A Method to Benchmark Swiss Hospital Catering

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Abstract
Switzerland ranks high on the OECD list of total health expenditures expressed as a percentage of the GDP, which is led by the United States (OECD, 2011). But in contrast to the US, where healthcare costs are already economically driven, the Swiss healthcare sector has benefited from a laissez-faire attitude in a situation where hospitals were paid for their services retrospectively, most of the time at whatever price they charged (Fetter, 1991). This attitude is now due to change as, since 2012, Switzerland also reimburses hospital costs through a diagnosis-related group system (DRG). This change forces hospitals to enhance cost transparency as a basis for operating in an increasingly restrictive financial environment. Decision makers need cost transparency and benchmark data to have a basis for argumentation and detect efficiency potential. This also affects supporting services, including hospital catering. To provide a basis for cost transparency and benchmarking activities, current process and cost situations in Swiss hospitals needed to be examined. This study set out to explore how existing sources of process and cost information can be used as a basis for benchmarking activities across hospitals and the cost of meals per patient per day in Swiss hospitals. The study used a methodological approach to establish a benchmarking opportunity for Swiss hospital catering.

Introduction & Background
Switzerland ranks high on the OECD list of total health expenditures expressed as a percentage of the GDP, which is led by the United States (OECD, 2011). But in contrast to the US, where healthcare costs are already economically driven, the Swiss healthcare sector has benefited from a laissez-faire attitude in a situation where hospitals were paid for their services retrospectively, most of the time at whatever price they charged (Fetter, 1991). However, this system, which was advantageous for hospitals, has recently changed due to the implementation of the SwissDRG system, which requires the reimbursement of hospital costs in advance through a diagnosis-related group system. Discussions pertaining to this implementation predict a ground-breaking change in hospital financing systems (Brügger, 2010) which is also expected to affect the provision of hospital support services. At the moment it is difficult to say how great this impact will be. The change will help ensure hospitals act more economically than previously (Oggier, 2012). Hence, a main and highly proclaimed benefit of the newly introduced SwissDRG system is that it forces hospitals and health care providers in general to focus on higher process transparency as a precondition for being cost-oriented (Balmer, 2011; Cording, 2007; Hurlebaus, 2004; Mathauer & Wittenbecher, 2012; Oggier, 2012; SwissDRG, 2011).

Besides hospital core functions of treatment and care, many support processes are also affected by this urge for transparency. These support processes can be put under the umbrella of facility management (FM), which is defined as the “integration of processes within an organisation to maintain and develop the agreed services which support and improve the effectiveness of its primary activities” (CEN, 2006, p. 5). Their importance is evident as while approximately 60-75% of hospital costs relate to core activities (treatment and care), a further 25-40% (Abel & Lennerts, 2006; Jensen, 2008) are incurred by support processes. Central to this study is the acknowledgment that hospital catering is one of the vital
services provided by FM for the benefit of patients and staff as well as other guests. Besides its influence on patients, hospital food also incurs significant costs within hospital support processes (Abel & Lennerts, 2006). Furthermore, hospital catering is considered to be a support process with cost-cutting potential, as stated by a number of authors (Arens-Azevêdo & Lichtenberg, 2001; Frosch, Hartinger, & Renner, 2001; Lieb, 1996; von Eiff, 2012). Hence, it can be stated that both the hard economic side as well as the softer, but still cost- and revenue-correlated, patient experience side justify paying attention to hospital catering.

It is interesting to note that the production method in Swiss hospitals is dominated by up to 95% in-house operated kitchens with a cook & serve system (von Eiff, 2012). This is in contrast to neighbouring countries such as Germany, where the rate has decreased to 65% in favour of outsourced solutions with cook & chill systems (von Eiff, 2012). Furthermore, hospital food has to cater for different customer segments, that is, not only for patients but also for hospital restaurants (staff and guests) as well as for external customers (such as day cares and nursing homes) (Arens-Azevêdo & Lichtenberg, 2001). In Switzerland food for all of these segments is generally produced simultaneously in one kitchen using shared resources such as staff and equipment. This combined production, together with the (until recently) lack of focus on costs, led to unclear cost structures. One example demonstrating this lack of clarity is that hospitals are not consistently able to state the cost of meals per patient per day (breakfast, lunch, supper, snacks), as only the combined production for all customer segments is recorded in accounting systems. Furthermore, accounting structures for hospital catering vary from hospital to hospital. Such non-transparency can again be a reason for non-efficient supporting processes (Balmer, 2011; Gudat, 2006; von Eiff, 2012). In other words, tools which assist hospitals in improving their cost transparency and also enable them to make comparisons are now required in order to face the challenges of an increasingly restrictive financial environment. This demand forms the research gap addressed by this study. Specifically a method was needed to establish the cost of meals per patient per day in order to enhance cost transparency and, based on this, to develop a benchmarking system for Swiss hospital catering for the benefit of decision makers.

