USER-CONTROLLED STANDARDISATION OF HEALTH CARE PRACTICES

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USER-CONTROLLED STANDARDISATION OF HEALTH CARE PRACTICES

Complete Research

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Abstract

The need to access information across different levels of the health care system has prompted attention to standardising electronic patient record (EPR) systems. However, this has proven extremely difficult to achieve. One reason is that much structuring of the EPR content translates into the need to standardise related routines and practices. In this paper, we demonstrate that the Norwegian national performance standard “cancellations of surgery” is adapted locally in ways that promote many different understandings and thus applications of the standard. We have identified differing interests in the performance standards relating to the various organisational levels of users. Using the emerging international openEHR framework as a backdrop, we discuss the effects of offering users the technical means to control standardisation processes given the different interests and levels.

Keywords: Electronic patient record systems, standardisation, work practice, openEHR.

1 Introduction

In response to both the global demographic changes of an aging population and the increased prevalence of chronic diseases, treatment and care are more often organised to offer continual services across different service levels in health care (Singh, 2008). This requires that information about patients can be easily compared and analysed across different service levels. An important means to achieve this is through structuring and standardising the content of electronic patient record systems (EPRs) (Morrison et al., 2013). Several international standardisation efforts are currently in progress, including classification systems such as SNOMED Clinical Terms, International Classification of Disease (ICDx), and the NOMESCO Classification of Surgical Procedures (NCSP). They are considered important means for comparability across health care domains and different information systems (Garde et al., 2007).

However, standardisation within health care has proven difficult to achieve (Ellingsen, 2004; Meum and Ellingsen, 2011; Timmermans and Berg, 1997). A reason for this is that much structuring of the EPR content translates into the need to standardise related routines and practices. Meum and Ellingsen (2011) have shown that terminology standards in nursing plans are constantly challenged by workarounds, trade-offs, and negotiations between different perspectives on nursing practice. Hanseth et al. (2012) have described how standard EDIFACT messages for health care were implemented in a top-down strategy of standardisation and less attention was paid to users’ work practices. The result of such strategy was a very slow diffusion of the standards.
Responding to some of these challenges is the emerging international openEHR architecture, which offers users the technical capability to conduct standardisation and structuration of EPR content themselves (Garde et al., 2007). The openEHR framework is founded on a two-level modelling approach in which the technical design of the health-related information system is separate from clinical concerns. Clinical concerns become wholly the clinicians’ responsibilities, for which they can easily define and implement structured/standardised information elements in the EPR. The openEHR approach is presumably a step in the right direction since the users naturally have first-hand insight into how standardisation of the EPR content implicates standardisation of the users’ practice.

While we appreciate the benefits of engaging users in standardisation processes, we are not convinced that simply handing over a technical customisation capability to the users solves all the critical issues implicated in the standardisation processes, as advocated through the openEHR architecture. However, we believe that standardisation activities spawned by the openEHR approach enable us to move beyond studies that conclude with dichotomies such as top-down strategy (presumably bad) vs. bottom-up strategy (presumably good). It challenges us to examine more closely who the users are and what the users’ practice really means. Hence, we ask the following research question: How do user-controlled standardisation efforts pan out in heterogeneous health care practices? Who are the users, what do we mean by the users’ local practice and what role can the openEHR architecture play?

Drawing on the IS literature that focuses on the implementation and use of standards in practice (Timmermans and Berg 1997, 2003; Ellingsen 2004; Meum and Ellingsen 2011; Hanseth et al 1996, Bjørn et al 2009) we study a large-scale ICT-acquisition project (hereafter named BigInvestment) based on the openEHR approach within the Northern Norwegian Regional Health Authority. The acquisition and development of a portfolio of clinical information systems—most notably the EPR—were expected to provide more standardised treatment and interoperability between information systems in Northern Norway. As part of this project, we investigated the efforts to establish more uniform use of the national quality indicator standard called “cancellations of surgery”, which was chosen for its importance internationally, nationally, and locally (Hovlid et al., 2012; Moghaddam et al., 2010). In the remainder of this paper, we begin by elaborating our study’s theoretical foundations. Next, we describe the method used for the case study, we describe and discuss the case, and conclude with our discussion and conclusion.

