diabetes towards 2030

changing diabetes®

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contents

Numerous Novo Nordisk colleagues, and select people across sectors and countries, have contributed to the development of the scenarios. We are grateful for the insights and perspectives that they have provided.

We wish to thank Carlo and Ciela Pultoo for sharing the story of their lives with diabetes. Mr Pultoo has had type 2 diabetes for fifteen years. Mrs Pultoo developed gestational diabetes 25 years ago, which disappeared after giving birth but then reappeared as type 2 diabetes. A brief story about the Pultoo family is presented in each of the two scenarios to illustrate aspects of the future.

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Future Health & Social Innovation
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welcome to diabetes towards 2030

This booklet presents two scenarios for how public health and diabetes care could develop and power new business models for pharmaceutical companies and healthcare towards 2030.

The scenarios are tools to help us navigate an uncertain future. They support a strategic dialogue about the future environment for doing business and also guide how Novo Nordisk can fulfil the promise of 'changing diabetes'.

Scenario building
Novo Nordisk's previous diabetes scenarios have followed a classic approach inspired by Shell, examining how the world might develop in various directions depending on how different factors play out.

'Diabetes 2020' in 2003 had a broad social point of departure sketching out two different societies focusing either on the technological or the human possibilities at hand.

'Diabetes towards 2025' in 2006 followed the same logic and counterpoised a biomedical and a public health perspective. The framing was somewhat narrower and discussed changes in the actor landscape in healthcare.

The 'Diabetes towards 2030' scenarios
'Diabetes towards 2030' zooms in even further and links pharmaceutical business models to the pandemic growth of obesity and chronic diseases, significant advances in the understanding of human behaviour and of biology, and the ability to improve health outcomes in populations with diabetes and other chronic conditions.

We have developed two plausible stories – scenarios – of how these factors might develop in the future.

The first scenario, **'The new normal'**, is a story that describes the continued growth of the pandemic of obesity and chronic diseases. Populations in most countries of the world reject government intervention in their lifestyle, and public health interventions therefore have limited effect. Innovation meanwhile drives the fast-growing obesity market, which segments into a consumer-oriented well-being market, and a medical market focusing not on obesity as such, but on chronic disease risk factors. The medical intervention showing the greatest success continues to be surgery, but it is available only for the fortunate few.

In the second scenario, **'No outcome, no pay'**, the confluence of several factors leads to a new paradigm for chronic care, where health outcomes rather than products are rewarded by those who pay. This story is about improved knowledge about the relative value of different care designs and interventions. In the most affluent nations, full cycle care delivery is facilitated by organisations that are able to manage partnerships between many stakeholders and disciplines. In most countries, 'good enough' diabetes care is the best hope for most people.

Each scenario focuses on the possible emergence of a new paradigm that can have profound implications for Novo Nordisk and the focus of our business.

key trends & drivers

The context for these scenarios is a number of long-term trends which will significantly shape our future world. These are political, socio-economic, cultural technological, governance and demographic trends, as well as trends in the availability of natural and human resources.

A set of key scenario drivers with the potential to impact Novo Nordisk's strategy and business design have been identified. Among the most important to highlight here are:

The geopolitical landscape

The fastest **economic growth** globally will continue to be in China and much of Asia. Three of the top four economies in the world – China, the US, India and Japan (in that order) – will be Asian before 2030. By then at least one billion new people, mostly in Asia, will have joined the global middle class (annual incomes between 6,000 and 30,000 USD). These people will create a significant opportunity as health markets are likely to largely remain funded by private resources in China and many other emerging economies. Most of these people will still have a relative purchasing power well below what is normal in today's high-income countries.

The shift of economic power to China and other emerging economies is likely to result in more country-to-country and country-to-multinational corporation deal-making and less universalism. International institutions will remain too weak to forge and reinforce binding international agreements and regulation, or to orchestrate a concerted effort against poverty, climate change and other formidable global challenges. There will nevertheless be important regional agreements. Unless there is an iconic climate-related event, successful change will continue to depend on self-interested agreements between the major powers (including major corporations).

The current global financial crisis is likely to lead governments to implement somewhat stricter **regulation of capitalism**, especially the use of high-risk financial instruments. There are likely to be both market incentives and new regulations to persuade companies to assume a wider responsibility for societal sustainability and human well-being, and to make it increasingly expensive to over-use resources, pollute the environment or cause illness among employees. There will also be attempts at modernising the institutions governing the global economy and cross-border policy areas.

Demographic growth is expected to increase exponentially – particularly in low- and middle-income nations – where 95% of the growth takes place. This will exacerbate already existing **competition for resources**, which increases the risk of disruptions and volatility in the global business operating environment.

Most critical are likely to be: the severe constraints on the availability of cheap oil as supplies stagnate from the early 2010s and the price of carbon rises; and increased tendency to price the water embedded in manufacturing processes. International trade is consequently likely to be significantly more expensive. The impact of oil scarcity in particular is likely to make the operating environment for business more volatile. Global transport systems are 95% reliant on crude oil for their smooth functioning, making even short term disruptions potentially extremely costly.

Competition for oil, land, water and precious industrial metals will increase political instability. All industrial sectors will need to develop sophisticated strategies and competencies to understand and manage the political, economic and logistical dimensions of supply chain resilience.

