity is at an all-time high and increasing worldwide, even among children, it is easy to understand why the onset of chronic disease has accelerated. At the time of writing, there are more obese than underweight people in the world, with the only exceptions being parts of sub-Saharan Africa and Asia. Most high-income countries have adult populations with a prevalence of overweight or obese people of at least 70 per cent.[3]

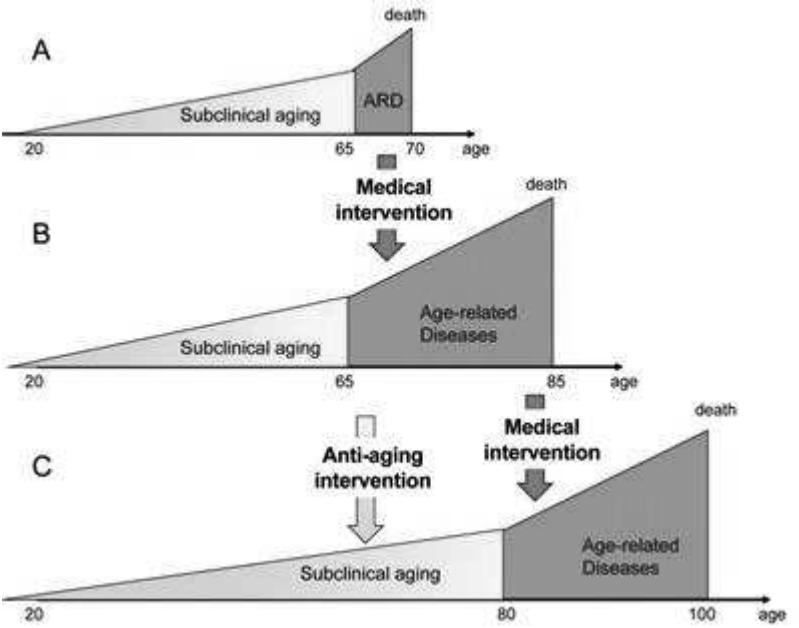

Figure 1. From A to B: Standard medicine increases lifespan by preventing death from age-related diseases. It simultaneously increases the number of old people suffering from age-related diseases. The ratio healthspan to lifespan is decreased. From B to C: Anti-aging intervention will slow down aging and delay the onset of age-related diseases. This in theory will restore the ratio of healthspan to lifespan.[4]

So why are we getting fat when countless scientific studies tell us we should not be, and the contemporary ideal of beauty and health looks like Angelina Jolie and Brad Pitt? All fingers point to food, of course. But not all food. What has changed dramatically in the last 50 years is the boom in ultra-processed foods. Ultra-processed foods are

defined as foods that are highly energy dense, where nutrients such as simple sugars, starches and processed oils are mixed with salt and additives to improve colour, taste and texture.[5] Examples of ultra-processed foods include fast food, soft drinks, cakes, biscuits, ready meals, crisps, ice cream, breakfast cereals, fruit yoghurts and other highly palatable products. And as we will see, the high palatability of these foods is what makes them so damn good and so easy to overeat. As if energy density and high palatability weren't enough, these types of foods are also extremely cheap, thanks to efficient production processes, the use of cheap raw materials and massive production scale; they are easy to prepare, easy to transport and easy to store for long periods of time. Combine these characteristics and you have the perfect storm. Over the past 50 years we have created and perfected a monstrous machine that makes becoming fat and unhealthy the default, while medical intervention tries to cure us and keep us alive for as long as possible, hopefully not too miserably. Only a few brave warriors, armed with iron discipline and possibly aided by a genetic advantage, can escape.

In this environment we are bound to lose. The individual is not the problem. The individual is literally built to indulge in similar circumstances. Our species has evolved over millions of years to seize every opportunity to secure food, the fattier and more sugary the better. It has been the difference between life and death for millions of years. And suddenly, in the last 50 years, food abundance has increased to incredibly high levels, food palatability has been engineered to the highest levels, while food quality has plummeted to an all-time low.

Make no mistake. You may have a tendency to gain weight, you may lead a sedentary life with no time to exercise, you may have an unstoppable sweet tooth; but if I could put you in the environment of the average person a few hundred years ago, your blood sugar would be perfectly within the norm, your blood pressure would please any doctor, and you would never have heard of type 2 diabetes.

Michael Moss, in his book "Salt, Sugar, Fat",[6] tells the interesting story of how the food industry has evolved over the last few decades to become a vast producer of food and drinks that are delicious, cheap, highly rewarding, looks good, smells good and can be stored for ages. You might have to believe that this is food when you turn the package over and read the list of ingredients on the back. But it is food. Highly engineered food to stimulate the brain's reward system. For example, a lot of research has been done on children to find the bliss point of sugary products. It must be fun to watch the faces of children tasting different yoghurts, desserts and the like. If you are a mum like me, imagine I met you at a local fair, smiling pleasantly at a colourful stand, and asked: "Would your daughter like to take part in a consumer survey? All she has to do is taste a variety of desserts and soft drinks and tell us what she likes best. Your child would probably start tugging at your sleeve, very excited and happy to participate. You would probably smile and say, "Why not? Then you'd probably pull your phone out and start taking pictures of your child to share on the family app.

