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Original Article

Measuring Progress toward Universal Health Coverage in Iran: Two Years after the Implementation of the Health Transformation Plan

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ABSTRACT

Introduction: One of the most important 2015-post agendas of countries' health systems is achieving Universal Health Coverage (UHC), so countries should monitor the activities carried out. The present study aimed to investigate the UHC status two years after Health Transformation Plan (HTP) in Iran.
Methods: This is a secondary analysis of the national household income and expenditure survey (with close 40,000 households as the survey sample). The survey was used to estimate financial protection indicators (out-of-pocket payment, catastrophic and impoverishment health expenditure) in 2016. Estimation for service coverage index provided by international databases was applied at the country level. Indicators of financial protection and service coverage were evaluated in relation to each other using the World Health Organization joint levels assessment method, which indicates UHC attainment in terms of a plot with four zones. The relationship was estimated for the entire population, first quintile, and fifth quintile in 2000, 2017, and 2030.
Results: The average per capita of OOP annually was 1,940,613 Rials (162.415 PPP int $). About 15.85% of households endured catastrophic health expenditures at the 10% threshold. The impoverishment health expenditure is about 0.6. Accordingly, Iran is on the border between zones 1 and 2 in 2017 in terms of achieving UHC and will move to zone 1 in 2030 with the current trend.
Conclusion: According to the results of this study, universal health coverage has not been achieved even despite the implementation of the HTP. Even with improved service coverage, achieving UHC by 2030 may seem impossible with the current trends.

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Introduction

Universal Health Coverage (UHC) is one of the important sustainable development goals (SDGs) It includes two pivotal dimensions[1]and countries are obliged to achieve UHC targets.[2] Financial risk protection (FRP) means that households who pay out-of-pocket (OOP) payments to utilize the health services they need are not subject to financial hardship.[3] Monitoring and evaluation of FRP are performed by using the two indicators in the context of UHC.[4, 5] OOP payments are the most regressive and inequitable way to fund the health system. In lower and middle–income countries, OOP payments are often the main form of health care financing[6] and so, OOP spending has historically been the most important source of health financing In Iran.[7] There is a relatively strong relationship between FRP indicators such as the incidence of catastrophic health expenditures (CHEs) and the share of OOP payments.[8]

Iran initiated a health reform, called Health Transformation Plan (HTP), in early 2014. The reform had the prime intention to achieve UHC and improvement financial risk protection. HTP was implemented gradually during a series of phases.[7] There was a severe pharmaceutical shortage in 2012-2013 due to imposed economic sanctions.[9] Hence, as the first step, The HTP aimed at reducing the shortage and controlling the price of medicines. With a considerable increase in the Ministry of Health and Medical Education's (MoH&ME) budget, insurance coverage was extended. A number of other interventions were introduced to reduce OOP payments to 20% or less of THE. A few months later, the next phase of the HTP started by scaling up the primary health services coverage. HTP is recognized as an ongoing process, which has been occurring over the past four years and revised according to the monitoring end evaluations' results. HTP can be considered as a massive health reform since it encompasses different areas including pharmaceutical markets, primary and secondary health care, health financing, and the insurance system. One of the main objectives of the HTP was to extend health insurance coverage to the currently uninsured population (free-of-charge universal basic-health insurance). To extend population insurance coverage, the other main objectives of the HTP were ensuring financial protection for the population against the cost of ill-health, especially, and promoting equitable access to health care.[7]

Many countries around the world use regular reliable household expenditure surveys to help monitor any financial hardship caused by seeking health care.[4, 5] Since 2015, achieving universal health coverage has been on the agenda of countries. Countries are committed to achieving this goal by 2030. It is important to assess the progress of countries towards this important goal. Further, World Health Organization (WHO) encourages countries to monitor both dimensions of UHC, i.e. service coverage and FRP, simultaneously and interpret them together.[3, 10]

The current study aimed to investigate the level of FRP after two years of HTP implementation and to monitor and forecast the degree of progress towards UHC in the context of HTP (recent health reform).

Methods

This is a secondary analysis of the national health expenditure and income survey (HEIS). So، the study setting was the national level.

