

Investing in Health: From Curing Illness to the Health Economy — How Investors Can Participate in the Sixth Megatrend

Roland Rupprechter¹

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Abstract

No megatrend combines as much certainty with as much potential for disappointment as health. The demand is certain: the world spends close to ten trillion US dollars a year on health — roughly one in every ten dollars produced — and the ageing of the industrialised world extends that growth for decades to come. Who profits from it is not: within the same two-year window, Eli Lilly became the first health care company in history to exceed one trillion US dollars in market value, while Novo Nordisk — in the same market, with the same class of drugs — lost almost two thirds of its value. This paper, the sixth on the great megatrends, examines both: the reliability of the trend and the selection risks within it.

The paper follows four dimensions of change: from cure to prevention, whose largest example is the new metabolic drugs; the biologisation of medicine, from gene editing to cell therapy; the digital transformation through artificial intelligence, telemedicine and wearable sensors; and planetary health, which treats human, animal and environmental health as one. Across all of them lies the economics of a sector that has been considered a special case of the market economy since Arrow (1963): politically priced, informationally asymmetric — and, precisely for that reason, rich in regulated, recurring earnings.

For investors, the paper names listed companies along the entire value chain — exclusively large- and mid-cap stocks, each with its business idea and trading venue — and screens the ETF universe against the fixed checklist of this series: physical

¹Roland Rupprechter, Economic Research, R&B Wealth Management, Kreuzgasse 1a, 6850 Dornbirn; Member Austrian Association for Financial Analysis and Asset Management. Email: roland.rupprechter@rbvm.at.
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replication, fund volume of at least 0.2 billion euros, costs, currency question, issuer, UCITS framework and exchange trading. The health shelf is the richest of the series so far — around twenty funds pass the volume test, sixteen of them the replication test as well, and for the first time since the urbanisation paper there is again a currency-hedged share class.

Keywords: health · demographics · prevention · GLP-1 · biotechnology · personalised medicine · digital health · One Health · thematic ETFs · megatrends.

JEL codes: G11, I11, I15, O33.

Non-Technical Summary

Health is the only megatrend whose demand every human being generates personally — from the first day of life to the last. The world spends close to ten trillion US dollars a year on it; in the United States, already one in every six dollars of economic output. And because humanity is ageing — in Japan almost one in three people is over 65, in Germany almost one in four — this demand grows with a reliability that no business cycle breaks: people fall ill in recessions too.

At the same time, medicine is experiencing its greatest upheaval since the discovery of antibiotics. Weight-loss drugs are turning obesity, a disease of civilisation, into a treatable condition for the first time — and became an eighty-billion-dollar market within five years. Gene editing cures the first hereditary diseases at their root. Artificial intelligence has predicted the structure of two hundred million proteins and is accelerating the search for new drugs. And the watch on the wrist detects cardiac arrhythmias before any doctor ever sees them.

For investors, however, the same industry holds the harshest lessons of the entire megatrend series: Eli Lilly rode the new metabolic drugs to become the first trillion-dollar health care company in history — while the pioneer Novo Nordisk lost almost two thirds of its market value over the same period. The telemedicine hope Teladoc lost ninety-six per cent even though telemedicine prevailed. This paper therefore not only names some sixty large- and mid-cap stocks from pharmaceutical research to animal health, but also shows where the reliable earnings sit: with the equipment makers, service providers and dividend payers behind the headlines. Around twenty European health ETFs exceed the volume threshold, sixteen of them replicate physically — more than in any other field of the series.

The most important warning comes last: in the health sector, politics has a seat at the table. America is negotiating drug prices for the first time, the patents of the biggest revenue earners are expiring, and approvals can let decades of research fail on a single trial result. Whoever adds health to a portfolio buys the most secure demand in the world — but never a secure individual company. Diversification here is not a recommendation; it is the price of admission.

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1 Introduction

On 21 November 2025, Eli Lilly became the first health care company in history to exceed one trillion US dollars in market value — carried by drugs against obesity and diabetes whose revenue had more than tripled within two years. Over the same period, Novo Nordisk — the Danish inventor of that very drug class and, as recently as 2024, Europe's most valuable company — lost around two thirds of its market value: disappointing trial data, a forced change of leadership, American price pressure. Two companies, one market, one drug class — and opposite fates. No opening could better display the double face of this megatrend: demand for health is as certain as almost anything in economics; who earns from it is not.²

The health megatrend describes — in the framework of trend research such as that of the Zukunftsinstitut — the shift from a system of curing illness to a lifelong, preventive and increasingly biological-digital health economy. Health is no longer understood as the absence of disease but as an individual, collective and planetary good. This paper adopts the four dimensions of that view as its structure: the shift from cure to prevention (chapter 3), the biologisation of medicine through genetics and cell therapy (chapter 4), the digital transformation through artificial intelligence, telemedicine and sensor technology (chapter 5), and planetary health, which treats humans, animals and the environment as one (chapter 6).³

This paper is the sixth in a series on the great megatrends — after mobility (Rupprechter, 2026g), artificial intelligence (Rupprechter, 2026h), urbanisation (Rupprechter, 2026i), water (Rupprechter, 2026j) and automation and robotics (Rupprechter, 2026k). Health is interwoven with all five: AI accelerates drug discovery, the ageing city needs health care real estate and nursing, clean water is the oldest health infrastructure of all, and surgery is among the fastest-growing fields of robotics. The paper is written for investors and pursues three goals: to understand why health demand grows so reliably and why its returns are nevertheless so unevenly distributed; to examine where the four dimensions of change have already created measurable markets; and to name specifically which stocks and funds cover the field — explicitly without any buy or sell recommendation.

The structure: Chapter 1 serves as an introduction. Chapter 2 presents the numbers of the megatrend — spending, demographics, employment — and the economic peculiarities of a sector considered a special case since Arrow (1963). Chapters 3 to 6 follow the four dimensions of change. Chapter 7 deals with politics, prices and patents — the rules that

² Eli Lilly: above 1 trillion US dollars in market capitalisation since 21 November 2025, around 1,040 billion at the end of August 2026; Novo Nordisk: from its mid-2024 peak (above 600 billion US dollars, Europe's most valuable company) to around 203 billion at the end of August 2026.

³ Framework following the megatrend systematics of the Zukunftsinstitut (health); dimensions as commissioned for this paper.

decide returns in the health sector. Chapter 8 presents individual stocks in three groups, chapter 9 screens the ETFs against the fixed list of this series, chapter 10 collects the lessons, and chapter 11 closes with conclusions and outlook.

2 The Megatrend in Numbers — and Why This Market Works Differently

2.1 Ten Trillion, and One Sixth of America

The World Health Organization puts global health spending at around 9.8 trillion US dollars a year — close to ten per cent of global economic output. No country drives this number like the United States: 5.3 trillion US dollars in 2024, eighteen per cent of GDP, more than 15,000 US dollars per inhabitant — more than most countries in the world produce per head in total. Figure 1 shows the range across industrialised countries: between the USA and the more efficient European systems lie five percentage points of GDP — Germany and Switzerland lead Europe with close to twelve per cent, Austria is level with Canada. For investors, the distribution of the money also reveals the distribution of the markets: where the most is spent, the largest revenues arise — and the fiercest political battles over distribution, the subject of chapter 7.⁴

