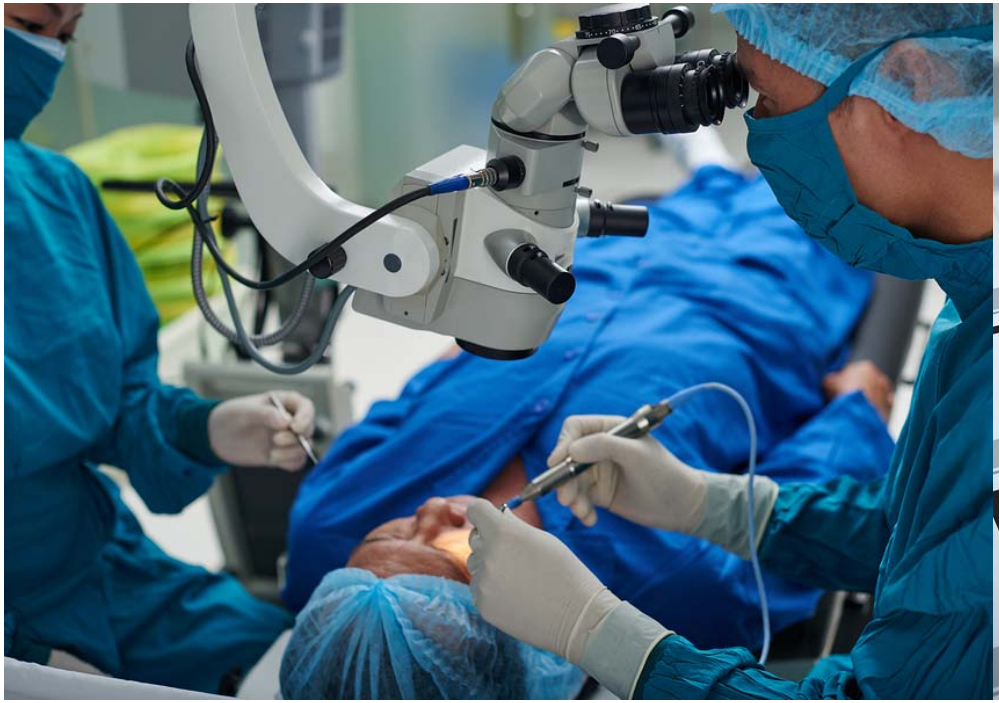
KCE REPORT 282

Federaal Kenniscentrum voor de Gezondheidszorg
Centre Fédéral d'Expertise des Soins de Santé
Belgian Health Care Knowledge Centre

PROPOSALS FOR A FURTHER EXPANSION OF DAY SURGERY IN BELGIUM



KCE REPORT 282
HEALTH SERVICES RESEARCH

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Other reported interests:	All experts and stakeholders consulted within the frame of this report were selected because of their involvement in day surgery in Belgium. Therefore, by definition, they all have a certain degree of conflict of interest to the main topic of this report.
Layout:	Joyce Grijseels, Ine Verhulst

Disclaimer:	• **The external experts were consulted about a (preliminary) version of the scientific report. Their comments were discussed during meetings. They did not co-author the scientific report and did not necessarily agree with its content.** • **Subsequently, a (final) version was submitted to the validators. The validation of the report results from a consensus or a voting process between the validators. The validators did not co-author the scientific report and did not necessarily all three agree with its content.** • **Finally, this report has been approved by common assent by the Executive Board (see http://kce.fgov.be/content/the-board).** • **Only the KCE is responsible for errors or omissions that could persist. The policy recommendations are also under the full responsibility of the KCE.**
Publication date:	31 March 2017
Domain:	Health Services Research (HSR)
MeSH:	Ambulatory surgical procedures; Belgium; Health Service Research; “Delivery of health care”
NLM Classification:	WO 192 Ambulatory Surgical Procedures
Language:	English
Format:	Adobe® PDF™ (A4)
Legal depot:	D/2017/10.273/09
ISSN:	2466-6459
Copyright:	KCE reports are published under a “by/nc/nd” Creative Commons Licence http://kce.fgov.be/content/about-copyrights-for-kce-publications.
How to refer to this document?	Leroy R, Camberlin C, Lefèvre M, Mistiaen P, Van den Heede K, Van de Sande S, Van de Voorde C, Beguin C. Proposals for a further expansion of day surgery in Belgium. Health Services Research (HSR) Brussels: Belgian Health Care Knowledge Centre (KCE). 2017. KCE Reports 282. D/2017/10.273/09. This document is available on the website of the Belgian Health Care Knowledge Centre.

TABLE OF CONTENTS

LIST OF FIGURES **4**
LIST OF TABLES **5**
LIST OF ABBREVIATIONS **7**
SCIENTIFIC REPORT **11**
1 INTRODUCTION **11**
1.1 BACKGROUND 11
1.2 OBJECTIVES & SCOPE 13
1.3 TERMINOLOGY 14
2 ELECTIVE DAY SURGERY IN AN INTERNATIONAL CONTEXT **15**
2.1 WORLDWIDE PRACTICE OF DAY SURGERY 15
2.1.1 Challenges and difficulties in comparing international day-surgery data 15
2.1.2 International data collections 17
2.2 SETTING TARGETS AND INCENTIVES TO PROMOTE DAY SURGERY 32
2.2.1 France: targets for day-surgery rates 32
2.2.2 France: instruments to increase day surgery 35
2.2.3 England: targets for day-surgery rates 37
2.2.4 England: instruments to increase day surgery 40
3 DAY-CARE STAYS IN BELGIAN HOSPITALS: DEFINITION, PAYMENTS AND VOLUME **42**
3.1 DEFINITION OF A DAY-CARE STAY 42
3.2 HOSPITAL PAYMENT SYSTEMS FOR DAY-CARE ACTIVITIES 42
3.2.1 Hospital-dependent lump sums 44
3.2.2 Hospital-independent lump sums 45
3.2.3 Patients hospitalised in another hospital 47

3.2.4 Financing of day surgery through the Budget of Financial Means....47
3.3 EVOLUTION OF DAY-CARE VOLUME AND EXPENDITURES....49
3.4 CRITICAL APPRAISAL OF THE PAYMENT SYSTEM FOR DAY SURGERY....51
3.4.1 List A....51
3.4.2 Inappropriate inpatient stays....51
3.4.3 Shared responsibilities between RIZIV – INAMI and FOD – SPF hamper coherent policymaking....51
3.5 REMUNERATION OF MEDICAL SPECIALISTS....52
3.6 PATIENT COST SHARING: CO-PAYMENTS AND SUPPLEMENTS....52
3.6.1 Fee supplements....53
3.6.2 Room supplements....53
3.6.3 Material supplements....53
3.6.4 Amount of supplements charged for inpatient and day-care stays....54
3.6.5 Co-payments....55
4 SCIENTIFIC LITERATURE REVIEW....57
4.1 RESEARCH QUESTIONS....57
4.2 RESEARCH QUESTION 1 – METHODS....57
4.2.1 Searches....57
4.2.2 Selection....59
4.2.3 Quality assessment & data extraction....59
4.3 RESEARCH QUESTION 1 – RESULTS....60
4.3.1 Evidence base....60
4.3.2 Which patient characteristics preclude patients from undergoing elective surgical interventions in a day-care setting?....60

4.4 RESEARCH QUESTION 2 - CAN ELECTIVE SURGICAL INTERVENTIONS BE PROVIDED IN A DAY-CARE SETTING AS SAFELY AND EFFECTIVELY AS IN AN INPATIENT SETTING? 75

5 IDENTIFICATION OF ELECTIVE SURGICAL PROCEDURES FOR DAY CARE 77

5.1 INTRODUCTION AND OBJECTIVES 77

5.2 METHODOLOGY 77

5.2.1 Expert recruitment 77

5.2.2 Composition of the expert groups 77

5.2.3 Composition and validation of the lists of interventions eligible for a day-care approach 79

5.2.4 Analysis of Belgian administrative data 85

5.2.5 Discussion in expert groups 88

5.3 RESULTS 90

5.3.1 Online survey 90

5.3.2 Belgian administrative data 91

5.3.3 Discussion in expert groups 103

■ **REFERENCES 116**

LIST OF FIGURES

Figure 1 – Cataract surgery in 2014 (or nearest year): volume and proportion performed in day care and in outpatient care for a selection of European countries....23
Figure 2 – Tonsillectomy in 2014 (or nearest year): volume and proportion performed in day care and in outpatient care for a selection of European countries....24
Figure 3 – Cholecystectomy in 2014 (or nearest year): proportion performed laparoscopic versus non-laparoscopic (open) for a selection of European countries....25
Figure 4 – Cholecystectomy in 2014 (or nearest year): volume and proportion performed in day care for a selection of European countries....26
Figure 5 – Partial excision of mammary gland in 2014 (or nearest year): volume and proportion performed in day care for a selection of European countries....27
Figure 6 – Price setting of day case Best Practice Tariffs – the case of cholecystectomy....41
Figure 7 – Overview of major reforms in payments for day care....44
Figure 8 – Evolution of Group 1-7 lump sum amounts (2007-2017)....46
Figure 9 – Evolution of lump sum payments for day-care activities by type, 1995-2015....50
Figure 10 – Evolution of the number of day-care activities by type, 1995-2015....50
Figure 11 – Selection of APR-DRGs within the selected Major Diagnostic Categories (MDCs)....82
Figure 12 – Evolution in day-care rate among 11 surgical disciplines, 2011-2013....92
Figure 13 – Regional differences in day-care rate among 11 surgical disciplines, 2011-2013....92
Figure 14 – Lens extraction with insertion of an intraocular lens prosthesis, 2011-2013....96
Figure 15 – Excision of an epididymal cyst, 2011-2013....98
Figure 16 – Unilateral repair of an inguinal hernia with a prosthesis or graft, 2011-2013....99
Figure 17 – Arthroscopic repair of cruciate ligaments of the knee, 2011-2013....100
Figure 18 – Laparoscopic cholecystectomy, 2011-2013....101

LIST OF TABLES

Table 1 – Total number of surgical procedures: comparison between OECD, Eurostat and WHO-Europe data (last available year) 17
Table 2 – Suggested lists of surgical index procedures 18
Table 3 – Surgical procedures in 2014 (or nearest year): volume and proportion performed in day care (and outpatient care) for a selection of European countries 28
Table 4 – Potential substitution rates (%) of day surgery for inpatient care 33
Table 5 – National growth path for day surgery 34
Table 6 – Calculation of the single tariff in 2014 for four categories of GHMs 36
Table 7 – Lump sum amounts for day-care activities in 2017 46
Table 8 – Co-payments for an inpatient and day-care stay (2017) 56
Table 9 – PICO table and selection criteria 58
Table 10 – References obtained through electronic databases 60
Table 11 – ASA classification 62
Table 12 – BMI classification 66
Table 13 – Composition of the expert groups 78
Table 14 – Major Diagnostic Categories considered for the present study 81
Table 15 – All Patient Refined Diagnostic Related Groups with specific words 82
Table 16 – All Patient Refined Diagnostic Related Groups without day-care stays in 2013 82
Table 17 – All Patient Refined Diagnostic Related Groups with “inconsistent data” 83
Table 18 – APR-DRG 313 87
Table 19 – Number of procedures discussed with the clinical experts 89
Table 20 – Response rate by expert group 90
Table 21 – Number of selected procedures and related day-care and inpatient stays (2011-2013) 91
Table 22 – Top-10 day-surgery procedures (2011-2013) 94
Table 23 – Lens extraction with insertion of an intraocular lens prosthesis, 2011-2013 96

Table 24 – Elective surgical procedures with high national day-care rates and outliers, 2011-2013 97
Table 25 – Excision of an epididymal cyst, 2011-2013 97
Table 26 – Elective surgical procedures with a variability in day-care rate between 0 and 100%, 2011-2013 98
Table 27 – Unilateral repair of an inguinal hernia with a prosthesis or graft, 2011-2013 99
Table 28 – Arthroscopic repair of cruciate ligaments of the knee, 2011-2013 100
Table 29 – Laparoscopic cholecystectomy, 2011-2013 101
Table 30 – Composition of the expert groups..... 103

LIST OF ABBREVIATIONS

ABBREVIATION	DEFINITION
ADH – HJA	Day-care billing data (“Anonieme daghospitalisatie”/”Hospitalisation de jour anonyme”)
AM	Ante meridiem (before noon)
ANAP	Agence Nationale d’Appui à la Performance des établissements de santé et médico-sociaux (France)
APR-DRG	All Patient Refined Diagnosis Related Group
ARS	Regional Health Agencies (”Agences Régionales de Santé”, France)
ASA	American Society of Anaesthesiologists
AZV – SHA	Hospital billing data (“Anonieme Ziekenhuisverblijven”/”Séjours Hospitaliers Anonymisés”)
BAAS	Belgian Association of Ambulatory Surgery
BADS	British Association of Day Surgery
BFM	Budget of Financial Means (“Budget van Financiële Middelen”/”Budget des Moyens Financiers”)
BMI	Body mass index
BPT	Best Practice Tariff(s)
CABG	Coronary artery bypass grafting
CI	Confidence interval
COPD	Chronic obstructive pulmonary disease
DC	Day care
DGOS	Direction Générale de l’Offre de Soins (France)
DS	Day surgery
DSDP	Day Surgery Data Project
FHP-MCO	Branche Médecine, Chirurgie et Obstétrique de la Fédération de l’Hospitalisation Privée (France)

FOD – SPF	Federal Public Service Health, Food Chain Safety and Environment (“Federale overheidsdienst Volksgezondheid, Veiligheid van de Voedselketen en Leefmilieu”/”Service public fédéral Santé publique, Sécurité de la Chaîne Alimentaire et Environnement”)
GHM	Groupes Homogènes de Malades (the French version of the Diagnostic Related Groups)
HAS	Haute Autorité de Santé (France)
HDR	Hospital Discharge Register (“Landelijke Medische Registratie”, the Netherlands)
HES	Hospital Episode Statistics
HIV	Human Immunodeficiency Virus
HTA	Health technology assessment
HRG	Healthcare Resource Group(s)
I.V.	Intravenous
IAAS	International Association for Ambulatory Surgery
ICD	International Classification of Diseases
ICD-10-AM	International Classification of Diseases, Tenth Revision, Australian Modification
ICD-9-CM	International Classification of Diseases, Ninth Revision, Clinical Modification
ICHI	International Classification of Health Interventions
IGF	Inspection Générale des Finances (France)
IGAS	Inspection Générale des Affaires Sociales (France)
KCE	Belgian Health Care Knowledge Centre (“Federaal Kenniscentrum voor de Gezondheidszorg”/”Centre Fédéral d’Expertise des Soins de Santé”)
LoE	Level of evidence
LOS	Length of Stay
MAOI	Monoamine oxidase inhibitors
MCPJ	Metacarpophalangeal Joint

MDC	Major Diagnostic Categories
MSAP	Prior approval procedure (“Mise sous Accord Préalable”, France)
MZG – RHM	Hospital discharge dataset (“Minimale Ziekenhuis Gegevens”/”Résumé Hospitalier”)
NCSP	NOMESCO Classification of Surgical Procedures
NHS	National Health Service
NOMESCO	Nordic Medico-Statistical Committee
NSAID	Nonsteroidal anti-inflammatory drugs
OCMW – CPAS	Public municipal welfare centre (“Openbaar Centrum voor Maatschappelijk Welzijn”/”Centre Public d'Action Sociale”)
OECD	Organisation for Economic Co-operation and Development
OPAT	Outpatient Parenteral Antimicrobial Therapy
OR	Odds ratio
OR	Operating Room
OSA	Obstructive sleep apnoea
P25	25th percentile
P50	50th percentile or median
P75	75th percentile
PbR	Payment by Results
PIPJ	Proximal Interphalangeal Joint
PSD	Planned same day
PTCA	Percutaneous transluminal coronary angioplasty
RCT	Randomised controlled trial
RD	Royal Decree

RIZIV – INAMI	National Institute for Health and Disability Insurance (“Rijksinstituut voor Ziekte- en Invaliditeitsverzekering”/”Institut National d’Assurance Maladie-Invalidité”)
ROM	Risk of mortality
SES	Socioeconomic status
SFAR	Société Française d’Anesthésie et de Réanimation (France)
SOI	Severity of illness
Sx	Surgery
T2A	Activity-based tariffs (“Tarification à l’activité”, France)
TCT	Technical Cell (“Technische Cel voor de verwerking van de gegevens met betrekking tot de ziekenhuizen”/”Cellule Technique de traitement de données relatives aux hôpitaux”)
TPED	Total Passive Extension Device
UK	United Kingdom
VCD	Vascular Closure Device
WHO	World Health Organization

SCIENTIFIC REPORT

1 INTRODUCTION

1.1 Background

Day surgery covers a wide range of surgical interventions, ranging from minor interventions under local anaesthesia to major interventions under general anaesthesia, encompassing all surgical disciplines.[1] In the last decades, day surgery has steadily and significantly grown in countries with established stable economies, though at varying rates.[2] As a matter of fact, day surgery represents an innovative tool for the health sector reform in Europe by contributing to several common objectives: improving quality of care, controlling cost, and enhancing efficiency and possibly equity.[3]

In order to promote the worldwide development of high quality day surgery the International Association for Ambulatory Surgery (IAAS) was founded (in 1995); the Belgian Association of Ambulatory Surgery (BAAS) was one of its founding members.(http://www.iaas-med.com)

Contributing factors to the growth of day surgery

In the literature, day surgery growth has been attributed to several factors:

- **Developments in surgery**: The introduction of minimally invasive surgical procedures has made several surgical interventions less complex and risky and results in less tissue damage and post-operative pain. It has allowed many procedures to move from inpatient to day-care settings.[4, 5] In addition, some completely new approaches (e.g. angioplasty) to surgical problems have facilitated a move to a day-care approach.[2]
- **Developments in anaesthesia and analgesia** (e.g. short acting anaesthetics with minimal side effects, improvements in regional anaesthesia, the laryngeal mask, new halogenated anaesthetic gases) also supported the growth in day surgery.[4] In addition, advances in both anaesthesia and surgical techniques have also allowed to offer more elective surgical procedures in day care to patients who were previously deemed unsuitable due to various co-morbidities (e.g. American Society of Anesthesiologists (ASA) grade III and IV patients).[2, 6]

- **Changes in clinical practice**: Over the past decades, the length of stay following surgery has been steadily reduced (e.g. in the 1960s patients were admitted to hospital for approximately one week after tonsillectomy while nowadays this is done in day care in many countries).[4] This reduction has been enabled (among others) with the development of care pathways and of enhanced recovery programmes[a], the latter encouraging early mobilisation.[6, 8]
- **A change in attitude of the surgical team**: Nowadays, there is e.g. in many cases no reason why patients should not return home with a catheter or drain in situ, as modern catheters have become less irritating than in the past and modern small plastic vacuum drains cause little inconvenience.[2] In addition, the surgical team has become more and more aware of important issues such as patient selection and proper peri-operative care in day surgery.[4] Yet, the medical team has to be prepared to undertake the extra work and responsibility involved in the management of day-surgery patients.
- The establishment of **dedicated day-surgery facilities with dedicated nursing and management staff** and **well defined care pathways**.[9] Although day surgery is very well possible without the provision of dedicated day surgery facilities, hospitals that achieve high performance in day surgery have dedicated units (e.g. with its own entrance, reception, waiting area, operating theatres, ward area).[2, 6] Both the internal configuration (ensuring ease of patient flows) and the external configuration (ease of patient access) are important aspects of day-surgery facilities.[10]
- **Financial factors**: Countries are struggling to control costs in health services; the ability to treat more surgical patients in less beds resulted in the cost-effectiveness of day surgery being high on the political agenda of many countries.[6]

Barriers to day-surgery growth

Yet, despite the growth in day surgery worldwide, several factors may impede the establishment of day surgery or may slow a further development:

- **Clinical preference and/or tradition among surgeons and anaesthetists**, who may believe that day surgery is unsafe, are important factors.[2] Some specialists may lack experience with new techniques (e.g. minimally invasive surgical techniques), may not be eager to adopt innovations, or may have doubts concerning the safety of certain new procedures.[11] Others are not inclined to organise their work (e.g. discharge administration) in a different way or see day surgery as “minor” and less of a challenge, while in certain countries surgeons fear the loss of control over hospital beds or “their ward”.[6] Not only surgeons and anaesthetists, but also the nursing staff may have a strong preference for inpatient surgery.[6]
- **Lack of day-surgery facilities**: As was mentioned before: day surgery is possible without the provision of dedicated day-surgery facilities, yet the lack of adequate facilities can also be a barrier to its growth.[2] The lack of a dedicated day-surgery theatre, may result in day cases being operated on in general theatres and therefore not always receiving priority and in many cases being pushed back or cancelled due to emergencies. This may in turn result in insufficient recovery time for patients, which necessitates unanticipated admission.[12]
- **Patient preference and lack of information**: Prospective patients and their referring physicians may not be fully aware of the opportunity to have day surgery,[10] leading to “patients who don’t want day surgery”. Indeed, in cultures where day surgery is new, it is important to educate patients on the advantages.[6]

[a] “An Enhanced Recovery After Surgery (ERAS) programme represents an interdisciplinary model, designed with the intention of safely hastening postoperative recovery by easing the stress response. Inevitably, postoperative complications impede recovery. However, several factors other than morbidity delay recuperation in postoperative patients, namely: pain; gut dysfunction, and immobility. Rehabilitation pathways apply evidence-based principles of care, focusing on the optimization of postoperative analgesia, early feeding, and ambulation to reduce stress and organ dysfunction.”[7]

- **Deficient local, home and community support**: Lack of adequate community services may preclude some patients from obtaining day surgery.[10] Also, if the communication between the surgical team and primary care is suboptimal, the quality of aftercare may be endangered.
- **Economic barriers**: Reimbursement may be more advantageous for hospitals and/or specialists if patients are admitted in hospital for 24 hours or more; the reimbursement system "values" the same intervention less if it is performed in a day-surgery setting.[9] Likewise, patients may be obliged to pay a percentage of the total fee for day surgery, while they can receive full coverage in case of regular hospitalization.[10]
- **Regulatory barriers and failing political will**: National regulations and legislation may preclude a shift to day surgery.[10] Apparently some governments fear they may lose votes when they promote day surgery, under the pretext of patients expecting a stay in hospital following surgery. Likewise, pressure from hospital managers and the medical profession to maintain the status quo has been identified as a potent political force in some countries.[2]

Conclusions of previous KCE reports adopted in the Action Plan for a reform of the Belgian hospital payment system

In the 2012 KCE report on day-care activities it was concluded that there was room for a further expansion of day-care activities in Belgium. One of the striking observations was that the increase in day-care payments was not compensated by a commensurable decrease in inpatient payments.[13] But also, the current payment rules for day-care activities are so complex that they fail to give clear incentives in favour of day care.[13, 14]

These KCE concerns were adopted in the Action Plan for a reform of the Belgian hospital payment system of the minister of Social Affairs and Public Health (April 2015):"In Belgium there is still room for the reduction of the number of inpatient stays (and this way for the cutback of the acute hospital infrastructure) and the transition towards day care, indeed on the understanding that sufficient after-hospital care is provided."[15]

1.2 Objectives & scope

The present study was commissioned by the cabinet of the minister of Social Affairs and Public Health, and fits within the above mentioned Action Plan. The study has two major objectives:

1. Define which elective surgical interventions can safely be performed in a day-care approach as an alternative for inpatient care;
2. Investigate how the day-care rate for those procedures can be increased.

For frequently conducted interventions, the impact of substituting day care for inpatient care on the needed hospital capacity (for example, measured in terms of beds) will be assessed in a subsequent study.

Due to time constraints, only elective surgical interventions (i.e. operating room procedures) were considered; hence, non-surgical procedures also performed in day care (e.g. dialysis, oncological therapies) were considered out of scope.

Likewise, emergency surgical interventions and in-office interventions were considered out of scope.

1.3 Terminology

In 2003, the following international definition was adopted by the IAAS Executive Committee and later confirmed in the Policy Brief published by the WHO, the Pan American Health Organization and the European Observatory on Health Systems and Policies in 2007:[10, 16]

> "A surgical day case is a patient who is admitted for an operation on a planned non-resident basis and who nonetheless requires facilities for recovery. The whole procedure should not require an overnight stay in a hospital bed."

In addition, the following definitions have been provided by the IAAS in 2003:

Term	Definition issued by IAAS in 2003
Inpatient	A patient admitted into a hospital, public or private, for a stay of 24 hours or more.
Ambulatory Surgery – Extended Recovery Patient	A patient treated in ambulatory surgery/procedure centre/unit, free standing or hospital based, who requires extended recovery including overnight stay, before discharge the following day.
Ambulatory surgery / procedure patient	A patient having an operation/procedure, excluding an office surgery or outpatient operation/procedure, who is admitted and discharged on the same working day.
Outpatient	A patient treated solely in the outpatient department, including such services as ambulatory procedure, interventional radiology, radiotherapy, oncology, renal dialysis, etc.

The terms "day surgery" and "ambulatory surgery" are synonyms. The term "outpatient surgery" equates to these two terms in some countries, but in others it is used in another setting.

In order to avoid Babel-like confusions, we will slightly deviate from these international definitions in the present report. More precisely, we opted to use the term "day surgery" and to avoid the term "ambulatory surgery" as the latter may cause confusion in a Belgian context where the Dutch word "ambulant" and the French word "ambulatoire" rather refer to office-based surgery provided in a doctor's consulting room or office (which can be outside or inside the hospital premises). Hence, for the present report the following terms and definitions apply:

Term	Definition applied in the present report
Inpatient	A patient admitted into a hospital, public or private, who is not discharged on the day of admission.
Day-surgery patient	A patient having an elective surgical intervention that requires a full operating theatre facility, excluding an office intervention, who is admitted and discharged on the same day.
Outpatient	A patient having an intervention in a doctor's consulting room or office (i.e. not in a full operating theatre facility), which can be outside or inside the hospital premises.

2 ELECTIVE DAY SURGERY IN AN INTERNATIONAL CONTEXT

2.1 Worldwide practice of day surgery

The increase in day surgery has been uneven. There are large variations in day-surgery activity between hospitals within countries (which will be discussed for Belgium in section 0) as well as between countries, which is the scope of the present chapter. For instance, the data collected within the scope of the DaySafe project[b] revealed a huge variability in the proportion of day-surgery procedures of the total number of planned surgical procedures: Denmark reported the highest level (91%), followed by Norway (64%), Italy, Spain, Belgium and Portugal, where the proportion was equal or near 50%, and finally Romania (7%).[9]

But before elaborating more on international data collections, it is wise to reflect on the challenges and difficulties when comparing international day-surgery data.

2.1.1 Challenges and difficulties in comparing international day-surgery data

Elective day surgery is undertaken in various settings in different countries; procedures performed in a hospital operating room in one country may be done in a doctor's office in another, which makes the comparison of international data hard.[1] But there are many more reasons why interpreting international day-surgery data should be performed with caution:

- The first problem is that there is currently **no international classification of procedures**[c] available and implemented across countries, which would facilitate consistent data reporting based on an identical coding system.[17] As a consequence, there is also no consensus on the "granularity" of national classification systems, more precisely on the structure, grouping and number of codes for recording different procedures.[17]
- At least three different methods are used to **count surgical procedures:**[17]
  - *A count of all procedures* that are registered on the hospital discharge record (without any restriction) may result in a much higher number of procedures reported than a count based only on the main procedure or on the number of patients treated. But this overestimation will also depend on the granularity of the national classification system used (e.g. a coronary angioplasty with the insertion of a stent is counted as two separate procedures in ICD-9-CM, while it is counted as only one procedure in several other national classification systems; see also the text box).[17] In the final report of the Hospital Data Project[d] Phase 2 the count of all procedures was recommended, but with the important caveat that only one procedure code per procedure category should be counted to avoid any double-counting arising from the different granularity of national classification systems.[18] The recommendation to count only one procedure code per procedure category was introduced by the OECD in the 2011 data collection.[17]

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b The aim of DaySafe project (2009-2011), which was co-funded by the European Commission, was to reduce the obstacles for day surgery expansion across Europe in order to improve patient safety.[9]

c The International Classification of Health Interventions (ICHI) is being developed to provide a common tool for reporting and analysing health interventions for statistical purposes; so far it has not been released yet. (http://www.who.int/classifications/ichi/en/)

d The Hospital Data Project Phase 1 resulted in a short list of data to be collected on diagnosis, while the objective of the Phase 2 project was to expand this shortlist to important parameters of hospitalisation and morbidity (for both diagnosis and procedures).[18]

- *A count limited to the main procedures* (excluding any secondary procedures) will provide in most cases a number equal or close to a count based on the number of patients receiving the operation, except if the operation is not recorded as the main procedure.[17] The authors of the Hospital Data Project Phase 2 did not recommend this approach because the practice of recording a "main" procedure only exists in about half of European countries (e.g. it does not exist in Belgium) and second, because this may result in an under-reporting of those procedures which are not recorded as the "main" procedure.[18]
- *A count of the number of patients* who have received a certain procedure during their hospital stay.

Impact of national classification systems on data reporting

The change in the classification system in Ireland in 2005 (from the ICD-9-CM American system to ICD-10-AM Australian system) provides a striking example of the impact a given classification system might have on data reporting, if all procedures are counted. In ICD-9-CM, a coronary angioplasty involving the insertion of a stent (which happens in most cases to keep the artery open) is coded as two separate procedures, while in ICD-10-AM, it is coded as a single procedure only. This explains why reported angioplasty rates fell by nearly half in Ireland following the implementation of the ICD-10-AM classification system in 2005. By implication, this means that countries that are still using the ICD-9-CM classification are reporting rates of angioplasties almost two times greater than those using the ICD-10-AM classification, even without any real difference in activity rates, if all procedures are reported without any caveat/limitation. The same is also true for cataract surgery.

(Reproduced from Lafortune et al. 2012[17])

- There are **differences in data coverage** across countries, particularly for surgical procedures that do not require any overnight stay in hospital.[17] For instance, in the data collection performed by the OECD and Eurostat (who traditionally applied a breakdown between inpatient cases and day cases), the coverage was in many countries limited to the number of patients formally admitted to hospitals and discharged the same day, while in other countries the dataset also included patients having an intervention in a doctor's consulting room (inside or outside the hospital premises).[16, 17] Similarly, since some countries (e.g. the USA) consider a stay of less than 24 hours as ambulatory/day surgery, their day-surgery databases also include these patient stays.[2]
- The need to report performed procedures in various facilities (e.g. private clinics, extramural surgery centres) differs among countries.[1] For instance in the IAAS survey the growing private sector of Denmark is not reflected in the data.[19] For Belgium the cataract procedures performed in extramural surgery centres are not adopted in the Technical Cell dataset (cf. section 5.2.4). Likewise, **data completeness is variable** since the original data sources are very different from one country to another: in some countries (e.g. the Scandinavian countries) there are very reliable central databases where all surgical procedures are registered, while in other countries there are decentralised registers or only some procedures are listed.[1, 3]
- There are **differences in perspectives**: day-surgery rates may be looked at as a proportion of the total number of surgical procedures or as a proportion of elective (planned) surgical procedures. It can be argued that the first approach is most useful since the size of waiting lists, cultural differences and traditions may influence the split between elective and non-elective surgery. On the other hand, this may also be disputed since the majority of day-surgery procedures are planned.[1]

2.1.2 International data collections

2.1.2.1 Data collections on the aggregate number of (surgical) procedures

Until 2010, the OECD, Eurostat and WHO-Europe were separately collecting data on the total aggregate number of surgical procedures. A comparison of these data collections revealed wide inconsistencies in national data submissions to the three organisations (Table 1). This is not surprising given the differences in scope and definition of the data collection: the definition for the Eurostat data collection was much broader (i.e. it included not only surgical procedures, but also diagnostic, rehabilitative and other medical procedures), the WHO-Europe data collection included merely inpatient cases (while the OECD and Eurostat data collection included both inpatient and day cases) and for the OECD data collection only the main procedure performed on a patient during a hospital stay was reported.[17] Yet, also other factors such as differences in the coverage of procedures or the coverage of settings may have contributed to the inconsistencies.

Recognising the difficulties in promoting consistent data reporting across countries as long as there is no international classification of procedures, the OECD, Eurostat and WHO-Europe decided, in line with the recommendations of the Hospital Data Project Phase 2, to discontinue their data collection on the aggregate level and to **focus on improving the disaggregated data collection** (i.e. on a selected shortlist of well-defined procedures).[17, 18]

Table 1 – Total number of surgical procedures: comparison between OECD, Eurostat and WHO-Europe data (last available year)

		Total number of procedures							Difference in %			
		OECD			Eurostat			WHO	OECD/ ESTAT		OECD/ WHO	WHO/ ESTAT
		Inpatient	Day care	Total	Inpatient	Day care	Total	Inpatient	In-patient	Day care	Inpatient	Inpatient
Belgium	2007	651 744	543 428	1 195 172	6 244 114	2 074 425	8 318 539	921 881	-90%	-74%	-29%	-85%
Denmark	2007	415 040	404 694	819 734	531 164	740 887	1 272 051	531 146	-22%	-45%	-22%	0%
Finland	2008	335 236	215 608	550 844	550 844	184 976	735 820	550 764	-39%	17%	-39%	0%
Germany	2008	5 425 693	1 808 747	7 234 440	41 348 869	443 961	41 792 830	5 425 693	-87%	307%	0%	-87%
Ireland	2008	143 453	98 819	242 272	1 046 492	966 482	2 012 974	143 453	-86%	-90%	0%	-86%
the Netherlands	2007	651 335	664 031	1 315 366	865 000	1 097 000	1 962 000	651 000	-25%	-39%	0%	-25%
Sweden	2007	671 461			428 534	1 085 769	1 514 303	632 922	57%		6%	48%
United Kingdom	2007	4 406 428	5 248 580	9 655 008	4 027 923	5 734 170	9 762 093	4 978 511	9%	-8%	-11%	24%

(Reproduced from Lafortune et al. 2012[17], limited to a selection of Western European countries with variable day-care share)

2.1.2.2 *Disaggregated data collection*

Index procedures

In order to monitor day-surgery changes over time within the different countries and to benchmark the activity in one country against other countries, some typical procedures from each specialty have been selected as "index procedures" or "basket procedures".[1]

From 2011 on, the 15 procedures selected for the OECD data collection (not focused on day surgery), were chosen mainly based on the criteria of high volume and/or high cost (Table 2). In order to make the data from different countries as uniform as possible, the usual surgical naming of a procedure has been combined with the international ICD-9-CM and the Nordic Medico-Statistical Committee (NOMESCO) Classification of Surgical Procedures (NCSP) coding systems (not presented in Table 2).

