

“The fault lies not with th players, but with flawed r

EUR 538.2 billion in healthcare spending in 2024, 12.4 percent of economic output. The reforms of recent decades have missed their targets because stakeholders circumvented them. Madeleine Barlozek MBA set out to find the causes and analyzed both the outpatient and the inpatient sector from a decision-theoretical perspective. In her paper “Vom Nobelpreis zur Versorgungspraxis” (From Nobel Prize to Care Practice) (1), the health economist traces many undesirable developments back to incentive structures whose effects were not factored in. All actors behave rationally in their own interest, yet the collective outcome is inefficient. An MVF conversation with her and OptiMedis founder Dr. h. c. Helmut Hildebrandt about misaligned incentives, options for action, and why “Gesundes Kinzigtal” (Healthy Kinzigtal) is still the exception after 20 years.

In conversation: Madeleine Barlozek MBA, consultant and Senior Market Access Manager at Danone, and OptiMedis founder Dr. h. c. Helmut Hildebrandt

>> Ms. Barlozek, in your paper (1) you describe the outpatient sector as a prisoner's dilemma in the game-theoretical sense. What does it consist of?

Barlozek: In the outpatient sector, two opposing undesirable developments can be identified fairly clearly: the expansion of service volumes on the one hand and the trend in EBM point values on the other. In decision-theoretical terms, this is a textbook prisoner's dilemma. With a capped overall budget, the expansion of service volumes lowered the point value for everyone. The empirical evidence clearly confirms this: after the introduction of the EBM (Uniform Value Scale) with fixed budgets, more cases were billed, whereupon the point value kept falling and the remuneration per case shrank accordingly. The result for all physician providers was therefore negative – they earned less even though they treated more patients.

"Policymakers overlook the fact that our healthcare system is not a machine but an ecosystem."
Madeleine Barlozek

The 2009 fee reform, with its orientation value and morbidity-based total remuneration, was supposed to change that. Why did the incentive to expand volumes persist?

Barlozek: That is the general problem of a great many reforms: in its well-intentioned reforms, policymakers do not try to change the incentive mechanisms but instead keep trying to fix specific problems in individual sectors. Policymakers overlook the fact that our healthcare system is not a machine but an ecosystem. Adjusting one screw can often trigger unforeseeable effects in many other areas. It is a bit like the environment: when a species dies out, you don't know what that means for plants and other living things, because everything is interconnected.

Mr. Hildebrandt, you have worked with selective contracts since § 140a SGB V was introduced in 2000. Has any reform ever changed the incentive structure itself?

Hildebrandt: One could mention the introduction of AMNOG in 2011. Or, before that, the introduction of selective contracts in 2000. Both reforms tried to change the relevant rules, and for a while they succeeded. But as is so often the case, the actors quickly and creatively looked for and found new logics that ultimately allowed them to keep following the old incentive structures. So far, no one has managed to prevent this. Perhaps because no one has thought of game theory until now, which I find absolutely fascinating. Unfortunately, the term "game theory" is somewhat misleading, because what we all do is not a game but serious situations in which our own actions affect the well-being, and even the life and limb, of others.

Let's turn to the inpatient sector. Only 41.5 percent of hospitals reach the threshold of 60 percent unchallenged invoices (National Association of SHI Funds, statistics under § 275c SGB V, Q4 2025). Does that make upcoding a systemic problem?

Barlozek: Upcoding means coding at the boundary between what is just about medically justifiable and what actually goes beyond it. Game theory explains why hospitals code exactly the way they do. If all other hospitals engage in upcoding except the one I am responsible for, I receive less and less in the long run. Conversely, if only I upcode and none of the others do, I receive much more. In other words: regardless of how other hospitals behave, upcoding is always the rational and dominant strategy for me. In game theory, however, this leads to a Nash equilibrium in which the logic of the prisoner's dilemma applies: at this point, everyone is worse off than if they had coded conservatively, because the individual advantages gained cancel each other out.

