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# Electronic health records

Broad-scale introduction in Germany requires a long-term strategy and an effective governance structure

- Electronic health records (EHRs) improve the quality and efficiency of treatment
- EHR systems are the key technological lever for greater cooperation in the healthcare sector
- The records empower patients in their role, and have to be conceptualized from the outset as a comprehensive treatment management platform
- Implementation presents a complex technical and organizational process that requires a long-term strategy, and should take place incrementally
- A special governance structure should be established that facilitates inclusion, while remaining functional and capable of exercising decision-making power

## Authors



Timo Thranberend  
Senior Project Manager  
Improving Healthcare –  
Informing Patients  
Bertelsmann Stiftung  
timo.thranberend@  
bertelsmann-stiftung.de



Prof. Dr. Peter Haas  
Medical Information  
Scientist  
Fachhochschule Dortmund  
peter.haas@prof.haas.de

**E**lectronic health records are cross-institutional electronic patient records (i.e., they are able to be shared across a range of healthcare settings). The use of such electronic health records (EHRs) as an instrument to improve the provision of healthcare has been discussed around the world for almost 30 years. Many countries, including Denmark, Austria and Switzerland, have already established national EHR infrastructures. There is widespread consensus in Germany as well “that the electronic health record represents the informational core of an individual’s medical history.” As far back as 2004, German IT experts indicated in a management paper <sup>1</sup> that its design should accordingly be the central task of all measures modernizing the healthcare system.

This consensus still exists almost 13 years later, as does an even greater consensus that there is no clear roadmap for establishing such a record system nationally. According to a recent study <sup>2</sup>, although Germany is not at the very back of the European pack with respect to developing the record, it still “has a long way to go to join the more advanced countries.”

With the E-Health Act, passed at the end of 2015, the establishment of cross-institutional records was legally enshrined for the first time – the organizational and technical prerequisites are meant to be established by the end of 2018. But what are the necessary steps in establishing electronic health records that provide real and comprehensive benefits? Which aspects need to be clarified, and what technological and organizational infrastructure is required?

On behalf of the Bertelsmann Stiftung, Professor Peter Haas, medical information scientist and long-standing spokesperson for Advisory Council for the Society for Telematics Applications (Gesellschaft für Telematik, gematik), has written an expert report analyzing these questions. The author reviewed the relevant literature and strategies of other countries, and developed proposed solutions and concepts, which were also based on his own experience. The expert report indicates

“Evidence and common sense advocate digitization and a comprehensive electronic health record. Electronic health records improve the quality and efficiency of healthcare provision.”

