Chapter 9

A New Approach to Measuring Health Development: From National Income Toward Health Coverage (and Beyond)

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Abstract

This chapter proposes an alternative approach to identify and constraints in countries, based on indicators that are broader than national income and more relevant to assess the stage of national development in health. A conceptual framework of “health coverage” underpins the construction of sub-indices of national performance in the dimensions of access to care, financial risk protection in health and domestic financial constraints, which are then used to construct overall indices of national health development. Country rankings in the health development scale vary substantially when the conditions of access to care, financial protection and domestic capacity to finance the health system are considered, compared to conventional income rankings. Furthermore, the decomposition of our health development indices sheds light on important aspects for health policy, including the identification of cases where there is a need for external support to maintain and expand current health coverage levels, as well as preliminary insights into specific support modalities by donor agencies that may be more efficient to promote health development in a particular setting. This chapter also demonstrates how our proposed indices can inform policy decisions at a higher granularity level subject to the availability of subnational level data.

1. Introduction

Historically, national income has been chosen in practice as the key (or only) indicator of a country's development achievement by multilateral organizations and countries that provide development assistance (Equitable Access Initiative, 2016). This choice is mainly due to pragmatic reasons. Average income levels — measured usually through Gross National Income (GNI) or Gross Domestic Product (GDP) per capita (pc) — are considered to be reasonably good indicators of a country's economic welfare. Measures such as GNI pc are simple, well understood and widely available for almost every country in the world.

Yet, the simplicity of GNI or GDP pc indicators means that many aspects of a country's development that may be deemed relevant for the assessment of population welfare are not satisfactorily captured in the measurements. In the health area, countries that make progress in terms of average income may do so with a persistent and very significant overall burden of disease, and this has been the situation in most low- and middle-income countries (LMICs) — including many of the countries that transitioned to the “middle-income” status in recent years and suffered a consequent reduction in aid flows to their health sectors based on their revised GNI pc levels (Equitable Access Initiative, 2016). Despite the rise in average incomes, some of these countries may still need a strong international contribution to remedy the lack of their health system's capacity to cope with a large and changing burden of disease.

Multilateral institutions such as World Health Organization (WHO), the World Bank and others have been urging countries to take concrete steps toward the achievement of universal health coverage, which in its simplest formulation means providing all people with access to needed health services of sufficient quality, which should be effective, without imposing financial hardship (WHO, 2010). Effective access to the health system accompanied (and enabled) by higher reliance on prepaid health spending and risk pooling mechanisms are regarded as key conditions for actual progress in terms of population health coverage, and expansions in coverage have become a fundamental development objective in the health sector (Backman *et al.*, 2008; Garrett *et al.*, 2009). Countries where the

average income has been increasing may still experience major challenges in meeting the fundamental development goal of expanding health coverage, facing growing and changing population's health needs in situations, for example, where a very limited tax and contributory base acts as a major constraint to reduce large shares of private out-of-pocket (OOP) spending in the total financing of the health system. Ideally then, the information included in assessing a country's development in health should reflect the national situation concerning the key strategic objective of health coverage. Sustaining and increasing the pool of funds available for health is crucial to promote equity of access to and quality of health services, ultimately improving population health.

The aim of this chapter is to propose an approach to identify health needs and constraints in countries, based on indicators that are broader than national income and more relevant to assess the stage of national development in health. In Section 2, we propose a framework that examines health needs and system performance jointly under the overarching concept of "health coverage". We then suggest methodologies for constructing measures of national development in health based on relevant indicators that are of comparable definition and measurement across countries, measured in an acceptably reliable way, not easily manipulated and publicly available for most countries. Section 3 presents the results for the computations of our health development indices, contrasting these results with country development assessments based solely on income pc, and showcases the flexibility of our suggested approach for broader assessments of development in health based both on national- and subnational-level data. Section 4 discusses the main implications for policy arising from our analyses and concludes.

