



## Tele-medicine improves patient care

March 15, 2010

**Tele-medicine has existed for over 25 years.** Since the early 1980s information and communication technology (ICT) has increasingly also been used for tele-medicine, that is the provision of medical services using technology that bridges the gap between different physical locations.

**Scandinavia leads the way in Europe,** due in large part to low population and doctor densities. Germany occupies a lower middle ranking among the eight most important tele-medicine countries because the German healthcare system is in many respects not yet suited to the use of tele-medicine and the doctor density is high by international standards.

**Tele-medicine helps save money.** Tele-medicine can be more efficient than traditional methods of treatment. The technology provides users with greater comfort and convenience. "Long-distance therapy" can often make doctor's visits or hospital stays unnecessary and allow drug treatment to be adjusted more quickly to the patient's condition.

**There are still risks and implementation obstacles to be overcome.** One obstacle to its nationwide use in Germany is the fragmentation of the tele-medicine market. In addition, many doctors are sceptical because they believe tele-medicine poses a threat to exercising their duty of care towards the patient.

**The status quo will change.** In the coming years there will be a shift in the status quo in favour of tele-medicine. As the population ages the number of chronically ill patients will rise. Many such patients are ideal candidates for the use of tele-medicine.

**The onward march is unstoppable.** All in all, tele-medicine turnover in Europe will probably grow by an average of 10% p.a. between 2006 and 2020, whereas health expenditure will rise only half as fast.

**Impact on care provision structure.** The outpatient sector could see its workload expand as demand for inpatient care declines. This is also suggested by the increase in the number of medical treatment centres providing integrated care whose personnel make them well suited to providing tele-medicine services.

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**Author**

Uwe Perlitz  
+49 69 910-31716

**Editor**

Tobias Just

**Technical Assistant**

Sabine Kaiser

Deutsche Bank Research  
Frankfurt am Main  
Germany

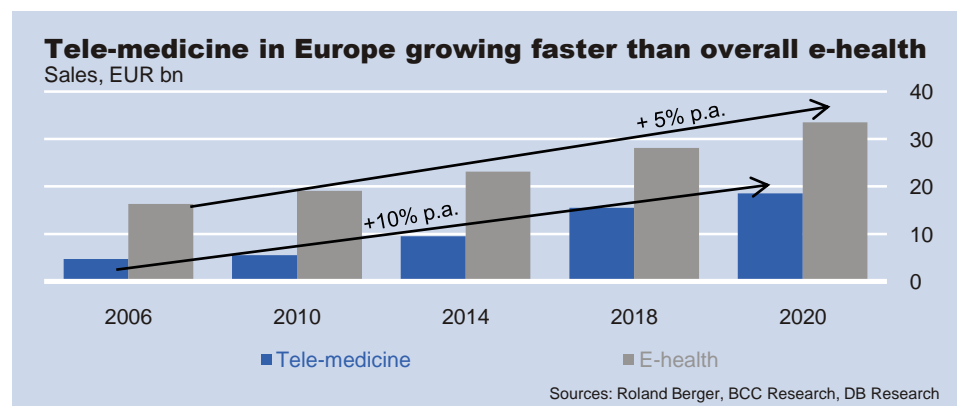
**Internet:** www.dbresearch.com

**E-mail:** marketing.dbr@db.com

**Fax:** +49 69 910-31877

**Managing Director**

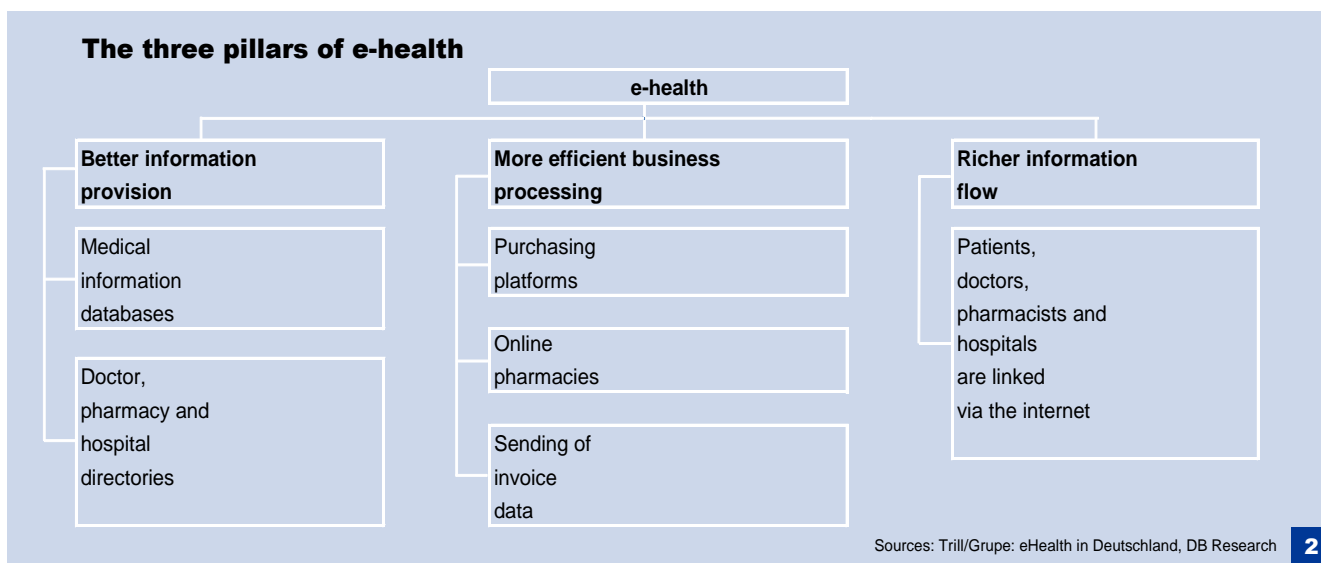
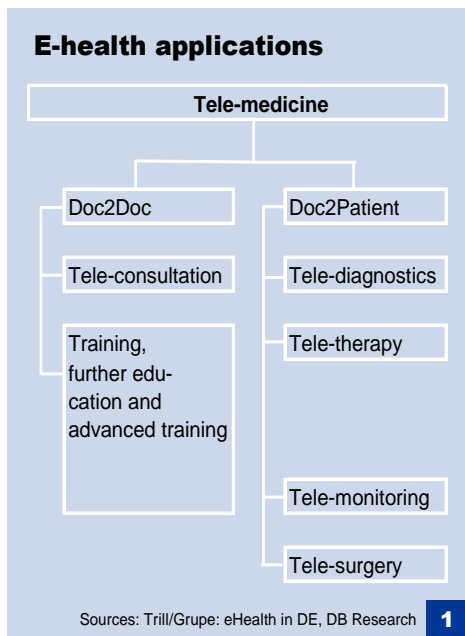
Thomas Mayer



