

Business & Marketing Data Driven Analysis

Analyze the relationship between per capita healthcare expenditure and life expectancy in different regions of the world.

Group Venus

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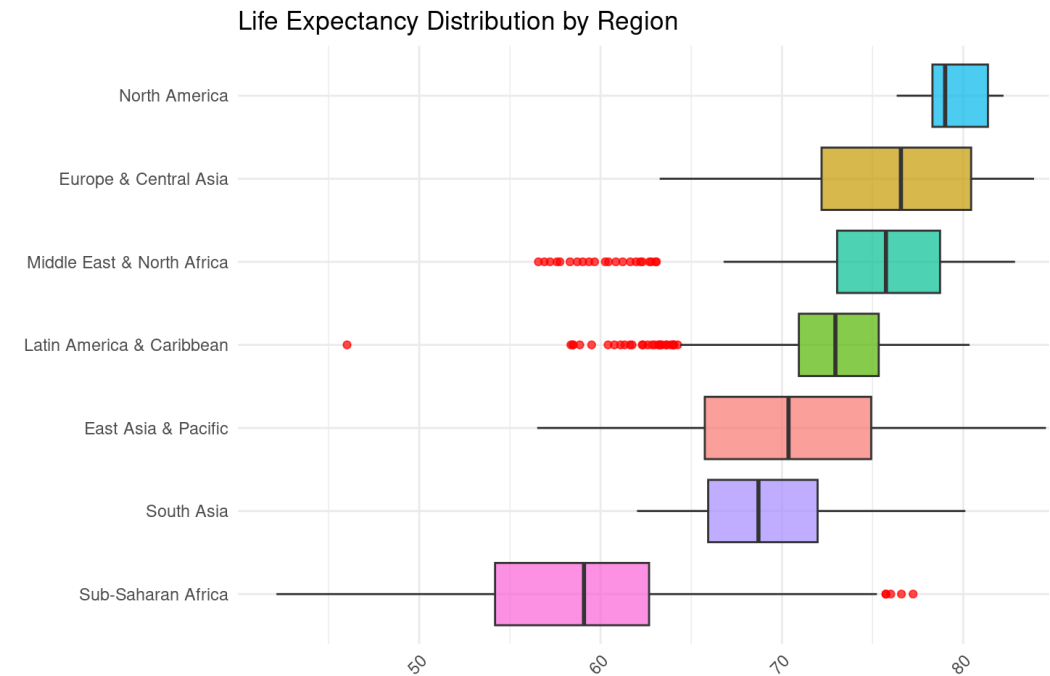
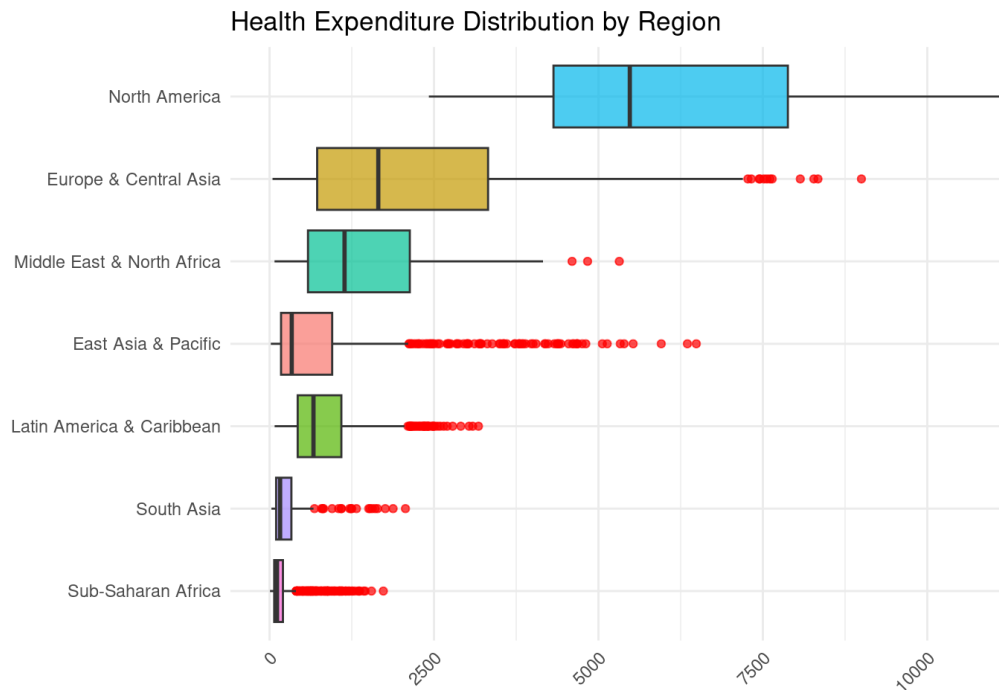
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Health Expenditure and Life Expectancy vary significantly across countries and regions of the world.