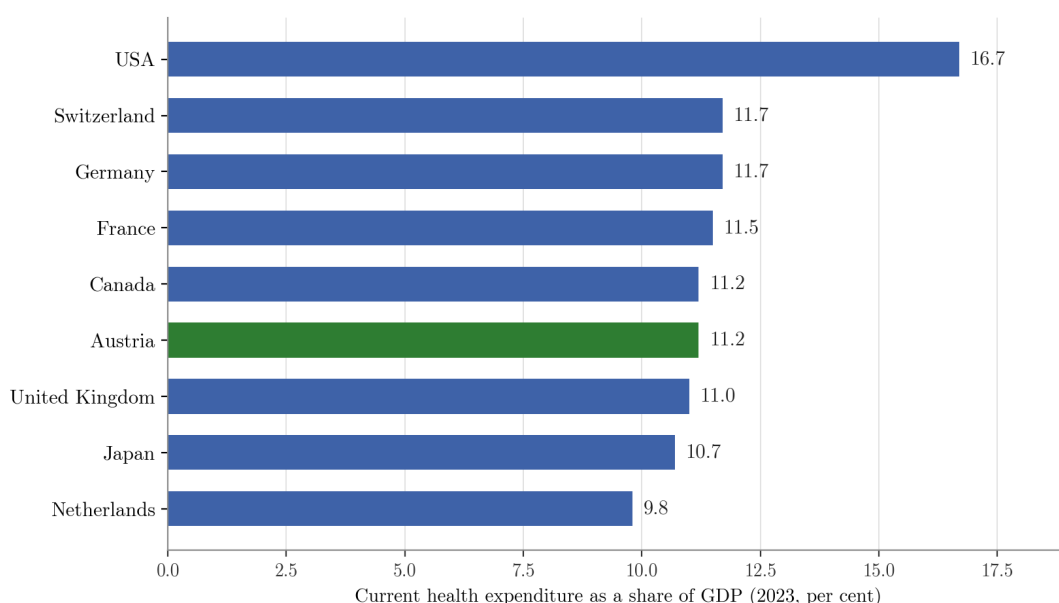


Figure 1: Current health expenditure as a share of GDP, reporting year 2023, uniform methodology of the WHO health expenditure database. Source: WHO Global Health Expenditure Database (via World Bank); own illustration.

⁴ WHO (2024), Global Health Expenditure Report (reporting year 2022): 9.8 trillion US dollars, 9.9 per cent of world GDP; CMS (2026): USA 2024, 5.3 trillion, 18.0 per cent of GDP, 15,474 US dollars per capita.

Germany illustrates the growth dynamic in miniature: 538 billion euros of health spending in 2024 — 12.4 per cent of GDP, 6,444 euros per inhabitant, an increase of 0.6 percentage points within a single year. At the same time, the industry is the country's largest employer: 6.2 million people — roughly one in eight of the workforce — work in health care. In the USA, health care and social assistance, with close to 24 million employees, is the largest single industry of the economy. These numbers ground a first investor insight: health is not a niche theme but, by size, employment and growth, one of the two or three load-bearing sectors of every developed economy — and already present in every world portfolio with a weight of a good tenth.⁵

2.2 Demographics: the Most Reliable Growth Force There Is

Behind the spending growth stands the most predictable of all forces: ageing. The number of people over 80 is set to triple to about 426 million between 2020 and 2050, according to the World Health Organization — within one generation. Figure 2 shows how far along this path countries already are: Japan, with thirty per cent of its population over 65, is the laboratory of the future; Germany and Italy follow with shares of close to a quarter; China is ageing faster than any country before it; and India still has the wave ahead. Since a large part of a person's health spending falls in the final years of life, this shift is the strongest structural demand driver of the century — and, unlike technology cycles, it is practically certain for decades ahead.⁶

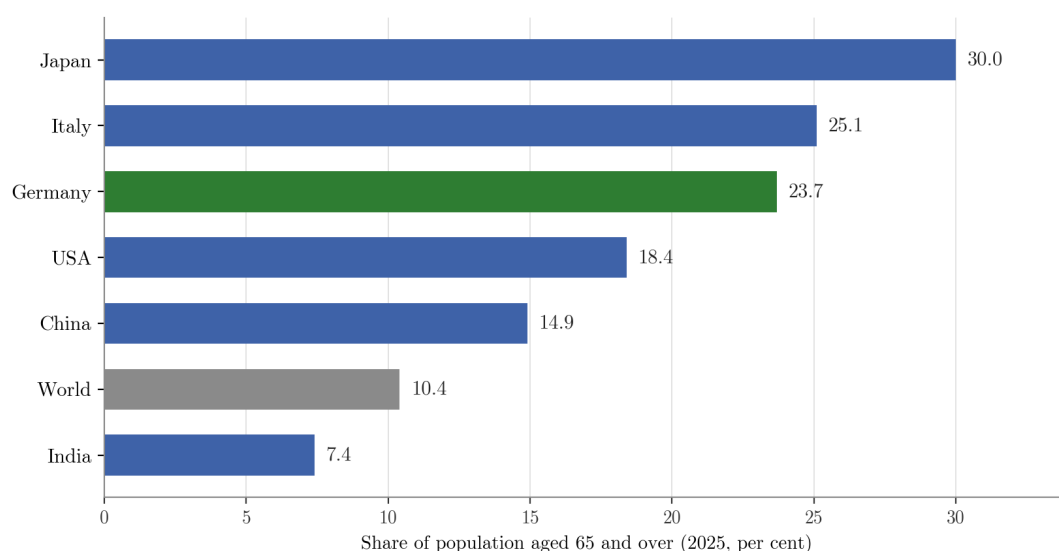


Figure 2: Share of population aged 65 and over in 2025, in per cent. Source: UN World Population Prospects 2024 (via World Bank); own illustration.

⁵ Destatis (2026): 538.2 billion euros (2024), 12.4 per cent of GDP, 6,444 euros per capita; 6.2 million employees at the end of 2024; USA: Bureau of Labor Statistics, Health Care and Social Assistance, around 23.9 million employees (July 2026), largest single industry.

⁶ WHO, Ageing and Health fact sheet: population aged 80+ tripling to around 426 million between 2020 and 2050; UN DESA (2024): global life expectancy 73.3 years; country shares 65+ see Figure 2.

2.3 Why This Market Works Differently

Anyone who wants to judge health stocks must first understand why this market is not a normal market. The founding text of health economics is Arrow (1963): illness strikes unpredictably, the patient cannot judge the quality of treatment, and structural information asymmetry prevails between doctor, insurer and patient — which is why, everywhere in the world, insurance schemes, licensing authorities and professional rules take the place of the free price. Grossman (1972) added the second founding idea: health is a capital stock in which people invest — through prevention, nutrition, education — and which depreciates with age. Together, the two papers explain what investors observe daily: prices here are made politically, demand follows demographics rather than the business cycle, and between medical value and economic return there is always a negotiation.⁷

Two further classics complete the framework. Baumol and Bowen (1966) described the 'cost disease' of the services: where human attention is itself the product — in the concert hall as at the sickbed — wages rise with the economy as a whole without productivity keeping pace; Baumol (2012) applied this explicitly to medicine and thereby explained why health spending grows faster than GDP — not out of waste, but out of the nature of the thing. And Preston (1975) showed with his famous curve that prosperity and life expectancy are closely linked, but that the gain per dollar flattens out. Murphy and Topel (2006), finally, quantified what health progress is worth: the American life-expectancy gains from 1970 to 2000 alone corresponded, on their calculation, to a gain in national wealth of about 3.2 trillion US dollars a year. The message for investors: the sector grows structurally faster than the economy, its value to society is enormous — and precisely for that reason its distribution is fought over politically.⁸

One anomaly deserves its own mention because it concerns the sector's largest investment universe: the United States. No country spends anywhere near as much on health — and yet American life expectancy lies below that of almost all other rich countries. The Preston curve and the cost disease explain this only in part; Case and Deaton (2020), with their 'deaths of despair' — drugs, alcohol and suicide in economically left-behind regions — described a social layer of causes that no drug addresses. For investors, the anomaly is doubly instructive: it shows that high spending does not automatically buy high health — and it explains the permanent political pressure on the American system from which the pricing rules of chapter 7 emerged. Whoever holds US-heavy health stocks also holds this tension.⁹

⁷ Arrow (1963), *American Economic Review* 53(5), pp. 941-973; Grossman (1972), *Journal of Political Economy* 80(2), pp. 223-255.

⁸ Baumol and Bowen (1966); Baumol (2012); Preston (1975), *Population Studies* 29(2), pp. 231-248; Murphy and Topel (2006), *Journal of Political Economy* 114(5), pp. 871-904.

