



**ICHOM** International Consortium for  
Health Outcomes Measurement

## COLLABORATING FOR VALUE: THE SANTEON HOSPITALS IN THE NETHERLANDS

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**Authors:** Dr. Oluwakemi Okunade<sup>1</sup>, Dr. Jason Arora<sup>1</sup>, Annemarie Haverhals<sup>2</sup>, Leonique Niessen<sup>2</sup>

**Designer:** Matthew Salt<sup>1</sup>

<sup>1</sup>*International Consortium for Health Outcomes Measurement (ICHOM)*

<sup>2</sup>*Santeon*



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Corresponding author: Oluwakemi Okunade, MD, MPH; [o.okunade@ichom.org](mailto:o.okunade@ichom.org)

## SANTEON PROFILE

Santeon is a group of six\* independently-run hospitals within the Netherlands. These are:

- Martini Hospital, Groningen
- OLVG, Amsterdam
- St. Antonius Hospital, Utrecht/Nieuwegein
- Canisius Wilhelmina Hospital, Nijmegen
- Medisch Spectrum Twente, Enschede
- Catharina Hospital, Eindhoven

Santeon employs 26,600 staff and has a physician workforce of 1,580. Together, they are responsible for 13,3% of the national volume of hospital care, providing both secondary and tertiary services. Their combined annual revenue exceeds €2.5 billion.

\*Santeon is currently working towards the formal inclusion of Maasstad Hospital, Rotterdam, as a seventh member of the group.

FIGURE 1 | GEOGRAPHICAL DISTRIBUTION OF SANTEON HOSPITALS

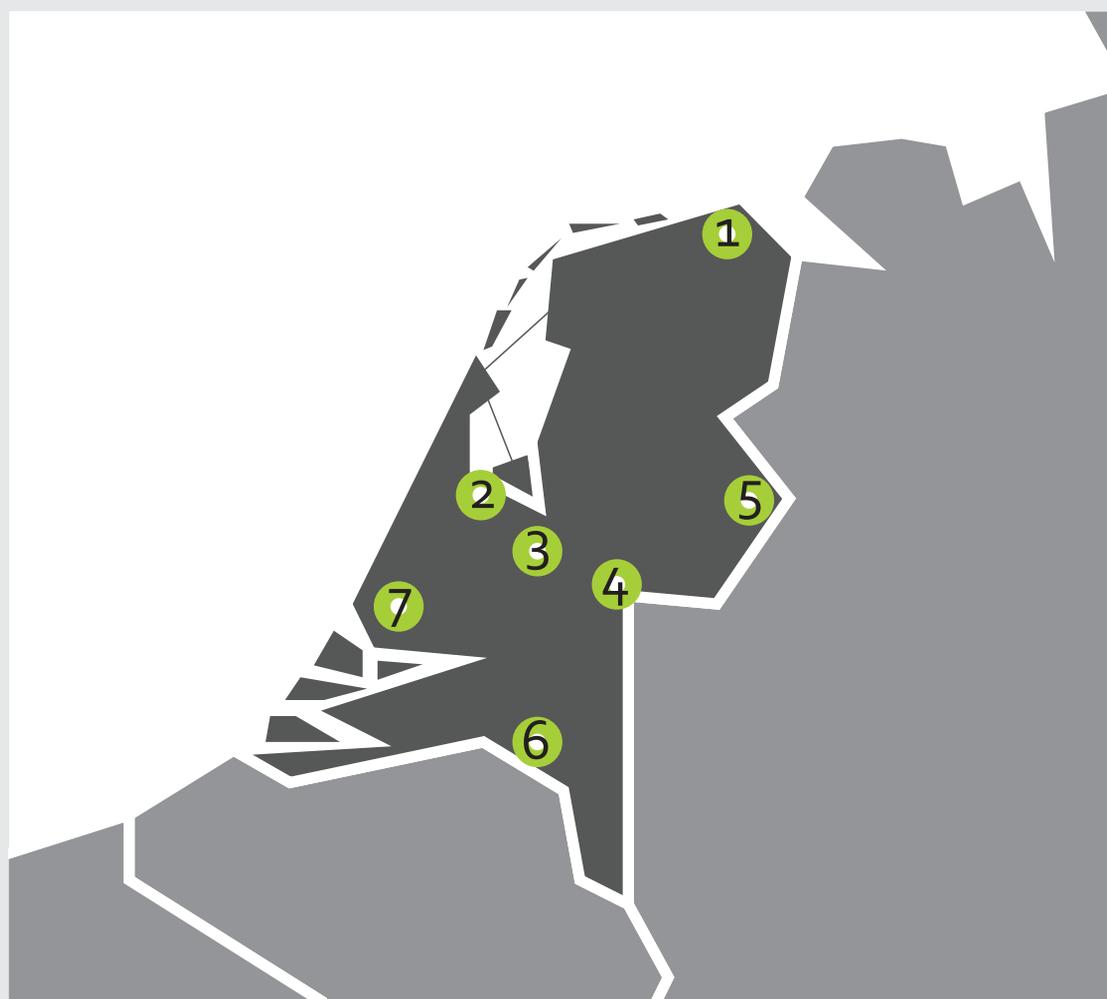


Figure 1: 1. Martini Hospital, Groningen 2. OLVG, Amsterdam 3. St. Antonius Hospital, Utrecht/Nieuwegein 4. Canisius Wilhelmina Hospital, Nijmegen 5. Medisch Spectrum Twente, Enschede 6. Catharina Hospital, Eindhoven 7. Maasstad Hospital, Rotterdam

## BACKGROUND

For any organisation to realise the full benefit of collecting patient outcomes data, the data must be used to drive improvements in patient care. However, this requires ensuring that the data collected is of high quality and is trusted by all parties, including clinicians, to be accurate and true. In an alliance comprising independently-run hospitals, creating an atmosphere in which healthcare professionals are able to openly discuss outcomes data with each other and their patients can be a challenge. Santeon has successfully overcome these hurdles and created a value-based healthcare (VBHC) programme driven by insights from their outcomes data. This programme has led to improvements in patient care both at the individual hospital level as well as organisation-wide.

