

# Measuring primary health care expenditure in low and lower-middle income countries

Conference Paper

25-26 October 2018

Nathalie Vande Maele<sup>1</sup>

Ke Xu<sup>1</sup>

Agnès Soucat<sup>1</sup>

Joe Kutzin<sup>1</sup>

Maria Aranguren<sup>1</sup>

Hong Wang<sup>2</sup>

---

<sup>1</sup> World Health Organization, Department of Health Systems, Governance and Financing

<sup>2</sup> The Bill and Melinda Gates Foundation

# Measuring primary health care expenditure in low and lower-middle income countries

## 1. Background (problem statements)

The 1978 Alma Ata Declaration that Primary Health Care (PHC) was touted as an integral step to achieving health for all (WHO, 1978). More recently, the 2008 World Health Report, WHA following resolutions, and the Sustainable Development Goals (SDGs) re-emphasized the importance of PHC in recognition that regardless of a country's income status, the majority of health conditions can be addressed via primary care interventions (Kruk, Porignon, Rockers, & Van Lerberghe, 2010; Starfield, Shi, & Macinko, 2005; WHO, 2008). PHC is recognized as the foundation of any health system and as the most effective, efficient, and equitable approach to delivering essential health services to the majority of the population for the lowest cost (Atun, 2004; Bitton et al., 2017; Engstrom, Foldevi, & Borgquist, 2001; Kringos et al., 2013; Kruk et al., 2010; Phillips & Bazemore, 2010; Rao & Pilot, 2014; Starfield et al., 2005; Stigler, Macinko, Pettigrew, Kumar, & van Weel, 2016; Veillard et al., 2017).

Today PHC is considered as the trajectory to UHC and to achieving SDGs. Increasing spending on PHC services (especially from domestic sources to improve the sustainability of financing) is a mounting priority (Bitton et al., 2017; Ly et al., 2016; Nayyar & Chatterjee, 2018, 2018; Stigler et al., 2016). Yet, there is considerable global debate about how to define PHC, how PHC service delivery should be structured and organized (Macinko, Starfield, & Shi, 2003; OECD, 2016; Starfield et al., 2005; Stigler et al., 2016).

Measuring PHC expenditure in a comparative and standard manner is a critical first step to understanding why some countries are doing better than others and where extra efforts can be made to gain better performance. However, there is no framework for countries to use to guide data collection or routine tracking of the resources spent specifically on PHC in a systematic way (Gurkan, Kaiser, & Voorbraak, 2009; Maeda, Harrit, Mabuchi, Siadat, & Nagpal, 2012; OECD/Eurostat/WHO, 2017; Pradhan, 1996; UNAIDS, 2009). The System of Health Accounts 2011 (SHA 2011) is commonly used as the global standard in tracking health expenditure (OECD/Eurostat/WHO, 2017), but PHC is not a category under any of the classification. The components of PHC are included under different classifications (OECD, 2016).

The objective of this paper is to develop a standardized methodology to measure PHC expenditure using SHA 2011; provide comparative PHC expenditure estimates for the first time for a sizable number of countries; and formulate recommendations for future PHC expenditure tracking. The paper structured in four sections with section on problem statement, section 2 on methods and data, section 3 on descriptive analysis of preliminary results, and section 4 on discussion and recommendations.

## 2. Methods and data

### 2.1 Operational definition of PHC

While the global debate on the definition of primary health care is evolving, this paper proposes to work with an operational definition for measuring PHC expenditure, which will help 1) provide a standard for comparison, and 2) contribute to the global debate.

The set of values identified as the foundations of PHC in the Alma Ata Declaration of 1978, which includes social justice and the right to better health for all, participation and solidarity, remain fully valid today. Over the past four decades, the spirits of PHC translated into health system strengthening approaches, endorsing principles of people centeredness, continuity, coordination, and comprehensiveness of care. The impact and need to address social determinants on health (beyond the health system boundary) were also recognized.

The operational definition for measuring PHC expenditure should have the following properties: the scope is clearly defined; expenditure is measurable; data is comparable across countries and overtime; and results can trigger policy discussions and further system diagnosis. Taking these properties into consideration, an operational definition for monitoring PHC expenditure would be based on health system service delivery function, which is about what services and which level of providers deliver the services. The objective is to define which functions are first-contact, accessible, continued, comprehensive and coordinated care. It should be noted that the 'first contact' is beyond the first level of health care provider. Depending on the specific setting and service delivery arrangement in a country the first contact could happen at any level service providers.

### 2.2 Accounting method

The System of Health Accounts (SHA 2011) provides the international accounting standards in recording health expenditure. The boundaries of health expenditure in SHA 2011 framework are defined by the primary purposes of the consumption of the health care goods and services. While there is no readymade classification for primary Health Care (PHC) mapping, components of PHC expenditure can be identified within the SHA 2011 framework. The Health care function (HC) and health care provider (HP) classifications can be used to define PHC expenditure for cross country comparison. It should be noted that in the SHA 2011 framework, capital and current expenditures are separated. Both HC and HP classifications exclude capital investment expenditure.

