

# In Search of an Appropriate and Well-Accepted Service Model for Telehealth in Germany

Volker, Viktor<sup>#</sup>  
Heiko, Schellhorn<sup>\*</sup>

## **Abstract**

*Introduction:* In Germany, telemedical support for allowing patients with long-term chronic conditions to remain in their homes ('Telehealth') has been in practice for more than ten years in small pilot projects, large clinical trials, and selective reimbursement agreements between providers and payors. However, a standard service model for telehealth has thus far not been established. Therefore, we need to learn more from the experiences of these existing programs to clarify how a telemedical service centre (TSC), as a new type of healthcare partner, should be positioned in order to use resources effectively and to achieve improved patient outcomes. This paper shows which service models for telehealth in Germany are possible and what kind of specific requirements, advantages or disadvantages can be seen for each of those models.

*Methods:* After an extensive literature and internet search, the four basic types of service models for telehealth were extracted and characterized. (a) TSC based at a care management organisation (CMO), (b) TSC based at a hospital, (c) TSC based at primary care physician network, or (d) TSC based at a health insurance company. The appropriateness of each model has been empirically analysed from different stakeholders' perspectives (healthcare providers, payors, patients) using delphi method. Seventeen experts have been surveyed in semi-structured interview and focus-group settings.

*Results:* The "hospital-based TSC" service model is widely seen as the most appropriate one for Germany, whereas two of the alternative models, "CMO-based TSC" and "payor-based TSC", tend to fit better with long-term oriented therapy-management approaches. Telemedical support that is provided and managed directly by the primary-care physicians (c) is considered by most of the interviewees as inappropriate or unrealistic due to resource restrictions. However, it plays an important role for getting telehealth successfully adopted in usual care practice (e.g., for enrolment of patients, data-based consultations).

*Discussion:* There could be several models to let a telemedical service centre become an active partner in healthcare. Depending on the goal-setting of each program, patients at high risk due to their chronic condition seem to be better suited for service models with high involvement of interdisciplinary clinical centres. Patients with less-acute long-term conditions seem to be more suited for service models using a centralised call-centre infrastructure.

---

<sup>#</sup> Consileon Frankfurt GmbH (Düsseldorf, Germany)

<sup>\*</sup> Robert Bosch Healthcare GmbH (Waiblingen, Germany)

## 1. Introduction

Telemedical support for patients with long-term conditions at their home (usually described as ‘Telemonitoring’ or ‘Telehealth’) has gained general interest of several stakeholders in healthcare systems all over the world. The evidence has been surveyed in several systematic literature reviews (see, among others: Pare et al. 2007; Clark et al. 2007; Chaudhry et al. 2007).

In Germany, Telemonitoring has been implemented into practice for more than ten years within smaller pilot projects, larger clinical trials, or selective reimbursement agreements between healthcare providers and payors (see, among others: Morguet et al. 2008; Kielblock et al. 2007.; Zugck et al. 2005).

However, the local scientific community has paid only little attention to the development of standardized service model for telehealth so far. To the author’s best knowledge, the work of Köhler et al. (2006, p. 38-40) makes a sole exception to this statement. They describe three generations of telemonitoring systems that differ not only by the underlying technology but also by the necessary service level, e.g. the involvement of physicians in a telemedical service centre (TSC) and the level of therapeutic decisions they make.

Since the service model mentioned above represents only one part of all telehealth activities in Germany, we need to learn more from the experience that already has been made. This leads to the central question of which way a telemedical service centre (TSC) should be ideally positioned as a new healthcare provider. This paper shows which service models for telehealth in Germany are possible and what kind of specific requirements, advantages or disadvantages can be seen for each of those models.

## 2. Methods

An extensive, but non-systematic literature and internet search has been conducted to identify basic types of organisational service models for telehealth in Germany as groundwork for the subsequent empirical analysis. The authors browsed literature databases like ‘Medline’ and ‘DIMDI SmartSearch’ as well as relevant journals like ‘Telemedicine Journal and e-Health’, ‘Journal of Telemedicine and Telecare’, ‘E-Health-Com’, and ‘Telmedizinführer Deutschland’. Additionally, reference lists of books and monographs has been searched as well as the websites from Germany’s major telehealth providers (SHL Telemedicine, Vitaphone, Almeda, 4sigma, Anycare, Stiftung Chronisch Kranker, IFAT) and organisations (like DGTelemed, ZTG, or VhitG).

