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HEALTH ECONOMICS LETTER

This is US: Geography of evidence in top health economics journals

Kalle Hirvonen

Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), Addis Ababa, Ethiopia

Correspondence
Kalle Hirvonen, Development Strategy and Governance Division, International Food Policy Research Institute (IFPRI), C/O ILRI, Bole Sub-City, Kebele no 13, Box 5689, Addis Ababa, Ethiopia.
Email: k.hirvonen@cgiar.org

Abstract

The *Journal of Health Economics* and *Health Economics* are arguably the top two journals in the field of health economics. Together, they published 1,679 empirical research articles in the past decade (2010–2019). In line with analyses based on earlier periods, the empirical evidence in top health economics journals continues to be dominated by the United States (37% of all empirical articles), whereas studies based on low-income countries remain rare (2%). Countries with higher disease burdens receive generally less attention from health economists publishing at the top of their field. Reflecting this, more research was published based on data from the Nordic countries (27 million people) than from sub-Saharan Africa and South Asia regions combined (2.9 billion people). Finally, one-third of the empirical articles did not indicate the country of evidence in the title or the abstract, possibly to signal external validity of the findings. This practice was particularly common for articles based on data from North America with more than half of the articles omitting the country of evidence from the title and the abstract. The study concludes by exploring some hypotheses that may explain these findings.

KEYWORDS

bibliometrics, external validity, health and inequality, health economics

JEL CLASSIFICATION

B20; I10; I14

1 | INTRODUCTION

The "10/90 gap" is a term coined in the 1990s to indicate the finding that only 10% of the global health funding for research is allocated to diseases affecting more than 90% of the world's population (Commission on Health Research for Development, 1990). These gaps have not been closed. Compared with low-income countries, high-income countries spend enormous sums on health research and development (R&D), and for each health researcher in low-income countries, there are 70 health researchers in high-income countries (WHO, 2020a, 2020b). Moreover, overall disease burdens decrease sharply with country income levels (Murray et al., 2015) further highlighting the drastic inequalities in global health.

Academic publishing in economics is beset with similar geographic research gaps. Das, Do, Shaines, and Srikant (2013) showed how between 1985 and 2005 the top-5 ranked journals in economics published 65 articles on

China, 39 on India, 34 on sub-Saharan Africa, and 2,383 articles on the United States (US). Wagstaff and Culyer (2012) and Pitt, Goodman, and Hanson (2016) document near-identical geographical patterns analyzing bibliographic data of health economics articles published in 1969–2014.

In this letter, I study whether such geographical evidence gaps are evident in health economics today. To do so, I analyzed the geography of articles published in the *Journal of Health Economics* and *Health Economics* in the last decade (2010–2019). These two journals are arguably the top-2 ranked journals in health economics (Wagstaff & Culyer, 2012). According to their "aims and scope" statements, both journals welcome submissions on problems in both developed and less-developed countries. I quantified the research output by country of evidence and contrasted the research volume with overall disease burdens, relative size of the economy, and health spending. I also explored the degree to which authors omit the country of evidence from the title or the abstract and whether this tendency varied across countries of evidence.

2 | DATA AND METHODS

I used the Web of Science database to download the reference information for all articles published in *Health Economics* and the *Journal of Health Economics* to a reference manager software. Together, these two journals published 2,066 research articles between 2010 and 2019. After dropping purely theoretical articles, editorials, notes, and commentaries as well as cross-country studies that did not report country-level estimates, I was left with 1,679 empirical research articles with 58% published in *Health Economics* and 42% in the *Journal of Health Economics*.

I marked the country (or countries) studied in each article using the title and the abstract. If the country of evidence, the nationality of the study subjects, or a city, province, or state were not mentioned in the title or the abstract, I looked into the actual article to determine the source of the empirical data used in the article. I then calculated the number of empirical articles published in the two journals by country of evidence. Using the World Bank classifications, I grouped countries by the relative size of their economy and by their geographical location. Finally, I contrasted the number of articles published on each country to the estimated disease burden (GBD, 2017),[1] gross domestic product (GDP) (Azevedo, 2019), and the level of current health expenditures (Azevedo, 2019). Ethical review was not required for this study because human subjects were not involved.