That is model and theory. How robust is the empirical evidence behind it?

Barlozek: Everything can be substantiated with available data. In my paper, I backed up my statements with empirical data. Random sample audits, for example, show coding errors to the detriment of the health insurance funds of up to 35 percent. At the same time, the case mix index rose steadily beyond what could be explained demographically. A well-known example is a study on upcoding in neonatology: after the case-based lump-sum system was introduced, all premature babies suddenly and strangely had a much lower birth weight than before. When this was compared with the actual data, it turned out not to be true. What happened is clear: if a newborn was just at a weight threshold, a few grams less were recorded so that the hospital would receive more money.

Mr. Hildebrandt, you managed Gesundes Kinzigtal GmbH from 2005 to 2018. Did you encounter this calculus there?

Hildebrandt: None of this surprises me. What I do find impressive, however, is that such undesirable developments can be traced and rationally explained using the decision theory applied here. That is extremely important, because misaligned incentives identified in this way could be avoided, or at least greatly minimized, through actually quite simple corrections to the incentive mechanics. Above all, this benefits patients: the neonatology example has shown how powerfully economic incentives can work and what sensitive questions they raise. Especially in areas where decisions have a direct impact on patients' health, remuneration rules must therefore be designed with particular care. The example shows us very clearly that it is not enough to develop an incentive system merely in the hope that the ethics of those acting in the organizations will prevent misaligned incentives. Now that Madeleine Barlozek has analyzed very precisely how and why misaligned incentives arise, policymakers must act and design incentive systems in such a way that the rationality of individual providers is consistently aligned with the socially desired goal and false rewards are minimized as far as possible.

Ms. Barlozek, you also modeled the current hospital reform as a strategic game. What was the most surprising result for you?

Barlozek: When I mapped the hospital reform as a strategic game, I really tried to model, with every conceivable facet and even three-dimensional games, the various options an individual hospital has vis-à-vis other hospitals in a region. The result surprised me greatly, because I actually did not manage to find a dominant strategy and a Nash equilibrium under the new incentive systems, which is rarely the case. For me, this means that the new law brings many opposing factors into this "game," so that it is practically impossible for an individual hospital to optimize strategically.

Why is that?

Barlozek: Take, for example, opposing incentives at different levels: at the individual hospital level, for a large share of hospitals in some service groups, the dominant incentive is to reduce volumes while increasing case severity, because within a 20 percent corridor the provision-based lump sum remains stable while variable costs are eliminated. At the state level, by contrast, there is an incentive to expand services in order to secure a larger share of the provision volume. For smaller hospitals, there are also minimum case volumes, which in turn pull in the other direction. And in the new system, upcoding becomes strategically even more attractive, because it increases remuneration without undermining the cap on case volume.

"For a 'game' to actually get better, you need a 'mechanism designer' who is able to understand the basic rules and shape them so that as few incentives as possible can be misused."
Dr. h. c. Helmut Hildebrandt

Isn't that a sign that the method is reaching its limits?

Barlozek: Quite the opposite: the absence of an equilibrium is precisely the result. That is also the feedback I have received from many hospital managing directors, because this reform brings them so much uncertainty that it will be almost impossible to optimize economically. The key message is therefore clear: this law has no winners, because there is no rational strategy.

Mr. Hildebrandt, that would then be a success, achieving the de-economization with which Karl Lauterbach once justified the hospital reform.

Hildebrandt: There will be winners nonetheless. There are always those who, with a lot of energy, commitment, and expensive consulting firms, find a way to maneuver through the complexities of the new law. Unfortunately, these will very probably not be the hospitals we as a society would like to preserve, but the clever free riders. These are the ones who can present the best concepts, at least on paper, to the state hospital planning authorities, which then allocate the desired planned case volumes. And these authorities will then decide which hospital may provide how many services and, of course, how much a hospital will earn in the future.

Mr. Hildebrandt, you have built many care systems. What do you conclude from this for incentive design?