The appropriateness of each model has been empirically analysed from different stakeholder’s perspectives (healthcare providers, payors, industry, patients) by applying the delphi method. Herein, 17 experts have been surveyed either in semi-structured interviews or within a focus group. In table 1, the participants who were recruited due to their practical experience with telehealth or high sector knowledge are described by their affiliation and function. All discussions were voice-recorded, transliterated and evaluated by applying qualitative content analysis according to Mayring (2007).

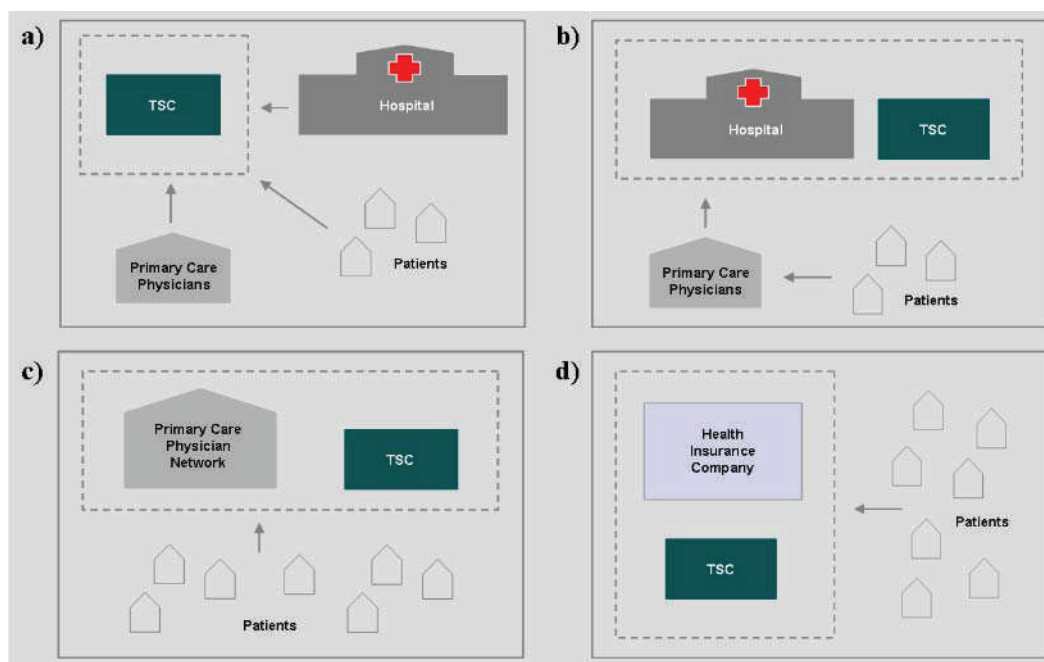
Table 1: Affiliation and function of interview partners (one-to-one and focus group)

<i>Stakeholder Group</i>	<i>Organisational Function</i>
Hospital	Clinical Director, University Hospital
	Senior Physician/ Director, Telemedical Service Center
	Senior Physician, Cardiology
	Project Manager, Telemedicine
Primary Care Physician (Network)	Representative member on behalf of the German Physician Association in the Federal Joint Committee (GBA)/ Director, outpatient clinic
	Manager, Primary Care Physician Network
	Manager, Integrated Delivery Network
Health Insurance Company	Chairman, Statutory Health Insurance (SHI)
	Member of Executive Board, Statutory Health Insurance
	Manager Integrated Care, Statutory Health Insurance
MedTech Industry	Director, Telehealth System Vendor 1
	Director, Telehealth System Vendor 2
	Representative Chairman, Industry Association
Others	Manager, Care Management Organisation
	President, Association for Biomedical Technology
	Organizer of Telehealth Conferences
	Patient, participant telehealth project

### 3. Results

#### 3.1. Basic types of organisational service models for telehealth

After an extensive literature and internet search, we extracted and characterised from the material four basic types of organisational service models for telehealth (illustration 1). Each of these models has been already implemented into practice in Germany.



**Illustration 1: Basic types of organisational service models for telehealth.** a) TSC based at a care management organisation; b) TSC based at a hospital; c) TSC based at a primary care physician network; d) TSC based at a health insurance company.

In model a), the telehealth service emanates from an independent care management organisation (CMO) that is not directly affiliated with other institutional healthcare providers. Hospitals or primary care physicians (PCPs) will refer patients to such a centre when selective reimbursement agreements with payors guarantee them a lump sum for enrolment. Patients may also request the centre's service directly and use out-of-pocket payments for services. The TSC in this model acts mainly as a complementary service provider for other institutional healthcare providers or payors. Its services are dominantly nurse-led and built on a call-centre infrastructure such as those of established Disease Management Programs. It seems to be the dominating organisational service model in Germany at the moment.