For the first (1994-95) and second (1997) IAAS survey 20 index procedures were chosen, but from the 2004 survey on, the number of index procedures was increased to 37 (Table 2).[1, 19, 20] The IAAS index procedures were chosen according to two criteria: either procedures that have been done in large numbers for a long time in day surgery or procedures that are increasingly being undertaken on a day basis and hence "on the edge" in the development of day surgery.[1 19]

Within the Day Surgery Data Project (DSDP) consensus was reached on a list of index procedures which was based on the OECD list, obviously with a specific focus on day surgery (Table 2, last column).[3]

Again, the problems described in paragraph 2.1.1 apply: due to (among others) different coding systems used in different countries, the lack of uniformity of the nomenclature and the variability in the coding of procedures by surgeons (which may also render problems when comparing data between hospitals within one country), one cannot be certain that comparisons of exactly the same procedures are made.[1]

Table 2 – Suggested lists of surgical index procedures

Surgical procedures	ICD-9-CM code	OECD 2011-2012 data collection		IAAS		DSDP
		Inpatient cases	Day-surgery cases	1994-5 & 1997	2004 & 2011	
Cataract surgery	13.1-13.7	v	v	v	v	v
Squint surgery	15.0-15.9			v	v	
Myringotomy (with tube insertion)	20.01			v	v	
Tonsillectomy with or without adenoidectomy	28.2-28.3	v	v	v	v	v
Rhinoplasty	21.8				v	
Surgical tooth extraction/ Extraction of impacted teeth	23.1			v	v	
Submucous resection	21.5			v		
Broncho-mediastinoscopy	33.22, 33.24, 34.22				v	

Surgical procedures	ICD-9-CM code	OECD 2011-2012 data collection		IAAS		DSDP
		Inpatient cases	Day-surgery cases	1994-5 & 1997	2004 & 2011	
Percutaneous transluminal coronary angioplasty (PTCA and stenting)	36.0	v				
Coronary bypass	36.1	v				
Laparoscopic antireflux	44.64-44.66				v	
Appendectomy	47.0	v				
Cholecystectomy	51.2	v	v			
Of which laparoscopic cholecystectomy	51.23	v	v	v	v	v
Colonoscopy with or without biopsy	45.23, 45.25				v	
Removal of colon polyps	45.42				v	
Abdominoplasty	86.83				v	
Inguinal and femoral hernia	53.0-53.3	v	v	v		v
(Inguinal hernia)	(53.0-53.1)				v	
Haemorrhoidectomy	49.43-49.46			v	v	
Anal procedures	96.23, 49.11, 49.12, 49.5, 49.73			v		
Pilonidal cyst	86.21				v	
Circumcision	64.0			v	v	
Orchidectomy & -pexi	62.3-62.5				v	
(Orchidopexy – varicoele)	(62.5-63.1)			v		
Prostatectomy (transurethral)	60.2	v			v	v
Prostatectomy (excluding transurethral)	60.3-60.6	v				
Male sterilisation	63.7				v	
Endoscopic female sterilisation/ Laparoscopic sterilization	66.2			v	v	
Dilatation and curettage of uterus	69.02, 69.09			v	v	

Surgical procedures	ICD-9-CM code	OECD 2011-2012 data collection		IAAS		DSDP
		Inpatient cases	Day-surgery cases	1994-5 & 1997	2004 & 2011	
Hysterectomy (vaginal only)	68.5	v		v	v	v
Caesarean section	74.0-74.2, 74.4, 74.99	v				
Legal abortion	69.51, 69.01				v	
Repair of cysto- and rectocele	70.5				v	
Breast conserving surgery	85.2	v				v
(Local excision of breast)	(85.21)				v	
(Excision of breast lump)	(85.21, 85.35)			v		
Mastectomy	85.4	v			v	
Bilateral breast reduction	85.32				v	
Ligation/stripping of varicose veins	38.5			v	v	v
Carpal tunnel release	04.43			v	v	
Dupuytren's contracture	82.35			v	v	
Hip replacement	81.51-81.53	v				
Knee replacement	81.54-81.55	v				
Cruciate ligament repair	81.43, 81.45				v	
Disc operations	80.5				v	
Knee arthroscopy	80.26			v	v	v
Baker's cyst	83.39				v	
Arthroscopic meniscus	80.6				v	
Removal of bone implants	78.6			v	v	
Repair of deformities on foot	77.51-77.59				v	

ICD-9-CM: International Classification of Diseases, Ninth Revision, Clinical Modification; OECD: Organisation for Economic Co-operation and Development; IAAS: International Association for Ambulatory Surgery; DSDP: Day Surgery Data Project.
Sources: Lafortune et al., 2012[17], De Lathouwer & Poullier, 1998[20], Toftgaard et al., 2006[1], Toftgaard 2012[19] and Day Surgery Data Project Final Report 2012[3]

Results

OECD surveys

The most recent OECD data (2014) for a selection of Western European countries with variable day-care share can be found in Table 3. Note that the list of OECD index procedures was not composed with a focus on day surgery. The data presented in Table 3 are limited to the two parameters that are guarded invaluable in comparing health care systems: the national volume (expressed as the total number of procedures per 100 000 inhabitants) and the proportion of procedures performed in day care.[21]

Despite the guidelines issued by the OECD in 2011 (cf. section 2.1.1), the way the number of performed procedures were **count**ed in 2014, still varied among the selected countries (http://stats.oecd.org/):

- Belgium, Denmark, Finland, Germany[e] and Ireland reported only one code per procedure category for each patient, following the guideline of the OECD;
- France based its count on the number of stays (i.e. those with complete hospitalisation and those of less than 24 hours of hospitalisation) involving such procedures realised in public and private health establishments and in the ambulatory sector in France (metropolitan and overseas departments). When different procedures are done during the same hospital stay, this stay is counted several times, but when the same procedure is done several times, it is counted only once;
- In the Netherlands only the most important procedure (i.e. principal procedure) per admission is counted, leading to a potential slight underestimation;
- In the UK all procedures per case are taken into account. The count is the number of cases with the given code corresponding to the category; cases with codes from several categories are counted several times;
- For Norway and Sweden no information was provided on the way procedures were counted.

Likewise, some comments should be made with regard to the **coverage** of the data provided by some countries before interpreting the data:

- Denmark: only surgical procedures carried out in hospitals (private and public) are included, which means that surgical procedures carried out by specialists in the outpatient sector are excluded;
- Ireland: the provided data do not include procedures performed in private hospitals as these data are not available. Based on a household survey carried out by the Irish Central Statistics Office in 2010, it was estimated that approximately 15% of all hospital inpatient activity in Ireland is undertaken in private hospitals[f]. The public hospitals' data coverage exceeds 96%, i.e. overall approximately 4% of activity in publicly funded acute general hospitals is missing in the provided dataset. All patients having cataract surgery or tonsillectomy in public hospitals, are formally admitted to the hospital as either an inpatient or a day case. As a consequence, there are no outpatient cases for these procedures.

The Netherlands: the Hospital Discharge Register (HDR, "Landelijke Medische Registratie") is the basic source of data on procedures performed in hospitals. From 2005 onwards, the HDR suffered from a substantial degree of non-response, especially for the reporting of surgical procedures. Therefore, data imputation was done for the non-responding hospitals, resulting in reduced accuracy of the figures. As the proportion of discharges for which the surgical procedures had to be imputed gradually increased

[e] For the purpose of international comparisons, the German Federal Statistical Office has developed a new method for counting procedures in the Diagnosis-related Groups (DRG)-Statistics. According to this it is possible to count only one code per procedure category for each patient, which applies to inpatient as well as to day cases. The total number of procedures in German publications is higher than the ones obtained from international comparisons since in the German DRG-statistics, all accomplished procedures are counted (including several procedures per patient).

[f] This is an estimate and therefore should be interpreted with caution.

from 1% in 2004 up to 40% in 2011, Statistics Netherlands decided to terminate the statistics on procedures based on the HDR from 2011 onwards (hence the last available data provided to OECD are those of 2010 – see Table 3).

- The UK: for cataract surgery and tonsillectomy only England, Scotland and Wales supplied outpatient data[g], as in Northern Ireland these procedures are never performed in the outpatient setting. Similarly, for coronary artery bypass graft the day cases refer to England, Scotland and Wales only, since Northern Ireland does not carry these out as day cases.

Last but not least, it should be kept in mind that some procedures provide alternative treatments for the same condition. In these cases it is important to consider them together to gain a clear understanding of the clinical treatment patterns of these conditions in different countries.[17] An example is Dupuytren's contracture repair for which in recent years in less severe cases surgery has been replaced by collagenase injections (which can be performed in the office[22]), while the more complex and severe cases are treated surgically (and may need an overnight stay to supervise post-operative complications). As a consequence, current day-surgery rates are probably lower than in 2011-2013 (when the majority of cases were treated surgically and more (simple) cases were eligible for a day-care approach).

For more details on the sources and methods of the OECD survey the reader is referred to the OECD website (http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT); more information on the definitions applied by the OECD can be found in Appendix 1.

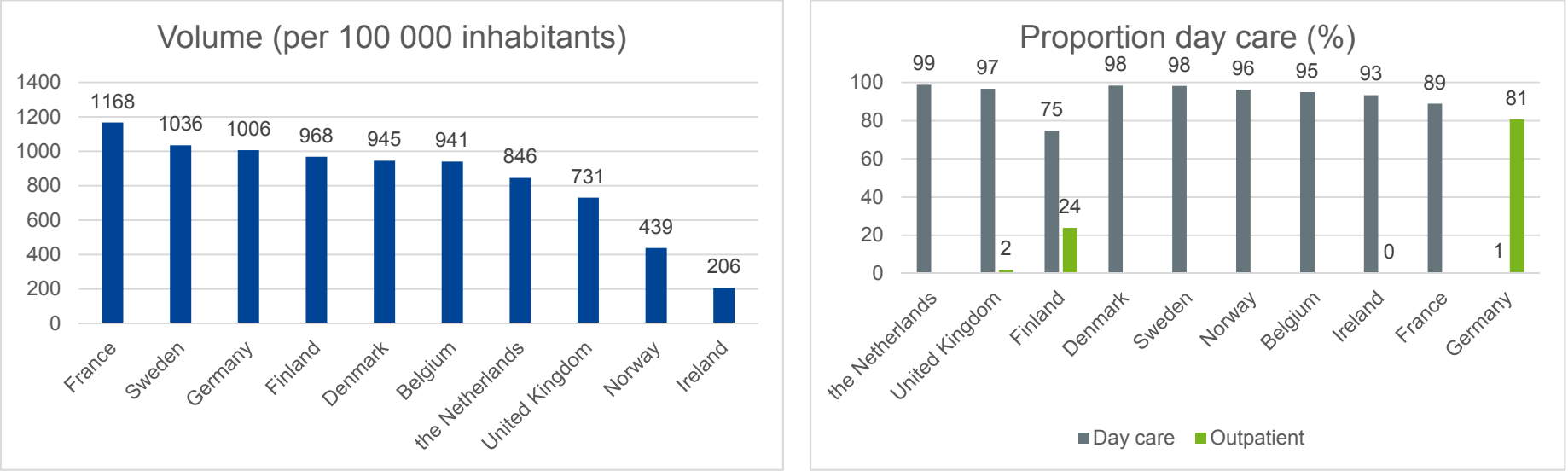
In the following paragraphs we elaborate more on a couple of procedures, selected by OECD, IAAS as well as DSDP as index procedure and with a variable share of day cases.

Cataract surgery

Due to the ageing of the population, cataract surgery is the most frequent (index) surgical procedure performed in most European countries. In 2014, the volume of cataract surgeries (expressed as the total number per 100 000 inhabitants) ranged from 206 in Ireland up to 1 168 in France; in Belgium cataract surgery was performed in 941 per 100 000 inhabitants (Table 3 and Figure 1). But as was explained above, the Irish volume may be underestimated as the data only include operations performed in public hospitals. In Belgium (95%), like in most selected countries, the majority of cataract surgeries (75% - 98%) are performed in day care. An exception is Germany, where 81% of these procedures are performed in the outpatient setting. However, for most countries (including Belgium) no data were provided on cataract surgeries performed in the outpatient setting.

g Outpatient data: patients treated as non-admitted cases in hospitals or even outside hospitals (in clinics or specialized ambulatory surgery centres)

Figure 1 – Cataract surgery in 2014 (or nearest year): volume and proportion performed in day care and in outpatient care for a selection of European countries



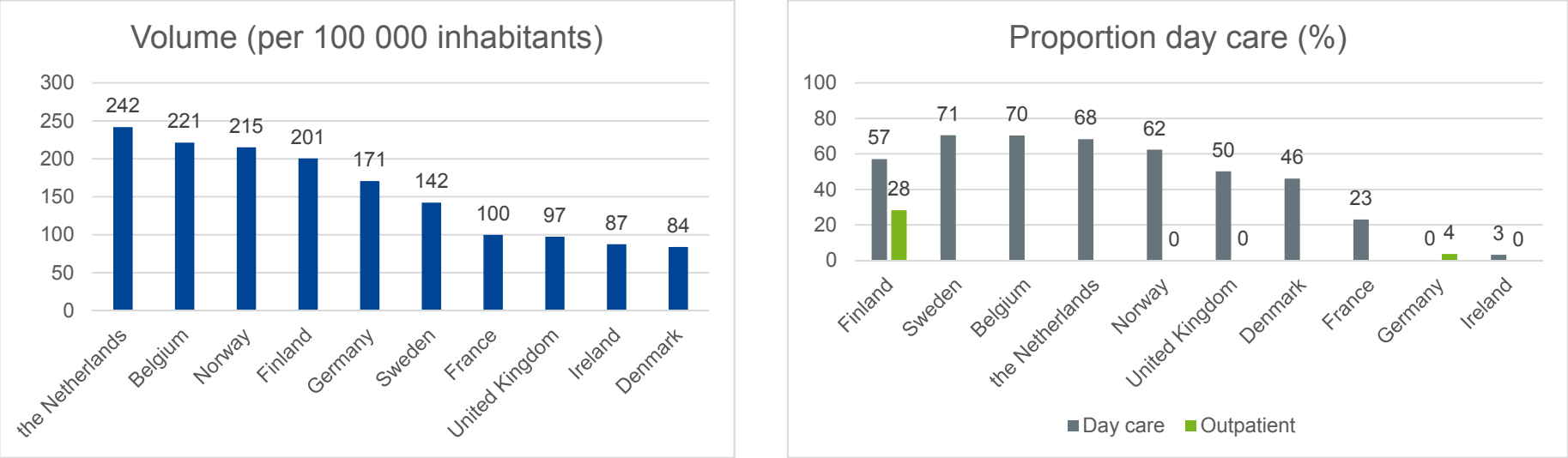
Volume: total number of procedures per 100 000 inhabitants; Day care: proportion performed as day case; Outpatient: proportion performed as outpatient; Belgium: data for 2013 (i.e. most recent data); the Netherlands: data for 2010 (i.e. most recent data); Norway: data for 2012 (i.e. most recent data); United Kingdom: outpatient data only refer to England, Scotland and Wales.

Source: OECD 2016 health database - Data extracted on 19 Oct 2016 (for more info on applied definitions see Appendix 1; more info on sources and methods can be found on http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT)

Tonsillectomy

Tonsillectomy is one of the most frequently performed surgical procedures in children. In the selected countries, the total volume varied in 2014 between 84 procedures per 100 000 inhabitants in Denmark and 242 in the Netherlands; in Belgium tonsillectomy was performed in 220 per 100 000 inhabitants (Figure 2). Although tonsillectomy is performed under general anaesthesia, at least half of the patients returned home the same day in Belgium (70%), Finland (57%), the Netherlands (68%), Norway (62%), Sweden (71%) and the United Kingdom (50%). On the other site of the spectrum one can see that in Germany none and in Ireland virtually none of the patients were treated in day care. The large differences in day-care rates for tonsillectomy have been attributed to differences in the perceived risks of postoperative complications, as well as to clinical traditions of keeping children for at least one night in hospital after the operation.[17]

Figure 2 – Tonsillectomy in 2014 (or nearest year): volume and proportion performed in day care and in outpatient care for a selection of European countries



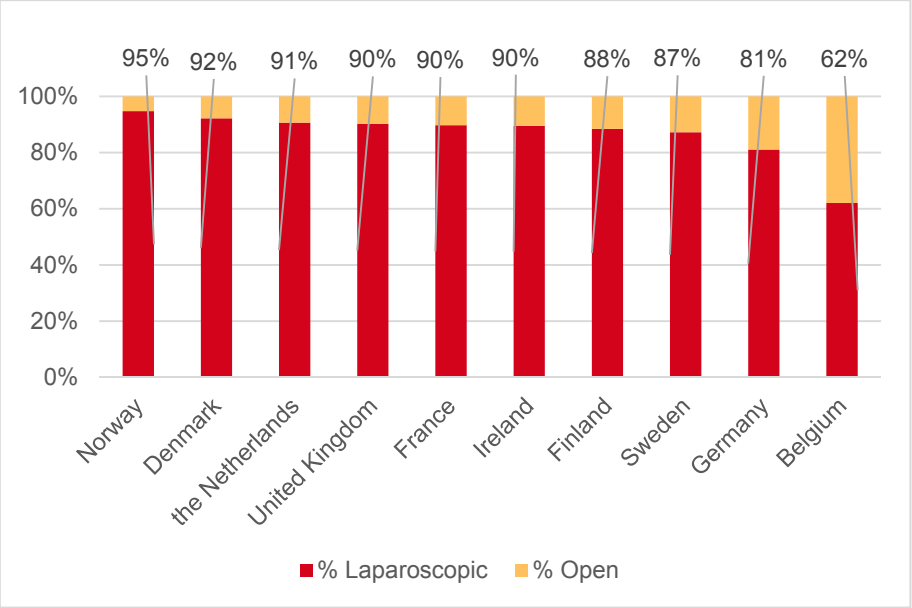
Volume: total number of procedures per 100 000 inhabitants; Day care: proportion performed as day case; Outpatient: proportion performed as outpatient; Belgium: data for 2013 (i.e. most recent data); the Netherlands: data for 2010 (i.e. most recent data); outpatient data for the UK only refer to England, Scotland and Wales.

Source: OECD 2016 health database - Data extracted on 19 Oct 2016 (for more info on applied definitions see Appendix 1; more info on sources and methods can be found on http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT).

Cholecystectomy

Cholecystectomy is a common surgical treatment of symptomatic gallstones or other gallbladder conditions; it can either be performed as an open, thus more invasive, surgical procedure, or as a laparoscopic (minimally invasive) procedure, the latter being more eligible for a day-care approach. As presented in Figure 3, the proportion of laparoscopic cholecystectomies (on the total number of cholecystectomies) varies considerably between the selected countries: 95% in Norway versus 62% in Belgium. The highest frequency ratio for laparoscopic cholecystectomies is observed in Germany (201/100 000 inhabitants), the lowest in Ireland (93/100 000 inhabitants); Belgium performed 138 laparoscopic cholecystectomies per 100 000 inhabitants. In Denmark more than half of all open and laparoscopic cholecystectomies (53% and 57%, respectively – see Figure 4) are performed in day care; the lowest day-care rates were reported for the Netherlands (5% and 6%), Belgium (4% and 5%) and Germany (0% and 0%). The reason why Belgium has the lowest day-care rate for (laparoscopic) cholecystectomies is further explained in sections 1.1 and 5.3.2.6.

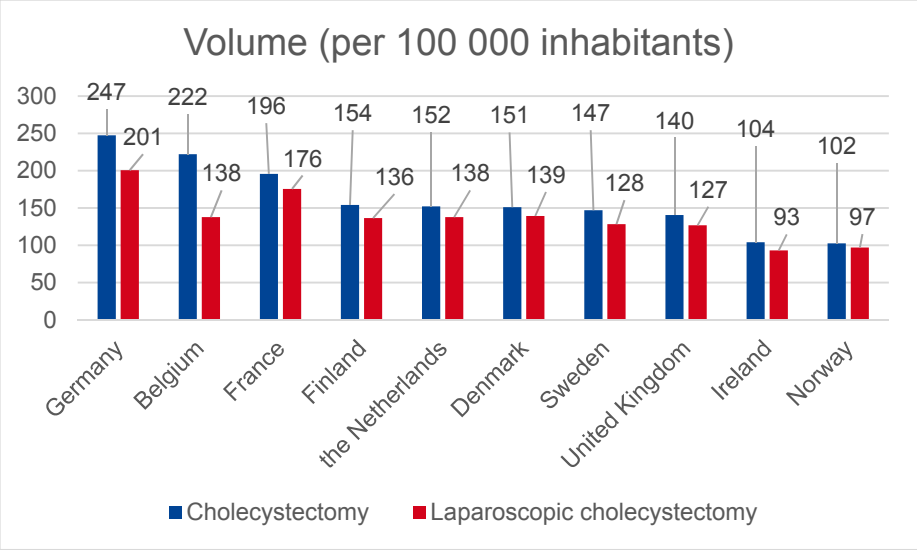
Figure 3 – Cholecystectomy in 2014 (or nearest year): proportion performed laparoscopic versus non-laparoscopic (open) for a selection of European countries

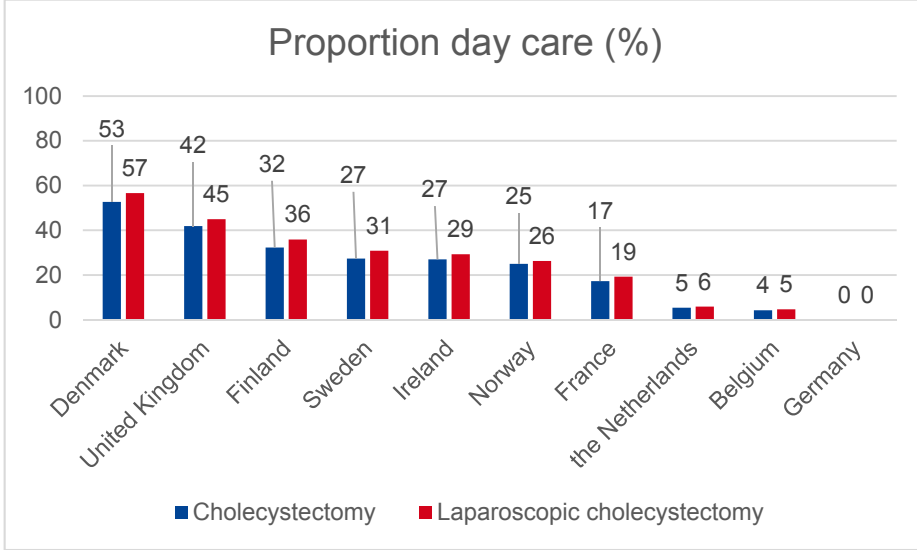


Belgium: data for 2013 (i.e. most recent data); the Netherlands: data for 2010 (i.e. most recent data).

Source: OECD 2016 health database - Data extracted on 19 Oct 2016 (for more info on applied definitions see Appendix 1; more info on sources and methods can be found on http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT).

Figure 4 – Cholecystectomy in 2014 (or nearest year): volume and proportion performed in day care for a selection of European countries





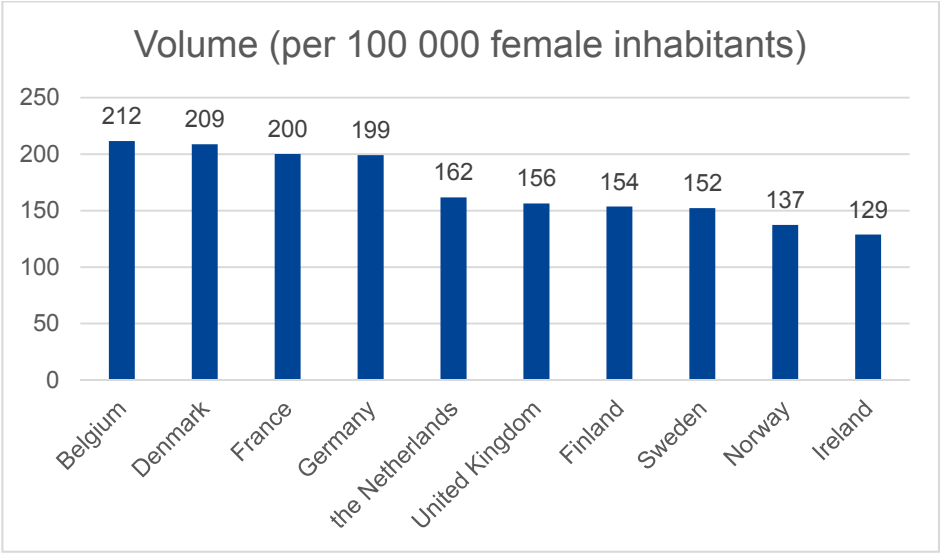
Volume: total number of procedures per 100 000 inhabitants; Day care: proportion performed as day case; Belgium: data for 2013 (i.e. most recent data); the Netherlands: data for 2010 (i.e. most recent data).

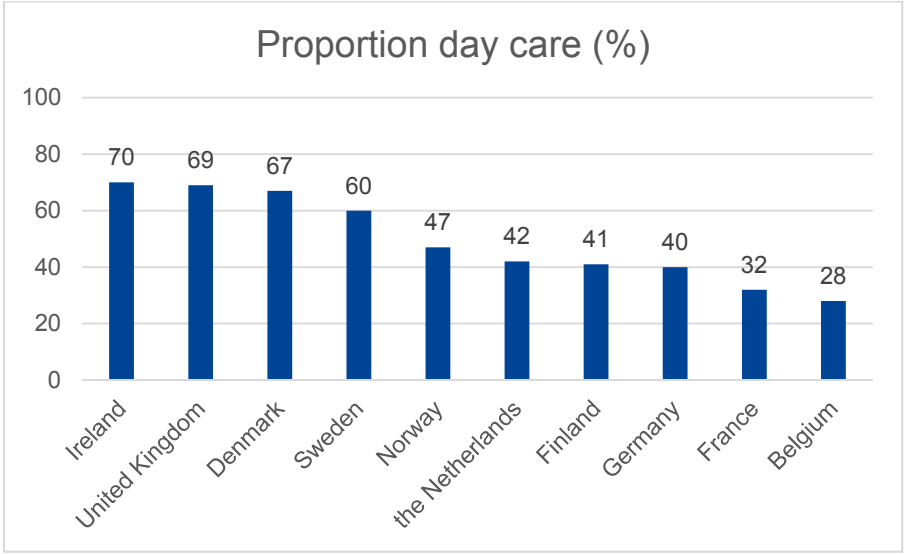
Source: OECD 2016 health database - Data extracted on 19 Oct 2016 (for more info on applied definitions see Appendix 1; more info on sources and methods can be found on http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT).

Partial excision of a mammary gland

In the selected countries, the total volume of partial mammary gland excisions varied in 2014 between 129 procedures per 100 000 female inhabitants in Ireland and 209 and 212 in Denmark and Belgium respectively (Figure 5). While in Ireland (70%), the United Kingdom (69%), Denmark (67%) and Sweden (60%) the majority of these procedures were performed in day care, Belgium was far behind with a day-care rate of only 28%.

Figure 5 – Partial excision of mammary gland in 2014 (or nearest year): volume and proportion performed in day care for a selection of European countries





Volume: total number of procedures per 100 000 female inhabitants; Day care: proportion performed as day case; Belgium: data for 2013 (i.e. most recent data); the Netherlands: data for 2010 (i.e. most recent data).

Source: OECD 2016 health database - Data extracted on 19 Oct 2016 (for more info on applied definitions see Appendix 1; more info on sources and methods can be found on http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT).

Apart from the data comparability issues discussed above (e.g. count of procedures, data coverage, countries unable to report data on outpatient cases) there are other factors that may explain the big differences in day-surgery activity between (and within) countries. One that seems very important is the level of reimbursement, where there may be more or less incentive built into the system.[1] In Denmark and England, for instance, the incentive for day care is higher since the pay for procedures performed in day care is in many cases the same as for inpatient care, while for instance in Germany the incentive for day care was initially much lower as the payment for day surgery was only 25% of the equivalent tariff for conventional hospitalisation. Only since 2004, a new law on integrated care ("Integrierte Versorgung") day surgery was paid at a tariff of between 50 and 90% of the conventional hospitalisation tariff.[1, 23] The variations in clinical practice may also reflect a different appreciation of possible risks of complications after surgery, but they may even so simply be caused by tradition among surgeons and anaesthetists.[1, 17]

Table 3 – Surgical procedures in 2014 (or nearest year): volume and proportion performed in day care (and outpatient care) for a selection of European countries

Procedure	Belgium*	Denmark	Finland	France	Germany	Ireland	The Netherlands°	Norway	Sweden	United Kingdom
Cataract surgery										
#/100 000	940.7	945.4	968.1	1167.5	1006.4	206.2	845.6	438.5[£]	1035.5	731.2
% Day care	95	98.4	74.7	88.9	0.6	93.4	98.8	96.2[£]	98.2	96.7
% Outpatient	-	-	23.9	-	80.7	0	-	-	-	1.8[¥]
Tonsillectomy										
#/100 000	221.3	83.9	200.5	99.7	170.6	87.4	241.7	215.1	142.3	97.4
% Day care	70.4	46.1	57.1	23	0.1	3.1	68.3	62.4	70.5	50.2
% Outpatient	-	-	28.3	-	3.6	0	-	0	-	0.2[¥]
Transluminal coronary angioplasty										
#/100 000	225.4	170.4	190.8	225.4	385.9	122.4	241.1	215.2	204	126.5
% Day care	9	30.9	10.7	0.6	0.9	15.9	23.2	1.8	12.1	26.2
Coronary artery bypass graft										
#/100 000	63.8	72.8	40.8	29.8	66.6	23.4	54.4	38.2	30.5	27.9
% Day care	0	0.2	1	0	0.1	0	0	0.2	0	0.3[β]
Appendectomy										
#/100 000	137.7	123.5	128.3	117	165.4	155.5	95.1	126.3	130.4	92.6
% Day care	0.8	11.6	2.3	0.9	0	0.7	0.2	2	2.8	1.5
Laparoscopic appendectomy										
#/100 000	119	108.1	64.9	89.9	130.4	110.5	46.2	104.7	69.6	60.3
% Day care	1	12.6	3.4	1.1	0	1	0.4	2.2	3.4	1.8
Cholecystectomy										
#/100 000	222.1	151.1	154.1	195.6	247.3	104	152	102.4	147	140.4
% Day care	4.3	52.7	32.3	17.3	0	27	5.4	25	27.4	41.9

Procedure	Belgium*	Denmark	Finland	France	Germany	Ireland	The Netherlands°	Norway	Sweden	United Kingdom
Laparoscopic cholecystectomy										
#/100 000	137.8	139.3	136.3	175.5	200.5	93.1	137.8	97	128.2	126.7
% Day care	4.7	56.6	35.9	19.3	0	29.3	5.9	26.3	30.9	45
Repair of inguinal hernia										
#/100 000	222.8	207.7	201	231	214.1	82.2	170.8	117.9	174.7	136.5
% Day care	36	80.6	66	56.3	0.3	56.3	72.8	59.7	78.2	70.4
Laparoscopic repair of inguinal hernia										
#/100 000	0.3	85.4	21.6	75.1	119.9	15.2	39.2	52.0	8.5	29.5
% Day care	34.5	81.1	64.4	63.7	0.2	53.1	77.8	61.7	77.4	72
Transurethral prostatectomy										
#/100 000[$]	171	117.6	138.2	209.4	173.2	38	131.1	128.6	113.1	87.3
% Day care	0.5	18.4	5.5	3.7	0	1.3	0	1.4	8.8	5.6
Hysterectomy										
#/100 000[µ]	247.8	33.5	188.7	190.2	301.2	110.6	172.5	147.6	180.4	162.6
% Day care	0.5	38.6	2.2	0.4	0	0.2	0	2.8	7.4	1.0
Laparoscopic hysterectomy										
#/100 000[µ]	102.9	-	105	58.2	90.6	16.4	20.2	59.2	38.4	37.3
% Day care	0.8	-	1.5	0.8	0	0	0	3.6	2.4	2.0
Caesarean section										
#/100 000[µ]	457.7	431.0	325.3	477.1	533.6	839.4[#]	342.5	382.2	401.8	596.0
% Day care	0.2	1.6	0.1	0	0.1	-	0	0.3	0.2	0.2
Hip replacement										
#/100 000	247.1	234.1	244.6	238.6	292.7	125.2	215.7	242.7	234.4	185.4
% Day care	0	1.1	0.3	0.1	0	0.1	0	0.1	1.6	0.3

Procedure	Belgium*	Denmark	Finland	France	Germany	Ireland	The Netherlands°	Norway	Sweden	United Kingdom
Secondary hip replacement										
#/100 000	161.6	25.4	35.2	26.1	30.5	12.2	14.6	23.9	19.5	14.5
% Day care	0	0.6	0.2	0	0	0	0	0	0.9	0.2
Total knee replacement										
#/100 000	189.7	172.0	191.1	155.9	197.2	45.6	117.9	96.4	130.8	148.4
% Day care	0	1.8	0.3	0.1	0	0.1	0	0	2.8	0.5
Partial excision of mammary gland										
#/100 000μ	211.6	208.8	153.6	200.2	199.2	128.8	161.7	137.4	152.3	156.4
% Day care	28.2	67.0	41.1	31.8	0.4	69.5	42.4	47.2	60.3	69.1
Total mastectomy										
#/100 000μ	94.2	92.7	100.8	64.2	67.1	41.1	89.4	78.5	90.4	67.3
% Day care	3.3	14.8	5.1	0.9	0	2.9	0	11.1	12.6	8.1

*#/100 000: total number of procedures per 100 000 inhabitants; % DC: proportion performed as day case; % Outpatient: proportion performed as outpatient (collected only for cataract surgery and tonsillectomy); *: data for 2013 (i.e. most recent data); °: data for 2010 (i.e. most recent data); £: data for 2012 (i.e. most recent data); $: total number of procedures per 100 000 male inhabitants; μ: total number of procedures per 100 000 female inhabitants; -: no data available; #: estimated value; ¥: outpatient data for cataract surgery and tonsillectomy only refer to England, Scotland and Wales; β: for coronary artery bypass graft the day cases only refer to England, Scotland and Wales.*

Source: OECD 2016 health database - Data extracted on 19 Oct 2016 (for more info on applied definitions see Appendix 1; more info on sources and methods can be found on http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT)

IAAS surveys

So far, the IAAS has conducted four surveys on day-surgery rates in 29 OECD countries. For the first survey (1994-95) the data were retrieved through the central health authorities.[20] As there were validity problems with the data, and not all OECD countries answered the questionnaire, an alternative approach was taken from the 1997 survey on: the IAAS representatives were chosen as the main data source on the presumption that their professional knowledge and networks would be the best guarantee of valid data.[20] Yet, the most recent data are still considered "the best possible" in many countries not having a national database covering all health activities. Based on the latest survey, the following conclusions were drawn:[19]

- Almost all countries still have an increase in the share of day surgery of the basket;
- The share of total and planned operations depends on the organisation within the country (e.g. in Denmark 74% of all surgical procedures and 89% of all elective surgical procedures are performed in day care while in Spain the respective proportions are 33% and 87%);
- There are even significant differences within a country;
- Countries that had a low volume of day surgery have seen a remarkable increase (e.g. in Portugal the proportion of IAAS index procedures performed in day care increased from 18% in 2009 up to 55% in 2011; for Belgium a comparable increase was seen from 31% in 2009 to 78% in 2011);
- The increase is mainly seen among the common procedures and not at "the cutting edge";
- There is still a large potential in many countries;
- The reimbursement systems are referred to as important for the move to day surgery.

As a final remark: in a subsequent analysis, IAAS revealed that only 6 member countries (Denmark, England, Finland, Germany, Scotland and Sweden) out of 10 who responded to the survey which was sent to 18 countries, met the criteria of the new OECD definitions issued in 2011 (cf. supra).[21] Hence the interpretation of the data should be performed with caution.

Key points

- **The increase in day surgery has been uneven, between countries as well as between hospitals within countries.**
- **The comparison of international data should be performed with caution: there is no international classification of procedures and currently countries use different coding systems, several methods are used to count surgical procedures, there are differences in data coverage, data completeness is variable and there are differences in perspective.**
- **As long as there is no international classification of procedures, the OECD, Eurostat and WHO-Europe discontinue their data collection on the aggregate level.**
- **For some surgical procedures (e.g. cataract surgery, tonsillectomy) Belgium keeps pace with other Western European countries, while for other procedures (e.g. laparoscopic cholecystectomy, partial excision of a mammary gland) it falls far behind.**

2.2 Setting targets and incentives to promote day surgery

Day-surgery growth has been attributed to various factors such as developments in surgery, anaesthesia and analgesia, changes in clinical practice or the establishment of dedicated day-surgery facilities (see the Introduction). However, the diffusion of day surgery varies substantially across Western European countries (see section 2.1.2.2). Possible explanations for the large variability in the share of day-surgery procedures in total surgical procedures are regulatory barriers and the lack of mechanisms that encourage day surgery in the hospital payment system.

The purpose of this section is to describe methods for setting day-surgery targets and for tariff incentives for day surgery in France and England. A recent overview of day surgery tariff-setting and the impact on day surgery for a larger number of countries can be found in a recent HAS report (2013).[23]

2.2.1 France: targets for day-surgery rates

For the last 10 years, French authorities have encouraged through various actions the development of day surgery, which is defined as hospital stays of maximum 12 hours without overnight stay. In November 2011, they first defined a target for day surgery.[24] The objective was to reach 50% of surgical stays being performed in a day-care setting in 2016. The target was applicable to all stays identified by a GHM[h] as a surgical stay (hence with root C), except stays concerning obstetrics and neonatology[i]. This scope has been criticised as it is more restrictive than definitions in other countries and impedes international comparison.[25] In 2015, the scope was extended to seven additional GHMs (four GHMs with root K that concern non-operative interventional acts that require the use of an operating room and three GHMs with root Z that concern acts listed as "undetermined" but figuring on a list of procedures established by the International Association for Ambulatory Surgery).[26] Using this new scope, the target for 2016 was recalculated to 54.7%.[26] Although the share of day surgery has increased from 43.3% in 2010[26] to 51.9% in 2015[27], the set target was not met. Moreover, the development of day surgery has been heterogeneous between regions as well as between public and private hospitals, the latter showing higher day-surgery rates.[25]

In 2015, a new national target, for 2020, has been set at 66.2%, following the method described hereafter.

2.2.1.1 Current methodology to define targets

The definition of national and regional targets in France is based on a two-step procedure. First, potential substitution rates are defined, based on several assumptions. Second, the pace of growth to reach the target is determined.

Step 1: Definition of potential rates of substitution of day surgery for inpatient care

In July 2014, a report from the *Inspection Générale des Finances* (IGF) and the *Inspection Générale des Affaires Sociales (IGAS)* established potential rates of substitution of day surgery for inpatient care based on "conservative" assumptions, relying on discussions with the Ministry of Health, previous analyses from medical scientific societies, and studies within hospitals.[25]

These rates are defined as a function of the level of severity (only levels 1 and 2 are kept, levels 3 and 4 are excluded) and the length of stay. Reductions are applied to these rates in order to take into account:

- Patients admitted through an emergency service: although not impossible, day surgery for patients admitted through an emergency service is more complicated. While emergency services account for

h "Groupes homogènes de malades", concept equivalent to the diagnosis-related groups (DRGs), although France developed its own classification.[23]

i Hence, concerned stays corresponded to all stays identified by a GHM with root C (surgery) except for two major categories of diagnosis: Major Diagnostic Category (MDC) 14 (pregnancy, delivery and post-partum affections) and MDC 15 (new-borns, premature infants and affections during perinatal period). The root is the third digit of the GHM.

18% of the admissions in public hospitals and 3% in private hospitals[25], available data do not permit to classify emergency admissions according to length of stay or severity level. Hence, it is difficult to identify whether stays following emergency admission are short and could be replaced by day surgery. Therefore, a fixed reduction of five percentage points is applied to the potential rates of substitution.

