

Economic Burden of Schizophrenia: An umbrella review of direct and indirect costs

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INTRODUCTION

Schizophrenia is a chronic mental health disorder that poses significant economic challenges worldwide. It is characterized by symptoms such as hallucinations, delusions, disorganized thinking and speech^{1,2,3}. The disorder incurs both **direct costs, such as healthcare expenses,** and **indirect costs, including productivity losses and caregiver burden**⁴. The existing literature on its economic impact is fragmented and varies in methodology, making it difficult to understand the full extent of the burden.

OBJECTIVES

To **synthesize evidence from existing systematic reviews and meta-analyses on the direct and indirect costs** associated with schizophrenia. Provide a comprehensive overview of these costs, identify trends and patterns in the data, and highlight areas where further research is needed.

METHODS

- Performed a **systematic literature search in MEDLINE, EMBASE, Cochrane Library, and APA PsycINFO** up to December 2023.
- Used **keywords and MeSH terms** related to “schizophrenia”, “economic burden”, “direct costs” and “indirect costs”.
- Included **systematic reviews and meta-analyses** and extracted data on direct and indirect costs.
- **Inflation was accounted for** using local Consumer Price Index data from the International Monetary Fund (PCPI_IX), and Harmonised price index data from Eurostat (HICP_annual) where the currency used in the included reviews was the Euro^{5,6}.
- **Costs were converted to 2010 US dollars** using market exchange rate data from the International Monetary Fund (ENDA_XDC_USD_RATE)⁷.
- A **data cleaning process** was undertaken to ensure the accuracy and consistency of the dataset. When data was reported for a different period than one year, it was converted by the authors to per-year figures.
- With regards to the difficulty of aggregating data from different reviews, we chose to present the **median** to illustrate central values, and **box plots** to illustrate distributions.

RESULTS

- After deduplication **1,007 abstracts** were screened. **180 full-texts** were assessed for eligibility, to produce **16 included articles**.
- The **mean number of primary studies in the reviews** were 41 (SD ±28, range 5–143).
- 11 reviews collected data **globally**, 3 reviews focused on **Europe** and 2 reviews focused only on the **United States**.
- The **median overall indirect costs were \$12,039 PPPY**. The US had the highest median indirect costs at \$25,232 PPPY and Thailand lowest median indirect costs at \$104 PPPY.
- **Caregiver burden** had a median of \$6,680 PPPY, while the **loss of productivity** had a median of \$6,490 PPPY.
- The **median overall direct costs were \$11,721 PPPY**. Norway had the highest median direct costs at \$55,780 PPPY, while Nigeria had the lowest at \$295 PPPY.
- **Hospitalization cost** had a median of \$2,036 PPPY (range: \$62–\$29,922 PPPY in the US); **drug costs** had a median of \$3,741 PPPY (range: \$151 PPPY in Nigeria to \$15,847 PPPY in the U.S.); **outpatient costs** had a median of \$926 PPPY (range: \$23 PPPY in Nigeria to \$9,047 PPPY in Taiwan); and **residential facility costs** had a median of \$1,592 PPPY (range: \$62 PPPY in Malaysia to \$19,470 PPPY in Italy).

DISCUSSION

- The fact **that indirect costs exceed direct costs** highlights the profound societal impact of schizophrenia.
- Notable gaps remain, particularly a **lack of data on costs related to self-harm, harm to others, permanent disability, and homelessness**.
- Data from **low- and middle-income countries are underrepresented** in the current body of research.
- The **wide variation of costs across countries** suggests systemic differences in healthcare systems, economic conditions, availability of services, and social support mechanisms.
- The **use of different currency conversion methods**, such as purchasing power parity rather than market exchange rates, can significantly affect cost comparisons, emphasizing the need for standardized approaches.

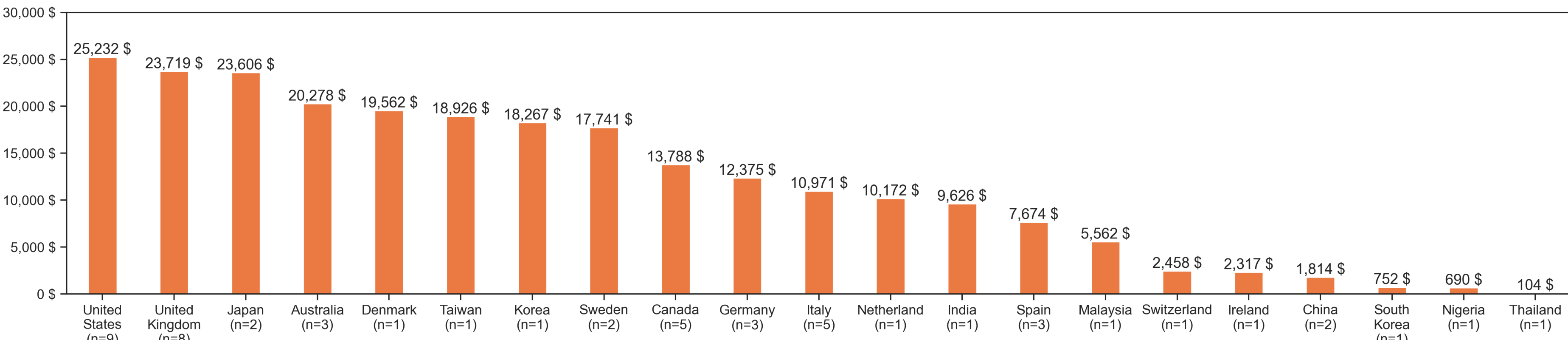


Figure 1. Country specific breakdown of overall indirect costs. Where multiple data was recorded, the median number is presented for the country.