2 Conceptualising Standardisation

The standardisation of EPR content promises to reduce medical errors, increase quality of care and increase efficiency (Berg, 2005) by increasing the availability and quality of clinical information, informing more effective planning of healthcare delivery, and by supporting clinical research. One type of standard crucial for EPRs is performance standards, which represent outcome specifications and measurements. Performance standards do not prescribe how things should be done, only what the outcome of the work should be (Timmermans and Berg, 2003). They were originally a key element of Total Quality Management (TQM) philosophies, aiming at improving the structures, processes and systems in care provision to achieve optimal patient care (Grol, 2000). This approach has had a fundamental influence on quality policies and activities in most countries, particularly in hospitals. Authorities have high expectations of systematic data collection, feeding these data back to institutions and practices and publishing these data to make care transparent to the public (ibid). The standards may measure performance on efficiency, e.g. the number of patients with a given diagnosis treated. Norway has 18 national quality standards that hospitals must report to the national level of public health administration every fourth month. Examples include the percentage of femur neck fractures operated within 48 hours (because mortality is related to preoperative waiting time), percentage of hospital stays in corridor beds, nosocomial infections and cancellations of surgery. In this paper, we examine the standard for “cancellations of surgery”, since it offers the transparency necessary for the accountability related to health systems performance.
While performance standardisation is primarily an outcome measurement, implicitly it also requires a standardisation of the practices involved (Timmermans and Berg, 2003; Ellingsen, 2004; Meum and Ellingsen, 2011). Since the rationale behind the feedback of data is to improve patient care, at some point it is adequate to suggest “best practice”. It becomes necessary to standardise the practice that produces the outcome, and if necessary change the practice and routines to achieve the goals defined by the performance standard (for example ‘cancellations of surgery’). The comparison aspect of performance standards calls for some alignment of work to compare processes regarding quality or efficiency.

However, despite heavy investment and considerable efforts, standardisation of health care practices has proven a cumbersome process (Ellingsen, 2004; Meum and Ellingsen, 2011; Timmermans and Berg, 1997) and, at times, an outright failure (Larsen and Ellingsen, 2010). In the United Kingdom, the NHS spent more than £12bn on a ‘one size fits all’ EPR system that was eventually scrapped and replaced by an innovative new system driven by local decision-making (Mail Online, 2011). An example from Norway is also illustrative: After major delays, the portal system project at the Oslo University Hospital proved a resounding failure, and was terminated in May 2011 having wasted approximately EUR 23 million, which was probably just the tip of the iceberg (Computerworld, 2011). It is no surprise that Timmermans and Epstein (2010) argue that when the implementation of standards moves from performance standards to procedural standards, it becomes even more challenging to satisfy diverse, autonomous interests.

No wonder, then, that both researchers and practitioners have looked for strategies and methods to overcome the challenges. A promising standardisation approach appears to be the emerging openEHR architecture promoted by the international openEHR foundation (Kalra, 2006). The openEHR approach enables extensive flexibility that encourages users to define and introduce local data structures (Beale, T and S Heard, 2007.) The openEHR architecture was developed by the openEHR foundations and standardised by CEN and ISO in the EN/ISO 13606 standard series. It consists of a two-level modelling approach for EPRs (Garde et al., 2007) that separates the technical design of the system and the clinical concerns. A standardised reference information model represents the first level while the openEHR archetypes, based on the reference model, represent the second level (Beale, T and S Heard, 2007; Garde et al., 2007). As structured data elements, archetypes can also be displayed in different presentations. In the hands of clinical personnel or domain experts, they can be seen as generic building blocks used to construct templates, or as structures corresponding to formatted displays, documents, or reports (Beale, T and S Heard, 2007). Consequently, this approach promises a high degree of local customisation for users (Garde et al., 2007) and ensures that clinical users can take the helm of standardisation and structuration processes.

_A fundamental aim of the archetype approach (…) is to empower domain experts to create and change the knowledge inherent in archetypes, thus controlling the way EHRs are built up using designed structures to express the required clinical data and assuring that all necessary constraints on the values of record components are observed_ (ibid, p. 336).

