



Geography of Economic Disparities and Global Health Inequality

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Abstract

The Millennium Development Goals have documented a sharp rise in health inequalities over the past decades. With the advent of the Sustainable Development Agenda health is positioned at the core with health equity used as measure of governments' success. This highlighted health expenditures as major concern in global health policy debates and raised the question whether countries do invest fair and sufficient money into the health of their people. This chapter focuses on the global economy from the perspective of health expenditures and aims to respond to this question by demonstrating global disparities in health expenditure and their potential relation to health inequalities. The chapter consists of four parts: first, the disparities in global expenditure on health as percent from gross domestic product, as well as absolute amount per capita, including the magnitude of global inequalities in health expenditure per capita; second, the global inequalities in health that can be attributed to the disparities in health expenditure; third, the discourse from just looking at health inequalities to

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drawing the attention to health inequities; and fourth, a proposal of three scenarios to address the shortage in health expenditure to ensure better lives for all.

Keywords

Economic disparities · Global health · Health expenditure · Inequality · Inequity

Introduction

Current escalating international and national concerns for achieving the Sustainable Development Agenda (SDA) have renewed commitment and initiated a significant momentum on the part of many national governments (United Nations 2015a). The Sustainable Development Goals (SDGs) build on the Millennium Development Goals (MDGs) and go further to portray the new holistic vision of the world leaders for the future. The MDGs have documented a sharp rise in inequalities over the past decades (United Nations 2015b). Inequality in the economic, social, and environmental dimensions that are unjust violates human rights and betrayals; the ethical obligations are inequities that are preventable to achieve the ultimate goal of “Leaving No One Behind” (World Health Organization 2008).

Most importantly, stepping toward the SDA has major implications on the health front. The 17 SDGs of the 2030 agenda recognized the interlinkage of all dimensions of sustainable development and position health at the core. Health is seen as both an outcome and determinant of most of the SDGs. Health inequalities that are rooted in the economic, social, and environmental determinants are health inequities that reflect the governments’ achievements. It is now clear that health equity is a wide central “Whole-of-Government-Society” goal (World Health organization 2008; United Nations 2015a).

Concern regarding health inequity as an economic issue dates back to many decades. Significant health inequalities exist between the rich and poor countries and between the rich and the poor within a country (World Health Organization 2008). The literature underlines that the number of people living in extreme poverty in developing countries has significantly declined over the past decades, however, alerted against the uneven and unfair distribution of these gains (UNFPA 2014; United Nations 2015b; World Health Organization 2019). In the poorest communities, life expectancies continued to be unacceptably low, and hundreds of women die daily in childbirth. This strong base of evidence calls upon governments to confront the inequality challenge that hurt the poorest and most marginalized. The main outcome of the literature acknowledges that human aspirations for dignity and human rights, including good health, security of place, and mobility, are the ultimate motivation for development (Khadr et al. 2012). Economic disparities have been pushed to the forefront calling for economic and social interventions to help the disfavored and neediest. Today many countries have economic and social policy reforms and poverty reduction initiatives targeting the poorest populations. In addition, there are global aid programs to the low- and middle-income countries to

reduce suffering of the vulnerable populations. All policies and interventions on the ground mostly seek to alleviate the burden of low socioeconomic status, what can be seen as just symptomatic or bandaging the burden of injustice, but radical transformative policies to prevent the suffering of people are not yet recognized.

Despite the global efforts, health inequalities still persist and are growing in several countries. This issue reflects a need for a paradigm shift in thinking. Is curtailing health equity to the economic progress of countries the right route for sustainable development? Historically, countries are always assessed and ranked according to the gross domestic product (GDP) per capita. However, with the new vision in the SDGs, it does not matter how rich are countries, but what matters is how much they offer to make the goal of “Leaving No One Behind” achievable. What really matters is not how are countries progressing on the economic front? But how much do they spend for the health of their people? The advent of the SDA changes the quest from “how good are poor countries progressing on the health equity front as compared to rich countries?” to “do countries pay fair and enough money for the health of their people?”. Despite the potential importance of health expenditure, the disparities in the absolute amount per capita spent on health have received hardly any attention. Thus, this chapter uses the most recent World Health Organization (WHO) statistics (World Health Organization 2019) to illustrate the global disparities in health expenditure and their potential relation to the inequalities in health. The chapter argues that health inequalities that are unfair and preventable are inequities. The chapter proposes three scenarios as an initial step to address the shortage in health expenditure in an attempt to reduce inequalities in health outcomes and ensure better lives for all.