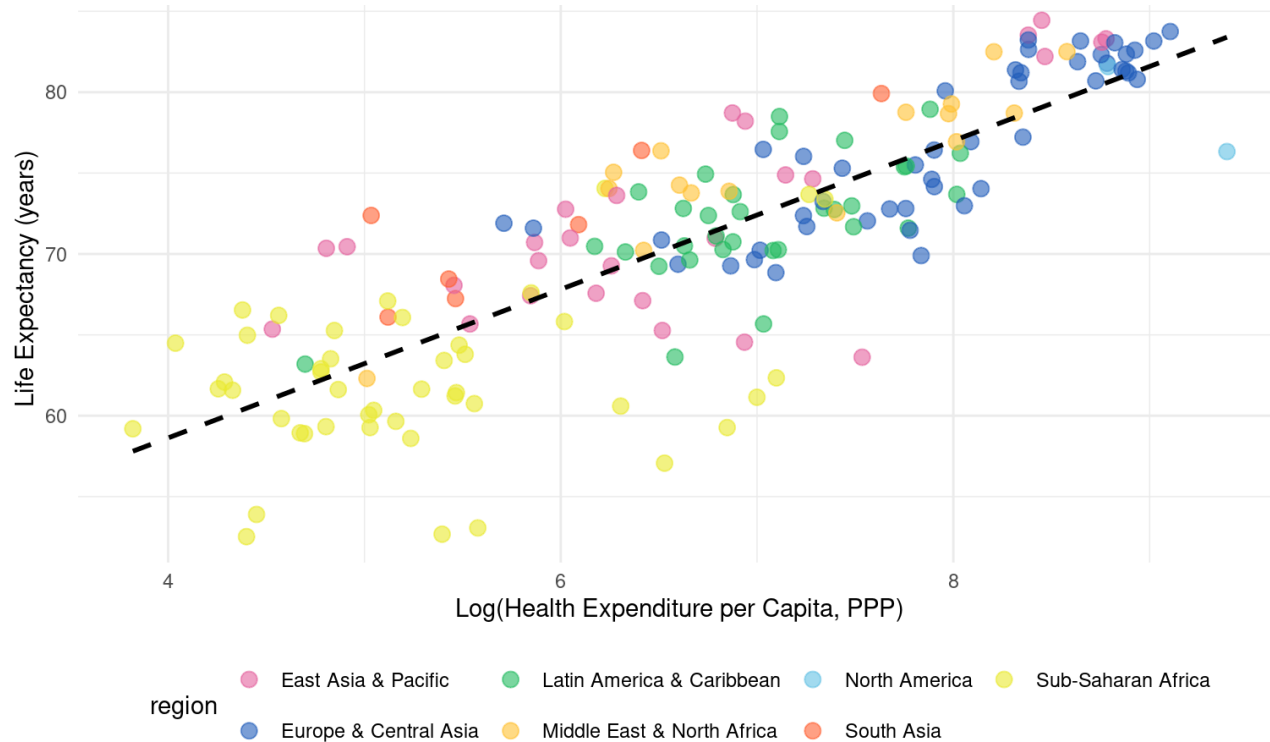


What is the impact of health expenditure on life expectancy?

To answer this question we have used World Bank Data 2000-2021:

- Health Expenditure per capita, PPP: <https://data.worldbank.org/indicator/SH.XPD.CHEX.PP.CD>
- Life Expectancy at birth, years: <https://data.worldbank.org/indicator/SP.DYN.LE00.IN>

An increase in Healthcare Expenditure results in improved population health.



- The correlation between life expectancy and health care exists;
- The impact is different across regions and may be influenced by unobserved country characteristics;
- Countries can be grouped by regions.