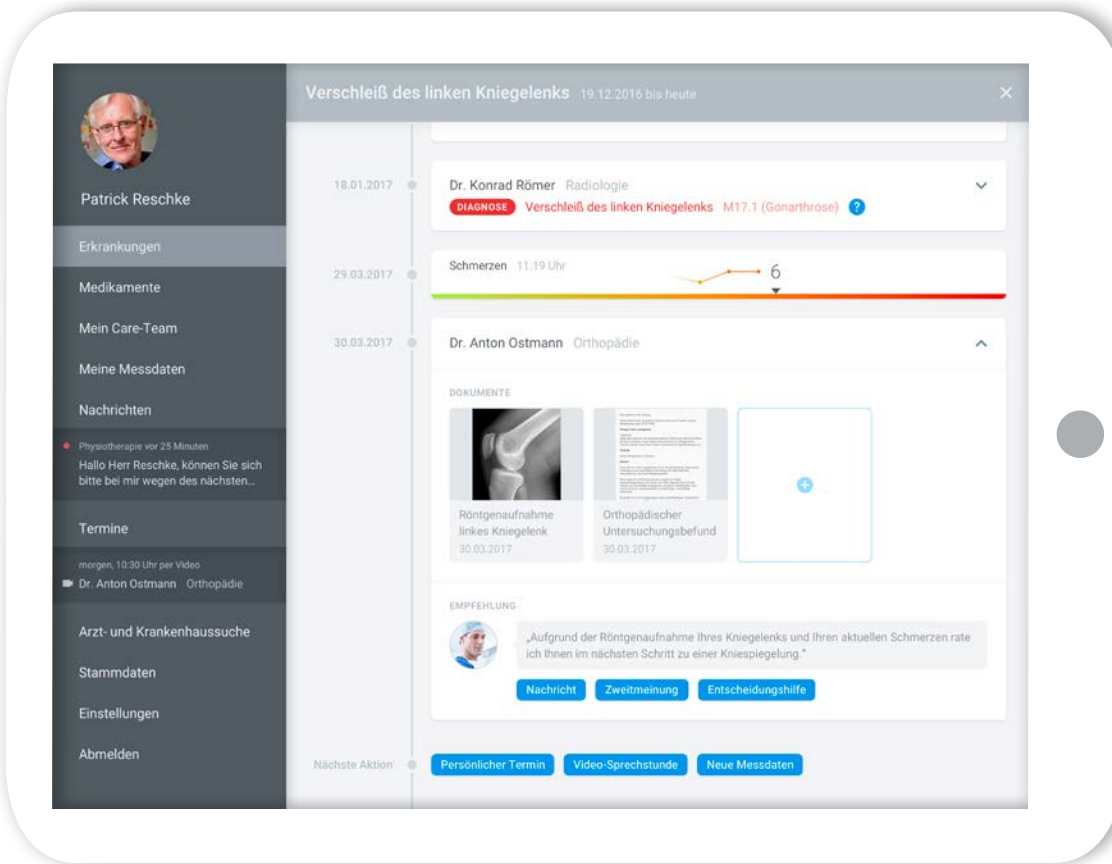
Prof. Dr. oec. Volker Amelung,  
Professor for International Health System  
Research at Hannover Medical School  
and President of the German Managed Care  
Association

that the nationwide implementation of EHR systems is a complex process, and many things need to be determined. A long-term strategy with clear milestones and an effective governance structure is required. Now seems the right time to pose questions regarding the framework conditions, and to actively address the task, as functioning EHR systems represent the key technological lever for greater cooperation in the healthcare sector, and thus for improved quality, efficiency and patient autonomy.

### Electronic health records increase the quality and efficiency of healthcare provision

Germany commands an effective healthcare system, however, there are marked problems with respect to the interfaces between the various stakeholders and sectors. Generally speaking, almost no physician or hospital possesses a comprehensive overview of all a patient’s treatments, healthcare is fragmented, and patients often have to provide the necessary flow of information themselves.

The quality, appropriateness and efficiency of healthcare suffer particularly with respect to the chronically ill and multimorbid patients: poor patient safety and avoidable duplicate examinations are the most commonly mentioned consequences. Experts estimate that thousands of



Example of a patient view of a record as a comprehensive treatment management platform.

## Electronic patient records

There are many varieties of the electronic patient record that are commonly not clearly defined or differentiated. Case records and cross-case records (for example, detailing all stays in a hospital) are already widespread today. They are digitally created by individual service providers and stored with them. There are also health records that are managed and administered by the patients themselves – personally controlled health records (PCHRs).

The expert report on which this Spotlight is based deals with electronic health records (EHRs). EHR systems (records with technological functionalities) save and process all relevant information regarding a patient's state of health, medical history and planned treatments. They can be accessed by the entire treatment team – namely the patient, as well as all healthcare institutions and service providers so authorized by the patient.

The expert report paints a picture of EHR systems available throughout Germany, linked with service providers' primary systems. In this case, there is not just the one national electronic patient record, rather various record systems based on defined and binding standards. Patients can freely choose their records; interface standards ensure that every physician and healthcare provider can work with the records. The record providers – for example health insurance funds or technology companies – compete with each other. Establishing general framework conditions, such as for operator models and the respective approval processes, would ensure that every patient's record had the same fundamental features and offered the same level of security as other records.



Comprehensive explanations of the content of this Spotlight can be found in the expert report "Einrichtungsübergreifende Elektronische Patientenakten als Basis für integrierte patientenzentrierte Behandlungsmanagement-Plattformen."