Hildebrandt: For that, I have to go back a little. My personal awakening came in 1984 during a study trip to the US. There I got to know managed care and HMOs such as Kaiser Permanente and others, which have a truly different business interest from what we have known and still know here in Germany – apart from a few exceptions that I was able to help shape. When I came back, I was completely inspired by the idea of how care organizations could be developed further here as well. But I quickly came back down to earth, because at the time there was no debate on this at all in Germany. It was not until 1993 or 1994 that the physician network movement and the debate on physician networks began here. That in turn was my starting point for developing a care system quite different from the usual one. When § 140a was introduced with the health reform of 2000, making contracts with health insurance funds possible, we worked out the "Gesundes Kinzigtal" concept as a model with AOK Baden-Württemberg and implemented it successfully.

Where do decision theory and game theory come into play here?

Hildebrandt: Without having tested it against this theory beforehand, we did the right thing, consciously or unconsciously: we set up a model that avoids individual misaligned incentives, in that the health management company founded together with the local physician network earned money solely from improving the health insurance fund's overall result for the population served relative to the reference costs. We received no other payments; we were and are measured only by the outcome, i.e., by how well our actions affect healthcare costs.

What conditions must be met so that such a model does not create new misaligned incentives?

Hildebrandt: Of course, certain sets of rules have to be taken into account. Insured persons must continue to have free choice of physician so that they do not end up in a prisoner's dilemma themselves. Providers must likewise be free to decide whether or not to join the project. In addition, it must not be possible to shift individual costs. That means: really all costs incurred for the geolocated healthcare system must be included in the cost analysis. If that is the case, you get an incentive-compatible model. The organization then has the economic goal of setting positive incentives for everyone involved in care – midwives, therapists, sports clubs, dance clubs, physicians, hospitals – so that they align strictly with outcomes rather than service volumes.

OptiMedis sold its shares in Gesundes Kinzigtal GmbH as of November 30, 2023, citing changed conditions in the morbidity-based risk structure compensation scheme (Morbi-RSA). Why has the model not caught on nationwide?

Hildebrandt: This brings us back to decision theory: for a "game" to actually get better, you need a "mechanism designer" who is able to understand the basic rules and shape them so that as few incentives

as possible can be misused. But in Germany, there is no organization at the regional level – a district, for example – that is responsible for health outcomes. Instead, we have a completely fragmented system: among health insurance funds, among providers, in the social systems, and among advisory services. In the last legislative period, the draft Healthcare Provision Strengthening Act briefly showed a flicker of intent on the part of legislators to create such a regional level of responsibility and decision-making, but it then fell victim to the collapse of the traffic-light coalition. I am pinning my hopes on our new Federal Minister of Health, Dr. Linnemann. As a trained economist, he is familiar with game theory. The same hope applies to the experts on the Health Finance Commission. Its second report at the end of the year could mark the start of the necessary process of restructuring and rethinking.

But Germany lacks a neutral mechanism designer.

Barlozek: With the missing "mechanism designer," you are addressing the main problem in our system. In Germany, we effectively have no "mechanism design," because although the Federal Ministry of Health (BMG) sets the rules, the standards and key decisions are made by other bodies that are not actually neutral, since they all have their own interests and agendas. In other words: in this country there are no neutral "mechanism designers," only players who are allowed to make their own rules.

Hildebrandt: In addition, some actors in the system have special power to shape it. This is a consequence of our system of self-governance, in which the central actors in healthcare are at the same time significantly involved in shaping the rules. This inevitably creates tension between the respective interests of those involved and overarching health policy goals. That makes it all the more important to design the rules so that different interests are taken into account and incentives are aligned as consistently as possible with socially desired goals.

Who could set the rules neutrally?

Barlozek: Only the legislature can do that, with preparatory work by the BMG, of course.