The data were collected from one round

(2016) of the survey. The survey is a nationally representative household survey conducted annually by the National Statistics Centre (NSC) with a sample of almost 39000 households. This study was analyzed all survey samples. This survey is used for expenditure session indicators.

Health service coverage indicators reflect the extent to which people in need receive important health interventions.[2] Institute for Health Metrics and Evaluation (IHME) and WHO estimated the service coverage index for 2000, 2017, and 2030. So, two main sources used in this study to generate measures for essential service coverage in Iran were IHME[11] and WHO universal health coverage profile.[6]

Constructions of indicators and statistically analysis

1. OOP payments

It is a direct payment for services from household primary income or savings (no third-party payer is involved).[12] In this study, per capita, OOP payment in rural and urban areas as well as the share of OOP in total households' expenditures in their non-food expenditures and in their capacity to pay were calculated.

2. Catastrophic health expenditure (CHE)[13]

CHE has been calculated as exceeding the health expenditure from 10 and 25% of total household expenditure and 25 and 40% of household capacity to pay (CTP).

3. CTP[13]

It is defined as household's non-subsistence spending and is obtained through subtracting subsistence expenditure from the total expenditure.

$$Ctph=exph-seh \ if \ seh \leq foodh$$

However, some households may report food expenditure that is lower than subsistence spending, where non-food expenditure is considered as the non-subsistence expenditures or the CTP:

$$Ctph=exph-foodh \ if \ seh \leq foodh$$

4. Impoverishing health expenditures[13]

A household is impoverished when its expenditure is equal to or higher than subsistence spending but is lower than the subsistence spending net of OOP.

A household encounters impoverishing health expenditures when it becomes poor after paying for health services, the variable for impoverishment is constructed as a dummy, taking the value of one when household expenditure is equal to or higher than subsistence spending but lower than subsistence spending net of OOP, and zero otherwise.

$$exph \geq seh \ and \ exph-ooph < seh \ impoorh=0$$
$$otherwise$$

Finally, the ratio of households experiencing the impoverishing expenditure is obtained as follows:

$$Imp=1\Sigma Nimpoorhi$$

The national poverty line (2016) was determined using the average food expenditure of households with food expenditure share within the 45th and 55th percentile of the surveyed households. In addition to the

national poverty line, international poverty lines were also used to estimate the percentage of households impoverished due to health expenditures in the current study. In October 2015, the global poverty line by World Bank was set at 1.9 dollars (2011 PPP) per day, per capita. In 2016, World Bank updated poverty lines, according to the countries' income categorization. Therefore, the national poverty line of 5.5 dollars per person was set for the-upper-middle-income countries (UMICs). In this study, the percentage of the population impoverished by health expenditures was determined based on both the WHO method considering the national poverty line as well as using international poverty lines set by the World Bank.[14]

5. Constant price

It represents the price of goods and services of households in a basic year, adjusted for the effect of inflation. All values were adjusted for urban and rural inflation rates based on an annual average of consumer price indices. In this study, all values were baselined to 2011.

6. Consumer Price Index (CPI)

This index is widely used in monitoring changes in the cost of living over time, wages and salaries adjustment, estimating national accounts to constant price, and so on. It is calculated as follows:

CPI= Cost of market basket in a given year cost of market basket in base year ×100

All expenditures were adjusted for inflations relative to 2011.[15]

7. Joint levels assessment method (JLM) of service coverage and FRP

The method proposed by WHO to assess the joint levels of service coverage and FRP was applied. The idea is that such an assessment will have utility in assessing UHC in a country, and in tracking progress over time, as well as providing an opportunity for cross-country comparison.[10] In the WHO global monitoring report issued in 2017, the median incidence of catastrophic spending at the 10% threshold was 7.1%. The current values for the UHC service coverage index ranged from 22 to 86 (composite service coverage index-Supplement 1, 2), with a median value of 65. These two indicators in relation to each other create four main zones.
In this study, the scenario that was used to track Iran's achievement to UHC was that catastrophic health payments' value (calculated for 2016) will not change over the future years (at the point of 2017 and 2030). The values predicted by IHME for the composite coverage index in Iran were used in 2000, 2017, and 2030.[6, 10, 11]

Ethics statement

This study was approved by the National Institute for Health Research, in August 2018.

