Access to care and medicines, burden of health care expenditures, and risk protection: Results from the World Health Survey


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ABSTRACT

Objectives: We assessed the contribution of health insurance and a functioning public sector to access to care and medicines and household economic burden.

Methods: We used descriptive and logistic regression analyses on 2002/3 World Health Survey data in 70 countries.

Results: Across countries, 286,803 households and 276,362 respondents contributed data. More than 90% of households had access to acute care. However, less than half of respondents with a chronic condition reported access. In 51 low and middle income countries (LMIC), health care expenditures accounted for 13–32% of total 4-week household expenditures. One in four poor households in low income countries incurred potentially catastrophic health care expenses and more than 40% used savings, borrowed money, or sold assets to pay for care. Between 41% and 56% of households in LMIC spent 100% of health care expenditures on medicines. Health insurance and a functioning public sector were both associated with better access to care and lower risk of economic burden.

Conclusion: To improve access, policy makers should improve public sector provision of care, increase health insurance coverage, and expand medicines benefit policies in health insurance systems.

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1. Introduction

Each year, an estimated 44 million households suffer severe financial hardship and 25 million are pushed into poverty because they need to use and pay for health care [1]. When households cannot pay for care from their income, they use savings, borrow money, sell assets, cut food expenditures, or take children out of school, thereby further restricting their short and long-term survival; or they forego needed care because they cannot afford to pay for it, resulting in worse health, less productivity and income, and increased poverty [2].

Protection from the risk of relatively large health care expenditures should improve access to and decrease the financial burden of care. Subsidizing health care costs by insurance schemes (in any form, including national social health insurance systems, mutual benefit societies, and commercial private insurance) is crucial for overcoming financial barriers to care and protecting households from high expenditure burden [3]. To the extent that people use it, a functioning public sector that provides quality care and medicines at low or no cost also protects from risk [2] and may diminish the need for insurance coverage, especially for the poor.

The objectives of this study are to (1) describe access to health care and medicines across countries and (2) assess the relationships among household access to care,
2. Materials and methods

2.1. Data source and study measures

We used data from the World Health Survey (WHS) [4,5] conducted by the WHO in 2002 and 2003 in 70 countries. Country samples were drawn from nationally representative sample frames to estimate general population parameters.

We analyzed information on household member demographics, health care needs, health insurance status, household assets, expenditures (by category), and sources used to pay for health care. For each household, the WHS identified one adult respondent. For adult respondents and the children they reported on, we analyzed overall health status; access to health care (including medicines) for acute and chronic conditions; reasons why care or medicines were not received; and respondents’ ratings of care they received in outpatient public facilities. Country-level descriptive data on which the present analyses are based, data on additional indicators of adult respondents’ and child health status, and detailed descriptions of the construction of the indicators are available elsewhere [6].

We constructed indicators of need for care, access to care and medicines, burden of health care expenditures, and household risk protection status.

2.1.1. Need for health care

We defined households as needing care if (1) in the past 12 months, the respondent or a child needed care for a condition that usually requires treatment with medicines (high fever, diarrhoea, cough; arthritis, asthma, heart disease, bodily injury); (2) the respondent reported at least one chronic illness (arthritis, angina, asthma, depression, schizophrenia, diabetes); (3) the respondent reported moderate, bad, or very bad health or moderate, severe, or extreme limitations in daily activities; or (4) anyone in the household was in an institution, needed care all the time, or could not be without help for more than 1 h due to his/her health.

2.1.2. Access to care and medicines

We defined households with access to care as those in which (1) the responding adult or a child who needed care for a condition that usually requires treatment with medicines reported receiving care; (2) the responding adult with at least one chronic illness was treated or reported taking medicines for his/her conditions in the past 2 weeks; (3) the responding adult or a child who needed care for a condition that usually requires treatment with medicines received all or most medicines needed.