Global Expenditure on Health

Current health expenditure is always looked upon as the percent of gross domestic product (CHE% of GDP). A global look (Table 1) shows that there is a global trend to reduce the CHE% of GDP spent on health. On average, the global CHE% of GDP has decreased from 9.2% in 2000 to 6.6% in 2016 with an average annual reduction of -2.1% . This reduction was mainly due to the annual average reduction in the Region of the Americas (-2.9%), Western Pacific Region (-1.2%), and European Region (-0.3%). By contrast, there has been an annual increase in CHE% of GDP in the Eastern Mediterranean Region (1.5%) and Southeast Asia (0.5%), and no change in the African Region. The change in CHE% of GDP over the years denotes that the global gap has been halved and puts an assumption that the regions are progressing toward closing this gap.

However, looking to the actual amount in US\$ per capita spent on health (CHE-US\$ per capita) reflects a different situation and shows clearly huge disparities between the six global regions (Table 1). Despite the global reduction in CHE% of GDP, the actual global CHE-US\$ per capita has nearly doubled denoting a global economic progress. The only region that decreased the CHE-US\$ per capita is the Region of the Americas and became, instead of the highest spender on health in

Table 1 Trend in global expenditure on health

	Current health expenditure as percentage of gross domestic product			Current health expenditure per capita (US\$)		
	2000	2016	Percent annual change 2000–2016	2000	2016	Percent annual change 2000–2016
African Region	5.9	5.9	0.0	35	103	7.0
Region of the Americas	12.0	7.5	−2.9	1849	1,126	−3.1
Southeast Asia Region	3.7	4.0	0.5	20	96	10.3
European Region	8.4	8.0	−0.3	931	1,990	4.9
Eastern Mediterranean Region	4.2	5.3	1.5	68	556	14.0
Western Pacific Region	6.8	5.6	−1.2	291	1,358	10.1
Global	9.2	6.6	−2.1	481	1,001	4.7

Source: World Health Organization (2019)

2000, the third spender after the European Region and the Western Pacific Region in 2016. The gap in absolute value between the least and most spenders on health increased from US\$1,814 per capita in 2000 to 1,894 in 2016. This piece of evidence provides an opposing picture to the trend in CHE% of GDP. It gives a good reason for the need to assess progress on the health expenditure front using the actual amount spent per capita rather than the percentage of GDP that depend on economic growth of countries.

It is evident that a specific CHE% of GDP in rich economy is by far higher than the same or even higher CHE% of GDP in poor economy. Thus, it is not a matter of CHE% of GDP, but most importantly, how much do people actually get to be in good health and is the CHE-US\$ per capita fair and enough to cover people's health needs. The evidence clearly denotes unfairness in health spending. An individual in Southeast Asia Region receives on average US\$96 for health care, while an individual in Europe receives on average US\$1,990. This difference is simply because she/he lives in poor underdeveloped low-resourced region.

These inequalities are not only between regions but also within the countries of the same region. For example, in Southeast Asia Region, the CHE-US\$ per capita is US\$34 in Bangladesh as compared to US\$222 in Thailand. Even in the European Region, the CHE-US\$ per capita is US\$272 in Albania as compare to US\$9,836 in Switzerland (World Health Organization 2019). Similar disparities in CHE-US\$ per capita is seen between countries within all regions.

