



3.3. Postoperative complications (patient safety indicators) (QS-3, QS-4)

3.3.1. Documentation sheet

Description	A. Postoperative pulmonary embolism or deep vein thrombosis in adults after hip or knee replacement B. Postoperative sepsis in adults after abdominal surgery
Calculation	A. Number of hospitalisations with a pulmonary embolism or deep vein thrombosis as a complication of hip or knee replacement, per 100 000 discharges for patients aged 15 and older B. Number of hospitalisations with a septicaemia as a complication of abdominal surgery, per 100 000 discharges for patients aged 15 or older
Rationale	<p>Postoperative pulmonary embolism (PE) or deep vein thrombosis (DVT) cause unnecessary pain and in some cases death, but can be prevented by anticoagulants and other measures before, during and after surgery. Likewise, sepsis after surgery which may lead to organ failure and death, can in many cases be prevented by prophylactic antibiotics, sterile surgical techniques and good post-operative care. ¹</p> <p>Two types of patient safety event can be distinguished: sentinel events that should never occur such as failure to remove surgical foreign bodies at the end of a procedure; and adverse events, such as post-operative sepsis, which can never be fully avoided given the high-risk nature of some procedures, although increased incidence at an aggregate level may indicate a systemic failing.</p> <p>These two indicators are international indicators calculated based on administrative hospital discharge data (Patient Safety Indicator, PSI), which belong to the framework of HCQI. ² They were originally developed by the US AHRQ Agency, ³ and are included in the maxi feedback sent from FPS Public health to hospitals. ⁴</p>
Data source	RHM-MZG (hospital administrative discharge data), Federal Public Service Public Health
Technical definitions	<p>From OECD website (all ICD-9 codes can be found on the HCQI OECD website):</p> <p>Indicator A: Postoperative pulmonary embolism or deep vein thrombosis in adults after hip or knee replacement</p> <p>Numerator: Discharges among cases defined in the denominator with ICD code for deep vein thrombosis or pulmonary embolism in any secondary diagnosis field</p> <p>Denominator: All hip and knee replacement discharges, meeting the inclusion and exclusion rules with an ICD code for an operating room procedure</p> <p>ICD-9-CM Total hip and knee replacement procedure code: 8151 Total hip replacement, 8153 Revision of hip replacement, 8154 Total knee replacement and 8155 Revision of knee replacement.</p> <p>Exclude cases (from numerator and denominator):</p> <ul style="list-style-type: none"> • with principal diagnosis of deep vein thrombosis or pulmonary embolism or (secondary diagnosis present on admission if known), • where a procedure for interruption of vena cava (ICD-9 CM 387 Interruption of vena cava) is the only operating room procedure, • where a procedure for interruption of vena cava occurs before or on the same day as the first / main operating room procedure. (Note that if day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available), • MDC 14 (Pregnancy, childbirth, and puerperium).



- with length of stay less than 2 days.

Indicator B: Postoperative sepsis in adults after abdominal surgery

Numerator: Discharges among cases defined in the denominator with ICD code for **sepsis** in any secondary diagnosis field

Denominator: All **abdominopelvic surgical discharges** only, meeting the inclusion and exclusion rules with an ICD code for an operating room procedure.

Exclude cases:

- with principal diagnosis of sepsis (or secondary diagnosis present on admission),
- with principal diagnosis of infection (or secondary diagnosis present on admission) –
- with any code for immunocompromised state, or cancer –,
- MDC 14 (Pregnancy, childbirth, and puerperium) or principal diagnosis -
- with length of stay of less than 3 days.

These exclusion rules were developed to deal with the uncertainty of the time when the problem occurred (during or before hospitalization). From 2008 this information (diagnostic present at admission) is recorded in the RHM, and exclusion rules will need to be adapted.

