

# Estimating health expenditure shares from household surveys

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**Objective** To quantify the effects of household expenditure survey characteristics on the estimated share of a household's expenditure devoted to health.

**Methods** A search was conducted for all country surveys reporting data on health expenditure and total household expenditure. Data on total expenditure and health expenditure were extracted from the surveys to generate the health expenditure share (i.e. fraction of the household expenditure devoted to health). To do this the authors relied on survey microdata or survey reports to calculate the health expenditure share for the particular instrument involved. Health expenditure share was modelled as a function of the survey's recall period, the number of health expenditure items, the number of total expenditure items, the data collection method and the placement of the health module within the survey. Data exists across space and time, so fixed effects for territory and year were included as well. The model was estimated by means of ordinary least squares regression with clustered standard errors.

**Findings** A one-unit increase in the number of health expenditure questions was accompanied by a 1% increase in the estimated health expenditure share. A one-unit increase in the number of non-health expenditure questions resulted in a 0.2% decrease in the estimated share. Increasing the recall period by one month was accompanied by a 6% decrease in the health expenditure share.

**Conclusion** The characteristics of a survey instrument examined in the study affect the estimate of the health expenditure share. Those characteristics need to be accounted for when comparing results across surveys within a territory and, ultimately, across territories.

Abstracts in **عربي**, **中文**, **Français**, **Русский** and **Español** at the end of each article.

## Introduction

Health expenditure share, or the percentage of the household expenditure spent on health care, is an important variable in health financing research.<sup>1</sup> This figure is used to determine the number of households incurring catastrophic health expenditures and, in many countries, to derive the estimates of private health expenditure reported in national health accounts.<sup>2-5</sup> Studies have shown that health expenditure share estimates derived from household expenditure surveys have problems with “reliability, validity, and comparability”.<sup>6,7</sup> For example, two nationally representative surveys conducted in the Philippines in 2003 reported widely different health expenditure shares – 1.3% and 7.7%. One wonders which of the two estimates is a more accurate reflection of reality.

An extensive literature exists on the sources of bias in surveys.<sup>8-10</sup> However, few studies have explored how biases affect estimates of out-of-pocket household health expenditure. Lu et al.<sup>6</sup> examined how the number of questions on health expenditure and the recall period of a survey affected estimates of household out-of-pocket payments and catastrophic expenditure on health. Their study analysed data from the World Health Surveys (WHS) for 43 countries and from the Living Standards Measurement Survey (LSMS) for three countries. They found that estimates of health spending were lower when the survey had fewer questions and that the estimates were higher when the recall period was shorter. Heijink et al.<sup>7</sup> conducted an exhaustive review of the evidence surrounding measurement errors in self-reported household expenditure and health expenditure. They also collected 90 household expenditure surveys from the International Household Survey Network (IHSN). Their findings concurred with those of Lu et al.: households reported higher health expenditures when more questions were asked. The authors reported that the influence of the recall period was unclear, but that the mode of data col-

lection, such as a diary versus face-to-face interviews, did affect the estimates. Most of the studies identified by Heijink et al.<sup>7</sup> concluded that diaries yielded lower expenditure figures;<sup>11,12</sup> one study showed conflicting results.<sup>13</sup> Heijink et al. also suggested that the questionnaire's structure affects the results.<sup>7</sup> In some surveys, health expenditure questions are included within the health module, whereas in others they are placed within the household expenditure module.

As noted, previous studies have identified the direction of the biases inherent in health expenditure share estimates. Our study, however, is the first to quantify the effect of these biases. We analyse multiple surveys per country or territory and show how the estimated share of the household expenditure devoted to health (i.e. health expenditure share) would have varied if survey instruments with different characteristics had been employed. Our contribution makes it possible for analysts to compare health expenditure share estimates across surveys. At the end of the paper we raise some points to be considered when conducting cross-country comparisons of household survey data.