The functional classification of health care (HC) delineates the boundaries of health care activities from an international perspective. SHA 2011 health expenditures contain all activities with the primary purpose of improving, maintaining and preventing the deterioration of the health status of persons and mitigating the consequences of ill-health through the application of qualified health knowledge. This primary purpose is pursued by the following groups of health care activities:

- Health promotion and prevention;
- Diagnosis, treatment, cure and rehabilitation of illness;
- Caring for persons affected by chronic illness;
- Caring for persons with health-related impairment and disability;
- Palliative care;
- Providing community health programs;
- Governance and administration of the health system.

Based on the concept of the first contact, PHC expenditure could be estimated using health care function classification (HC), or alternatively using the classification of health care provider (HP). The HC classification refers to the purpose of activities. The basic dividing lines for structuring the health care functions are individual versus collective health care goods and services, the basic purposes of care (e.g. curative, rehabilitative, long-term care), and the modes of provision (e.g. inpatient, outpatient). Governance and Administration of the health system and its financing are also one of the categories under the HC classification.

The HP classification encompasses organizations and actors that deliver health care goods and services as their primary activity, as well as those for which health care provision is only one among a number of activities. The principal activity exercised is the basic criterion for classifying health care providers. The classification of health care providers serves the purpose of classifying all organizations that contribute to the provision of health care goods and services. The purpose of the HP classification is to category country-specific provider units into common, internationally applicable categories. However, huge challenges exist. For example, hospitals, which are major health care providers, usually offer not only inpatient health care services, but also outpatient care, rehabilitation, long-term care services and so on.

Given the importance and the commitment to PHC, the government spending on PHC from domestic sources is one of the most important indicators. Within SHA 2011 framework this information could be identified from a cross between HC or HP classification with classification of revenue sources for health care financing scheme (FS). For international comparison purposes, the value added of the classification lies in two advantages: first, its connection with the functional classification, which gives an insight into the variety of country-specific settings for the provision of health care services, and second, its combination with the financing classification, which sheds light on the variety of health care funding mechanisms that exist across countries.

### **2.3 Options for defining PHC expenditure using SHA 2011 classification**

The options proposed using the SHA 2011 classification are informed by a series of technical discussions and consultations, including health care practitioners, policy makers, and technical experts from a wide range of countries through WHO regional offices, specific health programs, international organizations, and research institutes.

There was a recommendation to monitor PHC expenditure via the functional classification of SHA 2011. For one, the functional classification of the SHA 2011 framework provides more granularities than the provider classification. The functional classification organizes expenditure by type of services, from which be differentiated services that are first contact, coordinated, continued, and comprehensive services, from services that are specialized referral services. There is also an added value in using of the functional classification for delimiting PHC expenditure. PHC expenditure can be analyzed by place of services, flagging possible areas of improvement when PHC expenditure appear to be taking place in non PHC providers such as hospitals.

However, HP-only classification also has its advantage for country specific discussion. While HC and HP matrix provides much more insight on service delivery arrangements in specific countries, it is the preference not to use the cross classification to define PHC expenditure for reason of data availability and the comparability across different health system settings.

Six HC-based options are proposed and tested in this paper, and are outlined in table 1. The first five are incremental and build on each other (in other words, option b is option a plus added components, and option c is option b plus added components).

There is a consensus from the consultation for considering the following services as PHC services: general outpatient care, outpatient and home-based long-term care, preventive care, medicines for outpatient used, glasses and hearing aids. The consensus was less clear regarding rehabilitative care and ancillary services. The reason is that outpatient and home-based rehabilitative care include both PHC-type services (1st contact, continued care) as well as specialized clinical professionals, but reported expenditure data does not breakdown rehabilitative care spending between PHC and non-PHC services. For ancillary care, similarly, the data does not allow the differentiation between outpatient and inpatient related services.

Two HP-based options are proposed for testing, also outlined in table 1: one option including only expenditure on Providers of ambulatory health care, Retailers, and Providers of preventive care; and another including all expenditures except hospital expenditure.

Table 1 – Presentation of the options tested for monitoring PHC expenditure

Option name & number	HC-based options						HP-based options	
	PHC basic 1	1 + medicines 2	2 + long term 3	3 + rehab & ancillary 4	4 + admin 5	HC negative 6	HP positive 7	HP negative 8
<b>SHA 2011 items</b>								
General, Dental, Home-based curative care; and Preventive care								
Medical goods purchased by patients								
Long term outpatient and home-based care								
Ancillary services purchased by patients; and Rehabilitative outpatient & home-based care								
Health system & financing administration								
All services, including those mentioned above, except inpatient								
Ambulatory & Preventive care providers; and Medical goods retailers								
All providers but hospitals								

SHA 2011 codes:

- General and Dental outpatient and Home-based curative care - HC.1.3.1 & HC.1.3.2 & HC.1.4
- Preventive care (excluding emergency response programs) - HC.6.1, HC.6.2, HC.6.3, HC.6.4, HC.6.5
- Medical goods purchased by patients (HC.5)
- Long term outpatient and home-based care (HC.3.3 & HC.3.4)
- Rehabilitative outpatient and home-based care (HC.2.3 & HC.2.4)
- Ancillary services purchased by patients (HC.4)
- Health system and financing administration (HC.7)\*(PHC/CHE)

## 2.4 Data source

Data used in this paper comes from 27 published health accounts country studies, from 2012 to 2015. Two thirds of the countries included in the study are from Africa, and a bit more than half of the countries are low-middle income countries.