The study can be downloaded at [www.der-digitale-patient.de/epa-expertise](http://www.der-digitale-patient.de/epa-expertise)

## Sources

The literature cited in ① – ⑦ can be downloaded at [www.der-digitale-patient.de/spotlight-akte-literatur](http://www.der-digitale-patient.de/spotlight-akte-literatur)

people die every year as a result of drug interactions, and, one estimate ③, unnecessary over-treatments may have cost statutory health funds between 11 and 16 billion euros in 2014.

EHR systems can make a significant contribution to solving these problems. With them, all service providers always have the information they need when they need it so as to make treatment decisions. Practical experience and the available studies show that this can succeed: “Today, there is little doubt that an electronic health record can improve the effectiveness and efficiency of treatment.” ②

### EHR systems are a technological lever for cooperation

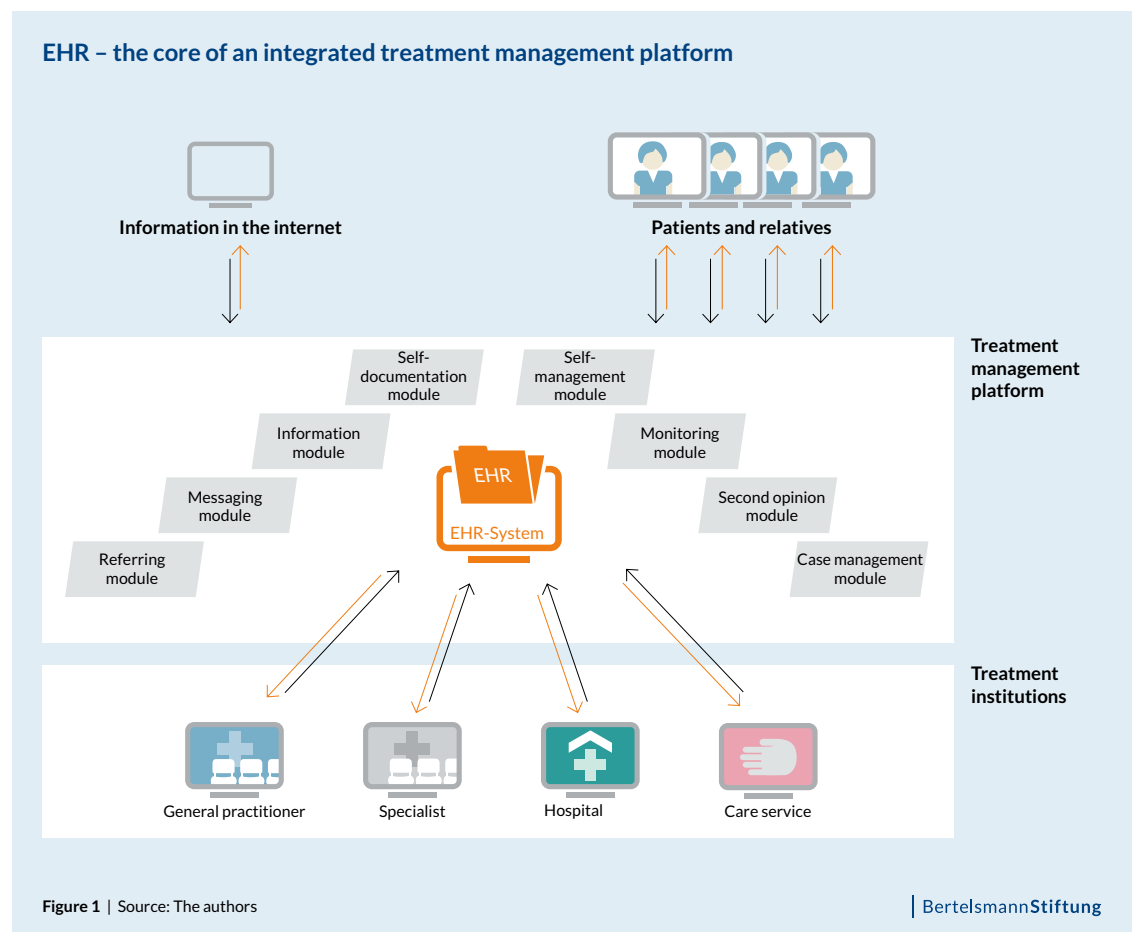
EHR systems provide more than just information transparency. The technology is also a key lever and driver for greater cooperation in the healthcare sector. The records are exceptionally well-suited for supporting the concept of integrated treatment. It is not enough to view electronic health records as only an instrument for hospitals, physicians and other healthcare pro-

fessions. They can, and should, also be an instrument that makes patients part of the treatment team.