A further look to the population size and distribution per region (Table 2) confirms that the expenditure on health is extremely unevenly distributed between the six global regions. The Index of Dissimilarity expressed in percent (ID%) a measure of inequality was calculated to assess the magnitude of the inequalities in

Table 2 Global Disparities in Health Expenditure

	Population		Current health expenditure (US\$)		Difference in current health expenditure ^a	
	Share ^b	Total observed ^c	Total expected ^d	Total	Per capita	
African Region	0.139	107,856,347	865,583,712	-757,727,365	-724	
Region of the Americas	0.133	1,127,473,934	827,691,915	299,782,019	299	
Southeast Asia Region	0.262	188,972,352	1,627,150,144	-1,438,177,792	-731	
European Region	0.122	1,829,721,420	760,033,070	1,069,688,350	1,163	
Eastern Mediterranean Region	0.090	376,391,984	559,585,133	-183,193,149	-271	
Western Pacific Region	0.253	2,580,166,050	1,570,538,113	1,009,627,937	531	
Total	1.000	6,210,582,087	6,210,582,087	4,758,196,612		
Absolute total difference/2				2,379,098,306		
ID% ^e				38.3		

^aDifference in current health expenditure: the negative sign denotes less than expected

^bShare: proportion of the population in each region from the total global population (Source: World Health Organization 2019)

^cCurrent total observed health expenditure (US\$) is calculated by multiplying the current health expenditure (US\$) per capita by the population size in each region (World Health Organization 2019)

^dTotal expected health expenditure (US\$) is calculated by multiplying the population share in each region by the total current health expenditure (US\$)

^eID%: Index of Dissimilarity expressed in percent and calculated as $100 * (\text{half the absolute total difference} / \text{total observed current health expenditure})$

CHE-US\$ per capita between regions (Shawky 2018; World Health Organization 2013). The ID% compares the expected distribution of the total amount of health expenditure to the actual observed distribution. The expected distribution is calculated as the population share from total population in each region multiplied by the total observed amount of health expenditure. The ID% is exceeding 38% denoting severe inequality between regions.

Achieving equality in health expenditure within the total amount in US\$ currently spent on health signifies the need that each region on average spends US\$ 827 per capita for health. Thus, the African Region and the Southeast Asia Region spend over US\$ 700 per capita less than what is expected. The Eastern Mediterranean Region, also, spends US\$271 per capita less than what is expected.

In the other three regions, the CHE-US\$ per capita exceeds what is expected, notably the European Region. But, does this mean that the amount spent on health in the countries of these regions enough to ensure health of their populations? Still much disparities in CHE-US\$ per capita is seen even within the region highest

spender on health. Example, the CHE-US\$ per capita in Switzerland is US\$9,836 as compared to US\$ 272 in Albania (World Health Organization 2019). A look at the health status in these regions can provide a reasonable answer to this question.

Global Inequalities in Health

The global life expectancy at birth is 72.0 years with an average of 63.3 years of healthy life expectancy at birth (Fig. 1). However, between regions inequalities account for 16.3 years of total life expectancy at birth and 15.1 years of healthy life expectancy at birth. The three regions least spenders on health are those where people die early, they hardly reach their 70s and get sick by their 60s. In the African Region, people lose 16.3 years of life, while in Southeast Asian Region and the Eastern Mediterranean Region, they lose around 8 years as compared to the European Region. In the African Region, people get sick at an earlier age than the other five regions; they either live healthy or die, denoting more fatal conditions and health systems incapable of addressing the health challenges in this region. In Southeast Asian Region and in the Eastern Mediterranean Region, people still fall sick early in life, but the health systems efforts can help them live unhealthy for around 9 years, similar to their peers in the three regions highest spenders on health.

The people living in the three regions highest spenders on health have better opportunity to live longer reaching around 77 years. On average, they also do not get sick before the age of 68 years and live from 8 to 9 years unhealthy.