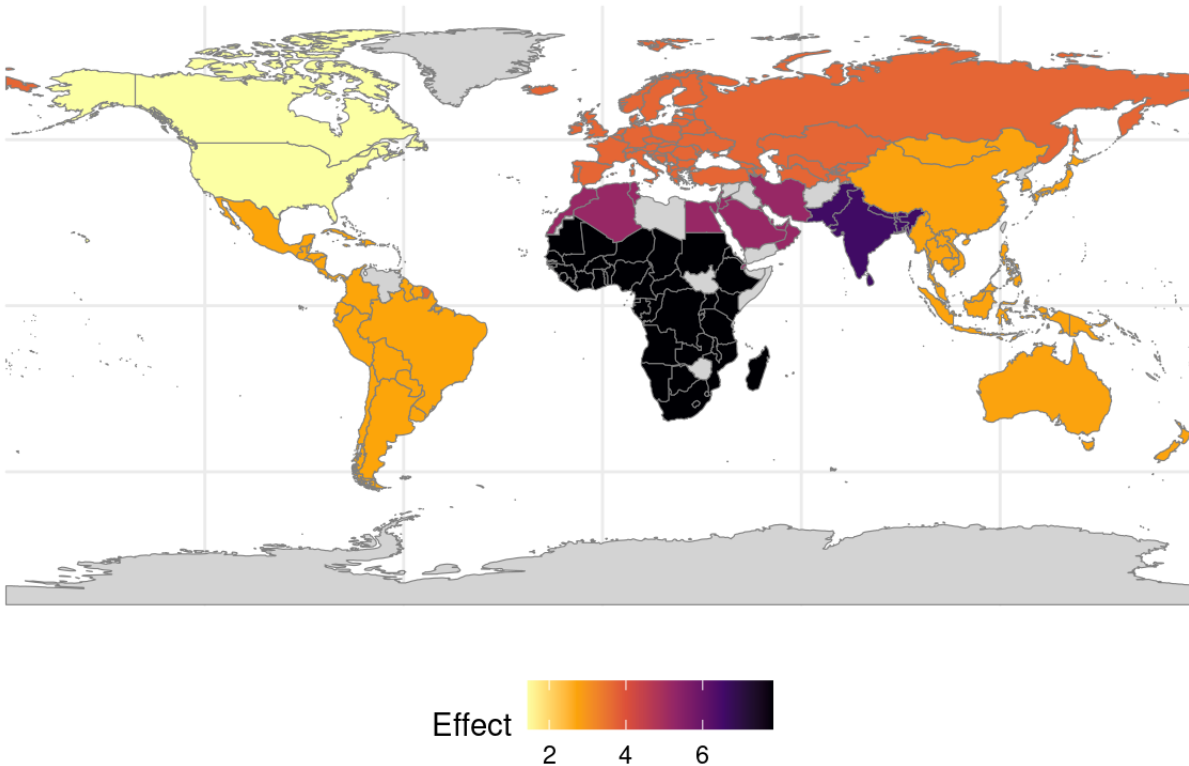
World Bank Data 2000-2021: SP.DYN.LE00.IN, SH.XPD.CHEX.PP.CD

The Fixed Effects Model can be used to identify marginal effect of Healthcare Expenditure on Life Expectancy.

- Fixed effects regression is a method for controlling for omitted variables in panel data when the omitted variables vary across entities but do not change over time (climate, culture and other static characteristics of the country);
- Two specifications were considered: one for the total effect and one with interactions by region;
- The fitted model captures the contemporaneous association between health expenditure and life expectancy;

The marginal effect of Health Expenditure on Life Expectancy varies across different regions of the world.