2. Methods

2.1. *Theoretical background and data sources*

Elsewhere, we propose a simple theoretical framework to underpin discussions and measurement of national health development based on the underlying degree of health system coverage (see details in Moreno-Serra and Smith, 2012a). Our framework examines the notions of health needs and system

performance jointly from a conventional microeconomic perspective. It implies that an operational health development index requires a count of people with adequate access to necessary services in a country, with the associated health benefits obtained. It also requires an assessment of the countries' performance on financial risk protection in health, i.e. the level of protection achieved against financial hardship caused by securing access to necessary care.

Most data we use in our empirical work come from major international, publicly available sources. These include the World Bank World Development Indicators (WDI), the WHO Global Health Observatory repository, UNICEF Childinfo and Global Burden of Disease estimates from Institute for Health Metrics and Evaluation (University of Washington). The indicators used are described in the following, and their sources are given in Table 1. The time period for which we have been able to collect the relevant country information is 1995–2013.

2.2. *Measuring access to care and health needs*

Rates of utilisation of services that should be provided to entire population groups (e.g. pregnant women, children) can be used as proxies for the conditions of access to needed services in a health system. Here we use the proportion of births attended by skilled health staff (% of total births in the most recent year). Skilled birth attendance represents a good proxy

Table 1. Indicator definitions and sources.

Indicator	Description	Source
Skilled birth attendance	Births attended by skilled health staff (% of total)	World Bank; WHO; UNICEF
DALYs lost	Total number of DALYs lost for all causes, all ages (per 100,000)	Institute for Health Metrics and Evaluation
Pooled prepaid health expenditure	Pooled prepaid health expenditure (= total minus out-of-pocket) as share of total health expenditure (%)	WHO
GNI per capita	GNI per capita, PPP (international dollars)	World Bank
Tax revenue	Tax revenue (% of GDP)	World Bank

for the conditions of access to the broader basket of services provided in a health system (WHO, 2008). It refers to a service that should be provided in clinical facilities to all pregnant women; thus, shortages from the 100% rate tend to indicate general deficiencies in access to the health system.

A rough estimate of the health benefits gained from adequate access to necessary treatments can be obtained in terms of disability-adjusted life years (DALYs). DALYs are a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death. In our application, we use the total number of DALYs lost for all causes (communicable diseases, non-communicable diseases (NCDs) and injuries) in the country in 2013, per 100,000 population. Since in this application we will be constructing an index that is intended to be a positive function of health development — i.e. the higher the index, the higher the level of development — we use in the computations the *inverse* of the total number of DALYs lost in a country.

2.3. Measuring financial protection in health

Given that conventional financial protection indicators such as catastrophic health spending incidence have been produced only sporadically and for a reduced number of countries (cf. e.g. WHO, 2015), simpler proxies must be used in this application. We have collected data on OOP health spending as a share of total, which has been found to be highly and positively correlated with indicators of catastrophic health spending (Xu *et al.*, 2007; Moreno-Serra *et al.*, 2013). We then construct a measure of pooled prepaid health spending as a share of total health spending, by subtracting the share of OOP health spending from the total. Pooled prepaid spending refers to funds paid by individuals before the need for medical care, through channels such as general taxation, social insurance contributions and private voluntary insurance payments. Higher reliance on pooled sources of health financing (as opposed to OOP funding) has been found to greatly enhance the positive population impacts brought about by additional resources pumped into the health system, through broader access to health services and improved protection against catastrophic health payments (Escobar *et al.*, 2010; Moreno-Serra and

Smith, 2012b, 2014). Therefore, the inclusion of the pooled spending measure in the computation of our health development index can also provide valuable information for policy on how effective additional domestic and donor funds are likely to be for spurring health improvements in a given country.

2.4. A flexible approach: Incorporating information on financial constraints

The operationalisation of our theoretical index can be flexible enough to incorporate information on other country factors beyond — but associated with — health needs, access and financial protection, that may be seen as relevant for welfare assessments in the health domain. These factors include perceived constraints for development in health. The importance of the latter aspect for global health policy debates is reflected, among others, by its inclusion (in various capacities) within the funding allocation formulas adopted by many international agencies, including the World Bank International Development Association (IDA) and the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) (Equitable Access Initiative, 2016).