Emerging economies – especially China – will shift their focus even more towards **knowledge-intensive products and services**. Chinese high-tech exports have crowded out Korean and Taiwanese exports since 2000. China and India already educate more science and engineering PhDs than all other countries combined – and the quality of education is likely to increase considerably in the coming years. There will be intense rivalry between Asian governments to create the best environment for investment in these high value sectors.

Social changes such as the widespread availability of social media – combined with the socio-economic ascendance of Chinese people who have lived abroad – is likely to be accompanied by **value change** towards more individualism, self-realisation and some democratisation in China.

Meanwhile, other emerging economies such as India and Brazil will remain firmly democratic. In South Korea, Russia, Mexico and Turkey the pressure for more democracy from new generations of citizens who have grown up digitally is likely to increase. Growing disparities in income and expectation are likely to lead to conflict and disruption in these democracies.

Diabetes care and prevention

Health markets will become more global, not just with an increasing number of medical tourists from high-income countries to high-quality hospitals and clinics in middle-income countries, but also with the reverse export of cost-reducing and productivity-enhancing innovations.

The **obesity and diabetes pandemics** will continue in most parts of the world and also in children. Even though there are signs that the incidence of obesity might be stagnating in some OECD countries, worldwide the number of obese people is expected to grow from roughly 400 million today to more than 1 billion in 2030. By then, more than half the world's population will be either overweight or obese and in some regions there will be more obese than overweight people. Consequently, the number of people with diabetes and related chronic conditions will continue to grow.

The majority of **new diabetes cases** will appear in people who are working-age, especially in low and middle-income countries.

The profiles and **needs of people with diabetes** will get more diverse as the special health needs of distinct population groups are better articulated. It is likely that differentiated approaches to treatment for the old, poor, highly connected, highly active and populations with other solution preferences than Western will be developed.

Understanding **cultural differences** will become essential. There is good reason to believe that a traditionally holistic approach to heath care will combine with the central role played by families, leading to a response to diabetes that is likely to be less product-focused, more holistic and more comprehensive in Asia than in other parts of the world.

New generations of people with diabetes use **social media** as an integral part of their lives. They do not feel threatened by new e-tools but rather embrace the idea of being fast adopters (or co-developers) of solutions that have the right approach and tone of voice. In 2030, this will be relevant for the majority of people below the age of 50 everywhere in the world.

The populations in high-income countries and China are ageing rapidly and there will be proportionately **fewer working-age people to provide and fund care**. The working-age population is already declining in Japan, and will begin to do so in Europe from 2010 and from 2015 in China. In the US, it will grow slightly over the next decades.

In 2030 there will be more than 1 billion people older than 65. The number of **elderly people with diabetes** will double in affluent countries and triple in low and middle-income countries. Health expenditure for the elderly is traditionally many times higher per person than the rest of the population.

In affluent economies, an average annual economic growth rate of at least 4 percent is required to **sustain pension schemes and public sector healthcare expenditures** in the coming decades. During the last two decades, economic growth has averaged 2-3 percent per annum in OECD countries.

The world-wide **shortage of health workers** – doctors, nurses and lab technicians – is most critical in poor countries where the existing problem of fewer health workers per capita is compounded by their subsequent migration to the OECD where more than 10 percent of nurses and almost 20 percent of doctors are 'foreign-born'. Already in 2009, at least 4 million health workers are needed to fill the gap.

These changing epidemiological and demographic trends, coupled with the effects of financial crisis and economic downturn, are amongst the most powerful forces that are likely to drive **aggressive cost control measures in health systems**. And this trend is facilitated by growing use of tools such as health technology assessment, comparative effectiveness, payment for impact (health outcomes and cost savings) and a tendency to care rationing.

Countries with the largest number of adults with diabetes in 2030

	Millions of people
India	87
China	63
USA	36
Pakistan	14
Brazil	13
Indonesia	12
Mexico	12
Bangladesh	10
Russia	10
Egypt	9
WORLD	438

Adapted from:
International Diabetes Federation (2009):
IDF Diabetes Atlas

Innovation opportunities

Prominent management experts argue that **chronic care is a fertile ground for product and disease management innovation**, citing diabetes care as a case in point. Measured in population health outcomes the investment in diabetes care is not yielding very impressive returns (see for example the figure below for China). Even in affluent countries, many people with diabetes are not diagnosed, do not receive care or do not reach their treatment targets. As a result, a large proportion achieves poor outcomes. The situation is even worse in low and middle-income countries.

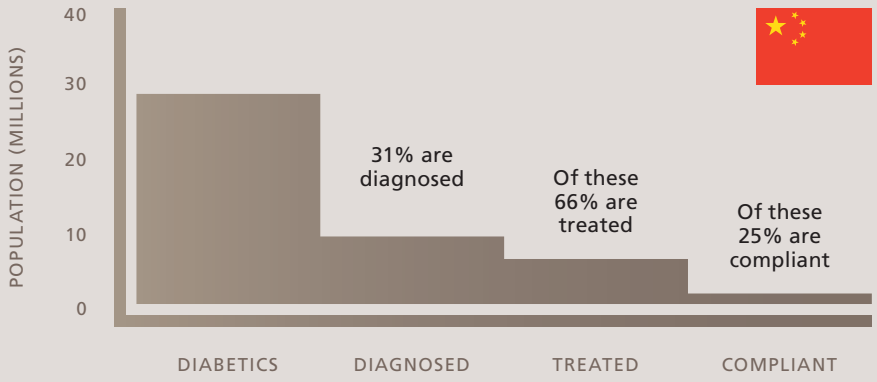
Leading health economists recommend strengthening disease management as a highly cost-effective diabetes intervention rather than investing in new medical technology. A recent Dutch study shows that people with type 2 diabetes treated according to guidelines in primary care live as long as those without the disease, regardless of the type of medication they receive.
Under these circumstances pharmaceutical companies will increasingly agree pay-for-performance deals or engage in disease management with leading care providers to ensure that innovative medicines remain a central element of diabetes care.