# 1. Introduction

ICT plays a supporting role in an increasing number of industry and service sectors as well as in the household segment. This is mainly because it yields efficiency benefits (not only lower transaction costs and time savings, for example, but also greater convenience) for both companies and their clients. Healthcare is another sector suited to ICT applications because the technology enables doctors to quickly access patient data and allows the patient's condition to be monitored more easily. Integrating tele-medicine services into national healthcare systems is by no means easy, though. Public health authorities retain their pivotal role as they bear the main responsibility for the organisation, financing and provision of healthcare services. Altering these arrangements is difficult in many cases.

The advent of the “new economy” in the late 1990s with its electronic marketplaces (e-commerce) inspired the coining of the term e-health. E-health denotes the electronic linking-up of all the participants in the healthcare market, that is not only the service providers and suppliers but also patients. These contacts enable the creation of new business models like those that have already materialised in the form of online pharmacies.<sup>1</sup> One particularly important e-health segment is tele-medicine, i.e. using ICT for the remote provision of medical services. It encompasses not only the storing and processing of data, but also the sending of data, text, tables, diagnoses and images that enable diagnostic or therapeutic interaction. One example of this is remote-controlled surgical robots that enable operations to be performed at distant locations. In addition, patients can send their vital sign parameters (measurements of the basic functions of the human body) to a health centre or a doctor's surgery and – if a reading is too high – receive an immediate response from there so that they can take the appropriate action.



<sup>1</sup> See Perlitz, Uwe (2008). The German pharmacy of the future. More pharmacy chains – more competition – cheaper products. Deutsche Bank Research. Current Issues. Frankfurt.



## Tele-medicine has only existed since the 1980s

It was in the 1960s that x-ray images were transmitted via cable for the first time, sent over a distance of five miles between two hospitals in Montreal. Only since the 1980s, however, have tele-medicine procedures been performed on a larger scale. Examples of this are the monitoring of the health of astronauts in space, workers on offshore oil rigs or participants in expeditions for whom the provision of medical personnel was impossible or too hazardous. Although the deployment of the technology was limited to small groups, it did nevertheless allow initial experience to be gathered. Economic efficiency was only a minor consideration with these applications.

## 2. Application areas

The two pillars of tele-medicine are the interactions between clinicians (doctor to doctor; D2D) and/or other care providers as well as between doctors and patients (doctor to patient; D2P). This categorisation is based on the differentiation between business to business (B2B) and business to consumer (B2C) relationships.

### Doctor to doctor (D2D)

#### Imaging systems particularly suitable

Tele-consultation between doctors is used to incorporate medical expertise that resides beyond the bounds of the hospital or surgery. It is a great help to the doctor in cases where the assessment of images is decisive. Naturally the disciplines that have shown themselves to be particularly suitable are those where the findings are logged and communicated electronically. This applies especially to medical imaging systems such as x-ray machines, computer tomography and magnetic resonance imaging equipment, nuclear medicine and ultrasound diagnostics. In this way images of pathological specimens or skin diseases can also be forwarded to experts for their opinion in order to back up or discuss the diagnosis of the doctor in charge of treatment. So the benefit lies in the possibility of quickly and inexpensively accessing the expertise that is available worldwide. For special cases this is occasionally decisive. Furthermore, doctors can expand their range of treatments.

Just like in other specialities electronically based training, vocational and continuing education, which have been available since the late 1990s, are also gaining ground in medicine. Furthermore, consultants can discuss their findings with other colleagues for training purposes.