Results

Out of Pocket Payments (OOP)

The average per capita of OOP annually was 1,940,613 Rials (162.415 PPP int $). Per capita, OOP paid by households living in urban and rural areas were 2,254,490 Rials (188.68 PPP int $) and 1,092,368 Rials (91.42 PPP int $), respectively. Table 1 presents the share of households' health expenditure (HE) from total

Table 1. The share of OOP from total HE, NFE, and CTP (2016)

	OOP/ HE	OOP/NFE	OOP/CTP
Urban	5.35	6.98	6.7
Rural	5.3	8.29	7.86
†Q1 (poorest)	3.44	6.45	6.34
Q2	6.29	6.45	6.34
Q3	4.72	6.66	6.42
Q4	5.85	7.8	7.39
Q5 (richest)	7.39	9.1	8.45
Total	5.34	7.32	7

*Exp-se,Total expenditure minus subsistence expenditure
†Q, Consumption quintile

Table 2. Proportion of the population facing CHEs

	OOP *exp*		OOP *exp - se**	
	Threshold		Threshold	
Total	10	25	25	40
†Q1 (poorest)	15.85	3.83	6.77	2.37
Q2	9.92	1.43	5.15	1.47
Q3	12.69	2.36	5.62	1.61
Q4	15.38	3.04	6.13	2.01
Q5 (richest)	18.90	4.49	7.53	2.56
	22.34	7.82	9.43	4.19

*Exp-se,Total expenditure minus subsistence expenditure
†Q, Consumption quintile

Table 3. Proportion of the population impoverished due to health expenditures in 2016

	Total	†Q1 (poorest)	Q2	Q3	Q4	Q5 (richest)
WHO Method (national poverty line)	0.6	2.71	0.28	0.01	0.01	0.00
International poverty line of $1.90	0.03	0.15	0.00	0.00	0.00	0.00
International l poverty line of $5.50	1.55	6.64	0.82	0.14	0.10	0.05

†Q, Consumption quintile

consumption expenditures, food expenditures, and households' CTP. The share of households' health expenditure from non-food expenditures (NEF), from total household consumption, and household's CTP were 7.3%, 5.34% %, and 7%, respectively.

Catastrophic Health Expenditures (CHEs)

Table 1 also, presents the percentage of households experiencing CHEs in 2016. About 2.37% of the Iranians spent more than 40% of their CTP for health services and 3.83% of the population spent more than 25% of their total expenditures to receive health services in 2016, whereby they faced CHES.

Impoverishing health expenditures

In addition, Table 1 reports the percentage of non-poor populations impoverished due to OOP. Considering the international poverty line of 1.9, health expenditures only affected the first quintiles. Around 0.15% of the population in this quintile became impoverished due to health expenditures in 2016. Based on the international poverty line proposed for UMICs, 1.55% of the Iranians were impoverished due to OOP payments in 2016.

Joint levels assessment method (JLM) of service coverage and financial risk protection

Figure 1 displays the joint levels of FRP and service coverage, where the percentage of households spending more than 10% of their total consumption on health in 2016 is compared against an estimated index for the coverage index in 2000, 2017, and 2030 in the population as a whole, as well as first and fifth quintiles.