2.1.3. Financial burden of health care expenditures

We report total household expenditures; expenditures for health care, and for medicines overall and as percentages of total expenditures; and the proportion of households for which medicines costs constitute all health care spending.

We constructed two indicators of financial burden: (1) incurring high (potentially catastrophic) health care spending in the past 4 weeks, defined as health care expenditures of 40% or more of expenditures after accounting for food expenditure needs, [3,7] and (2) using savings, borrowing money, or selling assets to pay for health care (modified from methods reported by Leive and Xu [8]).

2.1.4. Risk protection

Based on the reported number of household members covered by mandatory or voluntary health insurance, we identified households with none, some, or all members insured.

For each country, we created proxy measures of perceptions about public sector care based on ratings by households that reported receiving outpatient care in public facilities in the past year. By design, only a fraction of households (median across countries 18%) answered questions about perceptions of public sector outpatient care. We defined perceived adequacy of public sector functioning as the proportion of households receiving care that reported adequate skills, equipment, and medicines, and perceived positive experience of outpatient public sector care as the proportion of households that rated their treatment experience as very good or good. We assigned these country-level ratings of public sector adequacy and positive experience to all households in a given country. We then stratified countries into those whose ratings were in the upper 40% of countries (above 88% for adequacy of public sector functioning and above 70% for having a positive experience of public sector care) and those whose ratings were in the lower 60%. We entered these categorized ratings into regression models as country-level variables.

2.2. Analyses

The WHS employs a complex survey design with weights, stratification, and clustering in most countries. Our descriptive within-country analyses adjust for the survey design where possible. We report results for all households and for those that fell into the bottom two income quintiles based on reported permanent assets [9].

We used multi-country household-level logistic regression models (without country-level survey sampling weights) to explore the relationships between access to care, burden of expenditures, and household risk protection. Estimates are adjusted for household characteristics (household size greater or equal to 6 members [1/0]; having a member age 60 years and older [1/0] or a child under 5 years [1/0]; highest education of any household member as none or less than primary school [1/0]; household in lowest two quintiles of household poverty [1/0]; total household expenditures [continuous, Purchasing Power Parity-adjusted international dollars, 2002–2004]; urban location [1/0]) and respondent characteristics (female gender [1/0], age greater or equal to 60 years [1/0], married [1/0], education as either no formal schooling or less than primary school [1/0], health status reported as moderate, bad, or very bad [1/0], and difficulty with work or house-
Table 1
Median percent of households (number of countries) across countries in 2003 World Bank income category reporting need for and access to care and medicines, high burden of expenditures, risk protection, and ratings of public sector care, overall and for poor households.

<table>
<thead>
<tr>
<th>Country income category</th>
<th>Total population</th>
<th>Poor population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Lower middle</td>
</tr>
<tr>
<td>Need for health care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respondent or child</td>
<td>36.3 (21)</td>
<td>29.7 (16)</td>
</tr>
<tr>
<td>needing care in past 12 months</td>
<td>34.9 (22)</td>
<td>36.0 (17)</td>
</tr>
<tr>
<td>Respondent needing chronic care</td>
<td>41.8 (22)</td>
<td>45.9 (17)</td>
</tr>
<tr>
<td>Respondent reporting low health status</td>
<td>16.2 (22)</td>
<td>15.4 (17)</td>
</tr>
<tr>
<td>Household needing high level care</td>
<td>93.9 (22)</td>
<td>97.4 (17)</td>
</tr>
<tr>
<td>Access to health care</td>
<td>31.9 (22)</td>
<td>37.5 (18)</td>
</tr>
<tr>
<td>Care last time needed</td>
<td>75.6 (22)</td>
<td>79.3 (17)</td>
</tr>
<tr>
<td>Adult chronic care</td>
<td>22.1 (18)</td>
<td>16.4 (15)</td>
</tr>
<tr>
<td>All or most medicines</td>
<td>44.1 (21)</td>
<td>29.8 (16)</td>
</tr>
<tr>
<td>Financial burden</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potentially catastrophic</td>
<td>96.9 (22)</td>
<td>71.6 (18)</td>
</tr>
<tr>
<td>health care expenditures</td>
<td>2.4 (22)</td>
<td>12.8 (18)</td>
</tr>
<tr>
<td>Using savings, selling</td>
<td>0.7 (22)</td>
<td>11.6 (18)</td>
</tr>
<tr>
<td>assets, or borrowing money</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insurance coverage – no households members</td>
<td>83.0 (22)</td>
<td>88.9 (17)</td>
</tr>
<tr>
<td>Insurance coverage – at least one, not all members</td>
<td>57.1 (22)</td>
<td>64.4 (17)</td>
</tr>
<tr>
<td>Rating of public sector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public sector outpatient functioning adequate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive public sector outpatient experience</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Median percentages are calculated across countries in each 2003 World Bank income category in which at least 70% of households contributed data. For each value, the number of countries contributing data is noted in parenthesis. Poor households are those in the lowest two income quintiles as determined by self-reported permanent assets.*