Still within region disparities in life expectancy at birth are evident in the six regions. In countries spending US\$ 30 or less per capita, people hardly survive their 50s, while in the highest spender countries, people easily survive their 70s and even

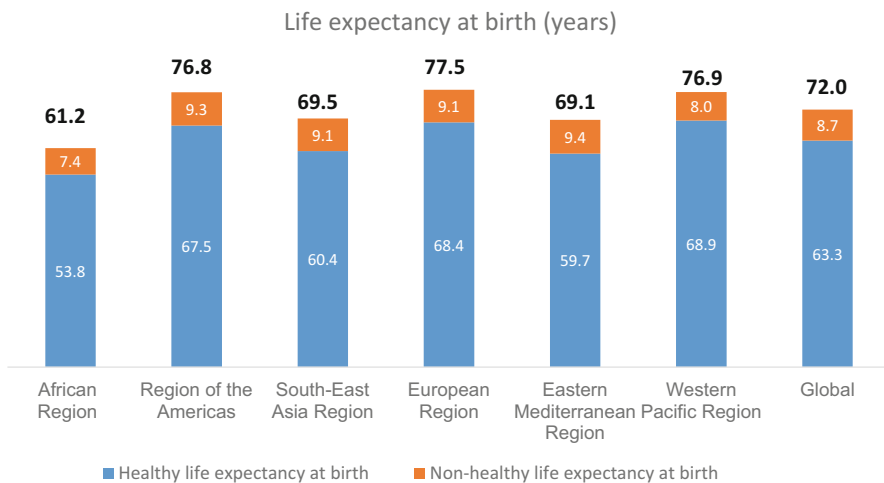


Fig. 1 Global healthy and non-health life expectancy at birth in 2016. (Source: World Health Organization 2019)

Table 3 Global disparities in maternal and child health

	Maternal mortality ratio (per 100,000 live births)	Neonatal mortality rate (per 1,000 live births)	Women of reproductive age who have their need for family planning satisfied with modern methods (%)	Proportion of births attended by skilled health personnel (%)
	2015	2017	2009–2018	2009–2018
African Region	542	27	55.7	59
Region of the Americas	52	8	82.8	95
Southeast Asia Region	164	21	71.4	81
European Region	16	5	76.7	99
Eastern Mediterranean Region	166	27	60.8	79
Western Pacific Region	41	6	87.2	97
Global	216	18	75.7	81

Source: World Health Organization (2019)

early 80s (World Health organization 2019). However, the quest is how much is a reasonable CHE-US\$ per capita to secure longer life expectancy at birth. A country like Switzerland spends US\$9,836 per capita on health and has a life expectancy at birth of 83.3 years, while a country like Japan spends US\$ 4,233 per capita on health and has a life expectancy at birth of 84.2 years. Also people in Japan live a longer healthy life than people in Switzerland. Furthermore, Norway spends US\$ 7,478 per capita on health, and Luxembourg spends US\$ 6,271 per capita on health; in both countries, people have a life expectancy at birth of 82.5 years; they live less than people in Japan and have around 4 years less of healthy life. This piece of evidence denotes that either the health status of people in these countries requires more expensive health care or that after a certain threshold for CHE US\$ per capita, the health system response to people's health needs and ability to reach and serve the vulnerable populations become the influencing factor.

The question now is what are the causes of death that result in such disparities in life expectancy at birth. This part assesses the inequalities in five main causes of causes. The global maternal mortality ratio (MMR) is 216 per 100,000, and the global neonatal mortality rate (NNMR) is 18 per 1,000 live births with one quarter of women deprived from having their need of family planning satisfied and one fifth giving birth in hands of non-skilled health professionals (Table 3). Much disparities between regions are seen in the reproductive health indicators. The MMR and the NNMR are unacceptably high in the African Region, Southeast Asian Region, and Eastern Mediterranean Region, the three regions least spenders on health. Furthermore, in these three regions, the health systems are incapable of responding