Development of a Benchmarking Method

Methodology

Research Questions

Based on the situation described above, the leading research questions were:

- How can the existing sources of process and cost information be used as a basis for benchmarking activities across hospitals in Switzerland?
- How much do meals per patient per day cost in a Swiss hospital?

The aim of this study was to investigate the current process and cost structures of catering activities in Swiss hospitals in order to provide defined key figures for benchmarking activities as well as to develop a method for establishing the cost of meals per patient per day. It was already known that such costs, necessary for benchmarking activities, could not be easily extracted from the existing accounting systems, and the few that were available were based on non-comparable calculations. The findings of the study will inform the development of a benchmarking method for Swiss hospital catering.

Qualitative Case Study Design

To achieve the above-mentioned aims, a qualitative approach was chosen based on a case study framework. There are various definitions of case studies: for this study the following definition is relevant:

“Case study research in business uses empirical evidence from one or more organisations where an attempt is made to study the subject matter in context. Multiple sources of evidence are used, although most of the evidence comes from interviews and documents” (Myers, 2011, p. 76). The findings of this research are derived from a single case study, on the subject hospital catering structures in five hospitals. The focus was on the activities around meal production, excluding
logistics and activities on wards as well as procurement. These delimitations needed to be made because the research resources available did provide access to the process steps of the entire catering system. Initially five hospital settings (all acute-care) providing in-house catering services for the three customer segments (patients, restaurant, external) were examined. Based on the nature of the research questions, actions in these settings are described to allow conclusions to be drawn from the comparisons. Hence, a comparative analysis within the case study strategy was applied.

**Case Access / Sampling**

The five hospitals were accessed through existing connections. A purposive, non-probability sampling technique was applied. Catering activities which are typical in Swiss hospitals were represented. Table 1 provides an overview of the key parameters of the five hospitals:

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Hospital A</th>
<th>Hospital B</th>
<th>Hospital C</th>
<th>Hospital D</th>
<th>Hospital E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of beds</td>
<td>684</td>
<td>334</td>
<td>144</td>
<td>377</td>
<td>602</td>
</tr>
<tr>
<td>Inpatients</td>
<td>28,155</td>
<td>10,459</td>
<td>4,628</td>
<td>18,406</td>
<td>30,767</td>
</tr>
<tr>
<td>Inpatient days</td>
<td>222,008</td>
<td>101,050</td>
<td>34,788</td>
<td>106,744</td>
<td>217,069</td>
</tr>
<tr>
<td>Number of staff (FTE)</td>
<td>3,847</td>
<td>788</td>
<td>410</td>
<td>1,325</td>
<td>2,995</td>
</tr>
<tr>
<td>Number of staff (headcount)</td>
<td>4,841</td>
<td>1,248</td>
<td>518</td>
<td>1,940</td>
<td>3,734</td>
</tr>
</tbody>
</table>

**Data Collection and Analysis**

In line with the qualitative research design and the case study definition given above, the data was collected using a multi-method approach for qualitative studies (Saunders, Lewis, & Thornhill, 2007), including semi-structured interviews (with a head chef), document research (mainly accounting data, delivery notes) and structured observation (focused on food distribution via a belt system). This allowed data sources to be combined to provide a comprehensive understanding of the five contexts. Informed consent was obtained for all the data collection methods used.

The data collected on process and accounting structures was analysed and compared. For this purpose a coding strategy was applied. Codes represent a thematic structure that serves to compare and describe settings (Flick, 2009). The codes used were derived from accounting structures and process steps. Using these codes, existing process and cost information were examined and a data framework was established to evaluate the cost of meals per patient per day. Both of these were necessary elements for the development of the benchmarking method.

**Findings**

The findings of the data analysis led to a knowledge gain in two main areas, as previously outlined. The combined knowledge was used to establish a benchmarking method for Swiss hospital catering.

**Defined Key Figures**

Essential for benchmarking activities are clearly defined key figures which are calculated from clearly defined base numbers to avoid inaccurate comparisons. Usable key figures were obtained from the data on existing sources of process and cost information (such as electronic meal ordering systems, cash register systems, inventory control systems and payroll accounting) and on the requirements of the catering representatives at the hospitals participating (extracted from
They key figures served to provide decision makers with argumentation aids based on improved process and cost transparency.

An example of how these figures were defined is given by the relatively simple key figure “seat turnover” in the restaurant, as shown in Table 2.