## Methods

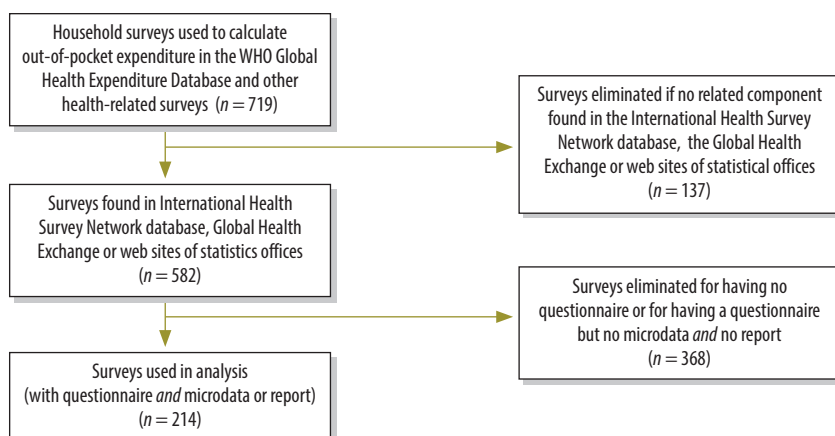
We conducted an exhaustive search of all surveys that reported information on health expenditure and total household expenditure. First we identified the data sources used by the World Health Organization to estimate out-of-pocket expenditure in its Global Health Expenditure Database. We identified a total of 719 household expenditure surveys. However, to conduct our analysis, we needed both the survey questionnaire and microdata (or a report) illustrating how to calculate the health expenditure share for that particular instrument. To obtain this information for the 719 surveys, we looked up the questionnaires, documentation reports and microdata in the IHSN, the Global Health Data Exchange and the web sites of statistical offices and

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Fig. 1. Flowchart showing strategy followed in searching for surveys



WHO, World Health Organization.

the health ministry of each country or territory. These supplementary sources were available for 214 surveys. The final sample therefore consisted of 214 survey years across 78 territories, as presented in Table 1 (available at: <http://www.who.int/bulletin/volumes/91/7/12-115535>). A flowchart showing our search strategy is presented in Fig. 1.

Surveys vary in how they report expenditures and, as a result, analysts have to employ different methods to calculate total household expenditure. For example, some LSMS surveys (such as the Viet Nam Living Standards Survey) place expenditure on food and on other recurrent daily and annual expenses and expenditures on health, education and housing in separate categories. To calculate the number of questions on total expenditure, we summed all expenditure questions corresponding to the first 12 categories of the Classification of Individual Consumption According to Purpose (COICOP), which are food and non-alcoholic beverages; alcoholic beverages, tobacco and narcotics; clothing and footwear; housing, water, electricity, gas and other fuels; furnishing, household equipment and routine household maintenance; health; transport; communication; recreation and culture; education; restaurants and hotels, and miscellaneous goods and services. All questions contributed to total expenditure regardless of their location in the survey instrument.

For surveys in which respondents were interviewed, we counted all the questions that pertained to expenditures. For surveys with screening or conditional (“skip”) questions, we assumed that the respondent replied affirmatively and

counted all the questions that followed the screening question. The process was more complicated for surveys in which respondents recorded results in a diary. If the survey report contained a detailed disaggregation of expenditure items, we counted all the items that were listed. If the report contained only aggregated totals (22 surveys), we used the number of disaggregated categories in the COICOP. For surveys in which a combination of interviews and diaries was used we relied on the data generated from the interview.

In our sample, the number of questions on health expenditure ranged from one (WHS surveys) to 274 (Dominican Republic 2007 *Encuesta Nacional de Ingresos y Gastos de los Hogares* [ENIGH]). Hence, the WHS asked a single question about the household’s total amount of health expenditure; other surveys asked multiple questions, each of them focused on a specific type of health expenditure. The number of questions on total expenditure ranged from one (WHS surveys) to 2431 (Dominican Republic 2007 ENIGH). Again, as the number of questions increased, the questions became more specific. WHS surveys had single questions for health expenditure and a single question for total expenditure, and they also had eight questions on disaggregated categories of out-of-pocket health spending and six questions on total expenditure. Given the focus of our analysis, we calculated four different iterations of health expenditure shares based on the aggregation of health and total expenditure questions. The survey with the largest number of questions – the Dominican Republic 2007 ENIGH survey – was con-

ducted through the use of diaries. When we state that the survey had 2431 health expenditure questions, we are referring to the number of expenditure items enumerated in the survey report. Since the diary method allows respondents to record their purchases in detail, this survey reports on a greater number of items than other surveys. For example, instead of reporting overall expenditure on medicines, the Dominican Republic survey reported expenditures disaggregated by different types of medicines, such as antihistamines, anti-depressants and analgesics.