3 | RESULTS

In 2010–2019, the two health economics journals published 1,679 empirical studies from 93 countries.[2] More than 85% of the articles originated from high-income countries, 6% from upper-middle-income countries, 5% from lower-middle-income countries, and only 2% from low-income countries (Table 1). These shares remained fairly constant across years (Figure 1).[3] In terms of geographical region, more than 80% of the research was carried out on North America (40%) and Europe and Central Asia (42%). While sub-Saharan Africa and South Asia regions together account for 38% of the world's population, data from these regions were only used in 5.3% of the empirical articles over the last decade. Only five (0.3%) articles used data from Middle East and North Africa.

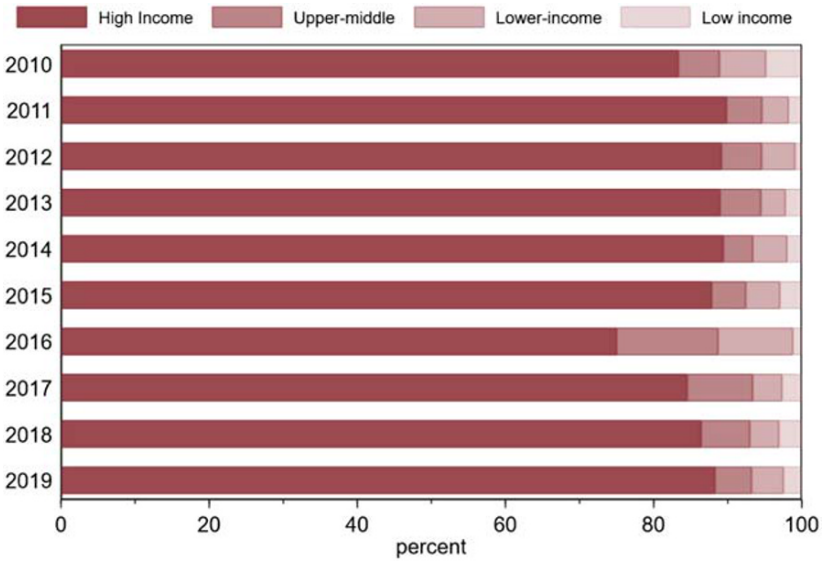
The top part of Figure 2 breaks these data by country of evidence. Studies from the US were by far the most common, accounting for 37% of all studies published over this period. The US was followed by the United Kingdom (11%), Germany (5.5%), Australia (3.9%), and the Netherlands (3.6%). The Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden) accounted for 8.1% of the published research,[4] which is 51% more than all countries located in sub-Saharan Africa and South Asia combined. The bottom part of Figure 2 maps the 2017 age-standardized disability-adjusted life years (DALYs) estimates per 100,000 people. Comparing these data with the number of articles published by country of evidence suggests that countries with lower DALYs rates receive more research attention in top health

[1]I used the 2017 age-standardized disability-adjusted life years (DALYs) estimates provided by the Global Burden of Disease Study (GBD, 2017).
[2]If an article used data and reported estimates from multiple countries, each country is assigned to an article. It is because of these multicountry studies, the number of articles reported in Table 1 exceeds the number reported in the text.
[3]Due to the special issue on "Economic evaluations in low- and middle-income countries" in *Health Economics*, there were more studies published on middle-income countries in 2016 than in other years.
[4]The success of the Nordic countries in this regard is most likely due to the medical birth register data that span several decades and cover entire populations (Langhoff-Roos et al., 2014).

TABLE 1 Number of empirical articles published in top health economics journals by country income level and region