In order for an EHR to fulfill this function, it has to be more than a “patient file,” from which the patient can retrieve documents and create their own. According to proposed scenario, patients should also be able to use their record for their own documentation, their self-management, and cooperation with the treating physicians.

### The goal: EHR to be a treatment management platform, increasing patient autonomy

In future, the EHR will be more than a collection of documents and data on a patient’s illnesses, diagnoses or medication. It establishes transparency regarding the past and the present, and has planning and organizational components: EHR systems can form the foundation for total treatment management (see Figure 1). For example, data from remote patient monitoring can feed into the systems and be monitored, and physicians can refer patients to other physicians using the systems.



This digital platform can serve as a kind of cockpit for patients with respect to all activities involving their own health. For example, using the platform they can plan appointments, communicate with physicians, get a second opinion, or save health data that they have collected. A special feature of the platform is that health information and aids for the collective decision making process of patients and physicians can be intelligently integrated; evidence-based information has a reach here that it can't achieve in a detached information portal. The EHR will thus become a central tool for patients in taking on an autonomous role in treatment.

### Implementation is a complex technical and organizational process

Other countries' experience shows that the nationwide implementation of EHR systems is not a trivial task. Many things need to be determined regarding content, data protection, access management, liability, interoperability standards, and financing. The expert report is based on seven major tasks / key areas of activity (see Figure 2). In each area, there are a number of specific points that need to be settled. This requires a defined roadmap and a comprehensive and long-term strategy – with clear objectives and milestones.

Because of the complexity of the project, an incremental approach is advisable: starting with the simple and general, and making refinements later incrementally. A phased plan with three major steps is proposed (see Figure 3):

1. Establishing the EHR as a documents record
2. Integrating medication plans, emergency data and laboratory results
3. Further activities developing the EHR as a treatment management platform

The first step towards a establishing a documents record follows the Austrian and Swiss models. The goal is to realize the first tangible benefits of the EHR as early as possible, and thus further encourage acceptance. The second step builds on the preliminary work already conducted in Germany in recent years. This step represents the first visible sign of an integrated platform approach, whereby medication plans, emergency data and laboratory results are not viewed as individual applications of the electronic health card, but as part of the record. In total, a timeframe of around ten years should be reckoned with for the nation-

### Key areas of activity for developing a national EHR infrastructure



Figure 2 | Source: The authors

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### EHR: Phased implementation plan

