



Measuring the affordability of medicines: Importance and challenges^{☆,☆☆}



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ABSTRACT

The issue of affordability of health care services remains high on the (health) policy agenda. Determining whether health care services are affordable is complex, however, as the concept 'affordability' is inherently normative. With a focus on measuring affordability in low- and middle-income countries, we discuss different methods used to operationalize this concept. Using the example of medicine purchases in Indonesia, we show the choice of method and threshold to have a significant impact on outcomes. We argue it is important to further standardize methods and appropriate threshold use in applied research to increase comparability of results and to facilitate sound assessments of affordability.

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1. Introduction

Issues of affordability appear to be at the center of health care discussions and decisions. Politicians and health care policy makers alike, in both high- and low- and middle-income countries (LMICs), see themselves confronted with the challenge of ensuring and, where possible, increasing access to health care services of sufficient quality for all those in need while at the same time containing (public) health care expenditures. This challenge raises numerous important questions and dilemmas. Some have even argued that these goals form an 'inconsistent triad', i.e.

that they can never be completely fulfilled simultaneously [1]. Still, policy makers may attempt to strike an optimal balance in reaching these goals.

An important issue in that context is that of affordability. In both high- as well as low- and middle-income countries policy makers struggle with questions regarding the payments people should be able to make out-of-pocket (OOP) on health care or through copayments in some form (affordability at micro level) and the sustainability of public funding of the health care sector raised through premiums or taxes (affordability at macro level) [2,3]. Because in LMICs the large majority of the population does not have health insurance [4], OOP payments are an important source of health care financing. Much of these OOP payments are on medicines, as in LMICs medicine expenditures often constitute a large portion of total health expenditures [2,3,5–7]. Indeed, as in LMICs the availability of 'free' quality assured medicines in the public sector often is low, people are forced to buy their medication in the private sector where prices are commonly high [3]. This immediately stresses the issue of affordability. By definition, an average individual in a low- or middle-income country has only a limited amount of resources with which all basic needs (food, housing, etc.) need to be fulfilled. The

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amount of money people thus can spend on health care, or more specifically medicines, therefore is limited. If prices of these medicines exceed the budget, people may forego procurement of essential drugs, go into debt or forego other essential purchases [3,7,8]. This stresses the gravity of the topic of affordability, which is also emphasized in several international treaties in which the access to health care is established as a right. This therefore must imply that OOP payments should be, somehow, 'affordable' [9].

In this paper, we will highlight the issue of defining and measuring affordability. We focus on affordability of health care, and medicines in particular, at the micro level in LMICs. We will emphasize how different methods to quantify affordability can have their specific limitations and lead to different results. Within methods, a further source of variation in affordability is setting a specific threshold for affordability. We will address these issues generally and will use the example of Indonesia to illustrate our point.

The paper is structured as follows. After a concise introduction of affordability, we first discuss several empirical studies of affordability in health care. We will highlight the differences in methods used and differences in operationalisations of similar methods. Next, we use an example of hypothetical medicine procurements in Indonesia to show how these different methods and their operationalisations influence the outcome of affordability measurement. The paper concludes by arguing that further standardization of methods used in this area will allow better comparison of results across studies and may stimulate further debate on when specific health care interventions can be deemed affordable or should be deemed unaffordable.

2. On affordability of health care and medicines

Affordability is an important, yet hard to define let alone operationalize concept. This has much to do with the fact that, by definition, defining affordability is a normative issue [10]. Indeed, it requires defining when we consider something to be too expensive for someone. One (extreme) answer could be that a good is unaffordable when the price of that good exceeds the total budget a person can attract. That however disregards all other spending (even at subsistence level) that a person needs to do. Another viewpoint could be that a person should at least be able to fulfill other basic needs after having purchased the good. From such a viewpoint a good is unaffordable if the individual, after the purchase, does not have enough resources left to fulfill her basic needs, i.e. falls below a poverty line. A difficult subsequent issue relates to the level at which the poverty line is set. A final alternative would be to link the price to the income of the individual and require it not to exceed some percentage of total income. Again here, a difficult next question is what this percentage should be exactly. When is it too expensive, that is, unaffordable? Unsurprisingly therefore, scholars in various fields, working on defining and measuring affordability, have indeed acknowledged the normativity of the affordability concept [10–16]. Moreover, it need not surprise that in applied work different concepts are used to calculate affordability in different areas such as housing [13,17,18], education [19,20], transportation [21,22] and utilities [14,23].

