Solimed:
A Case Study

1. Executive summary

In 2004, the Solimed Medical Quality Network Association was founded by 28 practice-based physicians. It now has 146 members. Plans for investment in an EHR developed and in 2007 Solimed-Health Company Ltd (Solimed – Unternehmen Gesundheit GmbH & Co. KG) was founded with 75 members of the Solimed Medical Quality Network Association.

Solimed GmbH invested €700,000 into a common software package to exchange information, and establish pathways to coordinate treatment across disciplines and sectors. The EHR connects outpatient doctors' practices in Solingen with the three Solingen hospitals using a network and exchange automated software. The Solimed EHR is unique within North Rhein-Westfalia as it is applied to the entire treatment process. To manage this, care pathways were established.

The Medical Quality Network Association Solingen agreed on requirements and investigated the solutions available on the market against their requirements. They thus formed an overview of the market and four potential solutions were identified. Following a trial period of six months two out of the four tested solutions were assessed as meeting the needs and requirements of the association. Representatives from these companies were then invited to present their solutions and run system demonstrations. Following the demonstrations, negotiations for a framework contract began. Based on performance in the demonstration and engagement in negotiations the bidders were assessed against the network's requirements and the successful solution was selected: MCS / medatiXX.

The changes to legislation for integrated care contracts in 2000 allowed Solimed to negotiate contracts with health insurance companies directly. Solimed was thus able to shift from a fee-for-service, the norm in Germany, to a budget model (capitation model) with health insurer AOK Rheinland / Hamburg. From 2010 Solimed receives an annual budget from AOK Rheinland / Hamburg to finance the entire range of services for patients insured with AOK and included in the EHR.

Lesson learnt include the value of forming a network of procurers based on trust, the importance of implementing clear operational rules, not being afraid to consult external expertise, the success of local level vs. top-down investment, the need to take risks, focusing on quality rather than money saving and the importance of investing in training.

2. Context

2.1 Health system

The German healthcare system is based on social health insurance, which covers, on a mandatory basis up to a certain level of income, the whole of the population, those on a high income, business owners or freelancers are exempt. The system is financed by three co-existing schemes: statutory health insurance based on salary or wage-based income with equal contributions from employers and employees and free coverage of dependants (spouse and children), private health insurance, and governmental schemes. In 2009, circa 52 million Germans were members of the statutory health insurance. There is no single insurance fund but presently still around 155 public health insurance companies that collect the contributions to the statutory insurances for health and long-term care. They negotiate contracts with health care providers and the Statutory Physician Associations (Kassenärztliche Vereinigungen – KV) at the regional level.[1] In addition, about 50 private health insurance companies operate in the market.[2]

The healthcare system in Germany is highly decentralised, the main decision makers in the social health system are the hospitals' (through the Deutsche Krankenhausgesellschaft), physicians' and dentists' associations on the providers' side and the health insurance companies and their associations on the purchasers' side. Until 2000 the KV for each region had a strong position concluding collective contracts with the health insurance companies on behalf of their members. Since 2000, non-hospital based physicians are able to conclude integrated care contracts directly with sickness funds, and between 2004 and 2008, these selective contracts received financial support.

2.2 Strategic setting

The Solimed Medical Quality Network Association (Solimed Ärztliches Qualitätsnetz Solingen e.V) recognised that there was a coordination issue between doctors' practices and hospitals. For example, there were no standard discharge documents. With an EHR it could be possible to implement a system which creates these discharge documents for the doctor from the information available and in a standardised way. This standardisation, as well as other features of an EHR, would lead to harmonisation and coordination of the care process and prevent loss of information. This is the main motivation behind investing in an EHR and essentially leads to integrated care.

Solimed's goal of coordinated care is mirrored in government policy and changes to legislation which, since 2000, have allowed GPs and office based specialists to enter into integrated care contracts directly with health insurance companies. Previously, the Kassenärztliche Vereinigungen (KV; regional associations of statutory health insurance physicians) concluded contracts on behalf of all office-based doctors for the region that the KV covered. The Solimed group took advantage of this health policy reform to arrange integrated care contracts directly with health insurance company AOK Rheinland / Hamburg.

