

BUDGET IMPACT ANALYSIS OF LOW-DOSE METHOXYFLURANE FOR THE TREATMENT OF MODERATE-TO-SEVERE TRAUMA PAIN IN CONSCIOUS ADULT PATIENTS IN SPAIN

PSY48

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INTRODUCTION

The analgesic treatment in hospital emergencies has a wide margin of improvement. **Methoxyflurane at low dose** is an inhalation anesthetic for the urgent treatment of moderate or severe pain in adult patients with trauma. It is already commercialized in several EU countries. It can be an important advance for patients and healthcare professionals due to its easy non-invasive administration, rapid onset of analgesic action, good analgesic power and because does not require close monitoring.

OBJECTIVES

To estimate the **budget impact** for the Spanish National Health System (NHS) of introducing **low-dose methoxyflurane (LDM)** as an alternative for emergency relief of moderate-to-severe pain in conscious adult patients with trauma and associated pain.



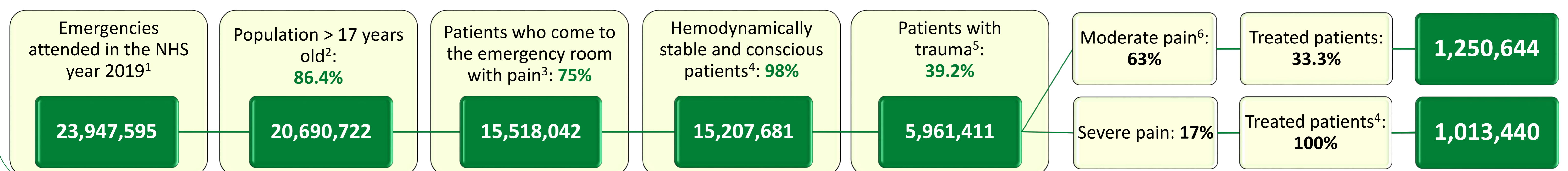
METHODS

A budget impact model was developed over a **3-year time horizon** and from the **perspective of the Spanish NHS**, following guidelines.

TARGET POPULATION

The target population was estimated based on epidemiological data. The **base case** incorporates an estimated population of adults who will be treated in the hospital emergency department during 2019, 2020 and 2020^{1,2}. Patients who come to the emergency room with pain (75%)³, hemodynamically stable and conscious (98%)⁴ and with trauma (39.2%)⁵. The patients were distributed according to the severity of the pain, 63% with moderate pain and 17% with severe pain⁶. All patients with severe pain receive analgesia, while with moderate pain only 33.3%⁷ (**Figure 1**). An Expert Panel was set up to fill information gaps and to validate the model assumptions.

Figure 1. Target population



THERAPEUTIC ALTERNATIVES

Those drugs with **fast-acting administration routes** were considered: intravenous (IV), intramuscular (IM), nasal transmucosal and oral transmucosal (**Table 1 and 2**).

Table 1. Market share in moderate pain

Paracetamol (IV)	15.48%
Dexketoprofen (IV)	17.92%
Dexketoprofen (IM)	3.71%
Metamizole (IV)	12.72%
Metamizole (IM)	1.14%
Diclofenac (IM)	18.63%
Tramadol (IV)	4.10%
Paracetamol (IV) + Dexketoprofen (IV)	9.32%
Metamizole (IV) + Dexketoprofen (IV)	16.98%

Table 2. Market share in severe pain

Fentanyl IV	7.32%
Transmucosal nasal fentanyl	2.50%
Oral transmucosal fentanyl	1.77%
Morphine IV	21.03%
Morphine IM	1.75%
Meperidine IV	13.44%
Rapid oral oxycodone	0.18%
Nitrous oxide	1.40%
Morphine IV + Metamizole IV	10.00%
Morphine IV + Paracetamol IV	10.83%
Morphine IV + Dexketoprofen IV	13.33%
Fentanilo IV + Metamizole IV	9.40%
Fentanilo IV + Dexketoprofen IV	7.05%

The penetration rate of LDM has been estimated: **0.61%; 2.53% and 4.52%** in the first, second and third year, respectively.