In many studies investigating (un)affordability of goods and services, the focus is on estimating a proportion of the population for which a particular good or service is unaffordable. In general, this requires three different sources of information: (i) the price of a commodity or service; (ii) income(s), and (iii) some measure of unacceptable burden [16,24]. The latter shall be labeled as 'threshold' henceforth. Whereas the first two parameters are to a large extent a matter of obtaining appropriate data (which can be challenging as well), setting the threshold essentially involves a normative choice, but one that influences the outcomes significantly. It thus lies at the heart of the 'vagueness' [10] of the affordability concept and appears an issue that deserves more debate and, if possible, further standardization.

In calculating affordability, the two most applied methodologies relate to the concepts of impoverishment and catastrophic spending as developed and applied by renowned health economists Wagstaff and van Doorslaer [25,26]. Methods based on the impoverishment concept calculate the proportion of the population that, after spending on a good/service, drops below a *relevant poverty line*. Thus, the impoverishment method works from the premise that there is an absolute minimum level of income people require for basic necessities. Implicitly, some poverty line is used as a threshold, therefore. The other method, catastrophic spending, calculates the proportion of the population that would spend more than X percent of their income to pay for a good/service. This method thus sets a threshold in terms of a forgone *proportion of income*. The underlying idea is that if a household spends a larger fraction of its income than the specified percentage on a particular good or service, it will have to scale back its consumption in other areas to an inappropriate extent. A common way of using these methods is to retrospectively assess how many people actually experienced impoverishment or catastrophic payments due to expenditures (on health care) [25,26]. The methods can also be used to prospectively calculate the proportion of the population for which the good *would be* unaffordable if it needed to be purchased. This provides insight in the proportion of the population at risk of facing either impoverishment or catastrophic payments *if the good or service would need to be bought* [7].

Because affordability in the impoverishment and catastrophic payment methods is calculated in relation to the actual incomes in the population, they automatically take into account the income distribution. An alternative methodology recently developed by the World Health Organization (WHO) and Health Action International (HAI) measuring affordability does not use this distribution. This straightforward method expresses the affordability of medicines in the number of days' wages the lowest paid unskilled government worker (LPGW) needs to spend to procure a course of treatment of a particular medicine [3,27]. WHO/HAI do not pose a threshold with the LPGW-method and leave the judgment regarding whether some medicine is deemed affordable to local policymakers who more easily can position the LPGW wage in relation to the average income (and its distribution) of the local population. Each of these three methods has own limitations, which will be briefly discussed in the next section.

3. Different methods, different limitations

The retrospective or prospective application of the impoverishment method captures the people that were or would be pushed below some relevant poverty line due to the procurement of health care or medicines (the impoverishment rate) and, as such, immediately shows which proportion of the population was impoverished or is potentially at risk of becoming impoverished. The method's main weakness is that it normally works from a rather extreme threshold. If used naively the method also ignores those already below the poverty line, which obviously can be easily corrected by including those living below that line anyhow [7]. Furthermore, for those people who are not pushed below a (commonly low) poverty line, but nonetheless experience a strong income drop, the relevant good is not deemed unaffordable, which may be considered debatable. Elevating the poverty line to a higher level could help, of course, but at the same time stretches the concept of poverty. A clear consensus on what the poverty line is or should be, does not exist. This is reflected in the range of values used in applied literature [2,3,7,28–31]. Hence, the more fundamental question is what poverty actually entails.

The main weakness of the catastrophic approach is that the rich, who can easily spend more than X percent of their income on medicines without suffering any hardship, are included in the estimates of 'unaffordability', while the very poor, for whom spending less than X percent may already be difficult (due to strict budget constraints and perhaps being pushed under a poverty line) are not. Hence, the method may not fully capture those individuals in estimating affordability, for which affordability, loosely defined, is actually a problem. The main question remaining in the catastrophic payment approach hence concerns the level of spending to be deemed affordable, and whether such a level might differ for high and low incomes.

The main advantage of the LPGW method is its simplicity and straightforwardness, both in terms of its application and how, on a local level, many people may be able to position themselves in relation to this LPGW. However, in its simplicity also lies its main weakness, i.e. knowing the number of daily wages the LPGW needs to pay for a course of medicines does not provide clear information on what this means for the population as a whole. Furthermore, its link to the concept of affordability also is less clear as is setting a threshold for the number of days the LPGW needs to work for medicines.

