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BRIEF ORIGINAL

Public healthcare expenditure and COVID-19 mortality in Spain and in Europe☆

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KEYWORDS
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Abstract
Objective: To analyze the association between public health expenditure per capita and the mortality rate due to COVID-19 in Europe and Spain.
Material and methods: Pearson's correlation coefficient was used to compare and contrast the mortality rate due to COVID-19 between countries and autonomous communities with higher and lower public health expenditure per capita than the mean.
Results: No correlation between the public health expenditure per capita and the mortality rate due to COVID-19 (r: 0.3; $p = 0.14$) was found among European countries or Spain's Autonomous Communities (r: 0.03; $p = 0.91$). No significant differences were found when comparing the mortality rate due to COVID-19 among the public health expenditure per capita groups.
Conclusions: The available evidence does not support association between «low» public healthcare expenditure and the poor outcomes observed in Spain during the COVID-19 pandemic. Increased funding for the Spanish National Health System should be earmarked for structural reforms to increase its social efficiency.

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PALABRAS CLAVE
Gasto sanitario público;
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Gasto sanitario público y mortalidad por COVID-19 en España y en Europa

Resumen
Objetivo: Analizar la asociación entre el gasto sanitario público per cápita y la tasa de mortalidad poblacional por COVID-19 en Europa y en España.
Material y métodos: Se utilizó el coeficiente de correlación de Pearson. Asimismo, se contrastaron los promedios de TMP-COVID-19 entre países y comunidades autónomas con mayor y menor GSPpc que el promedio.
Resultados: No se halló correlación, en los países europeos, entre el gasto sanitario público per cápita y la tasa de mortalidad poblacional por COVID-19 (r: 0,3; p = 0,14), ni en las comunidades autónomas (r: 0,03; p = 0,91). Tampoco se encontraron diferencias significativas en el contraste de la tasa de mortalidad poblacional por COVID-19 por grupos de gasto sanitario público per capita.
Conclusiones: La asociación entre «bajo» gasto sanitario público y malos resultados en España en la crisis de la COVID-19 no está sustentada en la evidencia disponible. Los aumentos de financiación de la sanidad pública deberían destinarse a las reformas estructurales para aumentar su eficiencia social.

Introduction

Despite the self-proclaimed merit of the Spanish National Health Service (SNS according to the Spanish acronym), Spain is one of the countries with the worst outcomes in the battle against the SARS-CoV-2 pandemic (it has the fifth highest mortality rate),[1] placing at the bottom of the list of countries in the Organisation for Economic Co-operation and Development (OECD) for the COVID-19 pilot index and performance indicators.[2]

The vast majority of experts heard by the Public Health and Health Services Workgroup of the Parliamentary Committee for Social and Economic Reconstruction pointed to the SNS' low" healthcare expenditure as one of the reasons behind the poor response to the COVID-19 crisis in our country[3] while the austerity" following the 2008 crisis has been highlighted as an aggravating factor.[4] If this thesis were correct, countries with higher public healthcare expenditure or the autonomous communities in Spain with higher public healthcare expenditure, should have achieved better outcomes.

This study analyses the relationship between public health expenditure and mortality rate due to COVID-19 (MR-COVID-19) in Europe and Spain.

Material and methods

The association between MR-COVID-19 and public healthcare expenditure per capita (PHEpc) was analysed. The OECD database was used to calculate the PHEpc comparisons between European countries (last available data from 2019)[5] and the Johns Hopkins University registry to calculate the MR-COVID-19 (referring to 29 August 2020).[1]

When comparing Autonomous Communities, public healthcare expenditure statistics[6] were used and the MR-COVID-19 was calculated as the number of deaths in each autonomous community as published by the Health Ministry as of 28 August 2020[7] divided by the community's population as of the first of January 2019, published by the National Statistics Institute (INE).[8]

Pearson's correlation coefficient was used to analyse the correlations between the PHEpc and MR-COVID-19 variables. Likewise, for the European countries and autonomous communities, the MR-COVID-19 was compared between those with higher and lower than average PHEpc using Student's t-test.

All comparisons made were two-tailed and the differences were considered significant when $p < 0.05$.

Results

In the European countries, no correlation was found between PHEpc and MR-COVID-19 (r: 0.3; $p = 0.14$) (Table 1). Nor was this association found for the autonomous communities (r: 0.03; $p = 0.91$) (Fig. 1). Likewise, no statistically significant differences were observed in the MR-COVID-19 among groups with higher or lower PHEpc than the average for European countries (29.5 $\pm$ 25.7, PHEpc > US$3,559 in purchasing power parities versus 14.4 $\pm$ 21.9, PHEpc < US$3,559; $p = 0.1$) nor among the autonomous communities (70.7 $\pm$ 42.3, PHEpc > €1,416 versus 14.4 $\pm$ 21.9, PHEpc < €1,416; $p = 0.3$).