Life science can contribute to efficient use of health resources by supplying more precise and effective medicines. Some of the building blocks to achieve this are emerging and will mature over the next decades. Models from systems biology are accelerating knowledge-generation and will gradually make it easier for scientists to predict future clinical outcomes and increase the productivity of life science innovation.

A crucial factor for achieving better health (and economic) outcomes in diabetes is to provide a **full cycle of care**, enabled by a standardised infrastructure of relevant health and cost data. This is complex and much of what is happening in the full cycle of care arena today can be characterised as experiments. Some major care providers are managing to show results. As more and more of the on-going experiments reach the 'proof of concept' stage, the script will be written for more providers to follow suit.

Another decisive factor is to **mobilise people to manage their health**.
In the future rapid advances in the understanding of people's lives with diabetes, what their preferences are, and how they make decisions, will build up the science-based evidence that can be applied in the design and execution of healthy living and care delivery programmes.

Behaviour change is rarely instigated by individuals themselves but has to be prompted and sustained by others. There is growing consensus that behaviour change is about physical and environmental design, behavioural economics and relative costs of actions, and – to support individual discipline – regular monitoring and peer pressure. Therefore, healthcare management will be the result of concerted multidisciplinary teamwork between designers, behaviour economists, decision scientists, psychologists, dieticians, physical trainers, nurses, doctors and many others.



Fewer than 10% of people with diabetes in China are 'compliant,' meaning that they follow the recommended prescription medication or treatment.

Adapted from:
Boston Consulting Group for World Economic Forum (2009): *Managing Chronic Diseases in Emerging Countries*

As the links between malnutrition and diabetes are better understood, it is increasingly likely that the role that **other sectors** such as global food manufacturers and retailers play in the spread of diabetes will come under greater scrutiny. This will provide opportunities to also involve them in prevention programmes as well as treatment regimes.

Two focused scenarios

The scenarios outlined in the following pages are each formidable in their own right.

The pandemic growth of obesity and resulting disease development will put tremendous pressure on healthcare infrastructures and economies.

Healthcare payers and policy-makers will, out of necessity, be required to adopt innovative approaches. New technologies and sophisticated tools will enable payers, policy-makers and prescribers to make more confident choices between interventions, determined by reliable information about their respective value.

Even with more coherent and integrated care, the majority of people with diabetes will largely be on their own in managing their condition and achieving a satisfactory quality of life. Diabetes patient organisations will continue to fight a neck-to-neck battle with other disease areas for resources and attention.

In low- and middle-income regions of the world, the models for reaching the millions of poor people with diabetes will be very different from the business of selling medicines in affluent regions. Solutions will likely have to be co-created with local partners in healthcare and in the wider community.

The question remaining is what will be the role for pharmaceutical companies – and in particular for Novo Nordisk – in this future environment.

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scenario 1

Scenario summary

- The global pandemic of obesity and chronic diseases continues to grow
- Affluent Asia succeeds in halting the epidemic through state-imposed interventions
- In India and poor countries, obesity and chronic diseases spin out of control
- In Western countries, public health interventions to control obesity largely fail
- Surgery is the most effective medical intervention against obesity and diabetes
- High level of experimentation and innovation in the private anti-obesity market

the new normal

'The new normal' is a future where waistlines continue to expand and obesity is so common that it has become the societal norm.

Insurance companies do not recognise obesity as a disease, but will readily reimburse medical intervention if biomarkers for other chronic disease risk factors are also present.

Drug intervention is ubiquitous, both in reimbursed medical markets and in a consumer-oriented private market for well-being. However, surgery shows the greatest success: more weight is lost by surgery than by all other interventions combined.

Politicians and citizens undertake a range of local initiatives to minimise the risk factors for obesity, but in Western countries the only real concerted action is directed towards pregnant women, infants and children. The effects will take a generation or two to take hold. In affluent Asia centralised and government instituted efforts show stronger results.

Diabetes care and prevention in 2030

In 2030, more than 1 billion people in the world are obese. Less than a quarter of these live in Western countries.

No country has yet succeeded in reversing the pandemic, but many are able to stop its increase,especially the richer Asian countries such as Japan, South Korea, Taiwan, Singapore and parts of China. India, however, is failing. The institutional capacity to deliver broad societal interventions has proved too weak, and diabetes numbers continue to rise dramatically.

In all regions, inequalities in mortality and morbidity outcomes have become more pronounced. Experts agree that it will take at least one or two more generations to decrease levels of obesity and overweight to pre-2000 levels.

Public health focuses on preventing weight gain. Weight loss will be addressed in a out-of-pocket consumer market and a medical market with reimbursement

The healthcare system: Clear demarcation of intervention arenas
With cost control at the top of the healthcare agenda, a clear demarcation of responsibility has evolved between society, individuals and health systems.

The state's responsibility extends to collective public health initiatives aimed – with limited success in most countries – at stemming the flood of the pandemic by preventing people from becoming obese.

