Chapter 7
Obesity in 2020: Three Scenarios on Techno-socio-ethical Co-evolution

Tsjalling Swierstra and Jozef Keulartz

Introduction

In Chapters 3 and 4 we sketched the current, tension-ridden, constellation around obesity. We saw how three discourses, connected to specific practices and artefacts, competed for hegemony in defining the problem, its causes, its solutions and the main-actors. In this way, each discourse allotted (primary) responsibility for solving the problem to other parties: the obese individual, the state or the physician, as we showed in the previous chapter.

Some place the responsibility for one's obesity squarely upon the shoulders of the individual. It is true, the age-old moral condemnation of obesity in terms of gluttony and weak will has to a large extent been replaced by an aesthetic regime which requests an effortless leanness as a symbol of a highly valued youthfulness. This attitude is no longer openly moral regarding weight-issues, but in its practical consequences it is almost equally forbidding as the preceding Christian attitude. Furthermore, obesity is still treated as a moral issue because of the medical and economic costs the obese person inflicts upon his or her fellows. Others point to the moral perversity that in large parts of the world people starve, whereas in the decadent West people eat themselves to death. These aesthetic and moral judgments, however, are fought by others, who contest the dominant aesthetic body-ideal, question the medical and economic costs of obesity, or point to the fact that many can not be held responsible for their condition because they were uninformed about the risks they ran. Furthermore, this moralizing and individualizing discourse is criticised by proponents of the (socio-economical and material) environment and of the body (or the genes) as the primary causes of obesity.

In this chapter, we want to sketch three scenarios for the ways genomics can be expected to influence and re-shape this constellation. Our methodological point of departure is provided by the so-called *co-evolution* thesis, which holds that technological development and social development mutually shape each other. More particularly, we want to focus on the *moral consequences* of genomics. That is: we

T. Swierstra (✉)
Department of Philosophy, Maastricht University, Maastricht, The Netherlands
e-mail: t.swierstra@maastrichtuniversity.nljozef

M. Korthals (ed.), *Genomics, Obesity and the Struggle over Responsibilities*,
The International Library of Environmental, Agricultural and Food Ethics 18,
DOI 10.1007/978-94-007-0127-4_7,

will try to anticipate the ways existing moral (and political) discourses might change as a consequence of this particular form of techno-scientific progress. In this respect we differ from genomics scenarios like '*Scenarios on Genomics and Society 2015: Priorities for Social Science Research*, A Project for the UK Economic & Social Research Council (ESRC), carried out by the Institute for Alternative Futures and the Centre for Research on Innovation and Competition' and '*Foresight Study on Bio and Health Technologies*, Danish Ministry of Science, Technology and Innovation, (2003'. Of course, these scenarios rest on speculation. But scenarios have aptly been described as a form of *controlled* speculation. This 'control' comes from a diagnosis of the resources, restrictions and patterns that can be detected in the here and now. The present constitutes the bed that determines the flow of the river. What we try to do is anticipate how the river's flow will change this bed in the future. Co-evolution entails that existing moralities, in a broad sense, encompassing discourse, practices and material objects. – as we sketched them in the second chapter – will influence how genomics will affect the ways we deal with obesity. And vice versa, that these moralities themselves are bound to change under the influence of genomics.

Method: Trends, Drivers, Key-Elements, Moral Agnosticism

In scenarios, we can differentiate between so-called *trends*, *drivers* and *key-elements*. Trends are extrapolations of the present that are accepted as highly probable. All the scenarios in a specific study therefore share these trends. Trends usually serve as the non-problematic, implicit background of scenarios. For example, in the following scenarios we quietly assume that the developments will take place in the context of the modern, pluralist, fairly affluent and democratic society typical for the Western part of Europe. In our scenarios we take aging as a trend, as well as the development towards a multi-ethnic society. We have put the influence from foreign countries between brackets.

Drivers are possible developments with uncertain or contested plausibility: it is quite imaginable that they will occur, but it is equally thinkable that they will not. For example: it is still highly uncertain whether genomics will in the foreseeable future result in important new therapies or not. It is also highly uncertain where the public opinion will shift to in the case of a disaster related to genomics. Therefore, these drivers – as dimensions of uncertainty – serve to differentiate the scenarios. Put differently: scenarios are ways of exploring different driver-modalities.[1] In our study we have selected as driver the question whether genomics will only lead to more opportunities for prevention, or also to a cure in the form of a pill. We will see that this driver heavily influences which discourse on obesity will plausibly be hegemonic. Note carefully, hegemonic is not meant as having triumphed completely over the two competing discourses, but as being in the lead and as being able to

[1]Of course, it can be a matter of heated (political) debate whether a development should be qualified as a trend or a driver, because labelling a development as a trend tends to close this development to political intervention.