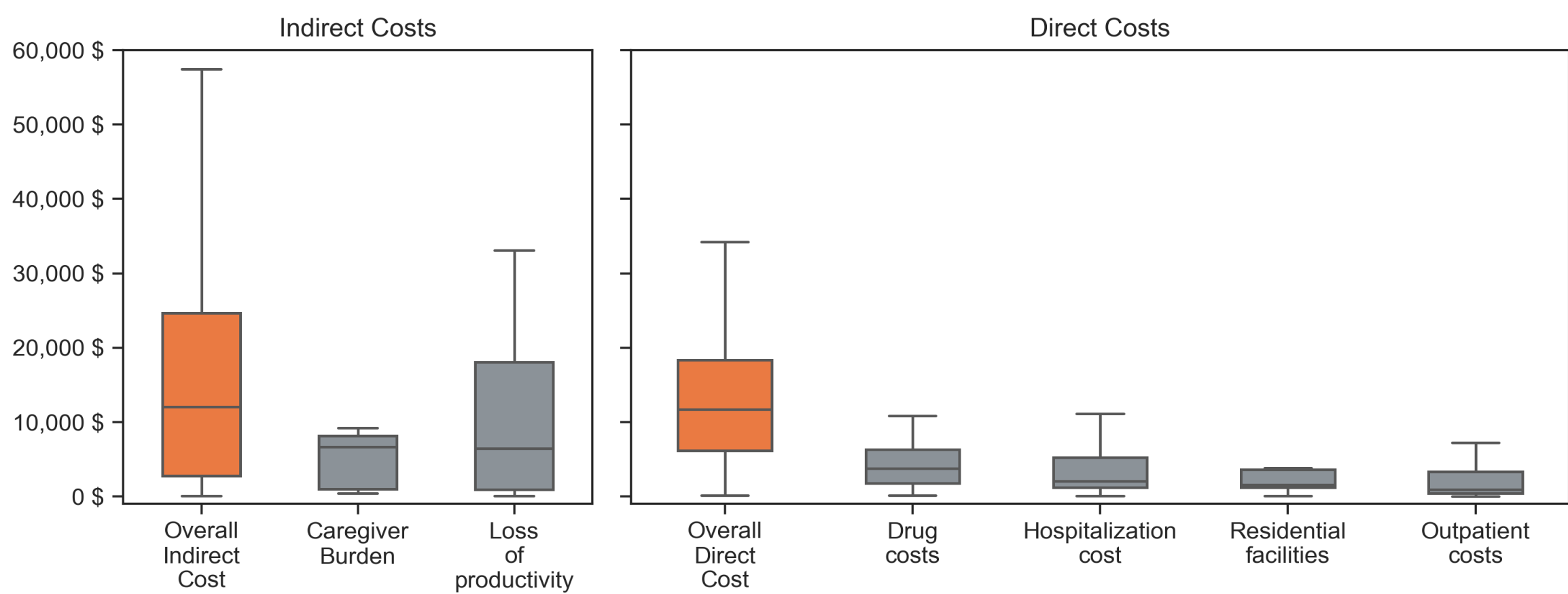


Figure 2. A box plot of indirect costs (left-side) versus direct costs (right-side) and their drivers.

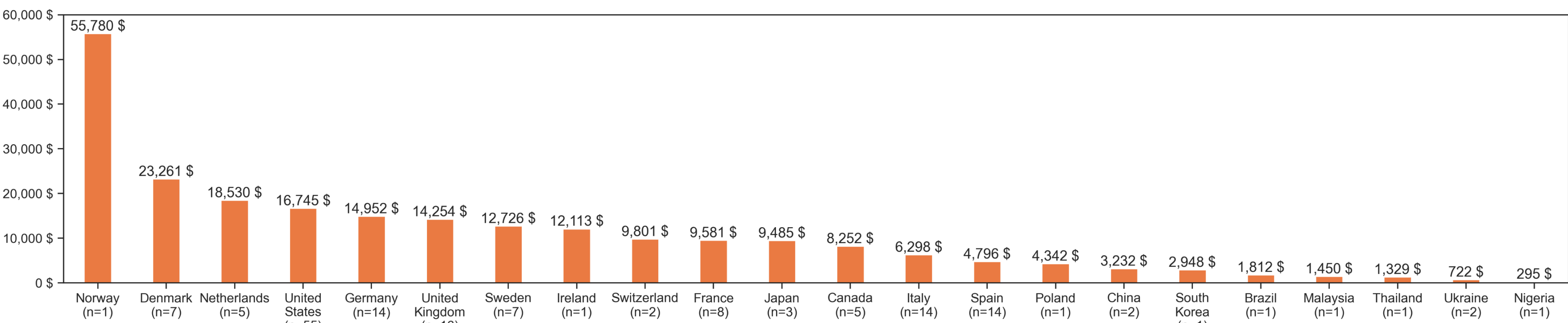


Figure 3. Country specific breakdown of overall direct costs. Where multiple data was recorded, the median number is presented for the country.

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Abbreviations: PPPY: per patient per year; US: United States; SD: Standard deviation

CONCLUSION

- Schizophrenia imposes a substantial economic burden on society, with indirect costs exceeding direct costs.
- Productivity losses and caregiver burden are significant contributors to total costs.
- Significant cost variations across countries highlight the need for tailored, context-specific strategies.
- Further research is essential to fill existing gaps and inform effective policy decisions to alleviate the burden on individuals, families, and society.

