

Incidence, Risk Factors, and Burden of Incisional Hernia Repair After Abdominal Surgery in France: A Nationwide Study

OBJECTIVES

Laparotomies are frequent operations, either for elective procedures or for urgent surgery.

Incisional hernia is a common complication of laparotomies¹ and may have been considered as a risk worth taking for a life-saving surgical procedure^{2,3}. While probably underreported, incisional hernia is estimated to develop in 4–15% of patients after laparotomy⁴, or 3–4% within 4–5 years of abdominal surgery⁵. **The burden of incisional hernia encompasses substantial morbidity, impaired quality of life, possible hospital admissions for a surgical procedure, and leads to expenses for the health insurance fund⁶.**

The objectives of this study were to assess the rate of incisional hernia repair after abdominal surgery, recurrence rate, hospital costs, and risk factors, in France.

METHODS

This national, retrospective, longitudinal, observational study was based on the French Hospital Discharge Database (PMSI).

All adult patients (≥18 years old) hospitalized for an abdominal surgical procedure between January 1, 2013 and December 31, 2014 and admitted to the hospital at least once for an incisional hernia repair within five years of the index surgery were included.

The index date was defined as the date of the first abdominal surgery during the inclusion period. A historical period of two years prior to the index date was considered to capture the patient's medical history. All patients were followed for five years from the index surgery, until the end of the study (31-12-2019), or death, whichever occurred first.

Descriptive analyses and cost analyses from the National Health Insurance (NHI) perspective (hospital care for the hernia repair) were performed.

A multivariable Cox model and a machine learning analysis were performed to identify risk factors for hernia repair.

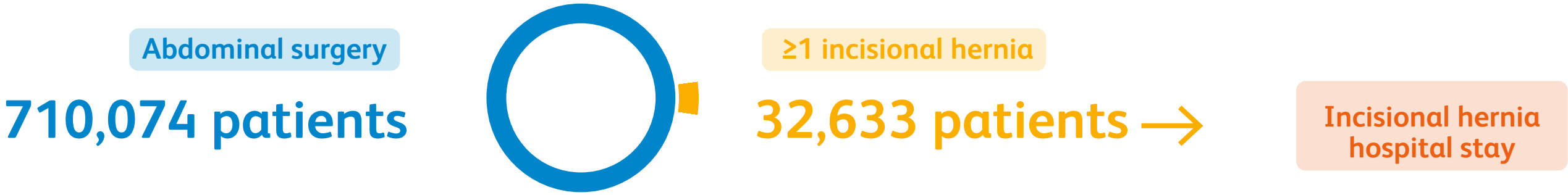
CONCLUSION

In this nationwide population, using an exhaustive healthcare database, at least 4.6% of patients who underwent an abdominal surgical procedure over 2013–2014 were admitted to the hospital for an incisional hernia repair within five years, and among them the recurrence rate was 15.6%. The hospital care cost of incisional hernia repair for patients undergoing an abdominal surgery was estimated to be about €4 150 per hernia repair.