A shortcoming the three methods have in common is that comparing their results across countries and time is not possible when different thresholds (let alone methods) are used. The choice of methods and their operationalization thus requires attention. This is highlighted in the next section, where we focus on the most commonly used impoverishment and catastrophic payment methods.

4. Practical applications of the methods

As the impoverishment and catastrophic payment methods define affordability in different ways, they can yield different answers to the question whether some

medicine is affordable to specific populations. Moreover, *within* methods the variation in answers can also be rather large when different poverty lines are used within the impoverishment method or when different percentages are used in operationalizing the catastrophic payment method. The next paragraph will substantiate this point by summarizing the findings of different empirical studies. (It needs noting that different data sources can also affect the outcomes.)

Several studies have been conducted applying these methods in the health care sector. In investigating the effect of OOP payments in health care on poverty estimates in 11 LMICs, van Doorslaer and colleagues used the World Bank's absolute poverty lines of US\$1.08 and US\$2.15. Using household data and actual expenditures they retrospectively show 78 million people to have dropped below the US\$1.08 poverty line when their payments for health care were subtracted from their incomes [2]. Niëns et al. worked with the World Bank's 2005 poverty line of US\$1.25 and US\$2.00 [32,33] to calculate medicine affordability for four essential medicines across 16 LMICs with a total population over 775 million. Applying the methods prospectively, their results for example indicate that, at the US\$1.25 PL, the lowest cost medicine (salbutamol inhaler), would be unaffordable for 140 million people in these countries [7]. Finally, in Mexico, Knaul et al. applied a US\$1.00 threshold, reporting 3.8% of families to suffer from impoverishing health care expenditures each trimester [34].

Besides these poverty lines other thresholds have been used as well within the impoverishment method. In Vietnam, Wagstaff and van Doorslaer applied both a food-based poverty line, based on the cost of reaching an intake of 2100 calories per day, as well as a poverty line that captured spending requirements on food and non-food items [26]. Furthermore, in Thailand several studies used the official national poverty line adapted to the specific province [29,31]. These studies showed that households using private inpatient services had a higher incidence of impoverishment [31] and that impoverishment rates decreased after the implementation of a policy broadening insurance coverage [29].

For catastrophic spending methods in the realm of health care, Xu et al. retrospectively applied a threshold of "40% of income remaining after subsistence needs have been met" [28]. They found that a 1% increase in the total proportion of total health expenditures provided by out-of-pocket payments resulted in a 2.2% increase in households facing catastrophic expenditures. Although Sun et al. also used the 40% of non-food expenditure threshold when retrospectively calculating the affordability of total health care in rural China, using sensitivity analyses with thresholds of 20%, 30%, 50% and 60%, they found catastrophic payments to decrease by 34.77% comparing the 20% and 60% thresholds [30]. Using similar thresholds (20%, 30%, 40% and 60%) in a study in Burkina Faso, Su et al. found catastrophic health care expenditure to decrease by 57.26% comparing the 20% and 60% thresholds [35]. Niëns et al. prospectively applied a 5% threshold of daily income when calculating the affordability of an anti-diabetic drug, glibenclamide, and found 65.9% and 78.6% of the Indonesian and Indian populations respectively to be

Table 1
Affordability studies in Health care.