⁹ Case and Deaton (2020), *Deaths of Despair and the Future of Capitalism*.

2.4 Four Dimensions of Change

Table 1 organises the megatrend into the four dimensions that chapters 3 to 6 follow and names — anticipating chapters 8 and 9 — the investable industries. The dimensions interlock: the prevention of the first lives off the sensor technology of the third, the biologisation of the second off artificial intelligence, and the planetary health of the fourth connects them all. Together they describe a sector in transition: away from the late, expensive repair of individual diseases, towards a lifelong system of prevention, early detection and targeted treatment — with new winners at every stage of the value chain.

Table 1: Four dimensions of the health megatrend and their investable industries

Dimension	Core themes	Investable industries (examples)
From cure to prevention	Prevention as a lifestyle, metabolic and weight-loss drugs, mental health, nutrition	Pharma (obesity), sensors and wearables, diagnostics for early detection
Biologisation of medicine	Genome, gene editing, cell and gene therapy, personalised treatment	Biopharma, sequencing, contract manufacturers and lab equipment makers
Digital transformation	AI in research and diagnosis, telemedicine, continuous measurement, health data	Health software, diagnostics groups, medical technology
Planetary health (One Health)	Zoonoses, antibiotic resistance, climate and health, animal health	Animal health companies, vaccines, laboratory service providers

Source: Dimensions following the megatrend systematics (Zukunftsinstitut) and the commission for this paper; industry assignment own presentation.

Notes: No buy or sell recommendation; chapters 3 to 6 treat the dimensions in turn.

3 From Cure to Prevention

3.1 The Weight-Loss Drugs: Prevention as a Billion-Dollar Market

No example shows the shift from cure to prevention more strikingly than the new metabolic drugs. The starting point is an epidemic in slow motion: according to the great Lancet survey, more than one billion people — 879 million adults and 159 million children — live with obesity, four times as many children as in 1990. Excess weight is a contributing cause of diabetes, cardiovascular disease and cancer, and thus one of the largest avoidable cost blocks of any health system. The GLP-1 drugs — originally diabetes medication — reduce body weight in trials by fifteen to more than twenty per cent and demonstrably lower cardiovascular risk as well: for the first time, a mass-market pharmaceutical prevention exists against the most expensive disease group in the world.¹⁰

¹⁰ NCD Risk Factor Collaboration (2024), The Lancet (data for 2022): more than 1 billion people with obesity; 1990: 195 million adults and 31 million children.

Economically, this drug class has written the fastest growth story in pharmaceutical history. Novo Nordisk's obesity division grew from 8.4 billion Danish kroner in 2021 to 82.3 billion in 2025 — tenfold in four years; Eli Lilly's rival products together reached 36.5 billion US dollars in 2025, more than twice the prior year. Analyst forecasts for the total market range from around 100 billion US dollars (2030) to 190 billion (2035) — a spread this series documents with its usual caution. And the next stage is already approved: at the end of 2025, Novo received approval for the first weight-loss tablet in the USA, followed in April 2026 by Lilly's orforglipron — the injection is losing its monopoly, which should broaden the market further.¹¹

3.2 Healthstyle: Health as a Way of Living

Beneath the drugs, everyday life is shifting. Health is becoming a lifestyle — trend research speaks of 'healthstyle': fitness, nutrition, sleep and mindfulness merge into a continuous self-management that feeds markets from sportswear to dietary supplements. It draws scientific support from young fields such as epigenetics and microbiome research, which show how nutrition and environment influence gene activity and gut flora — insights marketed under labels such as 'epi-food', whose clinical evidence is, however, young and mixed; this paper treats them as a research field, not as an investment thesis. More tangible is the de-tabooisation of mental health: according to the WHO, depression and anxiety are among the leading causes of years of life lost, and demand for therapy, digital programmes and workplace prevention grows with the openness to talk about it.¹²

For investors, the prevention shift is doubly relevant. First, it moves revenue between sub-industries: early detection and prevention strengthen diagnostics, sensor technology and consumer products, while late acute medicine loses relative weight — a process of decades, not a one-year event. Second, it changes the payers: prevention is often paid for privately, out of pocket and continuously — which makes its revenues more consumer-like, more brand-driven and more cyclical than insurance-funded acute care. The companies of chapter 8 reflect both sides: the prescription prevention of the pharmaceutical companies and the consumer prevention of the sensor, nutrition and fitness providers.

One piece of economic honesty belongs in this chapter: prevention is almost always desirable medically, but fiscally it is not automatically a savings programme. Whoever prevents heart attacks extends lives — and shifts spending into later years in which other diseases arise; health economics knows only a few preventive measures that pay for

¹¹ Novo Nordisk, annual reports: Obesity Care 8.4 (2021) / 16.9 (2022) / 41.6 (2023) / 65.1 (2024) / 82.3 (2025) billion DKK; Eli Lilly: Mounjaro plus Zepbound 16.5 (2024) and 36.5 (2025) billion US dollars; oral approvals: Novo 22 December 2025, Lilly 1 April 2026; market forecasts: Goldman Sachs most recently around 95 billion by 2030, Morgan Stanley 190 billion by 2035 (range 170-240).

¹² On the disease burden of mental illness: WHO, World Mental Health Reports; the assessment of epigenetics/microbiome marketing as a young research field is the author's own reading of the state of the evidence.

themselves in purely arithmetic terms. For the assessment of the megatrend this is not a weakness but a clarification: the willingness to pay for prevention flows from the value of healthy life years gained — which Murphy and Topel (2006) put in the trillions — not from budget relief. As long as societies grow richer and want to live longer, this willingness to pay grows; it is the true source of demand behind all the prevention markets of this chapter.¹³

4 The Biologisation of Medicine

4.1 From the Genome to Gene Editing

The second dimension began with a single page in *Nature*: in 1953, Watson and Crick described the double helix of DNA — ever since, biology has increasingly been an information science. Half a century later, the public Human Genome Project and the company Celera simultaneously presented the first sequence of the human genome; the public project had cost around 2.7 billion US dollars. Today, laboratories sequence a genome for a few hundred US dollars — a price decline by more than a factor of one million within 25 years, faster than any cost curve in this megatrend series. Only this cheapening makes personalised medicine practical: tumours are sequenced before therapy is chosen, newborns are tested for hundreds of hereditary diseases, drug effects are matched to the genetic profile.¹⁴

The second founding event of biologisation was a 2012 paper: Jinek, Chylinski, Fonfara, Hauer, Doudna and Charpentier described how the bacterial CRISPR system can be used as programmable gene editing — a method of cutting and altering DNA at any chosen position. Eight years later, Charpentier and Doudna received the Nobel Prize in Chemistry for it, and at the end of 2023 Casgevy became the world's first approved CRISPR therapy — against sickle cell disease and beta thalassaemia, with curative intent. Biologisation has thereby delivered its proof: hereditary diseases are, in principle, treatable at the root, and the number of approved cell and gene therapies in the USA has risen to 46.¹⁵

¹³ Murphy and Topel (2006); for the sober cost assessment of prevention, the standard health economics literature following Grossman (1972).

¹⁴ Watson and Crick (1953), *Nature* 171, pp. 737-738; International Human Genome Sequencing Consortium (2001), *Nature* 409, pp. 860-921; Venter and 273 co-authors (2001), *Science* 291, pp. 1304-1351; costs: NHGRI, Human Genome Project around 2.7 billion US dollars (programme costs), today's sequencing a few hundred US dollars (figures of around 100 US dollars from individual providers cover reagents only).

¹⁵ Jinek, Chylinski, Fonfara, Hauer, Doudna and Charpentier (2012), *Science* 337(6096), pp. 816-821; Nobel Prize in Chemistry 2020: Charpentier and Doudna; Casgevy: approvals United Kingdom November 2023, USA 8 December 2023; 46 approved cell and gene therapies in the USA (end of 2025).

