

Healthcare Expenditures in LMICs: The need for a paradigm shift

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1. INTRODUCTION

Purpose of this paper is to investigate possible “cross-influences” of GDP and healthcare expenditures in Low-Middle Income Countries (**LMICs**). An extensive literature has debated about the correlation between GDP (often as a proxy of income) and healthcare expenditure:

- In OECD countries, cross-sectional regressions of aggregate health expenditure per capita on GDP per capita consistently showed an income elasticity significantly above one, from about 1.20 to 1.50 (Kleiman 1974; Newhouse 1977; Leu 1986; Getzen 2000).
- Similarly, Musgrove, Zeramini and Carrin used cross-sectional data from 191 countries in 1997 and found that income elasticity of health expenditure was between 1.133 and 1.275 depending on the data included.
- Van der Gaag and Stimac, using cross-sectional data from 175 countries in 2004, found that income elasticity for health expenditure was 1.09.
- Murthy and Okunade used cross-sectional data in 2001 from 44 African countries and found an income elasticity between 1.089 and 1.121, depending on the specification used.

It is worth noting that the reverse causation, where GDP is a function of healthcare expenditure, also has a strong foundation, for example in Erdil and Yetkiner. As a matter of fact, if we treat health as another component of human capital together with education, we find that:

- i.* if health expenditure can be regarded as an investment in human capital, and given that human capital accumulation is an essential source of economic growth, an increase in healthcare spending must ultimately lead to a higher GDP
- ii.* An increase in healthcare expenses, associated with effective health intervention, increases labor supply and productivity, which ultimately takes to an increase in GDP.

2. TRENDS OF HEALTHCARE EXPENDITURES VS. GDP

In 2015, the world spent USD 7,4 trillion in healthcare expenses (hereinafter “**CHE**”¹), close to 10% of global GDP (hereinafter the ratio CHE/GDP in % referred to as the “**CHE index**”). More specifically, in LMICs health expenditures accounted for about 5.4% of GDP vs. 12.4% in High-Income Countries (**HICs**), despite LMICs bear a disproportionately larger share of diseases’ global burden.

¹ Current Health Expenditure, as per The World Bank definition

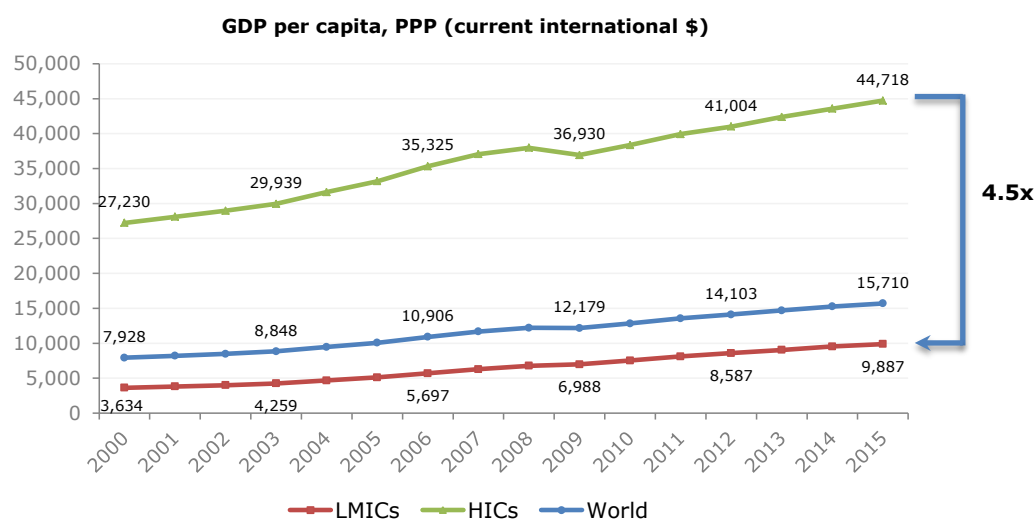
The difference between LMICs' and HICs' CHE Indexes is already remarkable but when we look at GDP and healthcare expenditures "per capita" and rebased on "Purchase Power Parity" (**PPP**) terms, the outlook immediately signals that something in the healthcare financing is not going into the right direction (Table 1):

	GDP 2015 [Billion \$]	GDP growth 2000- 2015	CHE 2015 [Billion \$]	CHE growth 2000- 2015	Population [Million]	Popul. %	GDP capita per PPP 2015 [\$]	CHE per capita PPP 2015 [\$]	CHE Index per capita PPP 2015
LMICs	26,535	369%	1,425	408%	6,123	83%	9,887	511	5.2%
HICs	48,322	73%	5,981	129%	1,235	17%	44,718	5,280	11.8%
World	74,857	123%	7,407	156%	7,358	100%	15,710	1,300	8.3%

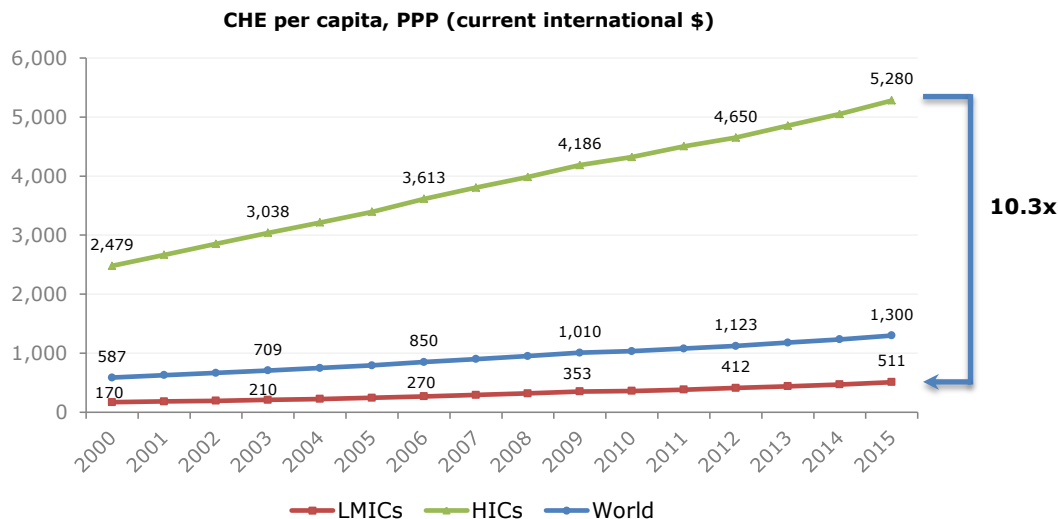
Table 1. Source: Data Processing The World Bank

In aggregate, the trend of GDP growth over the 2000-2015 period reflects the improvement of emerging economies vs. the old world; likewise, it should not surprise to read a 15 yr growth of healthcare expenses in LMICs equal to 408% in comparison with a 129% in HICs. In absolute values, presumably, the richer you are, the more you can spend to take care of your health, as already confirmed in 2011 report by WHO "The determinants of health expenditure - A Country-level panel data analysis".