- Patients who are excluded because of psycho-social or socioeconomic criteria, i.e. lack of support at home or geographical remoteness: no data are available to properly evaluate the number of patients that should be excluded. Therefore, an additional fixed reduction of five percentage points is also applied to the potential rates of substitution.

Final substitution rates which are the result of the above methodology are given in Table 4 (first and second row[j]). They correspond to the most ambitious scenario considered in the report. Other scenarios (high, middle and low substitution rates) have also been considered (see Table 4).

Table 4 – Potential substitution rates (%) of day surgery for inpatient care

Level of severity	1	1	1	1	1	2	2	2
Length of stay	1	2	3	4	>4	3	4	>4
Substitution rate	100	90	40	30	20	30	20	15
Substitution rate (after reductions)	90	80	30	20	10	20	10	5
Scenario: high	80	70	20	10	10	10	5	5
Scenario: middle	70	50	20	10	10	10	5	5
Scenario: low	60	40	8	5	5	5	0	0

Source: IGAS-IGF (2014)[25]

From the 5 382 953 inpatient surgical stays (restricted scope, i.e. except stays concerning obstetrics and neonatology) in 2013, the report estimated that 1 228 178 could be substituted by day-care interventions. Added to the stays already realised in day care, this led to a national day-care rate equal to 65.6% (restricted scope), with a total of 3 532 795 day-care stays. This rate should be reached within 5 years (horizon 2018). This estimate is based on the above described maximal scenario. The other scenarios (high, middle and low) led to a day-care rate of respectively 62.2%, 58.9% and 54.8% (all for the restricted scope). From Table 4, it is also possible to determine targets for the day-care rate at the regional or even at the hospital level.

The Ministry of Health has decided to use the "high" scenario to determine targets for 2020.[26] Applied to the 6 175 671 inpatient surgical stays (extended scope) in 2014, this led to a national target of 66.2%.

Step 2: Definition of the pace of growth for day care (national level)

The Ministry of Health[26] has also determined the pace of growth at which the 2020 target should be reached. It is divided in two periods:

- Transition phase (2014-2016):
  - For some GHMs, experts in surgery have been consulted to study the medical feasibility of day care. For these GHMs, the pace of day-care growth between 2014 and 2016 takes the experts' opinion into account.
  - For the other GHMs, the 2016 target is established using a linear trend between the observed data of 2013 and the target for 2020 calculated in step 1.
- Sustained growth phase (2017-2020): from 2017 onwards, the growth rate is calculated in order to reach the target calculated for 2020 in step 1.

Following this method, the national growth path is given in Table 5.

j For a stay to have a severity level of two, its length of stay has to be at least three days (see http://www.atih.sante.fr/sites/default/files/public/content/2096/Annexes_notice_technique_MCO_jan_2009_1.pdf).

Table 5 – National growth path for day surgery

Years	2014	2015	2016	2017	2018	2019	2020
Day-surgery rate (%)	50.2	52.5	54.7	57.6	60.5	63.4	66.2
Points of increase	2.2*	2.3	2.2	2.9	2.9	2.9	2.8

**Observed day-surgery rate was 48% in 2013.*

Source: Direction Générale de l'Offre de Soins (DGOS) (2015)[26]

2.2.1.2 Limits

The above methodology to define day-surgery targets has several limitations. Indeed, the same rate of substitution is applied to all interventions within each GHM. This does not account for hospital differences regarding organisation, architecture and economic conditions. Furthermore, this methodology does not make any distinction between complex interventions and less complex ones that could be more easily performed in a day-care setting.

In 2014, a collaborative research project has been realised between medical experts and the Ministry of Health. For a limited number of medical disciplines, a range of reachable day-care rates has been identified, per intervention. This approach is more precise and revealed an important heterogeneity within each GHM.[25] However, the research results have not been retained by the Ministry of Health to define the targets that should be reached in 2020.

One may also regret that the target rates were determined mainly on a statistical/administrative basis. While clinical experts were consulted to check whether the rates determined on a statistical basis were considered as feasible, their impact on the final definition of the targets was limited (as opposed to the important role of the British Association of Day Surgery (BADS) in England for instance, see section 2.2.3). As a consequence, hardly any medical criteria were used to determine the targets.

2.2.1.3 Implementation of the targets

Using the same methodology, regional targets have been defined for 2020, ranging from 61.9% in Limousin to 69.2% in Corse and 69.3% in Réunion.[26] In each region, the *Agence Régionale de Santé (ARS*) is responsible for the implementation. The ARS assigns a target for day surgery to each hospital, according to its case-mix (i.e. GHM). In addition to the case-mix, the assigned target takes the following elements into account:[26]

- The particularities of the hospital as well as its external context (size, supply in the area, etc.);
- The characteristics of the surgical activity within the hospital (field, volume and observed growth rate);
- The level of organisational maturity (day-care units and operating rooms).

These targets are included in the "multiyear contracts for targets and resources" ("*contrats pluriannuels d'objectifs et de moyens"*) the ARS negotiates with hospitals. The contracts are typically concluded for a period of five years. In the contracts it is clearly stipulated for which care activities and medical equipment authorisation from the ARS is required. But also the responsibilities of each hospital, the volume of services to be provided as well as the need for an annual evaluation of existing capacity and service volumes are described in these contracts.

However, the quantitative targets included in such contracts are non-enforceable. Rather, the ARS uses several incentives ("support programmes") to encourage the hospitals to reach the assigned target. The type of support programme depends on the considered hospital and its potential to improve the day-surgery rate. The support programmes include funding for:[26]

- Organisational innovations allowing to improve patient flows and pathways;
- High-tech equipment;
- Innovative techniques;

- Investments (real estate or not) aiming to restructure or reorganise the supply.
- More precisely, the ARS launches a call for proposals and the hospitals interested in improving their day-surgery performance can submit a project, which could be financed through the support programme.
- It must be noted that, aside from the financial incentives and programmes, the actors (ARS, hospitals, surgeons, etc.) have been continuously encouraged by the Ministry of Health to develop day surgery. For instance, day surgery is defined as a priority objective by the Ministry of Health; it has been included in the programme of risk management of the sickness funds; statistical indicators have been developed to facilitate the monitoring of the development of day surgery; ARS are invited to include day care in the contracts they negotiate with hospitals, etc. Due to this, a cultural change has been observed in France, most of the actors being convinced that clinical habits should evolve towards more day surgery (personal communication with Isabelle Hirtzlin, Université Paris 1).

2.2.2 France: instruments to increase day surgery

In France, activity-based tariffs (called "*tarification à l'activité*", T2A) have been introduced for public hospitals in 2004 and for private hospitals in 2005.[28] Since 2008, acute care in all hospitals is funded through this system. As other DRG-like systems, tariffs are based on a payment per stay, which itself is based on the activity actually carried out by the hospital taking into account clinical case-mix, level of severity and length of stay. Nevertheless, national tariffs were adjusted to reflect hospitals' historical cost patterns in order to protect them from excessive budget cuts.[29] Two T2A tariff scales are available, one for public and one for private hospitals.[28]

Within this system, promotion of day surgery has been financially encouraged by three instruments, which are detailed hereafter: the utilisation of a single tariff for day surgery and inpatient stays, the abolition of existing minimum length of stay thresholds and the implementation of a prior approval procedure.

2.2.2.1 Single tariff

Historically, the tariff for day surgery was calculated by applying a deduction from the full inpatient tariff. This method was counter-incentive and motivated hospitals to keep patients overnight to increase payments.[23]

Since 2007, hospitals receive the same payment for stays in day care and for inpatient stays with a severity level one for a growing number of GHMs (5 GHMs in 2007; 18 GHMs in 2009; 39 GHMs in 2012; 47 GHMs in 2013; 111 GHMs in 2014).[26]

The current tariff is calculated as a weighted average of the cost for stays in a day-care setting and the cost for inpatient stays.[23] The weighting formula takes into account the current national day-care rate (see Box 1). For instance, in 2014, the considered GHMs were classified in four categories (day-care rate above 80%; between 50% and 80%; between 10% and 50%; and below 10%) (see Table 6). In categories with a higher day-care rate, the weight applied to the day-care cost in the calculation of the single tariff is higher. In the last category, the single tariff is equivalent to the cost for an inpatient stay.[25]

Box 1 – Calculation of the single tariff

The single tariff is a weighted average of the cost for stays in a day-care context and the cost for inpatient stays using the following formula:

$$T_S = T_I(1 - w) + T_{DC}w$$

where T_S stands for single tariff, T_I is the tariff in an inpatient setting, T_{DC} is the tariff in a day-care setting and w is the weight applied according to Table 6.

Source: IGAS-IGF (2014)[25]

Table 6 – Calculation of the single tariff in 2014 for four categories of GHMs

Category	Definition	Weight
1	Day-care rate above 80%	w = trend day-care rate
2	Day-care rate between 50% and 80%	w = trend day-care rate
3	Day-care rate between 10% and 50%	w = observed day-care rate
4	Day-care rate below 10%	w = 0

Trend day-care rate is a rate estimated for 2016 using the trend observed between 2007 and 2013. Observed day-care rate is the actual day-care rate observed in 2013. The use of the trend day-care rate gives more incentives toward day care. Note that for GHMs ("Groupes homogènes de maladies") in category 1, the tariffs used in the calculation are based on theoretical costs, while those used for other categories of GHMs are based on observed average costs.

Source: IGAS-IGF (2014)[25]

While the implementation of the single tariff has been associated with an increase of day-care rates, it is not clear whether the new payment system did cause the change or simply accompanied it. A recent report stated that the increase of day-care rates can be attributed to the single tariff in some cases such as inguinal hernias, but not in others (such as interventions on vulva, vagina or cervix, circumcision, carpal tunnel, etc.)[25]

The absence of a visible effect may be due to the fact that the single tariff has been established at the same time as other changes in the payment structure. Moreover, the payment system has been changed many times which also entails a lack of visibility as well as of predictability. Despite the single tariff, some GHMs are still underfunded when performed in day care, due to other principles that are applied in the tariff calculation. For instance, for 35 GHMs, payments have been reduced for public hospitals in order to ensure convergence towards the payments used in the private sector.[28] These conflicting signals reduce the readability and predictability of the tariff system and moderate the strength of the incentive in favour of day surgery.[25]

2.2.2.2 Suppression of "bornes basses"

As the length of stay is the central indicator of hospital activity, and its distribution is often asymmetrical with particularly long or short stays, these "outliers" attract a specific tariff. The rationale behind this specific tariff is an attempt to avoid unintended consequences of the activity-based tariff model. If long-stay outliers were not paid for separately, hospitals would have incentives to avoid these high-cost cases, or to discharge them inappropriately early.[30] In addition, deductions are applied for short-stay outliers to control inappropriate early discharges.[29]

As a consequence, cut-offs (i.e. lower and upper limits of the length of stay) were set to define which length of stay has to be considered as an "outlier", more precisely, is under the lower bound (called "*borne basse*"), the payment received by the hospital is decreased by 50%.[23]

Following this principle, a stay in day surgery was treated as an atypical length of stay. Tariffs for day-surgery stays are therefore lower than those for inpatient surgery. Since 2010, the lower bound has been supressed for a growing number of GHMs.[25] Since 2014, it is suppressed for all GHMs in surgery with a severity level 1.[26] Obviously, this measure encourages the reduction of the length of stay since the financial penalty for short stays disappears, and therefore constitutes an incentive for day surgery.

In January 2015, eight months after the suppression of the lower bounds, the president of the French federation of private hospitals ("branche Médecine, Chirurgie et Obstétrique de la Fédération de l'Hospitalisation Privée, FHP-MCO) affirmed that *"the rate of day surgery increases, and this occurs more rapidly in private than public hospitals (…) and the average length of stay decreases and this also occurs more rapidly in private than public hospitals*".[31] While both effects (strengthening of the single tariff and suppression of the "bornes basses") cannot be distinguished, punctual observations attest the impact of the 2014 policies in favour of day surgery. For instance, in one hospital in Ile-de-France, the day-care rate for breast cancer surgery (excluding major reconstructive plastic surgery) has more than doubled (from 23% to 52%) between 2014 and 2015.[32]

2.2.2.3 Prior approval procedure (MSAP)

The prior approval procedure ("*mise sous accord préalable*", MSAP) is a system to assess the appropriateness of performing surgery in an inpatient setting, depending on the patient's medico-social situation (physical status, isolation, etc.). This measure, adopted in 2008, targets hospitals with low day-care rates (i.e. below the regional or national average) for well-defined surgical procedures[k]. These hospitals can be placed under the rule of MSAP for a maximum duration of six months and for a limited number of procedures. In that case, the hospital has to ask for the approval of the sickness fund before performing the procedure (except in emergency) in an inpatient setting. The approval is given within 48 hours[l]. In case the approval is not granted, the hospital is financed for this act as if it was done in a day-care setting, even if it is performed in an inpatient setting.[25]

It is difficult to isolate the effect of the MSAP on day-care rates, as for the concerned procedures day care is generally also encouraged through the single tariff. However, only a small number of hospitals is concerned by the MSAP, and recent studies show that, for some procedures, the concerned hospitals have a higher day-care rate once they are under the MSAP procedure. Moreover, for inguinal hernia for example, in a given region all hospitals under MSAP in 2011 had a higher day-care rate in 2012 than the ones that were not under MSAP.[25]

2.2.3 England: targets for day-surgery rates

2.2.3.1 Definition of day surgery

Day surgery is defined as "a patient being admitted to hospital for a planned procedure and discharged home the same calendar day". The procedure must have been planned for day care before the patient's admission to hospital. Patients who are planned as inpatients but discharged home on the day of surgery count as inpatients with zero length of stay. Surgery with a 23 hour stay is considered an inpatient surgery with a one day length of stay.[33]

2.2.3.2 A brief history of actions to encourage day surgery

Also in England health authorities have encouraged the development of day surgery, mainly through benchmarking and tariff-setting.

In 1985, the Royal College of Surgeons (an independent professional body) published "Guidelines for Day Case Surgery" suggesting a **day-care target for elective surgery of 50%.** In 1989, the **British Association of Day Surgery (BADS)** was formed. The BADS, which has the legal status of a registered charity, has since played a major role in the promotion of day surgery.[33]

In 1990, the Audit Commission of the National Health Service (NHS) published its first report on day surgery.[34] In the report barriers to the growth of day surgery in England (and Wales) were identified and it was estimated that "if all district health authorities performed day surgery consistently at readily achievable levels for each of 20 common procedures, an additional

k The following 17 procedures are concerned by the measure: adenoidectomies, knee arthroscopies (excluding ligamentoplasties), anal surgery, carpal tunnel surgery and other nerve release surgery, conjunctival surgery (pterygium), Dupuytren's surgery, surgery on the scrotum, inguinal hernia surgery, varicose vein surgery, lens surgery, breast surgery/lumpectomy, repair surgery for ligaments and tendons (hand), surgery for strabismus, uterine, vulval, vaginal and assisted reproduction technology surgery, pelvic laparoscopy, tooth extraction and excision of synovial cysts.

l If the patient presents at least one of the following criteria, the approval is given immediately by phone: ASA physical status score higher or equal to 3; no access to phone in the post-operative period; no presence of an adult care giver at home during the post-operative period; travel time between hospital and post-operative home larger or equal to one hour; difficulties to understand the procedure, complications and post-operative instructions. Otherwise, the demand is forwarded to a medical advisor for thorough examination.[28]

186 000 patients could be treated each year without increased expenditure." The **basket of 20 procedures** to be carried out in day surgery were considered by surgeons to be clinically appropriate, cover the main surgical specialties, account for about 40% of all surgical procedures in these specialties and for most of these procedures it was very unusual to be carried out in the outpatient setting. This list was meant to provide a means of comparing day-care performance between district health authorities. The Audit Commission also recommended that such list should be regularly updated. Following the report of the Audit Commission, the Department of Health set up a task force on day surgery and invested £ 15 million (€ 21 million) in the expansion of the number of **dedicated day-surgery units**.[35]

The basket of the Audit Commission, which consisted of 20 procedures to be performed in day surgery, has been expanded by the BADS since then. The fifth edition of their "Directory of Procedures" which was published in 2016, contained more than 200 procedures across all surgical specialities.[36]

Another initiative to promote day surgery was the Plan of the Department of Health in 2000 to **set a target for 75% of all elective surgical procedures to be performed in day care**. In 2004, the Institute for Innovation and Improvement published "10 High Impact Changes for Service Improvement and Delivery" of which the number one change to "treat day surgery (rather than inpatient surgery) as the norm for elective surgery".[37]

Since 2009 the BADS works together with the Department of Health to develop "**Best Practice Tariffs**" (BPTs) which provide a financial incentive to perform surgery in day care. The selection of procedures by the BADS and the development of the BPTs are elaborated in section 2.2.3.3.

2.2.3.3 Current methodology to define targets

Step 1: Day and short-stay surgical procedures defined by the British Association of Day Surgery (BADS)

The fifth edition of the *BADS Directory of recommended Day and Short stay surgical procedures*, published in June 2016, contains over 200 procedures. They consider four possible treatment options: procedure room (i.e. the doctor's office), zero night stay, 23-hour stay (patient admitted and discharged within 24 hours) and under 72-hour stay (patient admitted and discharged within 72 hours).[36]

The list of procedures is updated in close collaboration with the Audit Commission, the "Payment by Results" Tariff Team (see section 2.2.4.2), NHS Digital (providing Hospital Episode Statistics (HES) data) and the Sustainable Improvement Team (formerly NHS Improving Quality; providing Better Care, Better Value Indicators).[38] Box 2 outlines how the third edition of the Directory, released in 2009, was developed.[36]

Box 2 – Selection of procedures by the British Association of Day Surgery (BADS)

The third edition of the Directory (2009) deals with the activity of nine specialties (breast surgery; ear, nose and throat surgery; general surgery; gynaecology; head and neck surgery; ophthalmology; orthopaedics; urology; and vascular surgery).

The **highest volume procedures** for each specialty were assessed using the NHS Hospital Episode Statistics (HES). In addition, also some low volume but surgically challenging short stay surgical procedures were included. In total, 174 procedures over the nine specialties were selected.

Clinical leaders in the field of day and short stay surgery **reviewed** these procedures and defined what percentage of activity could be achieved in a procedure room, as a day case, as 23-hour stay or with a less than 72-hour stay. The reviewers were asked "to consider what would be possible in ideal circumstances with appropriately trained medical and nursing staff, appropriate facilities and equipment and also if they had access to morning surgical operating sessions". Before publication the results were reviewed by BADS Council.

Step 2: Best Practice Tariffs for day and short-stay surgical procedures defined by the BADS

For a selection of the procedures for which BADS recommends a day-surgery approach, NHS England has defined "day case Best Practice Tariffs (BPTs)". The basic idea is to introduce a financial incentive for complying with known best practice instead of a pricing method which reflects average cost (see section 2.2.4.2 for more information on BPTs).[39]

The selection of procedures eligible for a day case BPT takes into account whether they have a high impact (i.e. high volume, significant variation in practice, or significant impact on patient outcomes) and whether they are supported by a strong evidence base and clinical consensus as to what constitutes best practice.[39] More precisely, the following "rules of thumb" were applied in the selection process (personal communication with Olena Talavera and Daniel Sutcliffe from NHS England):

- First, only procedures with at least 2 000 stays (the sum of inpatient and day-care stays) at a national level in a given year are selected.
- Second, procedures with a day-care rate lower than 90% are taken into consideration to allow room for improvement. No lower threshold has been defined.
- Third, the day-care rate recommended by BADS is compared with the current day-care rate. Only those procedures for which current day-care rates are lower than 90% of BADS rate (e.g. current rate is 70% and BADS is 95%, 70/95=0.74 which is lower than 90% of the BADS rate or 0.855) are taken into account.
- Finally, to take account of inter-hospital variation, there should be at least a 15 percentage point difference between the median and the top 5th percentile for day-care rates in a particular service area.

Step 3: Setting targets for the selected procedures

When setting the target rates for the (new) BPT areas, previous experience has suggested that the biggest change to be expected in a year is a 10 percentage point increase. Therefore, "transition target rates" are calculated to mitigate the risk of uncertainty. The starting point is the current day-care rate (baseline rate) increased by 10 percentage points, and rounded up to the nearest 5. In case this calculation brings the target within 5 percentage points of the BADS target, the BADS target is adopted.[40]

Step 4: Updates and revisions of BPT for day and short stay surgical procedures

On a regular basis, the number of the day case BPTs is expanded to cover new clinical areas or the target rates are adapted. Since the introduction of the first day case BPT in 2010/2011 for laparoscopic cholecystectomy, the number of procedures has been expanded or (transitional) day-care rates have been adapted four times. This is done in close collaboration with the BADS and on the basis of data analysis (HES data from NHS Digital). For

example, because of coding errors and day-care procedures that are in most cases performed together with another procedure for which an inpatient stay is required, the final selection of procedures may deviate from the BADS procedures.

2.2.4 England: instruments to increase day surgery

2.2.4.1 Benchmarking

The **BADS Efficiency Assessment Tool** allows hospitals to compare their own practice with those of other hospitals for the four treatment options mentioned in Step 1 of section 2.2.3.3 (procedure room, zero night stay, 23-hour and under 72-hour stay).[41]

One of the NHS "**Better Care, Better Value Indicators**", which identify potential areas for improvement in efficiency, concerns day-surgery rates. They developed an online tool enabling a hospital to benchmark itself against others (see http://www.productivity.nhs.uk/PCT_Dashboard/DetailedView?practiceCode=National&pctCode=National&percentileId=2&yearQtrId=29&indicatorId=609&indicatorTypeId=1 for more information).

2.2.4.2 The tariff payment system

Payment by Results and Healthcare Resource Groups

In 2003-2004 a prospective payment system for hospitals, named "Payment by Results" (PbR) was introduced. Already in 1991 an English version of DRGs – Healthcare Resource Groups (HRGs) – was developed to explain variation in the length of stays and in 1997 a national schedule of reference costs, itemizing the cost of HRGs, was developed to benchmark costs. However, the provision of benchmarking information alone was not sufficient to incentivise hospitals to address cost differentials and inefficiencies.[29]

In 2003-2004 a national tariff was introduced for 15 HRGs. The number of HRGs for which a national tariff is defined, has increased steadily since then. A major revision of the grouping system was introduced in 2009/2010; the number of groups (HRGs) increased from 650 in the previous HRG version (HRG3.5) to 1 389 in HRG4, which is currently still in place. While HRG3.5 covered only inpatient and day-care activity, HRG4 also covers outpatient care and emergency care.[29]

Tariff setting as incentive for day surgery

Tariffs in the PbR are based on national average costs. From the introduction of the PbR in 2003-2004 until 2009 **a single tariff** was applied to elective patients treated on a day-care or inpatient basis, weighted according to the proportion of activity in each setting.[42] In 2009-2010 day-care activity was not covered anymore by the elective tariff but by a new "**planned same day (PSD) tariff**".[43] The original idea was to expand the scope of the PSD tariff to include procedures undertaken in outpatient departments. The following argument to abolish the single tariff was given: "The principle of HRGs is that they should reflect the care of the patient and not the setting in which care is delivered. In previous years, this principle has been supported by the tariff having a single price which covered the same service whether it was delivered as inpatient care or day case care. There was thus a financial incentive to treat patients as day cases where it was clinically appropriate to do so. In 2009-10 the prices attached to inpatient and day case activity have been separated and day case work will therefore attract a lower price which more closely represents the actual cost of delivering day case activity. As clinical services evolve and as the direction of policy travel is now clearly set towards patients receiving their care in less acute settings, the tariff is also changing so that it can support those providers at the forefront of delivering care as close to home as possible."[43]

The next year the PSD tariff was dropped in favour of the combined (weighted) day care/inpatient tariff which was reintroduced. The main reason was that the planned same day (PSD) structure under-rewarded day-care activity.[44]

Best Practice Tariffs

Best practice tariffs have been introduced in the PbR system in 2010/2011. BPTs have been implemented incrementally. In 2010/2011 four BPTs were introduced, in high-volume areas with significant unexplained variation in practice: cataracts, fractured neck of femur, cholecystectomy, and stroke care. In 2016/2017 BPTs cover more than 50 care procedures.[39]

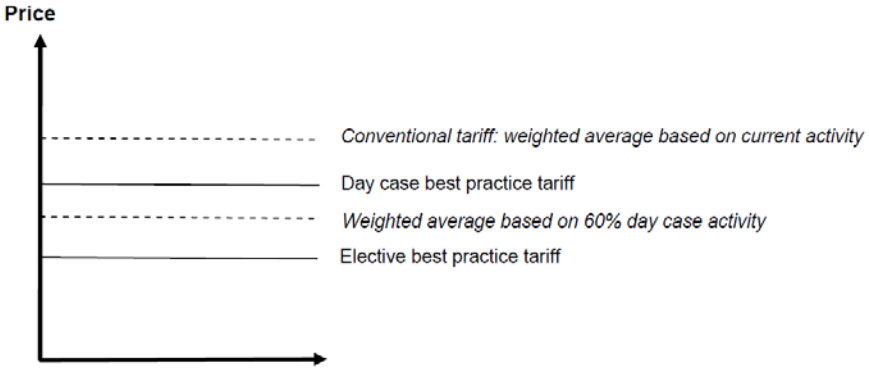
BPTs have different aims, designed to either change the setting of care, streamline the pathway of care, or increase the provision of high-quality care based on the best evidence available. BPTs that aim to change the setting of care are called **appropriate setting BPTs.** One type, the day case BPT, wants to promote the move to day care where appropriate.[29]

The day case BPT for a selected procedure is made up of a pair of prices: one applied to day-care admissions (called "day case best practice tariff" in Figure 6), the other to inpatient elective admissions (called "elective best practice tariff" in Figure 6), with the higher price for day-care admissions. Figure 6 shows the tariff setting for the first day case BPT for laparoscopic cholecystectomy.[44] At that time, the national average day-care rate for cholecystectomies was 19%. The British Association of Day Surgery (BADS) Directory of Procedures stated that at least 60% of patients having this operation could be managed on a day-care basis. Although 60% may not be achievable by all hospitals, some high-performing hospitals in England already achieved this percentage.

The aim was to create a clear incentive for providers to change practice. Hence, an enhanced tariff as a financial incentive was chosen instead of a reduced tariff based on reduced cost. Day surgery was over-reimbursed while inpatient care was underfunded. However, the BPT tariff structure was developed such that expenditures under the BPT structure were lower than under a conventional tariff structure. Although every procedure that shifts into the appropriate setting attracts a higher payment, this payment is lower than or equal to a tariff set in the conventional way, i.e. based on the national average of reported costs across both settings. In 2016/17 the ordinary elective payment is between 71% and 92% of the price of the day-care payment, depending on the procedure.[39]

As is the case for the conventional tariffs, also the BPTs are mandatory allowing little local flexibility and price-setting.

Figure 6 – Price setting of day case Best Practice Tariffs – the case of cholecystectomy



Source: PbR Guidance 2010/11[44]

In 2016/2017, day case BPTs cover 15 procedures (e.g. mastectomy, tonsillectomy, resection of prostate and hernia repair).[45] Some BPTs relate to specific HRGs while others relate to a subset of activity within a HRG. For the subset of activity that does not relate to the BPT activity, the conventional price is charged.[46] Between 2010/2011 and 2016/2017 some day-care rates were revised and BPT prices were recalculated based on revised transitional targets.[39, 40] Recently, an additional 19 procedures have been proposed to be covered by a day case BPT. These procedures have been selected based on minimum activity levels, suitable scope for improvement and evidence of high achievement for some providers.[40]

3 DAY-CARE STAYS IN BELGIAN HOSPITALS: DEFINITION, PAYMENTS AND VOLUME

3.1 Definition of a day-care stay

The function surgical day care

In Belgium, day care (more precisely a "day hospital") is defined in Article 2 of the National Agreement between hospitals and sickness funds of 1 July 2007 as "an organised and integrated function of day care in the institution with established procedures for selection of patients, safety, quality control, continuity, reporting and cooperation with various medical-technical services."[13, 47] An integrated function implies:

- the "day care" function run by the institution and led by a medical specialist;
- and / or the function "surgical day care", recognised on the basis of the provisions laid down by the Royal Decree (RD) of 25 November 1997 concerning the architectural and functional standards to which the latter must meet to be officially recognised.[48] One of the architectural standards is that the function surgical day care is a recognisable and identifiable entity.

Reimbursement criteria determine the criteria for a day-care stay

The criteria to define a day-care stay can be derived from the conditions for reimbursement claims for day care stated in Article 4§1 of the same agreement:[47]

- The hospital admission does not include an overnight stay (i.e. a stay that begins before midnight and ends after 8 AM the next day), regardless its length of stay;
- Care is not provided in the consultation room nor in the consultation ward of the polyclinic of the institution;
- The admission is not immediately followed by a scheduled hospital stay in the same institution;
- Under defined circumstances[m], a procedure is established for monitoring the patient after discharge, including a written report to the patient's general practictioner.

3.2 Hospital payment systems for day-care activities

In Belgium, payments by federal public authorities (see section 3.6 for patient payments) for day-care activities are different from payments for inpatient stays. For inpatient stays hospitals receive a budget, called the Budget of Financial Means (BFM), consisting of several sub-budgets which are allocated to hospitals according to a large set of criteria and parameters (see Box 3). The interested reader is referred to Crommelynck et al. (2013),[49] Durant (2015),[50] and KCE Report 229 (2014)[14] for a detailed description of the hospital payment system.

Also payments for surgical day care are included in the BFM. Non-surgical day care, however, is financed through various lump sums outside the BFM. Nevertheless, the distinction between both kinds of day care is not always clear-cut. For instance, the "nominative lists" of procedures for which hospitals receive a lump sum payment contain both non-surgical and surgical procedures.[n, 13]

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[m] Procedures allowing the hospital to charge a group 1-7 lump sum or a chronic pain lump sum (see hereafter).

[n] In particular, the nominative lists for group 1-7 lump sums contain several operating room procedures (procedures in bold in Appendix 2).

Box 3 – Budget of Financial Means (BFM)

Closed-end budget

Each year the national hospital budget or Budget of Financial Means (BFM) is defined by Royal Decree. It is a closed-end budget covering non-medical activities, such as the services for accommodation, accident and emergency services, and nursing activities. The BFM consists of three major parts (A, B and C), which are set separately: part A covers capital and investment costs; part B covers operational costs; and part C covers some corrections (positive or negative) of budgets for past financial years.

Allocation of budgets

Sub-parts B1 (common operational costs) and B2 (clinical costs) are the two major parts of the hospital budget, with a respective share of 20.3% and 38.4% in 2015. Every year, the budgets for the different sub-parts are set at the national level and allocated to individual hospitals according to calculation rules that are specific to each part.

Payment

Since 2002, the payment of the individual hospital budget consists of a fixed and a variable part. The fixed part is paid on the basis of monthly advances (called 'provisional twelfths'). It includes (theoretically) 80% of the components B1 and B2 and 100% of all other parts. The remaining variable part includes (theoretically) 20% of components B1 and B2 and is paid according to the number of admissions (10% of the budget) and the number of nursing days (10% of the budget). Hospitals receive a lump sum payment per admission and per diem for an inpatient and day-care stay; both lump sum amounts are hospital-specific.

Source: Van den Heede et al. (2016)[51], Van de Voorde et al. (2014)[14] and Crommelynck et al. (2013)[49]

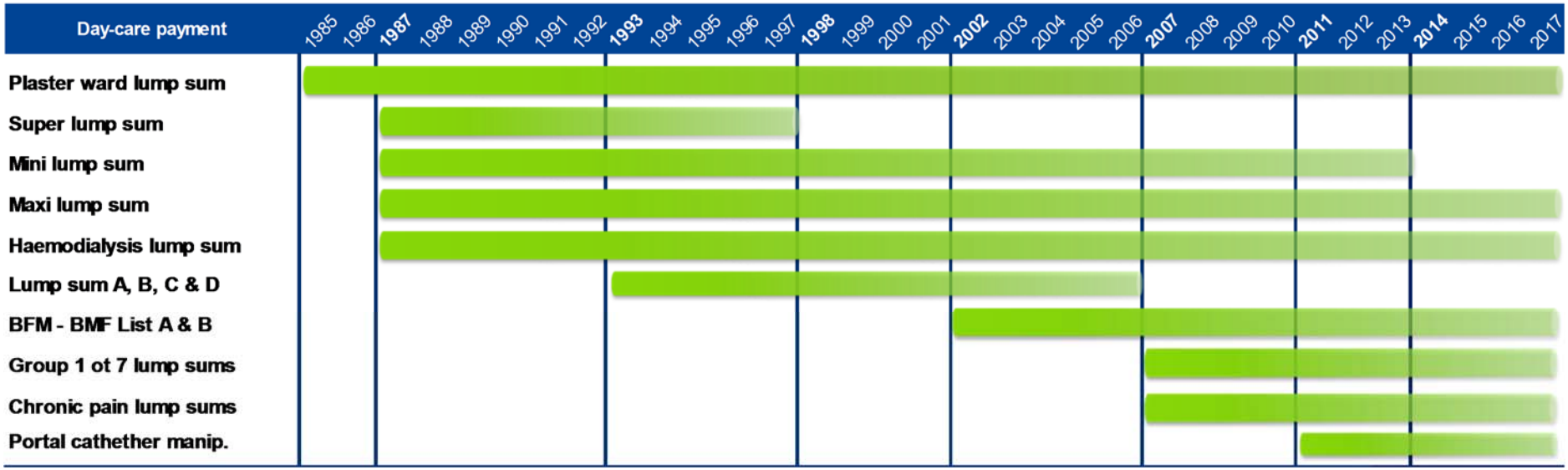
In the following sections, we provide an overview of different types of payments for day-care activities. The interested reader can find more details in Van de Sande et al. (2012)[13] and Van de Voorde et al. (2014)[14]. Figure 7 gives a summary timeline of the major reforms in day-care payments.

The first step in allocating separate payments for hospital services provided to day-care patients goes back to 1 April 1985. A lump sum, identical for all hospitals, was introduced to compensate hospitals for costs incurred by the use of plaster ward facilities and their assigned personnel. Before that date, payment for the use of plaster ward facilities was part of the per diem price[o]. The lump sum for plaster ward is currently still in use under the following conditions: for the treatment of fractures or dislocations, for other orthopaedic treatments or for certain types of plaster mouldings (Article 4§7 of the National Agreement between hospitals and sickness funds[47]). Hospitals can only charge this lump sum in case of use of the plaster ward in a day-care context (see criteria described in section 3.1), thus not for hospitalised patients (staying at least one night).

Since then, several lump sums have been introduced to pay for day-care activities. Some of them are the same for all hospitals, others are hospital-dependent.

[o] Up to 2002, hospitals were paid a per diem price for each patient day.

Figure 7 – Overview of major reforms in payments for day care



Source: Update of Figure 4 in Van de Sande et al. (2012)[13]

3.2.1 Hospital-dependent lump sums

On 1 January 1987, four lump sums were introduced resulting from the National Agreement between hospitals and sickness funds: the Mini lump sum, the Maxi lump sum, the Super lump sum, and a lump sum for hospital haemodialysis. Since then, the Super lump sum and the Mini lump sum have been abolished, in 1998 and 2014 respectively.

The Mini, Maxi and Super lump sums were hospital specific as they were determined by the B2-part of the per diem price, which covers clinical costs (mainly for nursing and care staff and for medical products). The price of the Maxi lump sum is equal to the B2-part of the per diem price while the price of the Mini and Super lump sums were respectively equal to half and twice this price.[13, 14] Each of these lump sums was linked to a restricted number of nomenclature codes (see Box 5 for a description of the nomenclature), the so-called "nominative lists" that were abolished in 2007. When the hospital provided one of the services from the nominative lists, it was entitled to the corresponding lump sum. Due to the hospital-specific character of the lump sums, large inter-hospital price variations existed for equivalent services.[13, 14]

3.2.1.1 Mini lump sum

Applicability rules for the Mini lump sums were profoundly changed on 1 July 2007. It remained hospital specific but with a minimum price of € 25 and the nominative list was removed.[13, 14] From then on, the Mini lump sum could only be charged in case of an emergency bed occupation or any condition requiring an effective medical surveillance because of the administration, by intravenous infusion, of a drug, blood or unstable blood derivate, under prescription by a physician.

On 1 January 2014 the Mini lump sum was abolished. It was decided to transfer the budget dedicated to this lump sum to the B2-part of the BFM from 1 July 2014 onwards.

3.2.1.2 Maxi lump sum

Applicability rules for the Maxi lump sums were also profoundly changed on 1 July 2007. As for the Mini lump sum, the lump sum amount remains hospital specific but with a minimum price of € 25 and the nominative list was removed.[13, 14] From then on, hospitals can only charge a Maxi lump sum in case of medical and nursing surveillance for any procedure needing a general anaesthesia supervised by an anaesthetist or for the administration of specific chemotherapeutic agents. In 2017 the amount of the Maxi lump sum (nomenclature code 761235) ranged between € 64.26 and € 284.46.

3.2.1.3 Super lump sum

In April 1998, the Super lump sum was abolished and was (largely) replaced by the A-lump sum (see hereafter).

3.2.1.4 Haemodialysis lump sum

The lump sum for hospital haemodialysis is also hospital dependent. Before 1996, it was linked to the hospital's per diem price through a linear relationship. Since 1996, the relationship between the lump sum for haemodialysis and the per diem price has been gradually reduced.