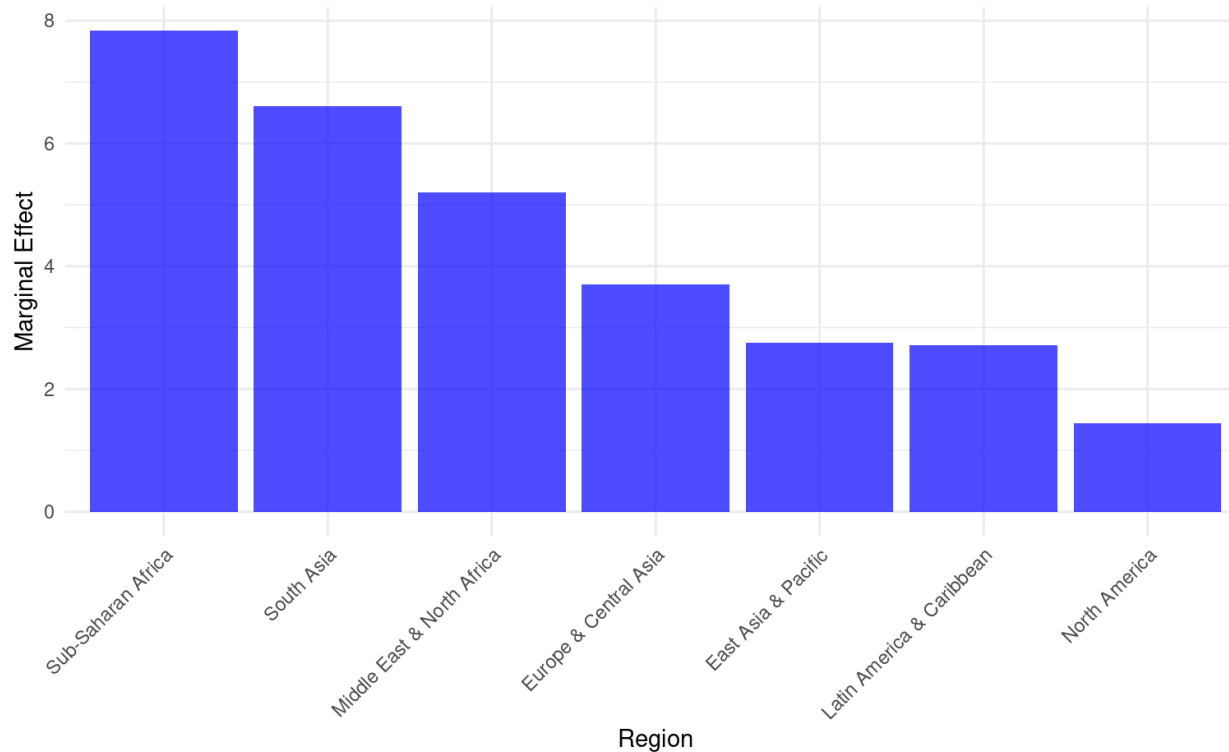
Effective coefficients by region (from FE model with interaction)



- Doubling per capita health expenditure is associated with an average **increase of 3.8** years in life expectancy;
- This marginal effect varies significantly across world regions, reflecting differences in baseline health systems, institutional quality, public sector efficiency, and population demographics.

Fixed Effects Panel Data model based on World Bank Data 2000-2021:
SP.DYN.LE00.IN, SH.XPD.CHEX.PP.CD

The most responsive region is Sub-Saharan Africa, while the least responsive is North America.



Fixed Effects Panel Data model based on World Bank Data 2000-2021:
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- **Sub-Saharan Africa** and **South Asia** exhibit strong marginal returns: doubling health expenditure in yields an **increase of over 6-7 years** in life expectancy;
- **Middle East & North Africa**: The region sees strong health returns from additional spending. A doubling of expenditure here adds more than four years to life expectancy;
- **Europe & Central Asia** shows a moderate responsiveness to increased spending. Additional investments produce here meaningful, though not large gains;
- **East Asia & Pacific** exhibits one of the lowest marginal returns. But this result the aggregate hides contrasts between countries like Japan and poorer Southeast Asian nations;
- **Latin America & Caribbean** also show low effect. Substantial funds **fail** to translate into proportionate health improvements.
- **North America**: additional investment often **does not result in life expectance increase**, the marginal effect in this region is the smallest. The policy priority should be improving value for money through better regulation and system integration.

The analysis confirms that Healthcare Expenditure positively influences Life Expectancy, but the impact varies significantly by region.

- High-income countries experience lower returns, while lower-income regions see strong benefits from increased investment.
- For effective decision-making, healthcare strategies and applied policies should be region-specific.
- Some regions invest heavily in healthcare but see minimal returns, suggesting potential systemic issues. These challenges could be addressed through improved management strategies and optimized investment approaches.