Country health accounts reports are support documents for disseminating health accounts results produced in countries. It includes contextual information (macro-economic, health system, epidemiological profile), a presentation of overall results (expenditure levels), and more detailed results on the flow and allocation of funds between sources of funds, financing agents, providers, and services consumed.

Reports used provide data produced following the System of Health Accounts 2011 standard methodology. This ensures comparability between country estimates, which is needed to compare PHC estimation options.

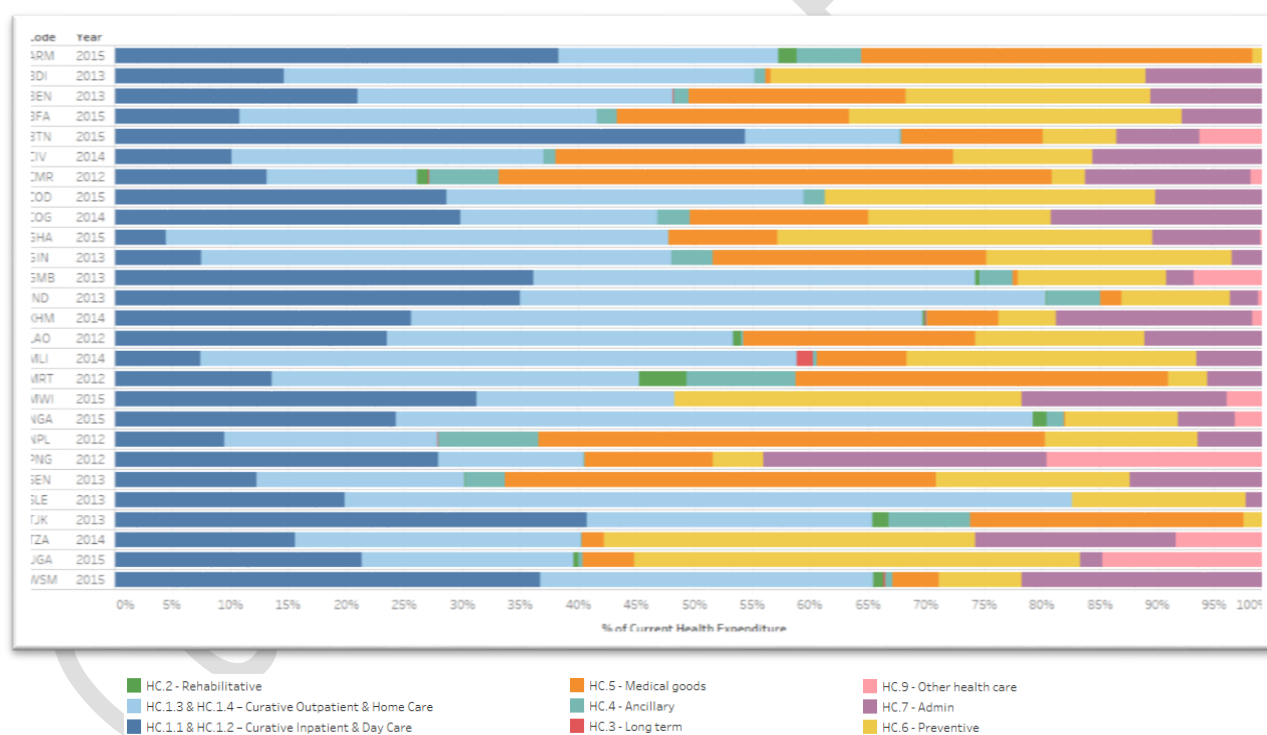
### 3. Descriptive analysis Results

#### 3.1. Overview of current health expenditure components

##### Components of current health expenditure by functions (HC).

Data from the 27 countries show that the largest components of Current Health Expenditure (CHE) is curative care including both inpatient and outpatient care (more than 50%). Taking a closer look at the distribution of curative care, between inpatient and outpatient care, we can see that inpatient represents about 40% of total curative care expenditure (and outpatient closer to 60%). The next largest items are expenditure on medical goods and expenditure on preventive care (about 14%). Expenditure on the administration of the health system represents about 10% of current health expenditure among countries studied in this paper, but it should be noted that for some countries it can reach levels as high as 28%.

Graph 1 – Current Health Expenditure by Health Care Function (HC)