3.2.2 Hospital-independent lump sums

3.2.2.1 Lump sums A to D

In 1993, four new lump sums were introduced as part of a pilot initiative aiming to encourage day-care activities. These lump sums, called A, B, C and D, were hospital independent and were linked to nominative lists of services, that were adapted over the years. In 2007, the lump sums A to D were abolished and partially replaced by group 1 to 7 lump sums.

3.2.2.2 Group 1 to 7 lump sums and chronic pain lump sums

As mentioned above, the National Agreement between hospitals and sickness funds effective on 1 July 2007 changed the application rules of the Mini and Maxi lump sum.[47] It also introduced seven new groups of lump sums, partially replacing the lump sums A to D, and three lump sums for chronic pain. These ten new lump sums have a fixed price per lump sum and are linked to nominative lists of services (see Appendix 2 and Appendix 3). When the hospital provides services from one of the nominative lists, it is entitled to the corresponding lump sum if the service takes place in a day-care hospital (as defined in Article 2 of the National Agreement between hospitals and sickness funds).

Price scaling for the fixed lump sums of the Groups 1 to 7 was based on a pilot study in 95 hospitals conducted in 2005 by the National Institute for Health and Disability Insurance (RIZIV – INAMI), which calculated the real cost of the procedures on the nominative lists. The following items were taken into account:[13, 49]

- general costs and costs of administration;
- costs for bedding and laundry;
- costs for cleaning and heating;
- nursing activity (time) for preparation of patient, ward and intervention as well as for after-care;
- type of anaesthesia;
- costs of intervention ward, recovery room and patient room;
- food and beverages.

Table 7 shows the amounts of the hospital-independent lump sums in 2017. Strict rules apply for cumulative charging of different lump sums (Article 4§10 of the National Agreement between hospitals and sickness funds[47]). In particular:

- Maxi lump sum, Group 1-7 lump sums, plaster ward lump sum and/or portal catheter manipulation lump sum cannot be cumulatively charged: only the highest amount can be charged;
- Group 1-7 lump sums, plaster ward lump sum and/or chronic pain lump sums cannot be cumulatively charged: only the highest amount can be charged;
- If a chronic pain lump sum is charged, the Maxi lump sum cannot be charged;
- If a procedure listed on List A is carried out, then the Maxi lump sum, Groups 1-7 lump sums, plaster ward lump sum, chronic pain lump sums and portal catheter manipulation lump sum cannot be charged.

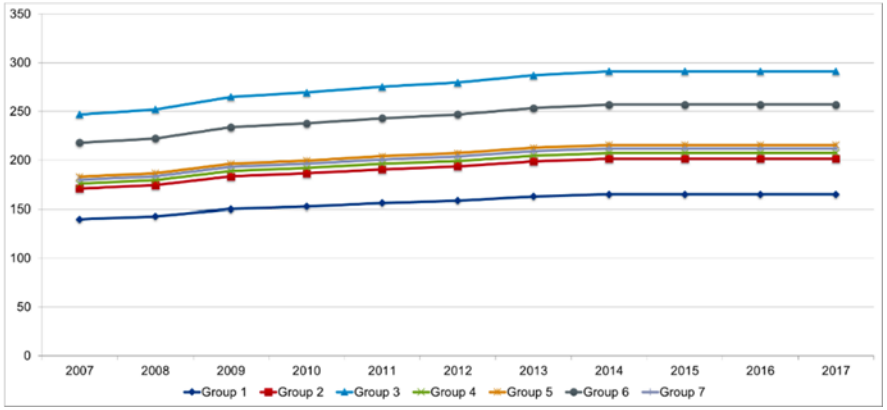
Table 7 – Lump sum amounts for day-care activities in 2017

Lump sum	Amount (€) in 2017
Plaster ward	29.95
Group 1	165.02
Group 2	201.57
Group 3	291.14
Group 4	207.45
Group 5	215.70
Group 6	256.97
Group 7	212.17
Group 1 chronic pain	231.02
Group 2 chronic pain	128.49
Group 3 chronic pain	100.18
Portal catheter manipulation	28.38

Source: RIZIV – INAMI (Nomensoft)

All the above prices should be adapted every year to the cost of living. They are revised every January 1st according to the evolution of the Belgian Health index (article 4§11 of the National Agreement between hospitals and sickness funds[47]). However, as an austerity measure they have not been adapted since 2014. Figure 8 shows the evolution of Group 1 to 7 lump sums over time.

Figure 8 – Evolution of Group 1-7 lump sum amounts (2007-2017)



Source: RIZIV – INAMI (Nomensoft)

3.2.2.3 Lump sum for portal catheter

Since 1 February 2011, hospitals are entitled to a fixed price for portal catheter manipulation (i.e. flushing in combination with medical imaging requiring contrast fluid or radioisotope and/or blood sampling). The lump sum was introduced to avoid that hospitals would charge a Mini lump sum for this procedure.[14, 49]

3.2.3 *Patients hospitalised in another hospital*

When a patient is hospitalised (i.e. with at least an overnight stay), hospitals are not entitled to the Maxi lump sum, groups 1 to 7 lump sums, the plaster ward lump sum, chronic pain lump sums and the portal catheter manipulation lump sum. However, exceptions have been introduced (2nd amendment of 29 June 2015 to the National Agreement between hospitals and sickness funds[52]) for patients who are hospitalised in another hospital (different from the one where the day care takes place). In particular, the lump sums can be charged for patients hospitalised in a psychiatric hospital, a specialised service (Sp) or a geriatric service (G) if they are not part of an acute hospital. In addition, groups 3, 6 and 7 lump sums can be charged for some procedures for patients who are hospitalised in a different hospital from the one where the procedure is performed (article 4§10).

3.2.4 *Financing of day surgery through the Budget of Financial Means*

Since the last major hospital payment reform of 1 July 2002, payments for day surgery are included in the Budget of Financial Means. The general costs are included in part B1 of the BFM and costs specific to the day-surgery centre and its activities in the operating room are included in part B2 (see Box 4).

Box 4 – Allocation of the B2-budget to individual hospitals

General principle

A national closed-end budget for part B2 is allocated to individual hospitals on the basis of a point system by which the national B2-budget is divided by the total number of B2-points "earned" by all hospitals. This gives the monetary value of one B2-point. "Justified activities" and the resulting number of "justified beds", the number of operating theatres and the availability or not of an emergency department determine the number of basic points a hospital is entitled to. Supplementary points can be attributed depending on activity and care profile (e.g. nursing intensity).

Justified activities

Justified activities are based on the number and type of stays during a reference year (2014 for the budget of 2017). A national average length of stay per pathology group (All Patient Refined Diagnosis Related Groups (APR-DRGs)) is calculated, which is then applied to the case-mix of each hospital. Multiplying the national average length of stay per pathology group with the case-mix of a hospital gives the number of justified patient days for the hospital. Per department or group of departments, the number of justified patient days is divided by the "normative occupancy rate" of the service (in general 80%). The concept of justified activities is based on average activity and should not be confused with justified as reflecting evidence-based practice.

The monetary value of a B2-point

The monetary value of one B2-point was equal to € 25 410.07 in 2014.

Source: Van den Heede et al. (2016)[51]; Van de Voorde et al. (2014)[14]

Payments for day-surgery activities concern two types of stays: realised day-care stays (for which at least one surgical nomenclature code from a specified list (List A – cf. infra) was recorded) and inappropriate inpatient stays. The total number of justified day-care stays is the sum of realised day-care stays and inappropriate inpatient stays. For each justified day-care stay the hospital is allotted a justified length of stay of 0.81 days for a surgery nursing unit (C-bed) as well as lump sum payments per admission and per diem. In 2017 the lump sum per admission ranged between € 105.88 and € 335.38 (nomenclature codes 768036-768040); the lump sum per diem ranged between € 22.05 and € 60.64 (nomenclature codes 768051-768062).

3.2.4.1 Realised day-care stays (List A)

List A concerns procedures for which day surgery is considered to be justified. The initial selection of nomenclature codes for List A was based on the previously fixed list of procedures that gave entitlement (before the reform of 1 July 2002) to a Maxi lump sum, a Super lump sum, or to lump sums A, B, C and D. In addition, the procedures had to meet two additional criteria: involving an invasive surgical procedure where prophylactic use of antibiotics is required and the proportion of the procedures performed in a recognised hospital setting (day care or policlinic) is at least 60% of all procedures performed in ambulatory care (i.e. day care, policlinic or in-office) at the national level. Each day-care stay for which at least one of the nomenclature codes on List A (see Appendix 4) has been recorded, is considered as a realised day-care stay.

3.2.4.2 Inappropriate inpatient stays

For some procedures an inpatient stay is considered inappropriate and hospitals receive exactly the same amount independent of the care setting (being inpatient or day care). The inappropriate inpatient stays include surgical as well as medical stays. To be classified as an inappropriate inpatient stay, the stay has to meet criteria, some of which hold both for surgical and medical stays; other criteria are specific for one of the two types of stays.

A stay, surgical or medical, is defined as an inappropriate inpatient stay if it meets at the same time all criteria listed in Appendix 3 of the Royal Decree (RD) of 25 April 2002 (modified by the RD of 8 January 2015) namely:[53]

- it concerns an inpatient stay;
- it involves one of the selected APR-DRGs (see Appendix 5);
- it concerns a scheduled admission;
- the length of stay is at maximum three days;
- the stay has a severity of illness class of 1 (minor);
- the patient did not die during the stay;
- the stay has a mortality risk index of 1 (minor);
- the patient is under 75 years of age;
- for stays classified in APR-DRG 097 (tonsil and adenoid procedures), the patient is under 14 years of age.

In 2002, 29 surgical and 3 medical APR-DRGs were included; since the RD of 8 January 2015 the number of surgical APR-DRGs is equal to 24 (see Appendix 5).[54]

- In addition, for surgical APR-DRGs the operating room procedure (coded in ICD-9-CM code) that determines the classification into this APR-DRG must have been performed in day care in at least 33% of the cases during a reference period. It is also required that at least 90 inappropriate inpatient stays could be identified at the national level for this procedure during the reference period (Minimal Hospital Data (MZG – RHM) from the last known three years).

An additional criterion for medical APR-DRGs is that a nomenclature code from List B (see Appendix 6) was recorded. List B was created on the basis of the same criteria as List A (former Maxi lump sum, Super lump sum, or lump sums A to D and involving an invasive surgical procedure). Moreover, for a procedure to be considered inappropriate the substitution level of the inpatient stays by day-care stays has to be at least 10% during a certain reference period.

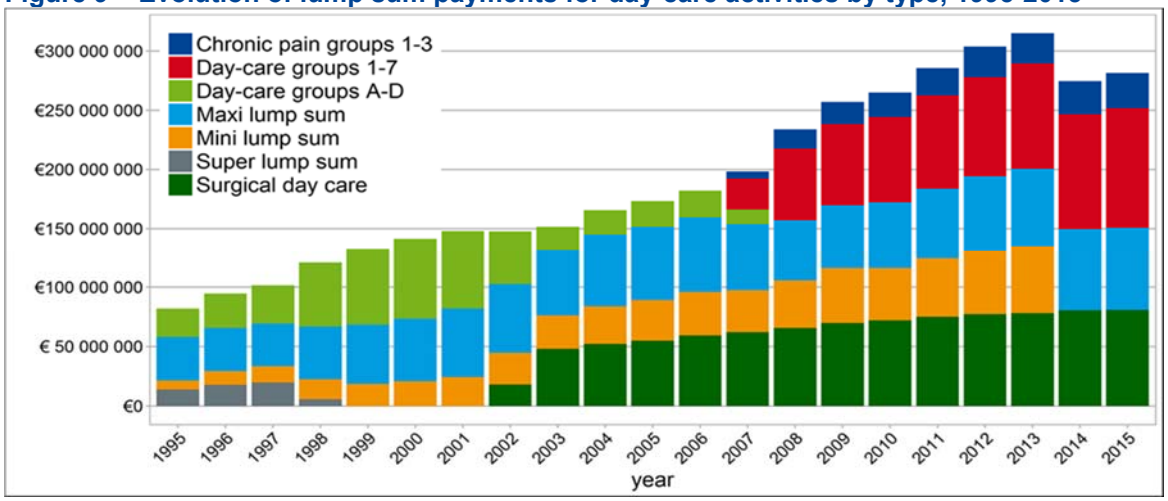
The (inpatient and day-care) surgical and medical stays for which at least one of the inappropriate nomenclature codes had been recorded, were identified. Based on this selection of nomenclature codes, the number of stays by APR-DRG was calculated. Finally, a list of the APR-DRGs representing 90% of the identified stays was established.[55]

3.3 Evolution of day-care volume and expenditures

Figure 9 shows the evolution of payments for day-care activities by type for the period 1995-2015. The payments for surgical day-care only refer to the lump sums per admission and per diem and not to the fixed part of the hospital budget (see Box 3). The figure illustrates a steady increase in payments for the whole period, except for 2014 and 2015 which is due to the transfer of the Mini lump sum to the BFM.

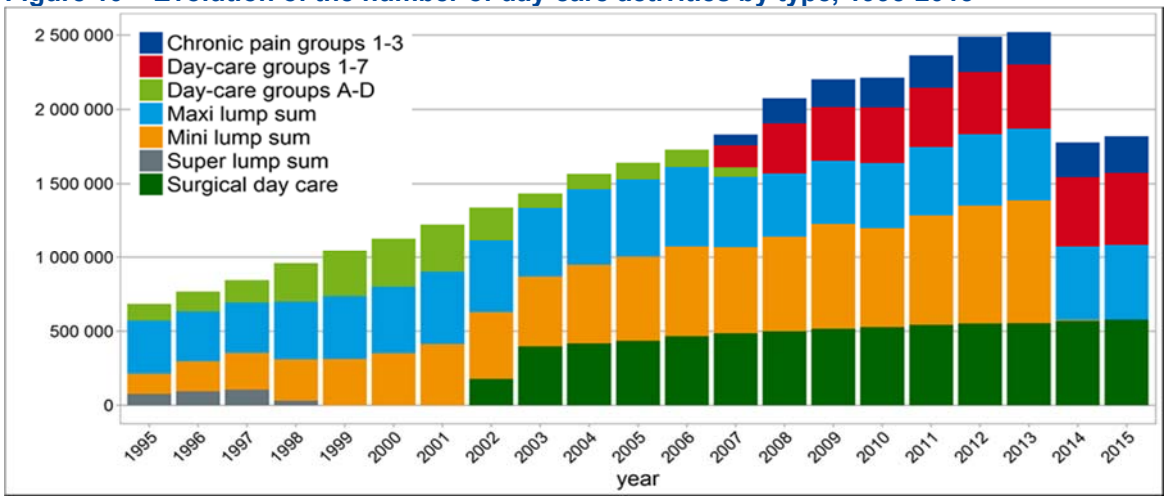
Figure 10 gives the number of day-care activities per type between 1995 and 2015. The number of day-care stays (excluding the more ambulatory activities such as the Mini lump sum, the chronic pain lump sums and the plaster ward lump sum) increased by on average 50 000 stays per year between 2005 and 2015 (from about 1.07 million stays to about 1.59 million stays).

Figure 9 – Evolution of lump sum payments for day-care activities by type, 1995-2015



The fixed part of the hospital budget is not included in the payments for surgical day care (see Box 3).
Source: RIZIV – INAMI (DOC N)

Figure 10 – Evolution of the number of day-care activities by type, 1995-2015



Source: RIZIV – INAMI (DOC N)

3.4 Critical appraisal of the payment system for day surgery

3.4.1 List A

A static and restrictive system that is not sufficiently evidence-based

The definition of the realised day-care stays is considered to be too static and too restrictive. Indeed, the list of nomenclature codes at the basis of List A is determined by pre-existing lists that have been abolished. Although medical technology is rapidly evolving, the initial selection of interventions on List A for day-care surgery has hardly been adapted since 2002, except with the reform in 2007.[13] Moreover, a number of nomenclature codes for orthopaedics that are on List A are no longer reimbursed since 2014.

In the same way, the criteria for an invasive surgical procedure are defined in a Royal Decree (21 February 1997, modified by the Royal Decree of 18 November 1998) that was abrogated in 2006. This definition limits an invasive surgical procedure to a procedure involving a prophylactic preoperative antibiotic therapy. Therefore, procedures for which no antibiotics are used or for which they are not only used for preoperative purposes but also as part of the therapy, are excluded.

Day-care stays with procedures not on List A are financially not rewarding

For day-care stays on List A, hospitals are allotted a justified length of stay of 0.81 days, which increases the number of points and hence their share of the national hospital budget (BFM). They are also entitled to a lump sum per admission and per diem. However, for procedures not on List A (except for those surgical procedures entitling hospitals to one of the Group 1-7 lump sum amounts) hospitals are entitled only to the Maxi lump sum for the general anaesthesia, which is lower than the sum of the lump sum per admission and per diem and the justified length of stay of 0.81 days for most hospitals.

3.4.2 Inappropriate inpatient stays

The selection of procedures on List B (medical APR-DRGs) is partially based on the same criteria as List A (former Maxi lump sum, Super lump sum, or lump sums A to D and involving an invasive surgical procedure), hence the same criticisms apply.

In addition, one major criticism addressed to the definition of inappropriate inpatient stays is that the list of APR-DRGs has hardly been updated since its introduction. Therefore, the measure did not help to stimulate a shift towards more day surgery.[13] Initially 32 APR-DRGs (29 surgical and 3 medical) were included. In 2015, 9 APR-DRGs were removed and 4 added, leading to a new list of 27 APR-DRGs (24 surgical and 3 medical) (article 22 of the Royal decree of 8 January 2015).[54] In reality, this modification represented only minor changes and was justified by the transition from version 15 to version 28 of the Patient Classification System to classify patient stays into APR-DRGs.

3.4.3 Shared responsibilities between RIZIV – INAMI and FOD – SPF hamper coherent policymaking

The amount of the lump sums and the corresponding nominative lists are determined by the National Commission of Sickness Funds and Hospitals, whereas the physician fees are negotiated in the National Commission of Sickness Funds and Providers, the so-called “Medico-Mut” (see Box 5). Both commissions operate within the healthcare department of RIZIV – INAMI. Within the FOD – SPF, the financing department of the Federal Council for Hospital Facilities gives advice to the minister on matters related to the hospital budget. Although there are initiatives to join efforts, the dual system itself results in a fragmentation of efforts and a multiplication of commissions. In KCE Report 229 a detailed analysis of the macro-level governance can be found.[14]

3.5 Remuneration of medical specialists

Physicians are **mainly paid fee-for-service**. Health insurance pays for medical services on the basis of a fee schedule, called "nomenclature" (see Box 5, which is a summary of the detailed information in Chapter 9 in KCE Report 229[14]).

However, also some **lump sum fees** exist. The medical activities **for laboratory tests** for inpatient stays and stays in day surgery are reimbursed as follows:

- A lump sum fee per admission which is determined at the national level and consists of a basic lump sum and an additional lump sum depending on certain characteristics of the clinical laboratory of the hospital (e.g. the number of staff, guarantee of continuity). The basic lump sum (nomenclature code 519091) equals € 34.20 in 2017, the additional lump sums, depending on certain characteristics of the clinical laboratory are € 53.58 (code 591076) or € 47.03 (code 591113) or € 25.65 (code 591135).
- A lump sum fee per day which is hospital-specific and partially depends on case-mix data (only for inpatient stays).
- A fee-for service component which has been reduced to 25% of its original value since the introduction of the (per admission and per diem) lump sums.

The lump sum fees per admission and per diem are both independent of whether or not tests were performed and of the number of those tests. The lump sum fees per admission can be charged for all procedures on List A or for which a Maxi lump sum can be charged as well as for procedures on a limitative list of 64 codes for which a Group 1 to 7 lump sum can be charged. This limitation is judged to impede a consistent evolution of (non-surgical) day-care activities in hospitals.[52]

For all stays during which a surgical procedure is performed for which at least one nomenclature code is included in a limitative list of 71 codes, a **coordination fee** (for the head of the day-surgery department) and a **surveillance fee** can be charged (both € 16.36 in 2017).[56, 57] The majority of these 71 codes are on List A, some are on the nominative lists for a Group 1 to 7 lump sum, one code is on List B and for one code a Maxi lump sum can be charged if the procedure is performed under general anaesthesia.

Box 5 – The remuneration system of medical specialists

The nomenclature

Medical and paramedical services covered by compulsory health insurance are listed in a fee schedule, called "nomenclature", which lists almost 9 000 unique covered services. The list of reimbursable codes contains for each item the professional qualification needed to be eligible for reimbursement, a code-number, a description of the item, a key letter according to the medical specialty, a coefficient and application rules. The coefficient gives for each procedure the relative value compared to other procedures with the same key letter. Multiplying the coefficient by the value of the key letter determines the amount of payment to the provider concerned (i.e. the fee).

Official tariffs negotiated in the "Medico-Mut"

The type of reimbursable benefits and their amounts (total fee and reimbursement) are determined through a process of negotiations with the various parties involved within RIZIV – INAMI, all within pre-set budgetary limits. The National Commission of Sickness Funds and Providers, the so-called "Medico-Mut" negotiates on the tariffs, and more specifically, on the value of the key letter. The negotiated fee or "convention tariff" is settled in agreements (for physicians and dentists) and conventions (for other healthcare providers).

3.6 Patient cost sharing: co-payments and supplements

The cost of a hospital stay, whether inpatient or not, is partly paid by patients. Various forms of patient cost sharing are implemented in the Belgian system of compulsory health insurance: co-payments (a flat rate per item or service), coinsurance (a percentage of the cost of the service) and supplements. The amount of patient cost sharing mainly depends on the type of hospital stay.

3.6.1 Fee supplements

On top of the negotiated fee (convention tariffs), medicals specialists are allowed to charge fee supplements under certain conditions.

A **fee supplement** is the **difference between the official tariff and freely set fees by providers**. We outline the procedure to determine physician fees in Box 5.

Physicians who subscribe the agreement (called "conventioned" physicians) have to adhere to the negotiated fees and receive certain benefits in return, such as a supplementary pension plan. Physicians can also be partly conventioned (i.e. only during specific hours of the day or week). If not conventioned, physicians can determine their fees freely (except in some cases, see the next section) and the patient pays the difference between the convention tariff and this fee, i.e. the fee supplement. Partly conventioned physicians may ask fee supplements only in an outpatient setting but not in case of an inpatient or day-care stay.[58] The convention applies to hospital-based physicians as well as physicians working in an ambulatory setting.

Regulation of fee supplements

- Inpatient stays: Over the years, possibilities to charge fee supplements for a hospital stay have been reduced. Physicians who have joined the agreement cannot charge fee supplements for hospitalised patients staying in a common or a two-person room since 2008 (article 152 of the Law of 10 July 2008[59]). Since 1 January 2013, this also applies for physicians who have not joined the agreement (article 26 of the Law of 27 December 2012[60]). Therefore, conventioned as well as non-conventioned physicians can only charge fee supplements if the patient stays in a single room. Exceptions are made if the single room is required for the medical condition of the patient or in case of unavailability of other room types.
- Day-care: Originally, fee supplements were allowed in all room types for day-care stays. Since 2014, fee supplements cannot be charged in a common or a two-person room for specific vulnerable groups of patients, such as beneficiaries of increased reimbursement of medical costs, patients who are eligible for the lump sum for chronic diseases as well as for patients undergoing (any type of) oncological care.[61]

  Since 27 August 2015, fee supplements cannot be charged anymore for day-care patients staying in a common or a two-person room (Articles 95-98 of the Law of 17 July 2015[62]).

Article 152 of the Hospital Act stipulates that fee supplements can only be charged when the hospital has determined a maximum fee supplement to which hospital physicians have to adhere. The amount (%) of the maximum fee supplement is determined in the compulsory financial agreement between hospital management and the physicians.[59]

3.6.2 Room supplements

Regulations for room supplements are stipulated in the Hospital Act (article 97).[59] The right to charge room supplements depends on the type of hospital room a patient chooses as is the case for fee supplements. Room supplements can be charged only if the hospital has at least 50 percent of its beds available for treatment without supplements. Also for children accompanied by a parent, a sufficient number of beds without supplements should be available (the law does not specify the number or share of rooms without supplements).[63] Since 1 January 2010 room supplements can only be charged in a single room. Before that date, they were also allowed in a two-person room under certain conditions.

The room supplement is freely determined by the hospital, there is no maximum amount. Article 97 of the Hospital Act stipulates that a maximum room supplement can be determined, but no implementing decree has yet been passed.[59] The argument to charge room supplements in single rooms is that more comfort and privacy is provided than in common or two-person rooms.

3.6.3 Material supplements

The amount of material supplements that can be charged by hospitals depends on the type of material and on whether or not the material is reimbursable by compulsory health insurance. The reimbursable devices are divided into (a) implants and long-term invasive medical devices and (b) invasive medical devices for short-term use. More information on material supplements can be found in Chapter 10 of KCE Report 229.[14]

3.6.4 *Amount of supplements charged for inpatient and day-care stays*

The figures in this section are based on supplements paid by patients enrolled in the Christian sickness funds, representing 41% of the population[p]. The figures were extrapolated to the Belgian population.[64] We focus on differences between inpatient and day-care stays.

Large differences between medical disciplines and between hospitals in the share of stays in a single room

Since August 2015 fee and room supplements for day care can only be charged in single rooms. This rule did already exist for inpatient stays. In 2015, the share of stays in a single room was on average 23% for an inpatient stay and 7.7% for surgical day-care stays. There are large differences in this share between disciplines (e.g. 68.5% for inpatient maternity services and 10.5% for inpatient geriatric stays) and between hospitals. In some hospitals the share of inpatient stays in a single room amounts to more than 40%. Also for surgical day-care stays large differences exist between hospitals: while in some hospitals the share amounts to 33%, in other hospitals there are no stays in a single room for an intervention in day surgery.

Fee supplements

In 2015, 32 of the 101 general hospitals included in the study of the Christian sickness funds defined the maximum fee supplement to be 100% of the official tariff; in 14 hospitals the maximum was fixed at 300% of the official tariff. The number of hospitals with a maximum fee supplement equal to 100% of the official tariff has decreased steadily over the years; many hospitals have increased the maximum tariff. The maximum fee supplements hold for both inpatient and day-care stays.

The actual fee supplement that was charged in 2015 for an inpatient stay amounts to an average of 66% of the official tariff. One of the explanations for this difference between the maximum percentage and the actual charged supplements is that for some fees (e.g. lump sum fees for clinical biology and medical imaging) it is not allowed to charge fee supplements. In the top-10 hospitals charging the highest fee supplements for an inpatient stay, the average percentage ranges from 124% to 171%; for the bottom-10 hospitals charging the lowest fees supplements the average percentages ranges from 26% to 48%. For a surgical day-care stay in a single room the average percentage for the top-10 hospitals with the highest fee supplements ranges from 150% to 221%.

Room supplements

Hospitals are free to set the amount of room supplements. In 2015, the average amount of room supplements per day for an inpatient stay was € 50, with € 18 as lowest room supplement to € 164 per day as highest room supplement. For a surgical day-care stay the average room supplement was € 46.

Hospital insurance

It should be kept in mind that the above-mentioned amounts of supplements refer to amounts charged by hospitals. Although supplements are not reimbursable by compulsory health insurance, people can buy a private hospital insurance. Private health insurance is offered by the sickness funds and by private for-profit insurers. Hence, for people who are privately insured the amounts actually paid are much lower than the supplements charged by hospitals.

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p https://www.cm.be/binaries/Jaarverslag-LCM-2015-Ledenaantallen_tcm375-130946.pdf

3.6.5 Co-payments

For the ease of writing we use the term co-payment for co-payments and coinsurance rates in this section. A co-payment is the difference between the official tariff and the amount that is reimbursed by the compulsory health insurance. The amount of co-payments is the same for all hospitals but differs between an inpatient and a day-care stay. Table 8 gives an overview of the co-payments that are charged for both types of stay in a general hospital. Low-income patients are entitled to increased reimbursement of medical expenses and pay lower co-payments.

Patients are charged four lump sum amounts on the first day of an inpatient stay: for clinical biology, medical imaging, reimbursed drugs and technical acts. These amounts are charged irrespective of actual utilisation. The lump sum amounts for clinical biology, medical imaging, and technical acts are not charged in case of a day-care stay. For reimbursed drugs, the different co-payment categories as applied in community pharmacies are charged (see RIZIV – INAMI[65] for more details).

Table 8 – Co-payments for an inpatient and day-care stay (2017)

Item	Co-payment inpatient stay		Co-payment day-care stay
	Patient entitled to increased reimbursement	Patient not entitled to increased reimbursement	
Lump sum amount on first day in hospital for:			
• Clinical biology	• € 0	• € 7.44	• € 0
• Medical imaging	• € 1.98	• € 6.2	• € 0
• Technical acts	• € 0	• € 16.4	• € 0
• Reimbursed drugs*	• € 0.62	• € 0.62	• Co-payment category**
Lump sum per day for hospital stay*:**			
• First day	• € 5.44	• € 42.58	• € 0
• Day 2-90	• € 5.44	• € 15.31	• /
• 91-end	• € 5.44	• € 15.31	• /

** This lump sum is charged per day; ** the co-payment category as applied for drugs dispensed by community pharmacies; patients entitled to increased reimbursement pay lower co-payments; *** for some specific categories of patients see http://www.cm.be/wat-te-doen-bij/hospitalisatie/ziekenhuisfactuur/verblijfskosten/index.jsp*

Key points

- **In Belgium, the payment system for day-surgery activities is very complex. Some activities are financed within a closed-end budget, other activities are paid by lump sums.**
- **Payments are often linked to procedures on nominative lists which bears the important disadvantage that those lists need to be kept updated regularly and adapted to clinical guidelines, current practice and reimbursement rules. This has, however, not been done.**
- **Responsibility for day-surgery activities is shared between the National Institute for Health and Disability Insurance (RIZIV – INAMI) and the Federal Public Service (FOD – SPF) for Health, Food Chain Safety and Environment which makes it difficult to realise a coherent policy and issuing of rules.**

4 SCIENTIFIC LITERATURE REVIEW

When an increase in day-surgery share is aimed at, it should verified if day surgery is a safe and effective alternative for the inpatient setting. Moreover, it should be verified which patient characteristics (e.g. comorbidities, socioeconomic status (SES)) preclude patients from day surgery. Therefore, an extensive literature search was performed.

Note: This chapter was sent as preparatory document to all participants of the 11 expert groups (cf. 5.2).

4.1 Research questions

In the following sections an answer is formulated to the following research questions:

1. Which patient characteristics (e.g. comorbidities, socioeconomic status (SES)) preclude patients from undergoing elective surgical interventions in a day-care setting?
2. Can elective surgical interventions be provided in a day-care setting as safely and effectively as in an inpatient setting?

4.2 Research Question 1 – Methods

4.2.1 Searches

4.2.1.1 Medline, PreMedline, Embase, and the Cochrane Library

Within the scope of the project “Ensemble pour le développement de la chirurgie ambulatoire”, the Haute Autorité de Santé (HAS) and the Agence nationale d’appui à la performance des établissements de santé et médico-sociaux (ANAP) performed a systematic literature search on day surgery, which is described in the document “Chirurgie ambulatoire : éléments d’appréciation en vue de la prise en charge d’un patient. Rapport d’évaluation technologique”.[66]

The searches in the electronic reference databases Medline, the Cochrane Library, the Banque de données en santé publique, the National Guideline Clearinghouse and the HTA Database were performed in April 2013 and covered scientific articles published from 1990 onwards.

For research question 1 we took the French systematic search as a starting point.

Our search comprised several steps. In a first step, an information specialist familiar with literature search protocols conducted the electronic search strategy with input from members of the research team. The search which was based on the French search was performed on February 2016 and covered scientific articles published between January 2013 (=French search date) and February 2016. Relevant publications were searched in Medline and PreMedline (through OVID) and the Cochrane Library of systematic reviews; no filters on study design were used. The same search was also performed in Embase, but limited to systematic reviews.

An overview of the inclusion and exclusion criteria is presented in Table 9. Further details on the search strategy are provided in Appendix 7.

Table 9 – PICO table and selection criteria

Selection criteria	Inclusion criteria	Exclusion criteria
Population	Patients having elective surgery in day care	
Intervention	Elective surgery in day care (no overnight hospital stay)	Oncological non-surgical interventions; interventional cardiological interventions; emergency surgical procedures; diagnostic procedures
Comparator	Elective surgery in inpatient care	
Outcomes	Clinical effectiveness, in terms of • recurrence rate • reoperation rate • quality of life Adverse events, in terms of • unexpected admissions to hospital/prolonged hospital stay • readmissions • visits to emergency room/department • complications • mortality	Cost-effectiveness; organisational and logistic aspects of day surgery (e.g. equipment)
Study design	Systematic reviews, randomized controlled trials, comparative studies, case series (n ≥ 1000)	Case reports, case series (n < 1000), simulation studies, narrative reviews, animal studies, in-vitro studies, letters, editorials, notes, congress abstracts
Language	English, Dutch, French, German	All other languages

The references from the different searches were first merged into a unique EndNote file so that duplicates could be removed. The references were then transferred into an excel file with separate sheets for each study design (i.e. systematic reviews, HTA, RCT and other).

In a first round, each sheet was screened for eligible articles based on title and abstract by one reviewer (RL). In case of doubt (n=23) this was indicated and 2 weeks later, the 'doubts' were re-viewed by the same researcher and a final decision was taken. In a second round, the remaining papers were retrieved and read in full for a final selection of studies to be included in the review. In a second step, the website of the National Guideline Clearinghouse (https://www.guideline.gov/) was searched for relevant guidelines. The same selection criteria were applied. The selection was performed by one researcher.

In a third step, grey literature was searched on the websites of a selection of (international) associations. Our short list was mainly based on a longer list from the French 2014 report on day surgery.[66] Searching and screening on inclusion criteria was done simultaneously by a single reviewer. The list of consulted websites is given in Appendix 8.

4.2.2 Selection

All documents that were selected based on title and abstract, were merged into one excel database, where they were categorised by subcategory (e.g. obstructive sleep apnoea (OSA), obesity, diabetes, etc.).

The selection of full texts was done for every single subcategory separately. In order to handle the large amount of references within a restricted time frame, we first checked for each subcategory if there was one (or more) methodologically well performed review(s) *(minimal criteria to be labelled as such were: (1) search sources documented in publication, (2) at least 2 literature sources searched (3) and at least Medline/Pubmed, (4) search strategy documented in publication or obtainable from authors, (5) selection criteria documented in publication).* If no review was available that fulfilled the above criteria, the French 2014 report on day surgery[66] was taken as starting point for research question 1. In case certain aspects were not clear to the review authors (e.g. it was not clear how certain conclusions were drawn), the original reviews and/or primary studies on which the French report was based, were retrieved. Where applicable, this is mentioned in the text.

The available RCTs (clinical effectiveness) and other primary studies (adverse events) were used to update the reviews. Comparative studies were only included if at least 100 patients per study arm were included and non-comparative case series if they considered at least 1 000 patients. From the non-comparative case series only data on adverse events (in terms of unexpected admissions to hospital or prolonged hospital stay, readmissions, visits to emergency room/department, complications and mortality) were extracted.

An overview of the excluded reviews and primary studies and the rationale for exclusion is presented in Appendix 9.

4.2.3 Quality assessment & data extraction

If reviews were considered methodologically well performed (cf. supra), they were assessed on their risk of bias with the Amstar checklist (Appendix 10 and http://amstar.ca/Amstar_Checklist.php). The results of these assessments are also summarized in Appendix 10. RCTs were assessed with the Cochrane Collaboration's tool for assessing risk of bias, as documented in Appendix 10.

The retrieved observational studies were not formally appraised since they provide by definition low-quality evidence on effectiveness. They are however considered useful for the assessment of adverse events. Indeed, while the assessment of clinical effectiveness in terms of survival requires data from high quality randomized controlled trials (RCT), observational data may be crucial when adverse events have to be identified. Observational data often consider larger populations than RCTs, and hence RCTs often lack the power to reliably detect differences in the occurrence of rare events between the intervention and control groups. Furthermore, observational studies may provide data over longer time periods. They also include less strictly selected patients, often with more co-morbid conditions than those enrolled in RCTs and they may reflect more recently induced changes in clinical practice.

Data extraction was performed by one reviewer. The evidence tables are given in Appendix 11.

Given the heterogeneity of retrieved studies, the data were summarized in a descriptive way; no attempts were made to pool the results in a mathematical way.

4.3 Research Question 1 – Results

4.3.1 Evidence base

4.3.1.1 References obtained through electronic databases

After removal of doubles, there were 407 systematic reviews, 570 RCTs, 23 HTAs and 1180 other primary studies which titles and abstracts were screened for eligibility (Table 10). This sifting process resulted in the selection of 2 systematic reviews and 9 other primary studies, which full text were obtained. Finally, based on full-text evaluation, 6 studies were included. An overview of the excluded studies and the rationale for exclusion is presented in Appendix 9. The list of included studies is provided in the respective paragraphs.