The shortest recall period was 10 days (2006 Household Socio-Economic Survey in Iraq) and the longest was 12 months (surveys from Bulgaria, Côte d’Ivoire, the Federated States of Micronesia, Gambia, Ghana, Madagascar, Mauritius and Saint Lucia). We derived health expenditure shares from microdata and validated those estimates by comparing them with the data from survey reports. If microdata were not available, we used the health expenditure shares from survey reports. Health expenditure shares ranged from 0.1% (Gambia 1992 Household Economic Survey) to 27.4% (1999 Cambodia Socio-Economic Survey). Descriptive statistics for these variables are presented in Table 2.

The dependent variable was the share of household expenditure spent on health. We modelled it as a function of the recall period, the number of health expenditure questions and the number of total expenditure questions. We also included binary indicators to represent the data collection method and the placement of the health module within the survey. We included the number of total expenditure questions because we hypothesized that one additional question pertaining to non-health expenditure would marginally increase the estimate of total expenditure without affecting the estimate of health expenditure. Therefore, we anticipated that the total number of expenditure questions would be inversely related to the health expenditure share. We assigned a value of 1 to the indicator for the data collection method if the data had been collected through a diary. We assigned a value of 1 to the indicator for the placement of the question within the health module if health expenditure questions and total expenditure questions were placed separately.

We included in the model gross domestic product (GDP) per capita

and average years of education, as well as fixed effects for territory and World Bank income categorization, to control for unobservable characteristics at the territory level. We allowed the territory fixed effects to interact with year indicators to generate a unique time trend for every country. The model was estimated using ordinary least squares regression. We found 57 unique survey types and we clustered our observations based on these types. To account for potential heteroskedasticity, we report heteroskedasticity-robust standard errors.

To illustrate how health expenditure shares are influenced by survey characteristics, we defined three types of survey instruments: “minimalist”, “typical” and “extensive”. A “minimalist” instrument would have one expenditure question, one health expenditure question and a two-week recall period. These thresholds represent the minimal value of those variables in our sample. A “typical” instrument would have six expenditure questions, five health expenditure questions and a one-month recall period. These thresholds represent the median value of those variables in our sample. An “extensive” instrument would have 2431 expenditure questions, 274 health expenditure questions and a 12-month recall period. These thresholds represent the maximum value of those variables in our sample. We used the point estimates to predict counterfactual values for each of the surveys in our sample, such that each observation has three counterfactual values (one for each type of instrument). For this exercise, we assumed that the surveys were collected through an interview and that the module on health expenditure was nested in the expenditure module. To generate confidence intervals we drew 1000 random samples from normal multivariate distributions based on regression coefficient point estimates and the variance-covariance matrix obtained from our main model and used them to generate 1000 estimates of health expenditure share. The middle 95% of these estimates are presented as our confidence intervals in Fig. 2.

## Results

Regression results are reported in Table 3. The results are consistent with qualitative conclusions from the literature: The greater the number of health expenditure questions, the greater the health expen-

Table 2. Descriptive statistics for independent variables

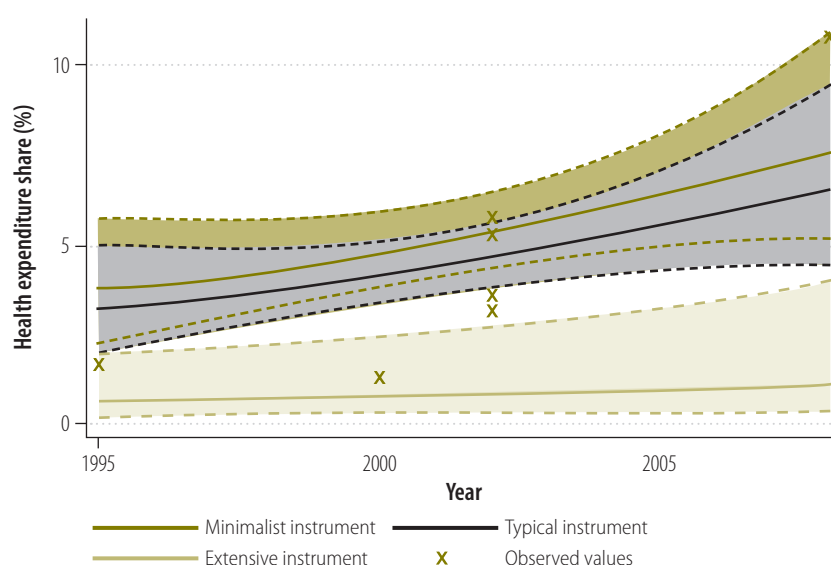
Variable	Mean	SD	Min	Median	Max
Health expenditure share (%)	6.28	4.07	0.11	5.24	27.42
Number of health questions	8.54	18.10	1	5	274
Number of total expenditure questions	96.58	202.28	1	6	2431
Recall period (months)	3.00	4.01	0.30	1	12
Data collection mode <sup>a</sup>	0.11	–	–	–	–
Health module placement <sup>b</sup>	0.04	–	–	–	–