When we shift the analysis on a "personal basis" aligning the real purchase power around the world, however, it must shock everybody that in 2015 the GDP per capita PPP in HICs was 4.5x as much as in LMICs (Graph 1) while the CHE per capita PPP in HICs was still 10.3x as much as in LMICs (Graph 2)



Graph 1. Source: The World Bank



Graph 2. Source: The World Bank

By the way, all this becomes scary when we consider that LMICs mean 83% of total world population.

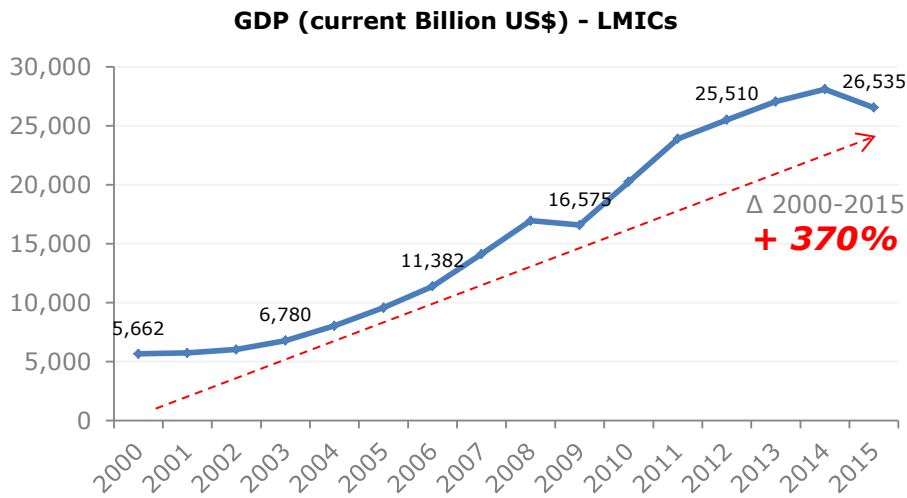
In theory, this huge disparity can be the effect of one (or more) of the following circumstances:

- iii. People in HICs get sicker than in LMICs
- iv. People get sick everywhere the same way but treatments in HICs are 10,3x more expensive than in LMICs
- v. People in LMICs don't have/receive enough money for healthcare nor access to more complex – thus, more expensive – care. As a consequence they don't get nor pay for treatments

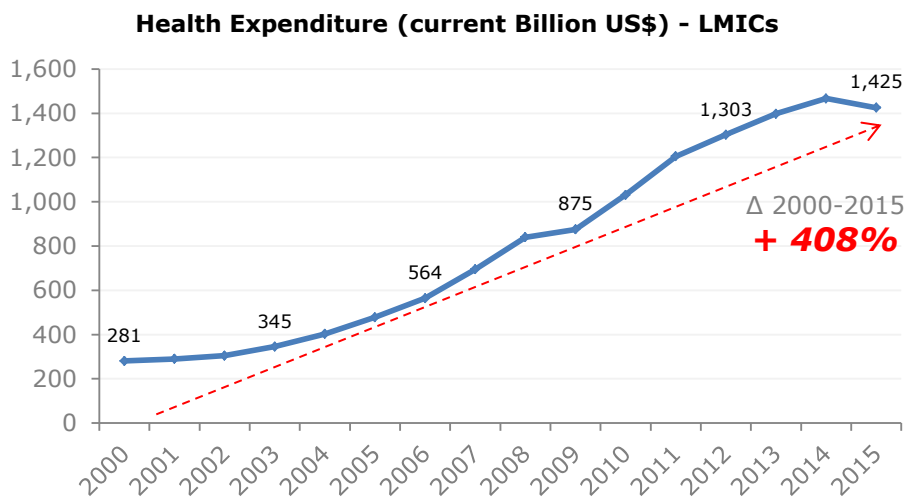
The first explanation is really nonsensical. It's a fact by all size and measure that the highest number of diseases hits LMICs for notorious overall sanitary conditions and for a simple statistic based on number of people. Secondly, healthcare costs are indeed higher in HICs but this can not explain at all the difference in CHE-per capita-PPP because we should otherwise assume that everyone in the world enjoyed access to the same treatments for each and every disease, and it's factually wrong. So we are left with the third explanation: in LMICs people don't have (directly or indirectly) enough money to pay for CHE in their own country or abroad. Arguably, the lack of access to care is one of the effects of the money shortfall: it's pointless to invest in providing new cares if the operating costs would end up being uncovered.

To this regard, a first alarm flashes out when we compare GDP growth rate and CHE Index' dynamics during the 2000-2015 period in LMICs. While the national wealth grew by 370% in 15 years (Graph 3), the CHE growth rate of 408% (Graph 4) outpaced the former but the CHE Index was overall fairly stable,

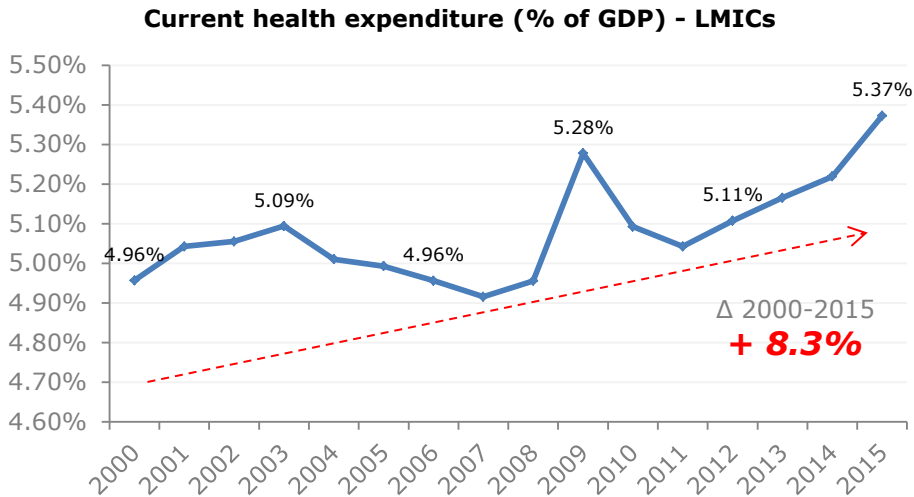
fluctuated positively and negatively overtime and concluded in 2015 with a very modest 8.3% marginal increase (over year 2000) of CHE Index (Graph 5).



Graph 3. Source: GDP (current billion US\$) in LMICs - The World Bank



Graph 4. Source: Data processing from The World Bank



Graph 5. Source: Current health expenditure (% of GDP) in LMICs - The World Bank

In other words, despite a serious growth in GDP, healthcare expenditures in LMICs increased pretty much in line with the trend of the nations' wealth despite the starting point of spending for healthcare was almost ridiculous, weighted by the number of people involved. But, why did neither the Public nor the Private sector increase the proportional allocation of wealth to healthcare?

3. A LOOK-THROUGH ANALYSIS OF HEALTH FINANCE

The next step is then to compare health finance in LMICs and HICs in order to explore possible correlations between GDP growth and healthcare coverage as well as, in LMICs, factual impediments to sustain healthcare expenditures.