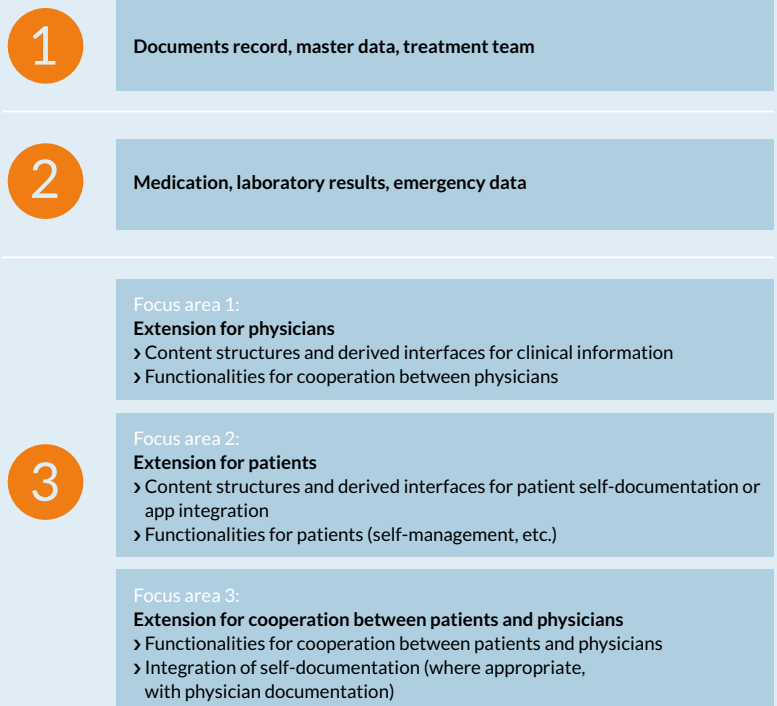
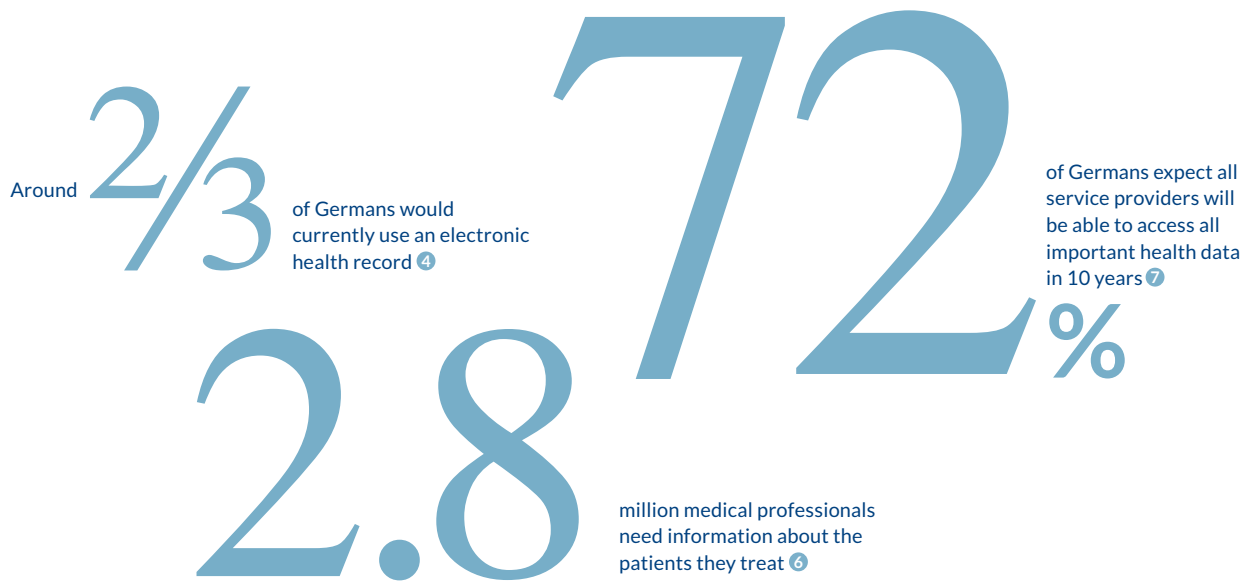


Figure 3 | Source: The authors

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“Without the appropriate policy framework, there is the risk that solutions will be fragmented. The benefits promised by the electronic health record will not be comprehensively delivered.”

Dr. phil. Karsten Neumann,  
Managing Director IGES Institute, Berlin <sup>7</sup>

wide implementation of the final development phase (in its current version).