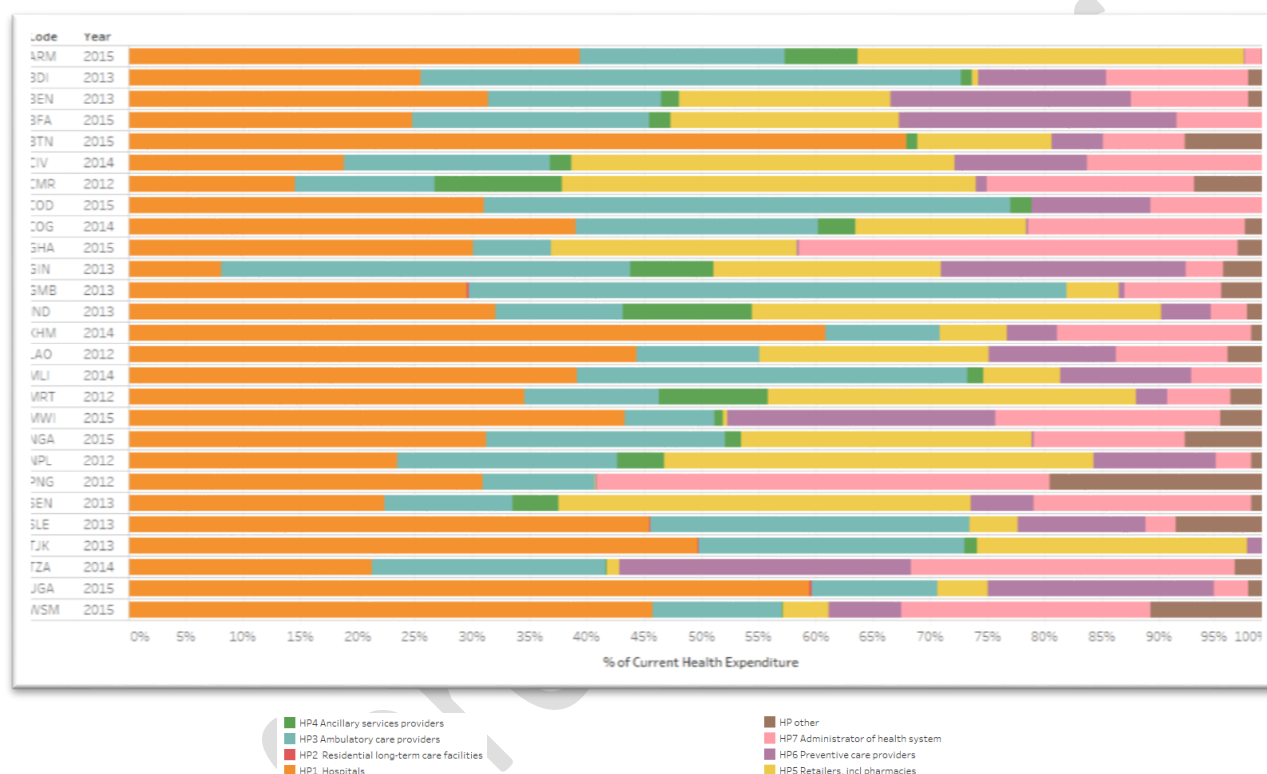


##### Components of current health expenditure by providers (HP).

The distribution of current health spending by provider show that the largest expenditure post are hospitals (over 30% of total current health expenditure), followed by ambulatory care providers and retailers (around 18% each). Expenditure on administration of the health system often outweighs

expenditure on preventive care providers (10% and 6% respectively). Different health systems use hospitals differently in relation to primary health care. Some countries deliver more ambulatory care services in hospitals than other countries, and the role of district hospitals may be more prominent in some countries than others. This is important to note when interpreting estimates for primary health care expenditure based on HP.

Graph 2 – Current Health Expenditure by Health Care Provider (HP)



### 3.2. Primary Health Care (PHC) expenditure measured by each option

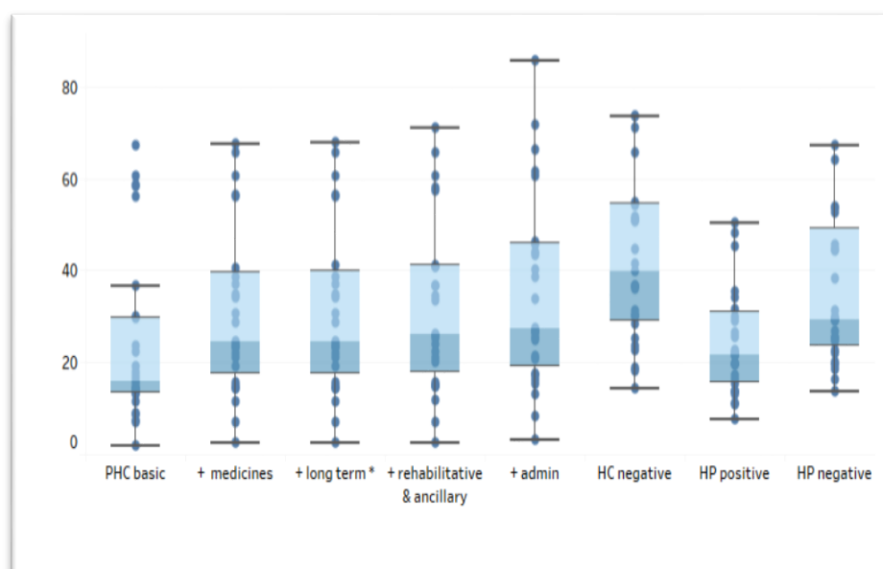
Shares and levels vary between options. There are two visible shifts in levels or shares, between option 1 and 2, and between the positive and negative options (i.e., adding some components or including all components but one; HC positive vs HC negative, and HP positive vs HP negative).

The first one results from including medical goods in the definition. Expenditure on medical goods is one of the three largest HC items, along with curative care and preventive care. The former two are included in the *basic PHC* option, and by default are counted in all HC-based options.

The second one is partially explained by data accessibility, and the classification of expenditure under undefined classes (and therefore captured when excluding inpatient from total current health expenditure).