Now imagine I start explaining that all the products she will be tasting contain high levels of glucose and fructose. The amount and bioavailability of glucose in these products is such that her young pancreas will have to produce large amounts of insulin to remove it from her body. At the same time, the large amount of fructose in these products will cause her liver to convert the excess sugar into fat. But do not worry. Your child is young enough to handle this very well. But if she likes our products, as we hope she will, and you buy them often enough, as we hope you will, she will develop insulin resistance, non-alcoholic fatty liver disease and, in a few years, type 2 diabetes.

You would probably run away screaming. And the frightening thing is that you would probably only decide to run when you heard the sentence 'she will develop insulin resistance, non-alcoholic fatty liver disease and type 2 diabetes'. The first part of what I said probably sounded like abracadabra to you, because most people have

no idea what happens in their bodies when they eat food, let alone highly processed food.

Does that sound exaggerated? Think twice, because this is our reality. Half of the world's population has insulin resistance for decades before the diagnosis of type 2 diabetes in their fifties. Cardiovascular events are not the result of a sudden onset of atherosclerosis in the blood vessels when you are 55 years old. The plaques, the blockages, the stiffening of the blood vessels start at a very young age and are constantly built up and aggravated by our eating habits and lifestyle, day after day, year after year, for decades. The good news is that no matter how old you are, no matter how far you have let it go, you can always intervene and improve the situation. But we shouldn't kid ourselves either. The extent to which you can repair the damage and maintain your quality of life depends on how far you let it get. In this sense, it may not be a very good idea to wait for symptoms to appear instead of taking a proactive role in maintaining your health. Unfortunately, waiting for health to deteriorate before taking action seems to be the current approach. Type 2 diabetes is perhaps the most striking example. If you are overweight, chances are you have insulin resistance. But doctors do not measure your insulin response during regular blood tests. They measure your blood glucose levels, which will stay well within the normal range until your liver and pancreas are exhausted and have stopped working properly. Only then will you be diagnosed with diabetes and receive treatment recommendations.

The effects of our eating habits and lifestyle build up slowly over the years, but we often do not notice them until it is very late. Someone who is lactose-intolerant may know how delicious ice cream is, but they have a strong disincentive not to eat it, because if they do, they will feel miserable very quickly. Someone who eats processed foods and drinks sweetened beverages to the point where they become overweight and obese may feel uncomfortable with their body and may choose to avoid activities that require too much physical exertion, but it may be years before they are "officially" ill.

And can you make a conscious decision to become overweight? Let's face it: anyone in their right mind would choose to stay healthy for as long as possible. But if being healthy comes at a high price and requires you to fight your own brain on a daily basis, wouldn't you just decide to go with the flow and eat all the delicious food you can get your hands on, whenever you can? Yes, at some point you might get seriously ill. On the other hand, there are enough pills and treatments to prolong your life for decades. Your quality of life might significantly decrease. You could lose your mobility, you could lose your cognitive abilities, your independence. But you do not know if that will happen. Nobody knows. You could end up developing diabetes and cardiovascular disease, but you could also be in the group of people who, despite their high risk, do not develop anything too serious. You could end up like the 96-year-old who smoked all his life and never got sick. It is all luck, as my grandmother used to say. And this is where I think politics and governments come in. When we look at individuals, we assess the risk of occurrence for a certain disease based on a snapshot of their health at a particular moment in their lives. When we look at society, we assess the certainty that a portion of the population will develop a certain disease. And that comes at a price. There is the cost of insurance, there is the cost of producing drugs that would otherwise be unnecessary, there is the impact on families, there is the impact on the workforce. And suffering, a lot of suffering for those involved. Reason enough, I think, not to leave the health of society in the hands of individuals. Because even if we like to think that we can choose how we behave, how we eat, how we live, in this obesogenic environment, we really cannot.

Will you starve that they be better fed?

