



Original Research

# Variability in elective day-surgery rates between Belgian hospitals - Analyses of administrative data explained by surgical experts



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## HIGHLIGHTS

- The variability in day-surgery rates between Belgian hospitals is considerable.
- Also for procedures with high national day-care rates there are some hospitals with low day-care rates.
- Medical team related factors, financial, organisational and patient related factors contribute to the high variability.
- Policies towards more day surgery in Belgium should also include benchmarking and the monitoring of quality indicators.

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## ABSTRACT

**Background:** In the last decades, day surgery has steadily and significantly grown in many countries, yet the increase has been uneven. There are large variations in day-surgery activity between countries, but also within countries between hospitals and surgeons. This paper explores the variability in day-care activity for elective surgical procedures between Belgian hospitals.

**Materials and methods:** The administrative hospital data of all patients formally admitted in a Belgian hospital for inpatient or day-care surgery between 2011 and 2013 were analysed and summarized in graphs. During 11 expert meetings with ad-hoc surgical expert groups the variability in day-surgery share between hospitals was discussed in depth.

**Results:** The variability in day-care share between Belgian hospitals is considerable. For 37 out of 486 elective surgical procedures, the variability ranged between 0 and 100%. High national day-care rates do not preclude room for improvement for certain hospitals as for the majority of these procedures there are "low performers". According to the consulted clinical experts, the high variability in day-care share may for the greater part be explained by medical team related factors, customs and traditions, the lack of clinical guidelines, financial factors, organisational factors and patient related factors.

**Conclusion:** If a further expansion of day surgery is envisaged in Belgium the factors that contribute to the current variability in day-surgery rates between hospitals should be addressed. In addition, a feedback system in which hospitals and health care providers have the figures on their percentage of procedures carried out in day surgery compared to other hospitals and care providers (benchmarking) and the monitoring of a number of quality indicators (e.g. unplanned readmission, unplanned inpatient stay, emergency department visit) should be installed.

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## 1. Introduction

In the last decades, day surgery has steadily and significantly grown in countries with established stable economies [1]. Advances in surgery and analgesia, changes in clinical practice and in the attitude of the surgical team, as well as the establishment of dedicated day-surgery facilities with dedicated staff and well-defined care pathways, together with financial incentives have

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made this development possible [1–7].

The rationale for the shift from inpatient towards day surgery is multifactorial. In comparison with inpatient surgery, day surgery is considered to be cost effective as hospitalisation time is diminished, night and weekend staffing is not needed, the hotel element of treatment is reduced and capital facilities and staff are used more intensively [1]. By moving surgical procedures to a dedicated surgical unit, inpatient beds can be unblocked for more extensive surgical cases or other usage, or closed with consequent savings [1]. Although a systematic literature search on the efficacy and safety issues of day surgery revealed that the quality of the retrieved scientific evidence was low [8], day surgery can be considered safe for a wide range of interventions [9,10]. Patients with stable chronic diseases (e.g. diabetes, epilepsy) are often better managed as day cases because their daily routine is minimally disrupted [11]. In addition, day surgery may reduce the risk of cross-infection since day-surgery patients are kept separate from sicker patients, spend less time in hospital, return quicker to mobility and recover further at home [1,12]. Finally, although patient and relatives' satisfaction rates following day surgery are high [1,13–15], a recent study stresses that problems (e.g. pain management, self-care) might occur after discharge when not sufficiently anticipated by the day surgery team [16]. Still, many patients prefer to recover from surgery in the comfort of their own homes [1].

Yet, the increase in day surgery has been uneven: there are large variations in day-surgery activity between countries, but also within countries between hospitals and surgeons [6,17–22]. Since the greater part of research in this topic concentrated on the international variability in day-surgery use, we intended with this paper to explore the variability in day-care activity for elective surgical procedures between Belgian hospitals. For that purpose administrative hospital data were analysed. In order to well understand the clinical reasoning as well as the practical, financial and organisational barriers that contribute to this variation, in depth discussion sessions with surgeons and anaesthetists were organised.