This case study describes the VBHC programme at Santeon and how it is evolving from a system using retrospective data to support clinical and management decisions into one that uses contemporaneous data to drive continuous quality improvement cycles.

## ESTABLISHING SANTEON

**“We strongly believe that one can innovate better and faster together rather than alone.”**

Leonique Niessen  
Director, Santeon

In 2007, six hospitals decided to form an alliance that would enable close collaboration around patient care and quality improvement initiatives. With six member hospitals, they were large enough a group to leverage their combined expertise and scale in many areas, yet nimble enough to innovate and implement new ideas quickly. The group formalised their alliance in 2010 by signing agreements to collaborate under the umbrella organisation named Santeon. Although they continue to operate as independent hospitals with separate governance structures, the formal relationship holds them accountable to each other. As a result, the Santeon hospitals are able to collaborate on more extensive projects such as a joint formulary known as Farmadatabase, and joint value-based contracts with insurers. **Figure 1** depicts the approximate geographic distribution of the Santeon hospitals and provides a brief profile.

Santeon’s board comprises chief executives of the individual six member hospitals. This representation from each hospital ensures that they all have an equal voice in the decisions that are made. All proposals made to the board are discussed and ratified by each member hospital before being accepted for Santeon-wide adoption.

## OUTCOMES MEASUREMENT AND VALUE-BASED HEALTHCARE AT SANTEON

Santeon’s VBHC initiative was launched in 2012. At that time, the number of performance indicators that hospitals in the Netherlands were mandated to report to external bodies such as governmental institutions, regulatory bodies and health insurers had grown rapidly. This was largely driven by a nationwide desire for increased transparency in healthcare. The country’s annual expenditure to support the collection and administration of this data stood at €80 million. Yet, the data comprised mainly process and structural measures, which did not provide information on what outcomes patients were experiencing.

Around the same time, Santeon was considering a major reorganisation of services, including the concentration of complex oncological procedures in a single centre. However, without relevant outcomes data it was difficult to decide how and where services could be combined.

## SANTEON'S VBHC PROGRAMME

Santeon's VBHC programme consists of two parts:

- Care for Outcome
- Care for Improvement

### CARE FOR OUTCOME

Care for Outcome, the first half of Santeon's VBHC programme, was developed in response to the organisation's desire to identify indicators that reflect the results of care they are providing to their patients. Since there were no nationally or internationally agreed-upon outcome sets available at the time, Santeon developed their own list of condition-specific outcome indicators, starting with lung and prostate cancer.

In this programme, a central data team retrospectively collects outcomes data from patient records in all member hospitals dating back up to 6 years. After adjustment for case-mix, outcomes are compared in search of variation. The analysis is led by the central data team with input from the lead clinicians within lung and prostate cancer care at member hospitals. Based on the insights gained from this programme, Santeon has been able to improve patient care in a number of ways, as illustrated below.

#### 1. More expensive tests are not always better

*Evidence that demonstrates equal outcomes for different treatment approaches can lead to more efficient use of resources and treatment choices associated with less risk for patients.*

Franz Schramel, a pulmonologist with a special interest in lung cancer care, has worked with data from Care for Outcome to drive improvements for early stage non-small cell lung cancer patients:

It is routine practice that these patients are monitored over several years with regular scans as the cancer may recur. Within Santeon, there is variation in practice, with some clinicians preferring plain chest radiographs, while others prefer Computer Tomography (CT) scans. CT scans provide better resolution and are able to detect much smaller lesions. However, this comes at the price of increased radiation exposure and an increased risk of false positives, which can lead to unnecessary additional procedures like biopsies or even surgery. CT scans are also more costly.

When patient outcomes between the two modalities were compared, there was no difference in overall survival or disease-free survival. This suggested that the increased radiation exposure and cost associated with CT scans may not always be justified. Dr Schramel's team is working on validating these findings in a prospective study before recommending a change in policy across Santeon hospitals.

## 2. Improving outcomes for prostate cancer patients by concentrating care

*Understanding variations in outcomes across the organisation helps identify opportunities for clinicians to learn from each other. This can also support decisions on re-structuring service lines.*

**“The concentration of procedures is not a goal in itself, the improvement in outcomes is the goal.”**

Jean Paul van Basten  
Urologist

Jean Paul van Basten, a urologist with a special interest in prostate cancer, tells the story of how two Santeon hospitals, Catharina Hospital and Canisius Wilhelmina Hospital, combined their radical prostatectomy procedures at a single centre:

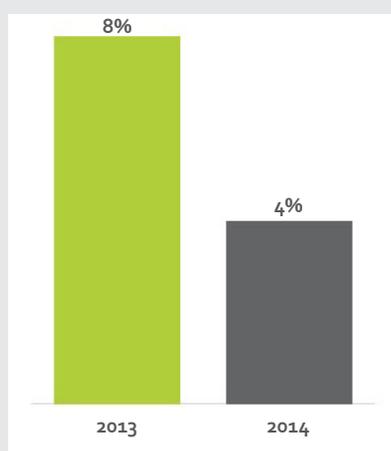
The data suggested that patients undergoing radical prostatectomies at Catharina Hospital, where urologists were using a conservative technique, were experiencing worse outcomes than their counterparts at Canisius Wilhelmina Hospital, where a robot-assisted technique was in use. The team at Catharina Hospital considered purchasing a robot. However, they were performing a relatively low volume of 40 prostatectomies a year, in contrast to the 150 performed annually at Canisius Wilhelmina. The purchase was therefore deemed a poor investment. Instead, they partnered with Canisius Wilhelmina Hospital, which was 40 miles away, to share access to the surgical robot.