The private consumer market for health and well-being continues to grow fast. It caters to all people who are keen to lose weight. Peer-to-peer support and 'live well' clubs are widespread, thriving particularly well via online social networks, but also meeting a strong demand for physical, sociable meetings. There is a high diversity of offerings in the market as companies compete on being the most innovative and customer-driven. However few people actually succeed in keeping off the weight over time, even with the newest lifestyle programmes that are tailored to fit with individual behavioural patterns.

The medical market has evolved dramatically, as huge investments in pharmaceutical research have resulted in the development and launch of a wide portfolio of drugs directed at obesity and chronic disease risk factors. These products target either the private weight loss and well-being market that is largely paid out-of-pocket, or the medical chronic disease risk market. Here medicines are prescribed and reimbursed when obesity is accompanied by the presence of biomarkers for specific risks.

The new generations of drugs deliver up to 15% weight loss and have only mild side-effects. The drugs are moderately

priced to capture a broad market base. Sales are brisk as access to weight loss surgery remains fairly limited.

Surgery is by far the most effective diabetes prevention intervention, and surgical techniques have been continuously refined. The procedure is now non-invasive, reversible, almost risk-free, and pays for itself after less than 12 months. In affluent countries, millions of people are clinically eligible for weight loss surgery, but healthcare systems are forced to ration surgical treatment options as capacity and budgets do not measure up to demand. Referral remains a luxury for the fortunate few – mainly those in specific demographic groups at significant medical risk and those who can pay, either out-of-pocket or through health insurance.

Health values: Freedom to live as you please

Around the world, people have become used to expanding waistlines. Obesity is not seen as a disease: it has simply become too normal. Most in the Western countries still prefer to be slim – it's a sign of self-control and beauty – but they agree that a body-mass index (BMI) of 35 is normal. Western societies have adapted to accommodate the growing body mass of their citizens, as prevention efforts have largely failed. People reject any direct government involvement in their lifestyles.

Medical intervention, on the other hand, is considered completely appropriate and routinely offered to overweight people with diabetes or chronic disease risk factors such as hypertension. The ubiquitous consumer market complements medical interventions and offers products and services to assist people in their unsuccessful efforts to lose weight.

Social pressure against obesity is higher in affluent Asia, where government, media, schools, workplaces, and families push for healthy lifestyles, and people more readily accept state interventions. This keeps obesity at bay, but stigmatises many who have trouble conforming.

Medical consensus statements have paved the way for global standards. They identify specific groups for key interventions in order to address the root causes of the obesity pandemic: pregnant women, new mothers, infants and children. There is public backing across the world for interventions directed at these groups to secure the future health of new generations, but in 2030 the curve of the obesity and chronic disease pandemic remains unbroken.

Prevention: Little coordinated effort

As obesity rates soar everywhere attention is focused on prevention programmes and community interventions. There are significant differences in the degrees of success in different regions.

In Western countries, well-orchestrated political movements have fuelled public protests against government intervention in public health but the ground is hotly contested by others concerned at the spiralling public health costs of obesity consequences. In this complex landscape widespread reform has proved impossible to achieve. In the US, state intervention to create healthy environments remains on paper, though there is much political discussion about the savings potential such programmes offer. Public health campaigns are the main government response to obesity.

In Europe, public tolerance for state and community intervention is somewhat higher. The result are initiatives aimed at making villages, cities, schools,

Most people have little support for healthy living

Like most people with diabetes, mr and mrs Pultoo only visit their house doctor or the diabetes clinic a few times every year. This means that their self-care and lifestyle is essential for how their health evolves.

The Pultoos are better off than most of their peers. They have each other for support and a large family, where diabetes is a major topic in conversations. "The first question when we talk to our family is often "How is your diabetes?". Diabetes used to be a sort of taboo, but no longer. One reason is that there is so much diabetes information available", the Pultoos say.

Mr Pultoo has succeeded where most people fail, namely to lose serious weight and maintain the loss. "I have lost 40 kilos in recent years, mainly by being disciplined about my and my wife's everyday diet. I haven't used any of the miracle products and services that are available everywhere".

"You know, 10-15 years ago, we had very little knowledge about diabetes or how to prevent the condition. As a result, we didn't take diabetes very seriously". Unfortunately, this is the situation in 2009 in most of the world and will remain so in this future scenario, despite much innovation in the consumer market for weight loss and diabetes prevention.

parks, shopping areas, work places and transportation systems less 'obesogenic'. But the initiatives are uncoordinated and despite massive investments, the effects on population health are disappointing.

Meanwhile, China and other affluent Asian countries are already seeing the first results of their national anti-obesity interventions. Comprehensive state programmes successfully target children and new mothers. Their success is driven by highly effective and institutionalised healthcare and governance systems, as well as by public acceptance of state-driven interventions.

Treatment: Diabetes surgery is routine

In the medical sphere, there are global consensus guidelines on how to care for individuals at high risk of developing chronic diseases and follow-on complications. Clustering of cardiometabolic risks is accepted as a key trigger for intervention.

After several decades of failure in modifying patients' lifestyles, doctors in the West are readily prescribing anti-obesity drugs to obese people or overweight people with pre-diabetes.

In public and insurance-financed health systems, diabetes surgery is a routine intervention. Doctors and payers accept and often prefer surgery for people, who – after having tried lifestyle change and medicines for years – continue to have elevated blood sugar levels and are at risk of developing debilitating and costly diabetes complications.