COSTS

The following direct health costs (€2018) were included:

- ✓ **Drug acquisition:** The Ex-Factory Price (EFP) was considered, including the RDL 8/2010 discount and the VAT^{8,9}.
- ✓ **Resource use:** fungible material and physiological saline.
- ✓ **Adverse events:** nausea, vomiting, hypoventilation, oxygen desaturation, hypercapnia and the need for naloxone.
- ✓ **Complications management:** phlebitis and extravasation.
- ✓ **Staff time:** preparation, administration and monitoring time, as well as time to deal with adverse events.

SENSITIVITY ANALYSIS

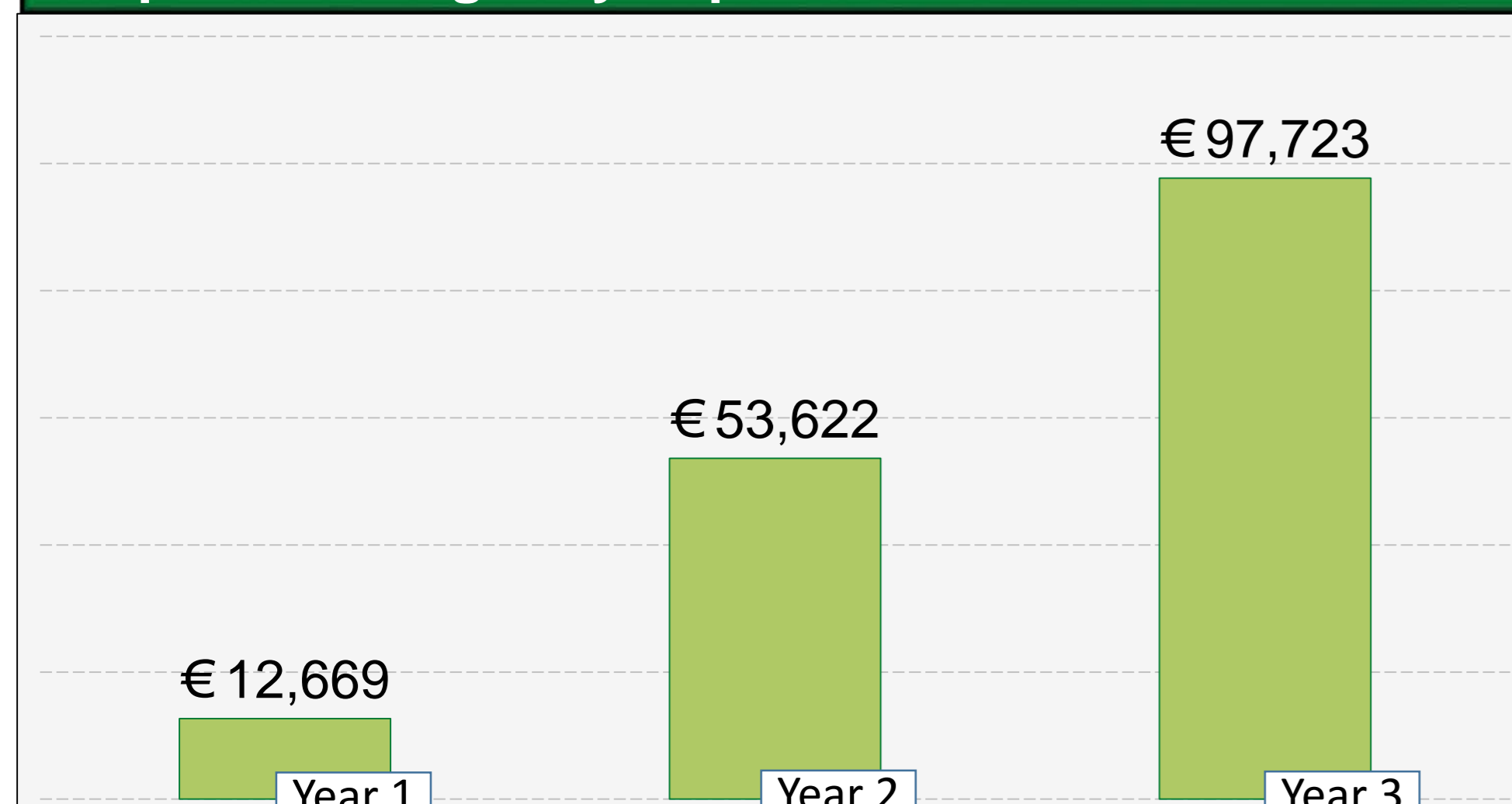
Several **univariate sensitivity analyses** were carried out, varying the most relevant variables by +/- 20%: the target population, the adverse events and the time of the health professionals (preparation, administration and monitoring). The penetration rate of LDM was varied by +/- 50%.