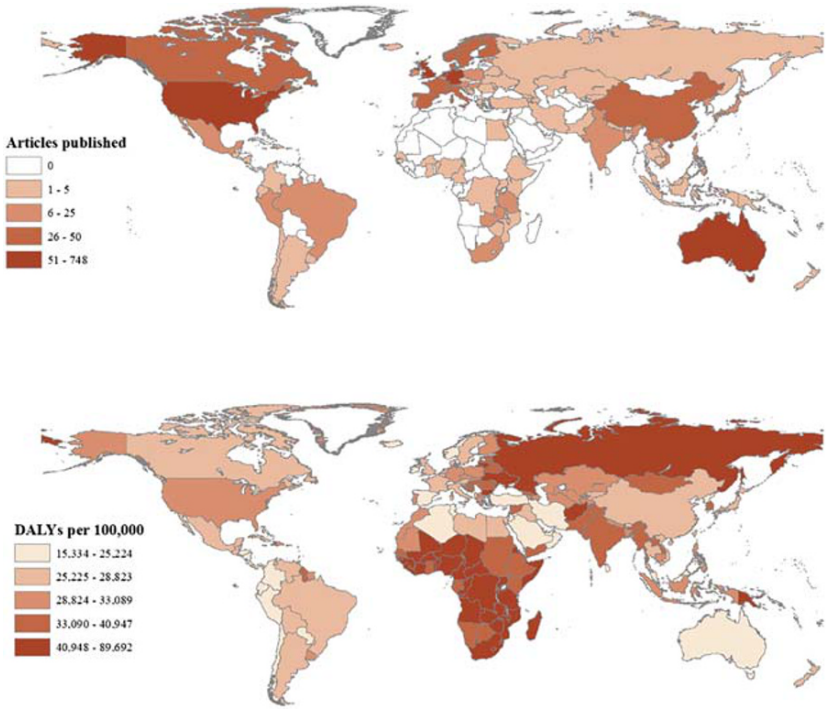
	Number of articles	%
All	**1,886**	**100**
By income level:		
High income	1,629	86.4
Upper middle income	121	6.4
Lower middle income	91	4.8
Low income	45	2.4
By region:		
East Asia & Pacific	201	10.7
Australia	*74*	*3.9*
China	*47*	*2.5*
Other countries	*80*	*4.2*
Europe & Central Asia	784	41.6
United Kingdom	*212*	*11.2*
Germany	*104*	*5.5*
Other countries	*468*	*24.8*
Latin America & Caribbean	47	2.5
Mexico	*14*	*0.7*
Brazil	*8*	*0.4*
Other countries	*25*	*1.3*
Middle East & North Africa	5	0.3
Israel	*3*	*0.2*
Other countries	*2*	*0.1*
North America	748	39.7
United States	*706*	*37.4*
Canada	*42*	*2.2*
South Asia	36	1.9
India	*25*	*1.3*
Other countries	*11*	*0.6*
Sub-Saharan Africa	65	3.4
Tanzania	*12*	*0.6*
South Africa	*10*	*0.5*
Other countries	*43*	*2.3*

Note: Top health economics journals refer to *Health Economics* and the *Journal of Health Economics*. Data pertain to articles published between 2010 and 2019.



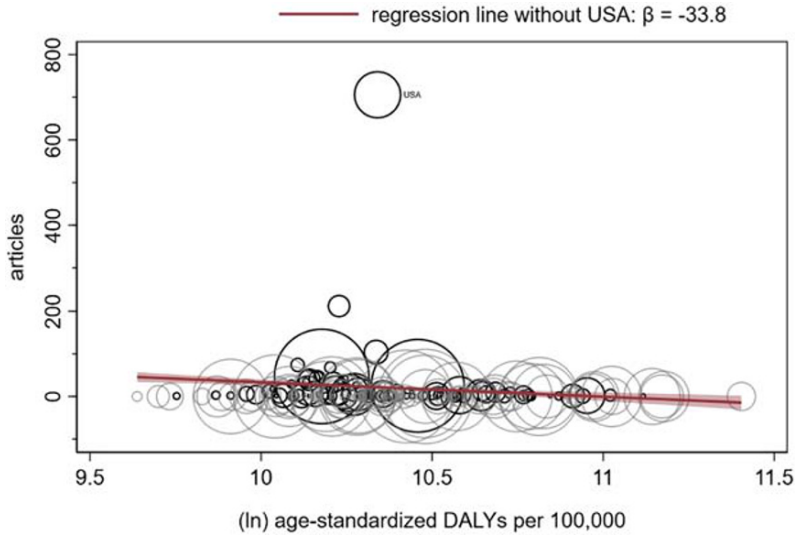
Note: Top health economics journals refer to Health Economics and the Journal of Health Economics. Data pertain to articles published between 2010 and 2019.