The study was exempt from human subjects review by the Human Studies Committee of the Department of Population Medicine.

3. Results

Across 70 countries (22 low, 18 lower middle, 10 upper middle, and 20 high income, according to 2003 World Bank criteria), 286,803 households and 276,362 adult respondents contributed data. Of those, 100,440 adult respondents lived in 97,578 poor households. Among high income countries, most indicators are available only for a small subset of countries (Slovenia, Spain, and the United Arab Emirates).

3.1. Need for and access to care, burden of expenditures, and risk protection

Tables listing household demographic, adult respondent, and child health characteristics for each country that completed the relevant modules of the WHS are available elsewhere. Table 1 summarizes the key outcome indicators by World Bank country income category, for both entire country populations and for the subset of households in the lowest two income quintiles in each country.

Many households reported health care need. Compared to higher income countries, more respondents in low income countries (median 36%) reported needing care in the past 12 months for a medicines-treatable condition for themselves or a child in the household (ranging from 8% in Georgia to 64% in Zambia); fewer (median 35%) households in low income countries reported needing care for chronic conditions. More than 40% of the respondents in low and middle income countries reported low health status; across countries, between 15% and 20% of households reported having a member institutionalized or in need of constant support at home due to health reasons.

Access to care was high in all countries, both overall and for poor households: Between 93% and 100% of households reported receiving care when it was needed within the past 12 months for conditions that usually require medicines. However, access to care for chronic conditions was lower, with 27% of respondents in poor households in low income countries and 51% in high income countries reporting treat-
reported some health insurance. Households in higher
age, while only 2% of households in low income countries
reported at least some members having insurance cover-
care: overall and among the poor, almost 100%
ance coverage: overall and among the poor, almost 100%
12 months.

Financial burden was higher in lower income countries
and in poorer households, with more than one in
five households incurring catastrophic health care
expenditures in the past 4 weeks. Similarly, overall
and among the poor, more than 40% of households in low
income countries used savings, borrowed money, or sold
assets to pay for health care expenditures.

Better-off households had much higher rates of
insurance coverage: overall and among the poor, almost 100%
of households in the few high income countries with data
reported at least some members having insurance cover-
age, while only 2% of households in low income countries
reported some health insurance. Households in higher
income countries also tended to rate public sector func-
tioning and positive experience higher than households in
lower income countries.

3.2. Relationships of access to care and burden of
expenditures with risk protection

We hypothesized that a functioning public sector is
related to better health care access and lower burden of
expenditures. Fig. 1 suggests that in countries where those
who used outpatient care rated provider skill, equipment,
and medicines as adequate, a higher proportion of house-
holds received all needed medicines (although access to
medicines varied widely across countries with high public
sector functioning); a lower proportion of households used
savings, borrowed, or sold assets to pay for health care.
Similar patterns were observed for other access and bur-
den measures and public sector functioning (data available
upon request).