Health finance is typically financed by mean of three main macro-sources: public sector (e.g. internal transfers and grants, enterprise financing schemes, non-profit institutions serving households), domestic private sector (e.g. out of pocket expenditures, private insurance and local private subsidies), and external sources (e.g. grants or loans from international donors²).

By comparing the dynamics of the three macro-sources ...

LMICs – Source of funding		2000	2002	2004	2006	2008	2010	2012	2014	2015
<i>% on CHE</i>										
Public		37.15%	38.68%	41.82%	44.21%	47.92%	47.73%	50.82%	51.38%	52.06%
Private		61.56%	60.10%	56.79%	54.41%	50.81%	50.69%	47.76%	47.19%	46.57%
External		NA	NA	1.62%	1.55%	1.40%	1.81%	1.64%	1.62%	1.50%

Table 2. Source: % on Current Health Expenditure in LMICs - The World Bank



...that reflected in absolute terms become...

² For their definition refer to the Annex 1.

LMICs Current billion US\$	2000	2002	2004	2006	2008	2010	2012	2014	2015
Public	104	118	168	249	402	492	662	753	742
Private	173	183	229	307	427	523	622	692	664
External	NA	NA	7	9	12	19	21	24	21

Table 3. Source: Data processing from The World Bank

HICs – Source of funding % on CHE	2000	2002	2004	2006	2008	2010	2012	2014	2015
Public	53.97%	53.83%	60.79%	61.37%	62.78%	63.89%	64.15%	64.23%	61.22%
Private	42.21%	42.33%	39.20%	38.63%	37.21%	36.11%	35.84%	35.76%	38.77%
External	NA	NA	NA	NA	NA	NA	0.01%	0.01%	NA

Table 4. Source: % on Current Health Expenditure in HICs - The World Bank



...that reflected in absolute terms become...

HICs Current billion US\$	2000	2002	2004	2006	2008	2010	2012	2014	2015
Public	1,407	1,580	2,256	2,565	3,098	3,361	3,698	3,919	3,662
Private	1,100	1,243	1,455	1,614	1,836	1,900	2,066	2,181	2,319
External	NA	NA	NA	NA	NA	NA	1	1	NA

Table 5. Source: Data processing from The World Bank

... it obviously stands out that:

- i. The higher is the GDP, the higher is the contribution of the public sector to CHE coverage, but this is not surprising as previous papers like Musgrove et al. 2002, Schieber & Maeda 1999 and WHO's Working Paper 2011³ have already explored the income elasticity for public health spending. Moreover, another study by Farag et al, based on panel data from 1995 to 2006 for a 144 countries, found that a 1% increase in GDP was associated with 0.66% increase in domestic government health expenditure in low-income countries and 0.96% increase in middle-income countries.
- ii. The higher is the access to care, the higher is the CHE
- iii. Even in HICs it seems that the physiological sustainability of the contribution of the private sector could not exceed 35-40% of total CHE

On this basis, a second big red flag comes out of the private sector contribution in LMICs where it is still in excess of 45% in 2015. The real concern relates, though, to the future and, in particular, to the actual possibility for people to pay for the needed treatments.

³ "The determinants of health expenditure - A Country-level panel data analysis", WHO, 2011

Approaching the core of this paper, let's anticipate that unless important changes occur overall in health financing, single individuals will struggle more and more to cover healthcare expenses they need.

As to LMICs, the increase of public sources depends directly on the GDP growth, overall government fiscal capacity and the relative policies of allocation (which in the past were only marginally in favor of healthcare)⁴: all targets/policies difficult to achieve/implement and carrying benefits in the long term. External contributions - given their volatility, unpredictability and short maturity - are expected to remain unchanged (conservative hypothesis), yet acknowledging the WHO's paper 2011⁵ concluded that external funding was negatively associated with government spending on health and caused intensive discussions on aid effectiveness.

Hence, private funding is the one driver we need to investigate further to assess how realistically households can bear the health expenditures' future increases.

Domestic private sources include⁶ funds from households, corporations and non-profit organizations. Such expenditures can be either prepaid to voluntary health insurance typically by corporations and non-profit (referred as "Other Private") or paid directly to healthcare providers by the private patients as out-of-pocket expenses (**OOPs**⁷).

Within the framework described so far and according to the data provided by The World Bank, we are getting to **the core issue**: in 2015, while in LMICs OOPs account for 36.6% of total healthcare expenses coverage, in HICs single individuals directly contribute only for 13.5% (Table 6), including countries such as the USA where this is a very hot topic.

<i>OOPs % on TOTAL CHE</i>	2000	2002	2004	2006	2008	2010	2012	2014	2015
LMICs	46.62%	47.51%	45.83%	44.08%	40.25%	38.93%	37.84%	37.10%	36.60%
HICs	16.22%	15.27%	15.25%	15.05%	14.91%	14.28%	14.09%	13.96%	13.54%
World	19.21%	18.36%	18.30%	18.58%	18.65%	18.33%	18.46%	18.47%	18.15%

Table 6. Source: OOPs - % on Current Health Expenditure - The World Bank

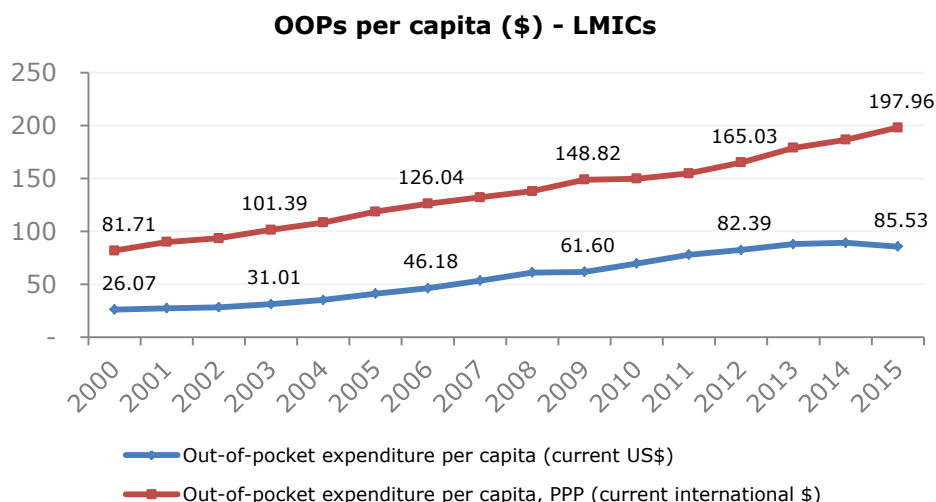
Moving from an aggregate result to a per-capita computation of OOPs, the comparison open the eyes to what is likely going to be an unsustainable path:

⁴ See Annex 4

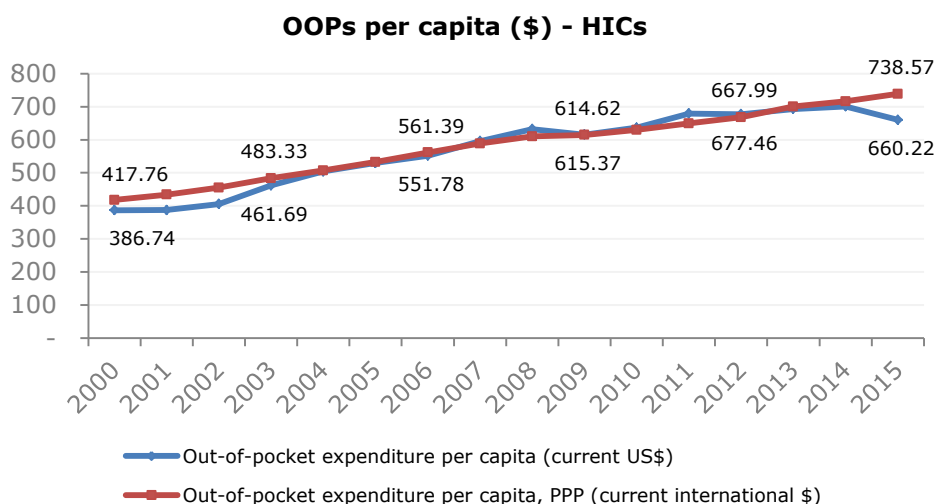
⁵ "The determinants of health expenditure - A Country-level panel data analysis", WHO, 2011

⁶ See Annex 1

⁷ See Annex 1



Graph 6. Source: OOPs per capita in LMICs - The World Bank



Graph 7. Source: OOPs per capita in HICs - The World Bank

In LMICs, OOP nominal spending as a share of current health expenditure has modestly declined between 2000 and 2015: nominal OOPs fell from an average of 46.6% of CHE to 36.6% (-21.5%) (Table 6) - but conversely the OOP expenditures per capita rebased in PPP terms⁸ increased from \$81.7 up to \$198 (+242.3%) (Graph 6): the real burden of direct payments for healthcare expenditure has more than doubled up in real absolute terms!

These results are consistent with previous studies by WHO⁹ and World Bank¹⁰: in LMICs GDP increase seems to lead to increases in OOPs and this may be related to governments' decision to allocate a bigger share of their additional domestic income not to healthcare improvements but to other public sectors -

⁸ Health expenditure through out-of-pocket payments per capita in international dollars at purchasing power parity (PPP)

⁹ "The determinants of health expenditure - A Country-level panel data analysis", WHO, 2011

¹⁰ "Health Financing Revisited: a practitioner's guide", World Bank, 2006

or sometimes regrettably on private affairs – without giving higher priority to health.

On this basis, how much do OOPs affect household’s income? And, furthermore, to what extent people can afford OOPs in the future?

4. OUT OF POCKET EXPENSES: A LIMITED SOURCE

At a glance, the private contribution of OOPs looks definitely sustainable both in LMICs and HICs when compared to the GDP per capita¹¹.

OOPs per capita PPP (% on GDP per capita PPP)	2000	2002	2004	2006	2008	2010	2012	2014	2015
LMICs	2.25%	2.34%	2.32%	2.21%	2.04%	1.99%	1.92%	1.96%	2.00%
HICs	1.53%	1.57%	1.60%	1.59%	1.61%	1.64%	1.63%	1.64%	1.65%

Table 7. Source: Data processing from The World Bank

Table 7 shows that OOP-per capita-PPP represent around 2% of GDP-per capita-PPP across the board, hence you could infer that either the financial sustainability of OOPs is ensured and the initially observed “10.3x distortion” is related to a higher number of treatments at very high costs in HICs. In other words, in HICs we have so large CHE simply because we can access an extraordinarily higher number of treatments and we do benefit from them at very high costs.

No question asked as to the lack of access to care in LMICs being one of the primary causes for death or bad healthcare conditions. However, this is not enough! Reality is that healthcare is not economically affordable by the largest majority of LMICs population and the economic hurdles discourage any investment aimed at providing further access to care.

In a survey and focus group of medical oncologists and healthcare policy experts from six Southeast Asian nations at the first “Southeast Asian Cancer Care Access Network” (SEACCAN) meeting in 2011, an estimated 15% of patients in LMICs in the region had access to an index of specific medications¹². By contrast, 55% of patients in Singapore, a high income country in Southeast Asia, had access to these treatments. Data have been validated using sales figures from IMS Health (London, UK) and calculating the expenditure per capita on the same index of drugs: \$0.49 in Thailand, \$0.48 in Malaysia, \$0.12 in the Philippines,

¹¹ For details see annex 2

¹² Sample of medications included oxaliplatin for the adjuvant treatment of patients with colorectal cancer, bevacizumab and cetuximab for palliative treatment in colorectal cancer, gefitinib or erlotinib for the treatment of patients with metastatic lung cancer who harbour EGFR mutations, sorafenib for the management of advanced-stage hepatocellular carcinoma and trastuzumab as an adjuvant therapy in patients with early HER2-positive breast cancer; Sources: “Access to cancer medications in low-and middle-income countries”, Gilberto de Lima Lopes Jr, Jonas A. de Souza and Carlos Barriosm, 2013

\$0.11 in Vietnam and \$0.04 in Indonesia; in Singapore and the USA the expenditures per capita on this drug index were \$6 and \$20, respectively.

Despite we acknowledge it is very difficult to gather reliable data on actual wages in LMICs, the WageIndicator.org¹³ provides very helpful data points:

All figures in USD per MONTH	Living wage individual ¹⁴	Living wage family ⁷	Total Fertility rate	Gross wage low skill worker	Gross wage med. skill worker	Gross wage high skill worker
Low Income (LICs)	114	185	4,38	45	71	190
Middle Income (MICs)	180	293	2,69	164	224	418
High Income (HICs)	563	623	1,72	852	1,131	1,613

Table 8. Source: <https://wageindicator.org/Wageindicatorfoundation/WageIndicatorgazette/wageindicator-news/patterns-in-living-wages-around-the-world-january-2015>¹⁵, assuming exchange rate EUR/USD on January 2015 equal to 1.13

Firstly, we must observe that in Low Income Countries wages earned by both “low-skill workers” and “medium-skill workers” are likely not sufficient to cover necessary living costs in a typical family neither of an individual.

If we take this to an extreme, then, it means that for low and medium-skill workers there is no point to spend for healthcare because it would lead to the paradox whereby if you care for health you die for starving.

Not surprisingly, the average OOPs-per capita-PPP in these countries in 2015 was in the region of 43.5 \$ (Table 9). We don’t know the actual distribution among skill-cluster workers but it is absolutely reasonable to expect a very high concentration of the overall OOP spending at the high-skill worker level.

Secondly, even in Middle Income Countries low-skill workers’ wages are not sufficient to cover individual and family living costs. Medium-skill workers are over the individual living requirements only while wages earned by high-skill workers are sufficient to cover also necessary living costs in a typical family.

It’s worth noting, lastly, low-skill workers are struggling in HICs too, despite a much lower fertility rate: family living costs hit more than 70% of lower wages! Even a short window of unemployment becomes a serious problem.

Drawn the framework, let’s see what is the weight of OOPs on individual wages in 2015, in order to understand the actual sustainability of the current healthcare system.