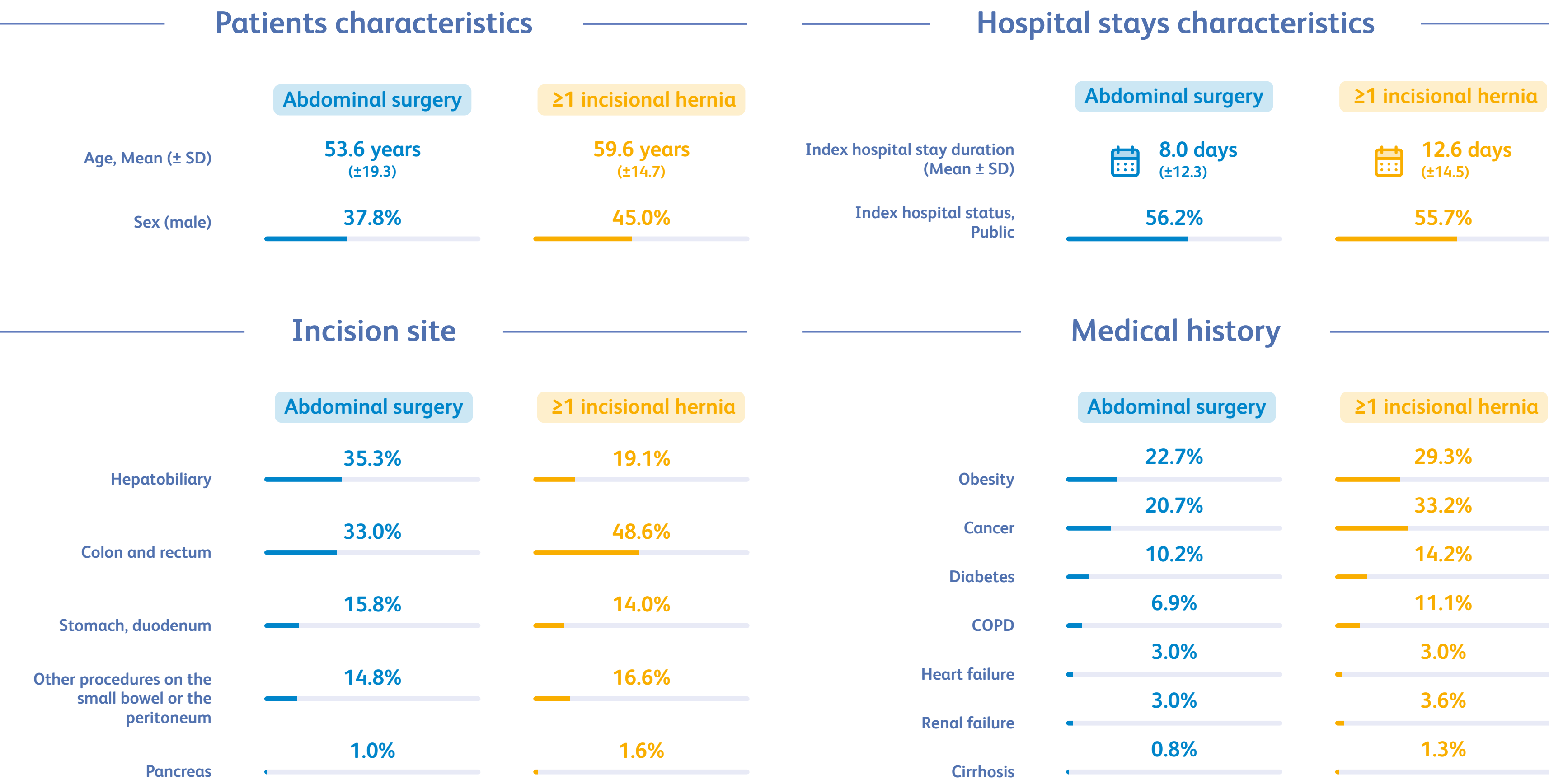
The site with the highest risk of subsequent incisional hernia repair was colon and rectum. Also, the machine learning analysis showed that individual risk factors (age starting as early as age 39, or surgery with laparotomy) also put patients operated on other sites at higher risk of incisional hernia repair. In clinical practice, identifying high-risk patients and applying specific measures and technologies to prevent the onset of incisional hernia is warranted.

