

Relationship between Health Expenditure and Tourism at the Macroeconomic Level

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This paper examines the potential relationship between health expenditure and tourism at the macroeconomic level to identify the need for further research. By analysing data over a time horizon from 2000 to 2019, focusing on four Central European countries (Slovenia, Croatia, Hungary and the Czech Republic), some significant correlations between health expenditure and tourism indicators at the country level are identified. The results indicate different correlations between health expenditure and tourism indicators, mostly positive, strong and moderate. This article therefore proposes further research that extends to longitudinal panel analysis using advanced econometric techniques to determine the nature of the relationship between health expenditure and tourism at the macroeconomic level.

Keywords: health expenditure, tourism, health, correlation



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Background

Health crises have a significant impact on international tourism (Xiong & Tang, 2023) and various studies have examined the impact of specific diseases on tourism (e.g. Haque & Haque, 2018; Novelli et al., 2018). The COVID-19 pandemic, in particular, has increased interest in researching the relationship between tourism and health, leading to a large number of studies looking at the impact of COVID-19 and health measures on tourism and highlighting the crucial importance of health status in the tourism sector. For example, Gössling et al. (2020) and Sabiote-Ortiz et al. (2024) examined the impact of the COVID-19 outbreak on the tourism industry. In addition to specific diseases and

pandemics, there are many other areas where studies on tourism and health overlap, such as healthy aging and tourism (Hu et al., 2023), the effects of tourism on physical health (Godovykh & Ridderstaat, 2020) and wellbeing (Godovykh et al., 2023). Nevertheless, the broader relationship between health and tourism from a macroeconomic perspective is still largely unexplored.

Global health spending reached 10% of global GDP in 2018, of which 59% came from domestic public sources and 41% from private health spending, but it remains unequal across countries, 75% of the spending being in the Americas and Europe (World

Health Organization, 2020). This can have an impact on the tourism sector, as countries with higher health expenditure often have better healthcare, which can influence tourism flows. Indeed, health expenditure is important for the evaluation of health care or health outcomes (Lichtenberg, 2004; Nixon & Ulmann, 2006; Wubulhasimu et al., 2016; Rahman et al., 2018). Following the OECD (2023), health status depends on the healthcare system, its accessibility, quality, healthcare expenditure and financing, health workforce, the pharmaceutical sector, aging and long-term care; health status is also influenced by risk factors for health (such as obesity and smoking) and factors that influence the healthcare system, such as the demographic, economic and social context.

There are a few studies that have examined the impact of health on tourism at the macroeconomic level. Indeed, health factors influence tourism flows (Prideaux, 2005). Konstantakopoulou (2022) examined the impact of health quality on international tourism receipts in 44 developing countries and 39 developed countries in the period 2000–2016 using the World Bank World Development Indicators. The impact of the growth of health services in the case of Turkey on inbound health tourism is also confirmed (Uçak, 2016). For the Iranian economy, a short- and long-term relationship between health care and international tourism was investigated in the period from 1971 to 2016 (Feshari & Hosseinzadeh, 2018). ‘Health and hygiene’ is one of the pillars that measure a country’s tourism competitiveness in the Travel and Tourism Competitiveness Index (World Economic Forum, 2024). Moreover, health has a positive and significant impact on outbound tourism expenditure (Olya & Mehran, 2017). As noted by Kim et al. (2003), health is also recognized as a push motivational factor in tourism.

On the other hand, there are some studies that examine the impact of tourism on health expenditure or life expectancy from the macroeconomic perspective. For example, using time series data from 1995 to 2015, Qureshi et al. (2017) analysed the impact of international tourism receipts, tourist arrivals, tourism expenditures and tourist departures on the health expenditure of 80 international destinations

in 37 countries. At the country level, tourism (measured by the number of international arrivals) leads to CO₂ emissions, which in turn leads to high health expenditure in Mexico; there is a significant positive relationship between tourism, CO₂ emissions and health expenditure in both the short and long term (Fan et al., 2022). In addition, Godovykh and Ridderstaat (2020) found an effect of international tourist arrivals in Spain on the health of residents (measured as life expectancy at birth), which is negative in the short term but positive in the long term.