In model b), the TSC is based at a hospital. In the event of selective reimbursement agreements for integrated care, patients can be enrolled by their primary care physicians in the telehealth program. In addition, there is a post-acute-care model where patients are enrolled subsequent to their hospital discharge in order to prevent avoidable re-hospitalisations. In some respects, this model provides a direct economic incentive to the hospital by the DRG system, as early re-hospitalisations (usually within 30 days) due to the same diagnosis cannot be reimbursed again.

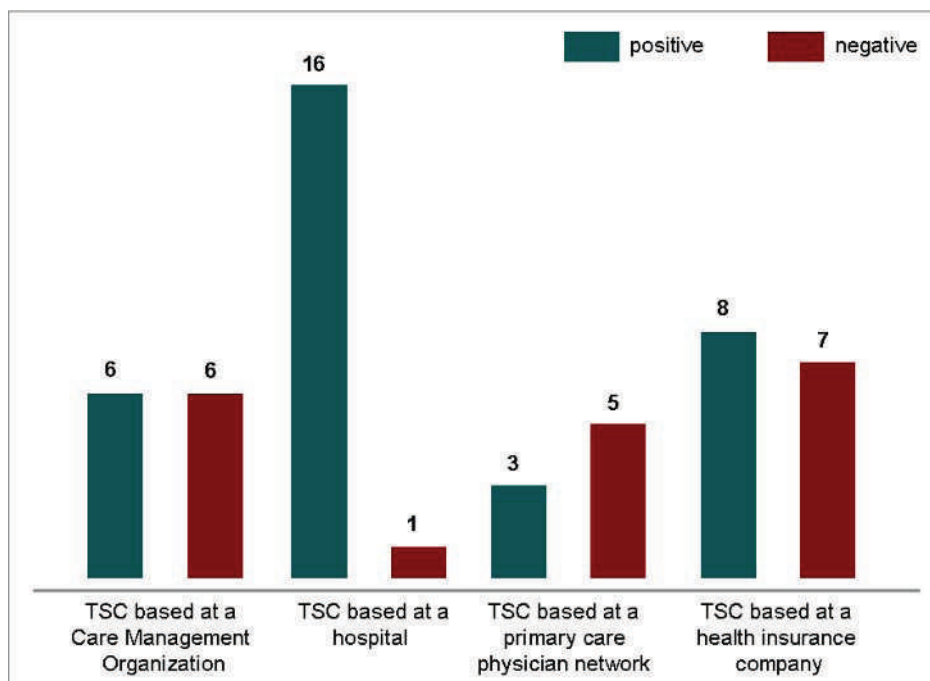
The primary care physicians can also take the lead in telemonitoring services as outlined in model c) rather than limiting themselves to enrolment activities. This could happen within networks where physicians share a service desk for their patients or as a result of innovative monitoring technologies (e.g., mobile alerts from implantable devices to the physician's cell phone). New types of managed care organisations where physicians take over (partial) budget responsibility from the payor might encourage them to do so because they participate in monetary savings from prevented hospitalisations.

With regard to model d), there has been a fundamental shift in Germany's (statutory) health insurance organisations in their role 'from payor to player' over the last decade. Meanwhile, most of them offer a group of services that can influence the course of their members' healthcare such as care management, disease management and health coaching programs. Telehealth programs that focus on educating and motivating patients with long-term chronic conditions in order to improve their self-management competencies offer, in that particular respect, an effective and efficient way for health insurers to contain costs by offering high quality care management.

### **3.2. Positioning of Telemedical Service Centres**

As shown in illustration 2, the hospital-based TSC model (b) is seen as highly appropriate for Germany. All but one of the experts were of a positive opinion towards this model and stated inter alia the following arguments in favour of it: high operational availability of high-qualified staff, interdisciplinary teams with specialised competencies, well accepted institution by patients, standardised workflow procedures and quality management.

There were equivalent opinions, both, in favour and against the CMO-based TSC model (a) which was discussed very controversial in the focus group. On the one hand, this model seems to offer cost advantages, centralised/ more appropriate call-centre infrastructure, and easier relations to payors for contract closings. On the other hand, the experts impute impersonal treatment of patients, a lack of medical expert knowledge, and less confidence by referring physicians to that model.



**Illustration 2: Positive and negative opinions towards differing service models for Telehealth** (absolute number of opinions from, both, members of the focus group and one-to-one interviews).

A telemedical support that is provided and managed directly by the PCPs (c) is considered by most of the experts as inappropriate or unrealistic mainly due to resource restrictions. However, they play a crucial role in getting telehealth successfully adopted in usual care practice, e.g., for enrolment of patients or data-based consultations because of their close and personal relationship to the patients.