RESULTS

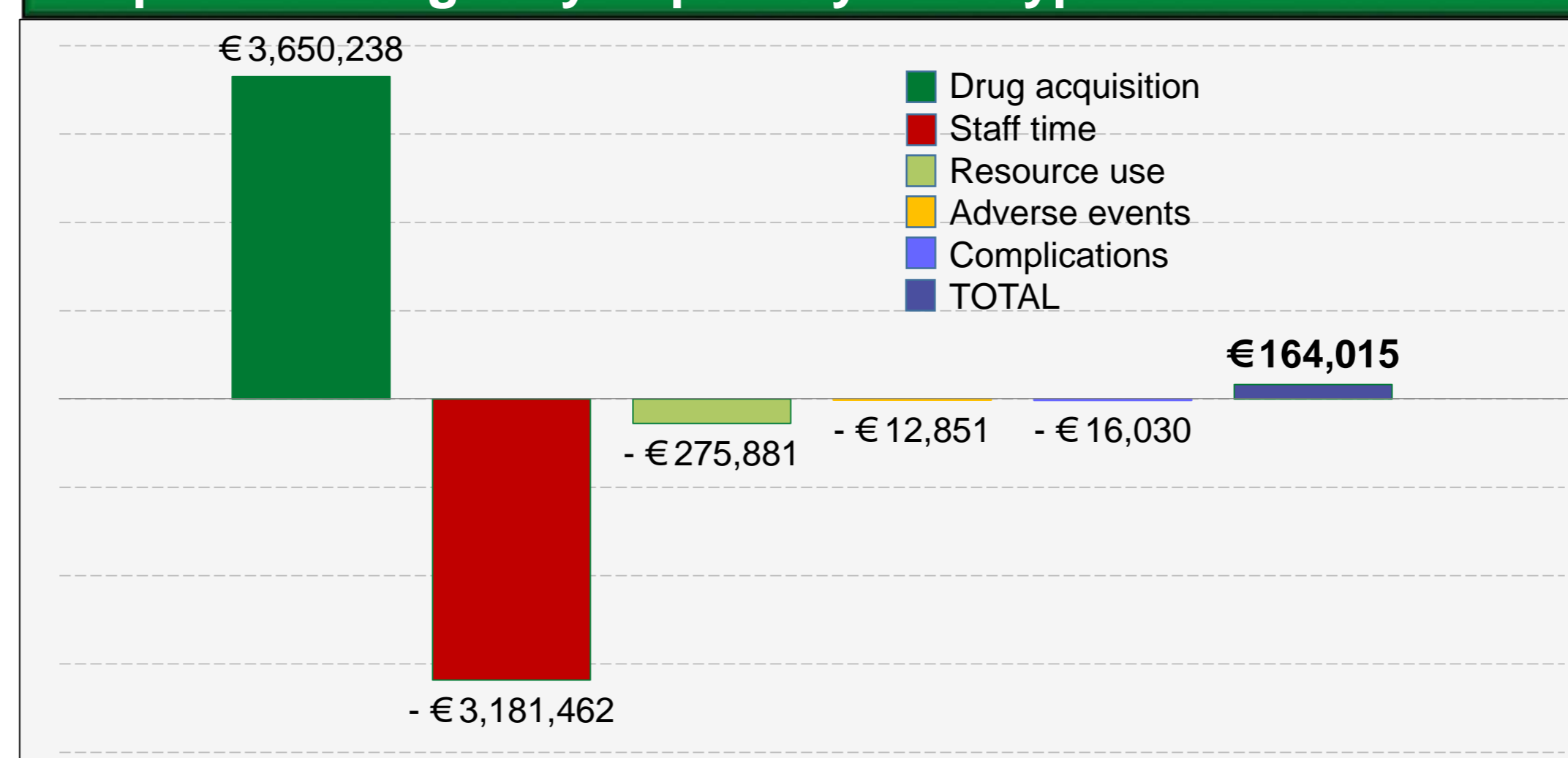
The results showed that LDM could have a modest budget impact for the Spanish NHS of **€12,669** in the first year, **€53,622** in the second year and **€97,723** in the third year, leading to a cumulative budget of **€164,015** in three years (**Graphic 1**). This represents an increase of **0.08%** with respect to the current scenario. **Graphic 2** shows the results broken down by cost type. The usage of this new drug could generate a substantial saving in time for the healthcare staff, valued at €3.2 million.