Merging the two units was a significant undertaking. It involved streamlining patient pathways to minimise inconvenience caused to patients and reconfiguring the operating room at Canisius Wilhelmina Hospital to accommodate the increased volume. The surgeons at Catharina Hospital are responsible for both the pre-operative and intra-operative care of their patients. The immediate post-operative care is carried out by the local team at Canisius Wilhelmina Hospital. Following the merging of the two units, urologists from both hospitals started to openly discuss their outcomes with each other. They also began to share ideas around what the best surgical technique was and learned from one another by observing each other operate.

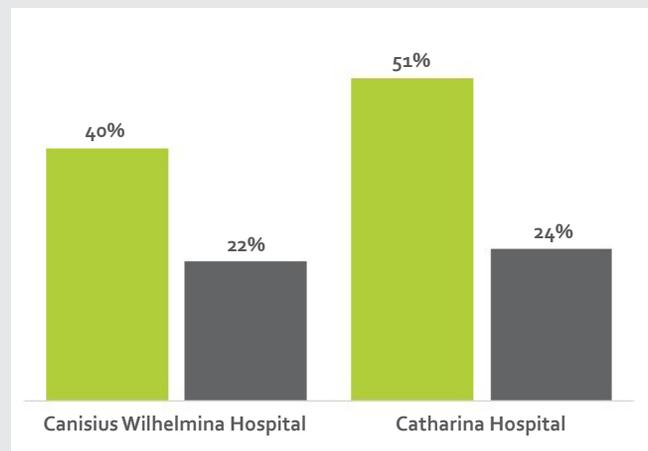
The combined post-operative complication rate for surgeons from both hospitals halved from 8% to 4% within a year. For urologists from Canisius Wilhelmina Hospital, the positive surgical margin rate dropped from 40% to 22%, and from 51% to 24% for urologists from Catharina Hospital. These improvements are highlighted in **Figure 2**.

**FIGURE 2 | IMPACT OF MERGING PROSTATECTOMIES FROM CATHARINA HOSPITAL AND CANISIUS WILHELMINA HOSPITAL INTO ONE CENTRE**

**FIGURE 2A**



**FIGURE 2B**



**Figure 2A:** Combined reduction in surgical complications after prostatectomy (Clavien > 2) for urologists from Canisius Wilhelmina Hospital and Catharina Hospital.

**Figure 2B:** Reduction in positive surgical margins one year after prostatectomy.

### 3. A predictive tool to guide on the appropriateness of surgery for prostate cancer patients

*Understanding how different approaches to care impact survival in patients makes it possible to develop a predictive model that improves shared decision making between clinicians and patients.*

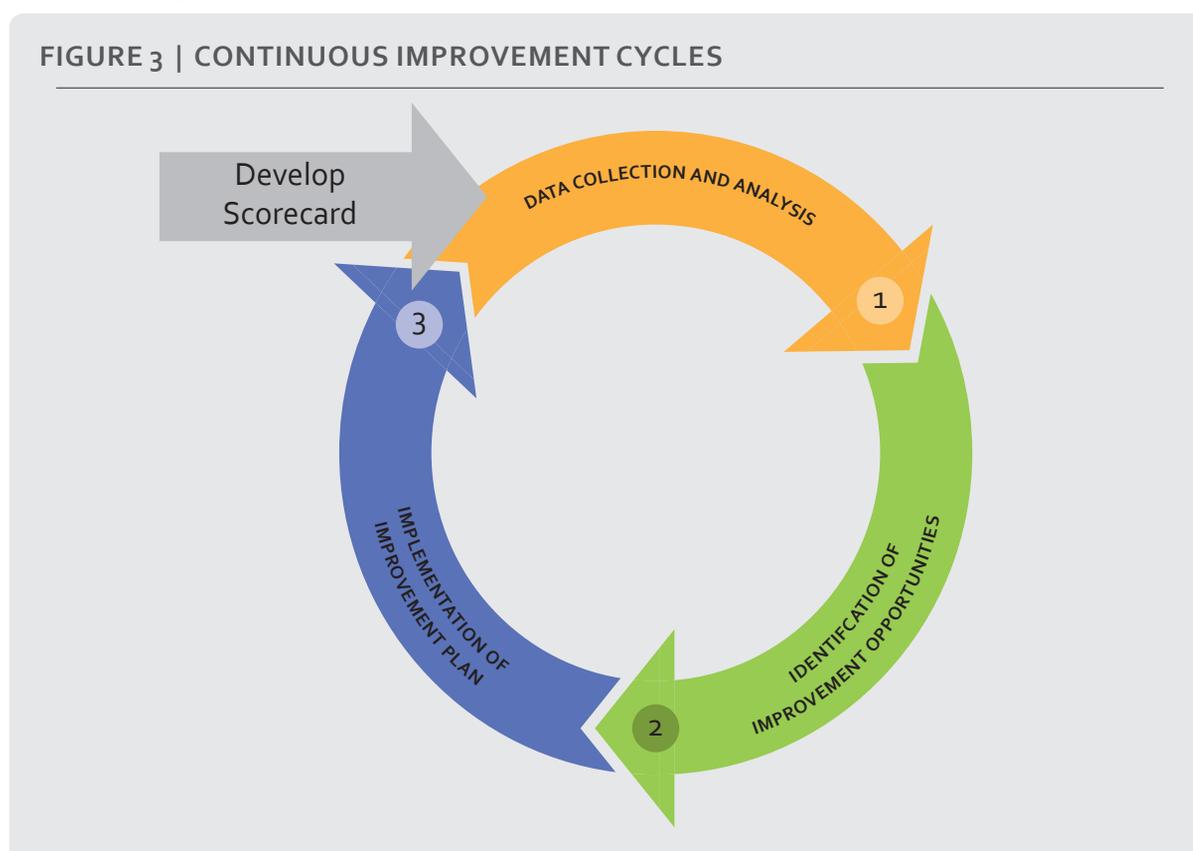
Using data on outcomes, the prostate cancer team developed a decision aid to help determine whether certain patients should be offered a radical prostatectomy or not. The team noticed that some older patients undergoing radical prostatectomy had lower survival rates than expected. When they evaluated these differences in more detail, they realised that the data enabled them to predict which patients were likely to have poor survival based on age, tumour aggressiveness and co-morbidities. Using this data, they built a predictive model that enables doctors to provide accurate information on likely outcomes, which in turn empowers patients to participate in decisions about their healthcare.