Table 7.1 Three scenarios of genomics going obese

1. Individual	2. Environment	3. Body
Health as merit	Corporate responsibility and no cure	The liberation of fun

marginalize or integrate the other two discourses. This leads to the following three scenarios (Table 7.1):

A third concept that is relevant in scenario-studies is 'key-element'. These serve to develop different scenarios in a commensurable and systematic way by listing the issues each scenario should dwell on. In our study, we selected the following key-elements:

1. A short account of the rise to dominance of the obesity discourse in question, with special attention for broader ideological, cultural, political, demographic, economic or technological developments that were functional in this process.[2]
2. The ways established morals influence the shape of new techno-scientific developments in the domain of genomics
3. The ways developments in the domain of genomics enhance some parts of existing morality, and discourage others. To be more precise: we will ask ourselves five questions:
   a. which new (im)possibilities does the new technology create?
   b. to what new rights and obligations does the new technology give rise?
   c. how are responsibilities (re)distributed as a result of the new technology?
   d. how does the new technology affect the established distributions of costs and benefits and the moral criteria with which these distributions are justified?
   e. how are existing identities and conceptions of the good life likely to be challenged by the new?
4. Public debate and political strife are bound to exist in the future. So: what shapes will the resistance to the dominant discourse most likely assume? What are plausible counter-discourses?

Finally: there exist different types of scenarios for different goals (Van Notten et al., 2003). Our goal here is to explore in the most open way possible the dynamic interplay between genomics and morality in so far both touch upon the issue of obesity. Because the moral discourses on obesity are themselves the subject of the scenario studies, it is important that we do not restrict our moral imagination beforehand by positing ourselves squarely in either one of these moralities. Instead, we have strived for a kind of moral agnosticism. Not because we are agnostics, but as

[2]An idea we put to use here is that ideological and cultural changes on quite separated issues are likely to pave the way for ideological, institutional and/or practical changes in the field of obesity/genomics. In evolutionary biology – and in Science and Technology Studies – this phenomenon is referred to a 'path dependency'.

a methodological stance to open our minds to whatever moral change the future of genomics might have in store for us.

The three scenarios are written from the perspective of the hegemonic discourse. The year is 2020.

Scenario 1: Health As Merit

In the first decade of the 21st century obesity became finally to be seen for what it in most cases is: a matter of individual moral failure. This was partly the result of broader political and demographic trends, partly the result of the further development of genomics.

By this time, politics had for several decades chosen to deal with complex social issues by privatising them, delegating them to the increasingly competent and vocal citizens. Collective problems can best be met by motivating individual citizens to change their behaviour. Politicians learned that the best solution in politics is usually: *stimulate individual responsibility*.

The existing system of collectively financed healthcare was finally denounced for what it was: ineffective, inefficient and far too costly. The costs of medical care soared, as a result of the constant invention of new, and invariably expensive, medical technologies. An erosion of social solidarity was the result. This trend was enhanced by demographic changes. Because of the aging of the population the costs of healthcare soared. More and more working people began to ask themselves why they should pay for the health of aging baby-boomers. Especially members of ethnic minorities – who by now constituted a considerable part of the work force – felt little or no obligation towards this generation. The solution was found in dividing up healthcare in two compartments: the government restricted collective financing to simple basic care, and if one wanted more expensive treatments, one had to pay for them oneself (directly, or indirectly by taking a private insurance). In this way, the individual patient was made more directly responsible for her own healthcare.

This general trend towards individualisation of healthcare was considerably stimulated by the development of genomics. First, the progress in medical and nutritional technology created new opportunities for diagnosis, prevention and treatment. Second, genomics made it possible to tailor diagnoses, advices and treatments to the individual and her genetic make-up. This helped spreading the notion that medicine is basically about and for individuals. Unfortunately, both new opportunities helped raising the healthcare costs. Prevention may help saving money in the long run, in the short run is demands extra investments. And the new tailor-made drugs and functional foods were more expensive than the older ones that had been produced in bulk.

Because obesity is a matter of great medical, economic and also some – why deny it? – aesthetic importance, billions and billions have been spent on genomics research conducted in this area. This at least is an example of how an important social value has determined the research agenda of genomics in the last two decades.

In the first decade of the new millennium our scientific understanding of the multifactorial causes of obesity increased rapidly. Obesity, genomics researchers have found out, is a multifactorial infliction: genes influence but *do not determine* this condition. Furthermore, genomics enables us to foretell who runs a higher risk to experience weight problems later on in life. There is no easy cure, but this is of limited importance because prevention – and losing weight – *is* possible.