One of the motivations for investing in an EHR is the realisation that a change was needed to the referral process and rather than this change coming from outside decision makers the doctors of the

[1] See Grosse-Tebbe (2004) Healthcare Systems in Transition, Germany, WHO Europe report, p. 26.
[2] Stroetmann K., Artmann J. and Giest S. 2010. eHealth Strategies Country Brief: Germany.

Solimed network wanted to have control over changes. Their decision to pre-empt a forced change was to create the change independently. The Solimed group also saw the need to protect themselves against health policy developments targeting the single provider such as "the introduction of medical treatment centres/ MVZs, increasing bureaucracy, and the trend towards selective contracting where single providers felt the need to stay on the ball in order to assert themselves in the market."[3]

Another reason is motivated from the position of patient confidentiality. A local solution is preferable for doctors in that the EHR is not based in the nearest large city and on a regional (Bundesland) basis, but is rather at the local level. Local level control protects patient confidentiality and security as the risk of exceptions being made for access rights to outstanding example cases, where the data would be shared to inform other doctors or so that lessons can be gathered, is lower.

3. eHealth investment brief

The overall aim of the EHR is to optimise care of patients through the harmonisation and coordination of processes and the prevention of information loss during the treatment process.

In 2004, the Solimed Medical Quality Network Association was founded by physicians. The association was founded by 28 practice-based physicians and now has 146 members. Plans for investment in an EHR developed and in 2007 Solimed- Health Company Ltd (Solimed – Unternehmen Gesundheit GmbH & Co. KG) was founded to achieve a higher commitment and more efficient structures.

The EHR will connect outpatient doctors' practices in Solingen with the three Solingen hospitals using a network and exchange automated software. Defined, patient-related data such as diagnoses, medications, allergies, warnings and other patient-related information will be exchanged. In addition medical reports will be sent directly to the treating physician. The Solimed EHR is unique within North Rhein-Westfalia as it is applied to the entire treatment process. To manage this, care pathways were established.

The 75 Solimed physicians invested €700,000 into a common software package to exchange information, and establish pathways to coordinate treatment across disciplines and sectors.

Health insurance companies AOK Rheinland/Hamburg and BarmerGEK have acted as partners to the Solimed company and supplied an investment as a boost to progress during the period of change over from the old system to the new.

Changes to legislation allowed Solimed to negotiate contracts with health insurance companies directly rather than through the KV. Solimed was thus able to shift from a fee-for-service, the norm in Germany, to a budget model (capitation model) with health insurer AOK. From 2010 Solimed receives an annual budget from AOK to finance the entire range of services for patients insured with AOK and included in the EHR.

[3] Schang L.K. 2011. Markets, networks and the quest for coordination. The story of Solimed Enterprise Health. *In:* HORSTMAN K., DOW E., PENDERS B. (ed.) *Governance of Health Care Innovation; Excursions into Politics, Science and Citizenship.* Raleigh, NC: Lulu. p.55

4. eHealth investment description

The aims of the Solimed EHR are:

• Improve the quality of medical care
• Develop, test and evaluate the practicality of a decentralised electronic medical record by creating a patient-oriented computing structure that requires little administrative effort
• Reduction / elimination of sectoral boundaries
• Increase efficiency by reducing the information asymmetry based on extensive communication (consultation and information) and avoiding ill-matched treatments, therapies and second examinations.
• Development and implementation of a regional full supply model with the aim to take over the responsibility of the budget for Solimed (virtual budget; capitation model)
• Increased compliance of both the patient and the provider of the computer network through internal agreements on informal Solimed pathways and better integration of the patient. By controlling and evaluating services within the network, high quality care is guaranteed.
• The computer network also offers the possibility to supply on-site research, evaluate the quality of medical care, measure the quality of the process, gain an overview of medical care in everyday practice and collect new structural data on cross-sectoral, interdisciplinary patient care in the region of Solingen.