¹³ <https://wageindicator.org/>

¹⁴ Living wage is the amount of money to support a typical family with children in a given country. The number of children is approximated from the national fertility rate. The living wage is estimated for an equivalent of a full-time worker. See Annex 3

¹⁵ See Annex 3

OOPs per capita PPP (Current Inter. US\$)	2015
Low Income (LICs)	43.5
Middle Income (MICs)	216.2
High Income (HICs)	738.6

Table 9. Source: The World Bank

OOPs per capita PPP/Annual Wages	Gross wage low skill worker	Gross wage med. skill worker	Gross wage high skill worker
Low Income (LICs)	N.M. (8.02%)	N.M. (5.09%)	N.M. (1.91%)
Middle Income (MICs)	11.00%	8.05%	4.31%
High Income (HICs)	7.22%	5.44%	3.82%

Table 10. Source: Data processing from The World Bank and WageIndicator.org

When comparing the split of OOPs among clusters of workers in LMICs and HICs, the initially observed level of healthcare expenses in LMICs seem unquestionably due to lack of access to care and, more importantly by far, to the lack of money to pay for treatments.

Considering the minimum cost of living individually and at the family level, it is pretty self-explanatory that in Low Income Countries any statistics based on “average” or “cluster” numbers are not material because of the absence of any marginal benefit for almost all the population to spend for healthcare. Hence, we should conclude just the very small enclave of wealthy people sustain the widest bulk of CHE, in those countries.

In Middle Income Countries, i.e. about 75% of global population, only high skill workers can sustain OOPs in the long run. The average OOPs-per capita-PPP across Middle Income Countries assessed in 2015 were in the thereabout of \$216.2 (Table 9), corresponding to a fairly unsustainable 11% and 8.05% of annual wages respectively for low-skill and medium-skill workers (Table 10).

It is clear now that in this scenario households are not able to face the high health expenditures or, however, they find it very hard. OOP expenses are limited by salaries growth.

Because of the heavy financial burden that direct payments impose, some households try to avoid seeking care: for example, according to a 2015 study¹⁶ on 100 cancer patients, only 59.5% respondents visited the first health facility within 30 days after the symptoms. But in so doing may ultimately incur even higher costs - if the illness becomes severe and requires expensive healthcare - and poorer outcomes. Those who need care but do not have ready cash may have to borrow from family, friends or other sources, possibly at high interest

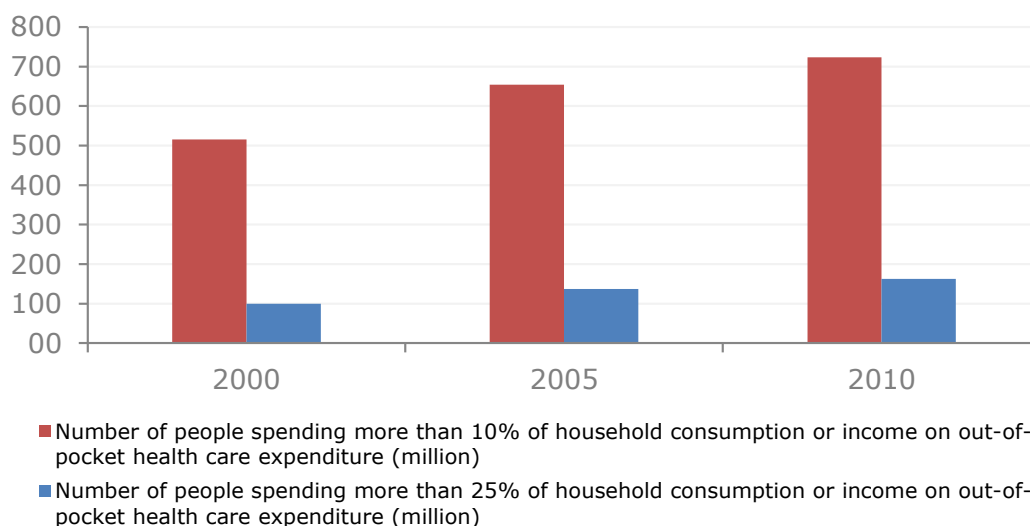
¹⁶ “Treatment Seeking Behaviour and Cost of Care among Cancer Patients in Nepal”, Ranjana Chataut, Ashok Pandey* and NSN Rao, 2015

rates, or sell assets and at the same time they face a loss of income due to the disease. For example, Ribero and Nuñez (1999) analyzed public and private investments in healthcare in Colombia in order to identify the magnitude of labour market returns from good health status. They found that each additional day of disability decreased earnings between 13 percent and 33 percent. Furthermore Ferrando, Hernández, and Savedoff (1999), using self-reported illness and days of illness, show that poor health can reduce productivity by as much as 58 percent and that better health status is associated with higher hourly income.

By consequence, the risk of pauperization increases more and more: for example, in India, it has been estimated that nearly one-quarter of people admitted to hospitals were above the poverty line when they were admitted but were below the poverty line at the end of their stay because of the health expenditures they incurred¹⁷. In Vietnam, health expenses are estimated to have pushed about 3.5 percent of the population into absolute poverty in both 1993 and 1998 (Wagstaff and van Doorslaer 2003).

When OOP expenditures exceed 10% and 25% of household income or consumption they are classified as **catastrophic health expenditures** by the World Bank and are unfortunately on a growing path¹⁸.

Catastrophic Health Expenditure (million) - LMICs



Graph 8. Source: *The World Bank*

¹⁷ "Health Financing Revisited: a practitioner's guide", World Bank, 2006

¹⁸ According to the 2015 WHO report, reporting data in LMICs in 2010 (the latest estimates available), 722.9 million people incurred catastrophic spending at the 10% threshold, equivalent to 12.6% of the LMICs' population (to be noted that around the world this index amounts to 808.4 million!!); at the 25% threshold, these figures were 163.1 million people and 2.9% of the LMICs' population <http://databank.worldbank.org/data/source/world-development-indicators>

% of Population	2000	2005	2010	Trend 2000-2010
over 10 %	10.3%	12.2%	12.6%	+22.3%
over 25%	2.0%	2.6%	2.9%	+42.7%

Table 11. Source: *The World Bank*

Along this path, the system is likely to crash in the long term because it is trapped into a vicious circle.