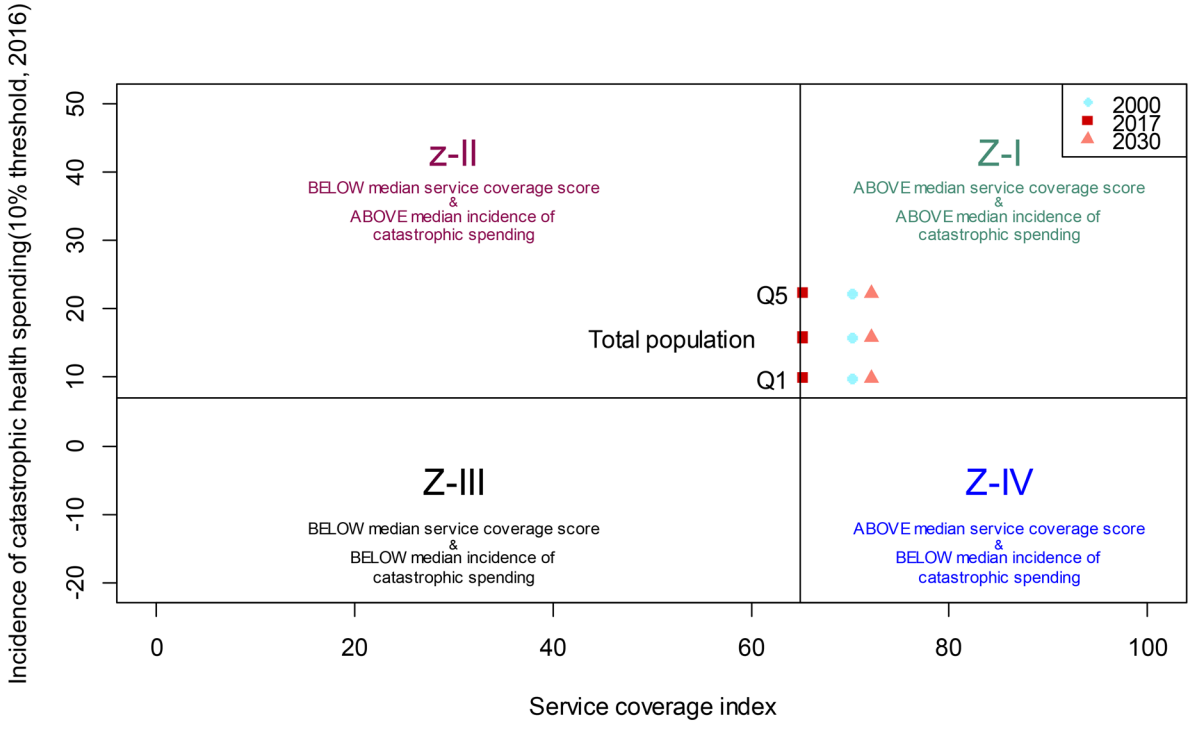

Figure 1. Joint visualization of service coverage index and incidence of CHE defined as OOP expenditures exceeding 10% of total household consumption across total population, quintile 1, and quintile 5 in 2000, 2017, and 2030