4.2 Cure as a Business Model — the Uncomfortable Arithmetic

Of all things, the greatest scientific triumph delivers the most economically sobering number of this paper: Casgevy costs 2.2 million US dollars per treatment — and generated only around 116 million US dollars of revenue in all of 2025, around seventy patients treated. The reason is not a lack of patients but the logistics and economics of one-time cures: the treatment requires specialised centres and weeks of preparation, and a medicine that cures once generates no recurring revenue — it competes, as a one-off price, against lifelong treatment costs that insurers are only learning to calculate. For comparison: the CAR-T cell therapy Carvykti, similarly complex, still reached 1.9 billion US dollars in 2025. For investors, this grounds a central caution of this paper: the scientific breakthrough and the viable business model are two different things — and decades can lie between them.¹⁶

Between the genome and gene editing lies the broadest field of application of biologisation: precision oncology. Tumours today are classified molecularly and increasingly monitored through the blood — so-called liquid biopsies detect tumour DNA in the bloodstream, sometimes before an imaging device sees the relapse. Within a decade, this technique has produced listed mid-caps: Natera and Guardant Health reached valuations of 20 to almost 50 billion US dollars with blood tests for prenatal, transplant and cancer diagnostics, and Abbott's multi-billion takeover of the colorectal cancer screener Exact Sciences shows that the giants regard the field as strategic. Early detection is the commercially most mature form of personalised medicine — recurring, insurable and scalable, everything gene editing still lacks.¹⁷

The mRNA technology has been through the same cycle of triumph and disillusionment. The vaccines of BioNTech and Moderna were among the fastest drug developments in history — and among the largest stock market exaggerations: Moderna fell from its year-end peak of 103 billion US dollars (2021) to as little as 11.5 billion at the end of 2025, before promising cancer vaccine data doubled the share price in 2026 and set it swinging violently again. The technology is maturing — individualised cancer vaccines are considered its true calling — but the path from pandemic revenue to a durable business was many times longer than the valuations of 2021 assumed. It is the same lesson as in Perez's technology waves from the earlier papers of this series: after the installation euphoria comes the valley, and only then the sustainable spread.¹⁸

¹⁶ Casgevy: list price around 2.2 million US dollars, revenue 2025 around 115.8 million US dollars (Vertex/CRISPR Therapeutics); Carvykti (Johnson & Johnson/Legend): 1.9 billion US dollars in 2025, more than 10,000 patients treated cumulatively.

¹⁷ Market capitalisations at the end of August 2026: Natera around 48, Guardant around 23 billion US dollars; Abbott/Exact Sciences: completion March 2026.

¹⁸ Moderna: market capitalisation 103 billion US dollars (year-end 2021), low around 11.5 billion (December 2025), around 56 billion at the end of August 2026; BioNTech: from 62.5 (2021) to around 26 billion.

The third front of biologisation — synthetic biology, the deliberate design of biological systems for drugs, enzymes and materials — also supplies the cautionary piece of the chapter. In the low-interest euphoria around 2021, platform promises of this kind were carried to the stock market at double-digit billion valuations; the biomanufacturing pioneer Amyris ended in insolvency in 2023, and the great platform hopes lost most of their value because elegant methods did not turn into viable unit costs. The technology advances nonetheless — as a tool in the laboratories of the established pharmaceutical and chemical companies. For investors, a lesson of this series repeats itself: between scientific feasibility and earned capital lies the labour of scaling — and it is best survived by those who do not have to finance it alone.¹⁹

5 The Digital Transformation of Medicine

5.1 Artificial Intelligence: from Structure to Drug

The combination of AI and biology — sketched as an application field in the second paper of this series (Rupprechter, 2026h) — now has its Nobel Prize: in 2024, the chemistry prize went to David Baker for computational protein design and to Demis Hassabis and John Jumper for AlphaFold. The Google DeepMind system predicts the three-dimensional structure of proteins from their sequence — a fifty-year-old riddle of biology — and has made more than 200 million structures freely available, used by around three million researchers worldwide. The step from tool to medicine is under way: Alphabet's subsidiary Isomorphic Labs raised 600 million US dollars in 2025 and around two billion in 2026 to bring AI-designed drugs into the clinic; the industry's most advanced AI-discovered candidate is in phase 3 trials. None is approved yet — the proof of AI medicine faces its most expensive stage.²⁰

Beyond drug discovery, too, AI is becoming the infrastructure of medicine: it reads X-ray images and tissue sections, designs clinical trials, summarises doctors' letters and guides bed and staff planning in hospitals. In 2025, Eli Lilly and NVIDIA announced the largest company-owned AI computer in the pharmaceutical industry — a signal that the companies now regard computing power as a research raw material. Topol (2019) has formulated the optimistic reading of this development: AI could give medicine back the time lost between doctor and patient — machines taking over the data work, humans the attention. Whether it turns out that way is decided less by the technology than by the

¹⁹ Amyris: Chapter 11 filing in August 2023; on the valuation and disillusionment wave of platform biotechnology after 2021, compare the technology cycles in Perez (2002).

²⁰ Jumper, Evans, Pritzel, Green, Figurnov, Ronneberger and 28 further authors (2021), *Nature* 596, pp. 583-589; Nobel Prize in Chemistry 2024: Baker, Hassabis, Jumper; more than 200 million structures, around 3 million users (DeepMind figures); Isomorphic Labs: 600 million US dollars (March 2025), around 2 billion (2026); first AI-discovered phase 3 candidate: Insilico Medicine (pulmonary fibrosis).

economics of the systems in which it works; Baumol's cost disease from chapter 2 remains uncured in the AI age as long as attention itself is the product.²¹

Alongside drug discovery, artificial intelligence is moving into everyday clinical work — more quietly, but more broadly. Image-recognition systems support radiology and pathology in finding tumours, early-warning models detect sepsis in intensive care hours before the classic signs, and language models take over the documentation that costs doctors a substantial part of their working time today. Topol (2019) coined the guiding image of 'deep medicine' for this: the machine takes over the repetitive so that the doctor regains time for the human. For investors, the special feature is that this productivity wave does not accrue to the health care companies alone: it permeates hospital software, laboratory equipment and administrative service providers — and thereby makes precisely the inconspicuous infrastructure stocks of chapter 8 its beneficiaries.²²

5.2 Telemedicine and Sensors: the Clinic on the Wrist

The second digital front runs along the body itself. The watch on the wrist detects atrial fibrillation, has also warned of high blood pressure since 2025, and records sleep and strain continuously; continuous glucose monitoring, once a speciality for diabetics, has been available over the counter in the USA since 2024 and is becoming a mass product of metabolic prevention — Abbott and Dexcom share this market. For the first time, a continuous biological data flow from the everyday life of healthy people is emerging — the technical basis of the prevention of chapter 3 and, at the same time, raw material for the AI of chapter 5.1. Europe has created the legal framework for it: with the European Health Data Space (Regulation (EU) 2025/327), patient data will become portable in stages from 2027 and — anonymised — usable for research.²³

Telemedicine, finally, has both its vindication and its bubble behind it. Professionally it is established: a noticeable share of doctor contacts in the USA now runs digitally for good, prescriptions and follow-up included, and market estimates range — depending on definition — from a good 130 billion US dollars today to a multiple of that in the 2030s. On the stock market, however, it delivered the object lesson of the series: Teladoc, the pandemic darling of 2020, fell from 29 billion US dollars in market value to a good one billion today — minus 96 per cent, although usage never collapsed. The business model had no moat: telemedicine can be offered by many, including insurers and hospitals

²¹ Lilly/NVIDIA: announcement 28 October 2025 (company statements); Topol (2019), Deep Medicine.

²² Topol (2019), Deep Medicine.