#### CARE FOR IMPROVEMENT

The Care for Improvement programme, which was launched in March 2016, builds on the Care for Outcome programme. As clinicians started to realise the power of measuring outcomes and the positive impact it was having on their practice, they were keen to use the data to evaluate outcomes of care on an ongoing basis. The Care for Improvement programme provides a structure that promotes the systematic evaluation of outcomes data by multidisciplinary teams.

#### Santeon's Quality Improvement cycle

The improvement cycles at Santeon run over a six-month period, split equally between data collection and analysis, identification of improvement opportunities, and the implementation of improvement projects. Each of these phases flows into the next (see Figure 3).



There are several components of Santeon's improvement cycles that are vital to their success, as described below:

### 1. The improvement teams

*Regular meetings between multidisciplinary implementation teams that assess the full cycle of care allow for systematic evaluation of outcomes across all hospitals and facilitate the sharing of ideas to drive improvement.*

A significant distinction between Care for Improvement and Care for Outcome is the condition-specific multidisciplinary teams that are set up at the beginning of each improvement cycle in every hospital. These teams, also known as improvement teams, bring together the project leader, the data analyst, patient representatives, physicians and other healthcare professionals involved in the delivery of care for a given medical condition. For example, clinicians on the breast cancer improvement team include breast surgeons, nurses, pathologists, oncologists, radiologists, plastic surgeons, nurse practitioners, pharmacists and radiotherapists.

The improvement teams meet every two months at key points in the improvement cycle. Here, interesting and clinically significant differences in outcomes are identified and hypotheses generated for possible explanations. For differences in outcomes that cannot be explained using the data on the scorecards, the improvement team asks the data team to investigate further using data from the hospital's clinical and administrative records.

The improvement teams work autonomously and decide which of the identified areas represent the biggest opportunities. They then appoint sub-teams to work on these. There are usually no more than two improvement projects running per condition in a hospital.

Representatives from the hospital improvement teams meet regularly with their counterparts from partner hospitals to discuss their outcomes and share ideas about underlying causes and ways to improve. Which representatives attend each meeting is determined by the relevance of their skills and experience to the outcomes that are to be discussed. The regular meetings between multidisciplinary teams permit the evaluation of the full cycle of care, from diagnosis to discharge, and encourage dialogue between team members who would otherwise not communicate with each other as part of their usual workflow.

### 2. Patient representation on improvement teams

*Patient-centred aspects of care are highlighted through patient representation on improvement teams.*