Hildebrandt: Healthcare is so complex and at the same time so crucial for life and death that we certainly cannot develop a revolutionary solution overnight. This means that what matters now is to develop a path for establishing regional accountable entities and increasingly orienting them toward improving the health of the regional population. However, this can hardly work as a one-size-fits-all solution for all of Germany! The challenge will be to convey to policymakers that we have to start with regional solutions, and that those acting there need latitude to shape things locally but must also take responsibility for outcomes at the same time. And above all, that the BMG finally allows the regional differences that exist anyway to be reflected in the respective local care processes.



Madeleine Barlozek MBA

is a freelance consultant and author in the healthcare sector and Senior Market Access Manager at Danone. Through her career stages in the pharmaceutical industry, medical technology, and management consulting, she knows the German healthcare system from various perspectives. She is particularly interested in developing incentive-based reform concepts grounded in health economics, game theory, and mechanism design in order to translate scientific findings into concrete health policy solutions.

That brings us back to the beginning. Whoever changes the rules changes the behavior of the players. Can game theory predict this reaction?

Barlozek: That is exactly the task of mechanism design: the rules must be designed so that individual behavior remains rational for the individual but is also desirable for society as a whole. Only then will those who behave ethically not be punished, as is currently happening everywhere: providers who code particularly conservatively, who follow all the rules, who do not exhaust every option, and who do not free-ride are ultimately penalized financially today. Instead, it should really be those who do not follow the rules who are put at a financial disadvantage. Ultimately, it is not the players who are to blame for undesirable developments, but flawed rules of the game.

Can you pin that down to a specific rule?

Barlozek: This is exactly the model that Helmut Hildebrandt has been advocating for many years: accountable care organizations, or ACOs, as embodied in Germany by "Gesundes Kinzigtal," for example, combined with shared savings and capitation models. The point is always to save costs in a region and to share in these savings. Of course, this must then be more attractive than sticking with the current system: the revenue increase I can capture by coding more, upcoding more, and treating more cases must not be as strong as the incentive to behave in such a way that the available budget is used particularly efficiently. That is the big challenge.

Mr. Hildebrandt, the US is hardly regarded as a role model here.

Hildebrandt: But it should be. Around 50 percent of the US public insurance programs now work with solutions that come close to this model. These are the accountable care organizations just mentioned, which have been established there as a regulatory framework through tendering by the Centers for Medicare & Medicaid Services. We also know that such solutions exist internationally in very differently organized healthcare systems – for example in Spain, the UK, the US,

or Switzerland, the prime example of liberal economic policy. Incidentally, such ideas are not entirely new here either. The hospital sector, for instance, has long had positive experience with regional psychiatry budgets.

Mr. Hildebrandt, Dr. Carsten Linnemann has headed the Federal Ministry of Health since July 29, 2026. What first steps would you recommend?

Hildebrandt: Permitting long-term contract models at district level with the entire statutory health insurance system, which must prove themselves through the health outcomes they achieve for the population. In return, while keeping overall spending at its current level, they should be given room to shift their structures toward outpatient care, establish more prevention and health promotion, and make patient journeys more patient-friendly. We will only achieve a new, optimized model if we allow healthy competition between re-

Game theory – understanding behavior under incentives

Game theory examines how rational actors behave when their decisions depend on the behavior of others. It is concerned not with games but with decision problems in business, politics, and healthcare. Its concepts come from economics, for which John Nash, John Harsanyi, and Reinhard Selten received the Nobel Prize in Economics in 1994, and Leonid Hurwicz, Eric Maskin, and Roger Myerson in 2007.

The incentive structure of a system determines which option is strategically most attractive for an actor. If an option is always the best regardless of how all the others behave, it is called a **dominant strategy.** A hospital that pushes its coding to the limit is better off, no matter how the other hospitals in the region behave.