### Doctor to patient (D2P)

#### Tele-monitoring dominant

The most important tele-medicine segment in the doctor-patient relationship is tele-monitoring, in which the patient's condition is monitored remotely with the aid of telematics. This system is particularly helpful for the chronically ill, such as diabetes sufferers or people with chronic cardiac insufficiency. This is because many of these patients require regular and frequent monitoring on account of the protracted duration of the disease, their health and the medicines they have been prescribed. The monitoring is primarily of vital sign parameters such as pulse rate, blood pressure, blood oxygen level and respiratory rate. The data is collected automatically using suitable equipment.

**Online consultations barely established**

Tele-diagnostics provides the doctor with direct access to the patient's data. These can be details that have already been logged, such as x-ray images, or information collected at a different location, like an ECG (electrocardiogramme) or video recordings of the patient.

Online consultations for humans, by contrast, have hitherto failed to become established as they only allow doctors to fulfil their personal duty of care to a very limited degree and restrict their ability to make a diagnosis.

Remote-controlled surgical robots have already been developed that are operated by a surgeon who is not present at the patient's bedside. This enables complicated interventions to also be performed at remote locations without the specialist being there in person. Costly transportation can be averted.

**3. The benefits of tele-medicine**

The benefits of tele-medicine for the service provider, the health insurer and not least for the patients have been confirmed by numerous domestic and foreign pilot projects.

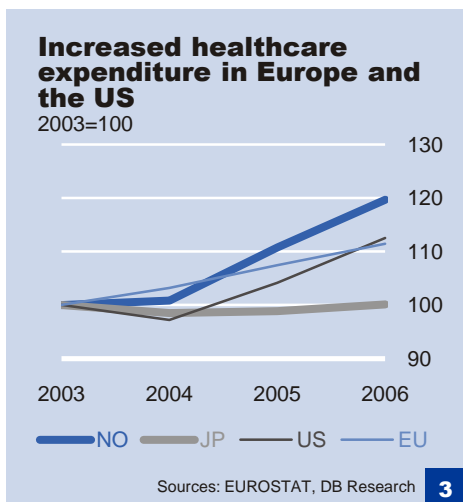
**Cost reduction for service providers and health insurers**

It is the health insurers above all that are looking for ways to cut costs on account of the way contribution rates are developing. The German healthcare system is very diverse, and it is good though expensive by international standards. In Germany 10% of GDP is currently spent on health services. This is the fourth-highest percentage in the world (surpassed only by the US, Switzerland and France), whereas in other large EU member states this figure is about 8%.

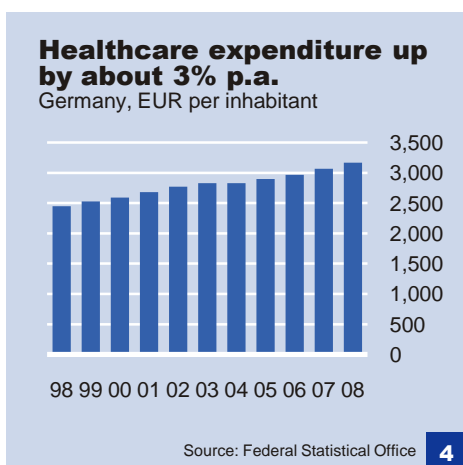
According to an OECD study the share of healthcare costs relative to GDP in Europe could rise from 10% at present to 16% by 2020.<sup>2</sup> One potential way of slowing the rise in healthcare costs is the comprehensive linking-up of individual providers and whole sectors. The Mannheim-based tele-medicine equipment vendor Vitaphone expects, for example, that treating a cardiac patient using tele-medicine equipment can yield savings of EUR 1,200 per year, or roughly 20% of standard treatment costs, because many consultations and numerous hospital stays will be rendered unnecessary.

When reforming the German healthcare system the decision-makers should not only concentrate on boosting revenues. After all further reductions in expenditure could also be made. For example, lawmakers have given service providers and health insurers scope for additional, new concepts within the framework of so-called integrated care. More extensive interconnection of general practitioners and specialists as well as hospitals is designed not only to improve patient care but also reduce healthcare costs by ending duplication of procedures. One example of this is the Disease Management Programme (DMP) for the chronically ill. However, these options have hitherto been underutilised.

The increased use of tele-medicine pays off for health insurers because it reduces the number of expensive hospital stays for patients. According to information from the Federal Health Ministry,



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<sup>2</sup> See OECD (2007). Health at a Glance.



spending on hospital stays in Germany over the last ten years rose by about 2% p.a. to EUR 52.6 bn and thus represents the biggest single cost item for the statutory health insurers. According to a report by Andreas Reichelt, a comparison of patient treatment costs revealed that the hospital costs for the group of patients that received tele-medicine care were around EUR 3,000 lower (i.e. some 50% less) than for the group of patients that did not receive tele-medicine care.<sup>3</sup>