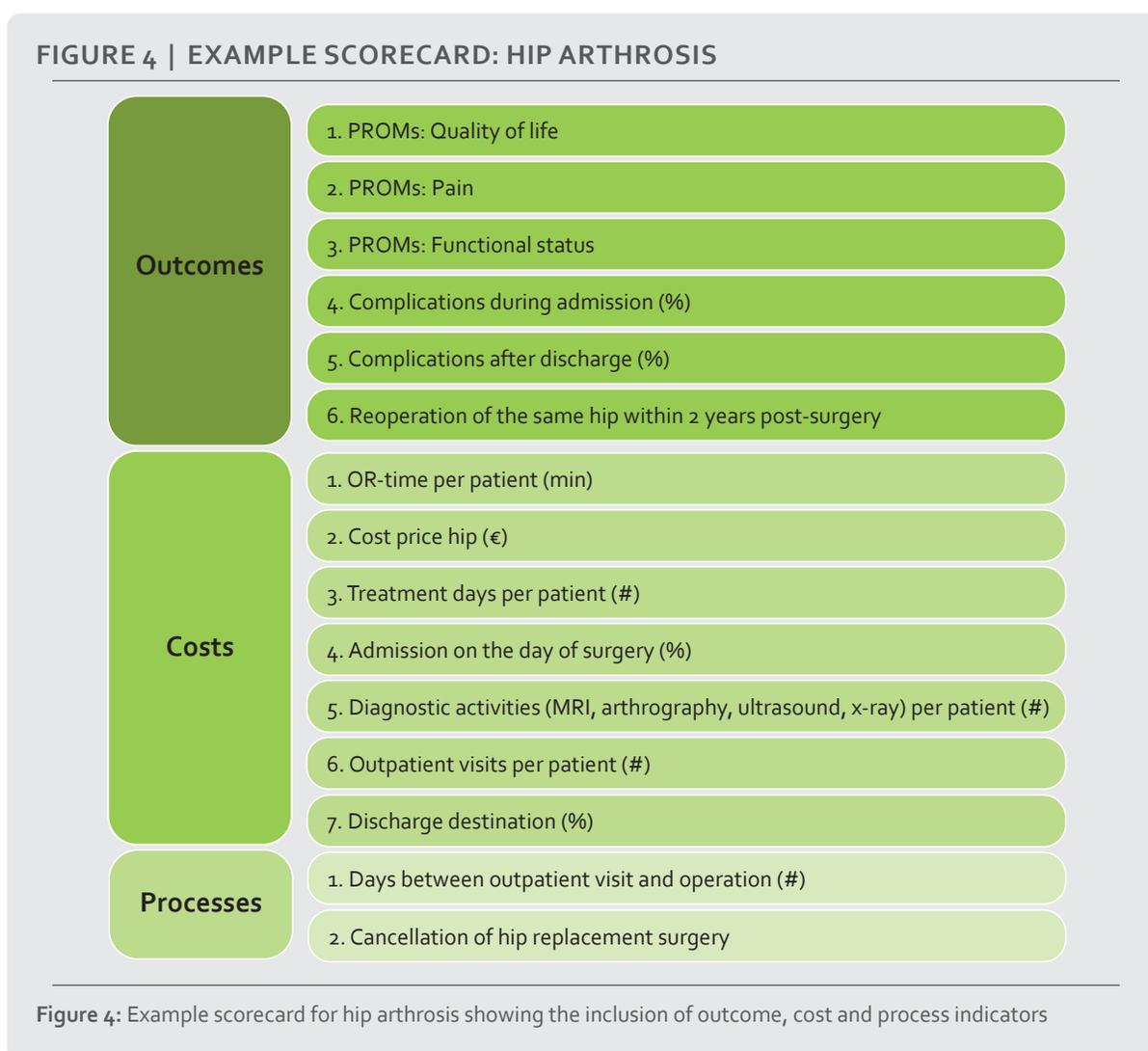
There are one to two patient representatives on every improvement team. Improvement teams place a significant emphasis on patient input, and this impacts the measures that are tracked. For example, in breast cancer care, insurers require that treatment is initiated within five weeks of diagnosis. However, patients indicated that the uncertainty around the treatment modality was more troubling than the wait for treatment itself. Consequently, Santeon now monitors how quickly patients are informed of their treatment plan.

### 3. The scorecard

*Scorecards should be kept simple. The indicators included should be readily available in the hospital's data system.*

After the improvement teams have been established, data managers work together with project leaders and clinician leads to develop a condition-specific scorecard with suitable indicators for the planned improvement cycle. An example scorecard is shown in **Figure 4**. Before this is adopted across the organisation, the proposed indicators are reviewed by the relevant improvement teams from all six hospitals. The final scorecard is a combination of outcome, cost and process indicators.

The outcome indicators in Santeon's scorecards are adapted from ICHOM Standard Sets. Emphasis is placed on ensuring that the scorecards can be completed using data that is already routinely collected at Santeon to minimise barriers. Therefore, in instances where the outcomes recommended by ICHOM are not already routinely collected by Santeon, proxy measures are used. Santeon has adopted this approach because the scorecards are intended to facilitate internal comparisons, not comparisons with external organisations. Analysis is conducted on both outcomes and cost data. Process measures, whilst proxies, provide Santeon with additional insight into potential upstream levers for modifying both outcomes and costs.



**“Our approach has its limitations, but our focus is to identify differences between hospitals. If the data serves that purpose, then it is good enough for our analyses.”**

Annemarie Haverhals  
Leader of Santeon’s  
value-based healthcare  
programme

#### 4. Data collection, cleaning and validation

Once the indicators for the scorecard have been agreed upon, the data analysts extract the relevant data from the hospital EMRs. As there is presently no central EMR within Santeon, data analysts meet with data managers on a weekly basis to discuss issues around data collection and to define what specific codes within the different EMRs are to be included on the scorecard. This ensures that the data used in the analysis is harmonious.

Each data analyst is placed at a specific hospital and does not rotate through other hospitals. This helps them develop a deep understanding of the local informatics infrastructure and establish relationships with the hospital project team.