Still, there is a fundamental tension between the need to standardise on the one hand and the need for local flexibility on the other, which any strategy, method or technology has to deal with (Hanseth et al., 1996). Along these lines, Timmermans and Berg (1997) investigate global-local tension and introduce the notion of ‘local universality’ to pinpoint how a standard always retains local variants, both shaping and being shaped by local practice. They argue that universality is always local universality and that local universality depends on how standards manage the tension involved in transforming work practices while simultaneously being grounded in those practices.

While Timmermans and Berg (1997) consider the extreme points (global and local) of standardisation, they overlook the way that standards may relate to each other on several health care levels. In this regard, we draw on a study by Braa and Hedberg (2002) that introduces a hierarchy of standards. They emphasise that lower levels of the health services need different or more extended datasets or...
standards for health and management data than the higher levels do, and they see this as a “softer” approach toward universality than that of Timmermanns and Berg (1997). Each level may formally define its contextual (local) universality as an extension of the “global” and they describe this system of health and management data standard as a hierarchy of (local) universalities. Each level, such as a local health unit, a district or a province, is an example of such universalities, which interact and communicate with the entire system through the standards of the level above, while at the same time maintaining their local data sets (Braa and Hedberg, 2002).

The interaction between the levels is not problem-free, but a study conducted by Bjørn et al. (2009) may be useful in this regard. Bjørn et al. (2009) try to balance the conflicting perspectives of standardisation and flexibility by introducing the notions of boundary factors and contextual contingencies. Boundary object is an analytical concept for the elements that inhabit several intersecting contexts but satisfy the informational requirements of each, such as information repositories and standardised forms. Boundary objects are plastic enough to be adapted to local needs and thus are meaningful across borders and contexts. Even though they inhabit different meanings, the structure of the boundary objects is stable and in this way comprises a mean for translations. Contextual contingencies describe the parts of work that clash with the standardised structure of the boundary object and that are closely related to the particular context. The contextual contingencies are not directly transferable across borders and are immalleable in nature (ibid).

3 Method

The Northern Norwegian Regional Health Authority is responsible for all 11 public hospitals in Northern Norway, each of which has different roles in the region’s specialised health care. The smallest hospital is a local hospital that serves 16,300 inhabitants, while the largest is a university hospital serving 500,000 inhabitants. The hospitals are organised in four trusts and together have approximately 12,500 employees. Following a bid for tender process, in 2011 the health authority decided to invest in new clinical ICT systems for all of its hospitals. The process of developing and implementing the systems was organised into a project called BigInvestment, which is budgeted to cost EUR 82 million from 2012 to 2016, making BigInvestment one of the most ambitious health care-related ICT projects currently in Norway.

Our study is positioned within a constructive paradigm and uses interpretive methods (Klein and Myers, 1999; Walsham, 1995). This includes detailed case descriptions of the different sites involved, as well as a variety of data sources, enabling us to look at the phenomenon from different perspectives. The discussions from the working group on standardising the use of the surgery planning tool in the Northern Norwegian health region were the starting points for the data collection. Some of the interviewees attended the working group, while others were specifically chosen so that we could gain a more thorough understanding of work practices in the different localities.


<table>
<thead>
<tr>
<th>Activities</th>
<th>Source and extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participatory observation</td>
<td>Informational meetings, workshops, BigInvestment steering group meetings, demonstrations, trials and pilot tests, working groups on standardisation. In total 230 hours</td>
</tr>
<tr>
<td>Interviews</td>
<td>2 surgeons, 5 coordination nurses, 2 secretaries, 2 project managers. Each interview lasted 35-74 minutes</td>
</tr>
<tr>
<td>Document studies</td>
<td>Official documents on ICT development within health care in Norway, bid for tender documents on new clinical ICT portfolio at Health Authority North Norway, minutes from steering group and project meetings</td>
</tr>
<tr>
<td>Informal talks</td>
<td>BigInvestment management, Vendor, Hospital ICT management, Product manager at Vendor, Regional Authority medical director, Coordinating nurses, Secretaries, Surgeons.</td>
</tr>
</tbody>
</table>

Table 1. The data collection

Topics addressed in interviews of health care personnel from the different hospitals—by the members of the working group—were discussed thoroughly during group meetings attended by the first author. Thus, these meetings not only served as data sources but also made considerable contributions to data analysis. The meanings of concepts such as ‘cancellations’ were analysed in relation to the work routines at each hospital. The themes identified in meetings came to form the interview guide, with a focus on trying to recognise interviewees’ understandings of the concept ‘cancellation’ and how this understanding influenced their work routines.