Thus, both directions of causality between tourism and health have been explored. Hu et al. (2022) examined the relationship between international tourism expenditure, international tourism receipts, international tourist arrivals, international tourism exports and tourism as a percentage of exports with the number of total COVID-19 cases, cases per million people, average rate of increase, and daily growth of COVID-19 cases in 178 countries and territories. The relationship between health and tourism has also been studied on a sample of Chinese respondents (Wen et al., 2022) but broader macroeconomic studies are still scarce. Such findings are central to understanding the relationship between tourism and healthcare at country level, and also the linkages between both sectors in the long term.

The bidirectional causality relationship between health expenditure (total, private and public) and per capita income in BRICS countries and Turkey is examined by Canbay and Kırca (2022). This raises the question of the interaction between health and tourism, as the latter is an important part of the economy. As there is little research that demonstrates the link between health expenditure and tourism at the macroeconomic level, this article examines whether tourism and health expenditure are linked at a country level. The hypothesis of the present study suggests that there is a positive correlation between health expenditure and tourism indicators at the macroeconomic level. For this reason, the correlations between tourism and health expenditure indicators are examined over a longer period of time to shed light on these relationships and thus decide whether further research steps are necessary.

Methodology

This study employs a quantitative research design and uses secondary data sources to examine the relationship between health-related and tourism indicators. Following previous research, there are a variety of indicators that can be used to measure healthcare at the country level, such as life expectancy, health expenditure, or other measures. Jagrič et al. (2023) underline the complexity of measuring the quality of healthcare services. In this study, we focus on health expenditure indicators. Tourism is measured using various indicators at the macro level, with tourism expenditure being a more accurate variable for macroeconomic environment than those using physical tourism measures.

Four Central European countries (Slovenia, Croatia, Hungary and the Czech Republic) are selected for the analysis to ensure a more homogeneous sample in terms of cultural background and EU membership, so that the results are more reliable and applicable in the specific context of European socio-economic studies. Countries that are geographically close often have similar healthcare systems (Jagrič et al., 2023).

A time series analysis is performed to assess the correlation across the selected Central European countries in the period 2000–2019, using annual data. The data from 2020 to 2022 are not included as COVID-19 events would distort the results. Secondary data from the World Bank Group (n.d.) was retrieved separately for the four countries, including variables on health expenditure and tourism:

- health expenditure is measured with number of community health workers per 1,000 people, current health expenditure (% of GDP), current health expenditure per capita (current USD), domestic general government health expenditure (% of GDP), domestic general government health expenditure per capita (current USD), domestic private health expenditures (% of current health expenditure), domestic private health expenditures per capita (current USD);
- tourism is measured with international tourism expenditures (% of total imports), international tourism expenditures (current USD), international tourism expenditures for travel items (current

USD), number of international arrivals, number of international departures, international tourism receipts (% of total exports), international tourism receipts (current USD), international tourism receipts for travel items (current USD).

Descriptive statistics are calculated for each variable to summarize its central tendency and dispersion. The bivariate Spearman correlation coefficients are calculated to measure the strength and direction of the relationship between the pairs of tourism variables on the one hand and the health-related variables on the other. The collected data are analysed using SPSS 29.0.

Results and Findings

No data was available for the indicator 'number of community health workers per 1,000 people' for the selected countries so this indicator is excluded from analysis. In addition, complete data for the entire 20-year period (2000–2019) is not available for some indicators. In these cases, a shorter period was taken into account depending on data availability.

Descriptive statistics of health-related variables and tourism indicators for each selected country, including mean value, standard deviation, and minimum and maximum value, are presented in Table 1 and Table 2. Table 1 shows that the mean value of current healthcare expenditure as a percentage of GDP ranges from 6.9% in the Czech Republic to 8.2% in Slovenia, which means that healthcare expenditure in the period between 2000 and 2019 is not very different between countries. The mean value of domestic general government health expenditure as a percentage of GDP is also similar, ranging from 4.9% in Hungary to 5.9% in Slovenia, with a difference of 1 percentage point. These indicators are important for understanding the extent to which a country invests in its healthcare system and thus in the quality and accessibility of healthcare services. In addition, three indicators showing health expenditure per capita (current expenditure, domestic government expenditure and domestic private expenditure) show the highest mean values in Slovenia. The percentage share of domestic private health expenditure in current