Financing: Most people are on their own

Everywhere, individuals are forced to assume greater responsibility for their own and their family's health, also financially.

This also means that the level of individual choice is high. The consumer market plays a vital role in people's health, especially when it comes to healthy living.

In Japan and most European countries first-class medical interventions are available, but with considerable co-payment for individuals. Lifestyle interventions are encouraged and reimbursed partially during the first six months. Private market companies provide these interventions.

In the US, Holland and Switzerland private insurance companies are willing to cover a wide range of interventions for obese middle-class people but operate with highly differentiated premiums based on individual risk profiles.

At the lower end of the market, 'no frills' insurance firms link premiums to individual risk profiles but offer little ongoing, practical support. Customers are routinely offered a preventive cocktail of generic cardio-metabolic medicines.

This model is echoed in the emerging economies, where the health insurance market develops, but is largely limited to the upper-middle classes.

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	< 2009	2010 - 2014	2015 - 2019	2020 - 2024
ARM'S LENGTH PUBLIC HEALTH	Body mass index (BMI) of 32 considered normal weight by the American public	Aggressive public health interventions are cancelled due to strong opposition from voters	Employer-based weight loss programmes mandatory in affluent Asia	Well-resourced Department of Health Promotion established in the UK – focus remains on health campaigns
MARKET-DRIVEN HEALTH	The fitness chain "Curves" is the fastest growing franchise in history	"Healthy life in a box" products emerge promising consumers total solutions for healthy living and weight loss	Out of pocket spending drives the majority of growth in health care spending while payers focus on cost control	Most leading pharmaceutical companies add services to their over-the-counter drugs to differentiate their products
MEDICAL SOLUTIONS	Swedish 15-year study shows that surgery cures diabetes	Broad uptake of obesity and diabetes surgery in Western countries	Obesity recognised as a medical condition by payers when other risk factors (e.g. age) are present	Total weight loss from surgery surpasses results from all other interventions

The path to 2030

The consumer market for obesity and chronic disease interventions began to take shape during the 2010s. It progressed from selling fragmented products to offering sophisticated solutions in the late 2020s. Medicines and surgery remained in a separate medical domain.

The formation of distinct intervention spheres came about as a result of three developments: an arm's length approach to public health; the evolution of market-driven healthcare; and a strong consumer preference for medical solutions.

Each of these drivers was influencing the development of chronic care and prevention. In combination they came to define the healthcare system altogether.

Arm's length public health
Between 2007 and 2009, obesity and chronic diseases in high-income countries advanced from 13th to 4th place on the World Economic Forum's list of most financially threatening global risks.

There was a near universal consensus that solutions should be local. Everywhere stakeholders in communities were encouraged to create coalitions in order to make change happen.

In the late 2010s pregnant women and new mothers became a central target for intensive counselling and monitoring by the healthcare system.

In other contexts adults were also offered information and healthy choices encouraged, but strong incentives were rarely used. Politicians preferred to use arm's length approaches to changing peoples' health, as voters rejected any interference in their habits and ways of living. Cross-national campaigns to ensure freedom from government involvement were successfully coordinated by a liberal movement in the 2010s and 2020s.

Market driven health care
All-in-all, the response from societies was piecemeal. Resources for public health action remained scarce and even countries with significant public health efforts had trouble demonstrating much impact.

2025 - 2030

Wide acceptance of societal interventions to control obesity in children (but not adults)

Commercial health franchise organisation reaches 20 million members globally

New generations of drugs deliver up to 15% weight loss with negligible side-effects

Implications for pharma

- The consumer and medical markets require very different strategies from pharmaceutical companies
- Innovative collaborations which combine pharmaceutical interventions in a sophisticated package that includes life coaching, devices, online services, and even shopping, are needed to succeed in the consumer market
- The reimbursed market is a purely medical market, where drugs compete head to head with surgery in type 2 diabetes treatment
- Major investments are needed to create drugs that offer a clear advantage over surgery, but the rewards are substantial for those who succeed
- Both the consumer and the medical market are strongly marketing driven, requiring sophisticated and aggressive market skills not necessarily available to more scientifically driven companies

Market-based offerings developed to fill the void and tap into the growing demand for services tailored to the individual's needs and demands for freedom of choice.

During the 2010s and 2020s the consumer market for healthy living was one of the fastest growing and most profitable retail segments. New companies and collaborations sprang up at record pace.

In 2012 the collaboration between Nike and Apple expanded to include Tesco and Curves. The consortium provided the first 'healthy life in a box' product, combining motivational tools and devices with healthy recipes, a healthy food shopping service, training equipment, and online advice from a life coach.

Medical solutions
Demand for medical treatment of obesity increased as waistlines continued to expand. In 2016 obesity was recognised by payers as a medical condition when other risk factors (e.g. age or ethnicity) were present.

However there were few products to actually meet the demand, as either the risk was too high or the efficacy too low. Out-of-pocket spending drove most sales until the mid-2020s.

A new generation of reversible and near-ambulatory bariatric surgery paved the way for consensus among health experts and payers that this was the most effective and relatively safe medical option to prevent chronic diseases.

By 2025, the pharmaceutical industry introduced obesity drugs that were sufficiently safe, effective and inexpensive for payers to offer at least partial reimbursement. These medicines gained a strong market position among patients who feared surgery, or who were not able to breach the waiting lists for the procedure.