### Doctor's visits made unnecessary

Outpatient treatment – above all of the chronically ill – can alleviate symptoms and complaints more quickly, the better the opportunities for a doctor to intervene in the treatment. Remote therapy obviates the need for doctor's visits and enables medicines to be adjusted more quickly to changes in the patient's condition. In US studies the potential savings from the easier sharing of medical data alone are estimated at up to 5% of annual healthcare spending, which is equivalent to around EUR 82 bn per year. According to information published by Steven Levitt, in recent years tele-medicine enabled doctors in the US to cut the time they spent on data management by around 25% and spend twice as much time on treating patients. In hospitals the number of patients has risen much faster than the number of employees.<sup>4</sup>

### Care provision structures are changing

#### Outpatient segment benefits

The increased use of tele-medicine could result in a considerable change in the structure of patient care provision. While the workload for the outpatient sector will increase, traditional inpatient care will see its role continue to recede. At the Klinikum München hospital, for example, the length of stay for patients who participated in the tele-medicine programme was reduced from 12 to 7 days. The number of beds in hospitals is thus likely to continue trending downwards.

There are health insurers, for example, that already assume the costs of tele-medicine treatment as a supplementary service for at-risk patients, the chronically ill or patients recovering from operations. For example, PHTS Telemedizin signed a contract with health insurer Landwirtschaftliche Krankenkasse (LKK) Niedersachsen-Bremen aimed at providing better care for cardiac patients.

Although virtually no-one now disputes the benefits of tele-medicine, it is estimated that in Germany a mere 1% or so of patients receive tele-medicine treatment.

### Lower costs for the chronically ill ...

#### Patient care can be optimised

Using tele-medicine to treat the chronically ill enables care processes to be optimised. According to calculations by the Fraunhofer Institut, some 80% of healthcare expenditure (roughly EUR 200 bn) is spent on treating the chronically ill or patients with long-term illnesses.

The most prevalent chronic illnesses like heart complaints, asthma and diabetes are particularly appropriate for tele-monitoring:

#### Tele-medicine particularly suitable for treating chronic illnesses

— Cardiac insufficiency is a condition in which the heart muscles receive an inadequate supply of blood and oxygen. In Europe

<sup>3</sup> See Reichelt, Andreas (2008). Telemedizin als Innovation, eine Technikfolgenabschätzung des Tele Home Care im deutschen Gesundheitswesen. Bayreuth.

<sup>4</sup> See Levitt, Steven D. and Stephen J. Dubner (2009). Super Freakonomics. London.

about 10 million people suffer from cardiac insufficiency, which consumes around EUR 20 bn or more than 2% of total healthcare spending in the EU-27. The condition requires lifelong monitoring and therapy. Breathing problems and/or rapid weight gain are key factors that need to be checked every day. An early adjustment of treatment based on the monitoring data can improve the patient's condition, reduce the number of consultations and shorten hospital stays or make them unnecessary.

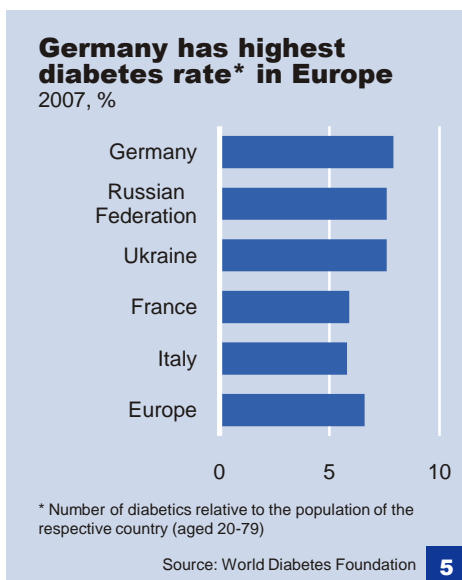
The costs of treating this illness are primarily incurred for stays in hospital rather than paying for drugs or expensive heart transplants. According to a report from the Kaufmännische Krankenkasse Hannover (KKH) and the tele-medicine company ArztPartner almeda AG, tele-medicine care can reduce the hospital stays for patients with this illness by around 50%. Total treatment costs were nearly EUR 7,000 per patient lower than for a control group (patients that received no tele-medicine care).<sup>5</sup>

- Asthma is a chronic inflammatory illness of the airways. In Germany nearly 6 million people suffer from asthma; in Scotland no less than 18% of the population are asthma sufferers. Tele-monitoring enables better reviewing of patient therapy and early identification of a deterioration in the patient's condition.
- Diabetes results from the insufficient effectiveness of insulin, the hormone produced in the pancreas that is responsible for regulating the blood glucose level. The impaired regulation of blood glucose means that blood glucose levels need to be monitored constantly to prevent secondary diseases that are extremely cost-intensive (e.g. eye problems and foot complaints).<sup>6</sup> Telemonitoring systems are geared towards sending information that enables patients to be assisted in managing their illness. They can, however, also be the basis for a change in the existing therapy. Patients whose diabetes is well managed and monitored cost far less to treat than patients with chronically excessive blood glucose levels and the resulting long-term consequences. Of the roughly 7 million diabetics in Germany around 60% currently keep a record of their blood glucose levels. For many of them the reading merely serves as the basis for calculating the next amount of insulin that they need to inject.