4.1 Strategic planning

There was no funding available at the time the association was looking to invest in an EHR. The Solimed association searched for a sponsor, at least for the initial trial stages, however none could be found. Health insurance companies AOK Rheinland / Hamburg and BarmerGEK have acted as partners to the Solimed company and supplied an investment to boost progress during implementation. However, the vast majority of the planning and financial investment has been undertaken by Solimed physicians. The total investment from physicians is €700,000 with two years predicted as the timeframe for a return on investment.

4.2 Design stage

4.2.1 Clinical procedures

Requirements were easy to agree on as the doctors joined the association with the same motivations and held similar beliefs. The main requirements were for an EHR which could create discharge documents from new and previously input data and that the solution should be decentralised.

It was also agreed upon, by doctors in the association, that the EHR should allow for medical reports to be sent directly to the treating physician. This directness allows physicians and their clinics to provide more effective treatment based on all available relevant medical information. This means that treatment is tailored to the patient: any incompatibility of drugs can be foreseen, unnecessary duplication of tests avoided, planning improved and documentation readily available so as to shorten or avoid waiting periods. Integration between the three Solingen hospitals should also shorten the length of hospital stay and enable a more efficient booking system for appointments meaning appointments for further treatment can be booked quickly.

The Solimed EHR is unique within North Rhein-Westfalia as it is applied to the entire treatment process; previous approaches were only applied to a narrow spectrum of medical care. Structures and guidelines had to be developed for such a unique and encompassing approach. These structures and rules were first developed to ensure process quality for Solimed care pathways which are based on guidelines from professional societies or the specifications of disease management programmes. These guidelines make the responsibilities of doctors in the practice and the clinic mandatory and define the interfaces between general practitioners, specialists and hospital healthcare providers. In particular the guidelines define the nature and extent of treatment, time frames and commitments for communication. In addition, quality indicators for the medical but also the quality process should be documented and evaluated.

The Solimed care pathways are only successful if they are accepted; therefore they were drawn up by both general practitioners and specialists together. These care pathways were then discussed with all stakeholders and AOK Rheinland / Hamburg defined the technical specifications and content before adoption. The developed care pathways were then introduced and implemented through quality circles for doctors and further education for medical assistants.

4.2.2 Organisational changes

In 2004, the Solimed Medical Quality Network Association was founded by 28 practice-based physicians and now has 146 members. The goal was, and is, a more effective communication and coordination between home and specialty care. Plans for this improvement in communication and coordination centred on an IT solution with the development of standards on communication around the patient. In response to this the association established communication guidelines. The association also set a goal of improving medical quality through developing quality standards.

In 2005, the association constructed a template referral letter for communication between doctors and which would accompany chronically ill patients when they were referred. The letter contained diagnoses, findings, allergies and medication. Association physicians were required to fill out the template and fax it directly to the physician to whom the patient was being referred. Following this the association then developed transition agreements with hospitals which standardised patient admission and discharge in order to facilitate the referral process.

In practice, however, the latter solution was not a viable as it was often required in times of stress where it seemed relatively unimportant. The failure of this initiative led to reflection on grounds for the solution's breakdown and alterations for future improvement. The conclusion was that a software solution which uses the information already in the system to create an automatic referral letter would reduce the burden on doctors in times of stress and be more likely to succeed. Such a solution could also provide an up-to-date information exchange.

In Spring 2007, building upon this realisation, the association began to meet once a week to discuss electronic integration. However, the association was divided on how to proceed, some members wanted an entirely new system for integration across all practices, and others wanted to retain their own software with only additional, small scale integration. After two months of discussion, the association could not agree and so a vote was taken; the idea for an entirely new system won.

Plans for investment in an EHR developed and in 2007 Solimed – Unternehmen Gesundheit GmbH & Co. KG (Solimed- Health Company Ltd) was founded to achieve a stronger commitment and more efficient structures. As a result, a more extensive cooperation was agreed upon.