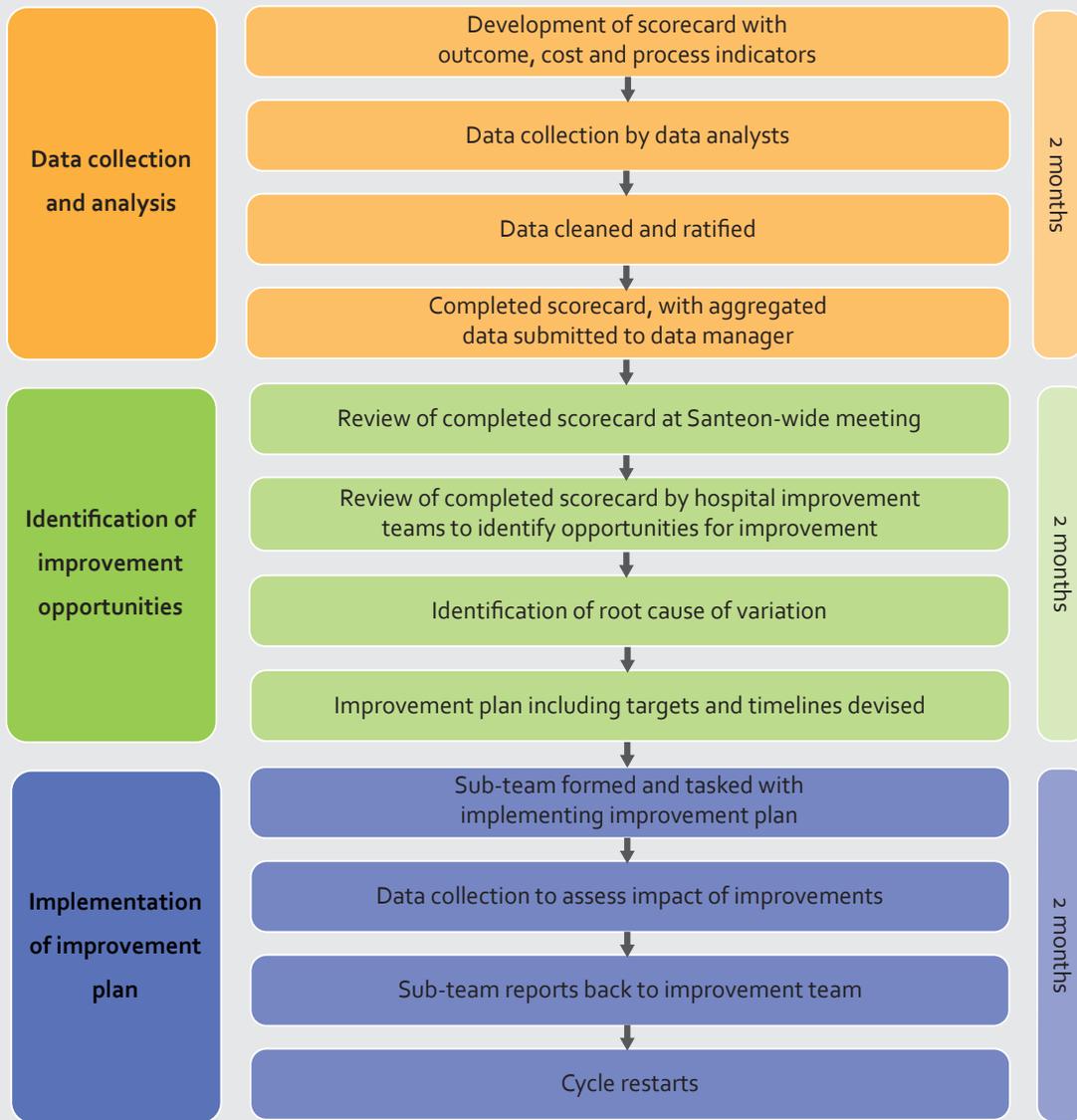
After the data has been collected and cleaned (i.e. any incorrect, incomplete or duplicate entries in the dataset rectified), it is validated by the lead physician on the project team before it is submitted to the central data manager in aggregate format. As the data cleaning and validation is performed locally at individual hospitals, potential disputes about the validity of the data during Santeon-wide meetings are avoided. The central data manager performs simple checks such as ensuring that the sub-domains add up to the main domain.

#### 5. A pragmatic approach to analysing data

Within the Care for Outcome programme, there is a strong emphasis on performing multiple checks and risk adjustments on the data. The primary aim of the analysis in Care for Improvement is to identify differences in outcomes across the organisation for internal discussion. To maximise analytical efficiency from a resource perspective, case-mix adjustment on outcomes data is not performed prior to meetings. The data is evaluated in more detail only if interesting or unexpected variations are uncovered. When further evaluation of the data is warranted, Santeon takes a structured approach, looking for four possible causes:

1. Data quality – Could the variation have been caused by differences in data registration, collection or validation between the hospitals?
2. Patient mix – Is the variation a reflection of different patient baseline characteristics?
3. Treatment decision – Is the variation due to differences in treatment choices?
4. Treatment execution – Is the variation due to differences in treatment protocols or differences in the way in which treatment plans are executed?

**FIGURE 5 | KEY STAGES IN THE IMPROVEMENT CYCLE**



**Figure 5:** Each stage of the improvement cycle is characterised by key steps as shown in the figure above

## Impact of the Care for Improvement programme

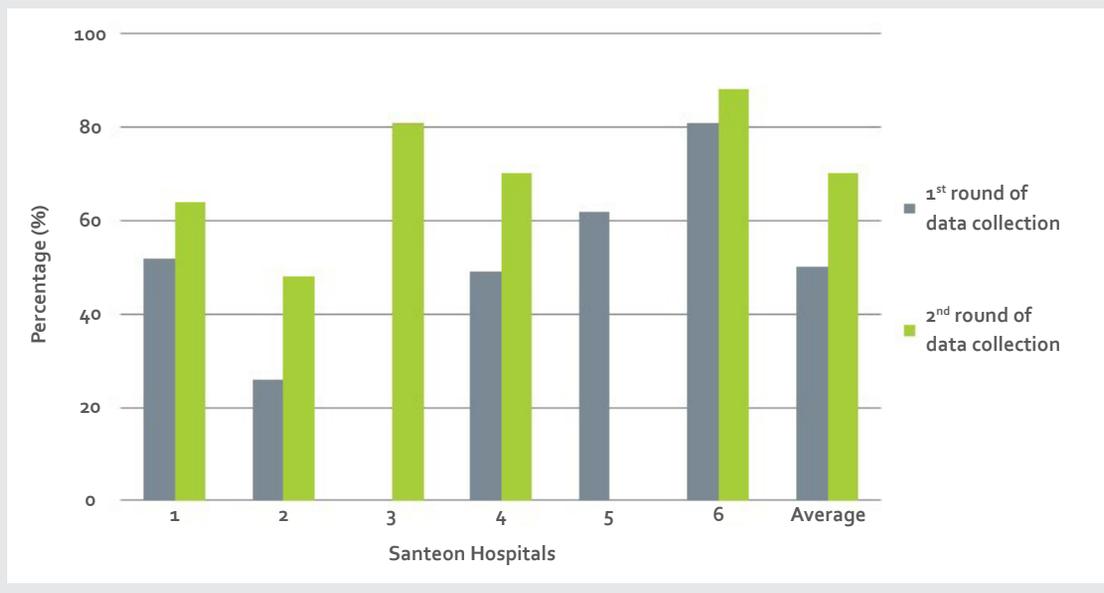
**“The mere measuring of outcomes can in some cases lead to improvements without major system changes, as it is like holding up a mirror for clinicians to see their own work.”**