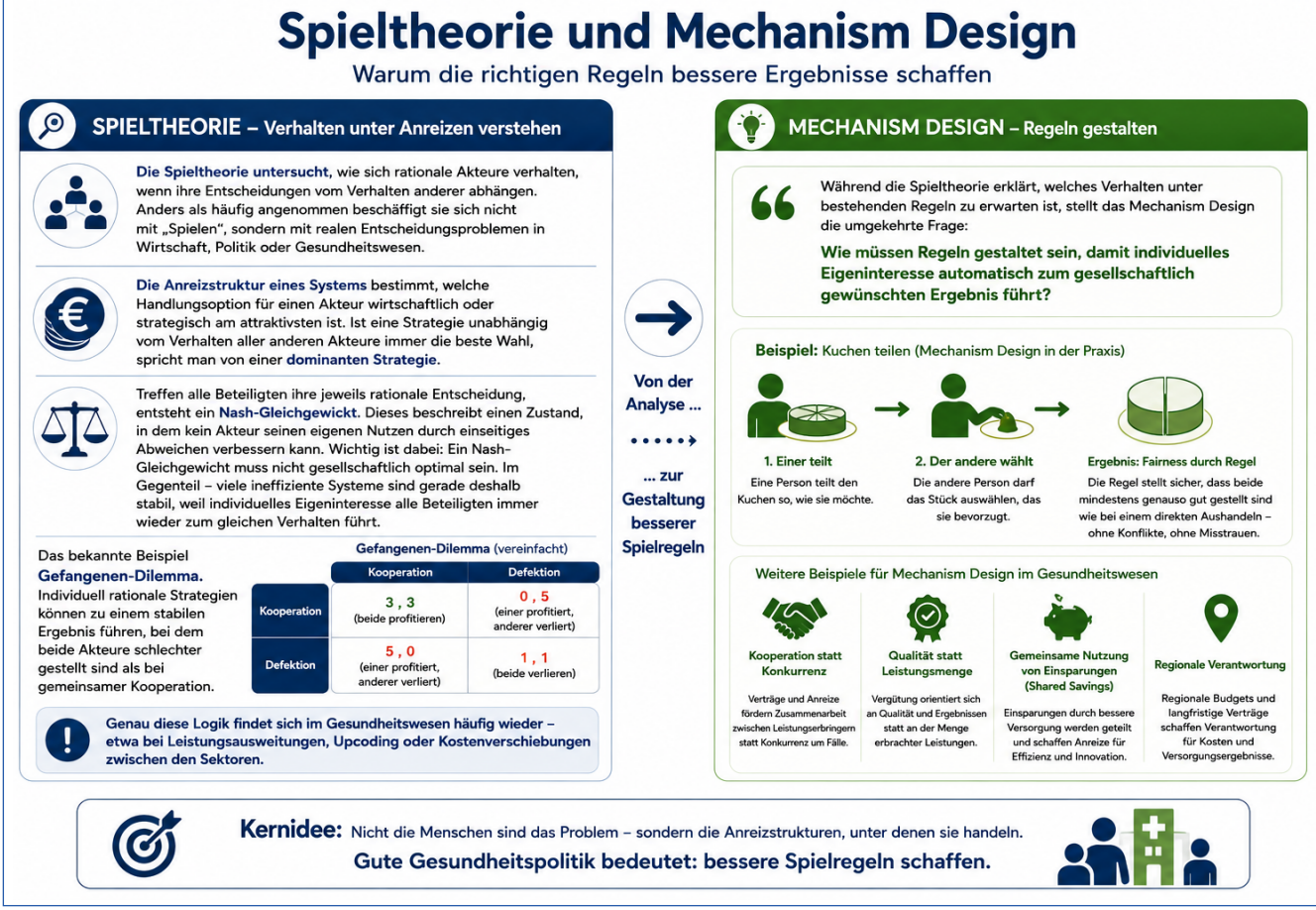
If all participants choose their best response to the behavior of the others, a **Nash equilibrium** arises. In this state, no one can improve their outcome by deviating unilaterally.

Such an equilibrium need not be socially optimal. Many inefficient systems are stable precisely because the self-interest of all participants keeps re-creating them. In the **prisoner's dilemma**, individually rational strategies lead to an outcome in which everyone is worse off than with cooperation. If all hospitals code at the limit of what is justifiable, the advantages cancel each other out, leaving higher audit effort on both sides.