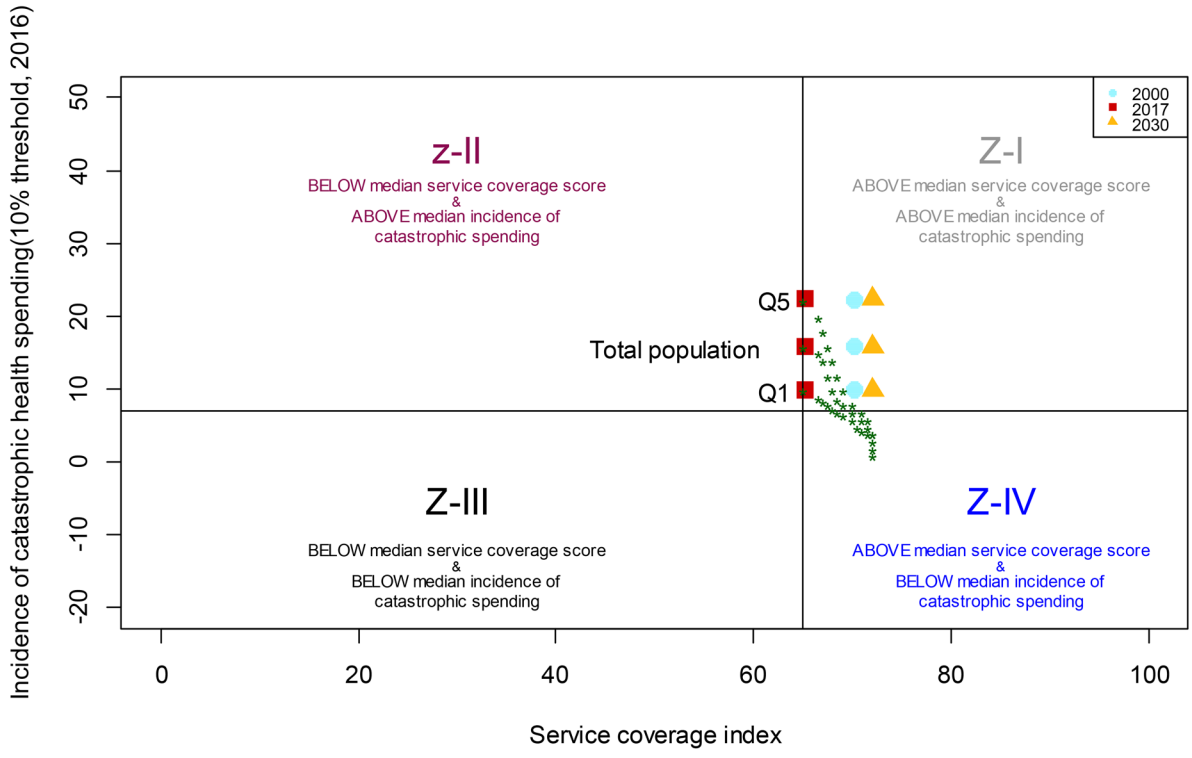

Figure 2. Incidence of CHE across the total population, quintile 1 and quintile 5 defined as OOP expenditures exceeding 10% of total household consumption in 2016 and estimated service coverage index in 2000, 2017, and 2030

Estimation of movement towards zone 2 and zone 4

The services coverage index in Iran will reach 72.1% in 2030. Considering the projection, the CHEs values that may lead Iran to move to zone four or zone two are illustrated in Figure 2. The value of CHEs should be less than 8.75% for Iran to be able to move to zone 4 and more than 15.85 to lead towards zone two. The green points in the plot represent the paths that Iran needs to go through to reduce the incidence of CHE and reach financial protection in 2030.

Discussion

Monitoring and evaluation of the level of financial risk protection from out-of-pocket payment is critical for assessing country-level progress towards UHC.[1] The use of SDG approach suggested that around 15% of Iranian households who utilized healthcare services underwent catastrophic health expenditure in 2016 when the threshold was set at 10% of daily per capita total household consumption. Iran doesn't seem to have a good situation in terms of incidence of CHEs among upper-middle-income countries (UMICs). However, considering poverty line of 1.9 $, Iran is among UMICs countries with the minimum population encountering impoverishing health expenditures.

Assessing the JLM and FRP using the WHO approach,[10] it was found that Iran is located on the border of zone one and zone two of the matrix; if the percentage of households with CHEs increases in the future, despite having a constant service coverage index, it may

move towards zone two. Most of the UMICs countries and all high-income countries are in the first and fourth zones of the matrix. On the other hand, most of the lower-middle-income countries are located in zones two and three. Assuming that the value for CHEs in 2017 and 2030 will be the same as 2016, it seems that Iran will move to zone one in the upcoming years. To achieve the UHC goals, countries should move towards zone four. Having the scenario in mind, Iran may hardly move to the fourth zone and achieve UHC at least in near future.

Analysis of the wealth quintile separately revealed that they do not move to the fourth zone with the same speed. To accelerate movement towards UHC, targeted interventions for further reducing socioeconomic health disparities should be designed and promoted. Having the same interventions for all population groups may not be an appropriate policy to achieve UHC in Iran.

Assuming that the population will not increase and remain stable until 2030 if CHE is reduced by 44% from 15.8% (i.e. the current value) to at least 8.75% (i.e. the targeted value that can move Iran to zone four), Iran will find a suitable situation in terms of achieving UHC. If no interventions are taken to reduce OOP, more than 16% of the households will endure CHEs in 2030. According to the population estimation of the United Nations, Iran's population will increase by at least 10% in 2030.[16] Hence, this issue should be considered while designing programs to accelerate achieving UHC.

The percentage of households facing CHEs (10%) of daily per capita total household consumption in total population, the poorest and richest were 15.85, 9.92, and 22.34%, respectively in 2016. According to the IHME estimation, the composite coverage index for Iran will reach 72.1% in 2030.[6] Considering these estimations, if Iran is to reach the fourth zone, the incidence of CHEs should be reduced less to than 8.75% across the total population provided that the population will not increase in the future. To achieve full-service coverage with a 100% FRP, some interventions should be designed to increase the index of service coverage beyond 72.1% in 2030. It means that in addition to reducing CHEs, attempts should be made to improve the coverage index. The coverage index for Iran was estimated as 70.1% in 2000 which then reduced to 65.2% in 2017, which is not promising. In the most optimistic scenario, if it remains constant until 2030 and the CHEs value does not diminish either, Iran may move to zone two (the worst area). This suggests that the currently implemented interventions are not effective enough at increasing access or improving FRP, despite an extensive reform in the health system. Therefore, in the remaining years to 2030, additional interventions in both dimensions of service coverage and FRP with an equity perspective should be designed and implemented to accelerate the progress towards UHC.