Here we explore the possibility of accounting for national capacity to finance health domestically. We focus on two related indicators to obtain a broad picture of such financing capacity. The first one is the traditionally used indicator of income per person, GNI pc, measured in purchasing power parity-adjusted (international) dollars. The second indicator is tax revenue as a proportion of GDP. The latter provides good information about the available domestic contributory base to support expansions in pooled health financing and — particularly in LMICs — the extension of the informal economy as an associated constraint for raising health revenues (Johnson *et al.*, 1997).

2.5. The computation of health development indices

The general approach we choose for index construction is close in spirit to the mechanics behind the Human Development Index (UNDP, 2015). We seek to construct indices of health development that are comparable

across countries, for each of the three dimensions: (a) access to care; (b) financial protection and (c) domestic constraints to expansions in health system coverage. After computation of these dimension-specific indices, we proceed to construct composite measures of health development combining all components (a), (b) and (c).

Since dimensions (a) and (b) correspond more closely to the notion of health development based on coverage as derived from our theoretical framework, we first compute a *strict* health development index encompassing only the dimension-specific indices of access to care and financial protection, under equal weights for each of the components. Finally, in a separate computation, we construct an *extended* health development index for each country, which is an overall measure combining country performance in all three dimension-specific indices for components (a), (b) and (c). Figure 1 summarizes our approach.

2.5.1. Access to care index

As shown in Table 2, the access to care index is constructed as the geometric mean of two normalized sub-indices reflecting performance in unmet health needs (the skilled birth attendance rate) and total health needs (total DALYs lost). For the normalization of the sub-indices, a minimum value of 0 and a maximum of 100 are set for skilled birth attendance. This of course means that the unmet needs sub-index is given by the observed ratio of skilled birth attendance itself. For total health needs, on the other hand, we

Figure 1. An overview of our approach to constructing health development indices.

Table 2. Detailed methodology for computation of health development indices.

Dimension	Aspect	Indicator	Relationship of indicator with health development	Minimum value (<i>full</i> = full sample, all countries, 1995–2013)	Maximum value (<i>full</i> = full sample, all countries, 1995–2013)	From indicator to sub-index (<i>t</i> = 2013 = latest year) (<i>full</i> = full sample, all countries, 1995–2013)	Dimension-specific index (<i>geo mean</i> = geometric mean) (<i>t</i> = 2013 = latest year) (<i>full</i> = full sample, all countries, 1995–2013)	Health development index strict	Health development index extended
Access to care	Unmet health needs	Skilled birth attendance (%)	+	0	100	(1) $\frac{\text{actual value}(t) - \text{min value}(\text{full})}{\text{max value}(\text{full}) - \text{min value}(\text{full})}$	(a) $\frac{\text{geo mean}(1,2)(t)}{\text{max value}(\text{geo mean}(1,2))(\text{full})}$		
	Total health needs	Total DALYs lost (inverse of)	+	$\frac{1}{\text{max value}(\text{full})}$	$\frac{1}{\text{min value}(\text{full})}$	(2) $\frac{\frac{1}{\text{actual value}(t)} - \frac{1}{\text{max value}(\text{full})}}{\frac{1}{\text{min value}(\text{full})} - \frac{1}{\text{max value}(\text{full})}}$	$= \frac{\sqrt{\text{index}(1)(t) \times \text{index}(2)(t)}}{\text{max value}(\text{geo mean}(1,2))(\text{full})}$		
Financial protection	Protection against financial hardship caused by out-of-pocket health payments	Pooled health expenditure (% total health expenditure)	+	Observed min value (<i>full</i>)	Observed max value (<i>full</i>)	(3) $\frac{\text{actual value}(t) - \text{min value}(\text{full})}{\text{max value}(\text{full}) - \text{min value}(\text{full})}$	(b) Same as (3)	$\sqrt{a \times b}$	$\sqrt[3]{a \times b \times c}$
Constraints	Domestic capacity to finance health and expand coverage	GNI per capita (USD PPP)	+	Observed min value (<i>full</i>)	Observed max value (<i>full</i>)	(4) $\frac{\text{actual value}(t) - \text{min value}(\text{full})}{\text{max value}(\text{full}) - \text{min value}(\text{full})}$	(c) $\frac{\text{geo mean}(4,5)(t)}{\text{max value}(\text{geo mean}(4,5))(\text{full})}$		
		Tax revenue (% GDP)	+	Observed min value (<i>full</i>)	Observed max value (<i>full</i>)	(5) $\frac{\text{actual value}(t) - \text{min value}(\text{full})}{\text{max value}(\text{full}) - \text{min value}(\text{full})}$	$= \frac{\sqrt{\text{index}(4)(t) \times \text{index}(5)(t)}}{\text{max value}(\text{geo mean}(4,5))(\text{full})}$		