Table 1 Descriptive Statistics for Health-Related Indicators

Country	Item	Mean	Min	Max	SD*
Slovenia	Current health expenditure (% of GDP)	8.22	7.51	8.74	0.36
	Current health expenditure per capita (current USD)	1720.65	797.00	2219.00	470.35
	Domestic general government health expenditure (% of GDP)	5.89	5.28	6.20	0.26
	Domestic general government health expenditure per capita (current USD)	1233.35	569.00	1606.00	338.46
	Domestic private health expenditures (% of current health expenditure)	28.33	27.57	29.76	0.76
	Domestic private health expenditures per capita (current USD)	487.35	228.00	613.00	132.97
Croatia	Current health expenditure (% of GDP)	7.03	6.14	8.08	0.58
	Current health expenditure per capita (current USD)	850.75	371.00	1259.00	273.25
	Domestic general government health expenditure (% of GDP)	5.84	4.85	6.69	0.54
	Domestic general government health expenditure per capita (current USD)	707.45	305.00	1055.00	230.00
	Domestic private health expenditures (% of current health expenditure)	17.00	13.57	20.99	1.80
	Domestic private health expenditures per capita (current USD)	143.30	56.00	204.00	45.48
Hungary	Current health expenditure (% of GDP)	7.20	6.28	8.12	0.47
	Current health expenditure per capita (current USD)	869.35	313.00	1117.00	233.73
	Domestic general government health expenditure (% of GDP)	4.90	4.29	5.68	0.37
	Domestic general government health expenditure per capita (current USD)	590.70	216.00	757.00	156.37
	Domestic private health expenditures (% of current health expenditure)	31.96	29.65	35.16	1.48
	Domestic private health expenditures per capita (current USD)	278.80	98.00	360.00	78.80
Czech Republic	Current health expenditure (% of GDP)	6.89	5.70	7.62	0.71
	Current health expenditure per capita (current USD)	1195.51	342.92	1803.05	467.25
	Domestic general government health expenditure (% of GDP)	5.85	5.01	8.44	0.54
	Domestic general government health expenditure per capita (current USD)	1009.08	304.19	1526.63	385.13
	Domestic private health expenditures (% of current health expenditure)	15.01	11.30	19.00	1.94
	Domestic private health expenditures per capita (current USD)	186.43	38.74	276.42	83.40

Note * Standard deviation

healthcare expenditure is 15% and 17% in the Czech Republic and Croatia, respectively, and around 30% in Slovenia and Hungary. This could be influenced by the differences in the healthcare systems of the individual countries.

Table 2 contains indicators measuring both international tourism expenditure (total and on travel items) and international tourism receipts (total and on travel), which is in line with the study's aim of identifying correlations. All four countries have more international tourism receipts (total and for travel items) than international expenditure abroad (total and for travel items), which shows that they earn more from tourism than they spend abroad for tourism purposes. Similarly, each of the four countries had more arrivals from international tourism than departures on average between 2000 and 2019. Croatia has the lowest international tourism expenditures

and the highest international tourism receipts of the four countries. In terms of international tourism receipts as a percentage of exports, Croatia is also at the top of the four selected countries with an average of 40.56%, which shows its high dependence on tourism. The international tourism expenditure as a percentage of imports, on the other hand, is very similar between the countries, with mean values between 3.41 (for Hungary) and 4.77 (for Slovenia).

Tables 3–6 show the correlation coefficients between selected tourism indicators on the one hand and selected health expenditure indicators on the other. The statistical significance is determined at a probability level of 0.05 for rejecting the null hypothesis. Table 3 shows the Spearman rank correlations between selected tourism and health-related indicators for Slovenia. International tourism expenditure in monetary units shows statistically significant and strong or