SD, standard deviation.

<sup>a</sup> The indicator was assigned a value of 1 if the data were obtained by survey and a value of 0 if obtained through interview.

<sup>b</sup> The indicator was assigned a value of 1 if in a separate module and a value of 0 otherwise.

Fig. 2. Counterfactual scenarios of health expenditure shares by survey characteristic, South Africa, 1995–2008



Note: The x-axis represents time and the y-axis represents health expenditure share. The points in the figure represent actual data from surveys in South Africa that were included in our sample. The lower line represents our predicted values if those surveys had all employed an extensive instrument. The middle line represents our predicted values if those surveys had all employed a typical instrument. The upper line represents our predicted values if those surveys had all employed a minimalist instrument.

diture share. Other factors held constant, a one-unit increase in the number of health questions was accompanied by a 1% increase in health expenditure share. A one-unit increase in the number of total expenditure questions (while holding the number of health expenditure questions constant) was accompanied by a 0.2% decrease in health expenditure share. A one-month increase in the recall period was accompanied by a 6% reduction in health expenditure share. Surveys that employed a diary generated lower health expenditure shares. Country income classification, GDP and education were not found to be significantly related to health expenditure share and removing them from the model did not alter the statistical significance of the other independent

variables namely, number of health questions, number of expenditure questions, recall period, and survey type.

Fig. 2 illustrates the counterfactual estimates for South Africa, which fielded surveys of all three types: minimalist, typical and extensive. As is evident in the figure, the instrument’s characteristics affect the estimated household health expenditure share.

The results yielded by minimalist, typical and extensive instruments differ dramatically. In most cases, the minimalist instrument results in health expenditure shares that are twice as high as those derived from the extensive instrument. This is problematic because unadjusted health expenditure shares (i.e. shares calculated without regard for the influence

Table 3. Regression results with the natural log of the health expenditure share as the dependent variable and survey characteristics as independent variables

Survey characteristic	Regression model 1		Regression model 2	
	Coefficient (SE)	P	Coefficient (SE)	P
Number of health expenditure questions	0.011 (0.004)	0.005	0.011 (0.004)	0.005
Number of total expenditure questions	-0.002 (0.000)	0.000	-0.002 (0.000)	0.000
Recall period (month)	-0.057 (0.012)	0.000	-0.065 (0.014)	0.000
Data collection mode	-0.559 (0.160)	0.001	-0.514 (0.174)	0.005
Health module placement	-0.273 (0.174)	0.123	-0.206 (0.214)	0.339
GDP per capita	0.193 (0.562)	0.733	0.310 (0.676)	0.649
Education (in years)	1.063 (0.991)	0.288	1.748 (1.140)	0.131
WB low-income country	NA	NA	-0.209 (0.129)	0.112
WB lower-middle-income country	NA	NA	-0.466 (0.279)	0.101
WB upper-middle-income country	NA	NA	-0.513 (0.209)	0.017
WB high-income country	NA	NA	0.044 (0.052)	0.399

GDP, Gross Domestic Product; NA, not applicable; SE, standard error; WB, World Bank.

Note: The regression model also includes territory fixed effects, year trends and territory-year interaction terms.

of the survey instrument) are routinely used to estimate two important metrics: the level of out-of-pocket expenditure reported in national health accounts and the level of catastrophic health expenditure across countries. For example, in the Philippines in 2003, catastrophic health expenditure was incurred by 8.3% of the households according to WHS data,<sup>14</sup> but by only 0.8% according to data from the Family Income and Expenditure Survey.<sup>15</sup> For both surveys, catastrophic health expenditure was based on the same threshold – 25% of household income. This dramatic discrepancy in the estimates generates mixed, confusing messages that policy-makers cannot properly interpret.