Discussion

With the available information for the European countries and autonomous communities, it cannot be alleged that low" public healthcare expenditure is an explicative variable of the poor outcomes of the COVID-19 crisis management in Spain. This finding is not surpris-

Table 1 Public healthcare expenditure in purchasing power parities (2019) and mortality rate due to COVID-19 in European countries.

	Country	PHE ppp pi	Mortality rate*
1	Norway	5,673	5.0
2	Germany	5,648	11.2
3	Switzerland	4,988	23.5
4	Sweden	4,928	57.2
5	Holland	4,767	36.2
6	Luxembourg	4,697	20.4
7	Denmark	4,663	10.8
8	France	4,501	45.7
9	Austria	4,402	8.3
10	Belgium	4,125	86.5
11	Iceland	3,988	2.8
12	Ireland	3,919	36.6
13	Unite Kingdom	3,620	62.5
14	Finland	3,536	6.1
15	Czech Republic	2,854	3.9
16	Italy	2,706	58.7
17	Spain	2,560	62.1
18	Slovenia	2,314	6.4
19	Portugal	2,069	17.6
20	Estonia	1,916	4.9
21	Slovakia	1,912	0.6
22	Lithuania	1,769	3.1
23	Poland	1,648	5.3
24	Hungary	1,542	6.3
25	Greece	1,412	2.4
26	Latvia	1,180	1.8

PHE ppp pi: public healthcare expenditure in US$ purchasing power parities per inhabitant. Source: OECD Health Statistics 2020[5]. Own elaboration.

* Mortality due to COVID-19 per 100,000 inhabitants. Source: Johns Hopkins University[1].

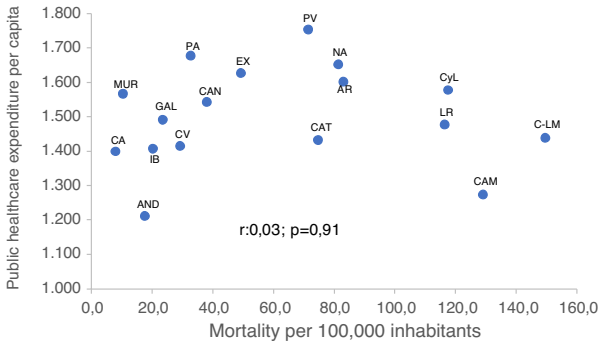

Figure 1 Public healthcare expenditure per inhabitant (2018) and mortality rate due to COVID-19 in Spain's Autonomous Communities.
AND: Andalusia; AR: Aragon; CA: Canary Islands; CAM: Community of Madrid; C-LM: Castilla-La Mancha; CV: Valencian Community; CyL: Castile and León; EX: Extremadura; GAL: Galicia, IB: Balearic Islands; LR: La Rioja; MUR: Region of Murcia; PA: Principality of Asturias; PV: Basque Country.

ing, as the possible explanations for this failure (lack of preparation for the pandemic; poor coordination between central and regional authorities, between hospitals and health centres, between the healthcare system and social services; the aging population; social and health inequalities, etc.)[3,4,9] are not directly related to the availability of resources but rather to their adequate use. Some studies comparing the mortality and case fatality rate due to COVID-19 did not find a relationship between higher public healthcare expenditure and better outcomes either.[10,11]

The relationship between low public healthcare expenditure" and poor outcomes, sustained by various SNS stakeholders and experts, would be harmless if it didn't act as a smokescreen for two relevant aspects, firstly ethics, and strategy.

Berwick[12] and others have brought up the fact that the majority of health determinants are related to social policies that compete with healthcare in the public distribution of resources. Demanding more resources for healthcare" in the name of health", without having addressed the actions needed to achieve higher social performance of the public resources devoted to healthcare, is not ethically sustainable. This reasoning leads to the next aspect. One of the positive effects that could result from the pandemic is its contribution to overcoming the reluctance towards transformation that the SNS needs, including the elimination of expenditure that does not benefit health.[13]

In Spain, the Spanish Society for Internal Medicine promoted the do not do" movement, which was in line with avoiding resource squandering in the SNS.[14] The association, not evidence-based, between low public healthcare expenditure" and outcomes diverts attention away from the crucial fact that a significant source of resources for healthcare must be found in improved clinical efficiency. Healthcare expenditure is concentrated in clinical management (hospitals, health centres,...), therefore it is necessary to work with clinical professionals and scientific-medical societies to increase its efficiency.

Increasing clinical efficiency does not exhaust the list of improvement and reform actions for our SNS, which also include structural elements, the healthcare service model, the information system, etc.[9,15]

Conclusions

The association between low public healthcare expenditure" and the poor outcomes observed in Spain during the COVID-19 pandemic is not supported by the available evidence. Increased funding for public healthcare should be earmarked for structural reforms to increase its social efficiency.

Conflicts of interest

The authors declare that they do not have any conflicts of interest.

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