Assuming health expenditures will increase overtime, all things being equal it is possible to envisage the following:

Private Sector

- Individual financial capacity to pay for healthcare treatments decreases
- Productivity and labor force reduce
- Corporations are less inclined to allocate further capital into the healthcare system
- GDP goes down → Salaries downturn

Public Sector

- GDP growth < CHE growth
- shortfall of incremental public funding to cover CHE increase

If this scenario is taken to the extreme, the more people die or live unhealthy lives, the more the risk of economic and/or social and/or political failure increases



National Collapse

5. CONCLUSIONS

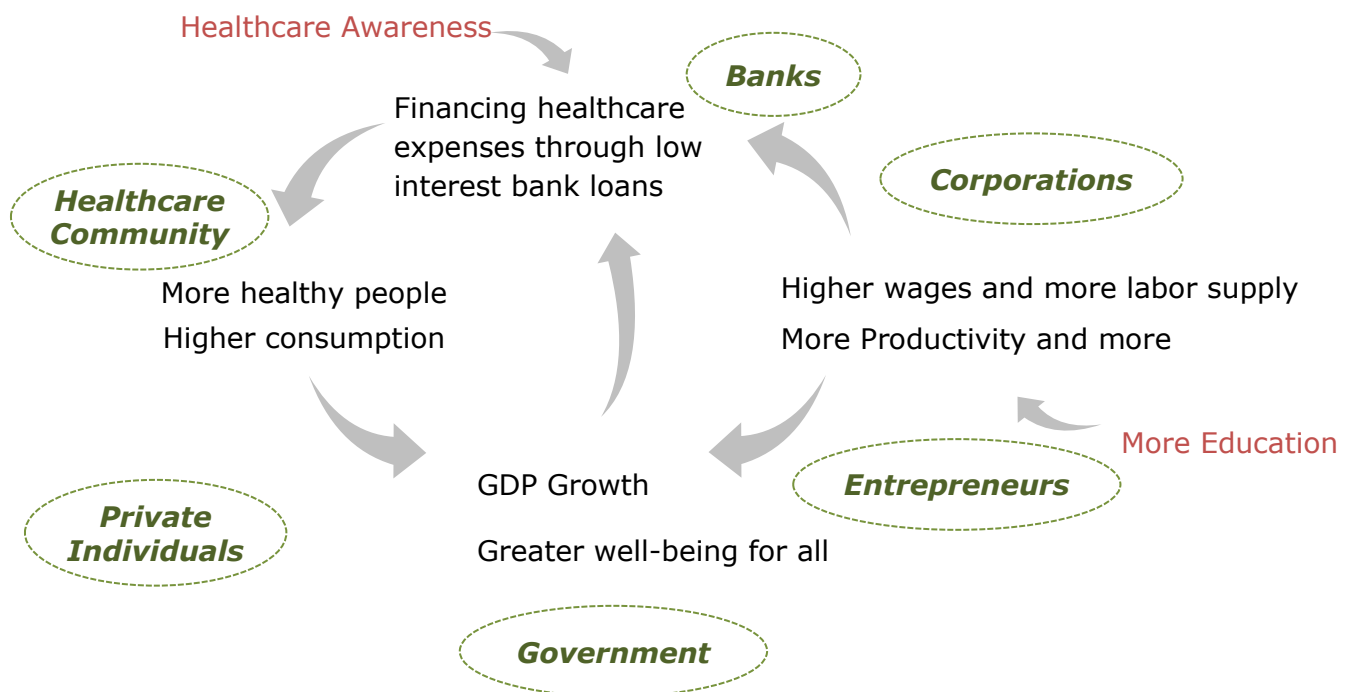
We don't know whether our analysis proves the existence of a direct correlation between coverage of healthcare expenditures and GDP growth from a statistical standpoint, but from a logical and factual perspective, it does. A healthier population can afford a better education; high skill workers are more productive and deserve higher wages; this circumstance respectively attracts investments and turns into higher consumptions, both pivotal components of a GDP growth. At the same, though, a step-up in GDP and in wages facilitates a higher public

contribution to CHE, a better reach of healthcare treatments, and a much higher financial sustainability of (decreasing) OOPs for healthcare expenses.

So, we deem totally reasonable to argue that a correlation between coverage of healthcare expenditures and GDP growth does exist, i.e. healthier citizens take to higher GDP growth. And the correlation is fed through two key channels: Healthcare Awareness and Education.

The You Foundation aims at fostering a virtuous system based on Healthcare Awareness and Education: the transition of financing responsibility for healthcare expenditure from personal OOPs and donations (captured in the Public Sector spending for healthcare) to a wider number of local economies' constituents combines a GDP increase, an increase of public spending for healthcare and a faster growth of households' income, heading back to an increase of GDP.

Below, a graph summarizing the virtuous circle:



A relevant example of combination of public and private efforts is that of GAVI Alliance¹⁹ (and its International Finance Facility for Immunisation), a public-private partnership aimed at increasing access to vaccines - including those that prevent cancer - in LMICs. Bringing together all important stakeholders — including industry, donor and recipient governments, international

¹⁹ <https://www.gavi.org/>

philanthropists, research and technical agencies and representatives from civil society groups — the Alliance has helped immunize an additional 325 million children and likely helped avert 5,5 million future deaths since its foundation in 2000. In cancer care, GAVI has been able to lead negotiations in decreasing the cost of cancer-preventing vaccines in low-income bringing the price per dose of hepatitis B and HPV vaccines down to \$0.18 and \$5 from \$24–43 and \$96–135, respectively. Recipient countries are incentivized to create and develop their health and human capital infrastructures with adequate technical support from the Alliance’s technical partners; additionally, through the provision of funding, the Alliance has created a functioning market of vaccines for LMICs, generating interest and solutions from private players.

6. CASE STUDY: NEPAL

Let’s now try to make the same analysis focusing on Nepal, a low income Country. In 2015 Nepal spent USD 1.3 million in health expenses, representing about 6% of its GDP.

	GDP 2015 [Billion \$]	GDP growth 2000- 2015	CHE 2015 [Billion \$]	CHE growth 2000- 2015	Population [Million]	Popul. %	GDP per capita PPP 2015 [\$]	CHE per capita PPP 2015 [\$]	CHE Index per capita PPP 2015
LMICs	26,535	369%	1,425	408%	6,123	83%	9,887	511	5.2%
HICs	48,322	73%	5,981	129%	1,235	17%	44,718	5,280	11.8%
World	74,857	123%	7,407	156%	7,358	100%	15,710	1,300	8.3%
Nepal	21.41	290%	1.32	570%	28.66	0.39%	2,464	151	6.1%

Table 12. Source: Data Processing The World Bank

The overall trend between 2000 and 2015 confirms what previously reported:

- Growth in GDP and CHE reflects the improvement of this emerging economy
- There is a huge disparity between countries defined as HICs and Nepal: on a “personal PPP basis” in fact the GDP in HICs was 18.1x as much as in Nepal, while the CHE in HICs was still 35x as much as in Nepal

Differently, though, from the overall LMICs scenario, comparing GDP and CHE dynamics during the 2000-2015 period, we can find that despite a serious growth in GDP (290%), CHE increased much more than the Country’s wealth (570%). But the pivotal question is: how was this growth of health spending financed?

Nepal – Source of funding

% on CHE	2000	2002	2004	2006	2008	2010	2012	2014	2015
Public	15.51%	21.21%	15.99%	23.90%	18.63%	18.13%	17.53%	18.22%	18.13%
Private	62.97%	57.44%	58.54%	49.73%	66.55%	68.02%	69.00%	70.84%	71.39%
External	NA	21.34%	25.48%	26.37%	14.82%	13.85%	13.47%	10.94%	10.48%

Table 13. Source: % on Current Health Expenditure in Nepal - The World Bank

Based on the data reported above, the largest majority of this increase was financed by private contributions (71.4% in 2015) by an incomparable magnitude compared to the “35%-40% physiological threshold”; followed by public sources with a stable 18% since 2008 and remarkably decreasing external donations plunging at about 10% in 2015.