We assessed the effect of risk protection through health
insurance in multi-variable household-level models across
51 countries that had sufficient data to construct access,
burden, and insurance indicators. Generally, households in
which members were insured were more likely to have
access to care and less likely to be burdened by health care
expenditures than households without insurance (Table 3).
Perceptions about the adequacy of public sector function-
ing and positive public sector experience moderated the
effect of insurance on access and burden. However, even
when the public sector was perceived as adequate, hav-
ing all household members insured significantly improved
the odds of having access to care when last needed (odds
ratio 1.54; 95% confidence interval [1.30, 1.83]) and to adult

| Table 2 |

Household health care and medicines expenditures in 2002 US$, overall and for poor households$. |

<table>
<thead>
<tr>
<th>Country income category</th>
<th>Total population</th>
<th>Poor population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Lower middle</td>
</tr>
<tr>
<td>4-week total household expenditures</td>
<td>64 [49,83] (20)</td>
<td>114 [89,142] (15)</td>
</tr>
<tr>
<td>4-week health care expenditures among households with non-zero health care expenditures</td>
<td>7 [4,10] (22)</td>
<td>11 [7,21] (18)</td>
</tr>
<tr>
<td>Percent health care expenditures of total expenditures among households with non-zero health care expenditures</td>
<td>31.8 [18,37] (22)</td>
<td>21.7 [18,25] (18)</td>
</tr>
<tr>
<td>Percent medicines expenditures of total expenditures among households with non-zero medicines expenditures</td>
<td>7.5 [4,8] (22)</td>
<td>7.9 [6,8] (17)</td>
</tr>
<tr>
<td>Percent households with 100% health care expenditures on medicines among households with non-zero health care expenditures</td>
<td>40.8 [33,54] (22)</td>
<td>46.4 [34,60] (16)</td>
</tr>
</tbody>
</table>

$ Values displayed are medians [25th and 75th percentiles] and (number of countries) in each 2003 World Bank country income category in which at least 70% of households contributed data. Poor households are those in the lowest two income quintiles as determined by self-reported permanent assets.
chronic care (1.38 [1.31, 1.44]); insurance also decreased the odds of potentially catastrophic health care expenses (0.84 [0.81, 0.88]) and of having to use savings, borrow money, or sell assets to pay for care (0.66 [0.64, 0.68]) (Table 3). The effect of health insurance on medicines access is less clear – a functioning public sector attenuates the positive effect of insurance on medicines access. Regardless of health insurance status, households reported better access to care and medicines and lower expenditure burden in environments where public sector functioning is rated better (Table 3, Fig. 2).

Several household and respondent characteristics were related to access and risk protection. For example, controlling for insurance status and public sector characteristics, adults in households with six or more members were less likely to access treatment for chronic illnesses (0.95 [0.91, 0.99]) and more likely to pay for care through savings, selling assets, or borrowing money (1.22 [1.19, 1.25]). Similarly, households where the highest education level was less than primary school were less likely than those with higher education levels to access needed care (0.79 [0.70, 0.88]), more likely to have potentially catastrophic health care expenses (1.18 [1.13, 1.22]) and more likely to use undesirable coping strategies (1.11 [1.07, 1.14]). Descriptive statistics and parameter estimates for all variables in the models are available upon request.