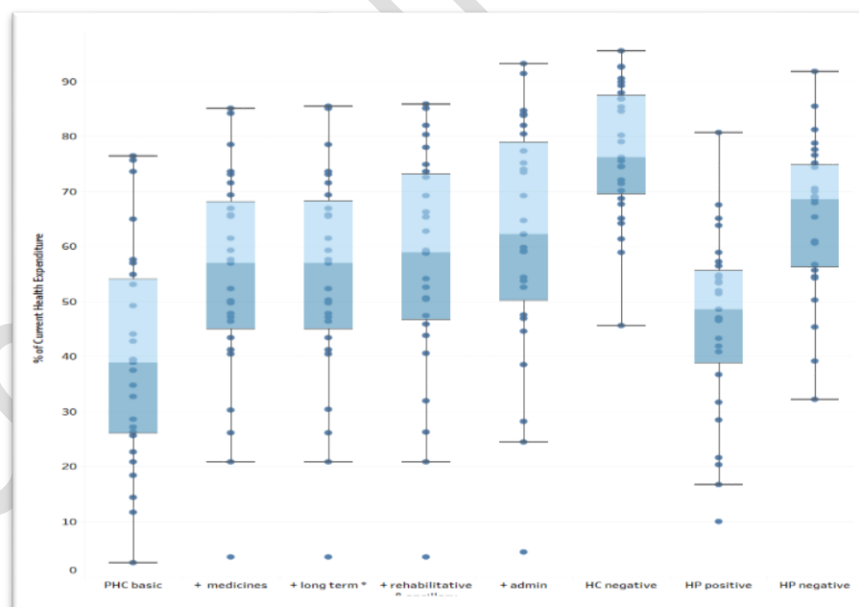
**LEVEL: Primary Health Care (PHC) Expenditure per capita USD – results by option.**

Graph 3 – Boxplot of country estimates, by option, for PHC Expenditure per capita USD



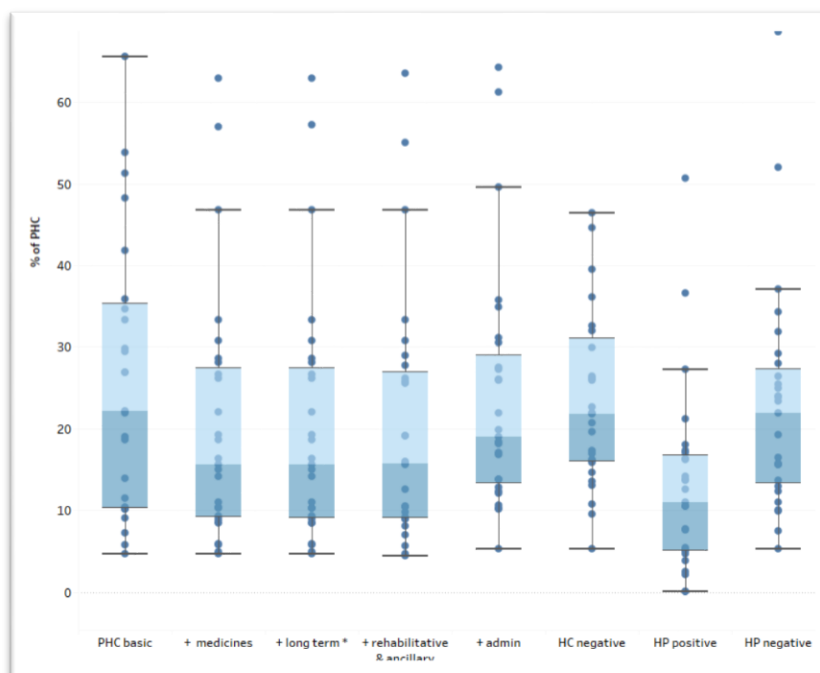
**PROPORTION: Primary Health Care (PHC) Expenditure as a share of Current Health Expenditure (CHE).**

Graph 3 – Boxplot of country estimates, by option, for PHC expenditure % CHE



**PROPORTION: Domestic Government spending as a share of Primary Health Care (PHC) Expenditure.**

Graph 4 – Boxplot of country estimates, by option, for domestic government PHC expenditure % PHC



**Key summary results**

Table 2 – Results from tested options: Primary Health Care Expenditure per capita USD

Primary Health Care Expenditure per capita USD	Median	Mean	25 <sup>th</sup> percentile	75 <sup>th</sup> percentile
Option 1. PHC basic	16	24	13	30
Option 2. + medicines	24	36	17	40
Option 3. + long term*	24	36	17	40
Option 4. + rehab & ancillary	26	38	18	41
Option 5. + admin	27	41	19	46
Option 6. HC negative	40	52	29	55
Option 7. HP positive	22	30	16	31
Option 8. HP negative	29	44	23	49

\* option used for PHCPI estimates

Table 3 – Results from tested options: Primary Health Care Expenditure % Current Health Expenditure

<b>Primary Health Care Expenditure % current health expenditure</b>	<b>Median</b>	<b>Mean</b>	<b>25<sup>th</sup> percentile</b>	<b>75<sup>th</sup> percentile</b>
Option 1. PHC basic	39	40	26	54
Option 2. + medicines	57	54	45	68
Option 3. + long term*	57	54	45	68
Option 4. + rehab & ancillary	59	57	47	73
Option 5. + admin	62	62	50	79
Option 6. HC negative	76	77	69	87
Option 7. HP positive	49	46	39	56
Option 8. HP negative	69	65	56	75

\* option used for PHCPI estimates

Table 4 – Results from tested options: Domestic government spending % PHC expenditure

<b>Domestic government spending % primary health care expenditure</b>	<b>Median</b>	<b>Mean</b>	<b>25<sup>th</sup> percentile</b>	<b>75<sup>th</sup> percentile</b>
Option 1. PHC basic	22	27	10	35
Option 2. + medicines	16	20	9	27
Option 3. + long term*	16	20	9	27
Option 4. + rehab & ancillary	16	20	9	27
Option 5. + admin	19	24	13	29
Option 6. HC negative	22	25	16	31
Option 7. HP positive	11	13	5	17
Option 8. HP negative	22	23	13	27

\* option used for PHCPI estimates

### 3.3. Consistency across options

The options tested for this paper are built from either the functional (HC) or the provider (HP) classification. The first 5 options are defined from functions, and simply add components onto the preceding option. Ranking of countries between these 5 options is highly correlated. The lowest correlation is found between the functional and provider approaches.