Nevertheless, total weight loss from surgery surpassed results from other interventions in most Western countries throughout the 2020s.

scenario 2

Scenario summary

- Major stakeholders actively pursue and invest in chronic care
- Breakthroughs in the ability to help people make lasting lifestyle changes
- Standard for full cycle chronic care in place in most high-income countries
- Pharma innovators offer solutions combining medicines and services
- Low-cost solutions reach a very broad population base around the world
- Large companies have the advantage in evidence-driven health systems

no outcome no pay

'No outcome, no pay' is a future where investments in health data infrastructure and evidence-based health promotion programmes in high income countries are beginning to pay off.

Coordinated, full cycle of care solutions for chronic diseases successfully mobilise many people to lead healthier lives. These solutions provide a package of medicine and services, supported by intelligent diagnostics and devices. Health and quality of life outcomes are monitored and directly influence how patients and providers are rewarded.

An affordable, no frills version of the full cycle of care package adopted by and available to the wealthy is created to meet the needs of low income populations in rich and poor countries alike.

The evidence shows that the key to successful health outcomes is the organisation of the care package rather than pharmacological treatment in itself. This is changing the dynamics of the healthcare industry.

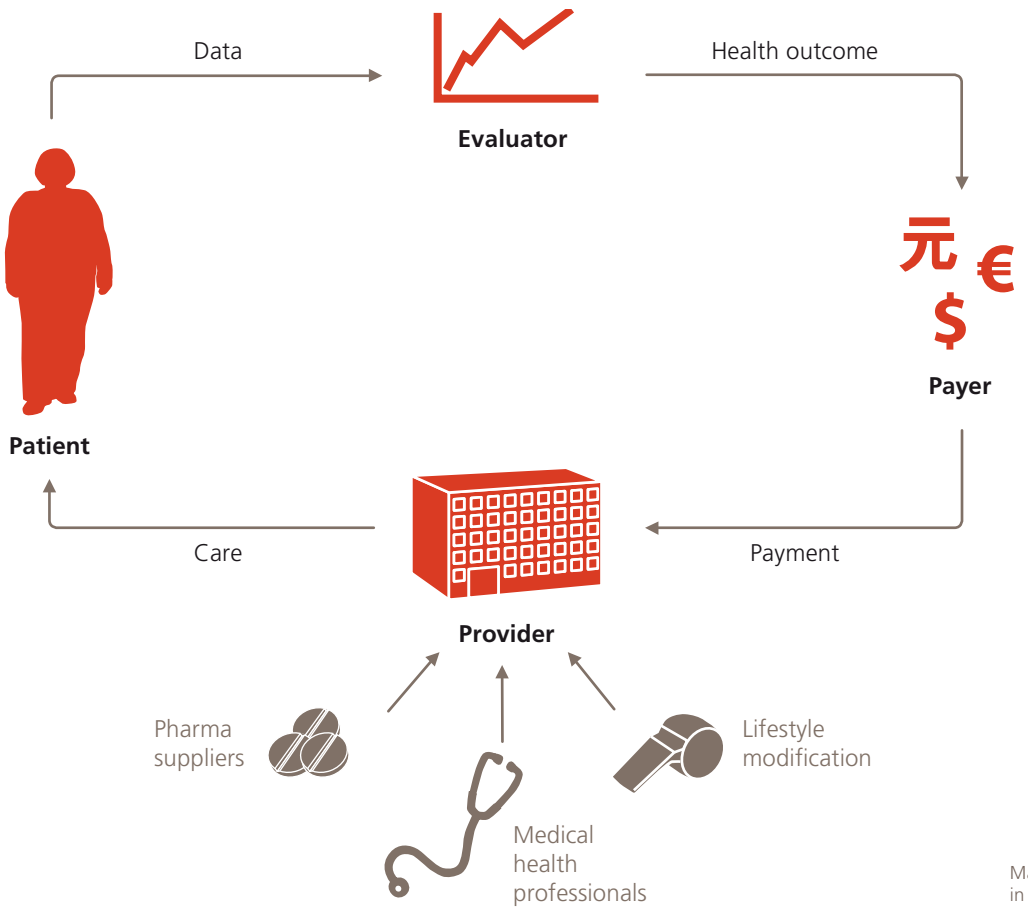
Diabetes care and prevention in 2030

In 2030, people with diabetes live longer than ever and many remain healthy until the very end of life.

Outcomes are improving dramatically because care providers have the tools, knowledge and incentives to effectively organise full cycle health care solutions. They are also successful in mobilising the resources of the people and communities they serve, which enables effective self-management and – increasingly – healthy living.

Government and private health insurance payers place premium value on population health outcomes. Payers have sufficient information to demand broad value from their significant investments in healthcare by focusing on endpoints such as maintaining individuals in the workforce.

no outcome
no pay



Map of key stakeholders and relations in the no outcomes, no pay scenario

The healthcare system: Organising to improve outcomes

Healthcare providers compete in a tender market for health outcomes. The payer – an insurer, employer, state or regional authority – sets specific goals for improving or maintaining the health status of their members or employees, and long-term contracts are offered to the care and prevention providers that deliver the most attractive bid for the assignment. The winning provider is paid a fixed fee per person for performance on the set of payer-defined targets.