Between the meetings in the working group documents on the project, field notes and interviews were transcribed and analysed to identify topics or themes to investigate further. The material was coded with colours reflecting different situations or associations with a topic. Reflections were added to the coded material and discussed both in the working group and in the research group in which the authors participated. Thus, this approach is like a hermeneutic circle, relating the whole to the parts, and the parts to a whole, allowing changes to the unit of analysis (Klein and Myers, 1999).

4 The Thorny Road Towards Standardisation

Since the chief goal of the Regional Health Authority (and therefore the BigInvestment project) was to standardise care by implementing clinical guidelines and protocols into a process- and decision-supportive EPR, the bid for tender specified an EPR with a high level of interoperability and customisation. The vendor—here named ‘BigVendor’—is one of the largest EPR vendors in the Norwegian health care market and already delivers systems to all 11 hospitals supervised by the Northern Norwegian Regional Health Authority. To create the requested EPR interoperability, BigVendor had made the strategic decision to move to the openEHR architecture. The effect of this was that the standardisation of the content was delegated to the clinicians. This modification promised to make the structuring of the new EPR smoother:

“*The clinicians decide themselves how the archetypes should be defined to ensure the clinical content. This will be more straightforward than if the standardisation were pushed by some formal instances*”

(developer at BigVendor)

By initiating standardisation of the EPR content, the Northern Norwegian Regional Health Authority also sought to improve the quality of the data used to monitor, compare, control, and allocate resources to the hospitals in the region. Thus, BigInvestment established a dedicated track to standardise the deployment, government and support of the future system as well. To propose a set of uniform guidelines for the definitions and use of EPR content, as well as templates in which the data could be recorded, the BigInvestment track established 18 working groups, consisting of 70 health care personnel, to address standardisation. The personnel were selected from different hospitals and
from different professions to ensure that the local perspectives on standards were addressed. The working groups were to map current practices in order to suggest standards or best practices on their areas of expertise.

One of the areas identified for standardisation was the use of the surgery planning module, which included the defining and recording of indicators for surgery, anaesthesiology, and intensive care. As surgical activities are some of the costliest in health care, it is of immense importance to make this part of the service efficient, measured against performance standards. Participants in the working group for this area consisted of two surgeons, an anaesthesiologist, two anaesthetic nurses, an intensive care nurse, three surgery nurses, and three coordinating nurses (i.e., surgery planning nurses). All participants had extensive experience with surgery, while some had also worked at more than one hospital in the region. In the following section, we will look more closely at the work process of this group as demonstrated by examples.

5 The Practical Use Of Standards

5.1 The mandate

The working group was mandated to map current practices, from which it could present regional guidelines and standards for how to configure, utilise, and govern the surgery planning tool within the EPR. The group divided the 11 hospitals among its members, which formed subgroups that corresponded to given themes and that collected data via telephone interviews with personnel using the surgery planning tool. Themes included a) planning for surgery; how tasks were divided among professionals; who performed the data entry, set-up and use of the planning tool; b) the use of the ‘cancellations of surgery’ variable: how the variable was interpreted and how it affected work routines; and c) the use of data from the recordings of ‘cancellations’, feedback, and reporting routines. The subgroups conducted several telephone meetings between the four times the whole group met. Meetings with the whole group mainly aimed to present and discuss each subgroup’s findings.

Telephone interviews indicated that there was a variety of registration practices and that local (and even individual) needs shaped the use of the planning module. The working group therefore found it difficult to use any of the practices as the best practice and agreed that much more thorough work was needed to present standards for the use of the planning tool. Thus, based on the work completed at this stage, the group was mostly able to present a few guidelines.