HTP was implemented to improve access to health services and provide FRP to the Iranians in early 2014. The share of OOP to THE decreased to more than 40% following the HTP implementation.[17] Local studies reported improved service coverage.[18] However, WHO evaluation indicated that the service coverage decreased in 2015 compared to 2000. Hence, the results should be interpreted with caution.[6]

Cross-country data have confirmed that high OOP payments, often in the order of 40% and beyond the THE, increase the risk of poverty.[19] The results of this study indicated that two years after the HTP implementation, the percentage of households undergoing CHEs remained stable with no considerable change

in 2016 in comparison with 2013. However, the percentage of the population impoverished by health expenditures considering the international poverty ($1.90) line significantly declined from 0.17 in 2013 to 0.03 in 2016. Therefore, the results suggest that the poor have benefited more from the HTP.

The results showed that CTP and NFE were higher among rural households than across urban households. Hence, when the share of OOP to CTP is used to calculate CHEs, the incidence of CHEs will be higher among rural households, which is confirmed by other local studies as well.[20]

In this study, wealthy households were more likely to encounter CHEs, which is consistent with results from other studies.[21-25] Also, due to the short distance between per capita consumption and the poverty line, the poorest households encountered impoverishing health expenditures more than other quintiles did. Indeed, the minimum expenditure on health could be impoverishing for the poorest population. Considering the international poverty line of $5.50, about 6.7% of the poorest population became poor due to OOP spending. Health services are provided by both public and for-profit private sectors in Iran. Primary health care services are free of charge for the entire population in Iran.[26] Free of charge healthcare services and exemption mechanisms that are provided by the governments to the poor and vulnerable populations could explain why CHEs are disproportionally concentrated among the better-off in Iran.

It is argued that measures of FRP need to be extended to incorporate any non-use of services because of the need to pay.[3]

The share of OOP varies by type of health services among different socio-economic groups. Targeted interventions to reduce OOP and mitigate the risk of CHEs should be designed and implemented. OOP payments, particularly those made by the rich, should be channeled through prepaid and pooled mechanisms to the main public health insurance funds. Further, there is still an FRP between patients and physicians, some part of which is related to informal payments. Although one of the goals of HTP was to reduce informal payments, it has not been achieved completely.[26] Conducting relevant studies to estimate the prevalence of informal payments seems necessary in the future.

The assessment can provide a snapshot of health system performance and its impacts on the population receiving essential health care coverage and FRP.

Conclusion

According to the results of this study, universal health coverage has not been achieved even despite the implementation of the comprehensive health transformation in Iran. Even with improved service coverage, achieving UHC by 2030 may seem impossible with the current trends.

The results suggested that despite progress, Iran will not achieve the 2030 UHC targets unless the country scales up targeted interventions to focus on both rather than only either of the dimensions of UHC. Given that the country has committed to achieving UHC by 2030, targeted health financing and other health system interventions must be implemented to increase FRP and improve essential service coverage simultaneously.

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Author Contributions

Conceptualization: EA, ZHA. Data curation: ZHA, RA. Formal analysis: EA, ZHA. Funding acquisition: None. Methodology: ZHA, BN, EA. Project administration: EA. Writing – original draft: EA, ZHA. Writing – review & editing: ZHA, BN, EA, IH, SS, BH.

Competing interests

The authors have no conflicts of interest to declare for this study

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References

1. Boerma, T., et al., Monitoring Progress towards Universal Health Coverage at Country and Global Levels. PLOS Medicine, 2014. 11(9): p. e1001731.

2. Hogan, D.R., et al., Monitoring universal health coverage within the Sustainable Development Goals: development and baseline data for an index of essential health services. The Lancet Global Health, 2018. 6(2): p. e152-e168.

3. Saksena, P., J. Hsu, and D.B. Evans, Financial risk protection and universal health coverage: evidence and measurement challenges. PLoS medicine, 2014. 11(9): p. e1001701.