The value of the services provided is constantly monitored through an independent assessment of cost and health outcomes data. Applying second-generation health technology assessment tools evaluating agencies, such as NICE in the UK, continuously monitor health data in real time. If the interventions are not delivering the agreed-upon targets, payers are likely to switch providers.

Incentives and rewards are built around broad health outcome metrics, including medical, quality of life and socio-economic. A standard for outcome metrics agreed by a consortium of employers and integrated insurers-providers in the United States dominates the market, having inspired similar standards in healthcare systems worldwide.

To deliver on the cost and health outcome targets, providers assemble and coordinate a team of sub-suppliers that provide distinct elements of the healthcare package. Lifestyle modification elements are combined with medical treatment and are supported by carefully designed transitional care to form a highly effective full cycle of care

package. A standardised infrastructure of relevant health and cost data forms the backbone of the package, enabling efficient sharing of data and incentives across multiple partners in the delivery network.

The market structure favours larger companies which can meet the requirements for providing standardised outcomes data. Small niche suppliers aiming at delivering lifestyle interventions face tough competition from large, specialised disease management companies. Innovation in behavioural interventions is increasingly aiming at creating blockbuster models in order to recuperate the costs of providing evidence.

Pharmaceutical companies supply one of the elements in the full cycle care package. To add value to their offering, some innovative companies have expanded their business model to include an active role in shaping care delivery models.

Health values: Healthy living needs external support

Around the world it is recognised that long term health prospects are determined by viewing a person's whole life and the impact of their environment.

Even though many in the Western countries would prefer to be left alone by the authorities, they accept that interventions in their daily lives are necessary to keep them healthy and prevent chronic diseases. Without external help they would simply not be able to bring about and sustain the changes needed to be healthy, and it is considered more important to be healthy than to have freedom of choice.

An accelerated understanding of human behaviour based on advanced decision science has enabled healthcare providers to design services that 'nudge' individuals to adhere to treatment programmes and adopt healthier lifestyles.

Combined with evidence from public health epidemiology, social design and applied ethnography, successful models for behaviour change have been developed and implemented to create new standards of chronic care.

Even though (or perhaps because) most interactions between the patient and the healthcare system are standardised, satisfaction with diabetes care is high among most people with diabetes. The majority of people with diabetes are now engaging actively in managing their condition with support from zealous healthcare providers.

Prevention: 'Hands-on' public health

Incentives to keep people healthy and manage healthcare costs are very strong. Care providers continuously assess results and scrutinise the value of each activity when delivering care and prevention.

They engage frequently with people, using online systems, social software and networks of walk-in clinics to support and reward healthy living as part of a personal health plan. These interactions begin early in life and intensify as people age or as chronic risk factors develop.

In affluent Asian countries and countries with private insurance-based healthcare systems, employers are part of prevention efforts. They are directly incentivised to keep their employees healthy. Good results are rewarded by tax deductions while they get large penalties if the waistlines of their employees grow too large.

Full cycle care is already here for some

Mr and mrs Pultoo are among the global minority of people with diabetes who are already experiencing care services in 2009 similar to the future laid out in this scenario.

They live in The Netherlands, where diabetes care is routinely coordinated between primary and secondary care and produces remarkable results. It helps many people control their blood sugar levels and avoid eye, kidney or foot complications.

Access to health services is fairly unrestricted, but requires the Pultoos to take the initiative. "We usually agree with the diabetes nurse how long it should be before our next visit. If we need to see her, we can just stop by the diabetes clinic at the nearby hospital. She can often see us right away", they say.

The Pultoos are very content with the care they receive but do wish for some improvements. "Diabetes plays a major role in our lives – we dream about the day when there is a medicine that is very convenient to use and predictably controls blood sugar without hypos and weight gain."

Another improvement could be to use their blood sugar data and similar information to monitor their health status. Mr and mrs Pultoo wouldn't mind having the doctor or nurse call them when blood sugar levels indicate that a change in the treatment or lifestyle may be needed. "We don't have access to that yet. But it sounds quite nice".

Treatment: Full cycle care is key
Full cycle care is standard in most OECD countries. The people who are served by a full cycle care provider experience personalised care delivery which is centred on the medical, psychological and social needs of the individual and her family, rather than on separate diseases.

The highest premium in the healthcare packages is paid to services that mobilise the resources of the individual patient and his or her community and effectively span the patient's transitions between different settings, inside and outside the health system. These incentives ensure strong relations and smooth collaboration among the professionals in the care and prevention delivery network.

However, as with the earlier experience of smoking, it proves difficult to empower marginalised groups to make much use of healthy living support. Mistrust of authority, more limited access to technology and disorganisation in personal lives make it harder and more expensive to reach the people with most to benefit from such programmes.

The cost is a disincentive to providers who increasingly turn to the state to cover this population segment. In Europe and affluent Asia, governments are stepping in. With the development of universal standards for health data, the building blocks are widely available to set up lower end, 'good enough' versions of full cycle care.

In the US and major middle income markets, global retailers such as Wal-Mart see an unmet market need and move to provide for the lower-middle income segments of the population with biosimilar drugs and standardised services offered through their in-store clinics.

Financing: Not so good for the poor
Health systems in Western countries are largely tax-funded through the public sector. Private co-payment for 'high end' care services has surpassed 20% of expenditure and continues to grow. Resources are increasingly used to 'predict and prevent' rather than 'diagnose and treat'.