use the inverse of the number of DALYs lost (as explained before), and the corresponding minimum and maximum values are those observed in the entire sample of countries for the available period 1995–2013.

Having calculated the normalized unmet needs and total health needs sub-indices, the geometric mean of these sub-indices is computed. The final access to care index for a given country is then computed as the normalized value of its sub-indices' geometric mean, using the minimum value of 0 and, as maximum value, the highest geometric mean of the sub-indices for all countries and years under consideration. As with all other indices computed in this application, the normalization employed ensures the access index lies between 0 and 1, with higher values of the index indicating better conditions of access to care given health needs in a country.

2.5.2. *Financial protection index*

The financial protection index is constructed based on the share of pooled health spending in the total health financing (Table 2). It is computed as the normalized value of a country's pooled spending share, where the minimum and maximum values used in the normalization procedure correspond, respectively, to the lowest and highest values of the pooled spending share observed for the entire sample of countries and years under consideration. Higher values of the index indicate higher degrees of protection against financial risk due to health care payments.

2.5.3. *Constraints index*

The constraints index is computed as the geometric mean of normalized sub-indices for GNI pc and tax revenue as a share of GDP (Table 2). The normalization of these two sub-indices is based on the corresponding minimum and maximum values for each indicator observed in the entire sample of countries for the available period 1995–2013. Having computed the normalized GNI and tax revenue sub-indices, the geometric mean of these sub-indices is computed. The final constraints index for a given country is then given by the normalized value of the GNI and tax revenue sub-indices' geometric mean, where the minimum value used for the normalization is 0 and the highest geometric mean of the sub-indices for

all countries and years under consideration is used as the maximum value. A higher value of the constraints index suggests a higher domestic capacity to finance health and improve coverage.

3. Results

3.1. Overview

The full results for the computations of the health development indices described above are shown in Table S1 (see Supplementary Data). All analyses in this chapter refer to the results for the 165 countries with data on GNI pc and for which at least the “strict” health development index could be calculated, given data availability. The additional information required to account for the *constraints* dimension as defined above means that the “extended” index could only be calculated for a smaller number of countries (141). All indices refer to year 2013, the most recent year available at the time of analysis. Further breakdowns of the analyses presented in the following, as well as computation of health development indices using additional measures of access to care, are presented in the Supplementary Data.

We start by examining the distribution of the “strict” and “extended” health development indices according to income groups (defined as per the World Bank classification of countries). Figure 2 shows the composition of each quartile of the “strict” index (1 = first quartile, countries with the 25% lowest values of the “strict” index”; going up to 4 = fourth quartile, countries with the 25% highest values of the “strict” index) by income group. Half of the first quartile is made of low-income countries (LICs) (21), followed in composition by 39% of lower-middle-income countries (l-MICs). All remaining LICs and most of the remaining l-MICs belong to the second quartile of the “strict” index distribution. Interestingly, many upper middle-income countries (u-MICs) (16) — and even some non-Organization for Economic Cooperation and Development (non-OECD) countries classified as high-income — rank in the bottom 50% of health development levels measured by the “strict” index.