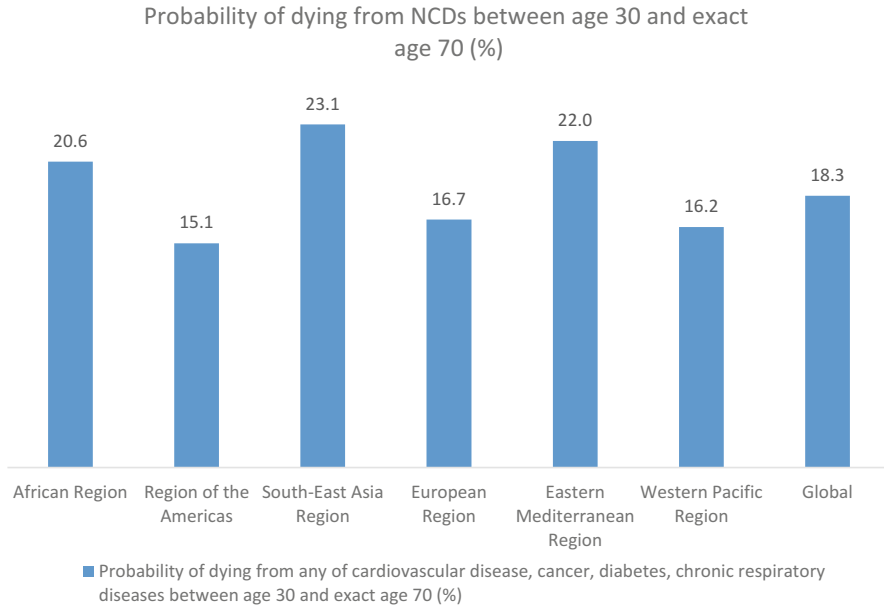


Fig. 2 Global disparities in probability of dying from any of cardiovascular disease, cancer, diabetes, and chronic respiratory diseases between age 30 and exact age 70 (%). (Source: World Health Organization 2019)

to the reproductive health needs. Women in these three regions are least to have their need for family planning satisfied with modern methods and are the least to be attended by skilled health personnel during child birth. Much disparities in the reproductive health indicators are seen between the countries of these three regions with the highest spenders on health showing better reproductive health outcomes.

The SDG Target 3.2. calls for reducing the global maternal mortality ratio to less than 70 per 100,000 live births and neonatal mortality to at least as low as 12 per 1,000 live births (UNDP 2016). Considering this target shows that the European Region, the Western Pacific Region, and the Region of the Americas have already achieved it. However, if we look to the country rates, in Japan, the MMR is 5 per 100,000 live births, and NNMR is 1 per 1,000 births, while countries with higher CHE-US\$ per capita as Switzerland and Norway have equal MMR but at least double NNMR. Also Canada that spends on health little higher than Japan has an MMR of 7 per 100,000 live births and NNMR of 4 per 1,000 live births. Thus, even in the three regions highest spenders on health, within region reproductive health inequalities are still occurring and require further attention.

The incidence of noncommunicable diseases (NCDs) is on rise in all countries and became the major threat of the new millennium. Globally, the probability of dying from NCDs is 18.3% with much inequalities between regions reaching around 7% (Fig. 2). NCDs are major causes of death in the three regions least spenders on health. The probability of dying from NCDs is highest in the Southeast Asia Region,

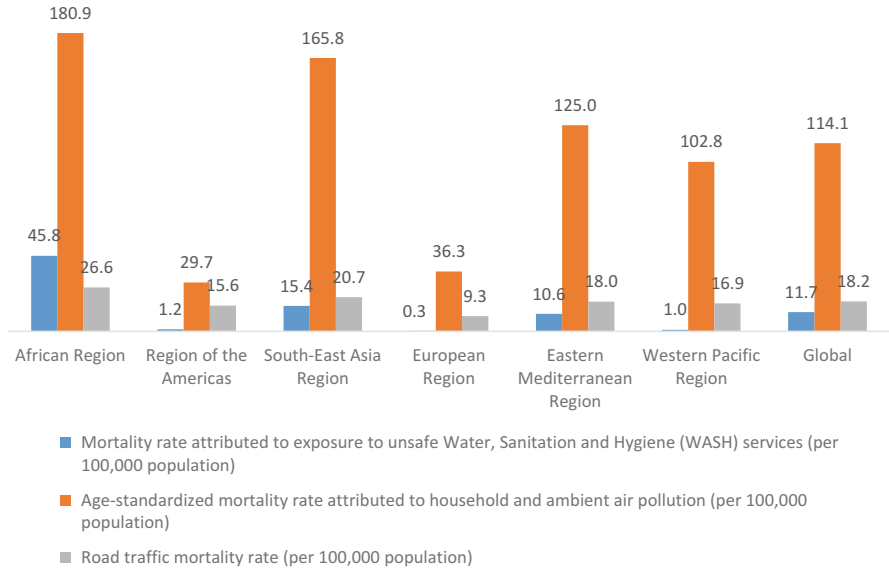


Fig. 3 Global disparities in mortality rate attributed to exposure to environmental hazards and road traffic accidents (per 100,000 population) in 2016. (Source: World Health Organization 2019)

African Region, and the Eastern Mediterranean Region. Much disparities are seen between countries of these regions between the highest and least spenders on health.