## Discussion

Policy-makers need to rely on accurate and reliable out-of-pocket expenditure estimates. Household expenditure surveys were originally designed to measure consumer price index, living standards and household consumption for the national accounts, but not to measure out-of-pocket expenditure. Because of this limitation, the manual *A system of health accounts: 2011 edition* advocates an “integrative approach” to estimating private expenditure that involves mak-

ing use of all available data sources, such as provider tax returns, pharmaceutical sales databases and household surveys.<sup>16</sup> This approach would triangulate flows from these different channels to generate an accurate estimate.<sup>4</sup> Although this approach is ideal, it is also impractical, especially in the near term for low-income countries. An interim solution would be to rigorously track the flow of funds at selected validation sites, as is done for the Medical Expenditure Panel Survey of the United States of America. This exercise would capture expenditure outflows from households to all health-care platforms in the community, including hospitals, clinics and pharmacies, and would provide a “gold standard” estimate of out-of-pocket expenditure that could then be used to adjust existing household survey data. Analysts will be able to systematically, reliably and accurately estimate out-of-pocket expenditure only if these validated estimates exist. Efforts should be made to ensure that policy-makers have access to data that capture reality rather than the idiosyncrasies of survey design. ■

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**Competing interests:** None declared.

## ملخص

تقدير حصص الإنفاق الصحي من الدراسات الاستقصائية الأسرية  
الغرض تحديد كم تأثيرات خصائص الدراسات الاستقصائية  
للإنفاق الأسري على الحصة المقدرة للإنفاق الأسري المخصص  
للصحة.  
الطريقة تم إجراء بحث في جميع الدراسات الاستقصائية للبلدان  
التي تبلغ بيانات عن الإنفاق الصحي وإنفاق الأسر الإجمالي.  
وتم استخلاص البيانات المعنية بإجمالي الإنفاق والإنفاق الصحي



الناتج صاحب زيادة وحدة واحدة في عدد أسئلة الإنفاق الصحي زيادة نسبتها 1٪ في حصة الإنفاق الصحي وفق التقديرات. ونجم عن زيادة وحدة واحدة في عدد أسئلة الإنفاق الصحي انخفاض نسبته 0.2٪ في الحصة وفق التقديرات. وصاحب زيادة فترة الاستدعاء شهراً واحداً انخفاض نسبته 6٪ في حصة الإنفاق الصحي.

الاستنتاج تؤثر خصائص أداة الدراسة الاستقصائية التي تم فحصها في هذا الدراسة على تقدير حصة الإنفاق الصحي. ولا بد من إيضاح أهمية هذه الخصائص عند مقارنة النتائج عبر الدراسات الاستقصائية داخل الإقليم، وفي النهاية، عبر الأقاليم.

من الدراسات الاستقصائية للتوصل إلى حصة الإنفاق الصحي (أي نسبة إنفاق الأسرة المخصص للصحة). وللقيام بهذا، اعتمد المؤلفون على البيانات الجزئية للدراسات الاستقصائية أو تقارير الدراسات الاستقصائية لحساب حصة الإنفاق الصحي من أجل الأداة المعنية على وجه الخصوص. وتم نمذجة حصة الإنفاق الصحي كدالة لفترة الاستدعاء الخاصة بالدراسة الاستقصائية وعدد بنود الإنفاق الصحي وعدد بنود الإنفاق الإجمالي وطريقة جمع البيانات ووضع وحدة الصحة داخل الدراسة الاستقصائية. وتواجدت البيانات عبر المكان والزمان، ولذلك تم إدراج التأثيرات الثابتة للإقليم والعام كذلك. وتم تقدير النموذج بارتداد عادي أقل تربيعاً باستخدام الأخطاء القياسية المجمعة.