This explains why appeals to the behavior of those involved achieve little. As long as the rule generates the advantage, the undesirable strategy remains rational, and whoever avoids it bears the costs alone.

Mechanism design asks the question the other way around. Game theory explains what behavior can be expected under existing rules. Mechanism design asks how rules must be designed so that individual self-interest leads to the socially desired outcome. It does not presuppose moral behavior, but designs the rules so that cooperation, quality, and efficiency become the rational choice for each individual. In practice, this means tying the incentive to outcomes rather than to the volume of services provided, and setting it so that it exceeds the advantage of the previous strategy.

Reforms that miss their targets therefore often fail not because of a lack of insight on the part of those involved. They fail because of rules that reward undesirable behavior.



gions and provider consortia, while at the same time obliging them to ensure data transparency and evaluation. This is the only way to generate knowledge that moves us forward and to analyze how best to keep our population healthy. Through which methods? In which subpopulations? For which morbidities? In which social groups? For this, we need expanded knowledge that must be developed and taught in and with all health-related professions.

Such a system must be able to measure quality. Where is the data supposed to come from?

Hildebrandt: I disagree. With the data available today, quality measurement is much more feasible than 20 years ago, when we started in Kinzigtal. With the routine data of the health insurance funds, we can now make very good district-level comparisons; sociodemographic data have also improved, and this development is continuing steadily. For the OECD, for example, we ourselves contributed to developing the Patient-Reported Indicator Surveys (PaRIS). This means that patients themselves can also be involved through their own reports. For the start-up phase of ACOs, however, changes in the total costs of the respective regional population relative to the average costs of the general population can already be used as proxies. We too easily forget that higher SHI health expenditure is at the same time an indicator of poor health in that population.

Barlozek: Today we also have the opportunity to measure quality better than in the past. The key to better care is measuring the quality of treatment, because all other data only show what was treated, not what outcome was achieved. Yet to evaluate treatments in the inpatient or outpatient sector, there has so far been no consistently implemented outcome measurement at all – which digitalization would actually enable, if we wanted it. Once the electronic patient record (ePA) and the Research Data Center are filled with data, we can try to reduce costs in a quality-optimized way.

Shared savings distribute savings between health insurance funds and providers. Initially, patients gain nothing financially from this.

Hildebrandt: True. But they do benefit if they receive better support in staying healthy and unnecessary services are no longer provided, because more budget is then available for the necessary ones.



Dr. h. c. Helmut Hildebrandt

is founder and Executive Board member of OptiMedis AG. His focus is on building and managing regional, population-based integrated care systems. From 2005 to 2018, for example, alongside his board role at OptiMedis AG, he was Managing Director of Gesundes Kinzigtal GmbH, which was responsible for integrated care in the Ortenaukreis district in Baden-Württemberg. He has also piloted similar solutions in the Hamburg districts of Billstedt and Horn, in North Hesse, in Thuringia, and in neighboring European countries. He is currently working on developing regional budget solutions in primary care and for hospitals.

What the right service is, however, must be defined by the providers themselves – on an ethical basis and transparently in comparison with other regions. Providers already know quite well which treatments are efficient and effective and which are not. Only they know how long a patient really needs to stay in hospital. Only they know when it makes sense to refer patients to specialists and when it does not.

Barlozek: That is why regional consortia consisting of physicians, all health insurance funds together, and other providers make sense – consortia that, sharing in the savings, can come up with sensible definitions. Such a body knows exactly where savings can be made without reducing quality. This also leads us out of the mental trap in which virtually all providers feel pushed into a kind of victim role by ever new cost-containment laws, because they believe that disproportionately large savings are being made at their expense.

Mr. Hildebrandt, more than 780 Innovation Fund projects have been funded since 2016. How realistic is implementation with so many parties involved?