²³ Apple: high blood pressure warning feature with FDA clearance, September 2025; over-the-counter glucose sensors: Dexcom Stelo (26 August 2024) and Abbott Lingo (5 September 2024); European Health Data Space: Regulation (EU) 2025/327, in force since 25 March 2025, application staggered from 2027, 2029 and 2031.

themselves. The digitalisation of medicine is real — but, as everywhere in this series, it rewards the providers of scarce goods, not the intermediaries of services anyone can copy.²⁴

At the end of the digital dimension stands a shift in the balance of power: whoever holds the health data gains influence over the value chain. Insurers tie tariffs to activity and prevention data, hospitals and corporations analyse treatment histories, and the consumer electronics platforms, through their watches and sensors, suddenly sit on the longest health record on the planet. The European Health Data Space attempts to tame this data power and open it up for research at the same time — a balancing act whose outcome will help decide whether the next generation of digital health companies emerges in Europe or elsewhere. For investors, the basic rule of the Teladoc lesson remains: it is not access to patients that is scarce, but protected data, approvals and reimbursement contracts — that is where the moats form.

6 Planetary Health: One Health

The fourth dimension widens the view: human health is inseparably linked to the health of animals and ecosystems — the World Health Organization calls this approach One Health. The evidence behind it is striking: according to the standard study by Jones, Patel, Levy, Storeygard, Balk, Gittleman and Daszak (2008), a good 60 per cent of all newly emerging infectious diseases are zoonotic — they jump from animals to humans, almost three quarters of them from wildlife. Deforestation, intensive livestock farming and the growing contact between humans and wilderness raise this jump rate; in this reading, the pandemic of 2020 was not a bolt from the blue but the most expensive confirmation of a known pattern.²⁵

The second planetary threat works more quietly: antibiotic resistance. According to the great Lancet study by the Antimicrobial Resistance Collaborators, around 1.27 million people died in 2019 directly from resistant bacterial infections — more than from HIV or malaria — and close to five million deaths were associated with them. The projections reach further: the O'Neill commission warned as early as 2016 of up to ten million deaths per year from 2050, and the most recent modelling expects a cumulative 39 million direct deaths by mid-century. Economically, resistance is a textbook market failure: new antibiotics are meant to be used as rarely as possible — which makes their development commercially unattractive, which is why states are now experimenting with purchase

²⁴ Telemedicine market estimates: around 130 billion US dollars (2025) with forecasts of more than 500 billion (2033) — the range depends on definition; Teladoc: around 29 billion US dollars market capitalisation at the end of 2020, around 1.2 billion at the end of August 2026.

²⁵ Jones, Patel, Levy, Storeygard, Balk, Gittleman and Daszak (2008), *Nature* 451, pp. 990-993: 60.3 per cent of new infectious diseases zoonotic, 71.8 per cent of those from wildlife.

guarantees and premium models. Climate change adds to this: the Lancet Countdown most recently counted 546,000 heat deaths per year, almost a quarter more than in the 1990s.²⁶

Institutionally, planetary health advances more slowly than scientifically: the WHO pandemic agreement was adopted in May 2025 after three years of negotiation, but is not in force for lack of the still-open annex on pathogen sharing — no state has yet ratified it. The dimension is nevertheless investable, and surprisingly directly: through animal health. Zoetis — the former Pfizer subsidiary — is the world market leader for animal medicines and vaccines with a good 30 billion US dollars in market value, Idexx dominates veterinary diagnostics, and Elanco and the French family company Virbac round out the field. Their demand flows from both sources of the One Health idea: livestock farming, whose disease control protects human lives, and the pet boom of ageing, urbanised societies — a market with consumer-like stability and pharma-like margins.²⁷

Planetary health, finally, is decided on the plate. The EAT-Lancet commission around Willett and 36 co-authors (2019) calculated that a growing world population can only be fed within planetary boundaries if eating habits shift towards more plant-based food — the food system contributes a substantial share of global greenhouse gas emissions and is at the same time the main cause of the obesity epidemic of chapter 3. How closely health and food markets are interwoven was shown, of all things, by the GLP-1 breakthrough: when the weight-loss drugs reached the mass market in 2023, the shares of large food and beverage companies came under temporary pressure because investors began pricing in permanently changed consumption patterns. The health megatrend thus reaches far beyond the health industry — into the portfolios of those who believe they are avoiding it.²⁸

The planetary dimension closes the arc to the earlier papers of this series: clean water remains humanity's oldest and most effective health infrastructure — no drug has ever extended as many lives as the separation of drinking water and sewage, and the water paper of this series (Rupprechter, 2026j) described the investment programmes behind it. The heat adaptation of cities (Rupprechter, 2026i) is, at its core, health policy with construction plans. For investors, One Health therefore does not mean searching for a new speciality segment, but recognising that parts of the health megatrend have long lived in other portfolios: in the water utility, in the climate adaptation engineering firm, in the

²⁶ Antimicrobial Resistance Collaborators (2022), *The Lancet* 399, pp. 629-655; O'Neill (2016); GBD 2021 Antimicrobial Resistance Collaborators (2024): more than 39 million cumulative deaths 2025-2050; Lancet Countdown (2025): 546,000 heat-related deaths per year (+23 per cent versus the 1990s); WHO: around 250,000 additional deaths per year 2030-2050 from climate effects.

²⁷ WHO pandemic agreement: adopted 20 May 2025, annex on pathogen access and benefit sharing still under negotiation in mid-2026, ratifications: none (60 required); market capitalisations at the end of August 2026: Zoetis around 32, Idexx around 43, Elanco around 12, Virbac around 3 billion US dollars.

²⁸ Willett and 36 co-authors (2019), *The Lancet* 393(10170), pp. 447-492 (EAT-Lancet commission); GLP-1 price reactions of the food sector in 2023: broad market coverage, including statements by the Walmart US chief on smaller shopping baskets.

animal health company. The borders between the megatrends are administrative borders — demand does not know them.²⁹

7 Politics, Prices, Patents: the Rules of the Game

Nowhere in this megatrend series does politics decide investor returns as directly as in the health sector — chapter 2.3 gave the theoretical reasons, the years 2025/26 supply the illustration. In the USA, the most profitable drug market in the world, the public old-age insurance is negotiating prices for the first time: since the beginning of 2026, the first ten negotiated drug prices have applied, with fifteen more to follow from 2027 — among them the GLP-1 blockbusters Ozempic and Wegovy. In parallel, the government decreed most-favoured-nation pricing in line with international prices and concluded price agreements with Pfizer and other companies in exchange for tariff relief. The direction is unambiguous: the American price umbrella that carried the industry's global margins for decades is being folded up step by step — with consequences for every valuation in the sector.³⁰

The second rule of the game is as old as the industry: the patent. By 2030, drugs with around 300 billion US dollars in annual revenue lose their exclusivity — the largest patent cliff in pharmaceutical history. The most prominent example is Keytruda, the highest-selling drug in the world: almost 30 billion US dollars of annual revenue hang on a US patent that falls in 2028. Eliquis already lost its European exclusivity in 2026, Ozempic's core patent ends in 2031. For investors, the cliff cuts both ways: it threatens the valuations of the originators — and at the same time feeds the businesses of generics and biosimilar makers, contract manufacturers and those companies that buy in new pipelines in time. The unprecedented takeover wave of 2025/26 that chapter 8 describes is the industry's direct answer to these two rules.³¹

How expensive the game has become is shown by development costs: according to the annual Deloitte analysis, a newly approved drug costs the large companies on average 2.23 billion US dollars in research and development; the classic academic estimate by DiMasi, Grabowski and Hansen (2016) already stood at 2.6 billion; only about one in ten programmes that reach clinical testing is ever approved. The return on pharmaceutical research capital most recently stood at 5.9 per cent — and without the GLP-1 products at a meagre 3.8. The economic conclusion is uncomfortable: a single drug class currently

²⁹ Rupprechter (2026j), chapter 2; Rupprechter (2026i), chapter 4.

³⁰ IRA price negotiations: first ten drugs effective from 1 January 2026, second round with 15 drugs (including Ozempic and Wegovy) from 2027; most-favoured-nation executive order of 12 May 2025; Pfizer price agreement of 30 September 2025, other companies followed.