Politicians at the time were above all concerned about the soaring costs of our healthcare. They were definitely not waiting for scientists with new, costly plans. But these scientists pointed out that for the foreseeable future genomics would generate hardly any new drugs. They stressed that most common afflictions were multifactorial in character and too complex for a simple 'pill'. Such a pill is unnecessary anyway, thanks to genomics, we can now match forms of dieting and exercise with everyone's individual genotype. To acquire a healthy bodyweight, one simply has to change one's patterns of eating and exercising. For all but a few exceptions, bodyweight has truly become a matter of the free will. Also, the politicians realized that a good obesity-prevention program would lower the intake of medication – which the collective often had to pay for –, even if the program would stimulate more expensive diets – which people had to purchase privately. They embraced the obesity-program because they hoped a shift from medication to nutrition would help reducing healthcare costs.

The geneticists pointed out that individual responsibility could only become successful if individuals could make well-informed choices. But when the *Gezondheidsraad* (National Health Council) advised in 2012 that everyone should be regularly tested for gene mutations, politicians rightly protested. It is everyone's own responsibility to take care of one's health, so people can be asked to pay for these tests themselves. If necessary, they can visit a doctor, who nowadays spends a large part of her time in giving individualized lifestyle advises to her patients. And instead of prescribing medication, she prescribes (or discourages) specific food. The government can therefore restrict itself to funding a publicity campaign urging people to take such tests and to visit the doctor. As a result, most people have now included genetic tests in their medical insurance. Only the really poor can apply for a free genetic test every 5 years and visit the doctor for free advise. However, if they choose not to obey the prescriptions of the doctor, they forfeit both these rights.

The new genetic knowledge and the connected opportunities for prevention and treatment have effected major changes in how we think about and deal with obesity. Thanks to the progress of genomics, public consciousness of the importance of prevention was considerably raised. By warning the potentially obese individually, genomics has motivated many to change their lifestyle. There are of course always those who are unwilling to change their behaviour, but now at least they have to accept responsibility for the consequences of their misconduct. They can no longer hide behind the worn excuse that they did not realize the consequences of their conduct.

Genomics has put a stop to the widespread practice of reaping the benefits of your behaviour individually, and then letting the collective bleed for the costs. Thanks to genomics, we now realize obesity is a lifestyle disease, which means that it

is ultimately self-inflicted. Understandably, more and more people started to ask themselves: why pay for other people's obesity related diseases, when these could have been avoided by adopting a healthy life-style? You misbehaved, then you suffer the consequences. That is only fair. The *possibility* of prevention turned into an *obligation*, at least if one wanted to claim solidarity from others. The right to ask for help has been made dependent on this obligation of self-care. And if one wants to exercise this right, society has the right to first check the facts. For the obese this means that their private life comes under scrutiny at the moment they ask help. Furthermore, genomics led to the proliferation of different risk-groups. Why, many asked themselves, should we show solidarity with people with whom we don't share the same medical risks? Let the potentially obese organize their own solidarity within their risk-groups.

It is also interesting to see how genomics affected people's self-image, as well as their conceptions of the good life. People have become more aware that everything they do affects their health, positively or negatively. There is a growing sense that we have a duty to take care of our own health. This implies that we now scrutinize everything to do with eating and exercising. It is now generally considered irresponsible to live carelessly. It is praised as virtuous to calculate long-term risks beforehand, and to command the willpower to take the necessary, sometimes unpleasant measures. In the last two decades, genomics has proven to be very effective in changing how people live. Much more effective, one has to admit, than over two and a half thousand years of (virtue)ethics.

All in all, genomics helped to accept that one's body weight is a matter of individual, moral responsibility, and it added significantly to the old obligation to take care of oneself. However, although true in most cases, there are two groups whose position is more complicated. First, low-income and low-education groups have proven to be slow to pick up the new genomics information, and to change their conduct accordingly. The information lies there waiting for them. Every citizen has the right to free information about her genetic make-up, so as to enable everyone to live responsibly. But these groups seem by and large uninterested: they lack the motivation to get this crucial information about themselves. However, they will learn in the next few years that society is no longer willing to pay for those who recklessly inflict damage upon themselves. If they are not motivated by their own health to acquire the relevant information, maybe the consequences for their wallet will provide the necessary stimulus.

Another group that cannot simply be held accountable for their body weight is the minority of the pathologically obese for whom no behavioural change seems to work. The 'certified pathologically and incurably obese' of course deserve our consideration. However, to prevent simulators from trying to qualify as pathologically obese and reap all the benefits of being officially sick, everyone has to subject to a strict behavioural regime before one is allowed to apply for help.