Hildebrandt: What Ms. Barlozek describes is the positive interpretation. In the reality of implementation, it becomes much more complex, because there are a great many parties on the provider side. Moreover, a care service involves not only GPs or specialists, but possibly also home care nurses, physiotherapists, or midwives. So it does become very complex when it comes to quantifying and financially dividing up the benefit generated. We will probably not be able to avoid initially continuing the current remuneration mechanisms in order to then develop them further step by step. Developing a completely new system will certainly take 10 to 15 years. But that doesn't scare me. It is actually not a bad thing that developments in healthcare proceed slowly, because we are dealing with a very vulnerable patient population. Incidentally, there is interest in such regional accountable entities both among office-based physicians and among hospital operators; we are in ongoing dialogue with a whole range of regions on this.

Mr. Hildebrandt, health economics mainly discusses prices and reimbursement. Why does incentive analysis play hardly any role?

Hildebrandt: In my perception, health economists discuss the truly

important and socially relevant issues far too little and instead too often discuss drug pricing, which is certainly important as well. On top of that, all of us in healthcare think in strongly normative terms. We often project our own, mostly quite positive mindset of how one should ideally behave correctly and ethically onto everyone else. Our own self-perception and wishful thinking then manifest themselves in draft legislation, and people wonder why even the most well-intentioned reforms come to nothing. This is exactly where game theory steps in: it takes us back to the rational underpinnings and shows that the wishful notion of how people should behave is merely a backdrop – a backdrop, however, that is often far removed from how decisions are actually made.

The regulatory impact assessment under Section 44 of the Joint Rules of Procedure of the Federal Ministries (GGO) requires a description of the effects. Is a game-theoretical review even feasible in the legislative process?

Barlozek: I think the decision-makers in this area are very much aware of the complexity. It is difficult enough to understand these many complex matters well enough to simplify them for decision-making purposes using game theory.

At what point should – no, must – a draft law be reviewed from a game-theoretical perspective?

Barlozek: Alongside the drafting of a reform. With every important change of system or rules, it must be known which effects are most likely. Classical game theory can show which Nash equilibrium will emerge where and when. And with the help of mechanism design, i.e., by thinking further ahead, we can then consider which rules actually put quality and efficiency at the center. Evolutionary game theory would also be interesting, incidentally, as it explains which strategies prevail in the long term under which given rules. The great thing is: we can already observe all of this in the available data.

If you could change only one rule, which would it be?

Hildebrandt: A solution that incentivizes the health insurance funds to support preventing the progression of disease and then to finance this jointly through regional accountable entities. Germany could develop something here that could ultimately become an economic export model for the European Union as a whole. After all, all developed countries in the world have this need. So I would say: Germany, from the "pharmacy of the world" to the "development lab for health for the world."

Ms. Barlozek, you call for regional consortia with all health insurance funds together. § 140a SGB V only supports contracts with individual funds. What would have to happen first?

Barlozek: The aim should be to give providers responsibility for efficiency in healthcare through regionally established shared savings models. If regional stakeholders were given back an ethically sound economic interest, implementation would be possible fairly quickly. That would be an approach we could implement and evaluate immediately in some regions.

Ms. Barlozek, Mr. Hildebrandt, thank you for the conversation. <<

Interview by MVF Publisher Prof. Dr. Reinhold Roski and MVF Editor-in-Chief Peter Stegmaier.

1: Barlozek, M.: „Vom Nobelpreis zur Versorgungspraxis: Spieltheorie als neue Perspektive im Gesundheitswesen", in: Gesundheitswesen aktuell 2026, BARMER Institut für Gesundheitssystemforschung, Berlin 2026: https://t1p.de/331z1

Note: On pages 20 ff., you will find a game-theoretical analysis of the current hospital reform, prepared for MVF by Madeleine Barlozek.

Citation

Barlozek, M, Hildebrandt, H., Roski, R., Stegmaier, P.: "The fault lies not with the players, but with flawed rules", in "Monitor Versorgungsforschung" (05/26), pp. 12–18. http://doi.org/10.24945/MVF.05.26.1866-0533.2862