During discussions at group meetings, members often returned to the question of whether standardising the use of the tool was feasible given the variety of practices they had found. Even within one hospital, there were different understandings of the definition of variables, as interviews with users demonstrated. The understandings corresponded to local needs, and accordingly, the records reflected this diversity. This resulted in great unreliability of secondary use, such as benchmarking based on the data. As users, members of the working group had experienced this unreliable themselves, confronted with data on their performance that were unrecognisable to them. Altogether, the group concluded that this diversity was due to different interpretations of the meaning of the variables.

5.2 The performance standard “Cancellations of Surgery”

As one example of the use of standards, the group examined the practices of recording “cancellations of surgery”, since mapping indicated great divergence in the use of this standard within the region. “Cancellation of surgery” is one of the 18 national quality indicators defined by the Norwegian Directorate of Health. National quality indicators are intended to support the government’s goal of
facilitating patients’ rights to choose where to receive treatment by offering patients, next of kin, and clinical personnel up-to-date information about the different hospitals concerning quality and other relevant information. Anyone can access a website (www.sykehusvalg.no) listing the national quality indicators to compare all the Norwegian hospitals.

The indicator “cancellations of surgery” is defined as the “percentage of patients not having surgery as scheduled”. It is intended to show the hospitals’ ability to plan and execute plans for surgery activities; the goal for this quality indicator is to have a cancellation rate of less than 5%. All cancellations should be registered, including those for patients who have become critically ill for other reasons and cannot undergo surgery (and thus have nothing to do with poor planning processes). Therefore, hospitals are recommended to keep an internal register of causes of cancellations and to devise ways to improve work routines.

The “cancellations of surgery” national quality indicator has been integrated into local practices in many ways. Planning for surgery is a temporally distributed activity, and patients may be scheduled for surgery and notified of the date up to 6 weeks prior to the surgery. Thus, the surgery plan is a plan-in-action; to record deviations from the plan presupposes agreement on what time the plan is regarded as final. The working group on standardising the use of the surgery planning module found that in the 11 hospitals in the region, approval of a final plan was registered at seven different times of day, which depended on the hospital’s internal routines. Times spanned from 14:00 on the day before to midnight on the day of surgery.

5.3 Shaped by old routines and practices

In one of the smaller hospitals, the working group found historical reasons, arising from paper-based routines, for the choice of 14:00 as the time for approving the final plan. In the paper-based routine, the head nurses in all the wards would submit a list of the next day’s patients for surgery to the general office in the operating department by 14:00. The management team in the operating department met at 14:00 to review the lists and assign an order of operations. A secretary then typed this plan into a form and distributed a copy to each ward. At 16:00, nurses would collect the plan during the late shift, and would display the plan in each ward in the room where the surgeons met every morning. This plan was thus a final plan with a deadline at 14:00. If changes occurred, the operating department had to be notified by an oral message or by phone.

Currently, the plan was approved in the evening, but the hospital had chosen to keep 14:00 as the deadline for the final plan, since this was the established routine. This deadline allowed personnel in the operating department more time to prepare for the following day’s activities. After the deadline, the surgery nurses started to check their personnel resources, whether the surgical team was qualified to conduct the operation, and whether sick leave or other factors might complicate performing the operation. Next, the nurses ordered the necessary kit of instruments (i.e., standardised instrument packages for the given intervention) from the sterilising unit and checked whether the package was sterilised or had to be prepared. The anaesthetic nurses also checked their personnel resources, while the anaesthetic doctors review the surgery order form to ensure that clinical data to assess the patient preoperatively were present. Thus, the old routine was kept, and the deadline for the final plan was still 14:00.

5.4 Flexibility in reallocation resources and patients

The working group also found that the size and character of the hospital seemed to influence the hour set as the deadline for a final plan. The larger hospitals had their deadlines late in the evening (i.e., 20:00 and midnight), while the smaller hospitals had their deadlines earlier (i.e., from 14:00 to 15:30). Larger hospitals had more emergency services and patients whose conditions were more complicated,
creating greater potential for unexpected circumstances. They were also more likely to have in-house patients needing more or less acute surgery, who could use time slots freed up by cancellations. In addition, unstable patients needing acute surgery were transferred from local hospitals to larger ones. Thus, an early deadline for a final plan would be difficult to meet, leading to a high ratio of cancellations.