Figure 3 shows a similar analysis, but for the composition of our “extended” index of health development. A clear message that arises is that all 21 LICs for which the “extended” index could be calculated

Figure 2. Composition of the four quartiles of the “strict” index of health development, by income groups.

Note: Number of countries in parentheses.

belong to the first quartile; in other words, all LICs present poor health development performance if domestic constraints to finance health and coverage expansions are taken into account. Similarly, all I-MICs fall in the lowest two quartiles of health development when financial constraints are considered, accompanied by eight u-MICs. Since the “extended” index includes the GNI pc indicator, it is not that surprising to see the composition of quartiles and ranking of countries according to the “extended” index to be closer to the simple GNI pc ranking, in contrast to what was observed for the “strict” health development index.

The information conveyed by our original “strict” and “extended” indices can be summarized through maps showing the comparative performance of each country according to performance bands (quartiles). Figures 4 and 5 show country rankings where lower rankings (closer to 1) represent lower health development (according to the “strict” index) and lower health development and higher financial constraints (“extended” index).

Figure 3. Composition of the four quartiles of the “extended” index of health development, by income groups.

Note: Number of countries in parentheses.

Figure 4. Country rankings according to the “strict” index (165 countries).

Although most bad performers according to the “strict” index are in sub-Saharan Africa and South Asia, some u-MICs and even high-income countries (HICs) such as Russia and Venezuela also belong to the two bottom groups in terms of health development performance (Figure 4). If

Figure 5. Country rankings according to the “extended” index (141 countries).

in addition to health development *per se* we also take into consideration domestic financial constraints measured by the “extended” index, the map in Figure 5 shows that the LICs in Africa and South Asia are still among the lowest-ranked nations, reflecting prevalent domestic financial constraints. Other countries such as South Africa, Russia and Venezuela climb in the rankings due to their relatively high capacity to finance health coverage expansions domestically. Arguably, for the latter group of countries, there is at least some degree of mismatch between their relatively high ability to pay for health coverage improvements and their relatively poor observed performance in ensuring adequate access and financial protection for their populations.

3.2. A closer look: Comparisons of health development indices and GNI classification for selected countries

We now turn to a closer examination of how the rankings of specific countries change in the health development scale when the latter is evaluated by our proposed “strict” and “extended” indices, compared to the commonly used GNI pc indicator.

Figure 6 shows country rankings according to GNI pc and the resulting rankings using our indices. We select for this analysis the 10 countries (or 11 countries in case of a tie) whose rankings change the most moving “from higher development to lower” (i.e. those with the largest negative changes in ranking when moving from the GNI indicator to the “strict” index, reflecting a deterioration in measured health

Figure 6. Changes in health development rankings using different indices, selected countries.

Note: The vertical axis denotes the country ranking according to the corresponding index. Lower ranking (closer to 1) = worse health development performance.

development from the former to the latter), as well as the 10 countries whose rankings change the most “from lower development to higher” (i.e. those with the largest positive changes in ranking between the GNI indicator and the “strict” index, reflecting an improvement in measured health development from the former to the latter).

Among the countries whose health development deteriorates when measured by our proposed indices, the majority are economies largely driven by oil production revenues. Countries such as Azerbaijan, Equatorial Guinea and Nigeria experience quite dramatic departures from their higher levels of health development measured solely by GNI, moving to the group of countries with the lowest health development rankings measured by the “strict” and “extended” indices. Beyond a simple reclassification of countries, the decomposition of changes in

ranking between a GNI criterion and our health development indices also sheds light on some potentially important aspects for health policy. For example, for the majority of countries whose health development ranking worsens the most when our proposed indices are used instead of GNI only, such deterioration is driven mostly by accounting for their situation regarding access to care and financial risk protection in health (reflected in the “strict” index version). Accounting for financial constraints (the “extended” index version) tends to improve the ranking of these countries. Thus, policy measures aimed at advancing health development in these countries could do well by ensuring that the relatively adequate domestic capacity to finance health care is channelled through pooled prepaid sources and effectively expands access to needed health services. Of course, the major bottlenecks for health development in a specific country may lie on financial/non-financial barriers to access and/or financial hardship caused by health care payments. To shed light on this, the changes from GNI ranking to the “strict” health development index ranking can be further decomposed by access to care and financial protection dimensions as well. We perform such analyses in Section 3.3.