FIGURE 1 Distribution of articles published top health economics journals by year and country income level. Top health economics journals refer to *Health Economics* and the *Journal of Health Economics*. Data pertain to articles published between 2010 and 2019 [Colour figure can be viewed at wileyonlinelibrary.com]



Note: Top health economics journals refer to Health Economics and the Journal of Health Economics. Data pertain to articles published between 2010 and 2019. N=218 countries. Age-standardized disability-adjusted life years (DALYs) are from Global Burden of Disease Study (GBD 2017).

FIGURE 2 Number of articles in top health economics journals and age-standardized disability-adjusted life years (DALYs) per 100,000 by country. Top health economics journals refer to *Health Economics* and the *Journal of Health Economics*. Data pertain to articles published between 2010 and 2019. $N = 218$ countries. Age-standardized disability-adjusted life years (DALYs) are from Global Burden of Disease Study (GBD, 2017) [Colour figure can be viewed at wileyonlinelibrary.com]



Note: Top health economics journals refer to Health Economics and the Journal of Health Economics. Data pertain to articles published between 2010 and 2019. N=218 countries. DALYs estimates are from Global Burden of Disease Study (GBD 2017). Countries with at least one article are marked with black hollow circles, countries with no articles are marked with grey. Size of the circle reflects total population in the country. Fitted regression line is based on a weighted least square regression where weights are based on total population in the country. The regression line is based on omitting USA from the dataset. Shaded area around the regression line represents 95%-confidence interval.

FIGURE 3 Relationship between the number of articles published in top health economics journals and disability-adjusted life years (DALYs). Top health economics journals refer to *Health Economics* and the *Journal of Health Economics*. Data pertain to articles published between 2010 and 2019. $N = 218$ countries. DALYs estimates are from Global Burden of Disease Study (GBD, 2017). Countries with at least one article are marked with black hollow circles; countries with no articles are marked with gray. Size of the circle reflects total population in the country. Fitted regression line is based on a weighted least square regression where weights are based on total population in the country. The regression line is based on omitting USA from the dataset. Shaded area around the regression line represents 95% confidence interval [Colour figure can be viewed at wileyonlinelibrary.com]

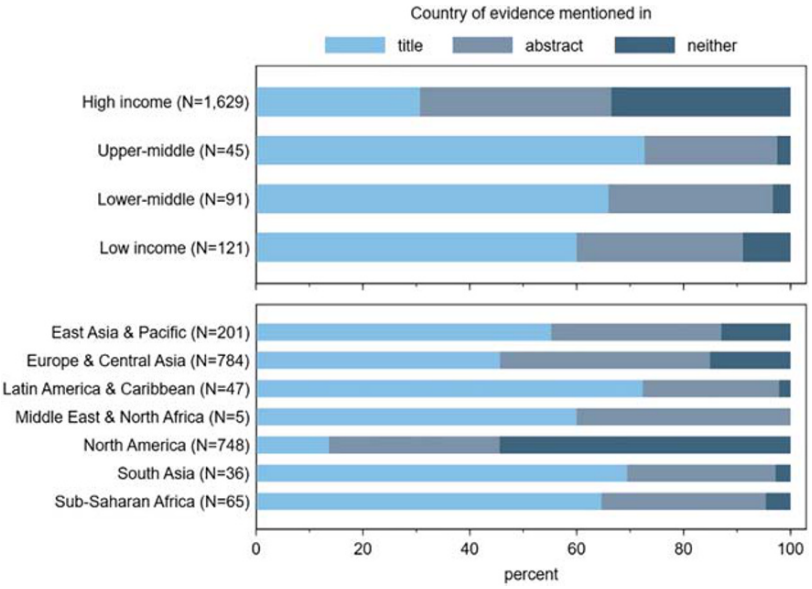


FIGURE 4 Percent of articles published in top health economics journals that indicate country of evidence in title or abstract, by country income level, and region. Top health economics journals refer to *Health Economics* and the *Journal of Health Economics*. Data pertain to articles published between 2010 and 2019 [Colour figure can be viewed at wileyonlinelibrary.com]

Note: Top health economics journals refer to Health Economics and the Journal of Health Economics. Data pertain to articles published between 2010 and 2019.