Limitation	A report on Belgian RHM data showed that these indicators are highly dependent of the quality of the registration of secondary diagnoses (as one could expect from the definition of the indicator). ⁵
International comparability	This definition is the same than the one used for reporting to health statistics at OECD. Caution is needed in interpreting the extent to which these indicators accurately reflect international differences in patient safety rather than differences in the way that countries report, code and calculate rates of adverse events. In some cases, higher adverse events rates may signal more developed patient safety monitoring system rather than worse care. A fundamental challenge in international comparison of patient safety indicators centres on differences in the underlying data. Variations in how countries record diagnoses and procedures and define hospital admissions can affect calculation of rates. ¹
Dimension	Quality – safety
Related indicators	Hospital-acquired MRSA and Clostridium difficile

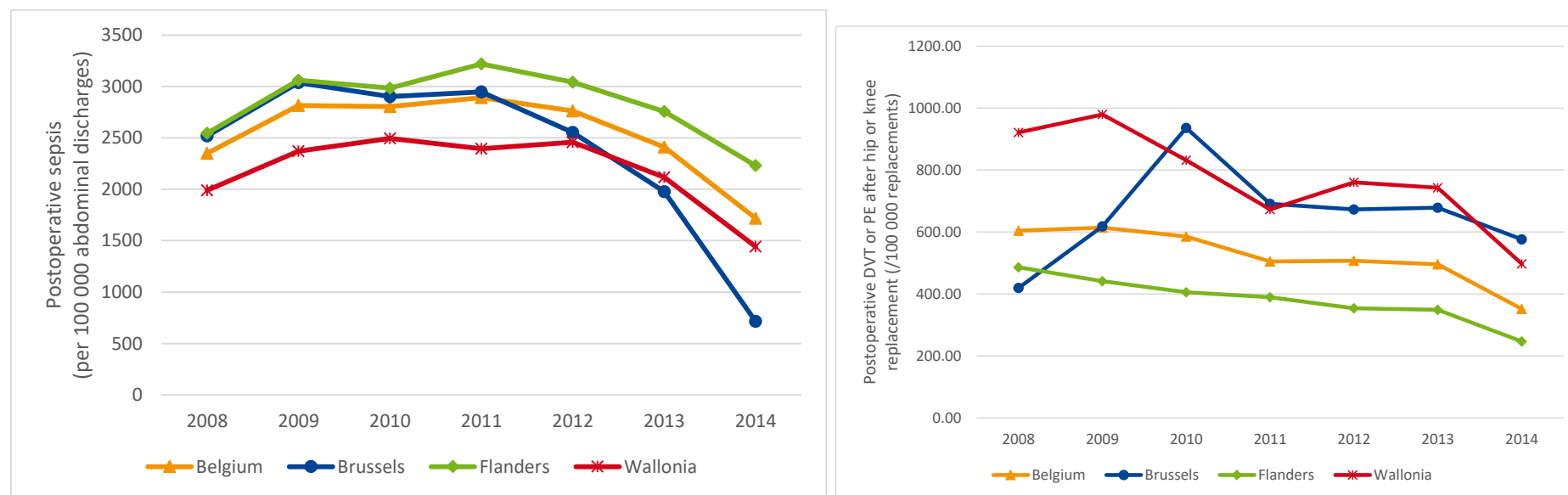


3.3.2. Results

3.3.2.1. In Belgium

Postoperative sepsis results are shown in Figure 38 (left), the complication rates have decreased in recent years in all regions. Results for postoperative deep vein thrombosis or pulmonary embolism after hip or knee replacement are also shown on Figure 38 (right). There is a slow decrease for these complications after hip or knee surgery in Belgium over the period 2008-2014. At the regional level, Flanders and Wallonia also have decreasing rates, Brussels' rate rose from 2008 (420 DVT or PE per 100 000 hip or knee replacements in 2008) to 2010 (936 per 100 000), then decreased from 2010 to 2014 (576 per 100 000).