RESULTS

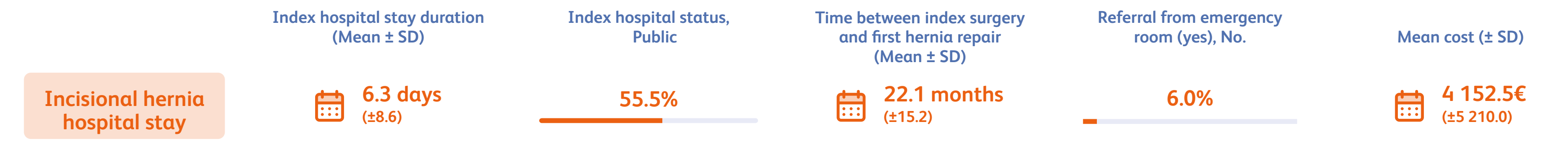
Study population



Description at abdominal surgery

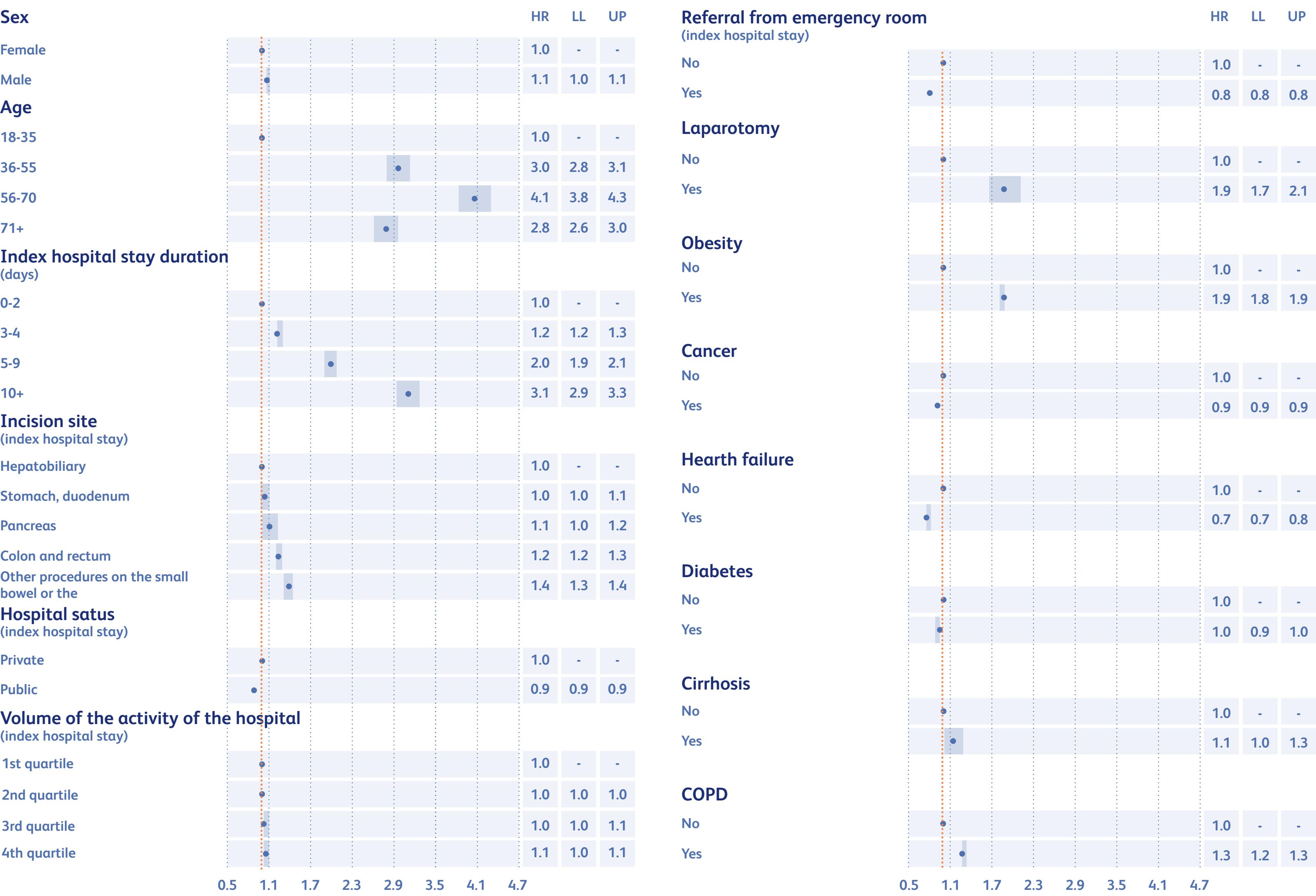


Characteristics and cost of the incisional hernia repair hospital stay



Risk factors of hernia repair after abdominal surgery

Multivariable analysis of factors associated with the first hospitalised incisional hernia



Factors associated with incisional hernia repair according to the machine learning analyses



¹ Muysoms FE, Antoniou SA, Bury K, Campanelli G, Conze J, Cuccurullo D, et al. European Hernia Society guidelines on the closure of abdominal wall incisions. Hernia. 2015 Feb 1; 19: 1–24.

² Dadashzadeh ER, Huckaby LV, Handzel R, Hossain MS, Sanin GD, Anto VP, et al. The Risk of Incarceration During Nonoperative Management of Incisional Hernias: A Population-based Analysis of 30,998 Patients. Ann Surg. 2022 Feb; 275: e488.

³ Söderbäck H, Gunnarsson U, Hellman P, Sandblom G. Incisional hernia after surgery for colorectal cancer: a population-based register study. Int J Colorectal Dis. 2018 Oct 1; 33: 1411–1417.

⁴ Höer J, Lawong G, Klinge U, Schumpelick V. [Factors influencing the development of incisional hernia. A retrospective study of 2,983 laparotomy patients over a period of 10 years]. Chir Z Alle Geb Oper Medizen. 2002 May; 73: 474–480.

⁵ Basta MN, Kozak GM, Broach RB, Messo CA, Rhemtulla J, DeMatteo RP, et al. Can We Predict Incisional Hernia? Development of a Surgery-specific Decision-Support Interface. Ann Surg. 2019 Sep; 270: 544–553.

⁶ Rhemtulla JA, Hsu JY, Broach RB, Mauch JT, Serletti JM, DeMatteo RP, et al. The incisional hernia epidemic: evaluation of outcomes, recurrence, and expenses using the healthcare cost and utilization project (HCUP) datasets. Hernia J Hernias Abdom Wall Surg. 2021 Dec; 25: 1667–1675.