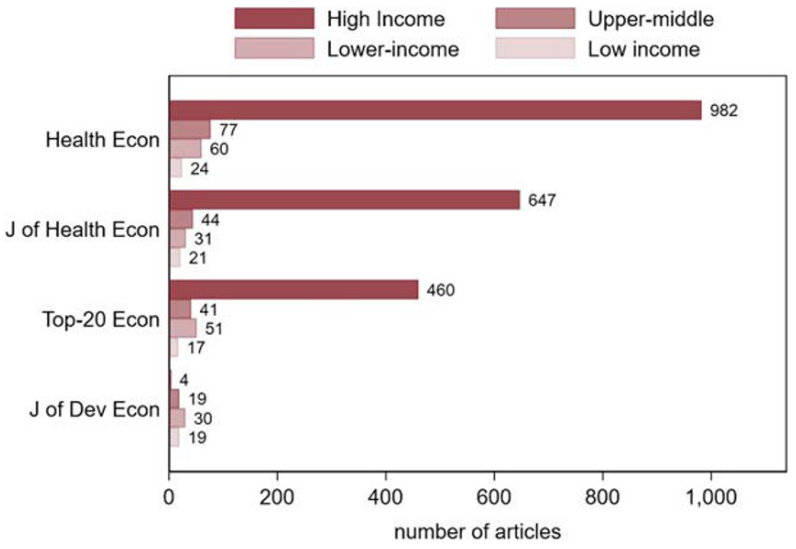


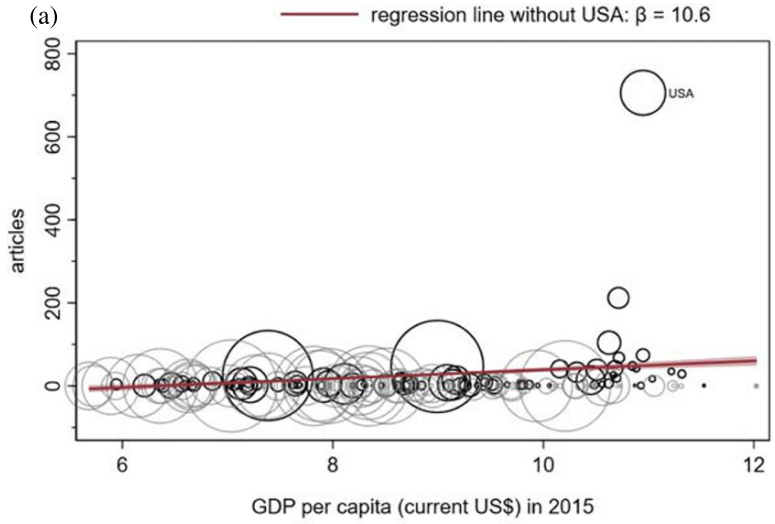
FIGURE 5 Number of health economics articles published in top economics journals by country income level. "Health Econ" = *Health Economics*; "J of Health Econ" = *Journal of Health Economics*; "Top-20 Econ" = Top-20 economics journals according to IDEAS/RePEc; J of Dev Econ = *Journal of Development Economics*. The Journal of Economic Literature (JEL) codes were used to identify health economics articles published in Top-20 Econ and J of Dev Econ. Data pertain to articles published between 2010 and 2019 [Colour figure can be viewed at wileyonlinelibrary.com]

Note: "Health Econ" = *Health Economics*; "J of Health Econ" = *Journal of Health Economics*; "Top-20 Econ" = Top-20 economics journals according to IDEAS/RePEc; J of Dev Econ = *Journal of Development Economics*. The Journal of Economic Literature (JEL) codes were used to identify health economics articles published in Top-20 Econ and J of Dev Econ. Data pertain to articles published between 2010 and 2019.