Still in the three regions highest spenders on health, much disparities in the probability of dying from NCDs are evident. Japan has the least mortality rate from NCDs (8.4%) as compared to other countries with higher CHE-US\$ per capita as Switzerland (8.6%), Luxembourg (10.0%), and Canada (9.8%).

Globally, mortalities attributed to exposure to unsafe water, sanitation, and hygiene (WASH) services account for 11.7 per 100,000 population (Fig. 3). They mostly occur in African Region, Southeast Asia Region, and Eastern Mediterranean Region. The three regions highest spenders on health has much reduced the mortalities from unsafe WASH services to range from 1.2 to 0.3 per 100,000 population denoting better living conditions than the other three regions.

However, mortalities from air pollution appear to be a global threat accounting for 114.1 per 100,000 population (Fig. 3). They are unacceptably high in all countries in the African Region, Southeast Asia Region, and the Eastern Mediterranean Region with much disparities between countries. They are also high in the Western Pacific Region, with much disparities between countries ranging from 4.1 per 100,000 population in Japan to 185.2 per 100,000 population in the Philippines. The European Region and the Region of the Americas have lower mortalities from air pollution, but still inequalities between countries are evident.

Mortality attributed to road traffic accidents (RTA) account for 18.2 per 100,000 population globally (Fig. 3). People living in the African Region, Southeast Asia Region, and the Eastern Mediterranean Region are more victims of RTA than the

other regions, with much disparities between countries. However, still mortality from RTAs is high in the three regions highest spenders on health with much disparities within regions. For example, mortalities from RTA ranges from 2.7 per 100,000 population in Switzerland to 17.1 in per 100,000 population Armenia, from 5.8 per 100,000 population in Canada to 21.3 per 100,000 population in Ecuador, and from 4.1 per 100,000 population in Japan to 26.4 per 100,000 population in Vietnam.

Moving the Discourse from Health Inequality to Health Inequity

There is significant evidence that there are inequalities in the survival and mortality between and within regions (Marmot 2015). The recognition of the short life expectancy at birth and the higher mortality rates in the African Region, Southeast Asia Region, and Eastern Mediterranean Region with low CHE-US\$ per capita, the three regions that host most of the low-resourced and underdeveloped countries, moves the discourse from health inequality to health inequity. The fact that people still die from exposure to unsafe WASH services and ambient air pollution demonstrates that people are deprived from their right to decent living conditions that influence their health.

The commitment to fairness and to impact fairness in health should receive much more attention. It is not only a matter of increasing the CHE% of GDP, but it is about the actual amount of money that people receive for health. It is also about the health system capacity and performance to respond to the population needs, serve the needy, and reach the vulnerable populations (Gilson 2003). It is also about improving people's living conditions and producing a promoting environment (World Health organization 2008). The fairness to these three regions is to work with governments to mobilize more resources for health. The concern with inequality indicates the need to strengthen the health system capacity and performance to be capable of addressing the health challenges threatening people's lives and to produce evidence to advocate for health outside the health sector and lead an intersectoral action for health.

Furthermore, the inequalities in survival and mortality between and within the Region of the Americas, the European Region, and the Western Pacific Region still denote unfairness. It is true that these regions host many of the rich countries which spend much more on health than the countries of other three regions, but still much within region disparities in CHE-US\$ per capita exist and influence the health outcomes in the countries of these regions. In addition, the evidence that countries the highest spenders on health, as Switzerland, Norway, and Luxembourg, do not always get better health outcomes as countries with around half the CHE-US\$ per capita as Japan also attracts attention to the fairness of distribution of resources within these countries, and whether they are capable of serving the needy and covering the vulnerable populations within their territories.