4. Discussion

The results of our analyses of WHS data from 2002 to 2003 indicate that protecting households from high burden of health care costs is associated with better access

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Insurance coverage</th>
<th>Public sector functioning adequate</th>
<th>Positive public sector experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At least one member insured (vs. none)</td>
<td>All members insured (vs. none)</td>
<td></td>
</tr>
<tr>
<td>Access – care last time needed</td>
<td>1.45 (1.23, 1.70)</td>
<td>2.06 (1.79, 2.36)</td>
<td>–</td>
</tr>
<tr>
<td>Access – adult chronic care</td>
<td>1.43 (1.36, 1.51)</td>
<td>1.63 (1.57, 1.70)</td>
<td>–</td>
</tr>
<tr>
<td>Access – all or most medicines</td>
<td>1.11 (1.03, 1.20)</td>
<td>1.27 (1.20, 1.35)</td>
<td>–</td>
</tr>
<tr>
<td>Burden – potentially catastrophic spending</td>
<td>0.92 (0.88, 0.95)</td>
<td>0.69 (0.67, 0.72)</td>
<td>–</td>
</tr>
<tr>
<td>Burden – paying with savings, selling assets, borrowing</td>
<td>0.77 (0.74, 0.79)</td>
<td>0.51 (0.49, 0.52)</td>
<td>–</td>
</tr>
<tr>
<td>Access – care last time needed</td>
<td>1.32 (1.08, 1.61)</td>
<td>1.54 (1.30, 1.83)</td>
<td>2.80 (2.39, 3.28)</td>
</tr>
<tr>
<td>Access – adult chronic care</td>
<td>1.30 (1.23, 1.38)</td>
<td>1.38 (1.31, 1.44)</td>
<td>1.36 (1.31, 1.42)</td>
</tr>
<tr>
<td>Access – all or most medicines</td>
<td>0.94 (0.86, 1.02)</td>
<td>1.02 (0.95, 1.09)</td>
<td>1.45 (1.36, 1.54)</td>
</tr>
<tr>
<td>Burden – potentially catastrophic spending</td>
<td>1.03 (0.98, 1.08)</td>
<td>0.84 (0.81, 0.88)</td>
<td>0.58 (0.56, 0.61)</td>
</tr>
<tr>
<td>Burden – paying with savings, selling assets, borrowing</td>
<td>0.96 (0.92, 1.00)</td>
<td>0.66 (0.64, 0.69)</td>
<td>0.80 (0.78, 0.82)</td>
</tr>
</tbody>
</table>

* All models control for household size; having a member age 60 years and older or a child under 5 years; highest education of any household member; household poverty; total household expenditures; urban location; respondent gender, age, marital status, education, and health status.
to acute and chronic care for adults and children, less risk of potentially catastrophic health care spending, and less use of coping strategies that further deplete household long-term resources. Our results are less clear with respect to medicines access. Specifically, when all household members are insured, access to acute and chronic care is better and economic burden is lower, even when households rate the functioning of the public sector highly; however, access to medicines is not necessarily improved. Health insurance programs are intended to protect households from burdensome health expenditures by covering all of part of the costs of care. Effects of health insurance coverage on access to care and medicines depend on the type and extent of benefits provided by each program, and the amount of out-of-pocket copayments members incur for services. Unfortunately, this information is not part of the WHS. In many developing countries, health insurance programs do not provide medicines benefits or do so with substantial copayments. Without a broad medicines benefit, insurance coverage may not improve overall access to medicines. In fact, if insurance covers inpatient care and outpatient physician services but not the costs of the medicines prescribed during consultations, insurance coverage may lead to worse access to medicines and to higher financial burden because households need to pay for prescribed medicines out-of-pocket.

While the roles of the public and private sectors in health care delivery in LMIC continue to be debated, studies suggest that inaccessibility of public services, poor availability of medicines and equipment, and perceptions of lower quality diagnosis and treatment prompt the high use of more expensive private sector care in LMIC. In particular, households in developing countries purchase most medicines in the private sector, arguably because perceived or actual availability and quality of medicines in the public sector are low, fees are high, and waiting causes additional opportunity costs. Our results indicate that positive overall perceptions of public health care service delivery in a country are associated with better access to acute and chronic care for adults and children, better access to medicines, less risk of potentially catastrophic health care spending, and less likely use of negative financial coping strategies.