Most of the counter discourses on obesity that existed in 2000, gradually petered out thanks to the progress in genomics. Of course, even now in 2020 some people persevere in their denial of individual responsibility for one's weight – notwithstanding the clear findings of genomics. For example, there still exist small subcultures

that hold the obese body in esteem. These protest against the aesthetic standards of the lean and mean body. But since the increased possibilities for preventing obesity resulted in an increased social pressure to actually do so, obesity has become much rare. This has reinforced the 'official' aesthetic norms and standards. Two decades ago the Body Shop advertised that only a handful of women actually looked like photo models; nowadays it is definitely more than a handful, which makes it harder for the rest to deviate from the ideal that is increasingly becoming a social norm.

The sceptics, who disputed that obese people did not harm their fellow-citizens by raising the collective medical costs, are equally seldom heard of nowadays. In all honesty, this is not due to new scientific findings. Rather, their sceptic arguments lost their point after the individualisation of the medical costs for obesity.

However, in their place a new group has come to the fore, the so-called *bon vivants* who denounce what they see as an intrusive moralisation of areas of life they feel should be left free of moralisation. They protest against seeing oneself as potentially sick and always at risk. They refuse to plan far ahead and say they want to live by the day. They are consequent in that they claim to be willing to forfeit the solidarity of their fellows in the case they become sick eventually. These people are often very young, however. So let us wait and see.

Notwithstanding the overwhelming scientific evidence, we also still find the idea that it is not so much the individual's will that is pivotal in obesity, but her environment. According to this small band of radicals, the government should take steps to change this environment. And of course, they are right in that people do not act in a vacuum. But they are not puppets either! However, what is more important is that these radicals forget that such regulations, although beneficial to some, are quite restrictive to others. What is good for one genetic risk-group can be a quite unnecessary restriction of the freedom of another risk-group. Yes, I am sure that for *you* it would be very beneficial if we would close the elevators in our office. But why should *I* be forced to climb the stairs simply because you are too lazy and irresponsible to do your physical exercise in your own private time? Be honest: even at work no one forbids you to take the stairs whenever you feel so inclined. The only government intervention we need is providing everyone with the necessary genomics information for making informed, autonomous and responsible choices. That is why snack food nowadays has labels a bit like those introduced 20 years ago for cigarettes – only now with the proviso that the danger is relative to your genetic make-up, so the advise is to check your gene-map or ask your genetic advisor.

At the other end of the spectrum, we find an equally small band of radicals holding that it is not the environment, but the biology that is the cause of everything. Some of them think nothing can happen to them because they have 'good' genes – so they eat and drink themselves to death. Others, having heard that they are at extra risk, have become fatalists. They simply give in to what they perceive to be their biological fate, quietly hoping that someday a doctor will appear on their doorstep with a miracle cure. (A rather unfounded hope. An 'obesity pill' is typically something hoped for by the weak and depraved – much easier than dieting and exercising! Happily, private capital has withdrawn to other pharmaceutical sectors, concentrating on more honourable types of medication.) Both groups commonly

suffer under the misapprehension that their genes determine their biological fate. This only shows – again – that a little knowledge is indeed a dangerous thing!

Scenario 2: Corporate Responsibility (The Environment + No Cure)

At the end of the second millennium the influence of the individualizing and moralizing discourse of individual responsibility was already waning. Of course, this was difficult to see clearly at the time. The demise of this discourse was largely due to two separate developments.

For a long time, the rightwing government had firmly believed in the beneficial workings of the free market of consumers and producers, and so pushed the freely choosing, autonomous individual to the ideological fore. This rapidly changed when the adverse results of previous privatisations of government tasks (e.g. railways, energy, welfare) became so evident that no one could deny them any longer. A similar influence on the political and public consciousness was the progressive damage to our natural environment. Everyone became aware that fighting environmental risks could not be left to moralizing the individual's private consciousness. Furthermore, partly in reaction to globalisation, more and more people openly expressed their longing for more community. As a result of these diverse developments, there came a swing back from an individualizing approach to social issues to a more collectivist one, in which the government was called upon to operate as organiser and supervisor. The previous talk about the responsible individual and his free choice now was denounced as being both sociologically naive and politically suspect – often by the same opinion leaders who had previously extolled the virtues of individual responsibility! And finally, last of all, our politicians and policy makers finally caved in to the message the obesity-experts had been sending them for almost two decades.