## 摘要

### 根据家庭调查估算卫生支出份额

**目的** 量化家庭支出调查特性对家庭卫生专用开支估算份额的影响。

**方法** 对报告有关卫生支出和合计家庭支出数据的所有国家调查进行搜索。从调查中提取有关合计支出和卫生支出的数据，生成卫生支出份额（即卫生专用家庭支出的分数）。为此，作者依赖于调查微数据或调查报告来计算相关特殊工具的卫生支出份额。将卫生支出份额作为调查回忆期、卫生支出项目数、合计支出项目数、数据收集方法和调查中卫生模块布置的函数进行建模。数据存在于空间和时间，因此，对领地和

年代的固定影响也同样纳入。以使用聚类标准误的普通最小二乘回归方法对模型进行估算。

**结果** 卫生支出问题增加一个单位，估算卫生支出份额就伴随增加1%。非卫生支出问题增加一个单位，就会导致估计份额减少0.2%。回忆期增加一个月，卫生支出份额伴随减少6%。

**结论** 研究中检查的调查工具特性影响了卫生支出份额的估算。在比较一个领地以及最终多个领地的调查结果时，需要将这些特性考虑在内。

## Résumé

### Estimer la part des dépenses de santé à partir d'enquêtes sur les ménages

**Objectif** Quantifier les effets des caractéristiques d'une enquête sur les dépenses des ménages sur la part estimée des dépenses d'un ménage consacrée à la santé.

**Méthodes** Une étude a été menée sur toutes les données d'enquêtes nationales portant sur les dépenses de santé et les dépenses totales des ménages. Les données sur les dépenses totales et les dépenses de santé ont été extraites des enquêtes afin d'obtenir la part des dépenses de santé (c'est-à-dire la partie des dépenses des ménages consacrée à la santé). Les chercheurs ont utilisé des microdonnées ou des rapports d'enquête pour calculer la part des dépenses de santé pour cet instrument particulier. La part des dépenses de santé a été modélisée comme une fonction de la période de rappel de l'enquête, du nombre de postes de dépenses de santé, du nombre de postes de dépenses totales, de la méthode de collecte des données et de la mise en place du module de santé au sein de l'enquête. Il existe des données aussi bien géographiques que temporelles dans ce domaine, donc, les

effets fixes pour un territoire et une année donnés ont également été inclus. Le modèle a été estimé avec une régression par la méthode des moindres carrés avec des erreurs standard sectorielles.

**Résultats** Une augmentation d'une unité du nombre de questions sur les dépenses de santé a conduit à une augmentation de 1% de la part estimée des dépenses de santé. Une augmentation d'une unité du nombre de questions sur les dépenses non liées à la santé a entraîné une diminution de 0,2% de la part estimée. L'augmentation d'un mois de la période de rappel a engendré une baisse de 6% de la part des dépenses de santé.

**Conclusion** Les caractéristiques de l'instrument d'enquête examinées dans l'étude modifient l'estimation de la part des dépenses de santé. Ces caractéristiques doivent être prises en compte lors de la comparaison des résultats d'une enquête à l'intérieur d'un territoire et aussi à travers les territoires.

## Резюме

### Оценка доли расходов на здравоохранение на основе опросов домашних хозяйств

**Цель** Количественно оценить влияние характеристик опросов домохозяйств, посвященных расходам, на оцененные доли расходов домохозяйств на здравоохранение.

**Методы** Был выполнен поиск всех опросов на уровне стран, в ходе которых собирались данные о расходах на здравоохранение и общих расходах домохозяйств. Сведения об общей сумме расходов и расходах на здравоохранение использовались

для оценки доли расходов на здравоохранение (т.е. доли расходов домохозяйств, выделяемых на здравоохранение). Для этого авторы опирались на микроданные и отчеты опросов, описывающие для конкретных инструментов порядок расчета доли расходов на здравоохранение. Доля расходов на здравоохранение была смоделирована в виде функции от периода, припоминания, количества статей расходов на

здравоохранение, общего количества статей расходов, метода сбора данных и места модуля, посвященного здравоохранению, в опросе. Данные существуют в пространстве и времени, поэтому в опрос также были включены фиксированные значения для регионов и годов. Модель параметризовалась с помощью обычного регрессионного метода наименьших квадратов с кластеризованными стандартными ошибками.

**Результаты** Увеличение количества вопросов о расходах на здравоохранение на одну единицу сопровождалось ростом оцененной доли расходов на здравоохранение на 1%. Увеличение количества не связанных с расходами на

здравоохранение вопросов сопровождалось снижением оцененной доли на 0,2%. Увеличение периода припоминания на один месяц сопровождалось снижением доли расходов на здравоохранение на 6%.