Authors	Country	Topic	Method: Impov./Cat.	Income measure	Poverty Line used	Results
van Doorslaer et al. [2]	11 LMICs	Total health care costs	Impov. (R)	HH-surveys	- US\$1.08 & US\$2.15	78 million people dropped below US\$1.08 due to HC costs
Niëns et al. [7]	16 LMICs	Medicine affordability	Impov. (P)	Estimates from aggregated World Bank data	- US\$1.25 & US\$2.00	At US\$1.25 salbutamol inhaler is unaffordable for 140 mln. people on pop. of 775 mln.
Knaul et al. [34]	Mexico.	Total health care costs	Impov. & Cat. (R)	Mexican Survey of HH income and exp.	- US\$1.00 – 30% of total income minus food exp.	3.8% of pop. impoverished (most in low-income quintiles)/cat. payments over total income distribution
Wagstaf and van Doorslaer [26]	Vietnam.		Impov. & Cat. (R)	Total HH cons., gross of OOP payment for health services.	- FPL based on cost of reaching 2100 calories per day -PL capturing spending on food and non-food items.	Between '93 and '98: – Impov. FPL dropped from 4.4% to 3.4%. For the PL impov. increased: 0.4% to 0.5% – Cat. payments more concentrated amongst the poor but decreased in time period
Limwattananon et al. [31]	Thailand.	Total health care costs	Impov. & Cat. (R)	Total HH- exp.	- Official national PL adapted to regions - 10% of total cons.; food included.	Cat. payments mostly occur for inpatient services (31.0% in '00 and 14.6% in '04). For outpatient services they decreased by approx. 33% (12.0% in '00 to 8.3% in '04)
Somkotra et al. [29]	Thailand.	Total health care costs	Impov. & Cat. (R)	Total HH-cons.	- Province-specific PL. – 5%/10%/15% of total cons. – 25%/30% of non-food cons.	Introduction UC in '00→ Cat. Payments decreased by 24.48% between '00 and '04. Impov. Decreased from 1.23% to 0.58% in same time period.
Xu et al. [28]	59 countries.		Cat. (R)	HH-surveys.	- 40% of income minus average food exp.	1% increase in proportion total HC exp. Paid for by OOP payments → 2.2% increase in HHs facing cat. Payments
Sun et al. [30]	Rural China; Shandong Province.	Total health care costs.	Cat. (R)	HH-survey.	- 40% of income minus average food exp.; with sensitivity analysis of 20%-30%-50%-60%	Cat. payments decreased by 34.77% between 20% and 60% thresholds
Su et al. [35]	Burkina Faso	Total healthcare costs	Cat. (R)			Cat. payments decreased by 57.26% between 20% and 60% thresholds
Niëns et al. [16]	Indonesia and India	affordability glibenclamide (anti-diabetic)	Cat. (P)	HH- surveys	5% threshold of daily income	65.9% of Indonesian & 78.6% of Indian pop. face Cat. payment
Cameron et al. [3]	36 countries	Medicine affordability	LPGW (P)	N/A	N/A	affordability differs much in WHO-regions

Abbreviations: Cat, catastrophic; cons, consumption; exp, expenditure; FPL, food-poverty line; HC, health care; HH, Household; Impov, Impoverishment; LPGW, Lowest Paid Government Worker; N/A, not applicable; OOP, out-of-pocket; PL, poverty line; poppopulation; UC, universal coverage; (P), prospective; (R), Retrospective.

Table 2

Affordability estimates: impact of methods and thresholds.

Methods	Outcome measure	Medicine (condition)		
		Glibenclamide (diabetes)	Amoxicillin (acute respiratory infection)	Atenolol (hypertension)
Panel A: Affordability estimates for 3 lowest priced generic medicines with micro data and methods				
Impoverishment	impoverishment rate	5.8%	14.2%	21.6%
	<US\$1.25 poverty line			
	impoverishment rate	3.7%	8.2%	11.6%
	<US\$2.00 poverty line			
Catastrophic payment	Catastrophic expenditure at 5%	65.9%	95.8%	98.6%
Lowest paid government worker	# of daily wages needed	0.6 days	0.4 days	2.4 days
Panel B: impoverishment rates at different thresholds				
	2011 National PL Indonesia (US\$0.89)	4.7%	13.5%	22.5%
	US\$1.08	6.0%	15.2%	23.5%
	US\$2.15	2.8%	6.3%	9.3%
Panel C: catastrophic payments at different thresholds				
	1.0%	>99%	>99%	>99%
	2.5%	92.3%	>99%	>99%
	5.0%	65.9%	95.8%	98.6%
	7.5%	37.1%	88.1%	96.4%
	10.0%	17.2%	78.0%	92.5%

at risk of facing catastrophic payments [16]. Wagstaff and van Doorslaer retrospectively used a range of thresholds (2.5%, 5%, 10% and 15%) which were applied for both pre-payment income and non-food expenditures [26]. One of their findings was that, in Vietnam, it was not inpatient care that increased poverty so much, but rather expenditures related to non-hospital care like medicine procurements. Knaul et al. also applied the catastrophic spending method but did so using a 30% threshold of income. Whereas they found almost all households with impoverishing effects to be from the poorest quintile, catastrophic health care payments were observed throughout the income distribution [34]. In Thailand, whereas Limwattananon et al. applied a threshold of 10% of total consumption including expenditures on food [31] Somkotra and Lagrada used ranges of thresholds of both total consumption (5%, 10% and 15%) and non-food consumption (20%, 25% and 30%) [29]. Both studies reported that moving toward implementation of universal health insurance coverage in 2001 decreased catastrophic expenditures [29,31]. The previous overview shows the affordability of health care and medicines in LMICs to vary and highlights the different thresholds used between but also within methods. Whereas some of these differences are likely to be data driven others may reflect differences in approach to or (even) opinion about affordability.