Figure 6 also shows information for the 10 countries whose health development ranking improves the most when measured by our proposed indices (“from lower development to higher”). Once again, the main drivers behind ranking changes are access to care and financial protection in health, whereas accounting for financial constraints through the “extended” index brings country rankings closer to their GNI-only rankings. The “strict” index rightly reflects health development progress achieved by countries known to have implemented wide-ranging health system reforms geared toward coverage expansions. As an example, Rwanda achieved great progress in terms of population coverage by formal health insurance arrangements in the last decade, based on increased reliance on pooled sources of health financing through a combination of enhanced government budget support and community-based health insurance schemes. This progress has been followed by measured improvements in access to services by disadvantaged populations and reductions in the incidence of catastrophic health expenditures (Saksena *et al.*, 2010), which are reflected in our “strict” health development index.

3.3. *Relative importance of access to care and financial protection for measured levels of health development*

From a policy perspective, it seems relevant to disentangle the particular impact of each of the components of the health development indices for the resulting country rankings. In what follows, we present analyses for the components of the “strict” index.

Figure 7 shows the variation in country rankings when we measure health development solely by GNI, then separately by each dimension of the “strict” index — access to care and financial protection — and finally by the resulting overall “strict” index. The selected countries are the 10 countries with the largest negative changes in ranking from GNI-only to “strict” indices, and also the 10 countries with the corresponding largest positive changes in ranking, as defined in Section 3.2.

Figure 7. Changes in health development rankings using different sub-indices, selected countries.

Note: The vertical axis denotes the country ranking according to the corresponding index. Lower ranking (closer to 1) = worse health development performance.

The examination of components of the “strict” index produces valuable insights about the main bottlenecks for health development — and consequently potential policy responses — across the selected group of countries. As an illustration, Azerbaijan’s substantial fall in the health development ranking when the latter is measured by the “strict” index instead of GNI pc is led primarily by low performance in the financial protection dimension. This may suggest a situation where improvements in the utilization of needed health services by its population have been achieved at the cost of relatively high private OOP payments associated with access to those services, potentially exposing large population groups to financially catastrophic health payments. The panorama looks somewhat different in Equatorial Guinea, another country with a significant drop in the health development ranking as measured by the “strict” index. The major driver behind this drop in Equatorial Guinea’s health development ranking is in fact poor performance in the access to care dimension, which suggests a situation where access to services is inadequate given the burden of disease in the population, possibly due to barriers to access beyond a lack of reliance in pooled health financing (such as physical availability of services for instance). Of course, more detailed analyses specific to each country should be conducted to validate the conjectures above and define policy responses, but the examination of our simple indices provides useful insights on where the main hurdles for health development may lie.

3.4. Computation of health development indices using subnational data: The case of India

We now present exploratory work on the computation of our health development indices using data at the subnational level. This exercise is useful to showcase the flexibility of the suggested methodological framework to provide policy insights at a higher granularity level. There are also important practical reasons why the calculation of health development indices with subnational data is relevant from a policy standpoint. National governments may be interested in using the information on health needs, access to care and financial risk protection available across jurisdictions to inform their decisions about transfers

from the central health budget to subnational levels of government. Such information could be incorporated, for instance, as further risk-adjusters — in addition to more traditional measures such as population size — into the capitated funding allocation models used by some national governments. From a different perspective, an international donor agency may wish to focus their efforts on the particular geographic areas that exhibit the lowest levels of health development within a given country, as opposed to supporting activities for the whole country population. This could contribute to the achievement of maximum value-for-money for a given pot of resources according to the agency's specific objectives.

We choose India, one of the most populated countries in the world, as a case study to illustrate the issues above. Although India belongs to the middle-income World Bank category classification as indicated by its GNI pc (US\$5,180 in 2013), the country's ranking in the health development scale drops substantially if our "strict" index is used instead of GNI pc. India becomes the 18th least-developed country in the world with a measured "strict" index of just 0.409 (Table S1), driven by relatively similar poor performance on both the access to care given health needs and financial protection dimensions.