PHC expenditure estimated from the provider classification differ largely from the functional approach because of the exclusion of expenditure on hospitals. Hospitals may provide outpatient curative care services, which are excluded automatically from the provider approach. This is the key cause for discrepancies between HC-based and HP-based options.

Table 5 – Country ranking correlation between options

PHC expenditure / capita USD : ranking correlation	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8
Option 1 = Outpatient and Preventive care	1.0							
Option 2 = option 1 + medical goods	0.8	1.0						
Option 3 = option 2 + long term care*	0.8	1.0	1.0					
Option 4 = option 3 + ancillary serv. and rehabilitative care	0.8	1.0	1.0	1.0				
Option 5 = option 4 + health system administration	0.8	1.0	1.0	1.0	1.0			
Option 6 = HC negative (CHE less inpatient care)	0.6	0.8	0.8	0.8	0.8	1.0		
Option 7 = HP positive (ambulatory/preventive care providers+retailers)	0.6	0.9	0.9	0.9	0.9	0.7	1.0	
Option 8 = HP negative (CHE less hospitals)	0.5	0.8	0.8	0.8	0.8	1.0	0.8	1.0
Domestic government spending % PHC Expenditure	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8
Option 1 = Outpatient and Preventive care	1.0							
Option 2 = option 1 + medical goods	0.9	1.0						
Option 3 = option 2 + long term care*	0.9	1.0	1.0					
Option 4 = option 3 + ancillary serv. and rehabilitative care	0.9	1.0	1.0	1.0				
Option 5 = option 4 + health system administration	0.7	0.9	0.9	0.9	1.0			
Option 6 = HC negative (CHE less inpatient care)	0.7	0.8	0.8	0.8	0.9	1.0		
Option 7 = HP positive (ambulatory/preventive care providers+retailers)	0.5	0.6	0.6	0.6	0.5	0.5	1.0	
Option 8 = HP negative (CHE less hospitals)	0.5	0.5	0.5	0.5	0.7	0.9	0.6	1.0

Amongst the options based on services (HC), the least correlated option is option 1. The key cause is the inclusion of medical goods from definition 2 onwards. Medical goods being the fourth largest HC component after curative care (curative care is over 50% of current health expenditure), and represent on average around 14% of current health expenditure. In addition, medical goods are typically purchased from households out of pocket. As a result, country ranking in domestic government spending as a share of primary health care changes between options 1 and 2.

It should also be noted that the ranking in option 5 (which includes medical goods, ancillary services, long-term and rehabilitative care services, and administrative cost) is close to the ranking in the HC-negative option as both options include almost all categories but the second largest HC item, inpatient care.

## 4. Discussion

While tracking health expenditure and using data to inform policy dialogue has been gaining momentum globally, estimating PHC expenditure in a comparative way is still at an early stage. This is the first attempt to report the data on PHC in 27 low and low-middle income countries. The process of this exercise gave us the opportunity to understand the bottleneck in producing global health expenditure in general, and primary health care expenditure in particular.

Countries are committed to strengthening Primary Health Care, but translating the political commitment into actions requires investment. Policy makers and other country health systems stakeholders want to know how much resources are available, in particular public funding, and how much is allocated to Primary Health Care. They want to compare themselves to other countries. The global communities including development partners, technical agencies, and civil societies also demand this information to effectively provide technical and financial support. However, tracking Primary Health Care expenditure in a comparative way is still at the early stage. There are many challenges that need to be addressed.

The first challenge is the scope and definition of Primary Health Care. In this study, we took SHA 2011 framework as the basis. Some elements that could be PHC are not included, such as water and sanitation. Within the scope of the SHA 2011, there are also uncertainties due to the absence of clear Primary Health Care operational definition. For example, whether, and under what condition, should outpatient and home-based rehabilitative care, normal delivery, and images and laboratory tests be counted as Primary Health Care? Recognizing that Primary Health Care is also country-specific, a clear definition is needed to make global comparison.

The second challenge is the accounting framework. SHA 2011 was developed to provide a comparable global accounting framework that would depict country's health system spending patterns. It lacks delineation for monitoring Primary Health Care expenditure. For example, the classification on expenditure by health care functions (HC), offers no breakdown for outpatient and inpatient pharmaceutical expenditure, nor for outpatient and inpatient ancillary services. Similarly, the classification for expenditure by health care provider (HP) proposes no standardized breakdown on levels of hospitals.