The present study adds to existing knowledge by shedding light on the relationships between access to care, financial burden of health care costs, and risk protection for households at different levels of poverty in more than 50 countries. Different from previous research, the study benefits from the availability of comparable data.
on both access to care and household expenditures that allowed construction of key indicators on access and burden across a large number of low and middle income countries.

Nevertheless, the available data pose several limitations. We lack data on the indirect costs of seeking care and medicines, including lost income due to ill health, travel, waiting at health care facilities, or providing care to family members [20]. Our estimates of household health care expenditures are therefore lower than the true costs of health care.

The WHS collected data on health status, health care need, and health care and medicines access for one adult household respondent and the youngest child in the household. We do not have information on health care need and access for all household members and may thus misclassify households with respect to need and access.

Our proxy measures of a functioning public sector are weak. Ideally, we would like external measures of how well the public sector functions, as indicated by the quality of care and medicines provided, how easily and reliably people can access public facilities, how well they are treated, and how much they have to pay for services. In the absence of such indicators, we used as proxy measures of functioning the perceptions of a fraction of respondents in households who used and rated the public sector outpatient care they received in the past year. Although they may misclassify the true status of public sector functioning in many countries, the strength of the overall relationships between these ratings with access and expenditures provides some face validity of these proxy measures.

Due to the nature of large household surveys, the data are cross-sectional and do not allow us to assess the cumulative effects of illness, access to care, and health care spending over time. Understanding the dynamic effects between these and other factors (for example, loss of income due to illness) is particularly important as chronic illness prevalence increases globally.

Lastly, key expenditure data are missing for almost all high income countries and results are thus not representative for this group.

These limitations notwithstanding, the results from the present analyses in more than 50 countries argue for increased attention to protecting households from the economic risks of ill health. If high quality care and medicines were conveniently available at affordable cost for those who can pay, and at no cost for the poor in either public facilities or private facilities contracted by government [15], poor households would experience less out-of-pocket cost burden [19] from medicines.

Our results also provide further evidence for the urgent need to expand health insurance coverage, so that all households can have access to needed care without risking financial hardship. In 2005, WHO member states endorsed universal coverage as a goal of health care financing and a framework exists to support countries in their development and implementation of necessary revenue collection, risk pooling, and purchasing mechanisms [21]. Based on the importance of medicines in treating acute and chronic illnesses, and because of their contribution to high out-of-pocket health care expenditures, coverage of essential medicines should be an early, key consideration as countries move from user fees to pooled pre-payment mechanisms. Establishing universal coverage of essential medicines is complex. Even in countries with established health insurance systems that cover inpatient care, patients pay out-of-pocket for most medicines [13,22]. The need to pay for outpatient medicines continues to put even insured patients at risk of high financial burden and leads to avoidable high health system costs through overuse of covered hospital care [22].

A preliminary framework exists to guide the expansion of medicines coverage policies in insurance systems in low and middle income countries [23]. Largely based on approaches in developed countries, [11] it suggests combining educational, managerial, financial, and contractual (“active purchasing”) policy approaches to incentivize providers and members in health insurance systems to achieve cost-effective use of medicines. However, little information exists on the effects of specific pharmaceutical benefit policy approaches in low and middle income countries. Countries implementing or expanding health insurance systems need to monitor medicines utilization and evaluate the effects of specific medicines coverage policies on access, use, and affordability of medicines.

5. Conclusions

To improve access to care and medicines and decrease economic burden of health care expenditures on households, policy makers should improve affordable provision of quality care, increase health insurance coverage, and expand medicines benefit policies in health insurance systems.

Role of the funding source

The World Health Organization (WHO), Geneva, developed and collected the data for the WHS and provided country and survey module level data files to the study team and WHO staff provided answers to requests for clarification. WHO was not involved in the design of the study, analysis, and interpretation of the data.

Disclosure statement

The corresponding author had full access to all data analyzed in the study. All authors confirm that they have no conflicts of interest.

Acknowledgements

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