Annemarie Haverhals  
Leader of Santeon’s  
value-based healthcare  
programme

The first scorecard comparison for breast cancer care in July 2016 revealed that the hospitals were not performing as well as anticipated on one of the cost indicators which Santeon monitors alongside outcomes to make a judgement on overall value delivered. The percentage of breast cancer patients scheduled for outpatient lumpectomy that went home on the day of their operation varied tremendously between the hospitals and was, on average, significantly below the expected 85%. Two Santeon hospitals decided to make this a focus for their improvement teams. After investigating, it became apparent that the high rate of overnight admissions was driven by the expectations of patients and nurses, who had been informed that patients would be admitted overnight and would be discharged on the same day only under specific circumstances. The problem was addressed by revising patient information leaflets to reflect the new practice and providing updated instructions to nursing staff. The subsequent improvement cycle showed significant improvements (see **Figure 6**).

Two other hospitals also showed significant improvements in this indicator despite not formally investigating the underlying causes. Annemarie Haverhals thinks this is most likely because making the data transparent had encouraged all those involved to review their practice.

**FIGURE 6 | IMPROVEMENT IN THE RATE OF OVERNIGHT ADMISSIONS FOR SANTEON HOSPITALS AFTER ONE IMPROVEMENT CYCLE**



**Figure 6:** Each of the hospitals demonstrated improvement in their overnight admissions rate after the data was made transparent, whether or not the issue of overnight admissions was formally investigated by the hospital's improvement team.

## OVERCOMING THE HURDLES AND CHALLENGES TO IMPLEMENTING VALUE-BASED HEALTHCARE

### 1. Aligning staff incentives with VBHC

*To ensure that all staff are committed to the organisation's VBHC agenda, the incentive structure must encourage a focus on patient outcomes rather than volume.*

All staff presented with the opportunities for improvement offered by outcomes measurement are keen to make changes. However, there are some organisational barriers that pose challenges. Many of those whose input into the programme is essential have commitments and responsibilities outside of the VBHC programme that compete for their time.

In other instances, staff incentives conflict with the aims of the VBHC programme. For example, for many clinicians, remuneration depends on volume of work carried out rather than outcomes achieved. The tension that is created because of this can only be resolved if within the organisation, outcomes are prioritised over volume.

### 2. Tools for mutual accountability within an organisation

*Formal agreements between the hospitals help maintain mutual accountability.*

There is a formal agreement which ties the hospitals together and acts as strong impetus to work together. Although this agreement is not limited to the VBHC programme, it ensures that there is a clear understanding between the hospitals about the following: there is to be open sharing of their data internally but restricted access to this data for organisations outside of Santeon.

## VALUE-BASED REIMBURSEMENT

*Entering a value-based reimbursement contract represents a shift in practice. By starting with a small fraction of the total reimbursement, healthcare organisations can implement value-based contracts in a stepwise manner.*

In 2014, Santeon approached a number of insurance companies with proposals for value-based contracts. While the idea of value-based contracts was not entirely new in Santeon – Catharina Hospital and St Antonius Hospital already had value-based reimbursement contracts in place – the idea of entering a joint contract was novel.

Breast cancer was selected as the first condition to include in the contracts for two reasons: clinicians in breast cancer care had already been collaborating on several quality improvement projects, and the breast cancer teams were very supportive of the idea and saw the contracts as an endorsement of their efforts to improve patient care.

Despite the broad support for this approach, there was initially some disagreement around the level of risk the organisation was taking on and the indicators to include in the contract. These disagreements were eventually resolved through internal discussions.

**“Even though people are very enthusiastic and they want to change, they have limited time to spend on this because they have a very high workload. This is something which we have to address.”**