In the smaller and local hospitals, activity was more often based on daytime work and patients needing less complicated surgery, making it easier for these hospitals to plan the next day’s activities, which allowed earlier deadlines. However, cancellations were more likely to result in unused resources at smaller hospitals, because substitute patients were more difficult to find as fewer personnel were on call during the evenings:

“We are usually very good at finding a replacement if a patient turns out not to need surgery, but it is very, very exhausting to work ad hoc like this. It takes lots of resources in terms of collaborative work late in the afternoon, since many of the personnel with whom you need to clarify surgery have left work. You also must order tests ‘urgently’ to have them performed outside regular hours, and this is very costly. It also looks unprofessional to the patient who is called for surgery the next day, and has to drop everything to rush off to the hospital.” (Surgeon)

5.5 Having notified the patient

There were many reasons for the different times for a final plan, and they were often a result of internal negotiations over the purpose of the indicator “cancellations of surgery”. In a discussion in one of the large hospitals, this was much debated. Some of the clinical personnel argued that any changes made to the plan after the patient had been notified about surgery should be registered as “cancellation”, since it led to inconvenience for the patient, even if the notice was given weeks before the scheduled surgery. Managers, however, disagreed on this definition, because changes were not deviations from a final plan when the plan could hardly be considered final, weeks in advance. Another concern in the debate was that such a definition would lead to very high rates of cancellation. Since “cancellation of surgery” is a national quality indicator used for comparing hospital quality, it was in the hospital’s interests to give reports that portrayed the hospital positively. This discussion ultimately ended in an agreement that the deadline for a final plan would be midnight the day before surgery and that any changes after this, including reallocations, would be regarded as cancellations.

Nevertheless, the survey by the working group on standardising use of the surgery planning module showed that the ways the different surgical departments in the hospital handled this recording did not comply with the established definition. The negotiations persisted in everyday practice, since debates about whether changes to the plan should be recorded as cancellations or not were brought up each time a patient had to be rescheduled, regardless of the deadline for a final plan. The coordinating nurse in one surgical department stated that, according to her understanding of the definition, even changes to the plan the week before were recorded as cancellations, given the a) inconvenience for the patient and b) the extra work needed to reschedule the surgery.

5.6 Avoiding bad planning

In another surgical department, personnel reported different routines that were motivated by the desire to avoid a high cancellation rate. In this discipline, many specialists worked outside the hospital in private clinics, referring patients for surgery at the hospital. Since the patients had already been evaluated by a specialist, they were not scheduled for appointments or examinations in the outpatient clinic but instead scheduled directly for surgery. However, this practice risked the proposed surgeon’s disagreement with the referring physician on indications for surgery and thus cancellation of the planned operation:
I know there are many changes before the actual date of surgery, so I avoid plotting the patients in the electronic surgery-planning module until the end of the week before surgery. Until I do the plotting in the planning tool, I keep a record of planned patients in a notebook, so that I get away with making lots of changes that can be traced and recorded as cancellations. I do not want the operating department to think that we have a lot of cancellations and that we do not utilise our resources. In fact, many changes mean that we do utilise our resources, for we act upon the altered situations and schedule other patients if needed (Coordinating nurse).

In this hospital, the nine different surgical departments are allotted time in the operating theatre for one period at a time, usually three months. The capacity in the current allotment is decided by how well the allotment has been exploited in the previous period. Thus many cancellations may suggest a poor use of resources, judged by the cancellation rate, which leads to less capacity in the next allotment. In turn, less capacity leads to longer waiting times for patients needing surgery. The coordinating nurse pointed out that there was not necessarily any correlation between high rates of cancellations and poor exploitation of resources. Thus, it is necessary to take yet another standard into consideration: resource exploitation, which is also recorded.