4. Wagstaff, A., et al., Progress on catastrophic health spending in 133 countries: a retrospective observational study. The Lancet Global Health, 2018. 6(2): p. e169-e179.

5. Wagstaff, A., et al., Progress on impoverishing health spending in 122 countries: a retrospective observational study. The Lancet Global Health, 2018. 6(2): p. e180-e192.

6. Lozano, R., et al., Measuring progress from 1990 to 2017 and projecting attainment to 2030 of the health-related Sustainable Development Goals for 195 countries and territories: a systematic analysis for the Global Burden of Disease Study 2017. The Lancet, 2018. 392(10159): p. 2091-2138.

7. Abdi, Z., R. Majdzadeh, and E. Ahmadnezhad, Developing a framework for the monitoring and evaluation of the Health Transformation Plan in the Islamic Republic of Iran: lessons learned. Eastern Mediterranean Health Journal, 2018. 24.

8. Akazili, J., et al., Assessing the catastrophic effects of out-of-pocket healthcare payments prior to the uptake of a nationwide health insurance scheme in Ghana. Global health action, 2017. 10(1): p. 1289735.

9. Kheirandish, M., et al., Impact of economic sanctions on access to noncommunicable diseases medicines in the Islamic Republic of Iran. Eastern Mediterranean Health Journal, 2018. 24(1).

10. Organization, W.H., Tracking universal health coverage: 2017 global monitoring report. 2017.

11. (IHME), T.I.f.H.M.a.E. Iran. 2019 April 17, 2019]; Available from: http://www.healthdata.org/iran.

12. OECD, Eurostat, and W.H. Organization, A System of Health Accounts 2011. 2017.

13. Xu, K. and W.H. Organization, Distribution of health payments and catastrophic expenditures methodology, 2005, Geneva: World Health Organization.

14. Ferreira, F. A richer array of international poverty lines. 2017 April 16, 2019]; Available from: http://blogs.worldbank.org/developmenttalk/richer-array-international-poverty-lines.

15. Statistical Center of Iran. Consumer Price Index. 2019 February 23, 2019]; Available from: https://www.amar.org.ir/.

16. worldometers and P.D. Department of Economic and Social Affairs. Iran population. 2019 February 23, 2019]; Available from: http://www.worldometers.info/world-population/iran-population/.

17. Zhaleh Abdi, et al., An analysis of financial protection before and after the Iranian Health Transformation Plan (Article in press) Eastern Mediterranean Health Journal.

18. Moghadam, M.N., V. Sadeghi, and S. Parva, Weaknesses and challenges of primary healthcare system in Iran: a review. The International journal of health planning and management, 2012. 27(2): p. e121-e131.

19. Verguet, S., et al., Is the sustainable development goal target for financial risk protection in health realistic? BMJ global health, 2017. 2(3): p. e000216.

20. Yazdi-Feyzabadi, V., et al., Prevalence and intensity of catastrophic health care expenditures in Iran from 2008 to 2015: a study on Iranian household income and expenditure survey. International journal for equity in health, 2018. 17(1): p. 44.

21. Aregbeshola, B.S. and S.M. Khan, Out-of-pocket payments, catastrophic health expenditure and poverty among households in Nigeria 2010. International journal of health policy and management, 2018. 7(9): p. 798.

22. Chhun, C., et al., Catastrophic payments and poverty in Cambodia: Evidence from Cambodia Socio-Economic Surveys 2004, 2007, 2009, 2010 and 2011. 2015: Cambodia Development Resource Institute.

23. Dorjdagva, J., et al., Catastrophic health expenditure and impoverishment in Mongolia. International journal for equity in health, 2016. 15(1): p. 105.

24. Rashad, A. and M. Sharaf, Catastrophic economic consequences of healthcare payments: effects on poverty estimates in Egypt, Jordan, and Palestine. Economies, 2015. 3(4): p. 216-234.

25. Van Doorslaer, E., et al., Effect of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data. The lancet, 2006. 368(9544): p. 1357-1364.

26. Asadi-Lari, M., et al., Public health improvement in Iran—lessons from the last 20 years. Public health, 2004. 118(6): p. 395-402.