**Вывод** Рассмотренные в исследовании характеристики инструмента проведения опроса оказывают влияние на оценку доли расходов на здравоохранение. Эти особенности необходимо учитывать при сравнении результатов различных опросов в определенном регионе, и, в конечном счете, между регионами.

## Resumen

### Estimación de los porcentajes de gasto sanitario provenientes de encuestas en los hogares

**Objetivo** Cuantificar los efectos de las características de las encuestas sobre el gasto de los hogares en el porcentaje estimado del gasto sanitario de un hogar.

**Métodos** Se realizó una búsqueda de todas las encuestas nacionales que informaran acerca de datos sobre el gasto sanitario y el gasto total de los hogares. Se extrajeron dichos datos sobre gasto total y gasto sanitario de las encuestas para generar el porcentaje del gasto sanitario (es decir, la parte del gasto del hogar dedicada a la salud). Para ello, los autores confiaron en microdatos o informes de las encuestas para calcular el porcentaje del gasto sanitario en relación con el instrumento particular implicado. El porcentaje del gasto sanitario se interpretó como una función del período de recuerdo de la encuesta, el número de cuestiones sobre el gasto sanitario, el número de cuestiones sobre el gasto total, el método de recogida de los datos y la ubicación del formulario sobre la salud dentro de la encuesta. Había datos ubicados

espacial y temporalmente, así que también se incluyeron los efectos fijos por territorio y año. El modelo se estimó por medio de una regresión por mínimos cuadrados ordinaria, con errores estándar reagrupados.

**Resultados** Un incremento de una unidad en el número de cuestiones sobre gasto sanitario se vio acompañado de un aumento del 1% en el porcentaje del gasto sanitario estimado. Un incremento de una unidad en el número de cuestiones sobre gastos no sanitarios conllevó una disminución del 0,2% en el porcentaje estimado. Aumentar el período de recuerdo un mes provocó una reducción del 6% en el porcentaje del gasto sanitario.

**Conclusión** Las características de una encuesta examinada en el estudio repercuten en la estimación del porcentaje del gasto sanitario. Estas características han de tenerse en cuenta al comparar los resultados de diferentes encuestas dentro de un territorio y, en última instancia, entre territorios.

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Table 1. List of surveys with data on total household expenditure and household health expenditure, by territory and year

Country or territory	Survey	Years
<b>High income</b>		
Croatia	Household Budget Survey	2003, 2004
	World Health Survey	2003
Czech Republic	World Health Survey	2002
Estonia	Household Budget Survey	2000–2004
	World Health Survey	2003
Hungary	World Health Survey	2003
Singapore	Household Expenditure Survey	2007
Slovakia	World Health Survey	2003
Slovenia	World Health Survey	2003
	Household Budget Survey	2004
Spain	World Health Survey	2002
Taiwan, China	Family Income and Expenditure Survey	1980–2009
United Arab Emirates	World Health Survey	2003
<b>Upper-middle income</b>		
Azerbaijan	Quarterly Household Survey	2002–2005
Belarus	Household Living Standard Survey	2009
Bosnia and Herzegovina	Bosnia and Herzegovina Household Survey Panel Series	2004
	World Health Survey	2003
Botswana	Household Income and Expenditure Survey	1993, 2002
Brazil	World Health Survey	2003
Bulgaria	Multi-topic Household Survey	2003
	Integrated Household Survey	1995, 2001
China	World Health Survey	2002
Dominican Republic	<i>Encuesta Nacional de Ingresos y Gastos de los Hogares</i>	2007
	World Health Survey	2003
Ecuador	World Health Survey	2003
Kazakhstan	World Health Survey	2002
Latvia	World Health Survey	2003
Malaysia	World Health Survey	2003
Maldives	Household Income and Expenditure Survey	2002
Mauritius	Mauritius Household Budget Survey	2001, 2006
	World Health Survey	2003
Mexico	<i>Encuesta Nacional de Ingresos y Gastos de los Hogares</i>	1984, 1989, 1992, 1994, 1996, 1998, 2000, 2002, 2004–2006, 2008
	World Health Survey	2002
Namibia	World Health Survey	2003
	World Health Survey	2003
Russian Federation	Russian Federation Longitudinal Monitoring Survey	1992–1995, 2000–2002
	World Health Survey	2003
Saint Lucia	Saint Lucia Survey of Living Conditions and Household Budget	2005
Serbia	Living Standard Measurement Survey	2002, 2003, 2007
South Africa	Income and Expenditure Survey	1995, 2000
	World Health Survey	2002
	National Income Dynamics Survey	2008
Tunisia	World Health Survey	2003
Turkey	World Health Survey	2003
Uruguay	World Health Survey	2002
<b>Lower-middle income</b>		
Bhutan	Bhutan Living Standard Survey	2003, 2007
Congo	World Health Survey	2003
Côte d'Ivoire	Côte d'Ivoire Living Standard Survey	1985, 1986
	World Health Survey	2003
Federated States of Micronesia	Household Income and Expenditure Survey	2005