³¹ Patent cliff: around 300 billion US dollars of annual revenue at risk by 2030 (industry estimates, range 200-400); Keytruda: 29.5 billion US dollars revenue in 2024, key US patent 2028; Eliquis: end of EU exclusivity May 2026; Ozempic: core patent December 2031.

carries the research return of the entire industry. That explains both the companies' takeover hunger and the caution with which this paper treats pipeline promises.³²

Every cliff has its climbers: what the originators lose, generics and biosimilar providers gain, whose copies cut prices by half and more after patent expiry — Sandoz, Teva and the Indian manufacturers live off precisely this calendar, and the world's health insurers are their quiet allies. In between stand the contract manufacturers, who produce for both sides, and the pharmaceutical wholesalers, whose margin hangs on volume rather than price. For investors, this creates a kind of natural hedge within the sector: a portfolio of originators, copiers and distributors is far more robust against the patent cliff than any single bet — the cliff shifts profits within the value chain, it does not destroy them.

That political and cost risks are no footnotes was demonstrated by the largest health care company in the world: UnitedHealth lost more than half its market value at the trough in 2025/26 — rising treatment costs in the old-age insurance programme, Department of Justice investigations into billing practices, a forced change of leadership. The case carries a double investor lesson. First: even supposedly defensive insurers are a regulated business with concentrated political risk. Second, more subtly: Berkshire Hathaway bought in after the first crash — and sold the position again completely within three quarters at a gain of around 45 per cent. Even the most famous long-term investor in the world treated the sector leader as a tactical opportunity, not a permanent holding. Whoever holds individual stocks in the health sector should know this humility.³³

8 Individual Stocks Along the Health Value Chain

8.1 Selection Principles and the Takeover Wave

The following overviews organise the field into three groups: the drug makers including animal health (Table 2), medical technology (Table 3), and tools, diagnostics and service providers (Table 4). Only large- and mid-cap stocks from around two billion US dollars upwards are included; prominent names below the threshold — the telemedicine pioneer Teladoc is now among them — remain unnamed. Whoever reads the tables should keep in mind the takeover wave currently reshaping the industry: in 2025/26 alone, Abbott bought the cancer screening specialist Exact Sciences for more than 20 billion US dollars, financial investors took the diagnostics group Hologic off the exchange for 18 billion, Johnson & Johnson acquired Intra-Cellular for 15, Novartis Avidity for 12, GSK Nuvalent for 11 and

³² Deloitte (2024): average development costs 2.23 billion US dollars per drug, research return 5.9 per cent (without GLP-1: 3.8 per cent); DiMasi, Grabowski and Hansen (2016), *Journal of Health Economics* 47, pp. 20-33; success rate of clinical programmes around 10 per cent.

³³ UnitedHealth: share price decline from the peak (606 US dollars) to the April 2026 low (277) of around 54 per cent; leadership change May 2025 (return of Hemsley); Berkshire Hathaway: entry in the second quarter of 2025 (around 1.6 billion US dollars), complete sale by the first quarter of 2026 (price gain around 45 per cent) — no position left at the end of August 2026.

Merck Verona for 10 billion — and in the obesity field, Pfizer outbid the rival Novo Nordisk in the battle for Metsera. The patent cliff of chapter 7 drives the companies on their shopping tour; for investors this means: pipelines are increasingly created by chequebook, and mid-caps with good data are structural takeover targets.³⁴

For the base statistics, Bessembinder (2018) applies here too: the entire excess return of the stock market comes from a few per cent of stocks — and the health sector sharpens this skew further, because binary trial results can halve or double entire company values in a single day. The Novo-Lilly story of the introduction is not an outlier but the basic pattern: in the same market, execution — trial design, manufacturing capacity, marketing — separates winners from losers more sharply than in any other industry of this series. The tables are therefore deliberately broad and explicitly no buy or sell recommendation, but a verified overview of the size classes.³⁵

A reading note on the tables: the size classes tell a story of their own. At the top stand no longer the broad traditional conglomerates but the focused winners of individual therapy fields — Lilly ahead of Johnson & Johnson, the immunology specialist AbbVie ahead of Roche and Novartis. Behind them follows a middle field of research-strong specialists — Vertex, Regeneron, argenx — which at the same time forms the preferred hunting ground of the takeover wave. And across from them stand the animal health stocks, whose business remains largely untouched by recessions and price negotiations. Whoever views the group as a whole recognises the pattern of the entire series: concentration at the top, consolidation in the middle, stability in the niches.

³⁴ Takeovers 2025/26 (selection): Abbott/Exact Sciences around 21-23 billion US dollars (completed March 2026); Blackstone-TPG/Hologic 18.3; J&J/Intra-Cellular 14.6; Novartis/Avidity 12.0; GSK/Nuvalent 10.6; Merck/Verona 10.0; Pfizer/Metsera around 10.0 after a bidding contest with Novo Nordisk; Danaher/Masimo 9.9; Sanofi/Blueprint 9.1; Novo/Akero 5.2.

³⁵ Bessembinder (2018), *Journal of Financial Economics* 129(3), pp. 440-457.

8.2 Drug Makers and Animal Health

Table 2: Drug makers and animal health — large- and mid-cap stocks

Company	USD bn	Business idea in the megatrend	Trading venue
Eli Lilly	1,040	GLP-1 market leader (Zepbound/Mounjaro); first trillion-dollar health stock	NYSE
Johnson & Johnson	641	Broadest portfolio of pharma and medical technology	NYSE
AbbVie	453	Immunology (Skyrizi/Rinvoq) and aesthetics	NYSE
Merck & Co	365	Oncology (Keytruda); 2028 patent cliff as the core question	NYSE
Roche	355	Oncology plus the world's largest lab diagnostics	SIX Zurich
Novartis	289	Innovative medicines, radioligand and gene therapy	SIX Zurich
AstraZeneca	251	Oncology and rare diseases	London
Amgen	232	Biologics; own obesity candidate	Nasdaq
Novo Nordisk	203	GLP-1 pioneer (Wegovy/Ozempic) after the crash	Copenhagen
Gilead	182	HIV market leader, cell therapy (Yescarta)	Nasdaq
Pfizer	162	Vaccines, oncology; Metsera purchase for obesity	NYSE
Vertex	138	Cystic fibrosis monopoly, CRISPR partnership (Casgevy)	Nasdaq
Bristol Myers Squibb	137	Oncology, neuropsychiatry (Cobenfy)	NYSE
Sanofi	106	Immunology (Dupixent), vaccines	Euronext Paris
GSK	101	Vaccines, HIV, oncology acquisitions	London
Regeneron	82	Ophthalmology and immunology	Nasdaq
argenx	64	Autoimmune diseases (Vyvgart)	Amsterdam/Nasdaq
CSL	59	Plasma proteins and flu vaccines	Sydney
Moderna	56	mRNA platform; cancer vaccines in trials	Nasdaq
Idexx	43	Veterinary diagnostics	Nasdaq
Zoetis	32	World market leader in animal health (One Health)	NYSE
BioNTech	26	mRNA oncology pipeline	Nasdaq

Source: Market capitalisations (rounded) at the end of August 2026; own compilation.

Notes: No buy or sell recommendation; selection without claim to completeness. Further notable names in the text.