For a long time the dominant conception had been that the individual should be held responsible for her own successes and failures. This was also how the victims of obesity were blamed. Not surprisingly, all this moral and financial pressure forced these individuals to fight back. They did this by showing how in fact others were responsible for what at first sight seemed an individual weakness of the will. Being poised in the ideology of individual responsibility, at first the general public frowned when obese customers started to sue MacDonald's and other fast food chains. But when they booked a modest victory in 2009, more obese people started lawsuits against other culprits. Advertisers of sweets and fast food were the next to be sued. This consistently failed, because they were largely protected by the freedom of information laws. However, – following the example of tobacco advertisements – popular pressure led the government to forge a covenant with the advertisers to make clear what health-damage was wrecked by the products they promoted. For example: each bar of chocolate now carries a warning in huge letters on its wrapper, laying out all the health risks of eating too much sweets. But respondents say that they are even more put of their appetite by the complimentary photo of a very

unhappy looking obese person. After that it was the turn of the food scientists, who had first claimed that all vegetable fats were healthy, only to later prove that many vegetable fats were not healthy at all. The lawsuit failed, but the result was that there was a demand for more government intervention in the food sciences, to develop procedures to ensure that health-related information were from now on to be more thoroughly checked before being made public. After that, a student filed a lawsuit against her former school for failing to supply and stimulate healthy lunches. She argued that the school was co-responsible for her obesity because it had neglected an essential task as an educator. In the end the school was fined to pay part of this students medical bills. A final row of lawsuits was filed against employers, who were held co-responsible for the health of their employees. They were charged with the fact that they had forced their employees into a sedentary work-environment, where it was virtually impossible to acquire a healthy amount of movement per day. These lawsuits failed because the judge ruled that employees had had enough opportunities to sport in their spare time. But the labour unions took over the complaint and succeeded in effecting changes on the work floor, partly by convincing the employers that a healthy workforce was in their own interest too. So, although most lawsuits failed, they did fuel a growing apprehension that an obese person is only the end-result of what can be truly dubbed a multi-actor process. Fighting obesity therefore requires orchestrated action, which only the state can initiate and regulate.

Together the two developments paved the road for a new perception of obesity and correlating policies, which stressed the responsibilities of corporate actors for the obesity of large parts of the population. Some consequences of this new perception were:

1. Obese people from now on confidently claimed that the costs of trainings, artefacts and diets had to be paid out of public funds. Why make them pay individually for what was essentially collectively produced misfortune? Politics ceded to their demands, because obesity was finally acknowledged to be less a matter of agency than of structure.
2. The state came up with new laws to ensure that corporate actors were made co-accountable for weight-problems in the citizenry, thus motivating them to make food(supplies) healthier.
3. But more influential in the end proved to be the covenants that the government made with the corporate actors. These circumscribed their societal responsibilities and how they should operate to honour these. As a result advertisements virtually turned into health-warnings, computers began to admonish their users to take some exercise,[3] and elevators had stickers – if they were not closed right away – which read: Are you ill that you cannot walk the stairs?
4. The state initiated policies to educate lower income groups with unhealthy eating habits.

[3] A development that had been foreshadowed by the so-called anti-RSI-programs at the turn of the millennium.

It was in this general constellation that *genomics* became prominent. With the increased knowledge of the multifactorial causes of obesity, our responsibility for public health took on a new form. Genomics scientists were the first to advocate large screening programs directed at the population as a whole. People have different genetic dispositions of which they are unaware. Of course, the 'worried well' find their way to the geneticist to have their genome mapped, but this is only for the happy and educated few. Common diseases like cancer and atherosclerosis cannot be fought on such an ad hoc socio-economically biased basis. If we know everyone's genetic profile, policies can be developed specifically for particular risk-groups.

With the benefit of hindsight, one can only regret that it took so long before the new science managed to change public health policies. But in the context of those days, it was in fact quite understandable that people reacted lukewarm. Politicians were above all concerned about the soaring costs of our healthcare. They were definitely not waiting for scientists with new, costly plans. It took a lot of lobbying by the scientists to have them change their minds. First, scientists pointed out that for the foreseeable future genomics would generate hardly any new drugs. They stressed that most common afflictions were multifactorial in character, and in all probability too complex for a simple 'pill'. The policy they advocated was about prevention, about saving money instead of spending it on expensive medication. Furthermore they pointed out that the environment can only be effectively shaped on the basis of scientific knowledge about the interaction between the genes and the environment. Furthermore, the scientists argued, politicians had a professional responsibility to look at long-term consequences. Yes, they agreed, in the short run large scale screening of the population costs money. But because screening makes prevention possible, we will avoid all kinds of medical costs in the long run.