Hitherto diabetics, for example, have not been discharged from hospital until their blood glucose has returned to normal levels. As the fees for hospital care in Germany have no longer been charged per day since 2004 but instead according to the patient's illness, there has been an incentive to examine cheaper alternatives. Patients could, however, be discharged without risk if permanent monitoring of blood glucose levels via tele-medicine were to be guaranteed by the hospital or the doctor in charge of treatment.

### Receiving better care is important for patients

For patients, however, the primary consideration – especially where their health is concerned – is not cost savings but assuring or improving the quality of care they receive. Quality of care is improved especially in the area of telemonitoring via the



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<sup>5</sup> See Häcker, Joachim, Barbara Reichwein and Nicole Turad (2008). Telemedizin. Markt, Strategien, Unternehmensbewertung, Munich.

<sup>6</sup> See Perlitz, Uwe (2009). Diabetes – the price of increasing prosperity. Deutsche Bank Research, Current Issues. Frankfurt.

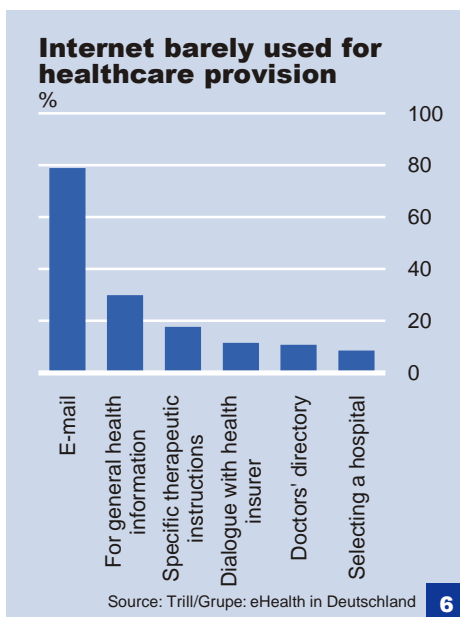


comprehensive monitoring of at-risk patients and the optimum interconnection of healthcare structures.

No objection can be raised against remote treatment if the doctor has been personally convinced of the condition of the patient in a preceding examination, can justify the continuation of tele-medicine treatment in a concrete situation and can trust the findings or past treatments of other medical practitioners.<sup>7</sup>

### ... but not everyone benefits

The undoubtedly better and more flexible patient care facilitated by tele-medicine does not, however, apply to the entire cohort of sufferers with a particular complaint, and distinctions do need to be made in assessing patients. For example, in Germany there are currently only about 22% of diabetes patients with both the required affinity and acceptance for the use of tele-medicine, according to analysis conducted by Häcker et al. Applying this ratio to the number of diabetics in Europe this would already have been equivalent to 12 million patients back in 2007. The picture is similar with other chronic illnesses. In the case of cardiac insufficiency only around 10% of sufferers can be considered for tele-medicine monitoring. For other chronic illnesses this share ranges between 5% and 25%. If the above-mentioned savings could actually be made healthcare costs could be reduced by more than 5%.



## 4. Risks and obstacles to implementation

The nationwide use of tele-medicine in many European countries does, however, still require the management of risks and the overcoming of obstacles to implementation.

### Major economic hurdles still exist

One major obstacle to broader tele-medicine coverage is the fragmentation of the market. In Germany there are currently roughly 5,000 to 6,000 small and medium-sized firms offering a wide variety of products and siloed solutions. US studies confirm that the lack of compatibility between systems is preventing potentially very large savings from being made. One reason is the large number of regional vendors. In addition, the patchy integration between decision-makers and payers has the downside of making it difficult to achieve nationwide implementation of major projects.

Furthermore, in German surgeries the often inadequate IT infrastructure constitutes a bottleneck because replacing equipment requires major investment.

For patients cost is one of the key factors that determines whether they receive tele-medicine care. The costs of tele-medicine are only reimbursed by health insurers in exceptional cases. As a rule patients have to pay for such health services out of their own pockets. This instrument is still relatively uncommon in Germany – the IGeL individual health services are one example. They are services that are regarded as medically sensible but which are not paid for by the statutory health insurers.

<sup>7</sup> The German ban on tele-medicine states that doctors must not administer individual medical treatment exclusively via communications media or computer communication networks. This means that merely exclusive treatment via communications networks is banned.

### **User-friendliness of equipment is important**

Another obstacle for tele-medicine concerns the ease of use of the required technologies – especially for the elderly. The elderly have had relatively little to do with such equipment up until now. For the chronically ill in particular this is highly important, as patients have to operate the equipment themselves, mostly in a domestic environment. Above all, the elderly often have problems with their vision, their hearing or their manual dexterity. This has to be taken into consideration in the design of the displays and the controls.<sup>8</sup> Additional controls are also important to prevent incorrect use.

### **Doctors' acceptance is vital**

#### **Duty care is important for doctors**

Without solving the acceptance problems among doctors, however, the success of every tele-medicine project is in jeopardy. For example, there are still many general practitioners who advise against using tele-medicine applications because they view them as competition or at the very least as an instrument for others to check on their activities and therefore might not accept them. The tele-medicine treatment of patients requires doctors to make investments in infrastructure and cope with an increased administrative workload. Moreover, the permanent access to the transmitted data – without an intermediate call centre – requires that the doctor fulfils a major duty of care towards the patient. Doctors who fail to comply run the risk of being sued for damages by patients.

