---

**Proceedings Paper:**
Kearns, B., Cooper, K. orcid.org/0000-0002-7702-8103 and Cantrell, A. orcid.org/0000-0003-0040-9853 (2020) PMU13 Schizophrenia treatment with second-generation antipsychotics: a MULTI-country evaluation of the costs of cardiovascular and metabolic adverse events and weight gain. In: Value in Health. Virtual ISPOR Europe 2020, 16-19 Nov 2020, Online. Elsevier , S605-S605.

https://doi.org/10.1016/j.jval.2020.08.1225

---

# SCHIZOPHRENIA TREATMENT WITH SECOND-GENERATION ANTIPSYCHOTICS: A MULTI-COUNTRY EVALUATION OF THE COSTS OF CARDIOVASCULAR AND METABOLIC ADVERSE EVENTS AND WEIGHT GAIN


**Kearns B[1], Cooper K[1], Cantrell A[1]**

[1]School of Health and Related Research, The University of Sheffield


## Introduction

Treating cardiovascular and metabolic diseases can be very costly. Second-generation antipsychotics have similar effectiveness for the treatment of schizophrenia symptoms, so drug choice is often based on differences in rates of adverse events. As schizophrenia is a life-long disorder it is important to consider the lifetime costs associated with the choice of antipsychotic. The aim of this study was to estimate these costs, and how they varied across European countries.

## Methods

Systematic searches were conducted to identify evidence on effectiveness and costs. A Markov model was developed to assess the costs of ten antipsychotics: aripiprazole, brexpiprazole, cariprazine, lumateperone, lurasidone, olanzapine, paliperidone, quetiapine, risperidone and ziprasidone. Costs were obtained for seven countries: Italy, Hungary, France, Slovenia, Spain, Sweden and the UK. The country-specific costs used are provided in Table 1 in US$ for comparability. For analyses, country-specific currencies were used. Acute and stable adult populations were modelled, with a life-time horizon for both. Risk models (QRisk3, Qdiabetes) were used to predict the incidence of cardiovascular and metabolic events.

Both short-term and long-term evidence was considered for the outcomes of Table 1, with evidence taken primarily from published network meta-analyses [1-4]. A model schematic is provided in Figure 1.

**Table 1:** Country-specific annual per patient costs (US $2018).

| | France | Hungary | Italy | Slovenia | Spain | Sweden | UK |
|---|---|---|---|---|---|---|---|
| Weight gain | 624 | 47 | 229 | 229 | 229 | 463 | 208 |
| Diabetes | 6,677 | 5,046 | 3,478 | 1,242 | 2,062 | 3,417 | 6,553 |
| Fatal CVD event | 8,142 | 4,137 | 5,178 | 4,137 | 10,575 | 8,175 | 5,158 |
| CVD event Year 1 | 23,572 | 3,006 | 7,310 | 11,685 | 13,557 | 6,325 | 4,093 |
| CVD event Years 2+ | 3,272 | 1,170 | 6,405 | 496 | 11,060 | 2,207 | 1,702 |
| Metabolic syndrome | 970 | 970 | 970 | 970 | 970 | 970 | 970 |
| Hyperprolactinaemia | 172 | 83 | 197 | 83 | 360 | 860 | 404 |
| QT prolongation | 441 | 129 | 493 | 129 | 477 | 1,461 | 832 |
| Stable disease | 1,508 | 612 | 341 | 1,089 | 4,949 | 10,826 | 2,497 |
| Relapse | 13,707 | 3,960 | 1,746 | 13,352 | 9,866 | 16,687 | 10,605 |
| Treatment switching | 330 | 97 | 370 | 97 | 358 | 1,096 | 624 |

CVD: Cardiovascular disease. Includes country-specific proportions of stroke and myocardial infarction.

**Figure 1:** Model schematic.

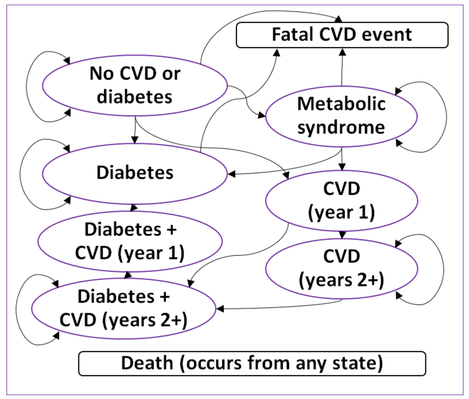
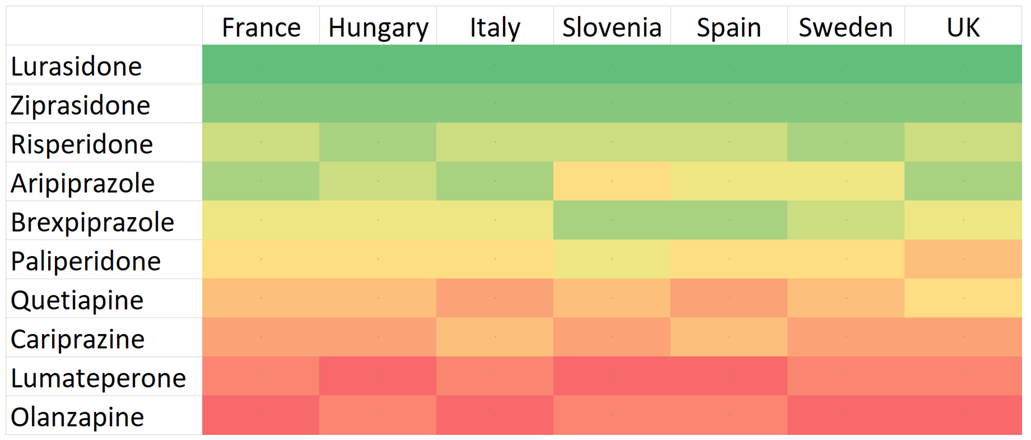