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Country or territory	Survey	Years
Georgia	World Health Survey	2003
Ghana	Ghana Living Standards Survey	1991, 1998, 2005
	World Health Survey	2003
Guatemala	World Health Survey	2003
India	World Health Survey	2003
Indonesia	<i>Survei Sosial Ekonomi Nasional</i>	1992, 1994–2005, 2007
Iraq	Household Socio-Economic Survey in Iraq	2006
Lao People's Democratic Republic	Lao People's Democratic Republic Expenditure and Consumption Survey	2002, 2007
	World Health Survey	2003
Morocco	World Health Survey	2003
Nicaragua	<i>Encuesta Nacional de Hogares sobre Medición de Nivel de Vida</i>	2009
Pakistan	Pakistan Social and Living Standards Measurement Survey	1999, 2005, 2006, 2008
	World Health Survey	2003
Paraguay	World Health Survey	2002
Philippines	Family Income and Expenditure Survey	1991, 1994, 1997, 2003, 2006, 2009
	World Health Survey	2003
	Annual Poverty Indicator Survey	2004, 2007
Senegal	<i>Enquête senegalaise auprès des ménages</i>	1994, 2001
	<i>Enquête de suivi de la pauvreté au Sénégal</i>	2005
	World Health Survey	2003
Solomon Islands	Household Income and Expenditure Survey 2005	2005
Sri Lanka	Household Income and Expenditure Survey	1995, 2005, 2006
	World Health Survey	2003
Sudan	Sudan National Baseline Household Survey	2009
Swaziland	Household Income and Expenditure Survey	1995
	World Health Survey	2003
Ukraine	World Health Survey	2002
Viet Nam	Viet Nam Living Standards Survey	1995
	Viet Nam Household Living Standards Survey	2002
	World Health Survey	2002
Zambia	Living Conditions Monitoring Survey	2002, 2004, 2006, 2010
	World Health Survey	2003
<b>Low income</b>		
Bangladesh	World Health Survey	2003
Benin	<i>Enquête 1–2–3</i>	2003
Burkina Faso	<i>Enquête prioritaire étude sur les conditions de vie des ménages</i>	1994
	<i>Enquête sur les dépenses des ménages de Ouagadougou</i>	1998
	<i>Enquête nationale</i>	2003
	World Health Survey	2002
Cambodia	Cambodia Socio-Economic Survey	1997, 1999, 2004, 2007
Chad	World Health Survey	2003
Comoros	<i>Enquête intégrale auprès des ménages</i>	2004
	World Health Survey	2003
Ethiopia	Urban/Rural Household Consumption Survey	1995, 1999, 2004
	World Health Survey	2003
Gambia	Household Economic Survey	1992
	Household Education and Health Survey	1993
Kenya	World Health Survey	2004
Madagascar	<i>Enquête nationale auprès des ménages</i>	1993, 1997, 2001
Malawi	World Health Survey	2003
Mali	World Health Survey	2003

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Country or territory	Survey	Years
Mauritania	World Health Survey	2003
Mozambique	<i>Inquérito ao Orçamento Familiar</i>	2008
	<i>Inquérito aos Agregados Familiares sobre Orçamento Familiar</i>	2002
Myanmar	World Health Survey	2003
Nepal	World Health Survey	2003
Niger	<i>Enquête permanente de conjoncture économique et sociale</i>	1995
	Core Welfare Indicator Questionnaire	2005
Tajikistan	Living Standards Survey in the Republic of Tajikistan	1999, 2003, 2007, 2009
United Republic of Tanzania	Household Budget Survey	2000, 2007
Uganda	Uganda National Household Survey 2002	2002, 2005
Zimbabwe	World Health Survey	2003