Table 10 – References obtained through electronic databases

Study design & database	Retrieved	Selected based on title & abstract	Selected based on full text
Systematic review	407	2	1
Medline	104		
Cochrane	185		
Embase	118		
RCT	570	0	0
Medline	299		
Cochrane	271		
HTA	23	0	0
Cochrane	23		
Other primary studies	1180	9	5
Medline	1180		
Total	**2180**	**11**	**6**

4.3.1.2 References obtained through other sources of evidence

A search on the website of the National Guideline Clearinghouse on February 18, 2016 yielded no useful references. The search on the websites of a selection of 18 (international) associations (see Appendix 8), yielded 2 reports, more precisely the manual of the International Association for Ambulatory Surgery and the BADS Directory of Procedures, 4th edition. In addition, from the website of the European project DaySafe we did not only download the final report, but also the several reports and related documents from the various working groups. Similarly, the website of the Haute Autorité de Santé provided several useful documents.

The majority of these documents were used as background information for the report in general, but were not adopted in the systematic literature review. There were two exceptions which were adopted in the systematic review: the HAS report and the review by Joshi et al. (2012).[66, 67]

4.3.2 Which patient characteristics preclude patients from undergoing elective surgical interventions in a day-care setting?

Whether a patient is eligible for day surgery depends entirely on an accurate pre-operative assessment of every single patient. There are some patient characteristics and medical aspects and criteria that may help in that assessment. They are described in the following paragraphs.

4.3.2.1 General patient characteristics

General patient characteristics are those factors to consider when evaluating any preoperative patient who will undergo surgery in day-care, regardless of his age, comorbidities and the aetiology of the intervention.[66]

For procedures for which it is agreed that day surgery is the default choice[68] specific patients may be moved to a short stay or inpatient pathway based on the pre-operative assessment. This assessment should be based on social and medical criteria according to recent guidelines, agreed with the anaesthetic department. Arbitrary cut-offs (such as age and weight) are considered inappropriate. In addition, they suggest that the pre-operative

assessment should be performed in time to correct any abnormalities and allow the patient to be adequately informed and prepared for surgery.[68]

Summary of the HAS report[66]

The authors of the HAS report viewed the obtained evidence on general characteristics for patients' eligibility for day surgery as limited, yet consistent. They support that:

- The general criteria are based on a case by case assessment taking into account the benefit/risk appraisal for the patient and the level of development of the facility, more precisely the experience of the medical team and the available resources.

In addition, the HAS authors quote the Société Française d'Anesthésie et de Réanimation (SFAR)[69] The choice for day surgery is a medical decision that is taken in dialogue with the patient (low level evidence).

From the literature search, we retained no additional studies.

4.3.2.2 Surgical aspects

Summary of the HAS report[66]

The surgical criteria found in the literature by the HAS report authors were mainly based on expert opinion, yet, the data from the guidelines and recommendations were convergent:

- Minimal risk of severe complications requiring immediate clinical monitoring (e.g. haemorrhage, cardiovascular instability, postoperative airway obstruction);
- Controllable postoperative pain;
- Rapid return of solid and liquid food taken orally;
- Manageable postoperative care by the patient and his caretakers.

From the literature search, we retained no additional studies.

4.3.2.3 Anaesthetic aspects

According to the Société Française d'Anesthésie et de Réanimation (SFAR), the pre-anaesthetic consultation in day surgery has the additional objective of confirming or challenging the eligibility of the patient for a day-care approach.[69] The anaesthetic criteria should be evaluated in such a way as to include patients without contra-indications for the available anaesthetic techniques. Also, the ASA score (Table 11) and the risk of malignant hyperthermia syndrome are part of these criteria since they are items specifically evaluated by the anaesthetist.[66]

Summary of the HAS report[66]

The anaesthetic criteria found in the literature by the HAS authors were mainly based on low level evidence, yet, the data from the guidelines and recommendations were convergent. They support the following:

- There is no specific anaesthetic technique recommended. General anaesthetic agents, hypnotics, morphine and curare, as well as general, regional or local anaesthesia, or a combination of techniques, can be used.

The following criteria are based on good practice recommendations in anaesthetics (low level evidence):

- Relative contra-indications are a history of anaesthetic problems, a short neck with a circumference ≥ 43 cm, mandibular retrognathism (i.e. posterior position of the lower jaw), a Mallampati score (which predicts the ease of endotracheal intubation) of 3 or 4[q], limited mouth opening;
- Absolute contraindications would be a history of difficult intubation, the inability to open the mouth or difficulty of keeping the mouth open.

[q] Mallampati classification: Score 0: ability to see any part of the epiglottis upon mouth opening and tongue protrusion; Score I: soft palate, fauces, uvula, pillars visible; Score II: soft palate, fauces, uvula visible; Score III: soft palate, base of uvula visible; Score IV: soft palate not visible at all

The following suggestions are only based on low level evidence:

- Preferably anaesthetic agents with a short lifetime and reduced side effects should be used – taking into account patient characteristics and the procedure to be performed – in order to facilitate the organization of the outpatient management mode;
- Anaesthetic techniques should cause a minimum of stress and a maximum of comfort for the patient; for every choice the benefit / risk analysis should be taken into account;
- In the event of local or regional anaesthesia, the cardiorespiratory status should be the only essential criterion for selection;
- In case of general anaesthesia, the eligibility criteria should be developed and validated by experienced anaesthetists.

From the literature search, we retained no additional studies.

ASA score

The American Society of Anaesthesiologists (ASA) physical status classification is a system for the pre-surgical assessment of patients' fitness (see Table 11). Although it has been argued that the classification is incomplete, it is simple to use. More precisely in patients with chronic diseases, the ASA classification allows the anticipation of more complex perioperative events.[66]

Table 11 – ASA classification

ASA score	Physical status
1	Healthy person
2	Mild systemic disease
3	Severe systemic disease
4	Severe systemic disease that is a constant threat to life
5	A moribund person who is not expected to survive without the operation
6	A declared brain-dead person whose organs are being removed for donor purposes

Summary of the HAS report[66]

The data found in the literature concerning the ASA score were considered low level evidence, yet, the data were convergent. They support the following:

- Patients with ASA score I and II and a stable score III are eligible for day surgery;
- The selection is based on a case by case benefit/risk analysis.

Non-consistent data were retrieved regarding the eligibility of patients with a non-stable score III or an ASA score IV.

From the literature search, we retained no additional studies.

Malignant hyperthermia

Malignant hyperthermia is a rare, but life-threatening, autosomal-dominant inherited[r] disorder that may lead to metabolic crisis of skeletal muscles in susceptible individuals following exposure to triggering agents, such as volatile anaesthetics or depolarizing muscle relaxants.[70] Functionally altered calcium release channels cause dysfunction of intracellular calcium homeostasis and uncontrolled calcium release from the sarcoplasmic reticulum, which may lead in some cases to a fatal hypermetabolic state known as malignant hyperthermia crisis.[70] As the initial signs are not specific, the diagnosis is difficult.[66]

Summary of the HAS report[66]

The limited data available in the literature were considered low level evidence by the HAS authors.

- Patients with a diagnosis of malignant hyperthermia (MH):

  The data retrieved from the literature concerning the eligibility of patients with a diagnosis of malignant hyperthermia were non-consistent.

- Malignant hyperthermia susceptible patients (MHS):

  The data retrieved from the literature concerning the eligibility of malignant hyperthermia susceptible patients were non-consistent.

From the literature search, we retained

- 1 retrospective cohort study (Lu et al., 2016[71] – see Appendix 11 for the evidence table); as explained above solely the data on adverse events were considered.

The main findings from our literature update are

- Lu and colleagues analysed the New York State Ambulatory Surgery Dataset (2002 – 2011) and identified 31 patients with a discharge diagnosis of malignant hyperthermia due to anaesthesia (ICD-9-CM[s]) in a total group of 17 092 765 discharges, yielding a prevalence of 0.18 per 100 000 discharges (95% CI: 0.12–0.25).[71] All 31 patients with a diagnosis of malignant hyperthermia were alive at the time of discharge.
- The authors admit that the accuracy and completeness of malignant hyperthermia diagnosis and coding may have varied across facilities. They further argue that the lower overall prevalence in the day-care setting compared to those observed in in-hospital studies, may be ascribed to an enhanced malignant hyperthermia awareness and preferential treatment of susceptible patients in the inpatient setting. In addition, the fact that patients in the day-care setting usually undergo low-risk surgical procedures, which are less complex and less invasive than those performed in hospital settings. As a consequence, the anaesthesia care often involves only regional and local anaesthesia, decreasing the risk of triggering malignant hyperthermia among susceptible patients.[71]

4.3.2.4 General medical criteria

Broadly speaking two types of medical criteria can be identified: general medical criteria and eligibility criteria for patients with known specific comorbidities or clinical conditions. The general medical criteria are described first.

[r] Autosomal dominant is one of several ways that a trait or disorder can be passed down (inherited) through families. In an autosomal dominant disease, you can get the disease if you inherit the abnormal gene from only one parent. (https://www.nlm.nih.gov/medlineplus/) There is a 50% chance that a child of an affected parent is also affected.

[s] The International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) is based on the World Health Organization's Ninth Revision, International Classification of Diseases (ICD-9). ICD-9-CM is a system of assigning codes to diagnoses and procedures associated with hospital utilization.

Summary of the HAS report[66]

The data with regard to general medical criteria retrieved from the literature, were considered low level evidence but consistent by the HAS authors. They support the following:

- The medical criteria are based on the evaluation of each patient, taking into account his condition at the time of evaluation and his personal and family history;
- In any case, the eligibility should not arbitrarily be limited by age, BMI, ASA score (Table 11), comorbidities or anaesthetic risks.

In addition, specific patient categories have been discussed in the literature (low level evidence):

- Lactating women would be eligible but special attention should be given to products and treatments that are excreted in human milk;
- Patients allergic to latex would be eligible, but prior adaptation (i.e. latex free surgical and anaesthetic equipment) in the perioperative period would be necessary and at discharge patients should be informed on how they can manage any symptoms and whom they can contact in that case;
- Patients at higher risk of surgical site infection (especially smokers, obese and diabetic patients) require special attention during the preoperative consultation.

Obstructive sleep apnoea

Obstructive sleep apnoea (OSA) is a common disorder in which one has pauses in breathing (apnoea) or significant reductions in ventilation (hypopnoea) while asleep. Although sleep apnoea usually is a chronic (ongoing) condition, it often goes undiagnosed (http://www.nhlbi.nih.gov/health/health-topics/topics/sleepapnea). There has been some debate on the suitability of a day-care approach for surgery in patients with OSA because of the concerns of increased perioperative complications, such as difficult/failed mask ventilation and/or tracheal intubation, difficulty maintaining adequate oxygen saturation, post-obstructive pulmonary oedema, need for tracheal reintubation, exacerbation of cardiac comorbidities.[67]

Summary of the HAS report[66]

The most recent source of information with the highest level of evidence on which the recommendations in the HAS report are based, is the systematic review by Joshi et al. (2012).[67] Through their search of electronic databases (Cochrane CENTRAL Register of Controlled Trials, Cochrane Database of Systematic Reviews, Medline and Embase) performed in February 2011, 3 studies were identified. An additional 4 studies were retrieved through hand-searching. Of those seven included studies, 2 were prospective cohort studies[72, 73] and 5 were retrospective chart reviews[74-78]. Hence, none of the studies were randomised controlled trials and 3[75-77] of the 7 studies did not have a comparator group of non-OSA patients. Apart from to the limitations inherent to non-randomised trials (e.g. selection bias), several other limitations were identified by the review authors: varying methods for OSA diagnosis were used in the different studies, the assignment to the non-OSA group was based on the absence of clinical symptoms (instead of a polysomnography or a validated screening questionnaire to exclude OSA), the definition of complications varied considerably between studies (e.g. hypoxemia was defined as oxygen saturation [SaO2] ≤95% or ≤90% or need for supplemental oxygen, which was provided at varying levels of desaturation) and varying definitions of difficult tracheal intubation were used. It is important to note that OSA patients had a higher body mass index and more comorbidities (including diabetes, hypertension, stroke, myocardial infarction, and congestive heart failure) in comparison with non-OSA patients. The review authors noticed that none of the included studies reported anaesthesia-related mortality, as assigned by the research groups. Yet, a higher incidence of postoperative hypoxemia in the OSA population was reported in several studies, but in none of the studies differences in the need for ventilator assistance or reintubation was observed.

Although the evidence base was considered sparse and of limited quality, Joshi and co-workers come to the following conclusions:

- Patients with a known diagnosis of OSA and optimized comorbid medical conditions can be considered for surgery in a day-care setting, if they are able to use a continuous positive airway pressure device in the postoperative period. OSA patients with non-optimised comorbid medical conditions may not be good candidates for surgery in a day-care setting.
- Since opioids have a significant propensity to exacerbate OSA and to prevent arousal, painful surgery may not be suitable for a day-care setting if postoperative pain relief cannot be predominantly provided with non-opioid analgesic techniques.
- Patients with a presumed diagnosis of OSA and with optimized comorbid conditions, can be considered for surgery in a day-care setting, if postoperative pain can be managed predominantly with non-opioid analgesic techniques.

From the literature search, we retained

- 1 prospective observational cohort study (Rotenberg et al., 2015[79] – see Appendix 11 for the evidence table); as explained above solely the data on adverse events were considered.
- 1 retrospective observational cohort study (Baugh et al., 2014[80] – see Appendix 11 for the evidence table); as explained above solely the data on adverse events were considered.
- *Note*: One primary study was excluded based on full text analysis as it was a non-comparative study with a sample smaller than 1000 patients and no outcomes of interest were assessed (see Appendix 9).

The main findings from our literature update are

- In a sample of 39 patients with no cardiovascular comorbidities who had an OSA related surgery (with the exclusion of major tongue-base surgery) and who were discharged based on the St. Joseph's OSA Risk Tool (SORT[t]) after 4 hours observation in the recovery room, no one had surgical complications and no patient was readmitted.[79] The results should be interpreted with caution since the study suffered from serious methodological flaws (see Appendix 11 for the evidence table).
- In an administrative claims database of 452 adult patients diagnosed with OSA and subsequently undergoing nasal and/or pharyngeal OSA related surgery, no significant differences between inpatient and day-care groups were observed in the 'any adverse event' rate, the readmission rate nor the GP or ER visit rate (see Appendix 11 for the evidence table).[80]

Obesity

According to the national health survey of 2013, 34% of the Belgian population is overweight (i.e. BMI between 25.0 and 29.9), while 14% is obese.[81] The body mass index (BMI) expressed in kg/m² is commonly used to define the severity of obesity (see Table 12). Obesity is a multisystem chronic pro-inflammatory disorder associated with increased morbidity and mortality[82], which may influence perioperative outcome. [83]

[t] St. Joseph's OSA Risk Tool (SORT): a patient is admitted for monitoring after OSA surgery if any of the following apply: 1) unable or unwilling to wear continuous positive-airway pressure appliance (CPAP) if planned to do so, 2) while breathing room air, evidence of witnessed apnoea, oxygen desaturation to less than 90%, or airway obstruction, 3) unexpectedly complex narcotic analgesic requirements.

Table 12 – BMI classification

BMI (kg/m²)	Classification
< 18.5	Underweight
18.5-24.9	Normal weight
25.0-29.9	Overweight
30.0-40.0	Obese
>40.0	Morbid obese
>50.0	Super obese

Summary of the HAS report[66]

Although the level of evidence of the gathered data on eligibility criteria for obese patients was low (mainly based on expert opinion) yet unisonous, they support that:

- Patients with a BMI <35 kg/m² are eligible for day surgery, except when there are individual contraindications;
- Patients with a BMI <40 kg/m² with comorbidities can be treated in the day-care surgery setting, if the comorbidities are optimized before surgery;
- A BMI >40 kg/m² is considered an exclusion criterion for several experts, except in specific cases after evaluation of the patient case;
- Apparently, patients who are super obese (BMI >50 kg/m²) are at increased risk for peri-operative complications and they should be well evaluated, taking into account the risks they incur;
- The comorbidities linked to obesity (e.g. obesity hypoventilation syndrome, obstructive sleep apnoea syndrome, pulmonary hypertension, resistant arterial hypertension, significant coronary artery disease, heart failure resistant to treatment) in patients with a BMI between 40 and 50 kg/m² should be identified, as these patients may not be eligible for treatment.

From our literature search, we retained

- 1 systematic review on the selection of obese patients for day surgery (Joshi et al., 2013[83] – see Appendix 11 for the evidence table). No meta-analysis of the results was performed 'because the included studies were too heterogeneous'; the data were summarized in a tabular form and a narrative description was added. The quality appraisal of the included studies was limited. Although this systematic literature review was also adopted in the HAS report[66], it was chosen to summarize it also in the present review since no more recent systematic reviews on the topic were identified. The quality appraisal (AMSTAR) can be found in the Appendix (see Appendix 10 for the evidence table).
- 1 retrospective propensity-matched cohort study (Rosero et al., 2014[84] – see Appendix 11 for the evidence table); as explained above solely the data on adverse events were considered.

The main findings from our literature update are

- The literature lacks adequate information to make strong recommendations regarding appropriate selection of the obese patients scheduled for surgery in a day-care setting.[83] None of the included studies assessed if there is a maximum weight above which elective surgical procedures should not be performed in a day care setting.
- The literature does indicate that the super obese (BMI >50 kg/ m2) do present an increased risk for perioperative complications.[83]
- The prevalence of surgery in a day-care setting among morbidly obese patients in the US (as assessed in the 2006 nationwide database of ambulatory surgery) was very low (0.32%), suggesting that conservative patient selection criteria are applied to morbidly obese patients offered surgery in a day-care setting.[84]
- Although the morbidly obese patients in the 2006 US ambulatory surgery database were younger, they had significantly higher comorbidity scores than their non-obese counterparts.[84] The prevalence of hypertension, diabetes, chronic lung disease, and neurological disease were significantly higher in the morbidly obese group.

- There are no significant differences in the unanticipated admission rates between obese and non-obese patients undergoing non-bariatric surgery.[83] However, this finding may be attributed to the inclusion of patients with low degree obesity (BMI approximately 30 kg/m2). It is very well possible that morbidly obese patients (i.e., BMI >40 kg/m2) are currently excluded from undergoing non-bariatric surgery in a day-care setting due to concerns of increased perioperative risks. Therefore, Joshi and colleagues conclude that at present it is not possible to determine whether this group of patients truly has a higher risk of unplanned admissions after surgery in a day-care setting.
- Several studies included in the systematic review by Joshi et al. reported a higher incidence of complications in the obese (e.g. hypoxemia, need for supplemental oxygen, need for airway manoeuvres, laryngospasm, and bronchospasm).[83] However, the authors noted that the clinical relevance of these adverse events may be limited, because it did not influence the incidence of unplanned admission or any other serious complications.
- Joshi et al. assume that the lack of increase in unanticipated admission rate in the bariatric surgical population may be related to preoperative identification and optimization of comorbid conditions.[83] From that assumption they infer that a morbidly obese patient may undergo surgery in a day-care setting if any comorbidities are identified and optimized before surgery.

Diabetes

In the most recent version of the national health survey (2013), 5.3% of the Belgian population of at least 15 years old reported having diabetes mellitus.[85] Based on the self-reported data, it was not possible to distinguish between type I and type II. Ninety-three percent of them explained that they use diabetes related medication: 28% uses insulin, 80% oral antidiabetic medication and 15% uses both.

Summary of the HAS report[66]

The most recent source of information with the highest level of evidence on which the recommendations in the HAS report are based, is the systematic review by Joshi et al. (2010).[86] Through their search of electronic databases (Cochrane Controlled Trials Register, the Cochrane Library, Medline and Embase) performed in November 2009, 1 systematic review and 9 trials including 5 RCTs were identified. The categories of evidence were based upon the level of evidence and agreement among the members of the consensus panel. The review authors noted that overall the retrieved studies evaluating perioperative glycaemic control in patients undergoing surgery in a day-care setting were sparse and of limited quality. As a consequence, their recommendations were based on general principles of blood glucose control in diabetics, drug pharmacology, data from inpatient surgical population, and review articles, as well as clinical experience and judgment.

Joshi and co-workers (2010) come to the following conclusions[86]:

- Diabetes is not considered an *a priori* exclusion criterion for surgery in a day-care setting in patients with diabetes.
- In a day-care surgery setting, the primary goals are the avoidance of hypoglycaemia and maintenance of adequate blood glucose control, which can be accomplished with minimal disruption in the patients' antidiabetic therapy, frequent blood glucose monitoring, and prompt resumption of oral intake after the surgery.
- There is no evidence in the literature that any particular blood glucose level is either beneficial or harmful for patients undergoing surgical procedures in a day-care setting. Therefore, the optimal blood glucose level for surgical patients in a day-care setting remains unknown.
    - For example, higher blood glucose levels may be acceptable in patients undergoing short surgical procedures after which patients are promptly expected to resume oral intake and antidiabetic therapy.

- On the other hand, in patients with poorly controlled diabetes, if the decision to proceed with the surgery is made, the blood glucose levels should be maintained around their preoperative baseline values rather than temporarily (i.e. perioperatively) normalizing them (LoE category 2A[u]).

- Surgery should be postponed in patients with significant complications of hyperglycaemia such as severe dehydration, ketoacidosis, and hyperosmolar nonketotic states (LoE category 2A[u]).
- It may be acceptable to proceed with surgery in patients with preoperative hyperglycaemia but with adequate long-term glycaemic control (LoE category 2A[u]).
- In chronically poorly controlled diabetic patients, the decision to proceed with surgery in a day-care setting should be made in conjunction with the surgeon while taking into consideration the presence of other comorbidities and the potential risks of surgical complications (e.g., delayed wound healing and wound infection). There are no RCTs evaluating the effects of preoperative glycaemic control on postoperative infection in surgical procedures in a day-care setting. However, a review of outcomes after non-cardiac surgery found that the glycosylated haemoglobin A1c (HbA1c)[v] <7% was associated with a significantly lower incidence of postoperative infections.

From the literature search, we retained no additional studies.

Cardiovascular disease

In the most recent version of the national health survey (2013), 1.0% of the Belgian population of at least 15 years old reported having experienced a myocardial infarction (or its consequences) during the 12 months preceding the health interview.[85] In the age group 75+ the respective proportion was 3.6%. Similarly, 1.5% of the Belgian population 15 years and older reported having had coronary disease (angina pectoris) in the year preceding the interview. Again, the proportion was highest in the oldest age groups, but also higher in men than in women. The reported prevalence of hypertension was much higher: 16.5% among the respondents of 15 years and older. Again, the prevalence increases with increasing age. For congestive heart failure no data were gathered in the national health survey of 2013.[85]

Summary of the HAS report[66]

The studies obtained in the HAS search were qualified by the authors as low level evidence. Moreover, for several items, divergent results (and recommendations) were obtained:

- **Myocardial infarction**: Contradictory data were obtained on the eligibility for surgery in a day-care setting of patients who had a myocardial infarction during the six months preceding the intended surgical intervention.
- **Coronary disease (angina pectoris)**:
  - Consistent, yet low level evidence (expert opinion) support that:

    Patients with angina pectoris class I & II (according to the Canadian Cardiovascular Society[w]) are eligible for surgery in a day-care setting if they are well controlled;

[u] LoE category 2A: Lower-level evidence (phase II or large cohort studies), but despite the absence of higher level studies, there is uniform consensus that the recommendation is appropriate. It is assumed that these recommendations may be modified as higher-level evidence becomes available.

[v] The glycosylated haemoglobin A1c([HbA1c) level reflects the average glycaemic levels over the preceding 3 to 4 months and is therefore a good indicator of long-term glycaemic control.

[w] The Canadian Cardiovascular Society grading of angina pectoris:
Class I – Angina only during strenuous or prolonged physical activity

Patients with angina pectoris class IV are not eligible for surgery in a day-care setting.

- Contradictory data were obtained on the eligibility of patients with angina pectoris class III for surgery in a day-care setting.

- **Hypertension**: Contradictory data were obtained on the eligibility of patients with hypertension for surgery in a day-care setting.
- **Congestive heart failure**: Contradictory data were obtained on the eligibility for surgery in a day-care setting of patients with congestive heart failure.

From the literature search, we retained no additional studies.

Respiratory disease

According to the national health survey of 2013, 4.3% of the Belgian population of 15 years and older has suffered from asthma during the 12 months preceding the interview.[85] Likewise, 4.0% of the Belgian population of 15 years and older was affected by chronic lung disease, which was defined in the health survey as chronic bronchitis, chronic obstructive pulmonary disease (COPD) or emphysema.[85]

Summary of the HAS report[66]

Again, the studies obtained in the HAS search were qualified by the authors as low level evidence, yet consistent. They support that:

- Asthmatic patients and patients with COPD are eligible for surgery in a day-care setting if they are not symptomatic or haven't had any symptoms the preceding 30 days.

The following items were identified, but as they are based on low level evidence, it hampers firm conclusions:

- Eligibility of patients depends on the severity of disease and the antecedents
- Patients with severe or uncontrolled disease, or those in which pulmonary status is uncertain, should be referred to a pulmonologist for assessment of pulmonary function.
- Non treated grade 2 dyspnoea and not controlled asthma are relative contra-indications for surgery in a day-care setting
- In patients with asthma a benefit / risk evaluation should be performed when anti-inflammatory drugs (NSAIDs) are prescribed postoperatively.

From the literature search, we retained no additional studies.

Other comorbidities

Summary of the HAS report[66]

Few data on the eligibility of patients with other comorbidities (e.g. renal, hepatic, neurological, gastro-intestinal, psychological diseases) for surgery in a day-care setting are available. Furthermore, the data are of low evidence level (expert opinion) which hampers firm conclusions:

- Patients with comprehension difficulties (psychological problems, mental disorders) would be eligible, provided that he is permanently accompanied. Actually, their rapid return to a familiar environment is recommended;
- Epileptic patients who are well controlled would be eligible;
- Surgery in a day-care setting would be contra-indicated for patients with severe comorbidities (e.g. haemodialysis, severe liver disease), with the exception of simple procedures.

From the literature search, we retained no additional studies.

Class II – Slight limitation, with angina only during vigorous physical activity
Class III – Symptoms with everyday living activities, i.e. moderate limitation
Class IV – Inability to perform any activity without angina or angina at rest, i.e. severe limitation

Concomitant treatments

Most concomitant treatments require actually a good management c.q. adaptation pre- and postoperatively. Therefore, patients on concomitant medication should have a careful assessment of the risks associated with stopping or continuing their treatment on the day of the surgery.[66]

Summary of the HAS report[66]

- **Antiplatelet therapy:**

  The literature on the eligibility of patients on antiplatelet therapy is based on low level evidence and hence no conclusions can be drawn.

- **Anticoagulant therapy:**

  The data on the eligibility of patients on anticoagulants is non-consistent and hence no conclusions can be drawn.

- **Monoamine oxidase inhibitors:**

  The level of evidence of the few available data on the eligibility of patients are under MAOI is so low that no conclusions can be drawn.

- **Other treatments:**

  The literature on the eligibility of patients on other medication is based on low level evidence and hence no firm conclusions can be drawn:

  - Most drugs usually taken by patients should be taken normally on the day of surgery in day-care;
  - Oral anti-diabetic medication should not be stopped the day before surgery. On the contrary, on the day of surgery no medication should be taken before resuming the normal diet;
  - In patients on insulin, the insulin scheme should be adapted on the day of surgery (depending on the type of insulin).

From the literature search, we retained no additional studies.

Tobacco, alcohol and substance abuse

Summary of the HAS report[66]

- **Tobacco:**

  The literature on the eligibility of patients exposed to tobacco is limited and based on low level evidence. Hence no firm conclusions can be drawn:

  - The eligibility of a patient who smokes or who is exposed to second hand smoke depends on the preoperative assessment, during which attention should be given to the degree and duration of the tobacco exposure, the co-morbidities that may be exacerbated by smoking and the risk of perioperative complications .

  In addition, divergent data were obtained regarding the time patients should quit smoking before the intervention (between six and eight weeks, and 24 hours before the procedure).

- **Alcohol:**

  The literature on the eligibility of patients who consume alcohol is limited and based on low level evidence. Hence no firm conclusions can be drawn:

  - Alcohol-dependent patients would be eligible but health professionals should be prepared to manage the perioperative complications;
  - Patients who are under the influence of alcohol (intoxicated) on the day of the intervention would not be eligible;
  - Highly intoxicated patients would not be not eligible.

- **Other substance abuse:**

  The literature on the eligibility of patients who are addicted to other substances is limited and based on low level evidence. Hence no firm conclusions can be drawn:

  - Patients taking ecstasy or cocaine would require special care;

- Patients taking cannabis patients would be eligible;
- Patients on narcotics (heroin) could present difficulties with the management of postoperative pain.

From the literature search, we retained no additional studies.

4.3.2.5 Paediatric age

Summary of the HAS report[66]

General criteria:

The studies obtained in the HAS search were qualified as low level evidence, yet consistent. They support that:

- Age is not an exclusion criterion, under the condition that the medical team has experience, the appropriate resources and rooms suited to treat children;
- The separation "child-parent" should be kept minimal.

Other criteria were identified, but as they are based on low level evidence, it hampers firm conclusions:

- Children may be eligible for day surgery only if the intervention is not complex, does not last too long, and if the patient does not have any comorbidity and if he has a comorbidity only if that comorbidity is well controlled;
- In case of more severe comorbidities, children may be eligible if the pathology is stable, the intervention minor and the risk for cardio-respiratory complications minimal.[87]

Minimum age limit of term infants and infants born prematurely

- The data on the minimum age limit for day surgery eligibility in term and premature babies are divergent.
- For term babies the following age limits were retrieved:
  - In France, children are according to the Société Française d'Anesthésie et de Réanimation (SFAR), eligible for day surgery when they are at least three months old and even when they are younger than three months if the medical team is experiences (average overall quality);
  - In Spain the minimum age limit is 6 months (average overall quality);
  - In Australia and New Zealand the minimum age limit is 6 weeks (expert opinion);
  - In the UK (and Ireland),
    - Each NHS entity may determine the minimum age limit (expert opinion);
    - According to the Royal College of Nursing the minimum age limit is 4 weeks, in babies who were not put on a respirator (expert opinion);
    - According to the Association of Anaesthetists of Great Britain and Ireland the minimum age limit is 4 weeks (expert opinion).
- Premature babies are eligible:
  - In Spain, if they are at least 12 months; those younger than 12 months would present a high risk of postoperative apnoea;
  - In France, certain preterm patients may according to the Société Française d'Anesthésie et de Réanimation (SFAR) be eligible when they have a postconceptional age of at least 60 weeks and up to the age of 1 year when the medical team is experienced and depending on the nature of the intervention (average overall quality);
  - In Canada, the eligibility depends on the risk/benefit evaluation performed for each patient (low level evidence);
  - In the UK (and Ireland),
    - Premature babies are according to the Royal College of Nursing eligible when they have a postconceptional age of at least 44 weeks (expert opinion);

- Premature babies are according to the Royal College of Anaesthetists eligible when they have a postconceptional age of at least 60 weeks. The minimum age limit for eligibility depends on available resources, the experience of the medical team and the clinical condition of the infant (expert opinion);
- Premature babies are according to the Association of Anaesthetists of Great Britain and Ireland eligible when they have a postconceptional age of at least 60 weeks (expert opinion).

o In Australia and New Zealand premature babies are eligible when they have a postconceptional age of at least 52 weeks (expert opinion).

Surgical criteria

- The criteria are based on a recommendation of good general quality.[88] It supports that the surgical contra-indications for day surgery in children comprise those interventions where there is a bleeding risk and / or which are deemed to be painful, or which may require specific postoperative monitoring or which may cause intraoperative or postoperative complications.

Anaesthetic criteria

- The criteria are based on a recommendation of good general quality.[88] It supports that the anaesthetic contra-indications for day surgery in children comprise serious and unstable conditions, acute pathologies and the onset of intraoperative or post- anaesthetic complications.
- Apart from that, according to the Royal College of Nursing, the duration of the anaesthesia and the intervention should not exceed one hour (low level of evidence data).[89] Anaesthetists should be trained and specialized in paediatrics and keep their knowledge up to date (low level of evidence).

ASA score (see Table 11)

The studies were qualified as low level evidence, yet consistent. They support that:

- Patients with ASA score I or II are eligible;
- Patients with an unbalanced ASA III score and patients with an ASA IV score are not eligible.

The advice on the eligibility of paediatric patients with a stable ASA III score is based on a recommendation of good overall quality:

- After prior agreement with the anaesthetist and/or surgeon, stable ASA III patients with or without treatment can be included if the interference of the planned intervention on the pathology and/or the treatment is negligible.

Upper respiratory tract infections:

Although the incidence of upper respiratory tract infections is high in the paediatric age group, few data on the eligibility of these day-care surgery patients are available. Furthermore, the data are of low evidence level which hampers firm conclusions:

- Patients would be eligible four weeks after the symptoms have disappeared;
- Eligibility would depend on the risk of respiratory complications (including endotracheal intubation, passive smoking, nasal congestion and productive cough)

Postoperative risk of apnoea:

Again, few data are available and they are of low evidence level which hampers firm conclusions:

- Patients would not be eligible if there is a recent history of episodes of apnoea, of heart or respiratory disorders, if there is a family history of sudden infant death syndrome or adverse social conditions to minimize the risks associated with postoperative apnoea.

From the literature search, we retained no additional studies.

4.3.2.6 Old age

When considering old age as an risk indicator or exclusion criterion for day surgery, it should be acknowledged that the group of 'older patients' actually represent a non-homogenous group of patients due to a high variability between individuals.[66]

Summary of the HAS report[66]

The studies on older patients' eligibility for day surgery which were identified in the HAS search were qualified as low level evidence, yet consistent. They support that:

- Older patients should not be excluded a priori from day surgery;
- Older patients' eligibility depends on the individual risk/benefit analysis, on the planned care and the organisation of care, more precisely the continuity of care;
- It comes down to evaluating the physiological and clinical age of the patient, in addition to his medical history and social environment;
- It is recommended to pay special attention to the pre-operative evaluation of the older patient (medical history, treatments, cognitive problems, support from relatives); in some cases geriatric advice may be requested (more precisely a comprehensive geriatric assessment, which allows a global medical, psychological, social, functional and environmental assessment of the older patient and the proposition of an adapted strategy for care and follow-up).

Other eligibility criteria were identified, but as they are based on low level evidence, it cannot be affirmed that:

- There should not be an arbitrarily fixed maximum age for day surgery;
- There are divergent data on the eligibility of extremely old patients.

Based on the low level evidence found in the literature, no conclusions can be drawn on a potential reduced risk of cognitive impairment in older patients who are referred for day surgery.

The identified literature on the eligibility of older patients with other comorbidities (e.g. diabetes, cardiovascular or respiratory disease, obesity, obstructive sleep apnoea, renal failure, cirrhosis) is based on low level evidence and hampers firm conclusions.

From the literature search, we retained

- 1 retrospective observational cohort study (De Oliveira et al., 2015[90] – see Appendix 11 for the evidence table); as explained above solely the data on adverse events were considered.

Note: Two primary studies were excluded based on full text analysis as it were both non-comparative studies with samples smaller than 1000 patients (see Appendix 9).

The main findings from our literature update are

- Even after adjusting for comorbidities, older adults are at greater risk of unanticipated hospital admission within 30 days of surgery in a day-care setting (adjusted OR for the effect of age (<70 vs ≥ 70) on hospital admission: 1.54 (99% CI: 1.29–1.84)). The most frequently cited causes of hospital admission within 30 days of surgery in day-care were wound problems (13.1%), infections (6.2%), bleeding (4.8%), and pain (4.7%).

4.3.2.7 Psychological, social and environmental aspects

Although psychological, social and environmental factors may have an impact on patients' eligibility for surgery performed in a day-care setting, they were out of scope for the literature review. Hence, only the major findings from the HAS report will be presented without a literature update.

Aspects related to information, understanding and patient consent

Summary of the HAS report[66]

Patient information is mandatory. What was found in the literature, was of low level, yet the results were converging. The analysis helps to remember that:

- The information given to patients during the preoperative consultation and reiterated in each step of the treatment, is essential for a successful path in day-care surgery;
- The information should be appropriate, provided orally and written (short, readable), developed and coordinated between all health professionals involved, adapted to the specific setting of day-care surgery, more precisely on the importance of respecting the pre- and postoperative instructions (non-compliance can lead to the postponement of the intervention or can be harmful in the management of the patient), on the post-anaesthesia and postoperative care, on signs that would suggest a postoperative complication and how to handle it, on the discharge policies and on the modalities in case of complications at home.

Note: more details to be found in the HAS report pp 149-157.[66]

The role of the accompanying person

Summary of the HAS report[66]

Preoperatively:

- It is recommended to identify preoperatively (a) person(s) in the patient's entourage likely to intervene in the patient care when he is back home. Their role will depend on the medical and social context.

At the patient's exit:

What was found in the literature, was of low level, yet the evidence was converging:

- It is recommended to ensure that the patient does not drive a care (or another vehicle) and that he is accompanied by a third party when returning home.