8.3 Medical Technology

Medical technology is the steadier sibling of the pharmaceutical industry: no patent cliffs of this severity, no binary trial moments, but recurring revenue from consumables, service and installed base — the pattern this series has identified again and again as a mark of quality, from lifts to surgical robots. Surgical robotics from Intuitive to Stryker was covered

in depth in the robotics paper of this series (Rupprechter, 2026k) — its sales most recently grew by more than 90 per cent a year and form the most dynamic segment of service robotics. Alongside stand the heart specialists around Boston Scientific and Edwards, the diabetes sensor technology of Abbott and Dexcom, the imaging of Siemens Healthineers and GE HealthCare — and the ageing winners in the literal sense: hearing aids (Sonova, Demant), eye lenses (Alcon, EssilorLuxottica), dental implants (Straumann).³⁶

Table 3: Medical technology — large- and mid-cap stocks

Company	USD bn	Business idea in the megatrend	Trading venue
Abbott	197	Diagnostics, cardiac technology, glucose sensors (Libre); Exact purchase	NYSE
Intuitive Surgical	135	Surgical robotics (da Vinci); revenue per procedure	Nasdaq
Stryker	127	Orthopaedics and Mako robotics	NYSE
Medtronic	118	Broadest device range from heart to diabetes	NYSE
EssilorLuxottica	86	Glasses and vision aids for the ageing world	Euronext Paris
Boston Scientific	70	Cardiology and minimally invasive procedures	NYSE
Hoya	55	Optics and endoscopy components	Tokyo
Edwards Lifesciences	52	Heart valves (TAVR)	NYSE
Siemens Healthineers	51	Imaging, lab diagnostics, radiotherapy	Xetra
Becton Dickinson	50	Syringes, infusion, medication logistics	NYSE
Alcon	35	Eye surgery and contact lenses	NYSE/SIX
GE HealthCare	34	Imaging and patient monitoring	Nasdaq
Dexcom	34	Continuous glucose monitoring; over-the-counter Stelo	Nasdaq
ResMed	33	Sleep apnoea devices	NYSE
Philips	26	Imaging and monitoring	Amsterdam
Terumo	24	Cardiovascular technology and blood management	Tokyo
Zimmer Biomet	19	Joint replacement	NYSE
Straumann	18	Dental implants	SIX Zurich
Sonova	18	Hearing aids	SIX Zurich
Coloplast	16	Ostomy and continence care	Copenhagen
Olympus	14	Endoscopy	Tokyo
Smith+Nephew	12	Orthopaedics and wound care; Cori robotics	London
Insulet	10	Tubeless insulin pumps (Omnipod)	Nasdaq
Demant	9	Hearing aids	Copenhagen

Source: Market capitalisations (rounded) at the end of August 2026; own compilation.

Notes: No buy or sell recommendation; selection without claim to completeness.

³⁶ Medical robot sales: plus 91 per cent (IFR, cited after Rupprechter, 2026k).

8.4 Tools, Diagnostics and Service Providers: the Equipment Makers of Medicine

The third group follows the pattern that runs through every paper of this series: whoever supplies the tools earns from every breakthrough — no matter which company achieves it. Thermo Fisher and Danaher equip the world's laboratories; after spinning off its environmental technology, Danaher is a pure diagnostics and bioprocessing group and added patient monitoring in 2026 with Masimo. Lonza, Samsung Biologics and Switzerland's Bachem manufacture under contract what others invent — the GLP-1 peptide wave fills their plants for years; West Pharmaceutical supplies the injection systems to match. IQVIA and ICON run the industry's clinical trials, Veeva provides its software. And in diagnostics, precision medicine shows its investable side: Natera and Guardant have opened billion-dollar markets with blood tests for early cancer detection and monitoring — fields in which Abbott's takeover of Exact Sciences sets the pace of consolidation. Only geopolitics demands caution: the Chinese contract researchers around WuXi stand under the sword of Damocles of American exclusion legislation.³⁷

³⁷ Danaher: Masimo takeover announced February 2026, completed June 2026 (9.9 billion US dollars); BIOSECURE legislative risk for WuXi AppTec and WuXi Biologics: legislative proceedings in the USA.

Table 4: Tools, diagnostics and service providers — large- and mid-cap stocks

Company	USD bn	Business idea in the megatrend	Trading venue
Thermo Fisher	230	World's largest life-science lab equipment maker	NYSE
Danaher	152	Diagnostics and bioprocessing; Masimo purchase 2026	NYSE
UnitedHealth	350	Largest insurer plus health services (Optum)	NYSE
McKesson	100	Pharmaceutical wholesale and logistics	NYSE
HCA Healthcare	90	Largest private hospital operator in the USA	NYSE
WuXi AppTec	74	Contract research and manufacturing (China; political risk)	Hong Kong
Cencora	61	Pharmaceutical distribution	NYSE
Samsung Biologics	51	Biologics contract manufacturing	Seoul
Lonza	50	Contract manufacturer for biopharma; GLP-1 capacity	SIX Zurich
Natera	48	Genetic blood tests for prenatal and cancer diagnostics	Nasdaq
Veeva	45	Industry software for pharma and trials	NYSE
Agilent	44	Analytical and laboratory instruments	NYSE
IQVIA	42	Clinical contract research and health data	NYSE
Waters	41	Chromatography and mass spectrometry	NYSE
Illumina	32	Market leader in gene sequencing — after the crash	Nasdaq
Fresenius SE	30	Hospitals (Helios) and drug production (Kabi)	Xetra
Labcorp	27	Laboratory diagnostics and trial services	NYSE
Quest Diagnostics	27	Laboratory diagnostics	NYSE
West Pharmaceutical	24	Injection and packaging systems (GLP-1 pens)	NYSE
Guardant Health	23	Liquid biopsy for early cancer detection	Nasdaq
Sartorius	16	Bioprocessing equipment	Xetra
Eurofins	15	Laboratory services	Euronext Paris
Tempus AI	11	AI-supported precision diagnostics	Nasdaq
Qiagen	9	Sample preparation and molecular tests	Xetra/Nasdaq

Source: Market capitalisations (rounded) at the end of August 2026; own compilation.

Notes: No buy or sell recommendation; selection without claim to completeness. Health care real estate (Welltower, Ventas) is covered in Rupprechter (2026i).

9 Health ETFs: the Richest Shelf of the Series

9.1 The Checklist and the Offering

For fund selection, the fixed checklist of this series applies: physical replication instead of swap constructions; fund volume of at least 0.2 billion euros; running costs (management fee or total expense ratio); the currency question; issuer; UCITS framework; continuous exchange trading. The result is a positive surprise: around twenty European health funds

exceed the volume threshold — more than in any other field of this series; Table 5 shows the nine most important. Two peculiarities stand out. First, four prominent funds fail the replication test: the two Amundi funds on world and European health stocks and two Invesco funds replicate their indices synthetically via swap constructions — as in the urbanisation paper, they serve as a textbook example of why each criterion counts individually. Second, for only the second time in this series, a currency-hedged share class exists: the iShares fund on the S&P 500 health care sector is also available in a EUR-hedged class.³⁸

Table 5: Health ETFs under European law compared (UCITS, selection from 0.2 billion euros volume)

ETF (short name)	Volume (EUR m)	Fee p. a.	Replication	SFDR	above 0.2 bn?
Xtrackers MSCI World Health Care	approx. 3,490	0.25 %	physical	Art. 6	yes
iShares S&P 500 Health Care	approx. 2,590	0.15 %	physical	Art. 6	yes
iShares Healthcare Innovation (HEAL)	approx. 1,150	0.40 %	physical	Art. 8	yes
iShares Nasdaq US Biotech (BTEC)	approx. 990	0.35 %	physical	Art. 6	yes
Amundi MSCI World Health Care	approx. 860	0.30 %	synthetic	n. a.	yes
Amundi Stoxx Europe 600 Healthcare	approx. 880	0.30 %	synthetic	n. a.	yes
iShares Ageing Population (AGED)	approx. 820	0.40 %	physical	Art. 8	yes
SPDR MSCI World Health Care	approx. 610	0.30 %	physical	Art. 6	yes
iShares World HC Sector Advanced	approx. 900	0.18 %	physical	Art. 8	yes

Source: Provider information and fund databases (justETF, extraETF), as of the end of August 2026; volumes rounded (Advanced: both share classes combined).

Notes: No buy or sell recommendation. Also above the threshold, among others: iShares MSCI Europe Health Care (approx. 890 m), Xtrackers MSCI USA Health Care (approx. 826 m), iShares Stoxx Europe 600 Health Care (approx. 714 m), SPDR MSCI Europe Health Care (approx. 581 m), Amundi S&P Global Health Care ESG (approx. 529 m), SPDR S&P US Health Care Select (approx. 478 m), Invesco US Health Care (approx. 476 m, synthetic), Invesco Nasdaq Biotech (approx. 415 m, synthetic), Xtrackers MSCI Europe Health Care (approx. 304 m) and L&G Healthcare Technology (approx. 278 m). EUR-hedged class only for the iShares S&P 500 Health Care (IE00BMBKBZ46).