The company was also set up in order to develop strong internal structures, including a management model, which would enable the company to contract with health insurance companies directly. Previously, the Kassenärztliche Vereinigungen (KVs; regional associations of statutory health insurance physicians) had acted on behalf of their members to form collective contracts with health insurance companies; however a change in legislation allowed single providers to negotiate directly.

Solimed approached the health insurers with a fully developed contract proposal, which was prepared together with a professional project manager. This project manager had helped to build up a similar health enterprise near Landshut, in the region of Oberpfalz, meaning that this previous experience could be learnt from and built upon. Experience has also provided a vital advantage to negotiations with health insurance companies, as Solimed was also able to benefit from the experience of its hospital partners who are practised in developing such contracts. Cross-sectoral experience of both medical and business aspects has aided the success of Solimed.[4]

The Solimed Health Company Ltd is a company which any doctor working in Solingen can join. The only requirements are that they must buy shares in the company and modify their system so that it is compatible with the EHR system. There is also a joining fee, a one time deposit, a one off legal fee to ensure that they are legally considered part of the company and a one off fee for overheads. These fees are considered post remuneration.

The decision making process within Solimed Ltd is in two stages. First, members delegate a task to a small working group with balanced representation of the main stakeholders; the functioning of the working group is defined by process rules such as a deadline for a deliverable. If the deadline is not met a new group can be created. However, if the deliverable is delivered on time the second stage of the decision making process commences and the deliverable is presented to all shareholders of the company. The shareholders meeting is the essential decision making component of the company and so decides whether to implement the deliverable or not.[5]

The forming of Solimed as it is has advantages. One advantage is that all members are equal which allows for a democratic process of problem solving. All members' opinions are included and complaints are heard and responded to. The other advantage of Solimed being comprised of doctors is that members have a similar background and tasks and so have similar needs which means that is easier to identify a common goal. The similarity of professions also means that there is a common vocabulary and an understanding which not only creates solidarity but also provides trust when reaching out to new members. Doctors are necessary for persuading other doctors of the system's value.

Aside from the Solimed company itself, there are also two health insurance companies which have acted as partners in the EHR project; these are AOK Rheinland / Hamburg and BarmerGEK. The

[4] Ibid. p. 50
[5] Ibid. p. 47-48

partnership of these parties with Solimed allows for solid professional and cross-sectoral networking of all stakeholders in the health care sector across the region of Solingen. The aim of this involvement of stakeholders is optimisation of control of the treatment chain for the good of the patient.

In order to effectively run the project and maintain motivation and commitment project goals were defined. A means by which to measure the reaching of these goals was also identified. It became apparent that monetary measures occasionally needed to be applied.

The final step of the planning process was training of staff in the use of the EHR. The training process followed a protocol: at the weekend, when the practice was closed, all employees attended a day long training session at the supplier's headquarters, following this employees returned to the practice for a second day of training on site, after this initial, intensive training the supplier then made an expert available at the practice for further training sessions.

4.2.3 Legal framework

The issue of patient confidentiality is taken seriously by the Solimed team, hence the decision to invest in decentralised storage of patient data. The risk of misuse of data from a central server is higher than a decentralised solution. Also, patient consent is required before their data can be exchanged. The patient also decides who may have access to which data.

One of Solimed's health insurer partners, Barmer GEK, pays doctors for the extra time invested into the adjustment of medication for those patients whose data can be exchanged. The second health insurer partner AOK Rheinland Hamburg reimburses based on a virtual budget (see below for more details). Only those patients insured with these two health insurance companies are included in the EHR.

3.2.4 Economic and financial aspects

There was no funding available at the time the association was looking to invest in an EHR, although public funding for such initiatives had previously been available. In light of the lack of funding Solimed association decided to look for a sponsor after it had identified possible providers, at least for the trial period. However, when a sponsor could not be found the decision was made, on a vote basis, to invest in the EHR themselves. 70% of association members voted in favour of personal investment in an EHR but on the condition that the solution was practically applicable to everyday use. In order to ensure that the selected solution would be practical the trial of the four identified solutions by four different test groups, formed from association members, was undertaken for six months. It was at about this time, in 2007, that Solimed Health Company Ltd was founded.