Postoperatively, at the patient's residence:

In the literature inconsistent data were retrieved with regard to the need of an accompanying person the night following the intervention:

- In some documents it is suggested that the presence of a companion at the place of residence postoperatively should be evaluated based on patient and intervention characteristics, and must be defined beforehand by the health professionals of the day-care centre. The permanent presence of a person during the 24 hours following a surgical intervention in day-care may not be useful for some patients, particularly when it concerned relatively minor surgery and very brief anaesthesia;
- In other documents the presence of a responsible adult at discharge and the patient's home the night following the intervention is considered a standard eligibility criteria for surgery performed in day-care;
- In case of an unplanned absence of an accompanying person at discharge, it is recommended to seek alternatives before proposing in-hospital admission;
- The presence of a companion would be important for the following patient categories: fragile or elderly patients, patients living with another senior, patients with mental disorders or patients who have difficulties communicating or deaf / hard of hearing, patients living alone and socially isolated.

Environmental factors

Summary of the HAS report[66]

Distance between the day-care setting and the patient's place of residence:

Only inconsistent data was retrieved from the literature with regard to the distance between the day-care setting and the patient's place of residence. Furthermore, the low level evidence does not support to set a maximum

travel time between the day-care setting and the patient's place of residence.

Equipment the patient's place of residence:

What was found in the literature, was of low level, yet converging and helps to remember that in the place where the patient resides postoperatively, it is recommended to have:

- an easy access to a phone to call for emergency assistance if needed;
- a minimum of comfort, suited to post-operative care (easily accessible, good hygiene) to allow adequate recovery.

When the environmental criteria are not fulfilled, care-hotels may be good alternatives.

Continuity of care

Low level evidence, yet converging helps to remember that:

- Sharing of information between the hospital and primary care is important pre- as well as postoperatively;
- It is recommended to transmit to the GP all relevant information that can be useful for the post-interventional care (intervention and hospitalization report, predictable side effects, instructions, recommendations for the continuity of care).

Note: In France, the day-care surgery unit is responsible for the organisation of the continuity of care. In case the day-care surgery unit is not able to ascertain the continuity of care, it is required to make agreements with another hospital that can provide in time hospitalisation to patients from all medical disciplines practiced by the day-care surgery unit.

4.4 Research question 2 - Can elective surgical interventions be provided in a day-care setting as safely and effectively as in an inpatient setting?

Within the scope of the project "Ensemble pour le développement de la chirurgie ambulatoire", the Haute Autorité de Santé (HAS) and the Agence nationale d'appui à la performance des établissements de santé et médico-sociaux (ANAP) performed also a systematic literature search on the efficacy and safety issues of day surgery.[16] The searches in the electronic reference databases Medline, Econlit, The Cochrane Library, the Banque de données en santé publique, the National Guideline Clearinghouse and the HTA Database were performed from June 2011 to March 2012. Unfortunately, they did not report the applied in- and exclusion criteria, they did not present any evidence tables and apparently no systematic quality appraisal was performed. They come to the following conclusions[16]:

- None of the retrieved studies compared the incidence of **mortality** between patients having day surgery and those treated as inpatient. Yet, mortality was a rare event;
- None of the retrieved studies compared the incidence of **severe morbidity** between patients having day surgery and those treated as inpatient. Yet, severe morbidity was rare;
- In one study no significant difference was observed in the number of **surgical site infections** between patients treated in day surgery and those treated as inpatient, while in three other studies it was suggested that day surgery was a protective factor against surgical site infections. It is likely that day surgery will benefit patients in terms of a reduction in healthcare-associated infection, because:
    - The risk of healthcare-associated infection increases with length of hospital stay and hence early discharge, on the day of the procedure, therefore reduces the likelihood of exposure to a risk of healthcare-associated infection;

  - The risk of a surgical site infection increases proportionately to the risk of exogenous contamination during prolonged procedures, during which tissue is exposed for a longer period of time. The use of minimally invasive techniques in day surgery is therefore likely to reduce the risk of surgical site infections.

- None of the retrieved studies compared frequency levels of **postoperative pain** between patients having day surgery and those treated as inpatient. Yet, pain at home was the most commonly observed complication after day surgery in adults;
- None of the retrieved studies compared frequency levels of **postoperative nausea and vomiting** between patients having day surgery and those treated as inpatient. Postoperative nausea and vomiting were predominantly reported in the immediate postoperative period, but were also seen after patients were discharged. The incidence data varied widely;
- Rates of **unplanned overnight admission** were between 0.2% and 26%. The wide variation can be explained by variability in patient selection, procedure type, differences in levels of surgical expertise and types of day surgery unit. The analysis of the causes of unplanned admissions (e.g. surgical, anaesthetic, medical and/or social) is hampered by the fact that there is a wide variety of ways of classifying causes;
- Rates of **unplanned return to hospital and/or readmission** were between 0.15% and 9.1%. Again, the observed variation could (among others) be assigned to methodological factors (different definitions used, variability in length of follow-up, under-reporting when patients go back to a hospital other than that in which they underwent the intervention);
- None of the retrieved studies compared **satisfaction** rates for day surgery with those for inpatient admission. Day surgery satisfaction rates were high, but varied according to the type of data collection, the time lag between intervention and data collection and the type of day surgery unit. In addition, selection bias could not be excluded as some patients could not be contacted and did not respond.

It was opted not to update this literature review for the present report. As was reported by the HAS authors, there are only few comparative studies comparing outcomes of efficacy and/or safety for day surgery with those for inpatient admission.[16] Moreover, a screening of the more recent literature on day surgery revealed that many comparative studies on the topic are not randomised and hence suffer from selection bias as patient characteristics (e.g. comorbidities, operative indications, severity of condition) differ between the inpatient and outpatient groups.[91-94] Even more, in some studies, patients were not eligible for day surgery if they refused an operation as a day-case or if they had comorbidities precluding day-case surgery (e.g. diabetes, coronary artery disease, epilepsy, chronic pulmonary disease, and morbid obesity (i.e. BMI > 40 kg/m^2)).[95] The added value of these studies can hence be questioned. In addition it should be noted that the evaluation of the efficacy and safety of a day-care approach compared to an inpatient approach for elective surgical procedures is more context specific, than e.g. the evaluation of a certain drug X for pathology Y. Also, a discipline specific systematic literature review (i.e. one for each of the 11 ad-hoc working groups) was beyond the human resources and time constraints of the present study.

Key points

- **Whether a patient is eligible for day surgery depends entirely on an accurate individual preoperative assessment, which should be based on social and medical criteria according to recent guidelines.**
- **Arbitrary cut-offs (e.g. for age and BMI/weight) are considered inappropriate.[68]**
- **The assessment should be performed in time to correct any abnormalities and allow the patient to be adequately informed and prepared for surgery.[68]**
- **The quality of the retrieved scientific evidence on the efficacy and safety of day surgery is low[16]; yet day surgery can be considered safe.[96, 97]**

5 IDENTIFICATION OF ELECTIVE SURGICAL PROCEDURES FOR DAY CARE

5.1 Introduction and objectives

The main objective of this study is to identify which elective surgical procedures can safely be performed in a day-care approach, as an alternative for inpatient care and to investigate how the day-care rate for those procedures can be increased. For this purpose, Belgian administrative data were analysed and thoroughly discussed with clinical experts.

5.2 Methodology

5.2.1 Expert recruitment

On 21 March 2016 the medical directors of all Belgian acute hospitals were sent an email which comprised the objectives of the present KCE study and an invitation for medical specialists to participate in one of the 11 ad-hoc expert groups. The medical directors were asked to share this invitation with all medical specialists of their hospital. In order to maximize the chance that all interested medical specialists received the invitation for the expert groups, the same email was sent on the same day to the dedicated Belgian medical societies (the list can be found in Appendix 12), inviting them to share the information with their members.

The invitation was also sent to all addressees of the KCE mailing list, shared via social media (twitter, LinkedIn and Facebook) and posted, in Dutch and French, on the KCE website from 23 March 2016 until the end of April 2016.

Experts were invited to apply for participation in one or several of following ad-hoc expert groups:

- Abdominal surgery
- Breast surgery
- Gynaecology
- Head & Neck surgery
- Neurosurgery
- Ophthalmology
- Orthopaedic surgery
- Plastic & dermatological surgery
- Thoracic surgery
- Urology
- Vascular surgery

Interested experts were asked to forward their coordinates to the KCE team no later than 11 April 2016.

As the number of applications for the expert groups “plastic & dermatological surgery” and “thoracic surgery” was low, the deadline for application was extended for these expert groups and additional invitation emails were sent between 12 April and 25 April.

5.2.2 Composition of the expert groups

In total, KCE received 179 applications (141 surgeons/medical specialists and 38 anaesthetists) for the 11 expert groups (based on surgical disciplines). The expert groups were formed in order to respect, as much as possible, an equilibrium in language (Dutch and French), hospital type (university and non-university) and speciality (surgeons/medical specialists and anaesthetists). Care was taken that in each expert group no more than 1 (sub) specialist per hospital was represented. Experts could apply for more than one expert group, but eventually most experts were assigned to only one expert group, and some to two or three at the most. On 10 May 2016 the experts were sent an email confirming for which expert group(s) they had been selected. Table 13 illustrates the composition of the 11 expert groups.

Table 13 – Composition of the expert groups

Group	Number of experts*	Dutch (%)	French (%)	University (%)	Non-university (%)	Surgeons (%)	Anaesthetists (%)
Abdominal	29	45.5	55.5	27.3	72.7	77.3	22.7
Breast	19	52.6	47.4	47.4	52.6	68.4	31.6
Gynaecology	21	76.2	23.8	28.6	71.4	76.2	23.8
Head & Neck	18	55.6	44.4	44.4	55.6	66.7	33.3
Neurosurgery	19	52.6	47.4	42.1	57.9	73.7	26.3
Ophthalmology	17	47.1	52.9	41.2	58.8	70.6	29.4
Orthopaedic	29	55.2	44.8	24.1	75.9	79.3	20.7
Plastic	15	46.7	53.3	40.0	60.0	60.0	40.0
Thoracic	12	58.3	41.7	50.0	50.0	58.3	41.7
Urology	20	50.0	50.0	40.0	60.0	75.0	25.0
Vascular	16	68.8	31.3	31.3	68.8	68.8	31.3

**: as some experts applied for more than one expert group, the total sum is higher than 179; experts working both in university and in non-university hospitals are categorised as "university".*

5.2.3 Composition and validation of the lists of interventions eligible for a day-care approach

5.2.3.1 Composition of the lists of interventions eligible for a day-care approach

Administrative hospital data in Belgium

For each patient seen in a Belgian hospital (inpatient and day care), hospitals have to send twice a year medical data (more precisely, Minimal Hospital Data (MZG – RHM[x]), defined in a Royal Decree[98, 99]) to the Federal Ministry of Health (FOD – SPF). The MZG – RHM are based on the International Classification of Diseases-9th Revision-Clinical Modification (ICD-9-CM[y]).[103]

At the FOD – SPF, inpatient and day-care stays are assigned an APR-DRG (All Patient Refined Diagnosis Related Group, see Box 6; Version 28, up to the end of 2014).

Box 6 – The APR-DRG system

The APR-DRG system is a type of patient classification system that aims to define medically coherent and cost homogeneous groups. APR-DRGs extend the basic DRG structure by adding two sets of subclasses to each base APR-DRG, i.e. severity of illness (SOI) and risk of mortality (ROM). Within each APR-DRG there are four grades of SOI: 1 = minor; 2 = moderate; 3 = major; 4 = extreme. Patients are allocated to an APR-DRG-SOI group on the basis of principal diagnosis, secondary diagnoses and procedures, age and sex of the patient and, for some APR-DRGs (e.g. burns), type of discharge.[104]

Based on the Minimal Hospital Data, the FOD – SPF classifies all stays in 1 282 possible APR-DRG-SOI combinations (which is done with APR-DRG-Grouper software). Each APR-DRG comprises one or more procedures.

The principal diagnosis mentioned in the MZG – RHM determines in which Major Diagnostic Category (MDC, see Table 14) a stay is classified. If the MZG – RHM data contain a procedure that is recognized by the grouper software as surgical, the respective stay will be labelled surgical. The surgical stays are then further classified in a surgical APR-DRG, mainly on the basis of the procedure code mentioned in the MZG – RHM. For medical stays, the principal diagnosis determines in which medical APR-DRG a stay is classified.

[x] MZG – RHM: Hospital discharge dataset (“Minimale Ziekenhuis Gegevens”/”Résumé Hospitalier Minimum”).

[y] International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) is based on the World Health Organization's Ninth Revision, International Classification of Diseases (ICD-9). ICD-9-CM is a system of assigning codes to diagnoses and procedures associated with hospital utilization. From 2015 onwards, the MZG – RHM data are based on version 31, using ICD-10-BE, a Belgian modification of ICD-10-CM[100] and ICD-10-PCS[101].[102]

In addition, information about the administered care and the related tariff (more precisely, Hospital Billing Data (AZV – SHA[z] (for inpatient stays) and ADH – HJA[aa] (for day-care stays)) have to be sent to the National Institute for Health and Disability Insurance (RIZIV – INAMI). The Hospital Billing Dataset contains all reimbursements by the RIZIV – INAMI related to hospitals stays: fees charged by physicians and other healthcare providers, pharmaceuticals and implants, per admission and per diem lump sum payments, etc. In real terms, hospitals bill the patient's sickness fund for the provided services which are covered by the health insurance on the basis of the RIZIV – INAMI nomenclature.[102] The nomenclature is a nationally established fee schedule, which lists almost 9 000 unique covered services and their payment rates.[102]

Each year, the Technical Cell[bb] links the MZG – RHM data with the AZV – SHA and ADH – HJA data at the level of each hospital stay (inpatient and day care). This linking allows a.o. to get an overview of the care provided and the costs reimbursed by the health insurance per medical condition for each hospital. This linked dataset (later named TCT-coupled data) serves two objectives: an in-depth analysis of the relation between pathology and health insurance expenditure, and the support of the development of financing and quality rules and policies.[102] For the present report, the Technical Cell data of 2011 - 2013 were used. As a consequence, stays of patients who are not entitled to a RIZIV – INAMI reimbursement (e.g. inhabitants who had a labour accident, inhabitants in social welfare (OCMW – CPAS), and foreign patients), are not included in the sample.[cc]

List of interventions for discussion with experts

For each expert group a preliminary list of interventions which were deemed eligible for a day-care approach, was composed. The list was based on APR-DRGs, ICD-9-CM codes and the Belgian nomenclature (RIZIV – INAMI billing codes, see also Box 5). For the selection of interventions to be discussed with the experts, the last available TCT-coupled dataset of 2013 was used (whereas for the analysis of the Belgian data, the 2011-2013 dataset was used, cf. infra).

In the TCT database, diagnoses and procedures are registered according to the ICD-9-CM classification and billed procedures according to the RIZIV – INAMI billing codes. It is important to note that this database only covers hospital activity (inpatient and day-care stays) and no outpatient activities.

We chose to work with APR-DRGs and ICD-9-CM procedures codes because these classifications are currently used by the FOD – SPF to identify the so-called inappropriate surgical inpatient stays (see Box 7 and section 3.2.4.2). Working with the same tool as the FOD – SPF allowed us to compare our results with the list of inappropriate surgical inpatient stays (cf. Appendix 15). Moreover, this approach allowed us in a following step to exclude all SOI 3 and 4 stays (see section 5.2.4).

For frequently conducted interventions, the impact of substituting day care for inpatient care on the needed hospital capacity (for example, measured in terms of beds) will be assessed in a subsequent study.

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z AZV – SHA: Anonieme ziekenhuisverblijven – Séjours hospitaliers anonymes

aa ADH – HJA: Anonieme daghospitalisatie – Hospitalisation de jour anonyme

bb Technische Cel voor de verwerking van de gegevens met betrekking tot de ziekenhuizen - Cellule Technique de traitement de données relatives aux hôpitaux

cc Over 98% of the inpatient hospital stays charged to the health insurance are linked to MZG – RHM.[102] Almost 90% of all inpatient general hospital stays are linked with reimbursement data. The majority of the missing 10% is not charged to health insurance, but to other payers (social security (e.g. labour accidents), social welfare (OCMW – CPAS), or international conventions for foreign patients). These stays are not available in the reimbursement data. The same reasoning applies to day-care stays; however, the lower proportions compared to inpatient stays are explained by emergency room contacts without admission, renal dialysis, use of the plaster room and mini lump sum in the reimbursement data for which no corresponding MZG – RHM stays are available.

Box 7 – Inappropriate surgical inpatient stays

Inappropriate surgical inpatient stays are stays for surgical procedures for which the FOD – SPF determined that they should be performed in day care if the patient is younger than 75 years old, presents a SOI and a ROM equal to 1, is not admitted through the emergency ward, does not die during the stay, and is hospitalised 3 days or less. These criteria are applied to the procedures with a national day care rate of at least 33% and a sufficient yearly volume within 24 surgical APR-DRGs.

A complete description of this process can be found in Chapter 3 (section 3.2.4.2).

Selection of Major Diagnostic Categories (MDCs)

We analysed the surgical APR-DRGs included in the following MDCs:

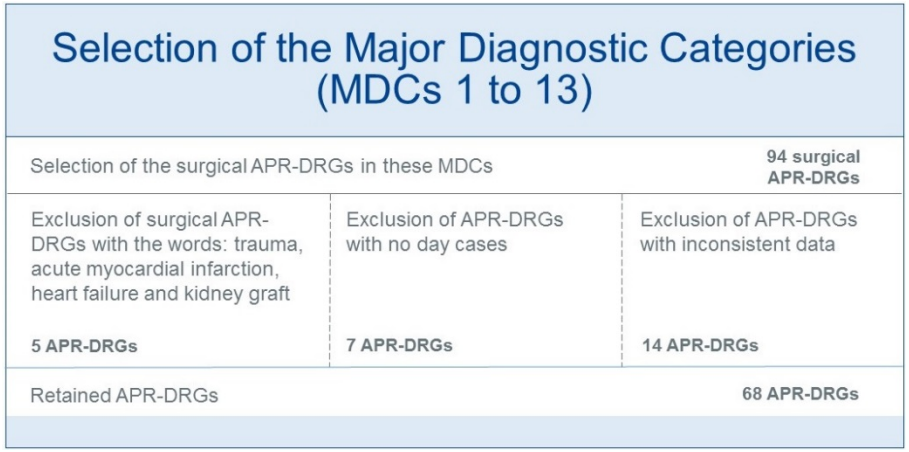
Table 14 – Major Diagnostic Categories considered for the present study

Code	Major Diagnostic Categories
1	Diseases and Disorders of the Nervous System
2	Diseases and Disorders of the Eye
3	Ear, Nose, Mouth, Throat and Craniofacial Diseases and Disorders
4	Diseases and Disorders of the Respiratory System
5	Diseases and Disorders of the Circulatory System
6	Diseases and Disorders of the Digestive System
7	Diseases and Disorders of the Hepatobiliary System and Pancreas
8	Diseases and Disorders of the Musculoskeletal System and Connective Tissue
9	Diseases and Disorders of the Skin, Subcutaneous Tissue and Breast
10	Endocrine, Nutritional and Metabolic Diseases and Disorders
11	Diseases and Disorders of the Kidney and Urinary Tract
12	Diseases and Disorders of the Male Reproductive System
13	Diseases and Disorders of the Female Reproductive System

The other MDCs dealing with pregnancy and newborn disorders, blood, HIV, infectious and mental diseases, alcohol and poisoning disorders, burns, rehabilitation and multiple trauma were not taken into account as they were considered out of scope for the present project (e.g. the procedures of the surgical APR-DRGs of these MDCs were already covered in the APR-DRGs included in the study; the procedures for multiple trauma are most frequently performed as a non-elective procedure).

Selection of APR-DRGs

Figure 11 – Selection of APR-DRGs within the selected Major Diagnostic Categories (MDCs)



At first, we excluded five surgical APR-DRGs with a description containing the word: trauma, acute myocardial infarction, heart failure or kidney graft, as these were all considered out of scope for the present study (Table 15):

Table 15 – All Patient Refined Diagnostic Related Groups with specific words

Code	All Patient Refined Diagnostic Related Group
020	Craniotomy for trauma
170	Permanent cardiac pacemaker implant with AMI, heart failure or shock
174	Percutaneous cardiovascular procedure with AMI
308	Hip and femur procedures for trauma except joint replacement
440	Kidney transplant

Secondly, we excluded seven APR-DRGs for which no day-care stays were registered in 2013 (Table 16):

Table 16 – All Patient Refined Diagnostic Related Groups without day-care stays in 2013

Code	All Patient Refined Diagnostic Related Group
160	Major cardiothoracic repair of heart anomaly
162	Cardiac valve procedures with cardiac catheterization
163	Cardiac valve procedures without cardiac catheterization
165	Coronary bypass with cardiac catheterization or percutaneous cardiac procedure
166	Coronary bypass without cardiac catheterization or percutaneous cardiac procedure
260	Major pancreas, liver & shunt procedures
303	Dorsal and lumbar fusion for curvature of back

In a next step, we roughly verified for each remaining surgical APR-DRG the frequencies of the respective ICD-9-CM procedure codes and the RIZIV – INAMI codes. More precisely, the surgical APR-DRGs without any surgical or interventional radiology RIZIV – INAMI code were excluded, as this was considered a proof of data inconsistency. The interventional radiology codes were also taken into consideration as they can be used for some vascular procedures under study. Important to note is that this step was performed at the level of the APR-DRG and not at the level of the procedure or the stay. In this step, the following fourteen APR-DRGs were excluded (Table 17):

Table 17 – All Patient Refined Diagnostic Related Groups with "inconsistent data"

Code	All Patient Refined Diagnostic Related Group
021	Craniotomy except for trauma
090	Major larynx and trachea procedures
091	Other major Head and neck procedures
120	Major respiratory and chest procedures
161	Cardiac defibrillator and heart assist implant
167	Other cardiothoracic procedures
220	Major stomach, oesophageal and duodenal procedures
221	Major small and large bowel procedures
223	Other small and large bowel procedures
261	Major biliary tract procedures
304	Dorsal and lumbar fusion except for curvature of back
401	Pituitary and adrenal procedures
480	Major male pelvic procedures
510	Pelvic evisceration, radical hysterectomy and related procedures

As a result of the above described selection process, 26 APR-DRGs were excluded. More information on APR-DRGs excluded based on these grounds can also be found in the chapters giving the details per discipline.

Selection of procedures within the selected APR-DRGs

As this report focuses on procedures performed in a full operating room, interventions that are currently performed by non-surgical specialists (e.g. interventions performed by gastroenterologists) were considered out of scope.

At the level of each selected APR-DRG, only procedures which were already in 2013 performed in day care were selected. As this might have induced a rather conservative approach (not taking into account a possible shift towards day care between 2013 and 2016), the respondents of the survey were asked which procedures that are eligible for a day-care approach should be added to the preliminary list.

For each of the 68 remaining APR-DRGs, we first identified all procedures that determine the assignment of a stay to a particular APR-DRG (as defined by the APR-DRG grouper software). For example, the following procedures assign a stay to APR-DRG 022 (Ventricular shunt procedures): ventricular shunt to structure in head and neck (02.31), ventricular shunt to circulatory system (02.32), ventricular shunt to thoracic cavity (02.33), ventricular shunt to abdominal cavity and organs (02.34), ventricular shunt to urinary systems (02.35), other operations to establish drainage of ventricle (02.39), replacement of ventricular shunt (02.42) and removal of ventricular shunt (02.43).

As in this project we focused on surgical procedures rather than stays, the stay of a patient who undergoes more than one procedure during the stay (e.g. myringotomy and adenoidectomy), may be counted twice: once for the myringotomy and once for the adenoidectomy (cf. section 5.2.4).

In addition, explicitly labelled revision surgery (identified by the words "revision of" or "control of" in the title of the ICD-9-CM procedure codes) as considered out of scope because these procedures are more complex and hence less eligible for day care Exceptions were made for those revision

procedures who are currently performed in day care, e.g. pacemaker revision.

Among the surgical procedures identified as described above, we made a final selection of procedures using the following criteria:

- Homogeneous APR-DRGs (criterion 1): all included procedures retained
- Less homogeneous APR-DRGs (criterion 2): most frequent procedures retained
- Extension to other anatomical region (criterion 3)
- Extension to the ICD-9-CM category (criterion 4)
- Surgical extension (criterion 5)
- Procedure suggested by a clinical expert at a preliminary review or by comparison with the procedures selected in British Association of Day Surgery (BADS) (criterion 6).

For medical and/or technically homogeneous APR-DRGs, all procedures of the APR-DRG were selected. For example, APR-DRG 263 Laparoscopic cholecystectomy, the procedure was included in the list to be discussed with the clinical experts.

For less homogeneous APR-DRGs, the most frequent procedures were selected. A precise cut-off could not be defined as the number of surgical procedures per APR-DRG is far too variable. An example of a less homogeneous APR-DRG is APR-DRG 073 Eye procedures except orbit.

The criterion “extension to another anatomical region” meant that if a procedure was frequent the same procedures were also selected when performed on another anatomical site. For example, as toe amputation was a frequent procedure, the amputation of a finger was also included.

The criterion “extension to the ICD-9-CM category” meant that if a procedure was frequent, all procedures classified in the same ICD-9-CM category were also selected. For example, since the removal of orthopaedic devices of the radius and ulna was a frequent procedure, the removal of orthopaedic devices from all other bones were also included (see textbox).

Example of ICD-9-CM procedure classification

78 Other operations on bones, except facial bones
- 78.0 Bone graft
- 78.6 Removal of implanted devices from bones
  - 78.60 Unspecified site
  - 78.61 Scapula, clavicle and thorax (ribs and sternum)
  - 78.62 Humerus
  - 78.63 Radius and ulna
  - 78.64 Carpals and metacarpals
  - 78.65 Femur
  - 78.66 Patella
  - 78.67 Tibia and fibula
  - 78.68 Tarsals and metatarsals
  - 78.69 Other (pelvic bones, phalanges [foot, hand], vertebrae)

With regard to the criterion “surgical extension”, the more extended variations (within the same anatomical site) of a selected procedure were also selected for discussion with the experts. For example, from thoracoscopic lung surgery we added thoracoscopic excision of a lung lesion, thoracoscopic segmental lung resection, thoracoscopic lobectomy and thoracoscopic pneumonectomy.

In a final step, the preliminary list was discussed with a clinical expert of the field and compared with the list of day-surgery procedures published by the BADS; the list was adjusted where appropriate (criterion 6).

One final note: if the description of a procedure contained “other” or “unspecified”, the procedure was not selected because in these cases, the procedure was considered not precise enough to be adopted in the list of procedures to be presented in the online survey and further discussed with the surgeons during the expert meetings.

For a more detailed description of the applied methodology per surgical discipline the reader is referred to the Appendix 13.

5.2.3.2 *Validation through an online survey*

In order to find out whether the members of the expert groups agreed with the suitability of the selected interventions for a day-care approach and whether the lists were comprehensive, a survey was performed. The survey was conducted online (web-based) using Lime Survey©, an open Source Survey Software for the creation and administration of online surveys.

A dedicated survey was developed for each expert group. Each selected expert received on 12 May 2016 an invitation by email to complete the web-survey; it included a unique access code for the online survey and the procedure to follow. The deadline for the online survey was set on 23 May 2016. Two reminders were sent to non-responders (on 18 May and 20 May 2016).

Survey development

The questionnaire was developed and distributed in English. The usefulness and the formulation of each question was discussed within the research team. A pre-final online version of the survey intended to the gynaecology expert group was sent to several medical experts within the KCE for comments and suggestions. The objective of this pre-test was to verify the formulation of the questions (clarity, comprehension) and the technical aspects of the survey. This pre-final online version was also tested for technical aspects by the members of the research team. It led to minor modifications of the questionnaire.

Survey structure

An overview of the questions posed in the online survey can be found in Appendix 14. For the principle question ("do you agree that the interventions listed below can be considered for a day-care (and/or ambulatory/in-office) approach") the option "I don't know / I don't have enough experience" was provided in order to avoid guessing. In case the respondent chose "I do not agree", (s)he was asked, in an open-ended question, to give the reasons for this choice. For all interventions on the list, an answer (either "I agree", "I don't agree" or "I don't know") was mandatory. Finally, respondents had the opportunity to suggest interventions that were not adopted in the list as well as to give general comments on the survey or the study.

Anonymity

The survey was not performed anonymously because the software required an identification by email, allowing participants to complete the questionnaire in parts, and preventing that the survey was completed more than once by the same participant. The analyses were performed ensuring confidentiality of the responses.

5.2.4 *Analysis of Belgian administrative data*

For each of the procedures selected or suggested by the experts in the online survey, the total number of stays, the number of day-care and inpatient stays and the respective proportions were calculated and presented in graphs. The applied methodology is described in the following paragraphs.

Data used

We worked with the 2011-2013 MZG – RHM data and the 2011-2013 TCT-coupled data in case the RIZIV – INAMI codes were needed (cf. infra). As a consequence all surgical procedures performed outside the Belgian acute hospitals were not taken into account. This concerns for example certain ophthalmologic, plastic, dermatological and maxillofacial surgical procedures which are in Belgium often performed outside a hospital. Likewise, all procedures performed in a doctor's consulting room or office (i.e. not in a full operating theatre facility), which can be outside or inside the hospital premises, were not included in the data. For more details on the Belgian administrative data the reader is referred to section 0.

Identification of procedures in the database

All surgical procedures selected as described in section 0 or suggested by the experts in the online survey (see section 0) were identified through the corresponding ICD-9-CM codes as these codes must be recorded in the MZG – RHM according to FOD – SPF instructions. For most procedures there is a one-to-one link between the surgical procedures and the code. For example, the laparoscopic cholecystectomy is coded 51.23 and no other procedure is covered by this code. Nevertheless, there are some peculiarities:

- Sometimes, a code may include more than one procedure. For example, code 81.54 covers total knee replacement, bicompartmental knee replacement or unicompartmental knee replacement. In these cases, no distinction could be made between these three procedures.
- Sometimes, we attributed a combination of codes to a single procedure, in case the level of granularity provided in the ICD-9-CM codes was not needed for the present study. For example, for the insertion of a stent into the coronary artery, code 36.06 (insertion of a non-drug-eluting stent) and code 36.07 (insertion of a drug-eluting stent) were combined.

When the RIZIV – INAMI billing code described the procedure more accurately than the ICD-9-CM code, then the RIZIV – INAMI billing code was chosen to select the procedure. This was only done in a few cases (see odd tables in Appendix 13). For example the ICD-9-CM code for arthroscopic mosaicplasty of the knee (i.e. code 81.47) remains vague ("Other repair of the knee"), while the RIZIV – INAMI code (i.e. code 300392-300403) is more detailed ("Treatment of an osteochondral knee lesion by ostheosynthesis or mosaicplasty"[dd]).

The count of stays

When 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. 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. When a procedure that was performed during a stay did not determine the choice of the APR-DRG, only the ICD-9-CM code of the procedure was used; such a procedure is throughout the report labelled as "no APR-DRG". An example of the latter is a laryngoscopy (ICD-9-CM code 3142), which is not considered a significant procedure by the grouper software.

The odd tables in Appendix 13 give an overview of the selected elective surgical procedures per surgical discipline, the corresponding APR-DRG and ICD-9-CM code (or group of codes).

Exclusion of severity levels 3 and 4, emergent stays and patients who died during their stay

For each selected surgical procedure, the following stays were excluded:

- APR-DRG-SOI 3 & 4 (5.2.3.1), because these refer most probably to patients who have severe comorbidities and hence are not eligible for a day-care approach;
- Stays with urgent admission (because this study focuses on elective surgical interventions);
- Stays referring to patients who died during the stay.

[dd] "Behandeling van een osteochondraal knieletsel door osteosynthese of door mozaïekplastie"/"Traitement d'une lésion ostéochondrale du genou par ostéosynthèse ou par plastie en mosaïque"

We defined as urgent admission the stays for which the admission type received the value “A”, “B”, “C”, “D”, “E” or “G” as described in the format of the MZG – RHM. The information on death during the hospital stay was retrieved from the destination value (= 8) collected in the MZG – RHM. Table 18 illustrates the impact of these filters on the number of stays when they are applied on APR-DRG 313 as example.

Example: Applied to APR-DRG 313 (Knee & lower leg procedures except foot):

In 2011-2013, 213 499 hospital stays (inpatient and day care) were assigned to APR-DRG 313 (Knee & lower leg procedures except foot). From the total number of stays for the period 2011-2013, 22 987 stays have been excluded applying the above filter (no SOI 3-4, emergencies or deaths), leaving 190 512 stays (89.2%) for further analysis of APR-DRG 313 (Table 18).

Table 18 – APR-DRG 313

Description	# Hospitals	# Stays	Filter (%)	# Inpatient stays	# Day-care stays	Day care (%)
Total	104	213 499	100.0	73 247	140 252	65.7
Filtered: Alive, non-urgent and SOI 1 or 2	104	190 512	89.2	50 764	139 748	73.4

#: total number; filter: impact of the filter on the total number of stays; %: percentage.

Identification of the hospital

The MZG – RHM data also contain the identification of the acute hospital where the procedure was performed. However, hospitals having recorded separate MZG – RHMs in 2011 or 2012 may have been merged afterwards into one hospital having a larger volume of interventions than the separate hospitals. In such cases, no retroactive merger has been applied on the data; the data have thus been treated as recorded.

Minimal volume

In order to avoid stochastic problems with hospitals performing only a couple of procedures, only those hospitals which had at least 10 cases for the selected procedure during the 2011-2013 period were presented in the bubble graphs for discussion with the experts. In case there was not a single hospital with 10 stays for a selected procedure, this procedure was excluded from further analysis (and discussion with the experts).

The bubble graphs of a selection of procedures are discussed in section 0; the medical input, suggestions, concerns and perceived obstacles expressed by the clinical experts while discussing the bubble graphs are summarised in section 5.3.3.

5.2.5 Discussion in expert groups

With each of the eleven expert groups a dedicated meeting was scheduled during which the Belgian administrative data (see 5.3.2) and the results of the online survey (see 5.3.1) were discussed for a dozen of interventions. The meetings were announced well in advance (1.5 to 5 months) in order to maximize the participation rate.

Preparatory documents

The following documents were sent to the experts so that they could prepare themselves for the meeting:

- A document stating the objectives and methods of the KCE study, explaining the presentation of the Belgian administrative data and posing some questions to be discussed during the meeting;
- The results of the online survey;
- The results of the analyses of the administrative data, summarized by APR-DRG.

Selection of procedures to discuss with the clinical experts

As for the majority of surgical disciplines the original selection of procedures was considered too large (n = 588) to be discussed with the clinical experts during one meeting, it was decided after the first expert meeting (with the orthopaedic surgeons) to restrict the procedures to be discussed with the clinical experts to a dozen procedures. The filter was applied as follows: first only those procedures with a sufficiently high volume (arbitrarily set at a volume of more than 1 000 stays over the 2011-2013 period) were selected, then those procedures for which there is still room for a considerable increase in day care (arbitrarily set at a day-care rate < 90%), and finally those procedures for which day care is feasible (with a day-care rate ≥ 5%) (Table 19).

The latter selection criterion was intentionally not set at 10%, as otherwise we would have missed some procedures with current low day-care rates in Belgium, but performed in day care in high(er) numbers abroad (e.g. laparoscopic cholecystectomy). If the final selection exceeded a dozen procedures, only a dozen were thoroughly discussed during the meeting (cf. infra), and for the remaining procedures the experts were asked if there were limitations to the administrative data (e.g. ICD-9-CM codes, nomenclature). In this way, we wanted to avoid interpretation errors, e.g. when the data are used to evaluate (in a subsequent project) which impact the substitution of inpatient care by day care may have on the needed hospital capacity.[ee]

Content of the meetings

During the meeting the objectives and methods of the KCE study and the presentation of the Belgian administrative data (in bubble charts) were first explained. Then the bubble charts of a dozen of procedures were discussed in depth:

- Which clinical (medical, surgical, anaesthetic), patient-related, cultural, financial or organisational factors may explain the variability observed in day-care rate between the hospitals?
- Is it possible (based on clinical grounds) to “move” all hospitals to the day-care rate achieved by the top 25% hospitals (indicated on the charts and presented in the tables)? If the answer is “no”, why is this not considered feasible?
- Which potential barriers should be taken into account, which may hamper “the move upwards”?
- Which factors may encourage low day-care performers to “move upwards”?

The meetings were not recorded; reports were drawn from each meeting which were then collated in section 5.3.3.

[ee] As orthopaedic surgery was the first expert group, the collection of information on the limitations of the administrative data was performed in a less consistent way than for the other groups. Having a second meeting with these experts only for this purpose was considered inappropriate, given the heavy workload of clinical experts.

Table 19 – Number of procedures discussed with the clinical experts

Group	Number of procedures	Procedures with a total volume <1000 stays*	Procedures with a DC rate ≥90%*	Procedures with a DC rate <5%*	Final selection of procedures
Abdominal surgery	61	27	0	7	27
Breast surgery	22	11	0	1	10
Gynaecological surgery	55	26	4	11	14
Head & neck surgery	85	36	14	4	31
Neurosurgery	17	9	1	1	6
Ophthalmologic surgery	42	22	7	0	13
Orthopaedic surgery	109	58	10	4	37
Plastic & dermatological surgery	26	16	1	0	9
Thoracic surgery	19	14	0	1	4
Urologic surgery	36	12	6	4	14
Vascular surgery	14	7	0	1	6
Total	**486**	**238**	**43**	**34**	**171**

*DC: day care; %: percentage; *: total numbers of stays and percentages restricted to the selection of hospitals which performed at least 10 of the respective procedures during the 2011-2013 period.*

5.3 Results

5.3.1 Online survey

The response rates ranged between 70% and 94%, depending on the expert group (see Table 20).