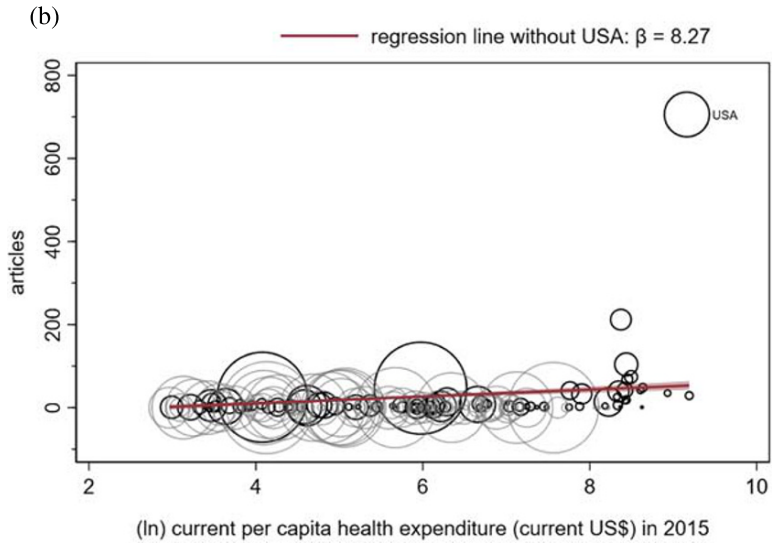
economics journals. This is confirmed by a population weighted linear regression reported in Figure 3: A 10% increase in country's DALYs rate is associated with a 3.4 fewer articles in top health economics journals.[5]

Finally, 70% of the published articles did not indicate the country of evidence in the title. About 33% failed to do so also in the abstract. This practice was particularly common for studies that used data from North America with nearly 55% of the articles omitting the country of evidence from the title and the abstract (Figure 4). In contrast, more than 90% of the studies based on low-income countries mentioned the country context either in the title or the abstract.

[5]This estimate is based on omitting the US, a major outlier, from the dataset. Including the US increases the β-estimate in absolute terms to −46.8.



Note: Note: Top health economics journals refer to Health Economics and the Journal of Health Economics. Data pertain to articles published between 2010 and 2019. N=203 countries. Country level estimates of GDP per capita were sourced from the World Bank (Azevedo, 2019). Countries with at least one article are marked with black hollow circles, countries with no articles are marked with grey. Size of the circle reflects total population in the country. Fitted regression line is based on a weighted least square regression where weights are based on total population in the country. The regression line is based on omitting USA from the dataset. Shaded area around the regression line represents 95%-confidence interval.



Note: Note: Top health economics journals refer to Health Economics and the Journal of Health Economics. Data pertain to articles published between 2010 and 2019. N=183 countries. Country level estimates of current per capita health expenditures were sourced from the World Bank (Azevedo, 2019). Countries with at least one article are marked with black hollow circles, countries with no articles are marked with grey. Size of the circle reflects total population in the country. Fitted regression line is based on a weighted least square regression where weights are based on total population in the country. The regression line is based on omitting USA from the dataset. Shaded area around the regression line represents 95%-confidence interval.

FIGURE 6 (a) Relationship between the number of articles published in top health economics journals and per capita gross domestic product (GDP). Top health economics journals refer to *Health Economics* and the *Journal of Health Economics*. Data pertain to articles published between 2010 and 2019. $N = 203$ countries. Country-level estimates of GDP per capita were sourced from the World Bank (Azevedo, 2019). Countries with at least one article are marked with black hollow circles; countries with no articles are marked with gray. Size of the circle reflects total population in the country. Fitted regression line is based on a weighted least square regression where weights are based on total population in the country. The regression line is based on omitting USA from the dataset. Shaded area around the regression line represents 95% confidence interval. (b) Relationship between the number of articles published in top health economics journals and current per capita health expenditures. Top health economics journals refer to *Health Economics* and the *Journal of Health Economics*. Data pertain to articles published between 2010 and 2019. $N = 183$ countries. Country-level estimates of current per capita health expenditures were sourced from the World Bank (Azevedo, 2019). Countries with at least one article are marked with black hollow circles; countries with no articles are marked with gray. Size of the circle reflects total population in the country. Fitted regression line is based on a weighted least square regression where weights are based on total population in the country. The regression line is based on omitting USA from the dataset. Shaded area around the regression line represents 95% confidence interval [Colour figure can be viewed at wileyonlinelibrary.com]

4 | DISCUSSION

What could be driving this wedge in research attention between lower and richer countries? While providing a causal answer to this question is beyond the scope of this letter, I explore some hypotheses below.