In terms of doctors investments an initial prediction was given of two years for them to return to a break-even point. However, five years later this point has not yet been reached. The doctors in Solimed have had no financial gain from the system so far. Any return they have had has been put back into the company. However, optimism remains high that the point of financial return on investment will be reached and the belief that the initial outlay has proved worthwhile prevails.

Health insurance companies AOK Rheinland/Hamburg and BarmerGEK have acted as partners to the Solimed company and supplied an investment as a boost to progress during the period of change

over from the old system to the new. The involvement of these partners also allows for a different funding model to be utilised. As outlined earlier, under the new legislation on integrated care, and as Solimed became a limited company, it was in a position to be able to negotiate contracts with health insurance companies directly rather than through the KV. This ability meant that Solimed was able to shift from a fee-for-service, the norm in Germany, to a budget model with health insurer AOK. From 2010 Solimed received a virtual budget calculated on the basis of a number of criteria to finance the entire range of services for patients insured with AOK and included in the EHR. Examples for these criteria were: number and age of patients, type of medication prescribed, and degree of care-dependency[6]. It was agreed that any surplus (difference in costs of Solimed compared to AOK control group) would flow back in equal parts to Solimed and AOK. In the first year of operation, only a small surplus was available, distributed in equal shares to all stakeholders („Gesellschafter").

As this budget model is applied across the Solimed Ltd, it means that all doctors are included as equals and so are more willing to work cooperatively. This means that the doctor with the most appropriate skills treats a patient, rather than previously where a doctor's role was restricted to treatments that reimbursement could be claimed for. In the past there was friction between doctors as to who treated the patient as the reimbursement claims dictated their income this has been neutralised by the budget model based on capitation.

A future distribution model along with more complex criteria is envisaged. A fixed part of the reimbursement will go into hardware and IT related costs, while the other is focusing on the number of treated patients and the active involvement of the network in further development (participation at shareholder meetings) and continuous medical education activities. For the long term, reimbursement according to quality criteria is currently under discussion.

A framework contract for the purchase of the EHR was, and is, perceived as an effective means of budgeting as there is a known, set price for each element including training. This allows for effective resource planning and management. Therefore, a framework contract was set up for the Solimed EHR.

4.2.5 Technical aspects

German GP offices are well equipped with IT, but focus mostly on administrative issues. In order to receive the quarterly reimbursement of costs according to the reimbursement system mandated by the KV, German doctors can use (and most of them do), a standardised interface with the IT infrastructure of the KV, known as KV Net.

This concern for standardised reimbursement processes imposes a number of technical requirements on any GP information system and also had to be taken into account in the Solimed ambitions, which were moving beyond mere administration.

[6] The German equivalent "Pflegestufe" describes the degree to which patients are in need of care to accomplish activities of daily living. Depending on the severity of their limitations, they are grouped in specific "Pflegestufen" which provide different amounts of money.

The KV facilitates this task by certifying vendors of GP information systems who are compliant with the technical requirements of the reimbursement system.[7] The solution ultimately retained for Solimed is equally compliant with the KV Net requirements.

For the more ambitious objectives of Solimed, which would eventually exchange patient data, one of the motivations for investing in a local level system came from confidentiality concerns. Which is why a Trusted Third Party Server (TTP) is used which enables secure storage and retrieval of data.

Old documents also had to be converted to the new system. The means for doing this had to go through a series of revisions.

A decentralised solution was a key requirement for the EHR. This means there is no central server but a data exchange platform is used instead. Access to the EHR by patients or staff is less complicated as no pin is required to be remembered, rather the system is accessed using the health insurance card. The lack of a central server and access by health insurance card have advantages in terms of security as there is no server with a whole patient record which could be accessed fraudulently.