With regard to the payor-based TSC model (d), similar advantages were seen as to the CMO-based model. It seems best suited for patients with less-acute long-term conditions with special emphasis on educational and motivational aspects of care management. However, many clinical experts were highly concerned about the trend of health insurance organisations becoming more and more involved in care-management activities.

### 3.3. Further aspects

Most of the experts (6 out of 7) considered a disease-specific division between several service centres as reasonable in order to provide high quality care to patients with complex chronic conditions at high risk. The argument in favour of such a division is, that different chronic conditions also imply different requirements for staff qualification. The more severe a condition is, the more important it is of the role of a specialist.

The service model has to be different for managing patients with less severe conditions at high volume. Here, 7 out of 8 experts stated that a TSC is ideally managed by high qualified nurses than physicians. standardised procedures and the role of highly qualified nurses become crucial, last but not least because of economical reasons.

The relationship between primary care physicians and specialists on the one hand and hospitals on the other hand has been strained since mayor healthcare reforms allow hospitals to provide more and more ambulatory services. According to 6 out of 7 experts this has to be taken into account by implementing telehealth into practice in order to gain acceptance by PCPs.

## 4. Discussion

There could be several models that could facilitate telemedical service centres becoming active partners in healthcare. Depending on the goals of each programme, patients at high risk of their chronic condition seem to be better suited for service models with high involvement of interdisciplinary clinical centres. Patients with less-acute, long-term conditions seem to be more eligible for service models using a centralised call-centre infrastructure. However, the leader in the entire process is the primary care physician and/or the specialist who has overall responsibility for the patient on an outpatient basis.

The results of this work provide beneficial insight in the perceptions and opinions of relevant healthcare stakeholders with regard to an appropriate service model for telehealth in Germany. These should be taken into account by future implementation of telehealth service models into practice. In comparison to other countries, the role of specialists in the ambulatory care sector is crucial to gain general acceptance. This could be the mayor reason that a hospital led TSC model is seen as the most feasible option.

However, the results of this work have to be considered with caution. The opinions of that expert panel might not be fully representative for all healthcare stakeholders in Germany, since they have been selected according to their practical telehealth experience rather than their functional levels.

## Reference list

- Chaudhry SI, Phillips CO, Stewart SS, Riegel B, Mattera JA, Jerant AF, Krumholz HM (2007) Telemonitoring for Patients with Chronic Heart Failure – A Systematic Review. *Journal of Cardiac Failure* 13: 56–62. doi: 10.1016/j.cardfail.2006.09.001
- Kielblock B, Frye C, Kottmair S, Hudler T, Siegmund-Schultze E, Middeke M (2007) Einfluss einer telemedizinisch unterstützten Betreuung auf Gesamtbehandlungskosten und Mortalität bei chronischer Herzinsuffizienz. *Deutsche Medizinische Wochenschrift* 132: 417-22. doi: 10.1055/s-2007-970350
- Köhler F, Nettelau H, Schweizer T, Waller T, Anker SD (2006) The Research Project of the German Federal Ministry of Economics and Technology 'Partnership for the Heart' – A New Approach in Telemedicine. *Dis Manage Health Outcomes* 14 (Suppl 1): 37-41.
- Clark RA, Inglis SC, McAlister FA, Cleland JGF, Stewart S (2007) Telemonitoring or Structured Telephone Support Programmes for Patients with Chronic Heart Failure – Systematic Review and Meta-analysis. *BMJ* 334: 942. doi: 10.1136/bmj.39156.536968.55
- Paré G, Jaana M, Sicotte C (2007) Systematic Review of Home Telemonitoring for Chronic Diseases – The Evidence Base. *J Am Med Inform Assoc* 14: 269-277. doi: 10.1197/jamia.M2270
- Morguet AJ, Kühnelt P, Kallel A, Jaster M, Schultheiss H-P (2008) Impact of Telemedical Care and Monitoring on Morbidity in Mild to Moderate Chronic Heart Failure. *Cardiology* 111: 134-9. doi: 10.1159/000119701
- Mayring, P (2007) *Qualitative Inhaltsanalyse – Grundlagen und Techniken* 9th ed. Beltz Verlag; Weinheim / Basel.
- Zugck C, Nelles M, Frankenstein L, Schultz C, Helms T, Korb H, Katus HA, Remppis A (2005) Telemedizinisches Monitoring bei herzinsuffizienten Patienten *Herzschr Elektrophys* 16:176–182. doi: 10.1007/s00399-005-0476-7