Using the LPGW methodology Cameron et al. find medicine affordability to differ significantly between WHO-regions. They show whereas treating an ulcer with a month's course of private sector originator brand (OB) ranitidine (150 mg capsules or tablets, two a day for 30 days) costs more than 35 days' wages in Africa, in South-east Asia this is just 2.7 days' wages [3]. Moreover, when defining affordability in relation to some normative threshold in terms of a maximum number of wage days a person could spend on a purchase of medicines before deeming it unaffordable, similar problems regarding comparability

between studies could occur as for the two other methods described above. These results are summarized in Table 1.

We will show that the previously explained differences and choices are not only theoretical but in effect influence outcomes. To illustrate this, and to stimulate the debate regarding appropriate and comparable measurement of affordability, we prospectively calculate the affordability of Lowest Priced Generic (LPG) glibenclamide, amoxicillin and atenolol in Indonesia, using both the impoverishment and catastrophic spending methods.

5. Putting the methods into practice: the case of medicine affordability in Indonesia

Niëns et al. [16] used LPG prices to prospectively calculate the affordability of LPG glibenclamide (used for treating diabetes; 5 mg per tablet at a daily cost of US\$0.11) in Indonesia. They applied the impoverishment method as described by O'Donnell et al. [36], using household level income data from the 2005 wave of the Indonesian National Socioeconomic Survey (Susenas – $n = 7302$ households) [37]. Thus, they calculated the percentage of the population that would be pushed below a poverty line when having to procure LPG glibenclamide. Using PLs of US\$1.25 and US\$2.00 they found 28.8% and 61.7% of the population, respectively, to already live below the poverty line *before* hypothetical medicine purchases. For them, the medicines may therefore be deemed unaffordable *at any price* above zero.

Applying the impoverishment method prospectively indicated that 5.8% and 3.7% of the population would be impoverished due to medicine procurement, using the two respective poverty lines [16]. Working with the prospective catastrophic payment method and a threshold of 5% (using household level income data), indicated that a proportion of 65.9% of the population would not be able to purchase glibenclamide without a catastrophic payment exceeding

5% of their daily income [16]. Using the LPGW approach WHO/HAI finds the LPGW needs 0.6 days' wages to pay for one course of treatment.

Here we repeated the same calculations for glibenclamide, amoxicillin (used for treating an acute respiratory infection; 250 mg per tablet at a daily cost of US\$0.27) and atenolol (against hypertension; 50 mg per tablet at a daily cost of US\$0.43) (see Table 2: panel A).

Besides the US\$1.25 and US\$2.00 poverty lines, we used the same household level income data to calculate the impoverishment and catastrophic payment rates for these three medicines at different thresholds. Impoverishment rates were calculated for the US\$1.08 and US\$2.15 poverty lines as used by van Doorslaer et al. [2] and the 2011 national poverty line of Indonesia which is US\$0.89 [38]. All calculations were done with poverty lines that were recalculated to local currency units using the Purchasing Power Parity conversion factor from 2005 [39]. Panel B shows the impoverishment rates to vary strongly with the thresholds used. Whereas for glibenclamide we find 4.7% of the Indonesian population impoverished at the national poverty line, for the US\$1.08 and US\$2.15 poverty lines this is 6.0% and 2.8% respectively. For amoxicillin and atenolol these proportions range from 15.2% and 23.5% at the US\$1.08 poverty line to 6.3% and 9.3% at the US\$2.15 poverty line, with the impoverishment rates at Indonesia's national poverty line, i.e. 13.5% for amoxicillin and 22.5% for atenolol falling in between.

Varying the catastrophic payment thresholds we also find large differences (see Panel C). If people are allowed to spend no more than 1.0% of their daily income on glibenclamide this medicine is unaffordable for more than 99% of the population, whereas increasing the threshold to 10% results in glibenclamide being deemed unaffordable for 17.2% of the population. For amoxicillin and atenolol these proportions range from over 99% for the 1% threshold to 78% and 92.5% at the 10% threshold, respectively.