## 2. Material and methods

### 2.1. Administrative hospital data

For each patient admitted in a Belgian acute hospital, hospitals have to send twice a year medical data (using the International Classification of Diseases - 9th Revision - Clinical Modification, ICD-9-CM) to the Federal Ministry of Health. Each inpatient and day-care stay is assigned an APR-DRG-SOI (All Patient Refined Diagnosis Related Group - Severity of Illness) combination. The APR-DRG system is a patient classification system intended to define medically coherent and cost homogeneous groups. Within each APR-DRG there are four grades of Severity of Illness (SOI): 1 = minor; 2 = moderate; 3 = major; 4 = extreme. In addition, Hospital Billing Data including information about the administered care and reimbursements of each hospital stay, have to be sent to the National Institute for Health and Disability Insurance. Each year, both datasets are linked at the level of the hospital stays. For the present study, the linked data of 2011–2013 (the most recent data available at the time of study) were used.

### 2.2. Identification of elective surgical procedures in the database

In general, surgical procedures were identified through their corresponding ICD-9-CM code. Only when the billing code described the procedure more accurately than the ICD-9-CM code, the former was used to select the procedure.

For the present study only elective surgical interventions were

considered. Likewise, stays with urgent admission and in-office interventions (i.e. procedures not performed in a full operating theatre facility) were considered out of scope. Only stays with SOI 1 and 2 were considered, since stays with higher SOI level refer most probably to patients who have severe comorbidities and hence are less eligible for a day-care approach. Last, stays referring to patients who died during the hospital stay were excluded.

### 2.3. The count of stays

If during a stay, the same elective surgical procedure was performed more than once, the stay was counted only once. However, if during the same stay different elective surgical procedures were performed, the stay was counted for each of the different surgical procedures. This occurred in 10.75% of 2 892 906 stays. For example, if during the same stay the surgical correction of a unilateral prominent ear (ICD-9-CM code 18.5) was combined with a myringotomy (ICD-9-CM code 2001 or 2009), the stay was counted twice.

### 2.4. Statistical analysis

For each surgical procedure, the total number of stays, the number of day-care and inpatient stays, and the proportion of day care were calculated. These data were summarized in bubble graphs, in which each Belgian hospital is represented by a circle. The size of the circles corresponds to the total (i.e. inpatient and day-care) number of selected stays for the procedure of interest. In order to avoid statistical problems with hospitals performing just a couple of procedures, only hospitals which had at least 10 stays for the selected procedure over the 2011–2013 period were considered. In all, the data of 486 procedures (ranging between 14 and 109 per surgical discipline) were analysed. As it is not feasible to include them all in the present paper, only a couple of “representative” figures are presented and discussed here. The interested reader can download the graphs of all these procedures from the KCE website [23].

All analyses were performed with SAS version 9.4 (SAS Institute, Cary, North Carolina, USA).

### 2.5. Recruitment of clinical experts for focus groups

Surgeons and anaesthetists were recruited through invitations sent to the medical directors of all Belgian hospitals and to the relevant Belgian medical societies. An announcement was also posted on the KCE website, shared via social media and through the KCE newsletter. Experts were invited to apply for one or several of the following groups: abdominal surgery, breast surgery, gynaecology, head and neck surgery, neurosurgery, ophthalmology, orthopaedic surgery, plastic and dermatological surgery, thoracic surgery, urology and vascular surgery. The groups were composed in order to respect, as much as possible, an equilibrium in language (Dutch and French), hospital type (university and non-university) and speciality (surgeons and anaesthetists). With each of the eleven groups a meeting was scheduled during which the graphs of a dozen of interventions with variable day-care rates were discussed. The experts received prior to the meeting all graphs related to their discipline so that they could reflect on the observed variability before the meeting.

In total 95 surgeons and anaesthetists from 54 different hospitals participated in one or a few focus groups.

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