Table 2 Descriptive Statistics for Tourism Indicators

Country	Item	Mean	Min	Max	SD*
Slovenia	International tourism expenditures (% of total imports)	4.77	3.75	6.27	0.53
	International tourism expenditures (current billion USD)	1.29	0.51	1.86	0.45
	International tourism expenditures for travel items (current billion USD)	1.17	0.51	1.74	0.40
	International tourism arrivals (million)	2.25	0.88	4.70	1.01
	International tourism departures (million)	0.54	0.44	0.68	0.70
	International tourism receipts (% of total exports)	8.46	7.35	10.14	0.83
	International tourism receipts (current billion USD)	2.35	1.01	3.38	0.81
	International tourism receipts for travel items (current billion USD)	2.20	0.96	3.18	0.76
Croatia	International tourism expenditures (% of total imports)	4.74	3.28	8.26	1.48
	International tourism expenditures (current billion USD)	0.98	0.63	1.81	0.32
	International tourism expenditures for travel items (current billion USD)	0.94	0.57	1.76	0.32
	International tourism arrivals (million)	48.42	29.21	60.02	0.77
	International tourism departures (million)	4.18	2.58	5.53	1.10
	International tourism receipts (% of total exports)	40.56	31.96	52.13	4.41
	International tourism receipts (current billion USD)	8.13	2.60	11.97	2.81
	International tourism receipts for travel items (current billion USD)	7.90	2.49	11.75	2.76
Hungary	International tourism expenditures (% of total imports)	3.41	2.37	5.48	1.14
	International tourism expenditures (current billion USD)	2.68	1.59	3.85	0.56
	International tourism expenditures for travel items (current billion USD)	2.26	1.54	3.23	0.42
	International tourism arrivals (million)	41.49	28.8	61.40	9.31
	International tourism departures (million)	16.58	10.62	24.86	3.49
	International tourism receipts (% of total exports)	7.41	5.15	13.14	2.28
	International tourism receipts (current billion USD)	6.20	3.62	10.22	1.94
	International tourism receipts for travel items (current billion USD)	5.14	3.57	7.28	1.11
Czech Republic	International tourism expenditures (% of total imports)	3.50	2.94	4.63	0.45
	International tourism expenditures (current billion USD)	4.25	1.80	6.07	1.30
	International tourism expenditures for travel items (current billion USD)	3.73	1.28	5.97	1.59
	International tourism arrivals (million)	26.81	20.11	37.20	5.34
	International tourism departures (million)	7.00	5.27	9.67	1.36
	International tourism receipts (% of total exports)	5.85	4.27	9.08	1.47
	International tourism receipts (current billion USD)	7.13	3.38	9.23	1.62
	International tourism receipts for travel items (current billion USD)	5.89	2.96	8.21	1.83

Notes * Standard deviation, ** The number of arrivals from the World Bank Group (n.d.) for the 4 countries includes to-tourists and same-day visitors, with the exception of Slovenia, where the number of arrivals only refers to overnight visitors as shown in UNWTO (2022), where the categories are broken down.

moderate correlations with the health expenditure indicators, with the exception of domestic private health expenditure as a percentage of current health expenditure, which shows no statistically significant correlation. The inbound tourism indicators (international tourism receipts in monetary units and international tourism arrivals) show mostly statistically significant, strong or moderate correlations (with the exception

of domestic private health expenditure as a percentage of current health expenditure), underlining the importance of health indicators in attracting tourists to Slovenia. In contrast, the number of international departures shows no statistically significant correlations with health expenditure indicators (with one exception). In fact, we can conclude that the statistically significant correlations between tourism expen-

Table 3 Spearman's Rank Correlation Coefficients Between Tourism Indicators and Health Indicators for Slovenia

	(1)	(2)	(3)	(4)	(5)	(6)
International tourism expenditures (% of total imports)	0.385 (0.094) <i>n</i> = 20	- 0.244 (0.301) <i>n</i> = 20	0.361 (0.118) <i>n</i> = 20	- 0.211 (0.373) <i>n</i> = 20	- 0.192 (0.416) <i>n</i> = 20	-0.275 (0.240) <i>n</i> = 20
International tourism expenditures (current USD)	0.621* (0.003) <i>n</i> = 20	0.950* (< 0.001) <i>n</i> = 20	0.681* (< 0.001) <i>n</i> = 20	0.955* (< 0.001) <i>n</i> = 20	- 0.295 (0.205) <i>n</i> = 20	0.899* (< 0.001) <i>n</i> = 20
International tourism expenditures for travel items (current USD)	0.650* (0.002) <i>n</i> = 20	0.923* (< 0.001) <i>n</i> = 20	0.698* (< 0.001) <i>n</i> = 20	0.925* (< 0.001) <i>n</i> = 20	- 0.265 (0.259) <i>n</i> = 20	0.884* (< 0.001) <i>n</i> = 20
Number of international arrivals	0.581* (0.007) <i>n</i> = 20	0.758* (< 0.001) <i>n</i> = 20	0.611* (0.004) <i>n</i> = 20	0.756* (< 0.001) <i>n</i> = 20	-0.151 (0.498) <i>n</i> = 20	0.768* (< 0.001) <i>n</i> = 20
Number of international departures	-0.689* (0.004) <i>n</i> = 15	-0.139 (0.621) <i>n</i> = 15	-0.508 (0.053) <i>n</i> = 15	- 0.136 (0.630) <i>n</i> = 15	-0.314 (0.254) <i>n</i> = 15	-0.345 (0.208) <i>n</i> = 15
International tourism receipts (% of total exports)	0.000 (1.000) <i>n</i> = 20	-0.478* (0.033) <i>n</i> = 20	-0.045 (0.850) <i>n</i> = 20	-0.457* (0.043) <i>n</i> = 20	0.035 (0.885) <i>n</i> = 20	- 0.493* (0.027) <i>n</i> = 20
International tourism receipts (current USD)	-0.569* (0.009) <i>n</i> = 20	0.926* (< 0.001) <i>n</i> = 20	0.592* (0.006) <i>n</i> = 20	0.916* (< 0.001) <i>n</i> = 20	-0.194 (0.413) <i>n</i> = 20	0.921* (< 0.001) <i>n</i> = 20
International tourism receipts for travel items (current USD)	0.579* (0.008) <i>n</i> = 20	0.919* (< 0.001) <i>n</i> = 20	0.614* (0.004) <i>n</i> = 20	0.913* (< 0.001) <i>n</i> = 20	-0.209 (0.376) <i>n</i> = 20	0.912* (< 0.001) <i>n</i> = 20