### **Numerous legal constraints**

#### **Data problems not yet solved completely**

In addition to the economic hurdles there are numerous legal constraints to be surmounted. The most important one is data protection. Sensitive patient data is obviously very valuable. It is therefore subject to a high risk of misuse. Moreover, data can be simply combined and easily copied. They must, however, be brought together at some stage. Otherwise the doctor is virtually unable to perform a consultation. According to a study conducted by the Fachhochschule Flensburg university in 2008, around 62% of service providers and 86% of doctors considered the risks to the general public from infringement of data protection rules to be “considerable to very considerable”. However, this scepticism could not be observed among the patients that participated in this study.<sup>9</sup> Evidently many of them are unaware of the potential for misuse. Of paramount importance is the separation of illness-relevant data from personal data. Examples are the data collected for illness statistics or analyses of typical courses of illness. In these cases the personal details of the sufferer are not significant and must always be removed.

## **5. The market for tele-medicine in Europe**

#### **Scandinavian countries are the leaders**

The low population densities of Scandinavian countries make them good candidates for the use of tele-medicine: the number of inhabitants per square kilometre there ranges between just 10 and 20, compared with 113 in the EU-27 and no less than 230 in Germany. Doctor density is also very low there. Whereas for example the doctor-to-inhabitant ratio is one to only around 170 in

<sup>8</sup> See Heng, Stefan (2009). Age-appropriate information technology on the advance - Putting paid to olden times. Deutsche Bank Research. Economics 74. Frankfurt.

<sup>9</sup> See Trill, Roland and Fritz Grupe (2008). eHealth in Deutschland, Bestandsaufnahme, Perspektiven und Chancen eines Wachstumsmarktes. Fachhochschule Flensburg. Flensburg and Hamburg.

Italy, one to 240 in Belgium and one to 270 in Germany, in Finland, Norway and Sweden it is roughly one to about 350. In Germany tele-medicine primarily lends itself for use in the eastern states where doctor density is considerably lower than in western Germany. In east Germany there is one doctor to every 300 or so inhabitants compared to a ratio of 1 to 250 in west Germany (in Hamburg and Bremen it is a mere 1 to 200).<sup>10</sup> As well as the demographic situation, however, a state-financed healthcare system is also beneficial for tele-medicine applications, as for example is the case in Sweden. The country's individual provinces finance and plan the healthcare system and are responsible for allocating funding; they own hospitals and healthcare centres.

#### **Technical infrastructure decisive**

In addition, the provision of technical infrastructure determines the scale of tele-medicine coverage. In Norway and Sweden there are already dedicated networks for nationwide tele-medicine usage that enable electronic communication and interaction in the healthcare sector. There, electronic data collection has also long since become standard practice, which is beneficial for tele-medicine. Essentially its main contents are patient medical records, a collection of diagnostic data, diagnoses and treatment summaries that doctors can access.

In Switzerland tele-consultation has even already established itself as an instrument. Those who first obtain tele-medicine treatment before they visit their doctor receive a discount from many health insurers. Every day Switzerland's leading tele-medicine provider Medgate is already receiving some 2,000 calls from patients that are answered by doctors.

#### **Wide range of products and services available**

There are numerous companies now operating in the European market. The European market for medical equipment is worth a total of around EUR 60 bn and constitutes about one-third of the global market. The tele-medicine technology share of this comes to about 8%, i.e. approximately EUR 5 bn. The growth rate in the last five years of around 5% p.a. was about as high as that of the industry as a whole.