### Table 2: Example Key Figure Definition

<table>
<thead>
<tr>
<th>Name of key figure</th>
<th>Daily seat turnover</th>
</tr>
</thead>
</table>
| Formula (use of base numbers) | **Average guest number per day**  
Number of seats in restaurant |
| Definitions |  
− Average number of guests (staff + external guests) per day in each restaurant = Number of cash transactions per year divided by 365  
− Number of seats available in the restaurant (excluding seats in outdoor areas) |
| Source systems of base numbers | Number of guests: transaction statistics of cash system  
Number of seats: restaurant lay-out plan |

One of the challenges in defining the key figures was the heterogeneous systems used in the hospitals. Taking the above example, the various transaction statistics from the restaurants had to be looked at very carefully in order to determine whether and how the information was usable to feed into calculations of key figures. Furthermore, the first draft of the definition had to be refined to exclude the outdoor seating from the number of seats. Every definition needed more than one draft until it was understood in the same way by the hospitals participating. Finding accurate wordings for the definitions which left the least possible room for misinterpretation was challenging.

A total of 23 key figures were defined in this way. Topic areas included turnover data (e.g. yearly catering turnover allotted to the three segments, patient, restaurant and external catering), staff data (e.g. ratio of skilled to unskilled employees) and floor space used for production (e.g. production space per hospital bed in square metres). Most of the key figures displayed relative data, which allowed benchmarking of catering data across hospitals of different sizes. The 23 base numbers required to calculate the key figures were drawn out of the existing systems, as previously mentioned, except for the cost of meals per patient per day. This number served as a basis for several key figures. An evaluation method was required and is explained in the next section.

### Method to Establish Cost of Meals per Patient per Day

The simultaneous use of resources (food, staff) to cater for the three customer segments (patients, restaurant, external catering) presented a challenge in calculating the cost of meals per patient per day. Where they were known, they were based on different rather than comparable calculations. It was therefore necessary to define keys to allocate the appropriate amount of the total costs. The finding and definition of such allocation formulas was central in developing a method to establish the cost of meals per patient per day.

Such allocation formulas have been developed by the use of two different approaches, which were applied during a two day on-site visit to the hospitals participating. These approaches are explained in the following paragraphs.

### Top-down Approach
Essential to this approach is scaling down the annual cost of goods and staff to the cost of meals for one patient per day. To do so, the patients’ share of the costs needs to be subtracted from costs incurred for catering for the restaurant (staff/guests) as well as for external catering. For this, allocation formulas for particular food categories, as defined in Swiss hospitals, were developed (see Table 3).

**Table 3: Allocation Formulas per Food Category**

<table>
<thead>
<tr>
<th>Food Category</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat/Sausage/Fish</td>
<td>in accordance with the ratio of the number of meals produced for patients to the number produced for the restaurant and external catering on survey day 1.</td>
</tr>
<tr>
<td>Bread and bakery products</td>
<td>Total yearly expenses minus costs used for patient breakfast supply - 5% reserve of total yearly expenses (e.g. for bread used for patient dinner) = Cost proportion spent for restaurant and external catering.</td>
</tr>
<tr>
<td>Milk/eggs</td>
<td>According orders: Total yearly expenses – ((Number of milk products sold in restaurant (cash statistics) * purchase price milk) = proportion used in production (\rightarrow) breakdown of usage for patients and other segments by number of meals produced per segments on survey day 1.)</td>
</tr>
<tr>
<td>Fruit and vegetables</td>
<td>in accordance with the ratio of the number of meals produced for patients to the number produced for the restaurant and external catering on survey day 1.)</td>
</tr>
<tr>
<td>Other food</td>
<td>in accordance with the ratio of the number of meals produced for patients to the number produced for the restaurant and external catering on survey day 1.)</td>
</tr>
<tr>
<td>Non-alcoholic drinks (excl. mineral water)</td>
<td>in accordance with the ratio of the number of transactions in the restaurant to the number of orders for the wards (= proportion for patients)</td>
</tr>
<tr>
<td>Alcoholic drinks</td>
<td>in accordance with the ratio of the number of transactions in the restaurant to the number of orders for the wards (= proportion for patients)</td>
</tr>
<tr>
<td>Mineral water</td>
<td>in accordance with the consumption by patients (= inpatient days * 1 litre per day * cost of 1 litre) to consumption in the restaurant and by staff (= total number of consumers – number of patients)</td>
</tr>
</tbody>
</table>

An additional element used in this approach is the allocation of personnel costs used for production. They are allocated in accordance with the ratio of the number of meals produced for patients to the number produced for the restaurant and external catering.