Genomics equally reinforced the well-known point that prevention of obesity was much more effective and efficient than correcting one's weight problem in a later stage. However, to be really successful, the prevention would have to start at a really early age. To reach the children, preferably from the moment they were born, meant that the government would have to intervene much more directly into the private sphere of the family. In 2012 the *Gezondheidsraad* (National Health Council) advised that everyone should be regularly tested for gene mutations, the politicians changed their positions.

One of the first experimental screening programs was directed at finding genetic dispositions for obesity. The program started relatively modest. The idea was that only patients with hereditary obesity in their families would be offered the test. However, this proved to be impracticable because without community genetics it was impossible to determine whether families were obese because of their genes or mainly because of their lifestyles. Nature and nurture are so intertwined that it is useless trying to separate the two. Environments can cause genes to mutate and genes can cause people to seek certain environments. For this reason medical professionals started to convince politicians and policy makers that everyone should be regularly screened from childhood onwards.

For a short while politicians were worried that there would be a large popular uproar that the screening programs infringed upon our privacy rights. In the

first decade of the third millennium programs like this would have been politically impossible because the discourse of individual responsibility laid much stress on the value of privacy. And indeed, there were still some elderly radicals who protested vehemently. But the majority could not care less; in the decade before, the war on terrorism had already accustomed them to the idea that privacy is not an absolute value, but may be put aside in the name of safety or health. More importantly, by this time interventionist government programs had been developed for children of ethnic minorities, whose parents spoke the national language insufficiently. The idea was that these children should not have to start their educational careers with a language handicap. This government program provided the knowledge and infrastructure for the new obesity-prevention program. It paved the way for other government measures directed at small children.

Large scale genetic screenings helped identify the groups with a particular risk to develop obesity, and community genetics then took over with a host of measures tailor made for these specific groups: information, advise, coaching, motivational trainings, etcetera. Of course, it would not do to simply check everyone's genes and then send the results at their homes. The interpretation of genetic data requires medical professionals, so they have to play a key role. By and large, the target groups were fairly open and cooperative, knowing hat they had a considerably more than average risk to become obese.

Nowadays large – medically supervised – prevention programs for obesity have become well embedded in society. Investments followed demand and shifted from pharmaceutical genomics towards nutrigenomics. This resulted in a rapid increase of knowledge regarding what nutrition is good or bad for people with this or that genome. More and more it has become clear that people from different ethnic backgrounds sometimes react quite differently to the same nutritional ingredients. What is healthy for one group can be poison to others. Restaurants began to cater for different genetic groups, their menu-cards containing information about which dishes were inadvisable for people with specified gene-mutations. However, there were also surprising discoveries made, e.g. that the people with Celtic forbearers reacted exceptionally well to Indonesian food, resulting in a whole chain of Celtic-Indonesian restaurants. The food industries were quick to adapt their marketing strategies to the new circumstances and developed different foods for different gene-groups.

An important finding of genomics was that bad food (too much salt, sugar and animal fats) modifies one's genetic make-up, with a life-long addiction as a result. This strengthened the causal link between the advertising, selling or providing of junk food on the one hand and obesity on the other. Now genomics had established this link it became virtually impossible for schools, junk food sellers, and advertisers, to deny their own responsibility for the obesity of those they had seduced. They could no longer hide behind the claim that they had not known. In this way genomics reinforced the already discernable shift from individual responsibility to corporate responsibility. New duties evolved for the likes of MacDonald, new rights evolved for the consumers.

At the start, information campaigns – now enthusiastically endorsed by most politicians – were specifically directed towards young women and mothers. Beautiful models appeared in all the media to extol the benefits which screening, followed by individualized diets, had brought them. Elderly models gravely told about their responsibility for the health of their children. And women were quick to take up the message. They volunteered on a large scale to be tested. Because women still play a strategic role in educating the next generation, children quickly followed suit. The third group to fall massively for the new obesity prevention program were the aging baby boomers, still desperately clinging to their faded youth. Young and middle-aged men were slower to react. A special campaign was designed for them, stressing that a healthy diet and MBI resulted in better energy levels, and it was suggested by the accompanying imagery that this would improve career chances.

Nowadays most people accept that obesity is largely a product of environmental factors. But some corporate actors, fast food corporations and advertisers especially, keep testing the water by trying to shove some more responsibility onto the plate of the individual.

And they are not alone. Not everyone is happy with all the progress booked. In the lower socio-economic strata there are still many men who are hard to convince of the benefits of prevention. For certain young men it even seems to have become a sign of manliness to purposely eat bad food, laughing death in the face as it were. In certain ethnic groups young women equally flaunt death by over-eating, because excessive body fat is considered sexually attractive.