**Figure 2:** Heat map of total costs: green = lowest, red = highest.




## Results

An overview of total costs by drug and country is provided in Figure 2 for the acute population as a heat map. Green and red colours indicate lower and higher total costs, respectively. Results were similar for the stable population.

For the acute population, the lowest lifetime costs were observed for lurasidone for all seven countries. The second lowest costs were for ziprasidone. The main drivers of cost differences were diabetes and cardiovascular diseases, which were lowest for lurasidone, followed by ziprasidone then lumateperone. Costs for managing weight gain were lowest for ziprasidone and lurasidone. The contribution of diabetes and cardiovascular diseases to total costs varied from less than 40% in Slovenia and Sweden to over 70% in Hungary and Italy.

Olanzapine and lumateperone had the highest total cost for all seven countries. For lumateperone, the main cost driver was the drug cost which contributed to between 21% and 46% of total costs. For the other antipsychotics, drug costs varied from 1% of the total cost (olanzapine in France and Spain) to 10% (lurasidone in Hungary).

## Discussion

Lurasidone was associated with the lowest total lifetime costs in the acute population in seven European countries compared to nine antipsychotics. This was primarily due to the avoidance of diabetes and cardiovascular events, although costs of weight gain were also lowest for these two drugs. The rankings of the remaining antipsychotics varied by country, emphasising the importance of considering country-specific costs. Future research could investigate the costs of relapse management, including differences in the costs and proportions of hospitalizations.

## References


1. **Huhn M** *et al* (2019) DOI: 10.1016/S0140-6736(19)31135-3
2. **Pillinger T** *et al* (2020) DOI: 10.1016/S2215-0366(19)30416-X
3. **Zhao YJ** *et al* (2016) DOI: 0.1192/bjpo.bp.115.002576
4. **Zhang Y** *et al* (2017) DOI: 10.1186/s12888-017-1539-0


## Funding and disclosure


Funding for this work was provided by Angelini.

The authors report no conflicts of interest in this work.



**Contact us:** b.kearns@sheffield.ac.uk https://t.co/NwJ9mRtczH @benjaminkearns2 @scharrheds www.scharrheds.blogspot.co.uk www.sheffield.ac.uk/heds www.facebook.com/scharrsheffield

**Table 1:** Country-specific annual per patient costs (US $2018).

| | France | Hungary | Italy | Slovenia | Spain | Sweden | UK |
|---|---|---|---|---|---|---|---|
| Weight gain | 624 | 47 | 229 | 229 | 229 | 463 | 208 |
| Diabetes | 6,677 | 5,046 | 3,478 | 1,242 | 2,062 | 3,417 | 6,553 |
| Fatal CVD event | 8,142 | 4,137 | 5,178 | 4,137 | 10,575 | 8,175 | 5,158 |
| CVD event Year 1 | 23,572 | 3,006 | 7,310 | 11,685 | 13,557 | 6,325 | 4,093 |
| CVD event Years 2+ | 3,272 | 1,170 | 6,405 | 496 | 11,060 | 2,207 | 1,702 |
| Metabolic syndrome | 970 | 970 | 970 | 970 | 970 | 970 | 970 |
| Hyperprolactinaemia | 172 | 83 | 197 | 83 | 360 | 860 | 404 |
| QT prolongation | 441 | 129 | 493 | 129 | 477 | 1,461 | 832 |
| Stable disease | 1,508 | 612 | 341 | 1,089 | 4,949 | 10,826 | 2,497 |
| Relapse | 13,707 | 3,960 | 1,746 | 13,352 | 9,866 | 16,687 | 10,605 |
| Treatment switching | 330 | 97 | 370 | 97 | 358 | 1,096 | 624 |

CVD: Cardiovascular disease. Includes country-specific proportions of stroke and myocardial infarction.

**Figure 1:** Model schematic

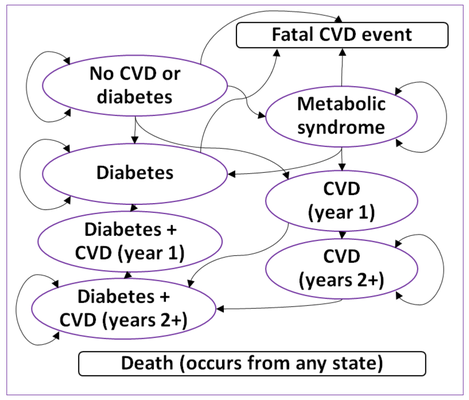



**Figure 2:** Heat map of total costs: green = lowest, red = highest.