5.7 Being aware of reasons for cancellations

The Norwegian Health Directorate advises hospitals to keep an internal register of causes for cancellations to form ways of improving working routines. As the working group discovered, the hospitals within the Health North Region had registers of 18 to 34 different variables. In addition, there were some unofficial registers:

“I keep my own record in an Excel sheet, because there are always reasons for cancellations that do not fit the categories or that give me important information about how our internal routines are working that the categories omit” (Head of surgery department)

In large hospitals, the variables were different for each clinic. Some variables expressed the same meaning but in different words and thus looked like different variables in the database. Other variables appeared similar but were not defined, so that they could not be used to compare the efficiency of different hospitals’ work routines. Instead, they could only be used to assess internal processes. Nevertheless, the quality of the data entered remains questionable, since the working group found divergent routines for registration of cancellations.

In some cases, there was no consensus on the reason for cancellation, and the reason given might have depended on the role of the user who recorded it. From the perspective of a nurse in one ward, cancellation might be perceived and recorded as a “shortage of surgical nurses”, since the nurses would be told that surgery was cancelled because there were no available personnel in the operating theatre. On the other hand, personnel in the operating theatre would classify the same situation as an “unrealistically planned activity” if the staff were assembled but unable to cope with all of the assignments. Thus, the reason given for cancellation depended on the perspective and understanding of the role of the user recording it and could not be regarded as an objective data foundation for improving internal routines. The actions taken to reduce cancellations and the responsibility for the actions would be very different, for the two reasons specified here. Thus, the context of a recorded cancellation is important for evaluating the value of the measurement and disentangling the measure from the context may prompt incorrect conclusions.

6 Discussion

As a national quality (performance) standard, “cancellation of surgery” typically has different meanings at the different levels of health care (Braa and Hedberg, 2002). To the national level, the
quality indicators are supposed to provide information to support the patients’ right to choose hospitals for treatment. The regional level is interested in how the hospitals perform in order to compare, control and allocate resources based on this. Thus, the variable’s power to compare between contexts is important. On the hospital level, the performance standard “cancellations of surgery” has no meaning without taking into account the time of approval of the plan. The standard receives an expanded meaning when seen in relation to both the time of approval of the plan and the reasons for cancellation. Even within hospitals, we can see different interests between management and health care workers regarding the time of approval. Managers would like a late deadline for the plan so the cancellation rate would be low and patients would choose their hospital. Health care personnel would like an early deadline, to give them more time to prepare for surgery (Christensen and Ellingsen, 2013). The patients’ perspective would indicate an even earlier deadline to bring about the inconveniences of cancellations. This perspective is taken by some of the clinical personnel, who interpreted the indicator as a way of expressing the inconvenience for the patient if changes are made after (s)he has been scheduled for surgery, introducing yet another perspective of the cancellation standard. Thus, the more contextual the standard becomes, the more aspects must be defined in order for it to be useful, while still building on the definitions of the level above (Braa and Hedberg, 2002). The challenge seems to be that since the comparison power of the standard is so important, even aspects on the lower level are brought up to the higher level, but without the necessary shared definitions and understandings. We can clearly see this in all the local data sets on reasons for cancellations, built on contextual understanding of what might cause cancellations. These contextual contingencies (Bjørn et al. 2009) cannot be transferred to other hospitals, because they are intended only to indicate something about the efficiency of internal routines. This seems to be the point at which the performance standard becomes intertwined with procedural standards; in order to evaluate the effectiveness of the different internal practices, it becomes necessary to make a standard for the work practices as well (Timmerman and Epstein, 2010).

Having standardisation as a main goal of the EPR acquisition, the North Norwegian Health Authority seems to have a strong interest in aligning working routines in the hospitals, asking the working group to use the information in the various local systems to define a “best practice” for all the hospitals. However, our study has illustrated that the routines may vary depending contextual contingencies like patient population, the size of the hospital, its internal policies, and in situ internal negotiations,(Bjørn et al, 2009). It is difficult to see how things could be otherwise: for instance, a small hospital can obviously forecast patients’ requirements more often, enabling better planning. In contrast, large hospitals need later deadlines because they must allow for patients with more unpredictable and acute conditions. Thus, the contextual standards will not easily translate to the level above and still carry the information that makes them useful. Some transferable boundary factors (ibid) must be identified and extracted for bringing the standards up to a higher level.