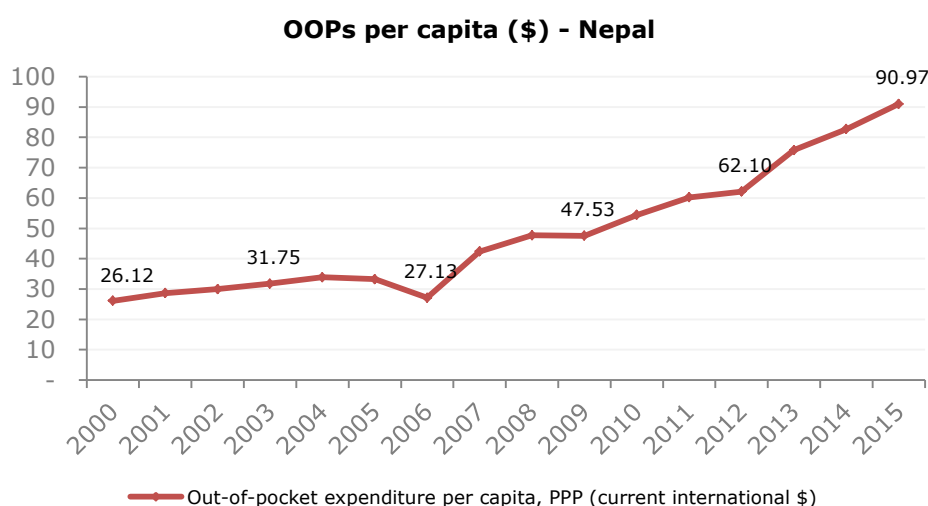
According to the analysis above, private funding is the one driver we need to explore further, paying specific attention to OOPs.

OOPs % on TOTAL CHE	2000	2002	2004	2006	2008	2010	2012	2014	2015
Nepal	55.78%	51.25%	51.60%	42.50%	61.63%	56.20%	56.10%	59.50%	60.41%

Table 14. Source: OOPs - % on Current Health Expenditure in Nepal - The World Bank

Contrary to the average previously observed for LMICs, OOPs in Nepal recorded an increase of about 5 p.p. throughout the 2000-2015 period. Hence, by looking the trend, the proportion of total healthcare expenditure paid by private sector, and particularly OOPs, has increased while the share from government’s sources has been more or less stable and external contributions have declined: the external aids’ decrease was offset by an increase in private sector while government seems to be unable to respond to the greater demand in healthcare services.

In order to assess how realistically Nepalese households can bear the health expenditures’ increases, let’s compare OPPs per capita PPP...



Graph 9. Source: The World Bank

... with average net salary by education ...

	Average Annual GROSS Salary (USD)	Average Annual NET²⁰ Salary (USD)	Average Monthly NET²⁰ Salary (USD)
Doctor Degree	24,972	18,952	1,579
Master Degree	13,463	10,217	851
Bachelors Degree	7,988	6,062	505
Some College	4,385	3,328	277
High School	10,381	7,878	657
Bellow H. School	1,382	1,049	87

Table 15. Source: <https://www.averagesalarysurvey.com/nepal> on January 2019

... and weighting OOPs by individual wages in 2015.

	OOPs per capita PPP/Annual Net wages
Doctor Degree	0.48%
Master Degree	0.89%
Bachelors Degree	1.50%
Some College	2.73%
High School	1.15%
Bellow H. School	8.67%

Table 16. Source: data processing from the World Bank and [averagesalarysurvey.com](https://www.averagesalarysurvey.com)

Not surprisingly, in Nepal – as well as in other Low Income Countries – low- and no-educated workers, representing the majority of Nepalese population, are not able to cover necessary living costs in a typical family (185 USD/month²¹) neither of an individual (114 USD/month²¹). Even more so these households are not able to sustain OOPs needed to afford treatments cost in the long run: in fact the average OOPs - per capita – PPP estimated in 2015 in Nepal were about \$91, corresponding to an unsustainable 8,7% of annual wages.

It is, therefore, reasonable to conclude that for low- and no-educated workers in Nepal - as well as in LMICs – there is no point spending for healthcare because it would lead to the paradox whereby if you care for health you die for starving: very few single individuals can face treatment costs by themselves!

Ultimately, healthcare, finance and education are the three pillars for a paradigm shift, and this is exactly what the You Foundation is promoting in Nepal!

²⁰ Fiscal effect equal around 24%; sources: <https://www.averagesalarysurvey.com/nepal> on January 2019

²¹ See Table 8

Annex 1. References to the glossary of The World Bank

Domestic general government health expenditure (Public sector's sources)= current health expenditures funded from domestic public sources for health. Domestic public sources include domestic revenue as internal transfers and grants, transfers, subsidies to voluntary health insurance beneficiaries, non-profit institutions serving households (NPISH) or enterprise financing schemes as well as compulsory prepayment and social health insurance contributions. They do not include external resources spent by governments on health.

Domestic private health expenditure (Private sector's sources) = current health expenditures funded from domestic private sources. Domestic private sources include funds from households, corporations and non-profit organizations. Such expenditures can be either prepaid to voluntary health insurance or paid directly to healthcare providers.

External health expenditure (External sources) = current health expenditures funded from external sources. External sources compose of direct foreign transfers and foreign transfers distributed by government encompassing all financial inflows into the national health system from outside the country. External sources either flow through the government scheme or are channeled through non-governmental organizations or other schemes.

Out-of-pocket expenditures (OOPs) = payments spent on health directly out-of-pocket by households²².

²² Meaning any direct outlay, including gratuities or in-kind contributions, that households make for services and goods from health practitioners, pharmacists, medical supply vendors, and others.

Annex 2. A detailed computation of OOP vs. GDP

On the basis of data provided by The World Bank...

LMICs Current Inter. US\$	2000	2002	2004	2006	2008	2010	2012	2014	2015
OOPs per capita PPP	81.71	93.37	108.20	126.04	137.94	149.66	165.03	186.47	197.96
GDP per capita PPP	3,634	3,998	4,670	5,697	6,776	7,521	8,587	9,534	9,887

Source: The World Bank

HICs Current Inter. US\$	2000	2002	2004	2006	2008	2010	2012	2014	2015
OOPs per capita PPP	417.76	455.06	507.08	561.39	609.96	629.66	667.99	716.29	738.57
GDP per capita PPP	27,230	28,949	31,627	35,325	37,972	38,355	41,004	43,570	44,718

Source: The World Bank

... we can estimate OPPs-per capita-PPP as a share of GDP-per capita-PPP:

OOPs per capita PPP (% on GDP per capita PPP)	2000	2002	2004	2006	2008	2010	2012	2014	2015
LMICs	2.25%	2.34%	2.32%	2.21%	2.04%	1.99%	1.92%	1.96%	2.00%
HICs	1.53%	1.57%	1.60%	1.59%	1.61%	1.64%	1.63%	1.64%	1.65%

Source: Data processing from The World Bank

Annex 3. In poor countries Minimum Wages too low, only in richer countries income of the medium skilled worker is in line with living wage

Wageindicator.org - Patterns in Living Wages around the World - In poor countries Minimum Wages are too low, only in richer countries income of the medium skilled worker is in line with living wage. January 2015

In poor countries Minimum Wages are too low, only in richer countries income of the medium skilled worker is in line with living wage.