In response to these requirements the EHR network was designed to be able to distribute information. Data distribution is then controlled by a hash code server and administered from there. Doctors define a basic set of data such as diagnoses, medications, allergies and immunisations. Only this record will be replaced automatically. Other important findings, such as ultrasound or ECG findings may be sent manually via an ISDN line rather than the internet. The use of the internet for the EHR solution would be difficult due to security and data protection issues. Only for very large data sets such as X-rays, a VPN tunnel is used.

4.3 Procurement phase

When considering investing in an EHR the Medical Quality Network Association Solingen considered what their requirements would be. Together they agreed on two core requirements for an EHR which were: ability to create discharge documents from data and a decentralised solution. From these agreed requirements the association then began an investigation into solutions available on the market.

This investigation began by surveying other doctors' groups and associations across the country as to their experiences and chosen solutions. The Knappschaft (Miners Association) were a particularly valuable source of information for Solimed being a previously heavily industrial area. This method of surveying helped the association to develop a true picture of the market from a source they could trust and which held the similar values, expectations, and needs: other doctors.

From these investigations four possible solutions were identified:

- Tsystems
- Compu Group
- MCS / medatiXX
- Onlab

[7] A list of certified providers of such services is available through the KVB, the federal association of all regional KVs at http://www.kbv.de/13815.html

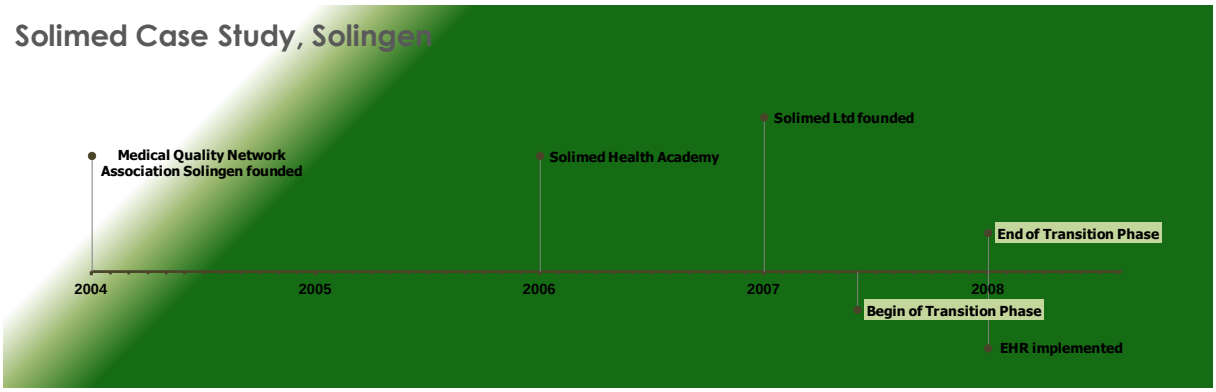
All of the four candidates retained were compliant with the above mentioned reimbursement requirements imposed by the use of the KV Net.

4.4 Implementation and use

In 2007 the transition to the new EHR system began and all practices switched to the same system. Each practice transferred directly from the old system to the new within one day. Although the old system still exists as an archive. The new EHR system is Solimed ISYNET from MCS / medatiXX with the network software comdoxx. The system was implemented and in operation by January 2008. 71 Solimed doctors use the system and the three Solingen hospitals are connected to the network and exchange defined patient-related data such as diagnoses, medications, allergies, warnings and other patient-related information

For an overview of the progression of the Solimed network and EHR please see the figure below:

Figure 1: Solimed timeline



4.5 Monitoring and evaluation

Reimbursement of the doctors in the Solimed network is based on two complex approaches which directly evaluate the clinical outcomes of the integrated solution on patients.