³⁸ EUR-hedged class: iShares S&P 500 Health Care Sector UCITS ETF EUR Hedged (IE00BMBKBZ46, fee 0.18 per cent); for the synthetic Amundi fund see Table 5.

9.2 What the Selection Teaches

Four observations. First, the cost range: between 0.15 and 0.40 per cent annual fee lies almost a factor of three for the same basic theme — broad sector funds are considerably cheaper than innovation and thematic cuts. Second, the concentration question: the broad sector funds carry Eli Lilly as their largest position — at around eleven per cent in the world index and a good fifteen per cent in the S&P 500 fund — whoever buys the sector buys, to a good part, the GLP-1 story; the broadly spread innovation fund HEAL and the 349-stock ageing fund AGED are the counter-designs. Third, the object lesson of theme cycles: the specialised genomics, telemedicine and bio-revolution funds, launched around 2021, today almost all lie below the volume threshold — the Global X telemedicine fund still manages five million euros. Ben-David, Franzoni, Kim and Moussawi (2023) documented this pattern systematically: thematic funds appear near the peak of enthusiasm. Fourth, the size question: the largest American health fund manages, at 44 billion US dollars, more than ten times the largest European one — but remains closed to European retail investors for lack of a key information document.³⁹

At the edge of the shelf one can observe how the fund industry rewrites its own history: in 2025/26, the iShares sector fund dropped the 'ESG' from its name and is now called 'Advanced', and the L&G fund went from 'Healthcare Breakthrough' to the sober 'Healthcare Technology & Innovation'. Such renamings are more than cosmetics: they show which narratives currently sell — and that holders of a thematic fund occasionally wake up owning a different product than the one they bought. Checking the identification number is not enough; index, methodology and name belong on the annual checklist.⁴⁰

The basic rule of this series applies on the richest shelf too: the thematic fund complements the world portfolio (Markowitz, 1952), it does not replace it — all the more so since the health sector is already contained in every world index with a weight of a good tenth. Whoever adds deliberately chooses between three logics: the broad sector (cheapest via the world and S&P 500 funds), the demographic bet (the ageing fund reaches beyond health into financial and consumer stocks) and the innovation bet (HEAL and the biotech funds) — knowing that the third is the most volatile. The currency question remains real: apart from the one hedged S&P 500 class, all funds carry the full dollar weight of their indices.⁴¹

³⁹ Ben-David, Franzoni, Kim and Moussawi (2023), *Review of Financial Studies* 36(3), pp. 987-1042; US funds: Health Care Select Sector SPDR (XLV) around 44 billion US dollars, iShares Biotechnology (IBB) around 10.5 billion — not accessible to EU retail investors without a PRIIPs document; Global X Telemedicine & Digital Health: around 5 million euros.

⁴⁰ Renamings: iShares MSCI World Health Care Sector 'ESG' to 'Advanced'; L&G 'Healthcare Breakthrough' to 'Healthcare Technology & Innovation' (provider information, fund databases).

⁴¹ Markowitz (1952).

10 What Investors Can Learn From All This

First lesson: the demand is the most secure in the world — the returns are not. Demographics and income growth guarantee rising health spending for decades; Arrow (1963) explains why this produces not a free market but a politically regulated one. Between secure demand and investor return stand pricing rules, approvals and patents — whoever buys the sector always buys its politics too.

Second lesson: in the right megatrend, execution decides. Lilly and Novo stood in the same market with the same drug class — one trillion versus minus two thirds. Trial data, manufacturing capacity and marketing speed separate winners and losers more sharply than in any other industry of this series. For stock pickers this means: even the best trend diagnosis replaces neither company analysis — nor spreading across several names per sub-industry.

Third lesson: the crash museum of this paper — Teladoc minus 96 per cent, Moderna at times minus 89, Illumina minus 45, UnitedHealth minus 54 — has a common denominator: expectations that grew faster than business models. The technologies themselves — telemedicine, mRNA, sequencing, care integration — all prevailed. The megatrend was real, the valuation was wrong. It is the Perez lesson of all the previous papers in medical form: after the euphoria comes the valley, and only then does the spread earn money.⁴²

Fourth lesson: the reliable earnings sit behind the headlines. Lab equipment makers, contract manufacturers, diagnostics groups, medical technology with consumables and service, animal health — they all earn from every breakthrough without hanging on a single trial result. It is the equipment-maker position of this series in medical form — and in the health sector it is additionally supported by the takeover wave that keeps buying up mid-caps with good data.

Fifth lesson: scientific breakthrough and business model are two different things. Gene editing cures — and generates a good hundred million; the weight-loss injection relieves chronically — and generates eighty billion. The difference lies not in medical value but in recurrence, scalability and the payment logic of the treatment. Investors should question breakthroughs by how often, for how many and by whom they are paid — not by how spectacular they are.

Sixth lesson: Bessembinder (2018) applies in sharpened form in the health sector — binary trial moments make the return distribution more extreme than elsewhere. The answer is the same as in the whole series, only more urgent: spreading across the three groups of chapter 8, across regions and across the funds of chapter 9 — and position sizes

⁴² Perez (2002).

that can absorb a failure. The currency question is part of it: only a single hedged share class exists on the entire shelf.⁴³

Seventh lesson: the megatrends of this series meet in the health sector. AI (Rupprechter, 2026h) permeates research and diagnosis, the ageing city (Rupprechter, 2026i) builds its real estate, water (Rupprechter, 2026j) remains its oldest infrastructure, robotics (Rupprechter, 2026k) operates on its patients. Whoever holds several thematic funds should know the overlaps — Intuitive Surgical, for example, lives in robotics as well as in health funds. Before every new addition, a look across the whole portfolio pays off: concentration can arise even from nothing but broad products.

11 Conclusions and Outlook

Health is the most human of the great megatrends — and the most contradictory. Its demand is demographically guaranteed, its value to society, following Murphy and Topel (2006), can hardly be overstated, and its science is experiencing a golden decade with gene editing, AI structure prediction and metabolic drugs. At the same time, no field of this series has destroyed more investor capital — not because the trends were wrong, but because valuations, politics and business models judge more strictly than enthusiasm. The paper has shown both sides and reaffirmed this series' answer to them: a broad base, checked funds, measured individual stocks — and the equipment makers ahead of the heroes.⁴⁴

The outlook: three developments deserve particular attention. First, the second GLP-1 wave: tablets instead of injections, new indications from heart to liver to addiction, and from 2027 American price negotiations over the blockbusters — on it hangs the question of whether the largest pharmaceutical market in history keeps its margins. Second, the proof of AI: by the end of the decade at the latest it will become clear whether AI-designed drugs reach approval and the development costs of two billion per drug actually fall — it would be the greatest productivity turn in the industry's history. Third, the planetary test: antibiotic resistance and climate effects are the most announced crises of medicine; whether premium models, vaccine platforms and the dormant pandemic agreement take hold in time is open — certain is only that prevention would be cheaper than any repetition of the year 2020.

For the megatrend series, health closes a circle: mobility, artificial intelligence, urbanisation, water and robotics described how the world is changing — health describes what for. All the technology of the preceding papers ultimately serves the longer, better life whose economics this paper has examined. The closing rule of the series remains the last word here too: the broadly diversified world portfolio as the foundation, megatrends

⁴³ Bessembinder (2018).

⁴⁴ Murphy and Topel (2006).

as a deliberate, reasoned, measured addition — and patience as the only position that could be recommended in all six papers without a checklist.⁴⁵

⁴⁵ On the logic of additions, Markowitz (1952).

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- Preliminary note: market, price and fund data without a separate reference are taken from company reports, fund databases and the cited publications; as of the end of August 2026. Revenue and approval information on individual drugs is based on annual reports and regulatory announcements.
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