**Bottom-up Approach**

Under this approach the cost of meals per patient per day were established by calculating the food and personnel costs per meal, and totalled for one day. Essential to this approach is calculating the cost of each meal component. This was done by weighing the components of the patients’ meals. The food used for patients was then subtracted from the total food produced. The calculation for one portion used the purchase prices of ingredients combined with their individual shrinkage/swelling factor. Hence the cost of each meal (breakfast, lunch, supper) was calculated based on what was on a patient’s tray. The whole procedure was necessary as most hospitals do not put this information into their electronic recipe and production systems. Added to the food costs were the proportion of food ordered (such as snacks and teas) to be stored and delivered to patients on the wards as well as the cost of personnel for production of patient meals.

The results of these two approaches were compared to check their plausibility. The more similar the results, the more confidence can be placed in the calculations. Although these two approaches are still very much based on assumed proportions and defined allocation formulas, their strict application provides identical calculation procedures in hospitals. This enables a comparable cost calculation for meals per patient per day. To ensure high standardization, and thereby benchmarkable results, the calculations are made by trained personnel.
Enabled Transparency - Results

The aim of this study was to develop a method to enable benchmarking activities among Swiss hospitals. However, it also adds to the understanding of the Swiss hospital situation and shows how the findings can be used to present benchmarking results. To do this, a sample of the 23 key figures calculated, that is, benchmarking catering activities of the five hospitals initially involved, is outlined. These results are based on the hospitals’ figures from the year 2012.

Results of the previously mentioned key figure “daily seat turnover” show restaurant capacity and guest frequency. As seen in Figure 1, four of the five hospitals are in the same range, whereas hospital A has a higher turnover. Referring back to the formula used, this could be explained by a high number of cash transitions as well as a high number of average guests through possibly integrated coffee vending machines in the system. This kind of interpretation is part of the discussion among the hospitals participating in order to understand and interpret the results.

![Daily Seat Turnover](image)

**Figure 1: Benchmark Results – Daily Seat Turnover**

Figure 2, “annual turnover patients/external catering/restaurant”, displays which of the three customer segments the catering at each hospital focuses on. It shows that hospital C mainly caters for the restaurant (65%), hospital B has a high percentage of production for external catering (42%) (for a nursing home), and only hospital A focuses mainly on patient catering. The question is raised as to where the main focus of hospital catering should be; the results of this study encourage hospitals to consider this. This is of importance as price calculations in restaurants and for external catering are rarely viable and, secondly, because hospitals may not wish to cross-finance catering activities.
Figure 2: Benchmark Results – Annual Turnover Patients/External Catering/Restaurant

Figure 3 shows the cost of meals per patient per day in Swiss francs, which is the key figure resulting from the method established. Hospital C has the highest costs (49 Swiss francs), which can be explained by it being a private hospital providing a high standard of catering in terms of menu composition. As previously stated, these costs only include staff and food used in production. Early research results for the remaining process steps (logistics and ordering/serving on the wards) indicate that a minimum of a further 25 Swiss francs needs to be added.

Figure 3: Benchmark Results – Cost of Meals per Patient per Day

Figure 4 shows personnel and food costs as a percentage of total turnover from hospital catering. Values higher than 100% indicate that personnel and food costs exceed the income expected. Taking again Hospital C, whose catering focuses on the restaurant segment, it can be assumed that the restaurant prices are not cost-covering and that money is actually lost. On the other hand, results for Hospital B suggest that its catering activities for the nursing home are sold at a good price as there is enough volume between personnel and food costs and the total turnover.
Conclusions

The research set out to explore how existing sources of process and cost information could be used as a basis for benchmarking activities across hospitals in Switzerland and the cost of meals per patient per day in Swiss hospitals. It was undertaken in the context of the current restrictive financial situation in Swiss hospitals, together with the implementation of the new reimbursement in advance system, which forces hospitals to act more economically than previously.

The findings add to the knowledge of how FM costs emerge and are justified in Swiss hospitals. As cost discussions predominately occur around the core activities of hospitals (treatment and care), less attention is generally paid to FM costs. The findings provide FM managers with argumentation aids when discussing effectiveness and efficiency issues on a strategic level. Benchmarking activities for hospital catering based on a mixture of clearly defined accountability and process-based data information are now possible.

Relevance of Findings

Based on this research, a benchmarking platform for Swiss hospital catering has been established and introduced to the market. So far, around 30 hospitals have made use of the platform. The response to it is very positive, as participation provides clear structures to enhance the cost transparency in hospitals and, for the first time, to effectively compare catering structures and costs across Swiss hospitals. In this light, the findings are very relevant to the target group. Limitations of this study are that the results have so far only been applied to production (material and personnel costs) and not yet to the whole process chain needed for hospital catering. Nevertheless, it provides a well-founded base for further developments.

Outlook

In the near future the benchmarking method should be extended to the whole process chain needed for hospital catering activities. It will also be adapted to other FM services, such as cleaning. All future research activities are guided by the aim of providing FM personnel in hospitals with argumentation aids to ensure efficient and effective support services.
References