In nutshell, disparities in health expenditure between and within regions are evident. The impact of such disparities on the between and within region health

inequalities is evident. These inequalities are unfair and avoidable. This moves the discourse from health inequalities to health inequities that must be addressed (Solar and Irwin 2010).

Potential Scenarios for Global Expenditure on Health

The health profiles of the six global regions indicate the need for reconsidering the expenditure of health not only in the African Region, Southeast Asia Region, and the Eastern Mediterranean Region but in all six regions. Three scenarios are proposed as rough targets to be achieved over the coming decades (Table 4). The three scenarios are founded on the CHE-US\$ per capita. Despite that the three scenarios do not propose an equal amount of CHE-US\$ per capita in the six regions, yet it aims at improving the health outcomes and reducing the inequalities in health.

First Scenario

The first scenario is to help the countries in the three regions least spenders on health to gradually increase the CHE-US\$ per capita to a minimum of US\$827, the amount that is needed to make the current global CHE-US\$ per capita equally distributed between the six regions as previously presented in Table 2. However, the three regions highest spenders on health are requested to keep the amount they currently spend without reduction or even think of an increase in the countries with CHE-US\$ per capita less than US\$827. This scenario makes an assumption that paying a minimum of US\$827 per capita will improve the health of the people in the three least spenders on health and will reduce inequalities in health. This scenario may help in improving the health outcomes in the three least spenders on health but will not help the highest spenders on health to progress on the health front. The scenario may also constitute an economic burden on the least spenders on health.

Table 4 Reconsidering the total health expenditure per capita (US\$)

	Total health expenditure per capita (US\$)		
	Scenario 1	Scenario 2	Scenario 3
African Region	827	142	1,259
Region of the Americas	1,126	1,234	1,498
Southeast Asia Region	827	116	835
European Region	1,990	2,162	2,327
Eastern Mediterranean Region	827	677	1,315
Western Pacific Region	1,358	1,487	1,725

Second Scenario

As the main aim is to achieve the best health outcomes for all and being efficient, the second scenario is founded on the experience in Japan. Japan has CHE-US\$ per capita of 4,233, an amount which is much less than what is spent in several countries of the European Region example Switzerland, Norway, Luxembourg, Iceland, Germany, Austria, etc. but has the highest life expectancy at birth, highest healthy life expectancy at birth, and low mortality rates. Ideally one would propose CHE-US\$ per capita as high as Japan. Yet this scenario is not feasible and cannot be achieved except after many decades. However, there is a need to strengthen countries capabilities to increase CHE-US\$ per capita to improve health and reduce health inequalities.

Thus, the second scenario is to accept that regions spend the current amount of money to reach the observed life expectancy at birth and to calculate how much would they need to pay to achieve a life expectancy at birth of 84.2 years as Japan. This scenario makes an assumption that slightly higher health expenditure would help the six regions to reach the targeted life expectancy at birth for all. This scenario calls for an increase in CHE-US\$ per capita in countries of each region paying less than the region average. This assumption does take into consideration the actual health needs of the different age groups and does not guarantee improving population health equitably but does not put much economic burden on the countries of the six regions.

Third Scenario

The third scenario is also based on the experience in Japan. Thus, the third scenario still proposes to accept that regions spend the current amount of money to reach the observed life expectancy at birth and to calculate how much does Japan pay per 1 year of life expectancy at birth then use this figure to calculate how much is needed to be payed to gain the number of years of life lost as compared to Japan. This scenario calls for an increase in CHE-US\$ per capita in countries of each region paying less than the region average. This scenario assumes that increasing spending on health by the amount of US\$ per capita that Japan spends on 1 year of life expectancy (US\$50 per capita) would help reduce the years of life lost in each region and increase the life expectancy at birth to the targeted number of years. This scenario may also constitute an economic burden on the least spenders on health and does not guarantee an improvement in health in all regions.