There also exists a considerable minority of non-obese citizens who protest what they see as the paternalism and interventionism of the state. Genomics, according to them, shows how different people are. One can never develop general policies that are so fine-grained that they can do justice to all these individual differences. Only the individual knows what is best for her. Even if one has the genome to safely eat fast food, it has become virtually impossible to acquire it. They refuse to pay for most of the prevention-policies. More generally, they protest against the progressive medicalisation of all domains of life. According to these radicals, we have become obsessed by preserving our health, thereby neglecting all the other values that make a human life truly meaningful. Their favourite form of political protest is setting up large tables in public spaces, loading them with food, and then inviting people with all different types of genomes to join them in sharing the same food together. That this comes down to poisoning some of their guests, does not seem to worry them. . .

Although at first glance this group might have a point, their arguments hide a fundamental egoism. The simple fact that you are ‘lucky’ in genetics should serve as an incentive to help your fellows who were less lucky, instead of using this genetic luck as an argument to distance yourself from your fellows. Especially because their sacrifices are very minor compared to the benefits we all reap as a society.

More surprisingly, we also see some of the citizens who indeed have been diagnosed with a heightened risk for obesity, object to what they see as discrimination. They think it is quite unfair that they are subjected to all kinds of interventions from which others are spared. For this reason they sometimes sabotage the programs that have been devised for their own good.

Scenario 3: The Liberation of Fun

The first two decades of the new millennium witnessed a rapid progress in our knowledge of the genetic background of obesity. Although being a multifactorial affliction, for a small group of patients' behavioural changes have no use. For years they demanded a genomics based obesity drug, as it has been successfully developed for a host of other diseases in recent years. However, being a minority, they were not commercially interesting to the pharmaceutical industry. Therefore the government decided to subsidise the development of an 'orphan drug' for this group. And with this aid, genomics researchers have indeed managed to develop a drug that restores the normal functioning to these patients' bodies. Furthermore, nutrigenomics has developed some kinds of health food, e.g. possessing less saturated fats or sojabeans that are genetically modified to possess fish-oil.

Initially, the drug was only administered to obese patients after their condition has been thoroughly checked for the relevant genetic mutations. But many cures for the really ill develop into enhancements for the not so ill. As we have seen happen earlier with such now common household drugs like Prozac and Ritalin, anti-obesity medications have rapidly become popular life-style drugs, easily obtained through the Internet (for a real story about anti-obesity-pills, see Chapter 14). Why restrict your diet to health food? Why suffer and sweat in gyms, when the same result, a lean and mean body, can be obtained in a much easier way by taking a pill? This development was of course enthusiastically supported by the pharmaceutical industries. Their commercial successes have drawn extra capital, and new genomics based medicines against obesity are currently put on the market in a steady tempo. This all happened very quickly, because the weight-industry already had its whole marketing machinery in place – advertisements, distribution channels, and selling points – waiting as it were for the appearance of these obesity drugs.

The vast majority of the obesity pills nowadays are taken as a form of enhancement. Of course one cannot expect the community to pay for this use. But there is no ground to forbid consumers this use of the obesity drug either, because they harm neither themselves nor others. Individuals are therefore free to purchase on the market whatever obesity drugs they want and can afford. It is indeed unfortunate that obesity is now rapidly becoming a biological marker of belonging to a low-income group, but that is only the price to be paid for our freedom as individuals. And anyway, nothing stops poor people to control their weight in the old ways: eating less and exercising more. Both are still free!

The availability of a cure for obesity has profoundly changed our moral outlook on obesity. First, since medication is available, obesity has transformed from a sin into a disease. This transformation was avidly taken up and propagated by the obese people themselves. Understandably, because they had been suffering for ages under the moral denunciations by others. The result has been a rapid a-moralisation of obesity. Physical exercise is increasingly seen as a waste of valuable time, better spent in productive areas. Many have even gone further and now claim enthusiastically that for the first time in human history hedonism itself is liberated. At last having fun is separated from the punishment of disease. Nor is their any reason for

guilt: the individual is not burdening the collective with the costs of her medication. Finally life style has really become a matter of free choice.

Also, people started questioning previous attempts to hold corporations accountable and to remove environmental causes of obesity. Thanks to this pill, they argue, the rationale for applying the blunt, undiscriminating policy of environment-change ceases to exist. There is no longer need for state interventionism, now people can effectively control their body weight with the help of medication. The human organism, they say, is programmed to save energy. No one *likes* to climb a stairs when they can avoid it. According to them, the new medication offers us a way to obey our natural impulse to laziness, instead of being forced to do unnatural exercises.