The results of the sensitivity analysis are shown in **Graphic 3**.

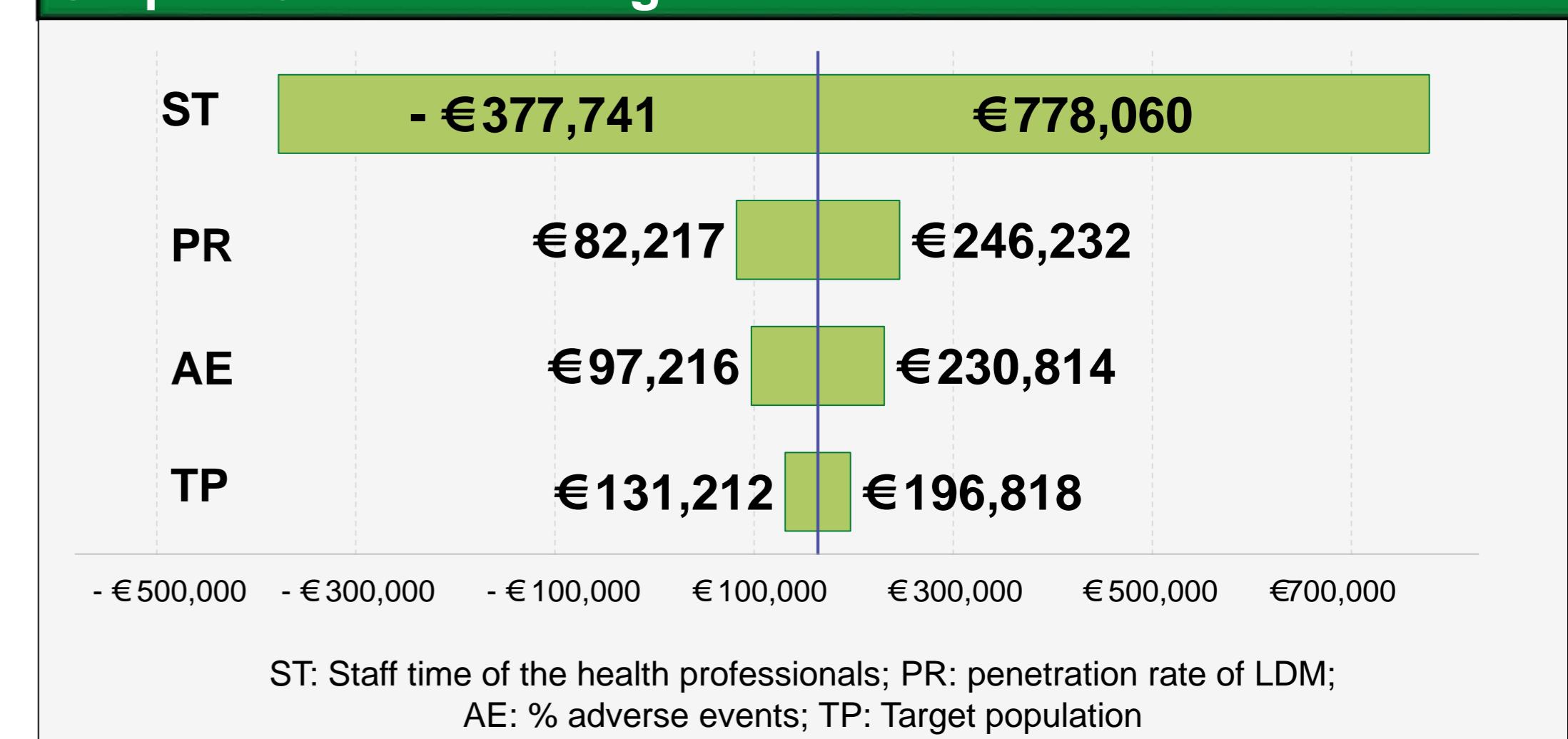
Graphic 1. Budgetary impact



Graphic 2. Budgetary impact by cost type



Graphic 3. Tornado diagram



CONCLUSION

The introduction of LDM for the emergency relief of moderate-to-severe pain in adult patients with trauma could have a very limited budget impact for the Spanish NHS (€164,015), during the first three years of its introduction, while providing fast and effective analgesia.

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