Notes Column headings are as follows: (1) Current health expenditure (% of GDP), (2) Current health expenditure per capita (current USD), (3) Domestic general government health expenditure (% of GDP), (4) Domestic general government health expenditure per capita (current USD), (5) Domestic private health expenditures (% of current health expenditure), (6) Domestic private health expenditures per capita (current USD). Correlation is significant at the 0.05 level (2-tailed)

diture (in terms of outbound tourism) and tourism receipts and arrivals from international tourism (in terms of inbound tourism) on the one hand and all health-related indicators except one on the other are in general positive and strong or moderate, suggesting that outbound and inbound tourism go hand in hand with healthcare. The correlation between the share of tourism in total imports and the share of tourism in total exports on the one hand and healthcare expenditure on the other does not give a clear picture of their relationship as it is not statistically significant in most cases, while in some cases there are statistically significant but negative and moderate correlations. Due to some missing data in some cases, there are fewer than 20 cases for calculating the correlation.

The Spearman rank correlations between selected tourism and health expenditure indicators for Croatia are shown in Table 4. Health expenditure (total, government and private) per capita correlates statistically significantly, strongly or moderately with international tourism expenditure, international tourism receipts and international tourism arrivals. Similar to the case of Slovenia, the number of international departures is not significantly correlated with the health-related indicators. It would be worth investigating further why the health-related indicators are not statistically significantly correlated with the indicator showing the importance of tourism as an economic sector in Croatia (receipts from international tourism as a percentage of total exports). Current health expenditure as a

Table 4 Spearman's Rank Correlation Coefficients Between Tourism Indicators and Health Indicators for Croatia