Figure 38 – Postoperative sepsis after abdominal surgery (per 100 000 abdominal discharges, left) and postoperative PE or DVT after hip or knee replacement (per 100 000 replacements)





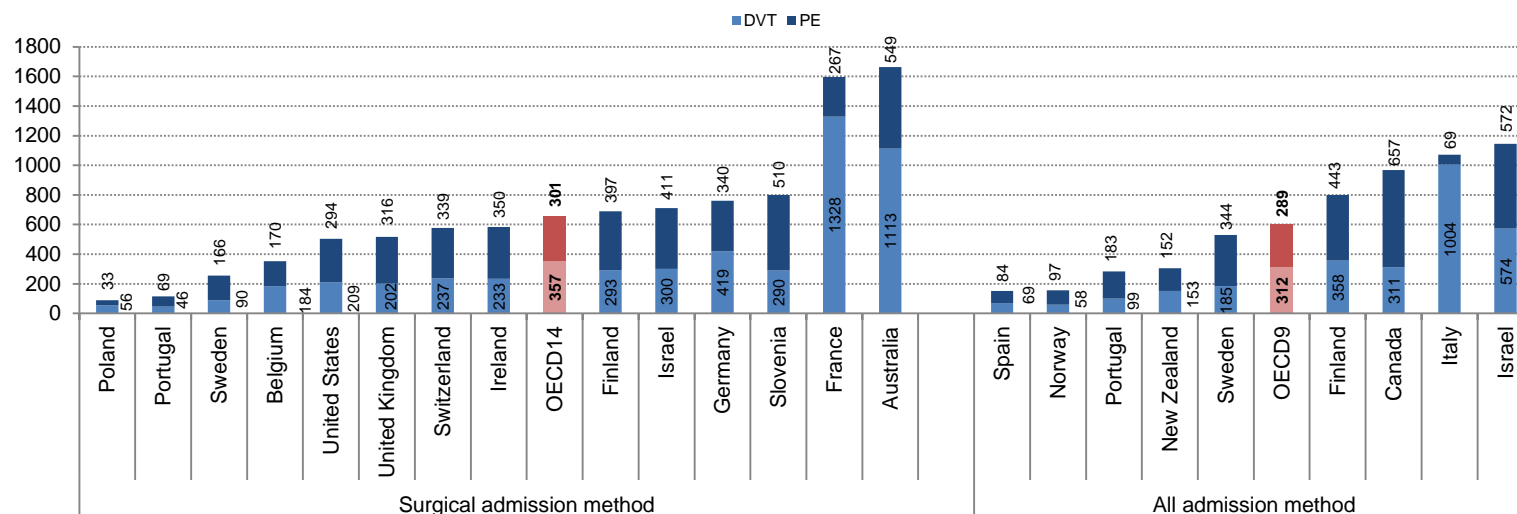
3.3.2.2. Internationals comparisons

Results from the international comparison are presented in Figure 39 and Figure 40 for postoperative pulmonary embolism or deep vein thrombosis, and in Figure 41 for Post-operative sepsis after abdominal surgery. Caution is needed in interpreting the extent to which these indicators accurately

reflect international differences in patient safety rather than differences in the way that countries report, code and calculate rates of adverse events.

In some cases, higher adverse event rates may signal more developed patient safety monitoring systems and a stronger patient safety culture rather than worse care. ¹

Figure 39 – Postoperative pulmonary embolism (PE) or deep vein thrombosis (DVT) in hip and knee surgeries: international comparison, 2015 (or nearest year, per 100 000 replacements)

