

Consumption and expenditure of WHO essential medicine for cancer: drug utilisation analysis of 40 countries and regions between 2012 to 2022*

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Introduction

This drug utilisation study aimed to evaluate international patterns in the consumption and expenditure of cancer medicines listed by the **WHO Model List of Essential Medicines**.

Methods

- Data source: For each year from 2012 to 2022, we adopted the MIDAS database, which captures monthly sales volume by IQVIA global auditing.
- Annual consumption: **standard units (SU)** sold per 1,000 capita of 65 WHO essential cancer medicines
- Changes in consumption and expenditure: **average annual growth rate (AAGR)**.
- Association between consumption, national/regional income levels, disability-adjusted life-years (DALYs), regional Gini index, and the universal health coverage (UHC) index: **Panel regression**.
- The constitutes of medicines regarding **documented overall survival (OS) benefits** at least four months in WHO technical report series(TRS) were examined.
- The **Lorenz curve** and **concentration index (CIX)** were adopted for visualising and quantifying consumption differences.

Conclusions

- Middle-income economies have **increased consumption** of EML cancer drugs under **controlled expenditure** with **decreased unit price** over the past decade.
- Global inequalities in the accessibility of these drugs have generally improved.
- Middle-income economies prioritise medicines with **documented overall survival benefits**.
- National and regional consumption of essential cancer drugs is positively correlated with **improved UHC services**.