### Governance structure has to be effective and facilitate inclusion

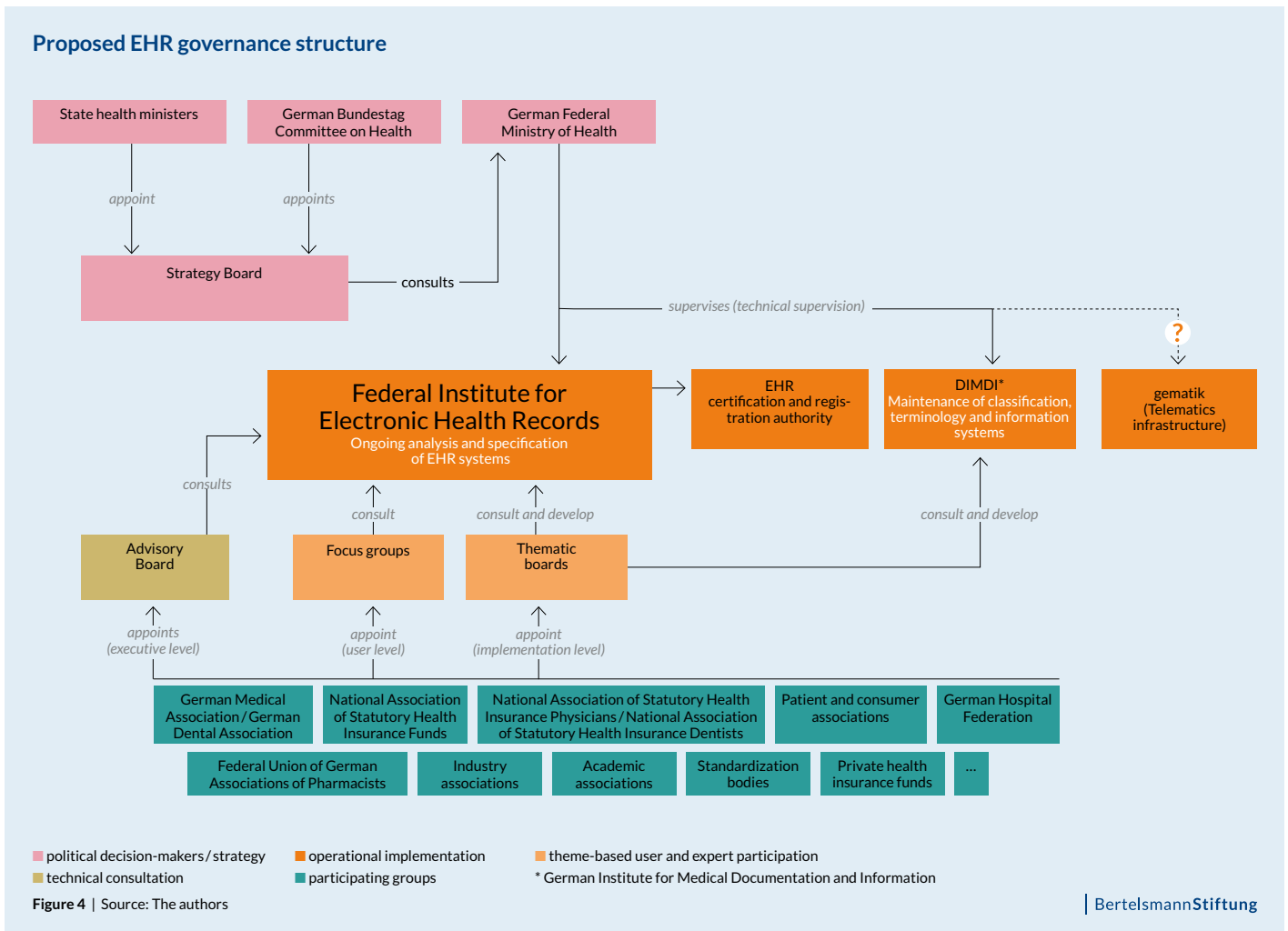
The phased plan developed in the expert report also describes the specific approach in implementing EHR systems in detail. An effective governance structure plays a decisive role in realizing the infrastructure project: responsibilities and decision-making competencies need to be clearly allocated. This is true not only in theory – it can also be seen looking at the experience other countries have had in introducing electronic health records.

To date, the governance structure in Germany has in principle consisted of gematik and its members, the umbrella organizations of the service providers (i.e., physicians, dentists, hospitals and pharmacies), and the National Association of Statutory Health Insurance Funds. This construction and the differing interests of the mem-

bers have often led to deadlocks in the past; the electronic health card project was further delayed time and again.

With the E-Health Act, the legislator has introduced clear deadlines and sanctions, and the German Federal Ministry of Health is closely monitoring the project's implementation. In principle, this approach is to be welcomed, and is beginning to bear fruit. Indeed, given the project's history, the ongoing influence of veto players, and the still looming deadlock, it seems advisable to continue down the path of political accountability and to think ahead regarding the management of the project in the near-term. This opportunity presents itself now with the start of EHR implementation.