Perhaps top health economists working on lower-income countries published their work in general interest journals or in a development economics field journals instead? To explore this, I looked at all empirical health economics

articles published in 2010–2019 in the top-20 ranked economics journals by IDEAS/RePEc (2020a)[6] and in the *Journal of Development Economics* (*JDE*), the top field journal for development economists.[7] Figure 5 provides the breakdown of the articles published in these outlets by country income level. Out of the 569 empirical health economics articles published in the top-20 economics journals, only 3% (17 articles) used data from a low-income country and 16% from a middle-income country (92 articles). These numbers do not support the hypothesis that top economics journals are publishing substantially more health economics articles based on data from low- and middle-income countries. While the majority of the *JDE* articles focused on low- and middle-income countries, the overall volume of health economics articles published in *JDE* was too low to change the overall geographical pattern.

Another hypothesis is that research volume tracks countries' expenditures on health R&D. Unfortunately, reliable country-level health R&D expenditure estimates are hard to come by. Data on the value of GDP and the overall current health expenditures were available for most countries and are probably highly correlated with health R&D levels. As already suggested by the top part of Table 1, the number of published articles was strongly positively correlated with GDP (Figure 6a), and same was true for countries' current health expenditures (Figure 6b).[8] In both regressions, the US was a major outlier; the number of articles was several times larger than the level of GDP or current health expenditures suggests. Another indicator of research capacity and related investments is the number of top health economics research institutes in the country. Based on the IDEAS/RePEc (2020b) rankings, more than 50% of the top-10% health economics institutions are located in the US, and 99.7% of these top institutions are based in high-income countries with only one institution from middle-income countries and none from low-income countries.[9] These findings suggest that limited resources in poor countries inhibit high-quality health economics research.

We can also speculate on the reasons for omitting the country of evidence from the title and abstract. Evans (2016) interprets this an implicit signal of external validity; that is, that "the source of the evidence is irrelevant." An alternative interpretation is the expectation that readers can infer the country context if only the name of the dataset (e.g., "Health and Retirement Study") being used or the program/policy (e.g., "Medicare") being studied is mentioned in the title or the abstract. This was the case for about half (53%) of the US-based articles that did not mention the country context in title or abstract. Out of the non-US-based articles that did not indicate the country context in title or abstract, less than 5% mentioned a dataset or a policy being studied in the title or the abstract.

5 | CONCLUSIONS

The lack of top-quality health economics research on low-income countries is of great concern. These countries face the highest disease burdens globally and have extremely limited resources to finance health R&D. Moreover, research findings from richer countries are rarely exportable to low-income country settings because the estimated intervention effects and costs are often mediated[10] or moderated[11] by the context in which the study occurred (Anderson, 2010; Thomas et al., 2019). These concerns extend to economic experiments conducted in laboratory settings (Levitt & List, 2007). Transportability of research findings is not guaranteed even across high-income countries due to fundamental differences in demographic and disease profiles and in how health care systems are financed. Moreover, context also dictates the types of research questions that are being asked by researchers.

Finally, given this importance of context in health economics research, it is paramount that researchers improve their reporting of the study setting and location. The adoption of standardized reporting guidelines improved the quality of reporting in major health journals (Moher, Jones, Lepage,, & Group, 2001). Health economics journals could consider following suit.

[6]As of April 2020, the top-20 ranked economics journals according to IDEAS/RePEc website were *American Economic Journal: Applied Economics*; *American Economic Journal: Macroeconomics*; *American Economic Review*; *Econometrica*; *Journal of Econometrics Journal of Economic Growth*; *Journal of Economic Literature*; *Journal of Economic Perspectives*; *Journal of Finance*; *Journal of Financial Economics*; *Journal of International Economics*; *Journal of Labor Economics*; *Journal of Monetary Economics*; *Journal of Political Economy*; *Journal of Public Economics*; *Quarterly Journal of Economics*; *Review of Economic Studies*; *Review of Economics and Statistics*; and *Review of Financial Studies.*

[7]I used the Journal of Economic Literature (JEL) codes to identify health economics articles in these journals.

[8]The R^2 in Figure 6a is 0.20, indicating that GDP per capita alone explains 20% of the variation in the number of articles published in the top-2 health economics journals. The R^2 in Figure 6b is 0.17.

[9]China (upper-middle-income country) has one institute in the list.

[10]That is, a reason why they were observed.

[11]That is, influencing the direction or magnitude.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

ORCID

Kalle Hirvonen https://orcid.org/0000-0003-2057-1612

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