In the US, free public healthcare is available to people who are old, poor or war veterans. Only highly cost-effective medicines are provided but co-payment for additional services is the norm for the elderly in Medicare.

The vast majority of people with diabetes around the world are offered 'good enough,' cost–effective packages combining generic or biosimilar medicines with a few carefully selected incentives for healthy behaviour.

In emerging economies, the growing middle class can purchase high quality health services from private vendors. Payment is out-of-pocket, except for an elite cadre of knowledge workers, where employers pick up the tab. For the remainder of the population, a tax-financed, public health system provides free basic care but faces significant resource shortfall and a shortage of health workers, who have emigrated abroad or to the private sector, which also caters to affluent medical tourists.

In low and middle-income regions, where the majority of people with diabetes are based, any care beyond the bare essentials is paid out-of-pocket, even by the poorest people. Healthcare continues to be supplied by NGOs, though interesting business models, such as the Grameen Health insurance model, developed by social enterprises, gain traction.

FURTHER READING

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	< 2009	2010 - 2014	2015 - 2019	2020 - 2024
HEALTH IT	Only few small scale investments in electronic medical records are successful	Health reforms in US and other leading markets create strong incentives to implement new technologies	User-friendly solutions create pull from patients for new health technologies	Electronic medical records in majority of United States hospitals and general practice clinics
PAY FOR PERFORMANCE	NICE global leader in health technology assessments. Surge in pay-for-performance agreements	Rapidly growing global sales of generic/biosimilar medicines	Wal-Mart health clinics dominate fast growing low-cost chronic care markets in US and Latin America	Consortium of US employers and insurers agree upon standard for broad outcome metrics (medical, quality-of-life, socio-economic)
PATIENT-CENTRIC HEALTH	Solid evidence from Kaiser Permanente and the Netherlands that full cycle of care models lower mortality and cost	New generation of full cycle of care experiments confirm cost and life-saving effects	Large, standardised employer-based health promotion programmes in US and emerging economies	The low cost Grameen Health model reaches 100 million people in five Asian countries

The path to 2030

Full cycle of care and prevention solutions came of age in Europe during the 2010s and advanced from disparate local occurrences to cost-effective, universally applied principles during the 2020s.

The changes came about as a result of three developments: massive investments in health data infrastructures; systematic outcomes evaluation; and patient-centric organisation of health interventions.

Each of these developments was important in its own right, but working together they formed an almost unstoppable force.

Health IT
In 2010 health IT had already been on the agenda for decades. Billions of dollars had been invested globally in electronic medical records and related technologies. Only few of these investments paid off however, mainly those that were carried out on a small scale.

Although little was accomplished initially, the stakeholders involved continued to learn from the experiments. In the mid-2010s a tipping point was reached as systems with high usability and relevance for healthcare professionals as well as patients began to spread. The wide-reaching healthcare reforms across the world in 2010-15 added strong financial incentives to the mix. Adoption of electronic medical records took off.

From the outset the technologies were seen as drivers of productivity. Healthcare professionals would have all relevant patient information available at the point of decision making, ensuring better diagnosis and intervention. Fragmented processes could be streamlined and integrated, and waste reduced.

When coupled with changing evaluation models the consequences of better records and information technology became much more significant.

Pay for performance
In the UK NICE had emerged as a pioneer in institutionalising systematic health technology assessment as early as the 1980s. Over the course of the 1990s and 2000s, HTA agencies spread around

2025 - 2030

Large scale, low-cost chronic telecare based in India serves global customer base

Pharma scrambles to negotiate long-term contracts with chronic care providers

Majority of care providers in the OECD area implement full cycle of chronic care model

Implications for pharma

- Strong price pressure on medicines due to greater bargaining power among payers and competition from lifestyle intervention in full cycle care models
- Most pharmaceutical companies are relegated to a peripheral role as suppliers of a generic part of a healthcare package developed and coordinated by others
- Innovative pharmaceutical companies enter long-term partnerships with full cycle care providers, aiming to play a greater role in delivering the health outcome that is rewarded by payers
- Low-priced biosimilar medicines are the standard components of the 'good enough' health delivery models
- Large companies have an advantage in evidence-driven health care systems because they can more easily meet the demands for providing the necessary data

the world, their influence growing in line with political concerns over exploding healthcare budgets.

As high quality health data became more prevalent, the negotiation game for evaluating and pricing new health technologies changed radically. Real life outcomes rather than performance in clinical trials became key success criteria.

Some older, low-priced technologies were revived while new medical innovations struggled to command the superior price premiums they used to.

Pay-for-performance agreements became normal and included broader and broader outcome metrics, moving from short-term medical results to long-term health and quality of life outcomes. The latter was driven by a more patient-centric health model.

Patient-centric health

In the late 2000s, prominent care providers in the United States such as the Mayo Clinic, Kaiser Permanente and Geisinger began to define a high-end model for full cycle care.

It was grounded in people's daily lives and aimed at preventing and managing the slowly evolving and compounding chronic maladies of modern lifestyles. This was necessary to prevent and manage chronic diseases in a cost-effective way and to deliver tangible health improvements to their members. The change in philosophy was supported by significant investments to get data and collaboration infrastructures in place.

In the course of the 2010s, design of effective behaviour change also came of age through the application of tools and evidence based on advances in new scientific fields of research such as social design, applied ethnography and decision science.

Still, not everyone was able to benefit from the advances. Full cycle care models gained the most success in high and middle income population groups.

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