The third challenge, although not specific to Primary Health Care expenditure tracking, relates to issues of data availability and data quality. Data from the existing information system is often not reported at the level of granularity proposed in the SHA 2011 framework. It is common that data is not available at 3-digit or even 2-digit coding proposed in the classifications, and data needs to be estimated using alternative information such as utilization data. For example, breakdown expenditures by general outpatient, dental, and specialized outpatient is typically challenging in both lower and higher income countries. Although we only want to include general outpatient services in Primary Health Care expenditure, it remains challenging to systematically exclude specialized curative care expenditure. Most countries under study in this paper (3 quarters) are not able to differentiate expenditure on specialized curative care from general outpatient curative care. Based on the 5 countries for which the breakdown is available, we can estimate that it inflates outpatient curative care expenditure by about 20%.

## 5. Way Forward

The demand for an international and standardized monitoring of primary health care expenditure is clear. Looking forward, the challenge posed by a gap in clear operational definition will need to be addressed to support methodological development. Further research and analysis would provide a clearer operational definition and distinct primary health care boundaries.

In parallel, the monitoring of primary health expenditure could test the possibility to add targeted granularity to the system of health accounts 2011 (SHA 2011). Country data production could work on the data collection and data estimation methods to support more robust mapping to the classification and improve comparability between countries. The methodology for estimating PHC expenditure tested in this paper requires should be further worked and refined to propose a standardized approach. Recommendation for triangulating Primary Health Care expenditure results and validating the quality of the results produced still needs to be researched and developed.

Alternatively, to test the pertinence of monitoring Primary Health Care expenditure using the SHA 2011 framework, countries will need to define how best to use SHA 2011 in coherence with the national Primary Health Care strategy. Lessons learnt and recommendations from country experience would inform on the adaptability of the System of Health Accounts for monitoring PHC expenditure.

In particular, the production process would benefit from more information on the required data collection effort for monitoring PHC expenditure, including on household survey questionnaires, increased facility-based data collection, and leveraging routine information system.

Finally, guiding principles on how to best use Primary Health Care expenditure for context-specific policy analysis or development, or for cross-country comparison.

## REFERENCES

1. Kruk, M & Porignon, Denis & C Rockers, Peter & Van Lerberghe, Wim. (2010). The contribution of primary care to health and health systems in low- and middle-income countries: A critical review of major primary care initiatives. *Social science & medicine* (1982). 70. 904-11. 10.1016/j.socscimed.2009.11.025.
2. Starfield, Barbara & Shi, Leiyu & Macinko, James. (2005). Contribution of Primary Care to Health Systems and Health. *The Milbank quarterly*. 83. 457-502. 10.1111/j.1468-0009.2005.00409.
3. Atun, R. 2004. What Are the Advantages and Disadvantages of Restructuring a Health Care System to be More Focused on Primary Care Services? Copenhagen: WHO Regional Office for Europe
4. Pesec, Madeline & Ratcliffe, Hannah & Karlage, Ami & Hirschhorn, Lisa & Gawande, Atul & Bitton, Asaf. (2017). Primary Health Care That Works: The Costa Rican Experience. *Health Affairs*. 36. 531-538. 10.1377/hlthaff.2016.1319.
5. Engström, Sven & Foldevi, Mats & Borgquist, Lars. (2001). Is general practice effective? A systematic literature review. *Scandinavian journal of primary health care*. 19. 131-44. 10.1080/028134301750235394.
6. Kringos - Pereira Martins, Dionne. (2013). The strength of primary care in Europe: an international comparative study. *British Journal of General Practice*. 63. e742-e750(9).
7. L Phillips, Robert & W Bazemore, Andrew. (2010). Primary Care And Why It Matters For US Health System Reform. *Health affairs (Project Hope)*. 29. 806-10. 10.1377/hlthaff.2010.0020.
8. Rao, Mala & Pilot, Eva. (2014). The missing link – the role of primary care in global health. *Global health action*. 7. 23693. 10.3402/gha.v7.23693.
9. Stigler, Florian & Macinko, James & Pettigrew, Luisa & Kumar, Raman & van Weel, Chris. (2016). No universal health coverage without primary health care. *The Lancet*. 387. 1811. 10.1016/S0140-6736(16)30315-4.
10. Nayar, Anjali & Chatterjee Siddharth (2018). Primary healthcare reforms key to achieving Universal Health Coverage. *The Star. Journal of the American Board of Family Medicine*. 16.5.412-422.
11. Bitton, Asaf & Ratcliffe, Hannah & Veillard, Jeremy & Kress, Daniel & Barkley, Shannon & Kimball, Meredith & Secci, Federica & Wong, Ethan & Basu, Lopa & Taylor, Chelsea & Bayona, Jaime & Wang, Hong & Lagomarsino, Gina & Hirschhorn, Lisa. (2016). Primary Health Care as a Foundation for Strengthening Health Systems in Low- and Middle-Income Countries. *Journal of General Internal Medicine*. 32. 10.1007/s11606-016-3898-5.
12. Veillard, Jeremy & Cowling, Krycia & Bitton, Asaf & Ratcliffe, Hannah & Kimball, Meredith & Barkley, Shannon & Mercereau, Laure & Wong, Ethan & Taylor, Chelsea & Hirschhorn, Lisa & Wang, Hong. (2017). Better Measurement for Performance Improvement in Low- and Middle-Income Countries: The Primary Health Care Performance Initiative (PHCPI)

Experience of Conceptual Framework Development and Indicator Selection: The Primary Health Care Performance Initiative. *The Milbank Quarterly*. 95. 836-883. 10.1111/1468-0009.12301.