Evaluation has taken place through a virtual network which used a control group of patients showing similar morbidity structures to those in the Solimed system for comparison. The two partner health insurance companies AOK Rheinland / Hamburg and BarmerGEK carried out the analysis. Using identical control groups AOK Rheinland / Hamburg focused on analysis of expenditure and BarmerGEK concentrated on the positive and negative effects on the health levels of patients. Through this a perspective was gained about whether it is worthwhile investing in an EHR.

Solimed members are committed to quality monitoring and evaluation. Quality indicators were introduced in conjunction with the implementation of each care pathway. The indicators reflect the performance of both hospital and ambulatory care.

5. Procurement process

Four solutions were identified as meeting requirements these were then examined and assessed by all members. Upon assessment, workflow was identified as the feature where the difference between the solutions was most observable in terms of meeting the procurer's needs.

Following a trial period of six months two out of the four tested solutions were assessed as meeting the needs and requirements of the association. These were Compu and MCS / medatiXX. Representatives from these companies were then invited to present their solutions and run system demonstrations for the association.

After these demonstrations the association set about negotiating a framework contract with the two remaining suppliers. It was assessed from the demonstrations and negotiations that MCS / medatiXX was the more engaged supplier and responded more effectively to requirements. The opinions of other practices across the country which had implemented solutions from the two contending companies were also taken into account. From these explorations a favoured solution was revealed: MCS / medatiXX.

Reasons for choosing the system lay with users' preferences and opinions. For users the system was required to be intuitive, particularly for those who use a mouse rather than a keyboard. Graphically it should also be pleasing and logical in its layout. The workflow should fit the working patterns of doctors and be suitable for interconnectivity.

Although a solution was chosen there was no obligation on the part of the practices to take on the EHR. It was still the practice's individual choice as to whether to buy into the system or not. However, if the practice wanted to remain a part of the Solimed Ltd then purchase and implementation of the shared system was required. This regulation was to ensure that the Solimed company could develop its internal structures and so allow the company to contract with health insurance companies directly. 60 out of the 75 physicians involved decided to buy new software and become a member of the company. For investment in the software practices had to provide between 7,500 and 20,000€ depending on the number of workstations[8].

The Solimed doctors then approached the three Solingen Hospitals and included them as Partners in Solimed Ltd. This allowed for a relationship of trust to be developed and extended the communication and effective referral system further.

6. Outcomes and lessons

Through the establishment of the network and the EHR Solimed has succeeded in creating an innovative model for integrated care. The key to the project's success is that it is based on trust; all members are equal and played an equal role in designing requirements, selecting vendors, testing solutions and selecting the solution. The governance of the network continues in this vein of equality, although this is particularly easy to deploy and sustain as all members have the same standing i.e. a shared profession, and preserve independence within the unity of the network; they maintain their own practices but agree on principles of exchange.

[8] Ibid.

However, trust alone would not serve for effective project governance. Solimed's other key feature is its clear operational structure. Processes are in place for decision making and management of quality. The regulations for these processes are strictly adhered to with contingency routes already prepared. The Solimed network is also aware of its weaknesses and so is not afraid to defer to hospital management staff or hire professional project managers when necessary.

The shift of power from a top down approach to a provider led approach is also a key feature of the Solimed story. The people who deliver the care are best positioned to be able to decide how the system of care delivery should be altered for better coordination and this is the case for Solimed. The decision to move to concluding integrated care contracts directly with health insurance companies has also shifted the power to providers where they are able to decide between themselves the most efficient care pathways rather than being dictated to by bureaucracy.

The virtual budget agreed with AOK Rheinland / Hamburg (based on a control group of AOK patients outside of Solimed with similar clinical conditions) has also been a success in that it has improved coordination and relations between doctors. This reimbursement model also allows for more transparency on the points in the treatment course of a patient which are more costly. In that sense, the reimbursement model also allowed participating doctors to steer and improve their own treatment. In the past there was friction between doctors as whoever treated the patient could claim the reimbursement. Under the new capitation model for the budget there is no longer such rivalry between doctors, the patient is treated by the most appropriate physician and as efficiently as possible rather than according to reimbursement restrictions. The introduction of electronic communication through the EHR has also served to reduce this friction as coordination of treatment is improved through faster availability of patient information and the introduction of patient pathways; this, in turn, has led to an improvement in the quality and efficiency of care.