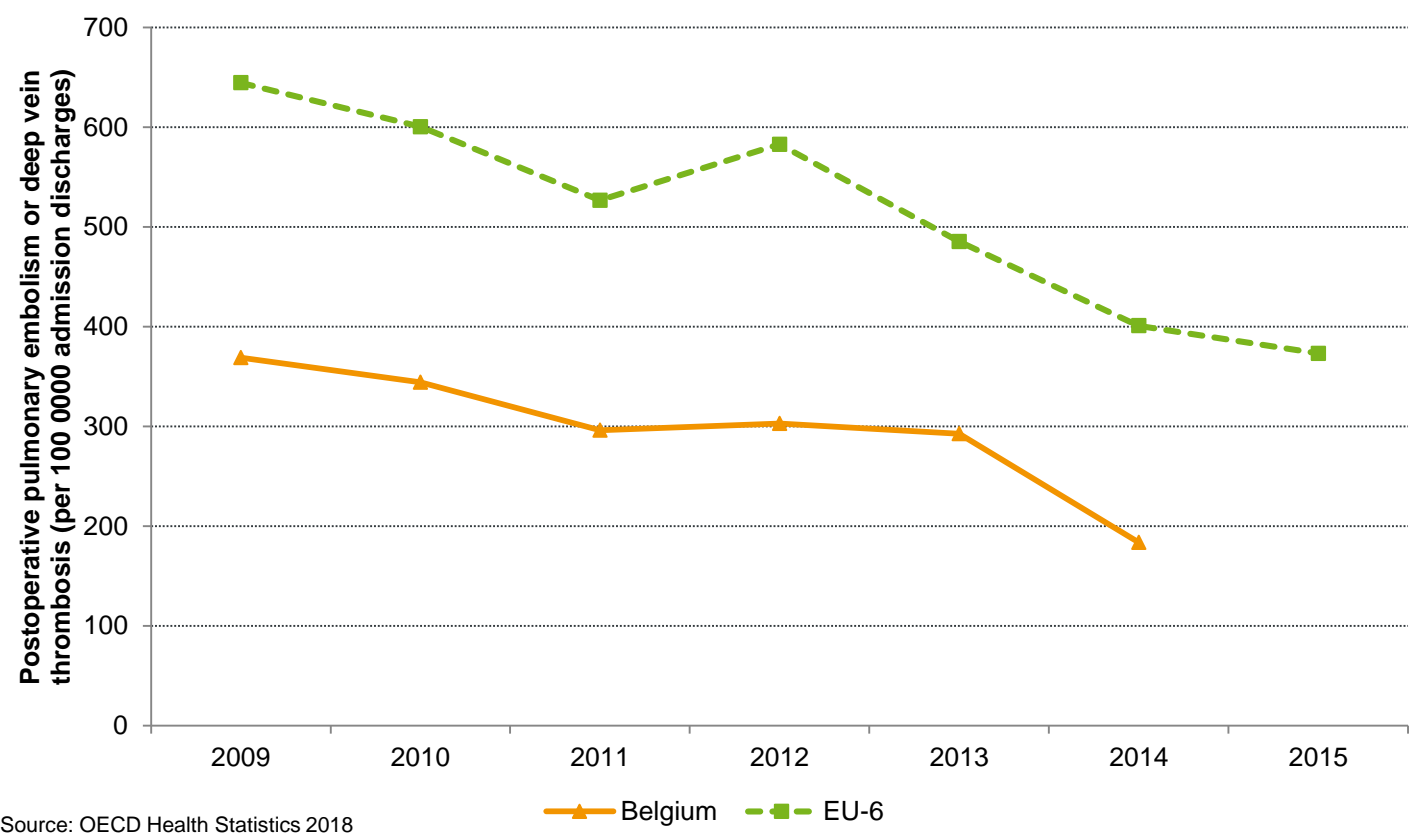


Source: OECD Health at a Glance 2017

Both indicators are on a decreasing trend for the period 2009-2014 in Belgium, while in European countries, PE or DVT after hip or knee surgery is also decreasing but post-operative sepsis after abdominal surgery remains stable. In 2014, Belgium is below EU countries.