	(1)	(2)	(3)	(4)	(5)	(6)
International tourism expenditures (% of total imports)	-0.141 (0.552) <i>n</i> = 20	- 0.422 (0.057) <i>n</i> = 20	-0.198 (0.399) <i>n</i> = 20	- 0.447* (0.048) <i>n</i> = 20	-0.508* (0.023) <i>n</i> = 20	-0.310 (0.183) <i>n</i> = 20
International tourism expenditures (current USD)	0.135 (0.571) <i>n</i> = 20	0.730* (< 0.001) <i>n</i> = 20	0.046 (0.849) <i>n</i> = 20	0.699* (< 0.001) <i>n</i> = 20	0.085 (0.722) <i>n</i> = 20	0.778* (< 0.001) <i>n</i> = 20
International tourism expenditures for travel items (current USD)	0.110 (0.645) <i>n</i> = 20	0.723* (<0.001) <i>n</i> = 20	0.029 (0.905) <i>n</i> = 20	0.690* (<0.001) <i>n</i> = 20	0.092 (0.700) <i>n</i> = 20	0.782* (<0.001) <i>n</i> = 20
Number of international arrivals	-0.020 (0.982) <i>n</i> = 20	0.592* (< 0.001) <i>n</i> = 20	-0.054 (0.821) <i>n</i> = 20	0.555* (0.011) <i>n</i> = 20	-0.126 (0.596) <i>n</i> = 20	0.660* (0.002) <i>n</i> = 20
Number of international departures	0.273 (0.417) <i>n</i> = 11	0.382 (0.247) <i>n</i> = 11	0.247 (0.465) <i>n</i> = 11	0.500 (0.117) <i>n</i> = 11	-0.077 (0.821) <i>n</i> = 11	0.202 (0.552) <i>n</i> = 11
International tourism receipts (% of total exports)	-0.058 (0.808) <i>n</i> = 20	-0.020 (0.935) <i>n</i> = 20	-0.029 (0.905) <i>n</i> = 20	-0.015 (0.950) <i>n</i> = 20	-0.041 (0.863) <i>n</i> = 20	- 0.178 (0.454) <i>n</i> = 20
International tourism receipts (current USD)	0.087 (0.715) <i>n</i> = 20	0.780* (< 0.001) <i>n</i> = 20	0.045 (0.850) <i>n</i> = 20	0.753* (< 0.001) <i>n</i> = 20	-0.158 (0.506) <i>n</i> = 20	0.791* (< 0.001) <i>n</i> = 20
International tourism receipts for travel items (current USD)	0.066 (0.782) <i>n</i> = 20	0.767* (< 0.001) <i>n</i> = 20	0.020 (0.935) <i>n</i> = 20	0.738* (< 0.001) <i>n</i> = 20	-0.132 (0.580) <i>n</i> = 20	0.797* (< 0.001) <i>n</i> = 20

Notes Column headings are as follows: (1) Current health expenditure (% of GDP), (2) Current health expenditure per capita (current USD), (3) Domestic general government health expenditure (% of GDP), (4) Domestic general government health expenditure per capita (current USD), (5) Domestic private health expenditures (% of current health expenditure), (6) Domestic private health expenditures per capita (current USD). Correlation is significant at the 0.05 level (2-tailed)

share of GDP also does not correlate significantly with any of the selected tourism indicators, which could be due to different spending priorities at country level. In summary, Croatia has fewer statistically significant correlations between health-related and tourism indicators compared to the other selected countries.

Table 5 shows the correlations between health-related indicators and tourism indicators for Hungary over a period of 20 years. Current health expenditure per capita and domestic general government health expenditure per capita indicators are statistically significantly, positively and strongly or moderately related to almost all selected tourism indicators. This suggests that better healthcare is related to the attractiveness of the destination and that residents travel

and spend more abroad for tourism purposes. Since international tourism arrivals and international tourism receipts are statistically significant, positive and strongly or moderately correlated with domestic private health expenditure per capita, further research in regard to the attractiveness of tourism, especially health tourism, would be welcome. The number of international tourist arrivals is statistically significantly, positively and moderately correlated with various health-related indicators, some of which show positive and some negative correlations, making it difficult to draw interpretations.

The Czech Republic also shows statistically significant, positive and strong or moderate correlations between international tourism expenditure and all

Table 5 Spearman's Rank Correlation Coefficients Between Tourism Indicators and Health Indicators for Hungary