Results

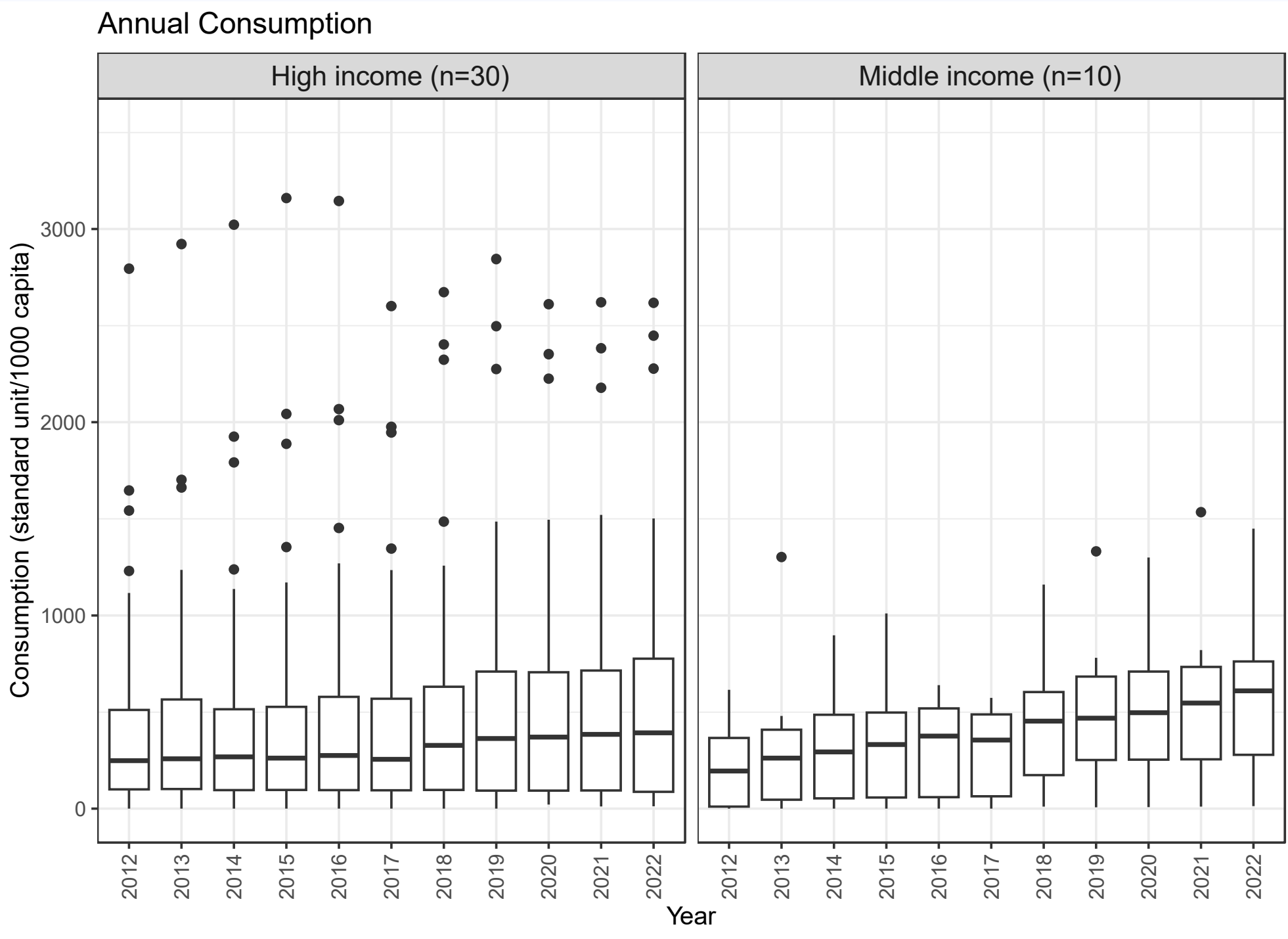


Figure 1. Annual consumption of EML medicines, by country income level

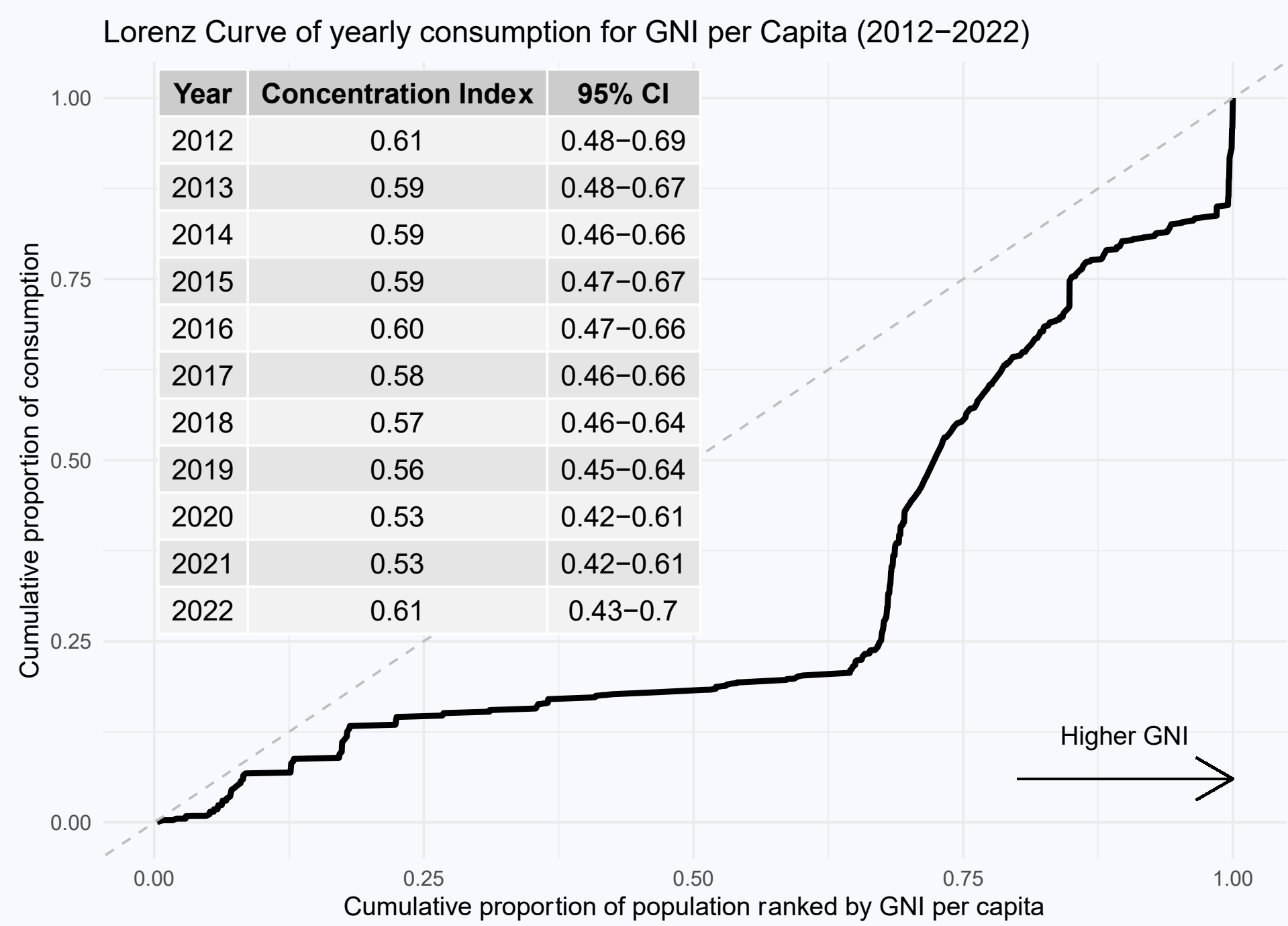


Figure 2. Lorenz Curve of yearly consumption for GNI per Capita

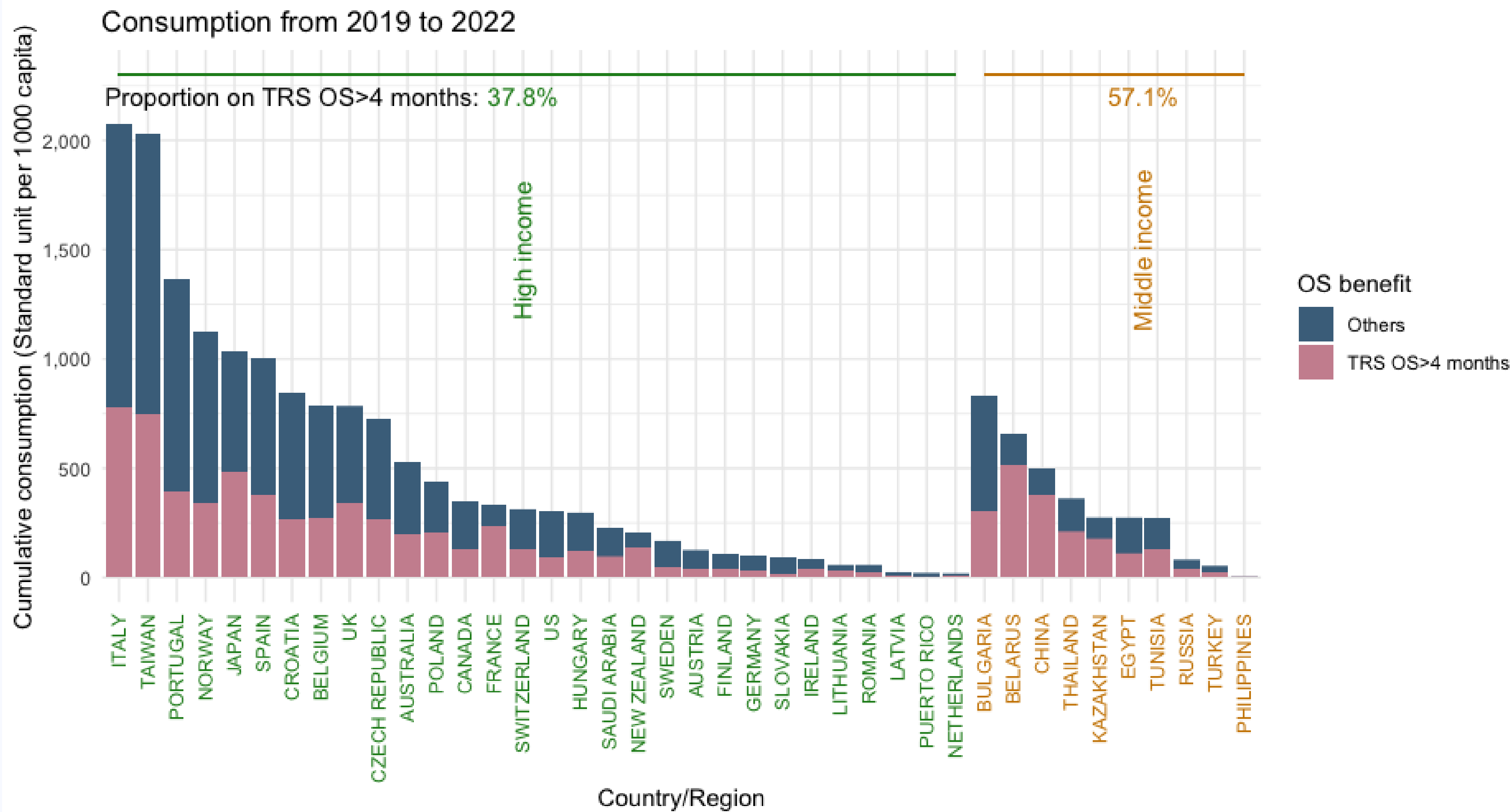


Figure 3. Consumption of WHO EML-listed cancer drugs with or without documented overall survival benefit

Variable	Crude effect				Adjusted effect			
	Estimate	CI Lower	CI Upper	P-value	Estimate	CI Lower	CI Upper	P-value
GNI per capita (1,000 usd)	2.89	-1.54	7.32	0.20	2.20	-2.07	6.47	0.31
DALY (per 1000 capita)	11.51	1.29	21.73	0.03	4.76	-5.26	14.78	0.35
Gini index	-19.71	-33.41	-6.00	0.01	-8.45	-22.39	5.48	0.24
UHC coverage index	12.70	8.27	17.12	<0.0001	11.35	6.59	16.10	<0.0001

GNI-Gross national income (USD per capita); DALY- disability-adjusted life years (per 1000 capita); CI-Confidence interval

Panel regression of consumption of WHO EML-listed cancer drugs

- At the end of the study period (2022), the median consumption per 1 000 capita achieved a similar level between high- and middle-income economies, with the difference being statistically insignificant.
- The consumption of EML cancer medicines is significantly associated with the service coverage of UHC in both crude and adjusted effect. Neither DALY nor the Gini index remained significant in the multi-variable panel regression.
- Middle-income economies have a higher composition of consumption on EML target therapies with documented overall survival benefits longer than four months in the WHO TRS

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