For some conservatives, however, this liberation seems to have come too late. They stubbornly stick to the old position that having a healthy bodyweight only 'counts' when it is the result and reflection of having a strong character and inner worth. Since the obesity pill is marketed, these old style moralists have begun propagating 'natural' weight-control, because that is so much more 'authentic'. There is as much difference, according to them, between exercising and taking a pill, as between Rembrandt's *Nightwatch* and a copy of that painting on the lid of a tin box. Well, if they want to be masochists, they are of course free to choose that lifestyle. If only they would stop bothering us neo-hedonists!

From the other side of the political spectrum, the remaining parts of the 'loony left' still desperately clings to the outdated view that obesity should be indirectly dealt with by changing environmental factors. According to them we are propagating a 'technological fix' to obesity: the attempt to superficially fight the symptoms of structural deficiencies in the way we have organised our lives. They warn us that we will literally end as drug-addicts who have sold their soul to the pharmaceutical industries. One can only reply that it is they who are subject to a 'social fix': trying to solve social problems by elaborate social means. That may seem logical in theory, but is very ineffective in practice. Medical technology is often able to provide solutions that are much easier to implement because these do not demand from people to change their established routines. We have to thank genomics for developing these solutions.

Conclusion

The new opportunities and possibilities created by technology, give often rise to controversies about new rights, obligations, responsibilities, the just distribution of costs and benefits, and conceptions about the good and virtuous life (although admittedly seldom in these terms. . .). Our scenarios try to show how new technology is interpreted within existing, established moral frameworks. When a moral controversy exists, the new technology is bound to be assessed in quite diverse ways. One party tries to show how the new technology based opportunities – preventive measures against obesity for example – reinforce the discourse of individual responsibility; the other party thinks the new knowledge makes it inescapable that corporate actors finally accept their responsibility and to develop large scale screening programs. The

discourses sketched here definitively possess their own kind of robustness; they are not simply shoved aside by the new technologies. The scenarios even show that the dominant moral discourse sometimes influences the course of scientific and technological research. The second scenario provides an example of this, where R&D investments are shifted from finding an obesity cure to developing functional foods due to the dominance of the environment-discourse.

However, new technologies possess their own kind of robustness. Not all interpretations are possible. They cannot always be seamlessly integrated in the established moralities. Compare it to reading a text: different interpretations are usually possible, but not all interpretations. New technologies force moralities to adapt to new realities, and sometimes this results in serious changes of these moralities, or causes shifts in the relative strength of the different positions in a controversy. For example: an increase in our knowledge about risks is bound to result in an increased responsibility for someone, even if it is contested for whom exactly. And it is equally unavoidable that this is bound to influence established conceptions of the good life. Technologies pose new problems, and the established moralities have to come up with new solutions to these problems. That is how moralities grow and change. And the more invasive the new technology is, the larger the moral changes.

This is shown in particular in the third scenario about the obesity pill or some gene therapy: an effective and relatively cheap genomics-based drug that somehow changes our metabolism so that we can consume without acquiring extra bodyweight. Science now offers an alternative route to deal with obesity by means of medical biotechnology, and that fact alone decreases the 'necessity' or rationale of 'moralizing' and 'environment control'. The existence of an alternative route means that the arguments underpinning 'moralizing' and 'policy' are weakened. And the (moral) costs of both strategies, guilt for the one, restriction of personal freedom for the other, are brought out more sharply. Some of the proponents of these discourse will choose to adapt to the new biotechnology and modify their position, e.g. by saying goodbye to moralizing and embracing hedonism. Others will try to develop new arguments for their old position, like those who suddenly start attaching a lot of importance to the 'naturalness' or 'authenticity' of weight-management without medical help. Or those who stress that taking medication only fights the symptom, not the causes, and makes us dependent on the pharmaceutical industries. This in time of course invokes new counter-counterarguments and so on.

The previous scenarios do not pretend to foretell the future. There is only one thing sure about the future, and that is that it will take us by surprise. The goal of the scenarios is different. They aim to sensitize us to the co-evolution of technology and morality. Although we do not know how technology and morality will influence each other, we can be pretty sure that they will somehow. And when we develop new technologies, it is best to prepare ourselves for this interaction. Our current discussions about the morals of dealing with obesity can be enriched by imaginative accounts of the ways our moralities interact with technological development.

Acknowledgement We want to thank Maartje Schermer for her comments and suggestions.

References

Danish Ministry of Science, Technology and Innovation (2003), *Foresight Study on Bio and Health Technology.* Kopenhagen

UK Economic & Social Research Council (ESRC) (1999), *Scenarios on Genomics and Society 2015: Priorities for Social Science Research.* Institute for Alternative Futures and the Centre for Research on Innovation and Competition

Van Notten, P.W.F. et al. (2003), An updated scenario typology, *Futures*, 35, 423–443