	(1)	(2)	(3)	(4)	(5)	(6)
International tourism expenditures (% of total imports)	0.185 (0.435) <i>n</i> = 20	- 0.615* (0.004) <i>n</i> = 20	0.362 (0.116) <i>n</i> = 20	-0.545* (0.013) <i>n</i> = 20	-0.466* (0.039) <i>n</i> = 20	0.702* (< 0.001) <i>n</i> = 20
International tourism expenditures (current USD)	-0.165 (0.486) <i>n</i> = 20	0.814* (< 0.001) <i>n</i> = 20	-0.128 (0.591) <i>n</i> = 20	0.852* (< 0.001) <i>n</i> = 20	0.114 (0.634) <i>n</i> = 20	0.645* (0.002) <i>n</i> = 20
International tourism expenditures for travel items (current USD)	0.020 (0.935) <i>n</i> = 20	0.606* (0.005) <i>n</i> = 20	0.101 (0.673) <i>n</i> = 20	0.660* (0.002) <i>n</i> = 20	0.138 (0.561) <i>n</i> = 20	0.423 (0.063) <i>n</i> = 20
Number of international arrivals	-0.471* (0.036) <i>n</i> = 20	0.683* (< 0.001) <i>n</i> = 20	-0.541* (0.014) <i>n</i> = 20	0.642* (0.002) <i>n</i> = 20	0.335 (0.148) <i>n</i> = 20	0.652* (0.002) <i>n</i> = 20
Number of international departures	-0.281 (0.230) <i>n</i> = 20	0.511* (0.021) <i>n</i> = 20	0.260 (0.268) <i>n</i> = 20	0.571* (0.009) <i>n</i> = 20	-0.212 (0.369) <i>n</i> = 20	0.327 (0.159) <i>n</i> = 20
International tourism receipts (% of total exports)	-0.438 (0.054) <i>n</i> = 20	-0.501* (0.025) <i>n</i> = 20	-0.305 (0.191) <i>n</i> = 20	-0.454* (0.045) <i>n</i> = 20	-0.439 (0.053) <i>n</i> = 20	- 0.641* (0.002) <i>n</i> = 20
International tourism receipts (current USD)	-0.502* (0.024) <i>n</i> = 20	0.929* (< 0.001) <i>n</i> = 20	-0.553* (0.011) <i>n</i> = 20	0.813* (< 0.001) <i>n</i> = 20	0.343 (0.139) <i>n</i> = 20	0.736* (< 0.001) <i>n</i> = 20
International tourism receipts for travel items (current USD)	-0.454* (0.044) <i>n</i> = 20	0.845* (< 0.001) <i>n</i> = 20	-0.499* (0.025) <i>n</i> = 20	0.839* (< 0.001) <i>n</i> = 20	0.369 (0.110) <i>n</i> = 20	0.754* (< 0.001) <i>n</i> = 20

Notes Column headings are as follows: (1) Current health expenditure (% of GDP), (2) Current health expenditure per capita (current USD), (3) Domestic general government health expenditure (% of GDP), (4) Domestic general government health expenditure per capita (current USD), (5) Domestic private health expenditures (% of current health expenditure), (6) Domestic private health expenditures per capita (current USD). Correlation is significant at the 0.05 level (2-tailed)

selected health-related indicators (Table 6) In addition, international tourism receipts on travel items and the health-related indicators mostly show statistically significant, positive and strong or moderate correlations. Surprisingly, the number of international tourist arrivals is not significantly correlated with most of the health-related indicators. Apart from the share of tourism in total imports and the physical measures (number of international arrivals and number of international departures), the tourism indicators generally show moderate or strong positive statistically significant correlations. Therefore, the correlations for the Czech Republic are mostly statistically significant, which is an important starting point for further investigation of the interrelations between the two sectors.

Conclusion

This study examines the relationship between tourism and health expenditure at country level to improve understanding of the link between the health sector and the tourism sector. It complements previous research by examining correlations at the macroeconomic level and comparing them between countries with similar backgrounds. The study demonstrates a positive correlation between health expenditure and tourism indicators at the macroeconomic level, thus, it supports the proposed hypothesis.

Based on the selected indicators and taking into account the differences between the countries, tourism indicators generally show statistically significant correlations with current health expenditure per ca-

Table 6 Spearman's Rank Correlation Coefficients Between Tourism Indicators and Health Indicators for the Czech Republic