Table 20 – Response rate by expert group

Group	Number of experts*	Completed the survey (%)
Abdominal	22	90.9
Breast	19	94.7
Gynaecology	21	90.5
Head & Neck	18	77.8
Neurosurgery	19	73.7
Ophthalmology	16	93.8
Orthopaedic	29	93.1
Plastic	15	86.7
Thoracic	12	83.3
Urology	20	70.0
Vascular	16	93.8

**: number of experts selected for the respective working group and invited to complete the survey*[ff]

Amongst the reasons for answering "I don't agree", pain, risk of bleeding and other complications and/or need for clinical monitoring (a.o. anticoagulation monitoring) were the most common. Other frequently mentioned reasons were: risk of swelling, risk of infections, slow return to per os feeding, need for a post-surgical drain, need for wound dressing and control of the wound, need for post-operative antibiotics/medication, need for a radiological examination on the first post-operative day, need for clinical follow-up, need for psychological care, difficult homecare/post-operative management, general anaesthesia, etc.

In none of the groups there was an expert who considered none of the suggested interventions eligible for day care (see Appendix 14, section 14.2.2). In most groups, anaesthetists tended to "reject" fewer procedures for a day-care approach compared to the surgeons; exceptions were the orthopaedic and vascular surgery group (were the opposite was observed) and the plastic & dermatological surgery group where the mean number of interventions rejected for a day-care approach were the same among both disciplines. No other tendencies were observed between Dutch versus French speaking medical specialists, nor between university versus non-university affiliated medical specialists. No statistical analyses were performed on the results of the online survey as this was not considered having an added value for this project.

More detailed information by expert group can be found in Appendix 14, section 14.2.1.

[ff] After receiving the invitation to complete the survey, two experts formally asked to be withdrawn from their expert group (respectively neurosurgery and urology, one being involved in too many ongoing projects and one asking to be part of only one expert group); they did not complete the survey.

5.3.2 Belgian administrative data

5.3.2.1 Elective day-care among 11 surgical disciplines

For each discipline between 14 and 109 surgical procedures eligible for day care were selected for review with the clinical experts (Table 21). Overall, the highest total number of stays is recorded for head & neck surgery (876 512 stays, based on 85 procedures) and the lowest for thoracic surgery (67 463 stays, based on 19 procedures) (Table 21). The highest day-care rate (taking into account only those procedures possibly eligible for day-care, cf. supra) is observed for ophthalmologic surgery (89%) and the lowest for thoracic surgery (11%). In-depth statistical analyses on these differences were considered beyond the scope of this project.

Table 21 – Number of selected procedures and related day-care and inpatient stays (2011-2013)

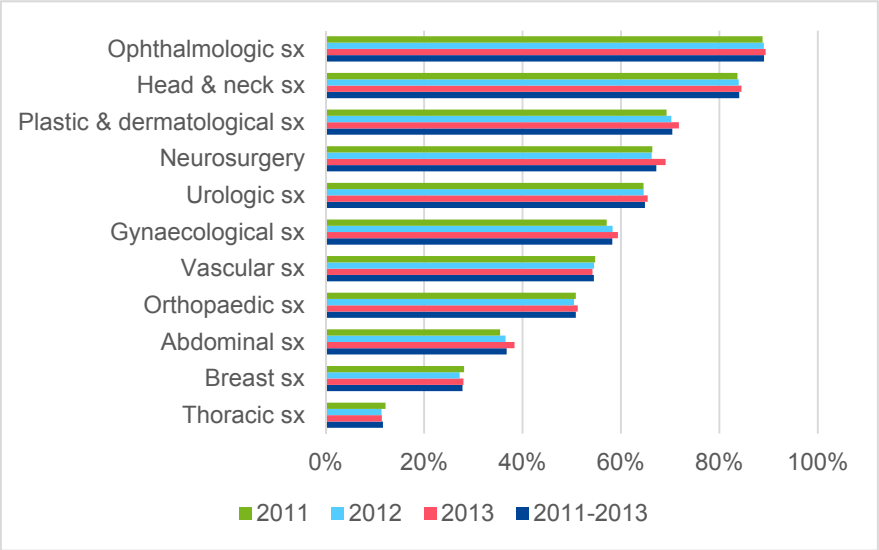
Discipline	# Proce-dures	# Stays*	# Day-care stays	# Inpatient stays	% Day care
Ophthalmologic surgery	42	434 195	386 380	47 815	89
Head & neck surgery	85	876 512	732 570	143 942	84
Plastic & dermatological surgery	26	129 407	90 815	38 592	70
Neurosurgery	17	164 142	109 714	54 428	67
Urologic surgery	36	276 021	177 522	98 499	64
Gynaecological surgery	55	193 446	110 155	83 291	57
Vascular surgery	14	121 930	65 888	56 042	54
Orthopaedic surgery	109	629 568	318 343	311 225	51
Abdominal surgery	61	274 173	99 868	174 305	36
Breast surgery	22	68 837	19 236	49 601	28
Thoracic surgery	19	67 463	7 706	59 757	11

**: total numbers of stays (day care and inpatient); %: percentage.*

5.3.2.2 *Evolution in elective day-care rate between 2011 and 2013*

Overall, there is not much evolution in the elective day-care rate between 2011 and 2013 (Figure 12). For some surgical disciplines (urologic surgery, plastic and dermatological surgery, neurologic surgery, head and neck surgery, gynaecological surgery and abdominal surgery) there has been an increase in the day-care rate between 2011 and 2013, but the increase is limited (between 1 and 3%).

Figure 12 – Evolution in day-care rate among 11 surgical disciplines, 2011-2013

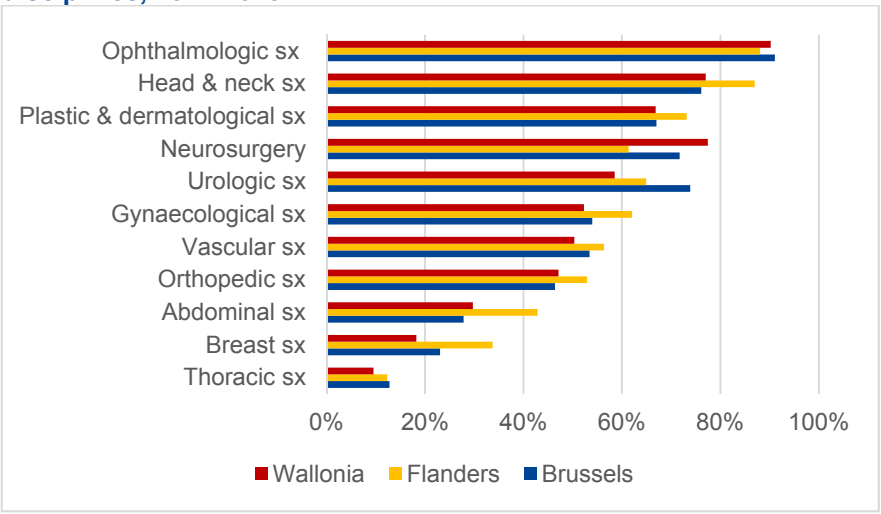


Sx: surgery.

5.3.2.3 *Regional differences in elective day-care rate among 11 surgical disciplines*

For the majority of surgical disciplines, the elective day-care rate was higher for hospitals in Flanders than in Wallonia; the smallest difference was observed for thoracic surgery (3%) and the most pronounced for breast surgery (15%, Figure 13). There were two exceptions: for ophthalmologic surgery (2%) and neurologic surgery (16%) the day-care rate was higher in Wallonia than in Flanders. Likewise, Brussels' day-care rates were lower than those for Flanders for 7 disciplines; exceptions are ophthalmologic surgery (3%), urologic surgery (9%), neurologic surgery (10%) and thoracic surgery (no difference). Differences between Wallonia and Brussels were limited for most disciplines (differences between 0-4%), with exceptions for neurologic surgery (day-care rate in Wallonia is 6% higher) and urologic surgery (day-care rate in Brussels is 16% higher). Important to note is that no adjustments were made for population characteristics, such as age, gender, socio-economic background etc.

Figure 13 – Regional differences in day-care rate among 11 surgical disciplines, 2011-2013



Sx: surgery.

5.3.2.4 Patient characteristics associated with day surgery

For each surgical discipline logistic regression analyses at the hospital stay level were performed to evaluate associations between patient characteristics and day-surgery use. For statistical reasons (among others to avoid small cell problems), models were run on the selection of 171 procedures presented during the expert meetings, i.e. those that totalised at least 1 000 stays in the period 2011-2013 in hospitals having at least 10 stays and that presented a national day care rate ≥ 5% and < 90% (see Table 19). Procedure type was each time introduced as a categorical factor, along with age category, sex and severity of illness (1, minor or 2, moderate). Alternatively, age was introduced as a continuous variable.

With the exception of neurosurgery, thoracic and ophthalmic surgery, regressions (when age was included as continuous as well as ordinal variable) showed for all other disciplines a slightly negative association between day surgery and age: i.e. young patients had a higher probability to be admitted/treated in day surgery than older patients. Overall, the observed effect was relatively small. In gynaecological surgery, the association was positive with age introduced as ordinal variable but not significant when age was introduced as continuous variable. In neurosurgery, thoracic and ophthalmic surgery, younger patients tended to have a lower probability to be admitted in day care than elderly (category aged 85 years or more as reference).

In most disciplines there was no appreciable association between gender and being admitted in day surgery, male patients tended (very) slightly more towards a day-care treatment, while only in vascular surgery the opposite was observed. Note that in those cases odds ratios derived from the regression analyses (male versus female) were always close to 1 and the effect was never blatant. It is also important to note that in the regression models studying the effect of sex, only age was included as factor, while other potentially confounding factors such as socio-economic status or social environment (e.g. vulnerable single mothers, or female elderly living alone who could be hypothetically more numerous than male elderly) could not be included since they are not available in the database. In thoracic surgery, the association did not reach statistical significance and it was borderline in head and neck surgery.

For all disciplines severity of illness (SOI) showed a clear negative association with day-surgery use: i.e. patients with a SOI 1 had a higher probability to be treated in day surgery than patients with SOI 2. With lower 95% confidence interval boundaries always far above 1, odds ratios of severity of illness 2 versus 1 ranged from 2.5 to 10 illustrating the clinical importance of this association.

It would have been very interesting to evaluate whether “place before admission” (e.g. nursing home or a home for the elderly) also had an impact on the care setting (day surgery vs. inpatient), but there were too few patients coming from a nursing home or a home for the elderly to perform these analyses meaningfully.

5.3.2.5 Top-10 elective day-surgery procedures, 2011-2013

When all 486 different surgical procedures for the 11 disciplines were arranged according to the number of day-care stays for the period 2011-2013, cataract surgery ranked first, followed by surgical tooth extraction and arthroscopic meniscectomy (see Table 22).

However, we should be careful with the interpretation of this ranking. More precisely, surgical tooth extraction is one of these procedures for which the experts elucidated that it is also done in the doctor’s office situated on the hospital premises, hence in principle not eligible for day-care lump sums, but nevertheless very often coded as day care. The same may apply to the excision of a dental lesion of the jaw and the excision of a skin tumour (or lesion) of the face, which can in many circumstances safely be performed in a doctor’s office. Based on the TCT administrative data it is not possible to retrieve which proportion of these procedures is really done in a full operating room (and thus correctly classified as day surgery) and which proportion is actually done in the doctor’s office (and should have been classified as outpatient).

Table 22 – Top-10 day-surgery procedures (2011-2013)

	Procedure	Discipline	# Hospitals	# Stays	# Day-care stays	# Inpatient stays	% Day care
1	Lens extraction with insertion of intraocular lens prosthesis	Ophthalmologic surgery	101	336 764	321 778	14 986	95.6
2	Surgical tooth extraction	Head and neck surgery	104	274 275	268 954	5 321	98.1
3	Arthroscopic meniscectomy (neither cruciate ligaments nor collateral ligaments repair)	Orthopaedic surgery	102	113 948	106 849	7 099	93.8
4	Excision of dental lesion of the jaw	Head and neck surgery	103	101 530	100 241	1 289	98.7
5	Carpal tunnel release	Neurosurgery	103	92 526	90 601	1 925	97.9
6	Circumcision	Urologic surgery	104	69 128	67 953	1 175	98.3
7	Excision of skin tumour (or lesion) of the face, with suture	Plastic and dermatological surgery	104	73 657	60 170	13 487	81.7
8	Electro-fulguration or ligation and stripping of lower limb vein(s)	Vascular surgery	102	70 727	59 877	10 850	84.7
9	Adenoidectomy	Head and neck surgery	103	56 723	55 611	1 112	98.0
10	Myringotomy	Head and neck surgery	104	54 101	53 414	687	98.7

#: total number; %: percentage.

5.3.2.6 Variability in day-care share between Belgian hospitals

Review of a selection of procedures

The number of procedures selected for review with the clinical experts was too large to discuss them here one by one. We will elaborate on a selection of procedures with variable day-care rates; the bubble graphs and respective tables of the other procedures can be obtained upon request. The factors that – according to the consulted clinical experts – may explain the observed variability between hospitals, are discussed in section 5.3.3.

Box 8 – Legend to the bubble graphs

In the bubble graphs each Belgian hospital is represented by a circle. The size of the circles corresponds to the total number of stays (i.e. inpatient and day-care stays) for the procedure of interest: the bigger the circle, the higher the number of procedures performed in 2011-2013. In order to avoid stochastic issues, only hospitals which performed at least 10 procedures of interest over the 2011-2013 period are presented.

The vertical axis corresponds to the day-care rate, whereas the horizontal axis to the cumulative percentage of the total number of stays across hospitals.

Three horizontal lines are drawn in each figure:

- The blue line corresponds to the national proportion of the procedure of interest performed in day care in those hospitals that performed at least 10 of these procedures in 2011-2013;
- The red (long) dashed line (P75) corresponds to the top 25% hospitals (with regard to day care);
- The pink dashed line refers to the weighted P75, where the percentage of procedures that each hospital performed in day care is weighted by their total number of procedures. In this way, high-volume hospitals have more weight in the calculation.

When the weighted P75 (pink line) is situated above the P75 (red line), one can conclude that the hospitals with a higher day-care rate have a bigger total volume (inpatient and day care), i.e. perform more procedures regardless of the setting. When the weighted P75 lays below the unweighted P75, the higher day-care hospitals perform less procedures than the other hospitals. When the P75 line (red line) and the weighted P75 (pink line) are situated close to each other, the percentage of procedures performed in day care in each hospital is more or less equally distributed over the hospitals, regardless of their volumes for the procedure of interest.

Lens extraction with insertion of an intraocular lens prosthesis (APR-DRG 073 - Eye procedures except orbital)

In the period 2011-2013, 101 hospitals performed at least one lens extraction with insertion of an intraocular lens. In total, 336 764 such procedures were performed, of which 321 765 (95.5%) in day care (Table 23). The hospitals that performed the highest proportion in day care, did so for all cases (Max % day care = 100%); the hospital with the lowest day-care rate performed 53.3% in day care (Min % day care). If we focus only on those hospitals which performed at least 10 lens extractions with insertion of an intraocular lens (i.e. the hospitals presented in Figure 14) 336 763 lens extractions are kept which were performed in 100 hospitals (Table 23).

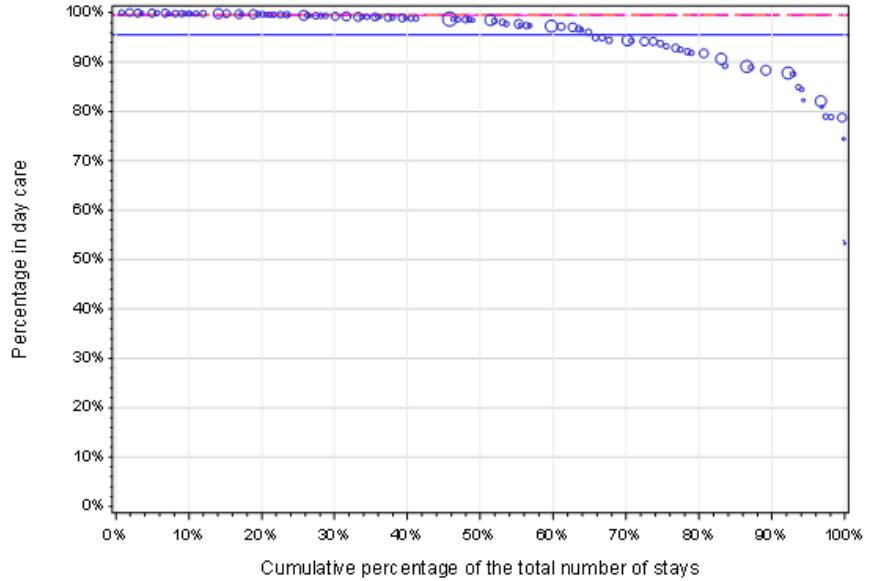
The hospitals having the top 5% highest day-care rate performed 16 689 lens extractions with insertion of an intraocular lens, which were all performed in day care. Likewise, the top 25% hospitals performed 72 832 lens extractions with insertion of an intraocular lens, 99.8% of which were performed in day care.

When interpreting these data, it should not be forgotten that cataract procedures performed in extramural surgery centres are not captured by the data and hence not presented in the graphs nor tables.

As was illustrated in section 2.1.2.2, Belgium performs well for cataract surgery compared to other Western-European countries with regard to day-care share. But although the national day-care rate of 95.5% would suggest that there is hardly room for improvement with regard to substitution towards day care, the graph illustrates that there are still a few hospitals with a day-care rate below 90%, including a hospital with a day-care rate of only 53.3%.

Comparable bubble graphs, with high national day-care rates and some hospitals with a much lower day-care rate, were obtained for several other procedures, also from other disciplines. Some examples (i.e. a non-exhaustive list) are presented in Table 24. In order to avoid stochastic issues, presented data are limited to those hospitals which performed at least 10 procedures of interest in 2011-2013.

Figure 14 – Lens extraction with insertion of an intraocular lens prosthesis, 2011-2013



Horizontal (long) dashed line drawn at P75: 99.6 %
Horizontal dashed line drawn at weighted P75: 99.5 %
Horizontal line drawn at National %: 95.5 %
Number of hospitals with 0% in Day care: 0

Table 23 – Lens extraction with insertion of an intraocular lens prosthesis, 2011-2013

Description	# Hospitals	# In patient stays	# Day-care stays	# Stays (all)	National % day care	Min % day care	Max % day care
All	101	14 999	321 765	336 764	95.5	53.3	100.0
All10	100	14 999	321 764	336 763	95.5	53.3	100.0
P95 %D	5	6	16 683	16 689	100.0	99.9	100.0
P75 %D	25	118	72 832	72 950	99.8	99.6	100.0
P50 %D	50	832	154 777	155 609	99.5	98.7	100.0

#: total number; %: percentage; min: minimal; max: maximal; all10: stays performed in hospitals which performed at least 10 lens extractions with insertion of an intraocular lens in the period 2011-2013.

Table 24 – Elective surgical procedures with high national day-care rates and outliers, 2011-2013

Procedure	# Stays (all)	# Day-care stays	National % day care	Min % day care	Max % day care	P25 (%)	P75 (%)
Carpal tunnel release	92 526	90 606	97.9	42.9	100.0	97.0	99.1
Lithotripsy	36 626	35 180	96.1	0.0	99.4	92.7	97.4
Lens extraction with insertion of an intraocular lens prosthesis	336 763	321 764	95.5	53.3	100.0	94.0	99.6
Blepharoptosis repair	5 893	5 585	94.8	63.6	100.0	92.3	100.0
Arthroscopic meniscectomy	113 946	106 847	93.8	51.3	99.4	91.2	95.8
Endometrial biopsy/aspiration with hysteroscopy	23 168	21 647	93.4	30.2	100.0	88.4	96.5
Tonsillectomy with adenoidectomy	41 828	37 133	88.8	2.7	100.0	86.3	96.3
Uni- or bilateral orchidopexy	6 973	5 867	84.1	16.0	100.0	78.9	96.0

#: total number; %: percentage; min: minimal; max: maximal; data limited to hospitals which performed at least 10 procedures of interest in 2011-2013.

Excision of an epididymal cyst (APR-DRG 483 - Testes & scrotal procedures)

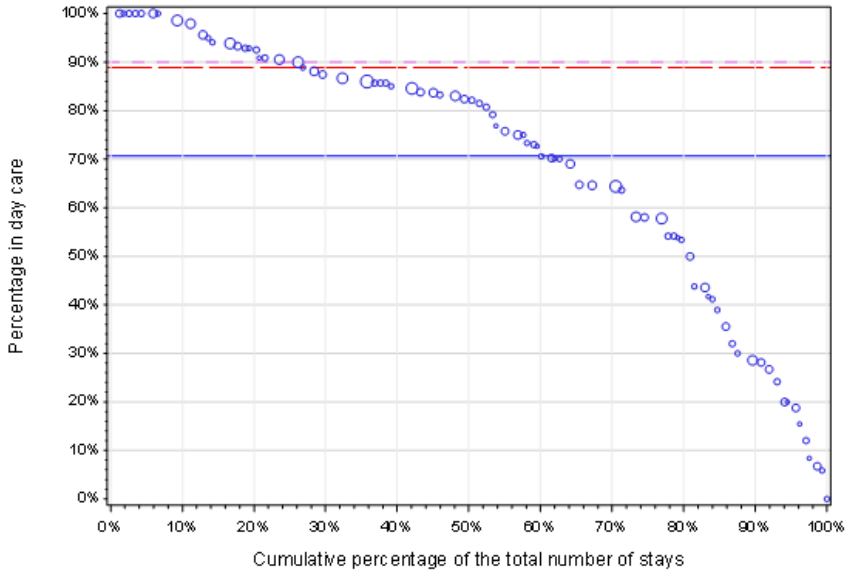
In the time span 2011-2013 85 hospitals performed at least 10 excisions of an epididymal cyst. In total, they performed 2 686 excisions, of which 70.7% in day care (Table 25). At least 7 hospitals performed all excisions in the day-care setting, while 1 hospital did them all as inpatient (Figure 15).

Table 25 – Excision of an epididymal cyst, 2011-2013

Description	# Hospitals	# In patient stays	# Day-care stays	# Stays (all)	National % day care	Min % day care	Max % day care
All	104	819	1 955	2 774	70.5	0.0	100.0
All10	85	788	1 898	2 686	70.7	0.0	100.0
P95 %D	7	0	177	177	100.0	100.0	100.0
P75 %D	22	34	686	720	95.3	88.9	100.0
P50 %D	44	172	1 374	1 546	88.9	75.0	100.0

#: total number; %: percentage; min: minimal; max: maximal; data limited to hospitals which performed at least 10 excisions of an epididymal cyst in 2011-2013.

Figure 15 – Excision of an epididymal cyst, 2011-2013



Comparable bubble graphs, with a variability in day-care rate between 0 and 100%, were obtained for several other procedures, also from other disciplines. Some examples (i.e. a non-exhaustive list) are presented in Table 26. Again, presented data are restricted to those hospitals which performed at least 10 procedures of interest in 2011-2013.

Table 26 – Elective surgical procedures with a variability in day-care rate between 0 and 100%, 2011-2013

Procedure	# Stays (all)	# Day-care stays	National % day care	Min % day care	Max % day care	P25 (%)	P75 (%)
Facial bone graft	6 198	4 524	73.0	0.0	100.0	46.6	88.5
Dacryocystorhinostomy	2 455	1 522	62.0	0.0	100.0	34.1	82.6
Excision of breast tissue in men	1 495	893	59.7	0.0	100.0	31.3	80.0
Insufflation of Fallopian tubes	5 592	3 048	54.5	0.0	100.0	29.9	80.3
Turbinectomy	19 558	9 623	49.2	0.0	100.0	24.5	69.9
Trabeculectomy	2 788	1 300	46.6	0.0	100.0	51.0	100.0
Facial rhytidectomy	1 523	369	24.2	0.0	100.0	8.2	48.2
Laser photocoagulation of retinal tear or detachment	3 016	522	17.3	0.0	100.0	3.1	80.2
Corneal graft	1 246	208	16.7	0.0	100.0	0.9	46.3

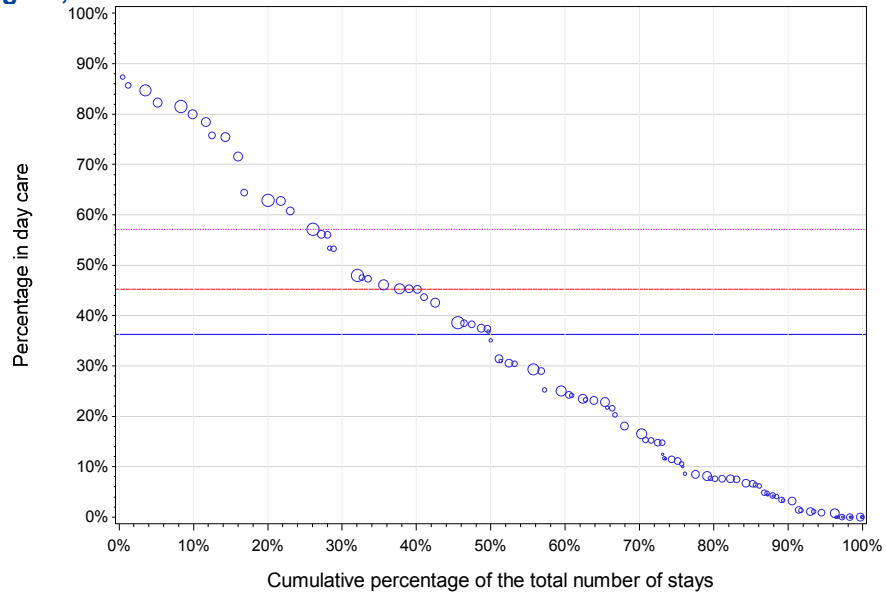
#: total number; %: percentage; min: minimal; max: maximal; data limited to hospitals which performed at least 10 procedures of interest in 2011-2013.

Unilateral repair of an inguinal hernia with a prosthesis or graft (APR-DRG 228 - Inguinal, femoral & umbilical hernia procedures)

In the period 2011-2013, 103 hospitals performed at least 10 unilateral repairs of an inguinal hernia with a prosthesis or graft. In total, they performed 22 395 repairs, of which 36.3% in day care (Table 27). The hospital that performed the highest proportion in day care, did so for 87.4% of cases while 11 hospitals performed none of the unilateral repairs of an inguinal hernia as day care.

Although the repair of an inguinal hernia is one of the index procedures for international comparison (see section 2.1.2.2), we opted not to compare our data with the international data since we have some doubts on the ICD-9-CM codes that were used.

Figure 16 – Unilateral repair of an inguinal hernia with a prosthesis or graft, 2011-2013



Horizontal (long) dashed line drawn at P75: 45.2 %
Horizontal dashed line drawn at weighted P75: 57.2 %
Horizontal line drawn at National %: 36.3 %
Number of hospitals with 0% in Day care: 11

Table 27 – Unilateral repair of an inguinal hernia with a prosthesis or graft, 2011-2013

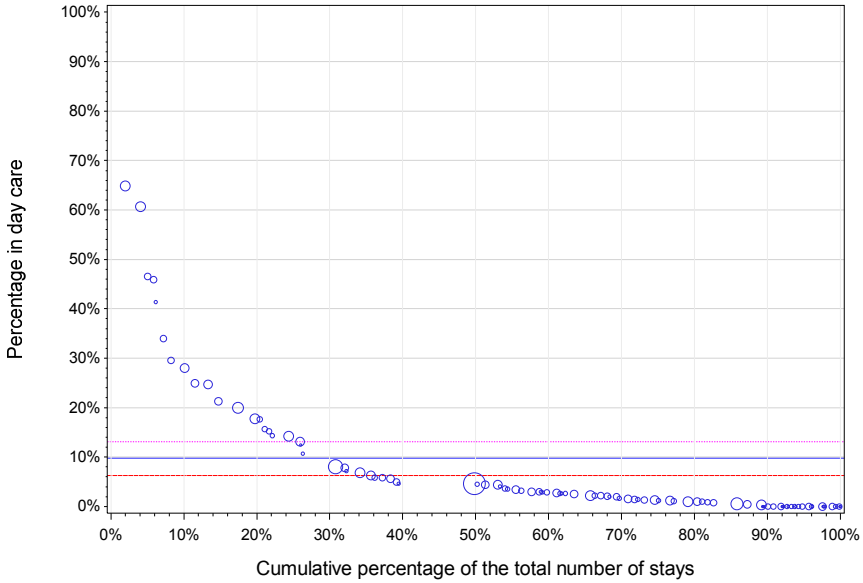
Description	# Hospitals	# In patient stays	# Day-care stays	# Stays (all)	National % day care	Min % day care	Max % day care
All	103	14 271	8 124	22 395	36.3	0.0	87.4
All10	103	14 271	8 124	22 395	36.3	0.0	87.4
P95 %D	6	383	1 839	2 222	82.8	80.0	87.4
P75 %D	26	3 232	5 759	8 991	64.1	45.2	87.4
P50 %D	52	7 331	7 601	14 932	50.9	20.3	87.4

#: total number; %: percentage; min: minimal; max: maximal; data limited to hospitals which performed at least 10 unilateral repairs of an inguinal hernia with a prosthesis or graft in 2011-2013.

Arthroscopic repair of the cruciate ligaments of the knee, not in combination with a meniscectomy or collateral ligaments repair (APR-DRG 313 - Knee & lower leg procedures except foot)

In the period 2011-2013 101 hospitals performed at least 10 arthroscopic repairs of the cruciate ligaments of the knee. In total, they performed 16 258 repairs, of which 9.8% in day care (Table 28). The hospital(s) that performed the highest proportion in day care, did so for 64.9% of cases. On the other side of the spectrum one can see 28 hospitals that performed all arthroscopic repairs of the cruciate ligaments of the knee as inpatient care (they are situated on the 0% day-care line in Figure 17). The top 25% hospitals performed at least 6.3% of the arthroscopic repairs of the cruciate ligaments of the knee in day care. Actually these hospitals performed altogether 23.5% of the arthroscopic repairs of the cruciate ligaments of the knee in day care.

Figure 17 – Arthroscopic repair of cruciate ligaments of the knee, 2011-2013



Horizontal (long) dashed line drawn at P75: 6.3 %
Horizontal dashed line drawn at weighted P75: 13.1 %
Horizontal line drawn at National %: 9.8 %
Number of hospitals with 0% in Day care: 28

Table 28 – Arthroscopic repair of cruciate ligaments of the knee, 2011-2013

Description	# Hospitals	# In patient stays	# Day-care stays	# Stays (all)	National % day care	Min % day care	Max % day care
All	102	14 668	1 598	16 266	9.8	0.0	64.9
All10	101	14 660	1 598	16 258	9.8	0.0	64.9
P95 %D	6	545	628	1 173	53.5	33.9	64.9
P75 %D	26	4 430	1 362	5 792	23.5	6.3	64.9
P50 %D	51	9 127	1 556	10 683	14.6	2.2	64.9

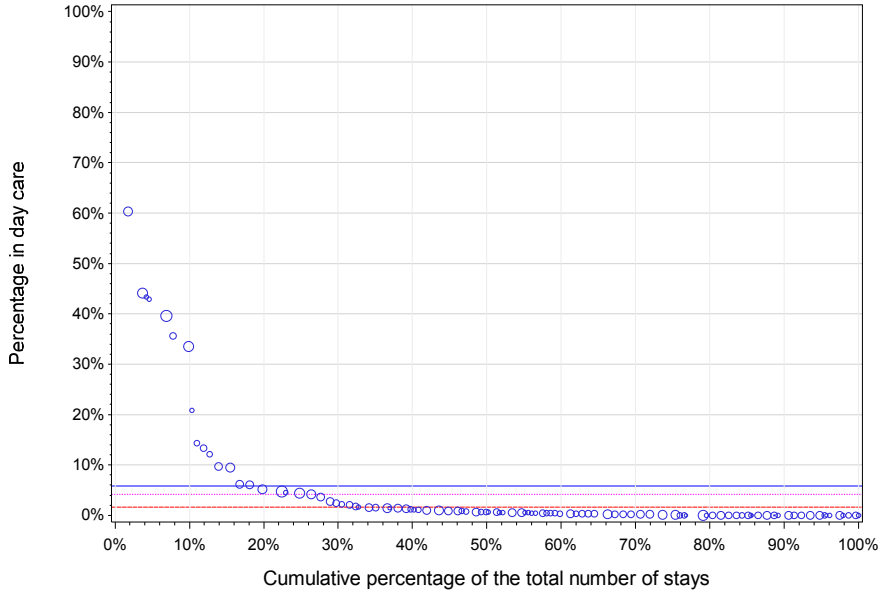
#: total number; %: percentage; min: minimal; max: maximal; all10: stays performed in hospitals which performed at least 10 arthroscopic repairs of cruciate ligaments of the knee in the period 2011-2013.

Laparoscopic cholecystectomy (APR-DRG 263 – Laparoscopic cholecystectomy)

In the period 2011-2013 all Belgian acute hospitals performed at least 10 laparoscopic cholecystectomies. In total, they performed 44 022 laparoscopic cholecystectomies, of which 5.9% in day care (Figure 18). The maximal day-care rate was 60.3% (Table 29), while 31 hospitals performed all their laparoscopic cholecystectomies in the inpatient setting (Figure 18). The top 25% hospitals performed altogether 10.6% of the laparoscopic cholecystectomies in day care.

As was illustrated in section 2.1.2.2, Belgium does not perform well for laparoscopic cholecystectomies compared to other Western-European countries with regard to day-care share. In 2014 more than half of all laparoscopic cholecystectomies (57%) recorded in Denmark were performed in day care, followed by the UK (45%), Finland (36%), Sweden (31%) and Ireland (29%). After the Netherlands (6%) and Germany (0%), Belgium (5%) came in last.

Figure 18 – Laparoscopic cholecystectomy, 2011-2013



Horizontal (long) dashed line drawn at P75: 1.7 %
Horizontal dashed line drawn at weighted P75: 4.2 %
Horizontal line drawn at National %: 5.9 %
Number of hospitals with 0% in Day care: 31

Table 29 – Laparoscopic cholecystectomy, 2011-2013

Description	# Hospitals	# In patient stays	# Day-care stays	# Stays (all)	National % day care	Min % day care	Max % day care
All	104	41 432	2 590	44 022	5.9	0.0	60.3
All10	104	41 432	2 590	44 022	5.9	0.0	60.3
P95 %D	6	1 884	1 562	3 446	45.3	35.6	60.3
P75 %D	26	11 763	2 467	14 230	17.3	1.7	60.3
P50 %D	52	21 687	2 566	24 253	10.6	0.5	60.3

#: total number; %: percentage; min: minimal; max: maximal; all10: stays performed in hospitals which performed at least 10 laparoscopic cholecystectomies in the period 2011-2013.

Exploration of hospitals with systematic low day-care rates

In a final analysis it was evaluated if there are hospitals that consistently have low day-surgery rates, across the 11 surgical disciplines under study and which hospital characteristics could explain the day-surgery rates. For this purpose the hospitals were classified for each procedure in 3 categories: having a day care rate (1) below the national 25th percentile of the respective procedure, (2) between the 25th and the 75th percentiles, or (3) above the 75th percentile.

Among available hospital characteristics, the distribution of the **rural character** of hospital municipality, as defined by Eurostat (http://statbel.fgov.be/fr/statistiques/chiffres/environnement/geo/typologie_communes/) did not tend to be different between the three categories.

The relation between day-surgery rate and **hospital size** (total number of recognised beds) was unclear. A trend for **university hospitals** to be located in category 1 (below the 25th percentile) was observed. Likewise, hospitals below the 25th percentile were most often located in Wallonia (and to a smaller extent in Brussels) while those in category 3 (above 75th percentile) were most often located in Flanders. Case-mix in terms of severity of illness did not explain these patterns. Unfortunately the available administrative data did not allow to verify other possible hypotheses, e.g. is the observed variability due to regional differences in clinical practice, in admission practice, or in organisation and availability of primary and home care services to follow patients after discharge. Accessibility and distance between hospital and patient domicile could also play a role, but could not be verified. Last but not least, patient socio-economic characteristics are not equally distributed across the country; hospitals located in zones with a more vulnerable or isolated population may face more hurdles to admit patients in day surgery.

Key points

- **The day-care rate (taking into account only those procedures possibly eligible for day-care) varies among surgical disciplines, with the highest for ophthalmologic surgery (89%) and the lowest for thoracic surgery (11%).**
- **For the majority of surgical disciplines, the elective day-care rate was higher for hospitals in Flanders than in Wallonia or Brussels; differences between Wallonia and Brussels were limited for most disciplines.**
- **Variability in day-care rate may be huge (up to a range between 0 and 100%); high national day-care rates do not automatically imply that there is no room for improvement with regard to substitution towards day care, given the tail of the distribution with hospitals with low day-care rates.**

5.3.3 Discussion in expert groups

5.3.3.1 Attendance

The attendance rates ranged between 25% and 62%, depending on the expert group (see Table 30).