#### **Above-average growth in D2D equipment segment**

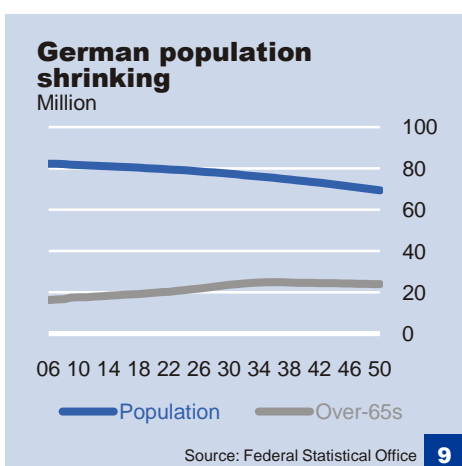
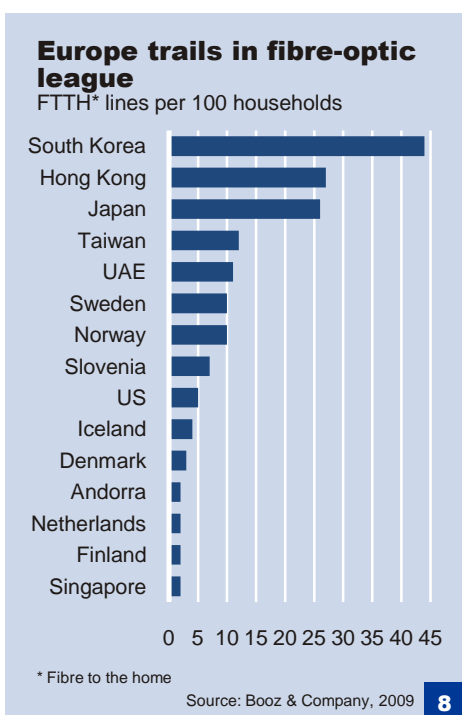
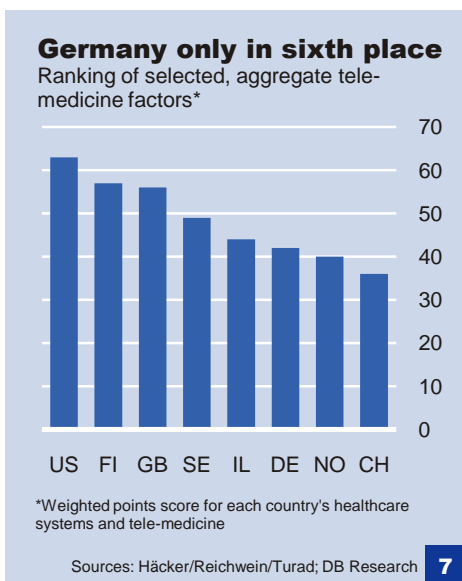
However, the sales growth in the individual segments was very mixed. In the D2D segment the past five years have seen annual sales of ultrasound machines grow by about 8%, of computer tomography equipment by 6% and of nuclear medicine products by 5%. By contrast, sales growth in the D2P segment was much lower – of blood glucose meters, for example, because patients and doctors still preferred traditional methods and the available systems have hitherto remained pilot projects. The picture is similar for tele-medicine-capable machines for recording vital sign parameters; they have probably registered merely below-average increases.

The markets for clearly attributable services cannot be quantified because the data collected to date is still inadequate.

#### **Still predominantly developed in pilot projects**

All in all, the use of tele-medicine in Europe at this moment in time is still largely restricted to pilot projects, and there is a lack of major cross-sector health economic analyses. Many countries still lack a clear strategy for the widescale deployment of tele-medicine.

<sup>10</sup> See Perlit, Uwe (2008). *Mediziner: Chancen durch neue Einnahmefelder*. Deutsche Bank Research. Aktuelle Themen 408. Frankfurt.



## Heavy IT spending on tele-medicine in Scandinavia

Of the eight countries in the world where tele-medicine is used most widely – according to the comprehensive analysis of Häcker et al.<sup>11</sup> – the US occupies top spot, followed by the north European states Finland and Sweden. Germany ranks in sixth place and Switzerland brings up the rear. Germany's performance is primarily attributable to its national health system, which is barely compatible with tele-medicine in many areas on an international comparison. Its doctor density is also high by international standards. It therefore comes as no surprise that a mere 2.5% or so of total IT spending is devoted to healthcare, whereas in Scandinavia, for example the figure is no less than 8.5%. Switzerland intends to employ a variety of measures to improve its tele-medicine system by 2015. These include establishing a network of electronic patient medical records and expanding online services. This is also planned in Germany.

All in all, the markets in Europe are still at very different stages of development. Since there is no data on tele-medicine users for individual European countries it can only be presumed that on account of the differing doctor densities the share of tele-medicine users – relative to the number of patients – is well above 1% in the Scandinavian countries and the US. The ranking shows the great potential of tele-medicine for European countries. This is the reason why the EU is planning a variety of measures – such as the pilot project planned for 2010 – to accelerate the deployment of tele-medicine in individual member states and thereby better meet the objectives of health systems with regard to boosting quality and cost efficiency. The aim of the European Commission is to create a European area for electronic health services. This may, however, take some time to implement since the deployment of tele-medicine and the universal access to EU health services can only be achieved after every country is linked to the broadband network. This is, however, a long way from being guaranteed in every region of Europe.<sup>12</sup>

## 6. Tele-medicine destined for growth

### Environment will change in favour of tele-medicine

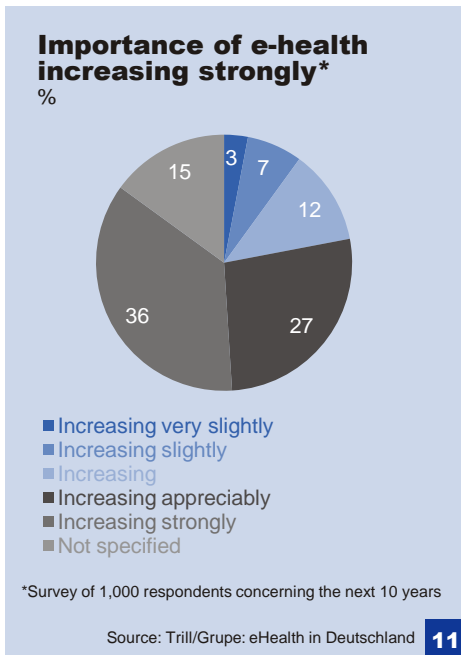
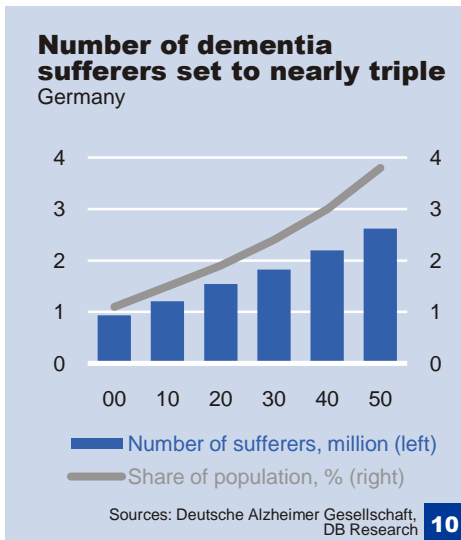
In the coming years the environment for tele-medicine applications is set to improve.