	(1)	(2)	(3)	(4)	(5)	(6)
International tourism expenditures (% of total imports)	-0.230 (0.358) <i>n</i> = 18	- 0.288 (0.247) <i>n</i> = 18	-0.176 (0.484) <i>n</i> = 18	-0.296 (0.233) <i>n</i> = 18	-0.152 (0.548) <i>n</i> = 18	-0.172 (0.494) <i>n</i> = 18
International tourism expenditures (current USD)	0.587* (0.010) <i>n</i> = 18	0.878* (< 0.001) <i>n</i> = 18	0.544* (0.020) <i>n</i> = 18	0.827* (< 0.001) <i>n</i> = 18	0.509* (0.031) <i>n</i> = 18	0.858* (<0.001) <i>n</i> = 18
International tourism expenditures for travel items (current USD)	0.698* (< 0.001) <i>n</i> = 20	0.904* (< 0.001) <i>n</i> = 20	0.647* (0.002) <i>n</i> = 20	0.868* (< 0.001) <i>n</i> = 20	0.645* (0.002) <i>n</i> = 20	0.992* (< 0.001) <i>n</i> = 20
Number of international arrivals	0.434 (0.082) <i>n</i> = 17	0.495* (0.043) <i>n</i> = 17	0.458 (0.064) <i>n</i> = 17	0.475 (0.054) <i>n</i> = 17	-0.007 (0.978) <i>n</i> = 17	0.333 (0.191) <i>n</i> = 17
Number of international departures	-0.495* (0.043) <i>n</i> = 17	-0.110 (0.673) <i>n</i> = 17	-0.446 (0.073) <i>n</i> = 17	-0.088 (0.736) <i>n</i> = 17	0.123 (0.639) <i>n</i> = 17	0.110 (0.673) <i>n</i> = 17
International tourism receipts (% of total exports)	-0.688* (0.002) <i>n</i> = 18	-0.841* (< 0.001) <i>n</i> = 18	-0.668* (0.002) <i>n</i> = 18	-0.802* (< 0.001) <i>n</i> = 18	-0.406 (0.095) <i>n</i> = 18	- 0.707* (0.001) <i>n</i> = 18
International tourism receipts (current USD)	0.432 (0.073) <i>n</i> = 18	0.756* (< 0.001) <i>n</i> = 18	0.377 (0.123) <i>n</i> = 18	0.777* (< 0.001) <i>n</i> = 18	0.558* (0.016) <i>n</i> = 18	0.851* (< 0.001) <i>n</i> = 18
International tourism receipts for travel items (current USD)	0.630* (0.003) <i>n</i> = 20	0.853* (< 0.001) <i>n</i> = 20	0.561* (0.010) <i>n</i> = 20	0.868* (< 0.001) <i>n</i> = 20	0.645* (0.002) <i>n</i> = 20	0.914* (< 0.001) <i>n</i> = 20

Notes Column headings are as follows: (1) Current health expenditure (% of GDP), (2) Current health expenditure per capita (current USD), (3) Domestic general government health expenditure (% of GDP), (4) Domestic general government health expenditure per capita (current USD), (5) Domestic private health expenditures (% of current health expenditure), (6) Domestic private health expenditures per capita (current USD). Correlation is significant at the 0.05 level (2-tailed)

pita, domestic government health expenditure per capita and domestic private health expenditure per capita. The significant correlations are almost all positive, strong or moderate. This underlines the need for further research and a deeper understanding of the interdependence and mutual influence of health expenditure and the tourism sector. In addition, the correlations between domestic private health expenditure as a percentage of current health expenditure are in general less statistically significant with the tourism indicators, but this should be understood in line with the specific characteristics of each country's health system.

Since global health expenditure accounts for 10% of global GDP (World Health Organization, 2020) and

current health expenditure as a percentage of GDP is significantly correlated with international tourism arrivals and international tourism receipts in two, respectively three, out of four selected countries, this opens up new challenges for the study of the interrelationship between health expenditure and tourism economic activity. Comparing the study by Konstantakopoulou (2022), which found for developed countries that domestic general government health expenditure as a percentage of GDP has a positive and significant impact on international tourism receipts, the positive correlation is also found for some countries in the present study based on Spearman rank correlation.

The correlation between the importance of tourism for exports and expenditure in the healthcare sector draws attention to investment challenges. The need for additional studies and explanations arises from the observation that in three countries a statistically significant negative correlation is found between some health-related indicators and the importance of tourism as an economic sector (international tourism receipts as a percentage of total exports).

The evidence-based research supports the need for a larger study on this topic, suggesting further research that extends to longitudinal panel analysis using advanced econometric techniques to determine the directions, causality and extent of the relationship between health expenditure and tourism indicators. Research can also explore the mutual benefits of health care and tourism development. It is expected that the results of further research will significantly influence the development of strategies to promote tourism through healthcare. So far, the Spearman coefficient provides a valuable first insight into the relationship between the health expenditure and tourism sectors but lacks causality between the variables.

There is a need for caution in generalizing the present results due to the small sample of countries included. Extending the geographical scope beyond the selected countries to other countries and regions could offer insights into the generalizability of the present findings and provide a more global perspective. Further, the study focuses on developed countries, which means that some indicators of diseases that are more common in developing countries or associated with malnutrition have not been addressed. It is recommended that indicators related to diagnosed common diseases that pose a public health challenge due to the high prevalence of diagnoses be included in further research, too. These include diabetes, depression and anxiety, hypertension, asthma and chronic obstructive pulmonary disease (Carlsson et al., 2013). As the present investigation suggests that healthcare and tourism are related, mediating effects such as country development and others should be included in further research.

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