The model for procuring and implementing the EHR is a transferrable one and could be applied throughout Germany, so long as the support of a health insurance company is in place. Awareness has been raised about the Solimed initiative through public events and the Solimed Health Academy which aims to inform and educate the people of Solingen in health matters for better prevention of health issues. Other initiatives include Solimed "Health Days" which are organised in collaboration with local health insurance companies.

Many other groups of doctors have shown an interest in how the Solimed company operates and their EHR solution. However, only a group in Remscheid have utilised the model. On the federal level, other groups of doctors are imitating the model, but have a lesser degree of organisational coherence and usually a smaller number of participating patients. This stems from risk aversion and the unwillingness of doctors to invest their own money. It is perceived by many doctors rather as an issue for insurance groups or the KV.

The doctors in Solimed have had no financial gain from the system so far. Any return they have had has been put back into the company. An initial prediction was given of two years for them to return to a break-even point. However, five years later this point has not yet been reached. Yet, optimism remains high that this point will be reached and the belief that the investment has proved

worthwhile is strong. That the coordination of care has improved and patient experience is better are seen as rewards in their own right.

An appropriate team is an important factor for the success of a project. This includes the need for an enthusiastic, charismatic and informed spokesperson to properly convey the message of the project and persuade others to become involved. This builds from the relationship of trust that has been established in Solimed by doctors working with doctors. A shared understanding of the working environment and pressures means that the advantages of an EHR can be convincingly communicated. Although a team comprised solely of physicians does not necessarily guarantee that a project will triumph. The competence of business personnel is also necessary in order for a project to be an economic success. In the case of Solimed business expertise were acquired through the use of a professional project manager with previous experience in such projects and cooperation with hospital management teams.

It was also discovered by Solimed that goals are required in order to maintain motivation. It was also found to be particularly effective when these goals had financial incentives attached as this was seen as a tangible means to measure success.

Technical problems were encountered at the start of implementation and so it was learnt that more training was required in order to overcome these issues. In the beginning it was difficult to gain user acceptance and so regular monthly training sessions were offered as an antidote. However, the training has proved a worthwhile investment as the workflow has changed greatly since the introduction of the EHR.

The drawback to the cross-sectoral cooperation achieved by Solimed is for those doctors outside of the Solimed network. Although any Solingen based doctor is able to join the network not all doctors have. This creates a sense of competition for patients between Solimed and those physicians who have not joined the network. This competitive atmosphere could be increased if, in the future, health insurance companies, such as AOK, advise their customers to consult Solimed doctors rather than doctors outside the network. This exclusion could create discord.[9]

7. Generalisation of lessons

Develop a network of procurers who are at the level at which the improvement in care integration needs to occur. If this network is built on trust and with a governance of equality that is founded on clear operational rules then it is likely to succeed.

A network should also not be afraid to refer to outside experts in areas where knowledge is lacking among network members.

Bureaucracy can be avoided through providers making decisions and providing investment at the local level rather than a top down approach to healthcare management. Providers are best positioned, at the point of delivery, to understand the weaknesses in the coordination of delivery of care and make decisions about solutions.

[9] Ibid. p.54

Risk aversion stems innovation. If responsibility for change is taken at each stage of care delivery and with that a willingness to accept the risks required when implementing something new then the project will be able to achieve its aims.

Procurement should not only be a money saving exercise. Improvement in the quality of service provision is also a worthwhile aim. If a healthcare project is not only orientated towards generating cost savings but has goals of improving patient experience then motivation is more likely to be maintained; money saving as a sole aim can seem a callous objective. However, the combination of the two is often required for tangible measuring of success.

Investment in training produces positive effects on workflow. If staff are trained then they will be more efficient in using a new system. If staff do not accept a system further training is an effective remedy.

8. References

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