In what follows, we use our proposed methodology to examine how such health development performance varies across Indian states. The subnational-level indicators used for this exercise are similar to the ones used for the cross-country analyses and are described in the Supplementary Data (Table S2). Given the availability of data, we are able to compute the indices for 28 states; the full results are shown in Supplementary Data Table S3.

Figure 8 illustrates how health development rankings for Indian states change from when we use GDP pc as the single criterion, moving to assessing health development separately by access to care and financial risk protection, and by the overall "strict" index. For the sake of comparison, we select the seven states in the bottom and top quartiles of the "strict" index. This exercise demonstrates how the flexible nature of the "strict" index may be used to generate insights into the major obstacles for health development, beyond what can be provided by a simple examination of income levels, and this time with more disaggregated data. For example, among the 25% worse performers according to the "strict" index, there are cases of relatively wealthy states such as Madhya Pradesh and West Bengal, alongside very poor states such as Bihar and Uttar

Figure 8. Changes in health development rankings using different sub-indices, Indian states.

Note: The vertical axis denotes the state ranking according to the corresponding index. Lower ranking (closer to 1) = worse health development performance.

Pradesh. The low levels of health development found in the latter two states are compounded by the relative scarcity of local resources to pay for health services, a situation that may be regarded as deserving particular attention by central government policies and international donor agencies, involving both financial and non-financial support mechanisms.

By contrast, the relatively higher ability to pay for health care in Madhya Pradesh and West Bengal may call for more nuanced approaches for development support. Madhya Pradesh's poor health development performance is driven primarily by deficient conditions of access to care given health needs, whereas in West Bengal the major development bottleneck refers to insufficient protection of residents against the financial consequences of health care payments. Central government policies may then be designed and targeted to the most pressing issue in each state, and donors may wish to adopt support mechanisms focused on non-financial aspects (e.g. technical assistance on service delivery geared

toward more equitable access to available health services by the poorest residents).

Some of these policies and support mechanisms could be designed based on success stories from other Indian states. Arunachal Pradesh, for instance, is among the top 25% states in terms of health development, with good performance both on the access and financial protection dimensions, despite an income level similar to West Bengal and much lower than Madhya Pradesh. Although Arunachal Pradesh may still require extra financial support from donors so as to maintain and expand health coverage for its residents, closer scrutiny of specific health policies managed locally may offer valuable lessons for other states on how to translate available resources for health into broader coverage more effectively. Analyses like these, complemented by more detailed case studies, may help national and international agencies allocate their scarce resources by targeting support to specific bottlenecks in selected states.

4. Discussion and Conclusions

The aim of this study is to suggest an operational methodology to measure health needs and constraints across countries, based on information broader than national income and relevant to assess levels of national development in health. Composite indices aggregating a few underlying indicators, such as the “strict” and “extended” indices discussed here, can be helpful to communicate broad results and draw attention to trends in health development performance. However, such an endeavour will always require the analyst to make simplifying methodological assumptions and the analyses will always be subject to practical limitations.

In particular, the policy insights offered by our proposed health development indices are limited by actual cross-country data availability on aspects related to coverage of necessary health services (at all levels of care) and degree of financial protection from health care payments. We acknowledge, for instance, that comparisons of the share of pooled health spending across countries may not necessarily reflect money well spent or the degree of protection against inefficient health spending. However, to the extent that the degree of efficiency in health spending can be captured by comparing national health expenditures and the corresponding benefits obtained in terms of population health, the joint examination of our

measures of access to care (which include population health status proxied by DALYs lost) and financial protection (through shares of pooled health financing) through the “strict” health development index should incorporate some relevant information on how efficient a country is in translating pooled health financing into better outcomes. Thus, perhaps the first lesson from our analytical work is the urgent need for standardized data collection procedures specifically designed to allow cross-country comparisons over time. National-level surveys will remain the main source of data for analyses of aspects such as financial protection, and, since cost is a major determinant of the interval between national surveys, it seems important for international agencies to intensify current efforts to support regular data collection in LICs.