Table 30 – Composition of the expert groups

	Number of experts		
Group	Selected*	Completed the survey	Attended the expert meeting
Abdominal	29	20 (91%)	10 (34%)
Breast	19	18 (95%)	8 (42%)
Gynaecology	21	19 (91%)	11 (52%)
Head & Neck	18	14 (78%)	9 (50%)
Neurosurgery	19	16 (84%)	7 (37%)
Ophthalmology	17	15 (94%)	8 (47%)
Orthopaedic	29	27 (93%)	18 (62%)
Plastic	15	13 (87%)	5 (33%)
Thoracic	12	10 (83%)	3 (25%)
Urology	20	14 (70%)	11 (55%)
Vascular	16	15 (94%)	9 (56%)

**: number of experts selected for the respective working group, invited to complete the survey and to attend the expert meeting*

5.3.3.2 Results

In this section medical background information, suggestions, concerns and perceived obstacles expressed by the clinical experts are summarised. They were raised during the expert meetings when discussing the bubble charts of the Belgian administrative data and the results of the online survey of a dozen of procedures per expert group. In the following paragraphs the experts' input is structured around different generic (i.e. non-discipline specific) topics and wherever appropriate, discipline specific items were added in a second part. All discussed factors should be read as "According to the consulted experts," since no GPs, hospital managers, patients or (in)formal caregivers were interviewed.

In Appendix 16, tables are provided with the procedures for which the interpretation of the administrative data should be performed with caution and the reason why the consulted experts suggested some prudence.

Note: All precautions have been taken by the KCE team to write faithfully down what was said during the meetings with the clinical experts. Due to time constraints, it was not feasible to forward this section to the attending experts for additional comments. For some procedures, new technologies (e.g. vascular closing devices) were suggested by the experts. The critical evaluation of the harms and benefits of these technologies was considered out of scope of this study. Also, when examples are provided, they should never be considered as an exhaustive list, but solely as (an) example(s) to clarify the statement made before. For many procedures more than one factor may explain the observed variability.

Finally, it is fully admitted that the groups of experts who completed the survey and/or attended the expert meetings cannot be considered representative for the entire group of medical specialists working in Belgian hospitals. On the other hand, expert meetings only deliver fruitful discussions when the group is not too large. Broader consultation of the concerned specialists should be considered in the implementation phase of the results of this study.

Generic topics

For the majority of experts consulted in the diverse expert groups it was the very first time they were presented data on how they perform with regard to day care vs. inpatient care. Medical teams are not aware of how they perform (with regard to day care vs. inpatient care) in relation to other teams/hospitals. In that sense, the graphs were considered very informative and in some cases even surprising. Many experts suggested that more feedback (incl. benchmarking) could definitively help in sensibilizing their peers on the (o.a. financial) consequences of the care choices (e.g. day care vs. inpatient care) made and thus help in stimulating towards more day care.

Factors that may explain the observed variability in day-care rates among hospitals, and especially the low day-care rates for some hospitals

Patient related factors

- *Patients living alone, with insufficient support from informal caregivers, with a weak social network are not eligible for a day-care approach.*

  In the Belgian law it is clearly stipulated[gg] [48] and the importance is repeated in various international guidelines on day surgery[66]: only patients who have at home someone at their disposal for care and supervision during the first 24 hours after surgery, can be treated in a day-care setting. Hence, when patients state that they cannot provide anyone for supervision afterwards, there is no alternative other than admitting the patient for at least one night. With increasing numbers of inhabitants living alone and a further crumbling of social networks, the experts expect that this problem will further expand. A group of patients for whom day care will be difficult is the growing number of elderly, of whom many have no or no fit caregiver. So-called hospital hotels[hh] where patients post-operatively can recover (common in Scandinavian countries and the USA[105]) could according to some consulted experts be an answer for these patients as well as for patients who live a long distance from the day-care unit. Other experts were more sceptical as this care concept may lead to a shift of costs towards the patient (and/or his hospitalization insurance).

- *Language barriers may also impede a further growth of day care.*

  The medical team feels responsible for the patients, also for follow-up and compliance with the post-operative instructions. In case of language barriers, the patient is kept in hospital until the most critical period is over.

- *Patients who have difficulty coping with pain and potential complications, should be given the opportunity to spend the first post-surgical night in the hospital.*

  According to the experts, the mental capacity of the patient (and his/her guardian) to cope with pain and complications should be assessed when the surgical setting is chosen. Psychological tests may help to categorize patients and hence forecast their recovery capacity/coping

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gg http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=nl&la=N&cn=1997112533&table_name=wet

Chapter III, Art. 8. De functie "chirurgische daghospitalisatie" beschikt over schriftelijk vastgelegde selectiecriteria betreffende zowel de patiënten als de ingrepen. Eén van de in het vorig lid bedoelde selectiecriteria bestaat erin dat er in de functie "chirurgische daghospitalisatie" enkel patiënten worden opgenomen die thuis, tot 24 uur na hun ontslag, over de nodige opvang beschikken. // La fonction " hospitalisation chirurgicale de jour " dispose de critères de sélection fixés par écrit, concernant à la fois les patients et les interventions. Un des critères de sélection précités consiste en ce que la fonction " hospitalisation chirurgicale de jour " n'admette que les patients qui chez eux, peuvent bénéficier d'une prise en charge adéquate, pendant au moins 24 heures après leur sortie.

hh Hospital hotels (also called limited care accommodation or medi-motels) are facilities of hotel quality, which are staffed by non-professionals who act in place of caring relatives. Professional healthcare is available on an on-call basis.[2] That way, patients who are socially stressed or who live far away from the day-care unit can have their treatment on a day basis rather than being admitted as an inpatient. [2]

with pain. Adequate pain management is important to facilitate mobilisation and rehabilitation after discharge home. It is extremely important that patients are well informed and (whenever possible) prepared for the pain they may expect in the post-operative period. For instance, when block anaesthesia has worn off, patients may be in extreme pain. In some cases this may lead to unanticipated admissions (whether or not through the emergency department). Experts warn that in the pursuit of higher day-care rates for elective surgical procedures, the extra costs for emergency visits and unanticipated admissions should also be taken into account.

- *After certain procedures patients are kept in hospital merely for psychological reasons.*

  An example is unilateral orchidectomy, which can be performed in day care, but in case the indication is oncological, the patient is often kept in hospital for psychological reasons. This is also applicable for oncological breast surgery.

- *After certain procedures patients are kept one night in hospital, just to allow the surgeon to give post-operative advice the day after surgery, when the patient is well awake.*

  An example is the implantation or replacement of a spinal neurostimulator, for which the patient needs sufficient info on how to use the device.

- *Some patients just want to stay one night in hospital as they assume they have that right.*

  Patients (and relatives) have to be educated and better informed on day-care possibilities. Many patients just expect to stay one night in hospital after surgery as they think this is the normal way and they have that right.

- *In case patients have to come back the day after surgery it is much more practical to keep them one night (although from a medical point of view that is not necessary). Likewise, if patients have to travel far to reach the hospital, they are often either admitted in hospital the night before to avoid the traffic jams and hence late arrival on the day of surgery or they stay one night after surgery before going home as they are scheduled later on the day.*

  An example is arteriovenostomy for renal dialysis[ii] which according to the experts can be performed in day care in half of the cases, but as many patients start dialysis the day afterwards, they are in some hospitals kept for one night in order to “save” the travel home. If day surgery is to be expanded, the transport of patients for post-operative consultations should be provided and reimbursed, according to some experts.

- *Some patients are already in hospital (for the same or another medical problem) when the procedure takes place.*

  Examples may be the excision of a skin tumour in an elderly patient admitted in the geriatric department, or the replacement of a pacemaker or defibrillator in a patient who has been hospitalised for cardiac arrhythmia.

Surgeon related factors

- *The high variability in day-care rates may (in part) be a reflection of the experience and subspecialty of a surgeon/surgical team and hence the case mix treated.*

  Certain surgeons are very experienced in the treatment of a certain pathology and hence are referred the more severe cases, who may be less eligible for a day-care approach and which may thus result in low day-care rates. On the contrary, other surgeons confine themselves to

[ii] In this particular case it is often not the vascular surgeon but the nephrologist who settles the hospital admission.

the least severe cases, which is reflected in high day-care rates. An example is Dupuytren's contracture repair.

- *The variability may reflect the lack of a thorough mastery of and/or experience in minimally invasive surgical techniques.*

  The expansion of day surgery has (among others) been enabled by the advance of various medical technologies. One of these advances is the gradual move from invasive open surgery (requiring incisions of some size) towards minimally invasive surgical approaches (e.g. laparoscopic procedures) that limit the incision size and hence reduce (among others) the risk of post-operative bleeding and infection, and the associated pain. Consequently, surgical procedures performed according to a minimally invasive approach lend themselves more for day care. Yet, it must be realised that while the younger generation of surgeons is thoroughly trained in these minimally invasive approaches, some surgeons may not. The consulted experts argue that in many instances it is not realistic nor safe to force (e.g. senior) surgeons to shift completely towards minimally invasive techniques.

- *Surgeons treating a higher number of patients have more experience, most often a lower number of complications and hence feel more comfortable to send the patients home the same evening.*

  In many expert groups the applied filter of at least 10 procedures for the 2011-2013 period has been criticised as far too low[jj]. The consulted experts argue that if you do not perform a procedure frequently enough you should refer to a colleague with more expertise.

- *Some surgeons have to backpedal towards an inpatient approach after negative experiences with day care.*

  Some experts indicate that they used to perform certain procedures (e.g. recurrent shoulder dislocation repair) in day care, but due to negative experiences (e.g. general practitioners who call them in panic as they do not know how to keep pain and/or complications into control) they backpedalled towards an inpatient approach. Likewise, as a result of serious complications after peripheral nerve blocks (e.g. nerve injury, catheter infection, bleeding, and local anaesthetic systemic toxicity) some surgeons are no longer eager to use them. Apparently bad experiences lead to the shift to inpatient care, whereas good experiences do not automatically lead to a (more pronounced) move towards day care.

Anaesthetist related factors

- *Some anaesthetic teams have insufficient expertise in managing perioperative pain outside the hospital.*

  After several elective surgical procedures (e.g. certain abdominal procedures) the classical analgesia (e.g. paracetamol, NSAIDs) are clearly insufficient to provide efficient pain relief. In these cases the per-operative administration of opioids may provide adequate pain protection. Apparently not all anaesthetic teams have this expertise and hence the patient is admitted in hospital. If day-care rates are to be increased, better training in peri-operative pain management will be needed.

- *Likewise, in some hospitals, certain procedures that can be done under local anaesthesia (and hence make it more eligible for day care) are performed under general anaesthesia so that (parts of) the procedure can then be done by a surgeon-in-training and so that the patient is not aware when something goes wrong.*

- *In some hospitals the anaesthetists demand for some procedures that the patient always stays one night in hospital.*

  An example is thyroid surgery, where post-operative bleeding may in rare occasions result in respiratory distress, which needs to be treated within a 30 minutes time frame. Likewise, in some hospitals, the

[jj] Although the filter was arbitrarily set at 10, it was deliberately not set higher so that the actual delivery of care in Belgium could be mapped.

anaesthetists demand that the patient always stays one night in hospital when the surgical procedure lasts more than 1 hour.

Lack of clinical guidelines (that are known and applied in practice) - customs & traditions

- *For certain procedures patients are admitted in hospital just because it is thought that this is the best option for the patient.*

  For several procedures in nearly all surgical disciplines the consulted experts admit that they are routinely not done in day care, just because this is the tradition of (e.g. the older members of) the medical team or the way they were trained. Examples include the excision of an anal lesion and the unilateral repair of an inguinal hernia, for which guidelines should stipulate that they can safely be performed in day care. According to the consulted experts, the unilateral repair of an inguinal hernia can safely be performed in day care in 80-85% of the cases. Other examples are several head and neck surgical procedures, where it is in some hospitals apparently tradition that patients stay one night in the hospital. These traditions are even more reinforced after a (rare) complication.

  Another issue is **the administration of per-operative antibiotherapy** in e.g. orthopaedic surgery (but also heard in other specialties): around the table several administration protocols were mentioned (and apparently applied in daily practice), some of them leading to inevitable inpatient admission. (cf. infra)

  Another issue for which guidelines are urgently needed is the **use of drains**. For instance in certain abdominal procedures, the use of drains is common practice in the French speaking part of the country (and results in a two day hospital admission, although some experts argue that a drain can safely be removed by a nurse and hence the drain itself cannot be seen as the sole reason for hospitalisation) but rarely done in Flanders. Similar issues are raised for breast procedures, which are often performed in day care in France (where no drain is placed) while in Belgium drains are placed and patients are admitted in hospital for at least one night. Another example is the repair of urinary incontinence by trans-obturator tape or tension-free vaginal tape, which is according to the gynaecologists eligible for day care. Because many teams are used to place a urinary drain for 24 hours, the patient has to stay one night in hospital, while the drain can according to some experts actually be removed after 3 hours.

  Guidelines would also be useful to guide the optimal **post-operative observation time** as this turned out as a topic on which there was no consensus in several expert groups.

  Likewise, after several ophthalmologic surgical procedures the **positioning of the patient** (e.g. left side laying down) is very important. This is for some surgeons (but surely not for all) a reason to keep the patient one night in hospital, while their peers who send the patients home do not observe a higher complication rate.

Financial regulations

- *At present hospitals are financially penalised when performing surgical procedures not adopted on List A (cf. chapter 3) in day care*[kk].

  An example is laparoscopic cholecystectomy (national day-care rate: 5.9%): the consulted experts suggested that a day-care rate of 40-50% is feasible, on the condition that financial incentives are given (cf. supra). Another example is the repair of urinary incontinence by trans-obturator tape or tension-free vaginal tape (national day-care rate: 12.8%), which

[kk] When the RIZIV – INAMI code of a surgical intervention is adopted on List A and the procedure is performed in day care, the hospital receives a length of stay of 0.81 days. But, when the code of a surgical intervention is not adopted on List A and the procedure is nevertheless performed in day care, the hospital only receives the lump sum for general anaesthesia. However, if the patient is admitted in hospital after that same procedure (which is not on List A), the hospital receives the national mean length of stay (LOS) of the APR-DRG*severity level in which the stay is classified. For more details on the payment system of day surgery in Belgium, the reader is referred to section 3.2.

is according to the consulted urologists eligible for day care when it is not combined with other procedures.

For varicose vein surgery there are 11 RIZIV – INAMI codes (which are prone to interpretation), of which only four are adopted on List A; hence, if the surgeon "chooses the right codes", the patient can be admitted in hospital, which is more profitable for the hospital.

- *From a financial perspective, it is in some circumstances more profitable to combine two procedures and admit the patient for one night in hospital.*

  An example is the insertion of a totally implantable vascular access device[II] which according to the consulted experts can safely be performed in day care. However, since 2012 the key identifier (or key letter, see Box 5) decreased from K120 to K60, except when the insertion of the vascular access device is immediately followed by the administration of I.V. drugs, in which case the patient is often admitted for one night (e.g. to observe possible complications). Hence, from a financial perspective, it is more profitable to combine both procedures and admit the patient for one night in hospital.

- *Many "small" procedures in e.g. plastic surgery could safely be performed in the doctor's office. The comparison is made with dentists who also perform surgery in their dental office. But as the reimbursement is considered far too low (e.g. K26 for the excision of a skin tumour which "barely covers the disposable material") the procedures are performed in day care, where the reimbursement is much higher. From a medical point of view, however, there is no reason at all for many of these "minor" procedures that they are performed in an operating room.*

Other financial factors

- *For certain procedures, eligible for day care, medical teams are kindly requested by the hospital management to admit their patients for one night.*

- *Conversely, certain procedures are performed in day care (often upon kind request of the hospital management as this is more profitable for the hospital) while from a medical point of view at least a proportion can safely be performed in the doctor's office.*

- *Even when very good non-surgical alternatives exist, the surgical intervention is often chosen as it is more rewarding for the surgeon.*

  An example is the endometrial ablation by hysteroscopy (equally well reimbursed as a hysterectomy) for which a hormonal intrauterine device is actually a good alternative for many patients.

- *The medical team is not always fully aware of the financial consequences of admitting the patient in hospital for one night.*

- *In certain hospitals where there are no single rooms available in the day-care setting, specialists can only charge fee supplements when the patients are admitted for one night.*

- *Some hospital insurance companies only refund their clients for procedures that were performed in an inpatient approach and not in a day-care approach. Other insurance companies are only willing to refund single room supplements when the procedure was not performed in day-care.*

  Upon inquiry with some Belgian hospital insurance companies it appears that both allegations are unfounded. It depends on the contract ("the package") whether day care in single rooms is covered by the hospital insurance; often the basic package does not cover single rooms in day-care while the more advanced package does.

II A totally implantable vascular access device is recommended for patients who need certain types of medicines or treatments that irritate or damage the smaller veins or who need intravenous therapy over a long period of time (e.g. chemotherapy).

- *In some hospitals the anaesthetists demand that certain procedures are done under general anaesthesia (which is more profitable) while local anaesthesia (administered by the surgeon himself) is perfectly possible.*

  An example is the electro-fulguration or ligation and stripping of lower limb veins: if it is performed under general anaesthesia the patent needs more recovery time and may not be eligible for day care when the procedure was performed too late in the afternoon.

Policy impediment

- *The reimbursement/nomenclature does not keep pace with the surgical technological innovations and hence impedes a further expansion of day care.*

  An example is laparoscopic unilateral oophorectomy which is a very painful operation if performed "the old way" (i.e. coagulation resulting in more necrosis). Newer techniques (e.g. sonicision, ultracision, ligasure, thunderbeat), result in a significant reduction of peri-operative pain and of operating time, which renders the procedure more eligible for day care (achievable day-care rate: up to 70-80%). The only problem is that the disposable material is not reimbursed by RIZIV – INAMI, which impedes a day-care approach.

  Another example is the electro-fulguration or ligation and stripping of lower limb veins for which only 1 fibre per patient (in a lifetime) is reimbursed. Still, the use of the fibre makes the procedure eligible for in-office care and allows the patient to go back to work the day afterwards (in contrast with the technique without the fibre where the patient is unfit for labour for three weeks).

  Another example is the abdominal or limb artery angioplasty with (or without) stent: the use of vascular closure devices (VCDs) may according to the experts reduce the post-operative observation time by several hours and hence render more cases eligible for day care. However currently these devices are only partially reimbursed which impedes their use.

Organisational factors

- *According to the experts of the 11 expert groups for many procedures the bulk of the variability in day-care rate can be attributed to organisational and logistic problems.*

  Higher day-care rates are possible on the condition that day-surgery units stay open longer at night and that more operating rooms are available (cf. infra). For instance, according to the experts, the variability in day-care rate observed in the treatment of a peritoneo-vaginal canal (national day-care rate: 69.3%) can only be attributed to organisational issues; they assume a target of 90-95% achievable. Another example is unilateral orchidectomy (national day-care rate: 27.7%), which can be performed in day care, but as in many hospitals the waiting list for day surgery is longer than for classical hospitalisation and this indication is semi-urgent, the patient is often admitted in hospital so that the procedure can be scheduled earlier.

- *Procedures scheduled late in the afternoon do not qualify for a day-care approach when the expected post-operative observation period is too short*.

  After surgery, patients need to recover (e.g. from general anaesthesia) and should stay under supervision for a certain period of time. As a consequence, surgical procedures intended for a day-care approach should not be scheduled too late in the afternoon as day-care wards are closed early in the evening (between 5 and 7 pm) to avoid the payment of additional salary for late work for nursing and administrative staff. On the other hand, from an economical point of view it is obvious that operating rooms' capacity is maximally exploited until late afternoon. Hence, when a further substitution of inpatient care by day care for elective surgical procedures is pursued, the experts suggest that day-surgery centres stay open until e.g. 10 pm. Also a broader interpretation of the concept "day care" should be evaluated. More precisely, one

should shift towards a "short stay/extended recovery[mm] approach" that takes the (maximum) stay in the hospital (of e.g. 12, 24 or 36 hours) into account, instead of focusing on the overnight stay in the hospital. In this way, patients who had surgery late in the afternoon and stay overnight are still considered "day-care patients". Experts are convinced that this broader approach (a.o. in hospital financing) will certainly generate a further growth of the eligibility of elective surgical procedures as well as of patients for a "day-care approach".

- *The surgeon who is working in the day-care surgery unit should not be on call.*

  Often emergency surgical interventions throw the day-care schedule into confusion, which results in the last patient(s) being admitted in hospital as the remaining recovery time is too short. Therefore, when the handling of emergencies and the day-care schedule are better geared to one another, this will definitely result in an increase in the day-care rate.

- *The organisation of day-care surgical units costs extra time and personnel; policy makers and the hospital management have to be willing to make and reward these efforts.*

  For a smooth organisation of a day-care unit sufficient administrative and nursing staff (e.g. day-care "planners") is essential. They schedule the procedures according to the instructions of the surgeons and anaesthetists, contact patients a day in advance (and hence reduce the number of no-shows), make sure the necessary staff and equipment are provided, contact the patients after their return home to give additional advice and record potential problems, etc. In short, they enable a smooth organisation of care (smooth for patients, physicians and staff) and an optimal use of the day-care unit's capacity. Experts suggest to enlarge the supportive administrative and nursing staff in order to realise a raise in the substitution rate.

- *A thorough pre- and postoperative patient information transfer is crucial in a day-care approach for elective surgical procedures.*

  It is very important that sufficient time is spent before and after the procedure to fully inform the patient: what does the surgery entail, how much pain can be expected and how can pain be prevented and/or subdued, what other potential complications can crop up and how can they be tackled, who can they reach in the postoperative phase in case of problems or additional questions… In this respect, it should be verified that patients are well awake when they get the post-operative instructions so that they understand and capture the instructions given. Experts experience difficulty in convincing hospital management to invest in patient information (e.g. organisation of multidisciplinary preoperative consultations which are currently not profitable according to the consulted experts). Among the experts, there are advocates and opponents of patient leaflets (e.g. easy to transfer correct information vs. difficult to know whether everything is well understood and whether the patient will comply with the instructions).

- *The power of the nursing staff*

  Several consulted specialists witness that in their hospital the nurses determine till what time the surgeons can operate. When it is determined that the operating room closes at 4 pm or that the day-care centre should close at 6 pm, there is less operating time and hence the

[mm] According to the Ambulatory Surgery Handbook (issued by the International Association for Ambulatory Surgery (IAAS)) those patients who can be managed with an overnight stay should be known as 'Ambulatory Surgery – Extended Recovery Patient', defined more precisely as 'a patient treated in ambulatory surgery/procedure centre/unit, free standing or hospital based, who requires extended recovery including overnight stay, before discharge the following day'.[6] These patients are also known as 23-hour surgery or day surgery with overnight stay. While the concept was introduced to increase the range of more major surgical procedures undertaken in freestanding day units, it can also be used as a confidence gaining stage in the transfer from the inpatient setting to the true day care setting.[106] On the other hand, one should be cautious, as the concept may delay the development of or even reverse the move to true day care.[106]

hospital day-care rate will be lower. If day care is to be expanded, then day-care centres should operate until later in the evening (e.g. 10 pm).

- *The order surgical procedures are performed should be adapted to day-care.*[nn]

  Many surgical teams prefer to start in the morning with the heaviest procedures (usually not eligible for day care) as they demand most concentration and wish to finish the day with the least demanding procedures, which are actually often eligible for day care. As the recovery time for the last patients is then too short, they have to be admitted in hospital. Likewise, anaesthetists generally ask that cases performed under general anaesthesia are performed first and that procedures under local anaesthesia (for which they are most often not needed anymore) are performed afterwards. And again, the majority of cases performed under local anaesthesia are eligible for day care, but may end up in hospital when recovery is too short.

Post-operative care at home/in the ambulatory setting

- *Post-operative care at home/in the ambulatory setting is not sufficiently organised and developed yet in Belgium.*

  When patients go back home the same day of (or short after) elective surgery, they need dedicated post-surgical medical and paramedical care at home (e.g. wound care, pain control, monitoring of complications, appropriate and timely physiotherapy). Experts sense post-surgical medical, nursing, physiotherapy and paramedical care in the ambulatory setting as not sufficiently developed yet, and hence keep their patients longer (e.g. for a night or two) in the hospital until the highest risk for complications is over. Experts also raise the issue that in some areas in Belgium, general practitioners are overloaded and do not have the time (nor the expertise) to deal with post-surgical complications. Not many general practitioners follow the new principles of day care, enhanced recovery etc. and hence, the consulted experts see a high need for better education of the ambulatory sector in post-operative care.

Factors that call for a careful interpretation of the administrative data

In Appendix 16 an overview is provided of the procedures for which the interpretation of the administrative data should be performed with caution and the reason why the consulted experts suggested some prudence. The procedures are presented by discipline and by APR-DRG. Here we rather give an overview of the reasons why the administrative data should be carefully interpreted.

- *Since 2011-2013 the treatment for certain pathologies has changed, hence the data do not reflect actual clinical practice.*

  An example is Dupuytren's contracture repair for which in recent years in less severe cases surgery has been replaced by collagenase injections. The injections can be performed in the office[22] but only in a hospital setting (as the drug can only be administered by the hospital pharmacy). As a result, especially the more complex and severe cases are treated surgically, and they may need an overnight stay to supervise post-operative complications. As a consequence, current day-surgery rates are probably lower than in 2011-2013 (when the majority of cases

[nn] This is actually provided in the legislation on day-surgery centres. Royal Decree of 25 November 2007, Chapter II, Art 4. De functie "chirurgische daghospitalisatie" beschikt in principe over eigen operatiezalen met nevenruimten. In afwijking op het voorgaande lid kan de functie gebruik maken van de operatieafdeling van het ziekenhuis, mits er schriftelijke organisatorische afspraken worden gemaakt die waarborgen dat de afwikkeling van het programma van het dagziekenhuis in geen geval ondergeschikt is aan het operatieprogramma voor opgenomen patiënten.// La fonction " hospitalisation chirurgicale de jour " dispose en principe de salles d'opération propres avec annexes. Par dérogation à l'alinéa précédent, la fonction peut utiliser le bloc opératoire de l'hôpital, pour autant qu'il existe des accords écrits en matière d'organisation garantissant que la réalisation du programme opératoire de l'hôpital de jour ne soit en aucun cas subordonnée à celle du programme opératoire pour les patients hospitalisés.

http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=nl&la=N&cn=1997112533&table_name=wet

were treated surgically and more (simple) cases were eligible for a day-care approach).

- *For certain procedures selected based on these codes, the Belgian physician fee schedule (the so-called 'nomenclature') has changed and hence the 2011-2013 data are obsolete.*

  Although the analyses of this project were based on APR-DRGs and ICD-9-CM codes, this issue was raised in several expert groups and is applicable, among others, to hand surgery (new codes were introduced in January 2014), foot and ankle surgery (new codes were introduced in January 2014).

- *The same nomenclature or ICD-9-CM code may in essence cover a variety of indications, procedures, techniques and/or severities.*

  An example is the repair of a recurrent shoulder dislocation: based on the ICD-9-CM nor on the nomenclature code it can be retrieved which technique has been used[oo]: the Bankart repair (which can be performed arthroscopically; eligible for a day-care approach), but also the more demanding Latarjet procedure (which is a more complex procedure, with possibly more complications and pain[107]; not eligible for a day-care approach according to some experts).

  Another example is Dupuytren's contracture[pp] repair. As Dupuytren's contracture can originate from different cords and can present in different severities, its surgical repair can range from "simple" surgery, perfectly amenable to day care, up to very extensive surgery, that may need overnight supervision in case post-operative complications are anticipated.

  Another example is the revision of an arteriovenous shunt, for which a distinction should be made between the intravascular approach (balloon dilatation, eligible for day care) and the surgical approach, which is more complex and not eligible for day care.

  Another example is a corneal graft, which can be performed with a whole cornea being transplanted (which leads to a lot of complications) or the newer technique where pieces of cornea are being transplanted (leading to less complications and hence eligible for day care).

- I*n case of a combination of several procedures at the same time, the patient may be less eligible for a day-care approach (because the procedure takes longer and becomes tougher for the patient), which is reflected in lower day-care rates.*

  Examples are acromioplasty which is often (but not always) used in combination with other procedures in the shoulder, insufflation of the fallopian tubes, which may e.g. be combined with endometrial resection.

- *Certain descriptions of procedures (or procedure labels) are too vague and may include very distinct procedures (which may or may not all be eligible for day care).*

  Examples are the curettage procedures (which may in certain instances be linked to severe sepsis, in which case the patient needs close monitoring and (among others) IV antibiotherapy and hence is not

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oo Nomenclature code 275295-275306: Heelkundige behandeling van recidiverende anterieure of posterieure instabiliteit van de schouder, ongeacht de techniek; cure chirurgicale d'une instabilité antérieure ou postérieure récidivante de l'épaule, quelle que soit la technique.

pp Dupuytren disease is a benign fibroproliferative disorder of the palmar digital fascia, typically seen in 50 to 60 year old men of northern European descent.22 Women are less frequently affected (in a 1:2 to 1:5 ratio). Treatment options include collagenase injections, needle aponeurotomy, and fasciectomy. The clinical manifestation depends on the affected cord(s): affected longitudinal cords over the palm and digits result in flexion contracture at the metacarpophalangeal joint (MCPJ) and proximal interphalangeal joint (PIPJ), respectively. The severity of the disease has been classified by total passive extension deficit (TPED), which is the sum of the degrees that the MCPJ, PIPJ, and distal interphalangeal joint fall short of neutral (0°) with maximum passive extension. Staging progresses from least to most severe, with stages 1, 2, 3, and 4 corresponding with TPED less than or equal to 45°, 46° to 90°, 91° to 135°, and greater than 135° respectively.[22]

suitable for day care), endometrial ablation by hysteroscopy, injection into the anterior chamber.

- *The administrative data (RIZIV – INAMI or ICD-9-CM codes) generally do not allow to make a distinction between primary and revision surgery, which is a serious shortcoming.*

  For some procedures (e.g. knee replacement, hip replacement) it is extremely important to make a distinction between primary surgery and recurrent/revision surgery, the latter rendering more severe surgery and hence a smaller chance for day care. As the administrative data do not allow to make that distinction, they should be interpreted with caution.

- *In general, administrative data do not allow to make a distinction between open surgery and minimally invasive surgery.*

  The 2011-2013 administrative data rarely allow to distinguish between open surgery (generally spoken less amenable for day care) and minimally invasive surgery, which calls for a careful interpretation of the data. The ICD-10-PCS (applied from 2015 onwards) will allow to make that distinction.

- *Certain nomenclature codes are "used" for other procedures than the ones intended, due to a lack of proper codes for the procedure that was performed (because the updates of the nomenclature do not keep pace with current practice) or because the reimbursement provided is considered too low.*

  Although the analyses of this project were based on APR-DRG and ICD-9-CM codes, this issue was raised in several expert groups and is applicable, among others, for intermaxillary uni- or bilateral osteoplasty, which is according to the consulted specialists often used for procedures that are less lucrative (the code is e.g. used for sinus lifting, for small displacements or for the grafting of autologous bone). Another example is radical endometriosis excision, which according to the experts should only be done in specialised centres (note: it has been attested in 80 hospitals, 57 of them not performing more than 10 cases over the 3-years period) and which definitely needs an inpatient approach. According to the consulted experts, the 119 cases that were performed in day care most probably reflect miss-use of the nomenclature.

  Another example is scleral buckle: most of these cases are urgent and demand one night hospitalisation. According to the experts the hospitals with high day-care rates most probably miss-use the code (for other procedures, e.g. trauma, removal of a scleral buckle).

- *Certain procedures are often done in the doctor's office situated on the hospital premises, hence in principle not eligible for day-care lump sums but in certain hospitals still coded as day care*.

  Examples are (surgical) tooth extractions, surgical removal of a residual tooth, apicectomy, frenectomy. Another example is the marsupialization of a Bartholin's gland, which according to the experts can safely be performed in the doctor's office in 95% of cases. For the experts it is astonishing that each year more than 500 women are admitted in hospital for this procedure and 17% even for an inpatient stay. Based on the TCT administrative data it is not possible to retrieve which proportion of these procedures is really done in a full operating room (and thus correctly classified as day surgery) and which proportion is actually done in the doctor's office (and should have been classified as outpatient).

Miscellaneous comments raised during the expert meetings

- *The issue of legal responsibility should also be addressed.*

  Surgeons are responsible for their patients, prefer to have their patients in the immediate surroundings and are not inclined to send them home as long as complications may occur. Moreover, they wonder who is responsible when complications arise at home that are not well diagnosed and/or taken care of. Likewise, what kind of responsibilities can be left to caregivers at home? What kind of responsibilities can be left to the patient's family?

- *When patients are kept in the hospital for one night to observe possible complications, it should be well realised that often there is only one nurse for 25 patients. So the intensity of the observation should not be overestimated.*

- *When the costs of inpatient stays are compared with the costs of day-care stays, then the additional costs of more physician visits, the nurse at home, the physiotherapist at home, etc. should also be included in the latter sum.*[qq]

- *Can patients be forced to go home? What about patients who desire to stay one night in hospital?*

- *When policy wants to increase the day-care rate, they should also install penalties in case of high re-admission rates.*

- *Targets are not needed; it is sufficient to change the financing systems.*

- *In the future, the use of new communication tools (e.g. apps) may help monitoring the patient's post-surgical status at home.*

- *In subsequent analyses of the data, it may be informative to further distinguish between pre- (e.g. in case of abscesses) and postoperative hospital stays.*

Discipline specific topics

Abdominal surgery

- *For certain procedures an increase in day-care rate can be anticipated.*

  Cholecystectomies have been performed laparoscopically for the last 25 years, but the day-care approach is of a recent date (last 3-5 years). The consulted experts suggest that with growing expertise, the day-care rate will increase in the next years. Also, because the diagnosis has improved tremendously over the past decades, the procedure is more often done in a non-urgent non-complex context, which lends itself easier to day care. They consider a day-care rate of 40-50% feasible, on the condition that financial incentives are given (cf. supra).

Ophthalmologic surgery

- *Special attention should be paid for mono-ophthalmic patients, who should be given the option to stay in hospital for one night after they had surgery in the only functioning eye they have.*

- *After the majority of ophthalmologic surgical procedures eye drops have to be applied, sometimes up to six times a day. This may raise problems for single patients who lack the needed dexterity, as the reimbursement of nursing acts is not unlimited for some patients*[rr].

- *The following procedures with high day-care rates could safely be performed in the doctor's office*:

[qq] As of 2017, no data are available on the costs of inpatient stays and day-care stays in Belgium.

[rr] If a patient is assigned a "nursing lump sum A, B or C" the number of visits and nursing acts is unlimited. For all other patients there is a daily upper limit, beyond which nursing acts and visits are no longer reimbursed. As of November 2016, the daily upper limit for reimbursement on weekdays is € 17.11. The reimbursement for the post-operative administration of eye drops is € 2.17 (and € 1.63 for patients with increased reimbursement of medical expenses). The reimbursement is limited to the first 30 post-operative days. (Personal communication)

- Blepharoplasty
- Repair of entropion/extropion
- Blepharoptosis repair
- Chalazion excision

From a medical point of view, there is no indication to perform them in an operating room. It is not possible to unravel which proportion of these procedures is really done in a full operating room (day care) and which proportion is actually done in the doctor's office.

Orthopaedic surgery

- *After many orthopaedic surgical procedures detailed instructions are needed to ensure correct mobilisation and hence uncomplicated recovery.*
- *After orthopaedic surgery patients are stimulated to mobilise as soon as possible, but this should be done in the correct way to prevent complications/recurrence of the problem.*

  For example, after shoulder stabilisation procedures movements in front of the body are allowed. In case these instructions are not complied with and broader movements are performed, re-rupture of the surgically restored shoulder junction may occur.
- *Day surgery is contra-indicated for autologous bone grafts when these are taken from the pelvis (as is usually the case) because of post-operative pain and the high risk of post-operative bleeding and other possible complications.*
- *In case patients need 24 hours post-operative IV antibiotherapy, a day-care approach is not practicable.*

  In case of e.g. implant surgery and graft surgery, IV antibiotherapy is administered in the immediate post-operative phase. In some hospitals it is given in 1 shot (hence day surgery is feasible) and in others it is given in 3 shots, making a longer hospital stay inevitable according to the experts.[ss] According to some experts, there is no (international) consensus on whether peri-operative antibiotics should be given with every type of implant surgery, and whether this then should be administered as a single dose or for 24 hours.
- *For some orthopaedic procedures there is a link between the duration of the surgical procedure and the amount of postoperative pain, although the duration itself should not be taken as a (contra-)indication for day care, as some surgeons work slower than others. The complexity of the surgery is in some cases more important than the duration in se. As a (general) rule, experts consider orthopaedic surgical procedures lasting longer than 1 to 1.5 hour not eligible for day care.*
- *The medical team has to guarantee that the patient returns home in the best circumstances and understands perfectly when (s)he has to sound the alarm.*

  An example is the post-operative monitoring of a plaster cast. In case it is applied too tight it may induce secondary problems like Sudeck's Atrophy. Therefore, for certain orthopaedic procedures, the surgeons prefer a one-night stay, so that in case of swelling, the plaster can be redone immediately and appropriately.

[ss] In Belgium there is some experience with Outpatient Parenteral Antimicrobial Therapy (OPAT) in the home setting of the patient.[108] In addition, following the recommendations of KCE report 250 "Implementation of hospital at home: orientations for Belgium"[109], a call for pilot projects on the implementation of IV administration of antibiotherapy at home has been launched in May 2016.

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