For example, the number of people suffering from chronic ailments will increase worldwide. In Europe alone the number of diabetes sufferers is forecast to rise from around 53 million at present to 64 million by 2025, an increase of roughly 11 million. Diabetics as a proportion of the overall population will rise from nearly 7% to 8%. In North America the number of diabetics could swell from 28 million to 41 million and the diabetes ratio could rise from 8% to almost 10%.

Furthermore, the populations of the industrial nations are ageing and thus the incidence of other age-related illnesses is rising. The UN expects that the number of over-60s in Europe will grow by 1.5%

<sup>11</sup> Häcker, Joachim, Barbara Reichwein and Nicole Turad (2008). Telemedizin. Markt, Strategien, Unternehmensbewertung. Munich. In order to be able to compare healthcare markets they were analysed with regard to their respective national degree of tele-medicine development. The weighted results are presented by the authors using a points system.

<sup>12</sup> See Heng, Stefan (2008). Telecom regulation in the EU facing change of tack. Deutsche Bank Research. Economics 66. Frankfurt am Main.



### Markets mainly opened up by small firms

each year between 2005 and 2025, to 222 million. The overall increase of 59 million is roughly equivalent to the population of the UK.

The future care requirements of elderly people are very closely correlated with population developments. Accordingly, the number of persons requiring long-term care, for example in Germany, will climb from some 2 million at present to 2.5 to 3 million by 2020 and to between 3¼ and 4 million in 2050.<sup>13</sup> At end-2007 around 70% of people requiring long-term care were looked after at home by family and/or ambulatory care services, and the remainder were treated in hospitals or similar institutions.

### Create incentives for general practitioners

To date, however, general practitioners in Germany have not been given any monetary incentives to link up to integrated tele-medicine care networks. In the list of benefits approved by the statutory health insurers the reimbursement for tele-medicine services is either not provided for (inpatient care) or is prohibited (outpatient sector). A first step towards this would probably be the inclusion of tele-medicine in the standard range of care services funded by the statutory health insurers. This would, however, require legislative changes to be made. Although Section 140 of the Social Law Code (Book V) does provide scope and options for shaping integrated patient care, they fall a long way short of enabling greater use of tele-medicine, because the decision is always made on a case-by-case basis and has to be agreed between the patient, the service provider and the health insurer. In addition, the ban on remote treatment frequently takes no account of medical reality – after all, no lab doctors have any personal contact with their patients for example. Occupational law, data protection and medical confidentiality therefore have to be quickly adapted to advances in technology and the realities of everyday medical life.<sup>14</sup>

### Sales expected to grow by 10% per annum

In the coming years tele-medicine may become more important in the EU. Between 2006 and 2020 the market for tele-medicine is set to grow 10% per year to nearly EUR 19 bn, expanding much faster than the e-health segment (excluding tele-medicine +5% p.a. to EUR 34 bn). This increase is however only achievable if the environment for tele-medicine improves significantly, i.e. if tele-medicine is approved for reimbursement by the statutory health insurers. This conclusion chimes with the findings of the above-mentioned survey conducted by the Fachhochschule Flensburg university. Of the tele-medicine companies surveyed by Trill et al. around 40% expect e-health to acquire rapidly increasing importance for their own firm and 40% expect e-health to acquire increasing or significantly increasing influence in general. By contrast, just 10% of respondents expect the influence of e-health for their own company to increase slightly or very slightly.

### Companies should utilise first mover benefits

The trend towards increased utilisation of tele-medicine will help bring success to those companies that dynamically launch

<sup>13</sup> See Blinkert, Baldo and Bernhard Gräf (2009). Deutsche Pflegeversicherung vor massiven Herausforderungen. Deutsche Bank Research. Aktuelle Themen 442. Frankfurt.

<sup>14</sup> See Heng, Stefan and Elisabeth Wieland (2009). E-Health: New medical and nursing options help doctors, health insurers and patients. Deutsche Bank Research, Talking Point. April 6, 2009. Frankfurt.

innovative products onto the market. The opening-up of the market will be driven in the medium term by small, flexible companies that can adapt their products and services to specific customer requirements. At the same time, the big market participants will also become more active in those areas where standardisation is possible. Over recent years the big players have tended to adopt a watching and waiting brief. As market penetration increases, however, there will be consolidation trends between big and small companies.

Uwe Perlitz (+49 69 910-31716)

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