"Will you starve that they may be better fed?" read the recruitment brochure for a famous experiment known as the Minnesota Starvation Experiment, in which 36 volunteers were subjected to semi-starvation and then refed. It was November 1944; the Second World War was drawing to a close and millions of people in Europe were living in conditions of extreme poverty with limited access to food, mostly potatoes and bread. At the time, little was known about the effects of starvation on the body and mind of the hungry, or how best to nourish them. It was at this time that Ancel Keys, a professor of physiology at the University of Minnesota and a consultant to the War Department, selected and enrolled healthy conscientious objectors to try to answer these questions.[7] The experiment lasted one year. It began with a 3-month standardisation period during which the participants were given a normal diet of 3200 kcal/d. This was

followed by a semi-starvation period of 6 months, during which the volunteers had their calorie intake reduced to 1800 kcal/d, based on the same type of food available in the war zones of Europe, typically bread and potatoes. The experiment would then end with a 3-month rehabilitation period. During this period, the volunteers would be assigned to one of 4 groups with different energy intakes. The volunteers were also assigned to standard laboratory tasks, allowed to attend university courses if they wished and asked to walk 35 km a week.

The goal of the semi-starvation period was for the participants to lose approximately 1 kg per week until a total loss of 25% of their initial body weight was achieved. The effects of starvation on the body and mind did not take long to manifest. The participants' behaviour changed: they became much more irritable. They would be deeply affected if a fellow participant got an extra slice of bread if they were losing weight too fast, they would get irritated at various small things, they would start to notice faults in everyone. Many would not have the energy to concentrate and attend the college courses they were enrolled in; they would completely lose their sex drive. Food became the only obsessive thought and some of the participants started collecting cookery books and recipes. Some started adding water to their soup and eating more slowly to make the meal last as long as possible.

The experiment clearly showed that food deprivation has a dramatic effect on both the body and the personality. The experiment showed that the effect of food on the body is not only related to weight loss or weight gain, but also to the regulation of vital parameters such as blood pressure, cholesterol, heart rate and body temperature regulation. It also showed that people living in conditions of starvation had lost their strength and will and were unable to do the work required to rebuild, let alone repopulate, a devastated Europe. Strikingly, the rehabilitation period seemed to be as hard as the starvation. The first thing the experimenters noticed was that a significant increase in calorie intake, more than doubling it, was

needed to rebuild the lost tissue. A 'normal' calorie intake was simply not enough. The participants were able to eat properly again, but for several months it felt as if the hunger would never go away. As a result, some of them ended up overeating to the point where they had to have their stomach pumped. The participants found that fatigue and dizziness were the first feelings to go, but it took more time for their libido, strength and sense of humour to return. In the end, none of the participants suffered any long-term effects from the experiment. However, these people were starved under close medical supervision and the 4 out of 36 participants who developed psychological or physical problems during the experiment were excluded as soon as the experimenters noticed. The uncontrolled starvation throughout Europe caused by the Second World War has certainly left its mark on the bodies and minds of those who were forced to endure it, as well as their descendants. Children born to malnourished mothers have a much higher chance of neurological problems and reduced cognitive function, as well as the development of schizophrenia.[8]

These are extreme conditions, and you did not need to read about the Minnesota starvation experiment to know that hunger is not the most pleasant of bodily sensations. You have probably never starved to death at any point in your life, but you have certainly experienced the feeling of an empty and growling stomach, irritability, the inability to concentrate properly, and the shifting of your attention to food. The dramatic effects of starvation, however, are proof that this feeling is deeply wired into our brains and bodies and is one of the biological processes responsible for our survival in good times and bad. It is the drive that would make hunter-gatherers leave their caves to hunt, knowing they could easily become prey rather than predator. The drive that would lead whole groups of people to travel vast distances to follow the animals. This is the drive that makes everything else unimportant and focuses the whole being on the pursuit of food. This is what makes extreme diets hopeless.

As well as the normal sensation of hunger that your body generates in response to a lack of nutrients and emptying of the gastrointestinal tract, you have probably experienced another sensation: the feeling of eating for the sheer pleasure of it. Maybe you felt it when you were watching a film on the couch and couldn't resist that bag of crisps, or after a long day at work when you passed a vending machine full of junk food; or when you didn't feel like shopping and cooking and decided to drive to the nearest fast-food restaurant instead; or when you were having a get-together with friends and the table was full of snacks and nice things to eat and drink. What is certain is that, whatever your situation, everyone in the affluent world is tempted to eat several times a day, whether they're hungry or not. And isn't that exhausting? We are constantly surrounded by food cues, we have an almost infinite choice of food, often the less healthy it is, the more irresistible and cheap it is. If we indulge once, we feel guilty; if we indulge often, we get fat; and if we indulge very often, we become obese and stigmatised by society.

But why is this? Why does so much of our lives revolve around food and why do we continue to eat too much, too often, of the wrong things when we know it is not good for us? I don't think there is a soul in the western world who hasn't stumbled across an article, a documentary, a film, a doctor, a friend and heard about the importance of healthy eating. Judging by the turnover of the weight loss industry, a huge proportion of the population is spending money in an attempt to lose weight and achieve the ideals of health and beauty that the media constantly reminds us of. But if health and beauty are so important to us, why do we overeat? How does it make sense? Well, unfortunately for most of us, it makes perfect sense. There are three forces at work: your genes, your environment and your mind.