An exemplary governance model is drawn up in the expert report, based on international experience and fundamental principles of governance. This model ensures the inclusion of all relevant groups, while remaining functional and capable of exercising decision making power. The core of the model is a permanently established Federal Institute for Electronic Health Records (Bundesinstitut für E-Patientenakten), under political management. In the model, technical supervision would rest with the German Federal Ministry of Health, while the institute would define standards, framework conditions and permissible operator models. A strategy board with political representatives from the federal and state levels would make recommendations, and the impacted expert and stakeholder groups would be involved by means of focus groups (technical) and an advisory board (superordinate). The technical expertise on



various topics would be integrated by means of thematic boards, and gematik would continue to maintain responsibility for operating the telematics infrastructure, though its organizational and structural anchoring would have to be politically clarified (see Figure 4). The model makes no claim to be a final version, but rather serves as a concrete basis for encouraging further discussion.

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**Responsible for content:**  
Uwe Schwenk  
Program Director  
"Improving Healthcare – Informing Patients"

**Contact:**  
Sonja Lütke-Bornefeld  
sonja.luetke-bornefeld@bertelsmann-stiftung.de  
Tel: + 49 5241 81-81431

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## Recommendations for action

# Nationwide implementation of EHR requires a clear roadmap

EHR systems improve the quality and efficiency of healthcare provision, and grant patients autonomy in their treatment. Nationwide implementation requires a long-term strategy, an effective governance structure and binding standards.

### Establishing a basic understanding in society

- › An approach such as a national EHR infrastructure requires broad social acceptance and a basic understanding of its benefits. The public, physicians, and other healthcare professionals should be informed and involved by means of broad-scale communications strategy.

### Defining a national strategy and building an effective governance structure

- › A long-term national strategy is required, with clear objectives and milestones. A governance structure should be established that facilitates inclusion, while remaining functional and capable of exercising decision making power.

### Establishing the specific legal framework

- › A national EHR strategy requires a special legal framework. A dedicated e-health chapter in Volume 5 of the German Social Insurance Code would be recommendable, which, in addition to covering the new regulations governing the use of the EHR, could bundle the numerous other regulations on related topics.

### Creating organizational structures and defining standards

- › Specialized organizational structures are needed, such as for the specification and updating of interoperability standards, as well as the determination of models and conditions for operating EHR systems

### Determining a content strategy and planning financing

- › In addition to technical matters, agreement has to be reached on what medical content the EHR should contain. A nuanced concept is required that ensures patients' informational self-determination, without letting deletions and the hiding of content counteract the goal of an EHR. There is also a need for detailed financial planning, reimbursement provisions for service providers, and decisions regarding the sources of financing.

### Establishing technical infrastructure and context-specific applications

- › The development of the telematics infrastructure has already established a national infrastructure for the operation of EHR systems. Important context-specific applications, such as a terminology server for semantics, or an electronic register for institutions and healthcare professionals, have to be specifically developed.

### Providing for implementation in the form of a phased plan

- › The implementation of a nationwide EHR infrastructure should take place incrementally. From the very outset, the goal should be the establishment of a comprehensive treatment management platform. For example, the current considerations regarding a German health portal should also feed into the concept.

SPOTLIGHT GESUNDHEIT is an initiative of the “Improving Healthcare – Informing Patients” program at the Bertelsmann Stiftung. Published several times a year, SPOTLIGHT HEALTHCARE addresses topical issues in healthcare. The Bertelsmann Stiftung is committed to promoting a healthcare system relevant to public needs. Through its projects, the Stiftung aims to ensure the provision of needs-based and sustainable high-quality healthcare in which patients are empowered by access to readily understandable information.

This SPOTLIGHT HEALTHCARE edition addressing EHR is a product of the “Digital Patient” project which explores the opportunities and risks of digitization trends in healthcare. Offering studies and recommendations, the project aims to help inform debates and promote the service of technology to healthcare. Broadscale inclusion of patients should be the goal of any new digital development. More information at [www.bertelsmann-stiftung.de](http://www.bertelsmann-stiftung.de) and [www.der-digitale-Patient.de](http://www.der-digitale-Patient.de)