Samyra Keus  
Project Leader

**“Hospitals, especially the doctors, need to trust each other in order to be open about data.”**

Lea Dijkman  
Methodologist

**“For the first time, a group of hospitals is being rewarded for working together.”**

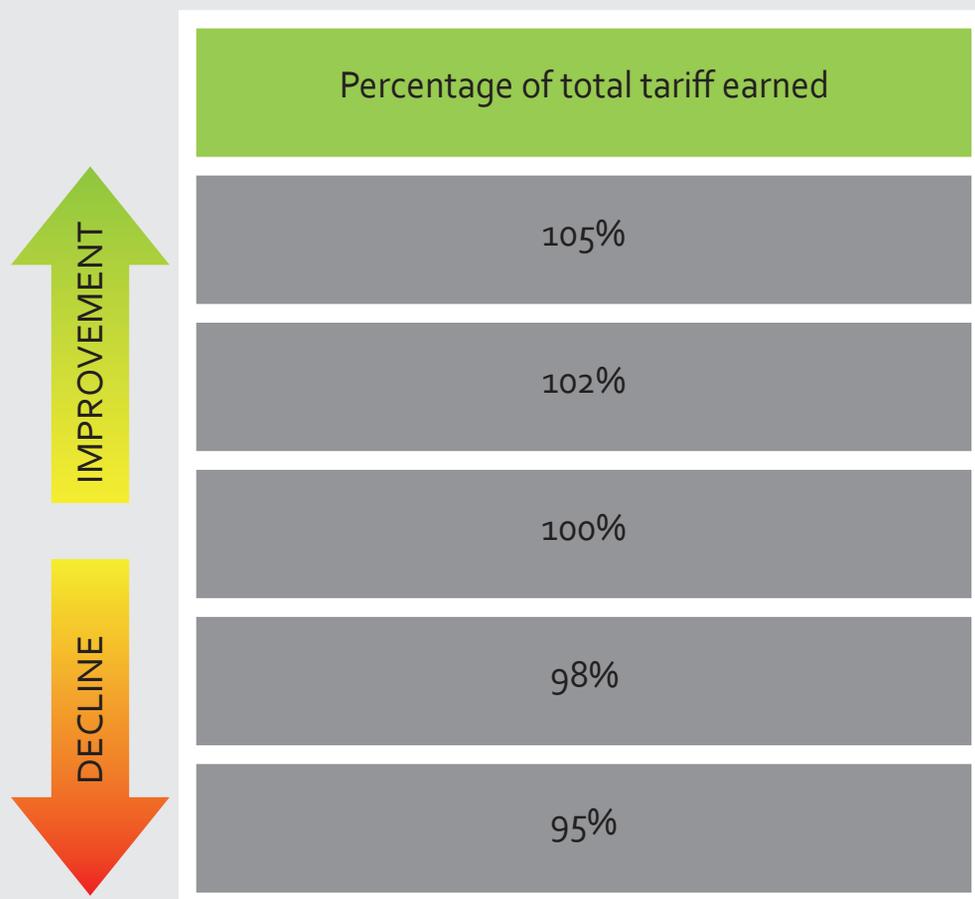
Joost Zuidema  
Head of Sales, St. Antonius  
Hospital

In December 2016, Santeon signed three value-based reimbursement contracts with three different insurers: CZ, Multizorg and Menzis. In the model agreed with Menzis, hospitals within Santeon earn between 95% and 105% of the tariff depending on performance, as illustrated in **Figure 7**. They are paid a bonus if their performance improves compared to the previous year. Hospitals miss out on the bonus payment if there is a decline in performance, although there are no penalties. If a hospital maintains its performance compared to the previous year, they receive a proportion of the total available bonus. The top performer within the group continues to earn a bonus if they can maintain their leading position. The contracts with CZ and Multizorg are based on similar principles.

From Santeon’s perspective, these contracts serve two important purposes:

- They present an incentive for them to continue striving towards improving patient outcomes as their reimbursement is hinged to their performance.
- They strengthen the level of accountability that hospitals have towards each other.

**FIGURE 7 | VALUE-BASED REIMBURSEMENT MODEL FOR SANTEON’S CONTRACT WITH MENZIS**



**Figure 7:** A stepwise increase or decline in proportion of total tariff earned based on the hospital’s performance compared to the previous year.

## NEXT STEPS

In the future, Santeon hopes to be able to collect data on patients after they have been discharged from hospital. For some conditions, such as stroke, this would provide additional valuable insight into the long-term outcomes that interventions in hospital are contributing to. Being able to collect outcomes data for patients after discharge requires that Santeon builds relationships with providers in the community, including primary care physicians. They would also need to improve their capacity to collect patient-reported outcomes after discharge.

The specialities currently involved in the VBHC programme are: breast cancer, prostate cancer, lung cancer, hip arthrosis and stroke. Based on the success they have experienced so far, Santeon is keen to extend the VBHC programmes across more conditions within the organisation. The success achieved in Care for Outcome and Care for Improvement serves as proof of concept.

**“With a lot of the things we are doing now, we are limited by the borders of the hospital. For a lot of patient groups, you need data from outside the hospital or before they get to the hospital. That is a real potential for growth in the future”**

Samyra Keus  
Project Leader

## KEY LESSONS

### 1. Start with the data you have

When initiating a VBHC programme, it is essential to start with data that the organisation is already collecting or that is easily accessible. Choosing indicators that are difficult to collect adds an unnecessary barrier to starting.

### 2. There must be a deliberate effort to foster trust within the organisation

Two factors play an important role in enabling the open data sharing between the Santeon hospitals:

- There is a deliberate effort to build relationships between the multidisciplinary team members. The focus of all of Santeon's efforts is collaboration rather than competition.
- There is a clear understanding between the hospitals around the boundaries within which the data can be used.

### 3. Regular conversations between multidisciplinary teams act as catalysts for improvement

Regular meetings between multidisciplinary teams that focus on the full cycle of care for a given condition form the foundation of Santeon's improvement programme.

### 4. Patient representation on the improvement teams provides a consistent patient voice for prioritisation of activities

Having patient representatives on the improvement teams helps ensure that Santeon's quality improvement efforts are addressing issues that matter to the patients they serve.

### 5. It is important to have a pragmatic approach to analysis

If outcomes data is to be used in a quality improvement programme, being pragmatic about the depth of analysis in the initial stages is important to enable the process to run efficiently. The key is to conduct basic analyses looking for trends, and investigate further if interesting patterns emerge.

### 6. Mutual accountability helps to ensure that all parties play their part in the programme

Formal agreements are crucial in facilitating mutual accountability. The new value-based reimbursement contracts have the primary role of fostering collaboration between hospitals. However, they also serve the additional purpose of holding the hospitals accountable to each other within the VBHC programme.

## SOURCES

- Interviews conducted during Santeon site visit on 30th January, 2017
- Telephone interviews conducted in January and February, 2017
- Data from organisational reports and presentations as provided by Santeon

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- Hetty Prinsen, Data Manager, Santeon
- Franz Schramel, Pulmonologist, St. Antonius Hospital
- Jean Paul van Basten, Urologist, Canisius-Wilhelmina Hospital
- Joost Zuidema, Head of Sales, St. Antonius Hospital
- Elizabeth Olson, ICHOM

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