The living wage is based on the amount an individual needs to earn to cover the basic costs of living. In 2014 WageIndicator initiated the Cost of Living Survey specifically designed to collect the actual prices of items necessary to calculate the cost of living. WageIndicator calculates the living wage as the amount of money sufficient to cover food expenses, accommodation costs, transportation expenses and other expenses together with a provision for unexpected events. The living wage is currently calculated for almost 50 countries (of which half are low and middle income countries in Africa, Asia and Latin America). Because food and housing costs may differ between regions within a country WageIndicator provides for regionally differentiated living wages within countries. There is a consensus that a living wage earned by a worker should be sufficient to support a family. WageIndicator calculates the cost of living also for a typical family so that the total household income earned by two parents receiving living wage should always be sufficient to cover the family expenses. WageIndicator keeps all estimates of living wage up-to-date and figures are published online at LivingWageIndicator.org

The living wage is always calculated for an equivalent of a full-time worker and therefore it is directly comparable to other income indicators.

WageIndicator presents living wage in context together with minimum wages, actual wages, and national poverty thresholds. The comparison reveals several interesting findings about income adequacy in the countries at different level of development.

1. In low income countries the National poverty lines (NPL) are defined relatively high compare to the statutory minimum wages. It also means that a worker earning the minimum wage is considered poor by national standards.

The comparison reveals that low-skill workers earn approximately two times the amount defined by the World bank poverty threshold of US\$2 PPP per day. On average the living wage (accounting for a typical family) in these countries is at least 2 to 6 times higher than minimum wage. Wages earned by low- and middle-skilled workers are likely not sufficient to cover necessary living costs in a typical family and neither of an individual. Only the earnings of workers in high-skilled

occupations are considered sufficient by living wage benchmark in low income countries.

Countries: Ghana, Honduras, India, Kenya, Madagascar, Mozambique, Nicaragua, Niger, Pakistan, Rwanda, Senegal, Vietnam, Zambia.

2. In middle income countries the amounts defined by the NPL are sufficient to cover food costs for an individual but below the total necessary living costs. Many countries in this group operate the minimum wage that is equal to the living wage however in few countries (e.g. Angola, Azerbaijan, South Africa) living wage is more than two times higher relative to minimum wage.

Comparison with real wages reveals that workers in low-skill occupations do not earn living wage to support their family in any country in this group. Wages earned in medium- and high-skilled occupations are decent and above living wage in most countries.

Countries: Angola, Azerbaijan, Brazil, Colombia, Costa Rica, Egypt, El Salvador, Guatemala, Indonesia, Paraguay, Peru, South Africa, Sri Lanka, Ukraine.

3. In high income countries the Minimum wages and real wages are on average above the estimated living wage. Yet in few countries the minimum wage is not sufficient to support a typical family (e.g. Belarus, Bulgaria, Kazakhstan, Mexico and Russia).

Likewise, the comparison of living wage with real wages reveals that low-skilled workers in Belarus, Bulgaria, Kazakhstan, Mexico, Russia may not be able to provide decent living to their families. Wages earned in medium-skilled occupation are above or not much different from living wages.

Countries: Argentina, Australia, Belgium, Brazil, Bulgaria, Belarus, Chile, Czech Rep., Finland, France, Hungary, Italy, Kazakhstan, Mexico, Netherlands, Portugal, Russian, Federation, Slovakia, Spain, Sweden, United Kingdom, United States.

All figures in EUR per MONTH	WB poverty thres -hold individ.	National poverty line individ.	Living wage individ.	Living wage family	Min. wage	Gross wage low skill worker	Gross wage med. skill worker	Gross wage high skill worker	Total fertility rate
Income Country Group									
Low income:	19	86	101	164	49	40	63	168	4,38
Middle income:	22	120	159	259	144	145	198	370	2,69
High income:	39	340	498	551	569	754	1001	1427	1,72

Terminology:

- High income group includes countries with GDP per capita PPP above US\$13,000. Middle income countries have GDP between US\$13,000 and US\$4,000 and low income countries below US\$4,000.
- World Bank 2\$ PPP Family = 2 USD in PPP per person/day is the measurement of poverty used by the World Bank. WageIndicator assumes family size of 2 + national fertility rate and each household member (including children) requires 2 USD in PPP per day.
- The national poverty line is a threshold set by most states to define the minimum level of net income necessary for an individual in order to survive in that country.
- Living wage is the amount of money to support a typical family with children in a given country. The number of children is approximated from the national fertility rate. The living wage is estimated for an equivalent of a full-time worker.
- A national minimum wage is the lowest gross wage for a full-time worker defined by national law and legally binding.
- Low-skilled workers are with occupations classified in ISCO 9; medium-skilled workers in ISCO 3-8 group; and high-skilled workers in ISCO 1-2.
- Source: WageIndicator Wages in Context (accessed on December 20, 2014).

Annex 4. Public Sources of revenue for health

An abstract from the World Bank Report 2006 "Health Financing Revisited: a practitioner's guide"

Government can increase health expenditure by increasing the fiscal space that can be devoted to health. Below main financing mechanisms available and the major factor constraining their expansion:

- Collecting new taxes through tax reforms – obviously where ratios of tax to GDP are low. This may be easier said than done! Increasing revenues through tax reforms affects many interests and cannot be done effortlessly, especially when institutional changes in the tax authorities are required, rural and informal sectors are important, borders are large, and wealthy elites are politically powerful.
- Budget reallocation from lower-priority expenditures to health; this path, too, is difficult. In the first place, government do not really have an optimizing function, so it is difficult to prove unproductive expenditure; second, reallocation of expenditure implies cutting expenditures to a particular institution or program. Automatically this raises a political or regional struggle. For example, for every rupee reaching the poor in a rice-subsidy program in India's Andhra Pradesh state in 1996, 3.6 rupees were lost in leakage to the non-poor (Radhakrishna 1997). Budget reallocation requires major political will and significant time!
- Debt relief, that is additional borrowing or debt relief to release domestic resources that could be used for additional investment and expenditure in health. But:
 - however, country must have resource to repay the debt complying with other social and poverty program
 - even though debt relief can generate significant savings in debt repayment, it does not automatically generate additional flows of resources in health (resources made available through debt relief are used to increase investments in different social sectors!)
- Social health insurance. It is an open question whether this mechanism can be realistically implemented in LMICs. First, while some countries have supportive economic conditions, with rapid growth and increasing formalization of the labor market, others are experiencing economic stagnation and have large informal sectors. Second, economies with large rural areas will face difficult challenges introducing social health insurance systems. Some countries in Latin America, such as Bolivia, Ecuador, and Peru, which have large rural populations and large informal sectors, have had difficulty increasing coverage beyond 25 percent of the labor force, despite having social insurance schemes in place for more than 60 years. Third administrative capacity is an important constrain

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