Subject to the data limitations above, our simulations offer potentially useful policy insights. First, our proposed approach does better than simple measures of GNI pc to assess and compare national health development levels. In general, country rankings in the health development scale vary substantially when the conditions of access to care and financial protection in health are explicitly considered through our “strict” index, compared to GNI rankings. Several u-MICs and l-MICs fall many positions in the rankings due to poor performance on access and financial protection, ranking in the bottom half of the development scale implied by our “strict” index. The indices also reflect adequately known progress made by some countries in system coverage given health needs.

The decomposition of changes in ranking between a GNI criterion and our health development indices sheds light on other important aspects for health policy. The decomposition of the “strict” index into its access and financial protection components is able to provide leads on where the major bottlenecks for health development lie. Moreover, our sub-indices can help identify those country cases where there is a need for external support to fill in gaps in domestic ability to maintain and expand current health coverage levels, offering preliminary insights into specific support modalities (financial or non-financial) that may be more efficient to promote health development in a particular setting. Accounting for financial constraints through the “extended” index leads, for example, to noteworthy differentiation between many African and Asian countries with similar health needs, based on their domestic capacity to ensure adequate health system funding. In instances where countries enjoy a relatively good financial position, the case

for external financial support may be weakened, pointing instead to support responses geared toward technical assistance and advocacy, rather than financial aid *per se*. Our indices are also able to flag cases where low ability to pay for health is a major hurdle for ameliorating low levels of health development. Finally, subject to data availability, similar analyses to the above can be conducted to help policy decision-making at the subnational level, as demonstrated for the Indian context.

We believe, therefore, that our methodological proposals can be helpful for policymaking in at least three broad informational fronts: to inform discussions around health resource allocation at the national and international levels; to inform programmatic choices and policy responses; and to inform priority setting by international donor agencies. With regard to the latter, we note that the primary aim of this study has been to contribute to the measurement of health needs and constraints across countries, based on information broader than national income. We nonetheless acknowledge that the issue of development assistance is a fundamental one and often linked to country classification mechanisms. In principle, our health indices could potentially be used as inputs within simple IDA-type allocation formulas, with alternative weights according to institutional preferences, or within more refined support allocation mechanisms such as capitation funding across and even within countries, for example with our “strict” index entered as a population risk-adjuster. This type of use for our proposed health development measures carries its own challenges of course. Some of these challenges are widely acknowledged in policy discussions, such as the potential for perverse incentives around indicator manipulation as countries seek to attract continued development support (Equitable Access Initiative, 2016). Although any approach based on measurement and country classification for aid entitlement is likely to be subject to perverse incentives to some extent, we believe that our guiding principle of selecting indicators mostly collected by international agencies through accepted mechanisms would help mitigate concerns about data manipulation. As such, the conceptual framework and health development measures proposed in this study could form the basis for discussions on new policies of national governments and international organisations to improve the health of populations.

Acknowledgments

This chapter has benefited immensely from comments received at several meetings organized by the conveners of the Equitable Access Initiative in Geneva and New York, as well as from participants of a seminar session at iHEA Milan 2015. We would also like to thank Raslan Alzuabi for excellent research assistance. All errors are our own. This work was supported by the GFATM on behalf of the convening partners of the Equitable Access Initiative (Grant Number 20155592).

Key Messages

- We propose a flexible approach to identify health needs and constraints in countries, based on indicators that are broader than national income and more relevant to assess national development in health.
- Our health development indices examine country performance under the overarching concept of health coverage, using indicators of access to care, financial risk protection and domestic financial constraints.
- Country rankings in the health development scale vary substantially when the conditions of access to care and financial protection in health are explicitly considered, compared to income per capita (pc) rankings.
- Beyond a simple reclassification of countries, the decomposition of changes in ranking between an income criterion and our health development indices also sheds light on where the main barriers to health development lie in each particular context.

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