Conclusion

It is the actual amount of health expenditure per capita that matters to ensure sufficient health spending and secure the health of people. The huge disparities in global health expenditure in absolute amount per capita are a fact and are reflected on

the health of the people. The scarcity of the amount spent per capita on health in the African Region, Southeast Asia Region, and the Eastern Mediterranean Region is translated into unacceptable poor health outcomes and shorter life. The pressure on public budgets make governments limit the amount spent on health care. In poor and overpopulated countries, notably where social health insurance is not available coupled with the advancement in healthcare technologies, the share of the individual in the health spending appears no more sufficient to secure good health. The disparities in the amount spent per capita on health in the Region of the Americas, Western Pacific Region, and the European Region still denote unfairness in health expenditure and health outcomes between and within regions and even within countries of the same region. There is a need for reconsidering the absolute amount of money spent per capita on health in all countries in an attempt to reduce between and within regions inequalities. Whatever the scenario to be used, there is a need for reconsidering the amount that individuals receive for health care. The three proposed scenarios deserve attention and further research to reach the ultimate goal of “Leaving No One Behind.” There is also a need for global aid to the poor underdeveloped low-resourced countries to increase the budget for health and strengthen health systems to avoid unfair and preventable health risks and diseases.

References

- Gilson L (2003) Trust and development of health care as a social institution. *Soc Sci Med* 56 (7):1453–1468
- Khadr Z, Rashad H, Watts S et al (2012) Health inequities: social determinants and policy implications. In: Jobbour S, Giacaman R, Khawaja M et al (eds) *Public health in the Arab world*. Cambridge University Press, Cambridge, UK, pp 61–74
- Marmot M (2015) The health gap: the challenge of an unequal world *RSS. Lancet* 386 (10011):2442–2444
- Shawky S (2018) Measuring geographic and wealth inequalities in health distribution as tools for identifying priority health inequalities and the underprivileged populations. *Global Adv Health Med* 7:1–10. <http://journals.sagepub.com/doi/pdf/10.1177/2164956118791955>. Accessed 20 Jan 2020
- Solar O, Irwin A (2010) A conceptual framework for action on the social determinants of health. In: *Social determinants of health discussion paper 2 (Policy and practice)*. World Health Organization, Geneva. https://www.who.int/sdhconference/resources/ConceptualframeworkforactiononSDH_eng.pdf. Accessed 17 Jan 2020
- UNDP (2016) Final list of proposed sustainable development goal indicators. Report of the inter-agency and expert group on sustainable development goal indicators, Annex IV. <https://sustainabledevelopment.un.org/content/documents/11803Official-List-of-Proposed-SDG-Indicators.pdf>. Accessed 7 Jan 2020
- United Nations (2014) Framework of actions for the follow-up to the programme of action of the international conference on population and development beyond 2014 report of the Secretary-General. https://www.unfpa.org/sites/default/files/event-pdf/93632_unfpa_eng_web.pdf. Accessed 13 Jan 2020
- United Nations (2015a) Transforming our world: the 2030 agenda for sustainable development. <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>. Accessed 13 Jan 2020

- United Nations (2015b) The millennium development goals report 2015. Available via [https://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20\(July%201\).pdf](https://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201).pdf). Accessed 15 Jan 2020
- World Health Organization (2008) Closing the gap in a generation: health equity through action on the social determinants of health: health equity through action on the social determinants of health. Final Report of the Commission on Social Determinants of Health. World Health Organization, Geneva. https://www.who.int/social_determinants/final_report/csdh_finalreport_2008_execsumm.pdf. Accessed 15 Jan 2020
- World Health Organization (2013) Handbook on health inequality monitoring with a special focus on low- and middle- income countries. World Health Organization, Geneva. https://apps.who.int/iris/bitstream/handle/10665/85345/9789241548632_eng.pdf;jsessionid=E204D37ECD0C081F8327AF17D5422E6B?sequence=1. Accessed 20 Jan 2020
- World Health Organization (2019) World health statistics 2019: monitoring health for the SDGs, sustainable development goals. World Health Organization. <https://apps.who.int/iris/bitstream/handle/10665/324835/9789241565707-eng.pdf?sequence=9&isAllowed=y>. Accessed 2 Jan 2020