6. Conclusion and discussion

Affordability is an important issue in many health care systems, especially those in LMICs. Van Doorslaer [2] highlight that only in Asia, already 78 million people would be pushed below the poverty line of \$1 per day after paying for health care. Medicines commonly constitute a large part of health care consumption. In many LMICs, therefore, essential medicines are unaffordable for many [3,7]. Niëns et al., for example, estimated that for over two-fifths of the in total approximately 775 million people in 16 LMICs, essential medicines are unaffordable [7]. They show this problem to be especially pressing for people suffering from chronic non-communicable diseases which require life-long ongoing medicine purchases [7].

These figures demonstrate that improving the affordability of health care, and especially medicines, should be an important policy goal. The current levels of unaffordability can have important detrimental health effects in the most vulnerable groups in the world. Governments have several options at their disposal to increase the affordability of health care and medicines, also in LMICs. From ensuring that quality assured generic medicines are available in

the public sector, to removing import levies on medicines and exempting them from value added tax, to implementing regulated (regressive) mark-up systems for medicines in the distribution chain [3]. Furthermore, installing pre-payment schemes (insurance) to finance health care offers the possibility for governments to better control (generic) medicine purchases and prices [40–42]. Such policies are ideally based on sound information on the current problem and evaluated to judge their impact. In that context it is pivotal to measure and quantify affordability.

Over the years, useful methodology has been developed by leading experts in the field [e.g. 25,36] that allows the quantification of the inherently 'vague' concept of affordability. Still, as the literature and our results show, the impact of the methods chosen to measure affordability as well as the thresholds chosen within those methods is significant on final outcomes. It appears that the observed differences, which are also reflected in the empirical literature regarding affordability, reflect the difficulty of univocally grasping the concept of affordability and to find suitable and general thresholds for affordability. The two most prominent methods, the impoverishment and the catastrophic payment method, both use different operationalisations of the concept of affordability and within the methods different thresholds are used, reflecting the difficulty in setting one unique standard for affordability. While the difficulty is understandable, the implications are worrisome since arbitrary variations in thresholds may strongly affect affordability estimates and, hence, may unduly if the thresholds or methods may be deemed inappropriate—influence policy makers and the sense of urgency regarding matters of financial access to health care and medicines.

In light of these findings, we argue that two things would be useful. First, it may be worthwhile to create a (preliminary) standard for calculating affordability. Rather than attempting to develop new methods (with own limitations) a fruitful way forward is to work with a fixed combination of methods and a fixed combination of affordability thresholds. As a first suggestion, we would recommend using both the impoverishment and catastrophic payment methods. This would ensure that large proportions of income being spent or required for the purchase of medicines would be detected (even when these do not push the individuals involved into poverty) and that those individuals who are pushed into poverty would also be detected; even when the proportion of income spent on medicines is fairly limited. Second, in terms of a threshold, it seems that a general discussion between policy makers and researchers leading to a (standard) range of thresholds would be a logical choice, given the current variation.

We emphasize that the threshold can and should be set in relation to the good or service under study. For instance, since medicines form only a portion of total health care expenditures, one may set catastrophic payments thresholds and impoverishment thresholds higher/lower when studying medicine expenditures than when studying health care expenditures. Studying partial expenditures in some area should be judged against different thresholds than when considering the whole. Similarly, a distinction

could be made between chronic and acute diseases, as the former require ongoing, sometimes lifelong expenditures. These may, *ceteris paribus*, sooner be considered unaffordable than once only purchases. For instance, in case of chronic conditions, it is less possible for people to use coping mechanisms like spending savings, loaning or selling assets to pay for the health care expenditures [8].

To help politicians and governments improve the access to medicines we therefore argue scholars and policy makers should discuss and agree on an international benchmark for how to best address the affordability question. An international benchmark, both in calculating and reporting, would foster transparency and intertemporal and international comparison. Since comparison in itself can increase the awareness and sense of urgency for governments to act swiftly on these issues, such a benchmark should be discussed.

To conclude, affordability is important and increasingly quantified. In order to increase comparability, also across countries, we urge for a further standardization of the measurement of affordability.

Conflicts of interest

None declared.

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