The working group consisting of local users was asked to prepare guidelines and standards for deployment, government and support of the EPR regionally; that is, they were asked to propose procedural standards. By investigating how a performance standard is perceived and interpreted locally, we can see that the performance standard affects the way that each hospital plans surgery, since it strives to comply with the standard. Thus, hospital negotiate the time of approval of the final plan to yield favourable data, even if this is counterproductive to their internal routines; they keep records on the side to avoid changes to the plan (which would not be cancellations anyway, according to the definition of the standard) and they keep records of reasons for cancellations to improve working routines. This may indicate that a strong drive to achieve the standard of cancellation rates below 5 per cent. According to Bjørn et al. (2009), recognising and defining the contextual contingencies is necessary to take them into account (here to make improvement in the work practices), but still only within the local universalities. This situation also shows that, for internal planning processes, “best practices” may be counterproductive because performance standards are so closely tied to organisational or procedural standards. For instance, to allow proper planning that
increases predictability for health care personnel and patients, it is clearly better to have an early deadline (i.e. time of approval) (Christensen and Ellingsen, 2013). The problem then, as we have pointed out, is that this may result in higher cancellation rates, while a late deadline would meet the incentives of the performance standard of keeping the rate of cancellations low.

The figure illustrates how the contextual contingencies increase the closer to the work practices we get, and hence explain the increasing complexity in interpreting and employing the standard.

The new openEHR technology is promoted as being very flexible for the users who may take charge of the standardisation processes. In a purely technical sense, variables can be defined at a moment’s notice and reused for other purposes. We do not question these technical benefits and believe that there is potential in them. However, it is a mistake to believe that the openEHR approach will solve the standardisation process in one fell swoop. Take but one example; if a standard were defined only locally—which is possible with the openEHR framework—and is supposed to be used across several contexts or even nationally, the standard would be impossible to define without the commitment of all the relevant stakeholders at the various health care levels. Consequently, there are inherent organisational limitations to the flexibility offered to the users despite the technical flexibility in the openEHR architecture. This forces us to reconsider who the users actually are. In a way, they reside on all the different levels discussed above. These users frequently have different interests in the standards, and the defining process will have to consider this. To some degree, such realisation has reached the openEHR community itself. Recently the Australia’s National E-Health Transaction Authority stated

Figure 1  Different user perspectives on the standard “cancellations of surgery”. The closer to the work practice, the more contextual factors shape how the standard is interpreted
that “undisciplined creation and application of archetypes threatens the goal of semantic interoperability” (Garde et al., 2007) and therefore there are increasing demands for systematic organisation of archetype development and maintenance on national and international levels (Kohl et al., 2008). Thus, it may not be as simple as saying that the clinicians are put in the driving seat for defining the content in the EPR.

7 Conclusion

Standardising health care seems extremely difficult, since by nature clinical work is unpredictable and individual-oriented. In this paper, we have examined the local use of a formal performance standard and how it is shaped by perspectives and contextual understandings. We have demonstrated that the national quality indicator “cancellations of surgery” is adapted locally in ways that promote many different understandings and thus application of the standard. These differences render data quality questionable, though the domain is nevertheless used in authorities’ and managements’ evaluation of performance in health care and as a data source for research articles. Through our case, we have identified interests in the performance standards differing according to the organisational level of the users. It thus becomes problematic to define the standard universally for all the users. As an alternative approach to standardisation, the openEHR architecture seems promising because it does not impose formal standards per se, but instead invites clinicians to contribute in defining archetypes as standards. Nevertheless, while the flexibility of openEHR technology may be evident, the organisational processes implicated in standardisation processes are still painfully complex. In defining archetypes, the need for interoperability must be carefully balanced against local usefulness. Thus, in the standardisation of deployment, government and support of the new EPR and in our case, the surgery planning module, the interests at the different levels must be identified so they may be built in the definitions of archetypes accordingly. Subsequently, each level may formally define its contextual (local) universality as an extension of the level above, interacting and communicating with the entire system through the standards of the level above, while at the same time maintaining their local data sets. The challenge seems to be the ability to compare performance, since, as we have shown here, performance and procedural standards are actually intertwined, and in surgery planning this is particularly true.

References