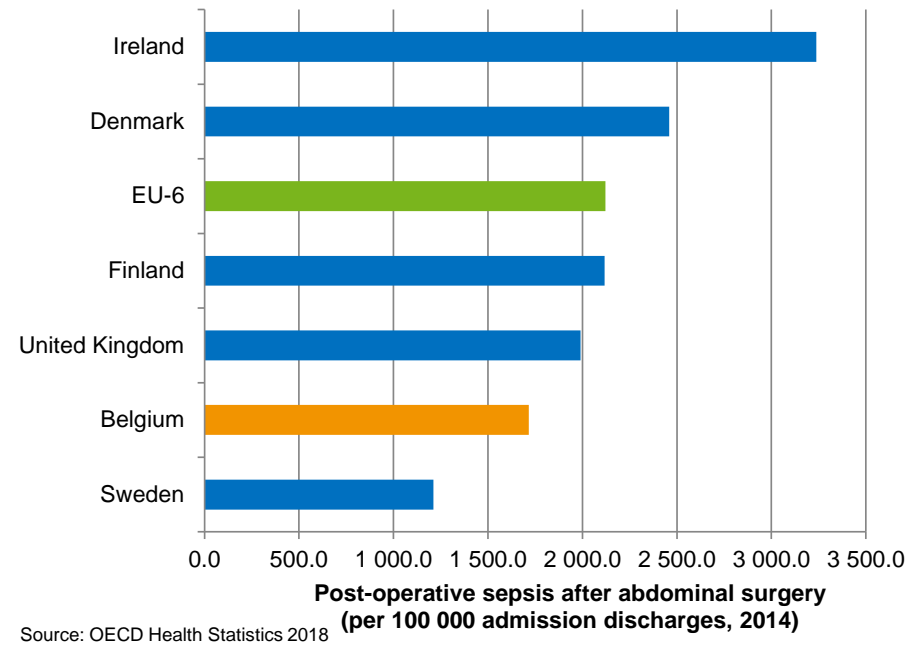
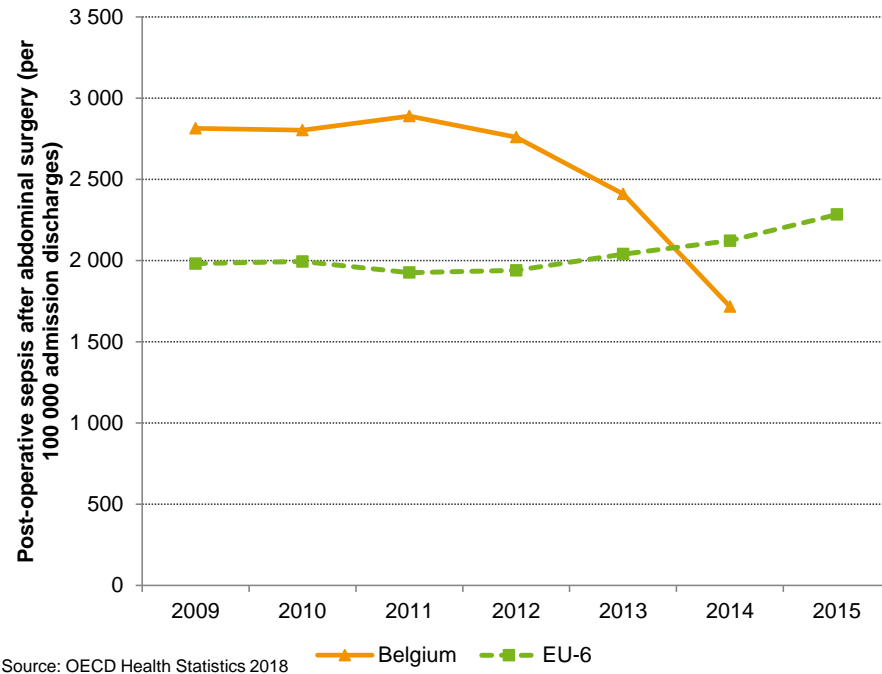


Figure 40 – Postoperative pulmonary embolism (PE) or deep vein thrombosis (DVT) in hip and knee surgeries (2009-2015)



Source: OECD Health Statistics 2018

Note: Surgical admission-related method.

**Figure 41 – Post-operative sepsis after abdominal surgery (per 100 000 admission discharges): international comparison**



Key points

- **The incidence of complications after surgery are international indicators of patient safety, which are monitored on the basis on administrative hospital discharge data, and hence rely highly on the quality of the coding of complications.**
- **Between 2009 and 2014, the incidence of postoperative pulmonary embolism or deep vein thrombosis in adults after hip or knee surgery decreased slightly, while the postoperative sepsis after abdominal surgery shows a stronger decrease in recent years.**
- **In comparison with other countries, Belgium has good results on these indicators (lower rates of postoperative complications) than other European countries, but this might be due to large differences in coding practices between countries.**

References

1. OECD. Health at a Glance 2017: OECD Indicators. Paris: 2017. Available from: http://dx.doi.org/10.1787/health_glance-2017-en
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