13. Aveyard, Paul & Lewis, A & Tearne, Sarah & Hood, Kathryn & Christian-Brown, Anna & Adab, Peymané & Begh, Rachna & Jolly, Kate & Daley, Amanda & Farley, Amanda & Lycett, Deborah & Nickless, Alecia & Yu, Ly-Mee & Retat, Lise & Webber, Laura & Pimpin, Laura & A Jebb, Susan. (2016). Screening and brief intervention for obesity in primary care: a parallel, two-arm, randomised trial. *The Lancet*. 388. 10.1016/S0140-6736(16)31893-1.
14. Shi, Leiyu & Macinko, James & Starfield, Barbara & Wulu, John & Regan, Jerri & Politzer, Robert. (2003). The Relationship Between Primary Care, Income Inequality, and Mortality in US States, 1980–1995.
15. Gurkan, Asli & Kaiser, Kai & Voorbraak, Doris. (2009). Implementing Public Expenditure Tracking Surveys for Results: Lessons from a Decade of Global Experience. *PREM Notes*; No. 145. World Bank.
16. Maeda, Akiko & Harrit, Margareta & Mabuchi, Shunsuke & Siadat, Banafsheh & Nagpal, Somil. (2012). Creating Evidence for Better Health Financing Decisions. World Bank.

## ANNEX 1 –Comparison of options

Options	Potential upper bias	Potential lower bias	Comparative advantage
Option 1. PHC basic	<ul style="list-style-type: none"> <li>Outpatient specialized curative care may be included</li> </ul>	<ul style="list-style-type: none"> <li>Medicines and tests / simple imaging services not provided during general outpatient services are excluded</li> </ul>	
Option 2. + medicines	<ul style="list-style-type: none"> <li>Inpatient medicine may be included</li> </ul>		<ul style="list-style-type: none"> <li>More accurate but involve extra step to estimate</li> </ul>
Option 3. + long term*			
Option 4. + rehab & ancillary	<ul style="list-style-type: none"> <li>Inpatient ancillary and image services are included</li> <li>Specialized outpatient and home-based rehabilitation services are included</li> </ul>		
Option 5. + admin	<ul style="list-style-type: none"> <li>Administrative expenditure is allocated proportionally</li> </ul>		
Option 6. HC negative	<ul style="list-style-type: none"> <li>Most likely over estimate PHC expenditure</li> </ul>		<ul style="list-style-type: none"> <li>Simple</li> <li>Less data intensive</li> <li>Includes PHC services provided in hospitals</li> </ul>
Option 7. HP positive	<ul style="list-style-type: none"> <li>Ambulatory care services provided in hospitals excluded</li> </ul>		
Option 8. HP negative	<ul style="list-style-type: none"> <li>Most likely over estimate PHC expenditure</li> </ul>		

\* option used for PHCPI estimates

## ANNEX 2 – WHO estimates by country

COUNTRY and YEAR	PHC per capita (USD)	Primary Health Care (PHC) % Current Health Expenditure	Domestic General Government Health Expenditure (GGHE-D) allocated to PHC % GGHE-D	Domestic General Government Health Expenditure (GGHE-D) allocated to PHC as a % PHC	external allocated to PHC as a % PHC
Armenia - 2015	191.5	52.3	35.9	10.9	0.6
Benin - 2013	21.5	60.1	19.8	10.6	30.1
Bhutan - 2015	23.8	26.1	16.5	46.8	2.8
Burkina Faso - 2015	23.0	68.7	42.2	17.4	31.3
Burundi - 2013	14.4	65.4	68.2	18.6	57.9
Cambodia - 2014	34.2	50.3	22.5	8.9	3.5
Cameroon - 2012	37.0	59.2	19.9	4.9	3.0
Congo - 2014	34.5	47.6	28.5	28.7	24.8
Côte d'Ivoire - 2014	56.5	71.4	19.3	5.9	19.3
DRC - 2015	11.4	56.9	20.3	5.8	59.4
Gambia - 2013	14.1	49.6	38.6	22.0	45.9
Ghana - 2015	63.8	82.8	71.8	31.7	26.3
Guinea - 2013	19.3	78.5	45.9	8.4	17.8
India - 2013	23.1	41.1	50.2	28.2	0.4
Lao People's Democratic Republic - 2012	15.5	47.1	34.8	15.6	15.9
Malawi - 2015	7.1	20.7	23.8	33.3	46.0
Mali - 2014	41.0	85.4	45.6	8.4	40.9
Mauritania - 2012	30.5	66.8	51.7	26.6	6.8
Nepal - 2012	22.9	68.4	55.8	14.3	15.3
Nigeria - 2015	56.2	57.6	36.1	10.3	3.7
Papua New Guinea - 2012	2.5	3.3	3.3	61.6	20.3
Samoa - 2015	66.9	30.0	22.0	58.0	11.7
Senegal - 2013	38.1	64.8	33.9	15.2	10.1
Sierra Leone - 2013	60.4	73.6	49.7	4.7	25.8
Tajikistan - 2013	28.8	46.4	38.2	26.2	-
Uganda - 2015	20.3	51.0	43.1	13.3	60.8
United Republic of Tanzania - 2014	14.9	40.5	24.9	19.2	39.4