

AN EFFECTIVE HEALTH CARE SYSTEM THROUGH HEALTH TECHNOLOGY ASSESSMENT AND AN EVIDENCE BASED PAYMENT SYSTEM IN INDIA

Arya Kumar*¹, Rajni Mathur², T. Shirmila³, Rahul More⁴, Ravindra Kaikini⁵, Kuldeep Bhalerao⁶

1. KSFHS, KIIT Deemed to be University, BBSR, Odisha, India
2. Bharati Vidyapeeth's Institute of Management Studies and Research, Navi Mumbai, India
3. Madras Christian College, University of Madras, Chennai, India
4. Sinhgad Institute of Management and Computer Application, Narhe, Pune, India
5. Department of Business Administration, Sahyadri College of Engineering & Management, Adyar, Mangalore, Karnataka, India
6. Bharati Vidyapeeth's Institute of Management Studies and Research, Navi Mumbai, India

Correspondence: aryantripathy@yahoo.com

ABSTRACT

The purpose of this research is to discuss the significance of health care insurance compensation for obtaining comprehensive medical treatment in India. Through a systematic review survey focusing on the keywords like out-of-pocket, health technology assessment and health care system was conducted by searching Google Scholar, Science Direct, PubMed and ProQuest Database.

It is observed that India ranks among the greatest out-of-pocket (OOP) healthcare expenditure across the globe. This seems to be notwithstanding the deployment of several public health plans and the provision of a significant variety of both private and public health coverage schemes. Decrease in the treatment quality across many healthcare institutions of government is a key cause causing the typical Indian individual to constantly rely on medical services provided by private firms, heading up OOP expenses. Among the most significant problems in implementing universal health care (UHC) in India is a poor acceptance of insurance products and awareness between many Indians. The burden of large OOP expenditures on people might be lessened by increasing medical insurance acceptance, which may be accomplished by enhancing India's medical claims system.

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KEYWORDS

Health insurance, medical expenditure, technology, out of pocket, public health

INTRODUCTION

Out-of-pocket (OOP) medical spending is very common and highest in India. Since about 2016, over 65% of overall medical spending is carried through OOP by Indian families, which is greater than those of other Southern Asian nations such as Thailand, Sri Lanka, Nepal, Maldives, Indonesia, China, and Bhutan [1]. Specialist appointment charges, laboratory testing, the cost of medications and healthcare products, and treatment bills are all examples of out-of-pocket expenses. The substantial OOP expenditure on medical services leads to financial disaster, as when 40% of a family's earnings are invested on medical care [2]. The financial disasters caused by significant OOP medical expenditure lead to massive indebtedness for single families, which is seen in either middle-income or low-income individuals. According to the Healthcare Use Survey 2014, 24.9% of all assessed Indian families were suffered crisis repayments due to medical expense [3]. An optimal medical plan would offer preventative and therapeutic treatment, in addition to appropriate compensation structure for individuals to obtain quality and prompt treatment, decreasing OOP spending.

The medical sector in India is complicated, including both governmental and private organisation [4]. The level of treatments offered in India varies from internationally famous institutions to disorganized centres providing subpar treatment. India's private medical practice, like that of various emerging economies, typically offers excellent performance yet is greater priced, while the government medical network is neglected and badly implemented but offers lower services. The poor treatment quality provided at primary medical clinics and community levels clinics is mostly attributable to insufficient public medical costs, insufficient supervision, and insufficient regulation. India's important national medications list is marketed at cheap prices and are anticipated to be available to a substantial proportion of the people; more costly items can be found within just a few large hospitals set by government and many private medical institutions, and therefore are not widely obtainable. It has developed as a scenario in which both the lowest-income and least educated individuals of India in both urban and rural regions choose the highly premium commercial hospitals and clinics over the government medical establishments.

In 2015, the private industry provided approximately 60% of hospital services and approximately 80% of outpatient

services [5]. This increased reliance upon that pricey commercial medical industry is a key contributor to India's high percentage of severe OOP medical costs. The rising out-of-pocket medical spending in India also suggests a deficiency to obtain universal health coverage (UHC) that further seeks in supplying equitable accessibility to high-quality healthcare to all common people, such as exposure to new medications introduced globally, while avoiding economic stress [6]. The Indian Government and other governments at state level have developed numerous wellness programmes to minimize OOP medical costs and so attain UHC, with variable levels of effectiveness in decreasing OOP cost. The way to cut OOP cost is to increase medical coverage enrolment in India, which is now relatively small. In a 2017 report for India, just over 34% of entire nation is protected by medical coverage, as well as the large bulk (about 79%) of medical coverage firms are public firms. [7] An option for increasing healthcare coverage adoption is to improve payment systems, which may be accomplished by using evidence-based healthcare (EBH) standards for compensation. We carefully explore the different national medical plans that have recently been implemented, and then show how applying EBH standards might enhance not just the level of medical treatment, but also coverage enrolment and medical insurance compensation in India. India has significant public medical plans. In India's healthcare system, technology assessment is critical to ensuring that medical technology and infrastructure investments are cost-effective and consistent to minimize out-of-pocket medical expenses. Assessing healthcare technology uptake and effect can assist in optimizing budget allocation, improving healthcare quality, and expanding access under national medical insurance.

METHODOLOGY

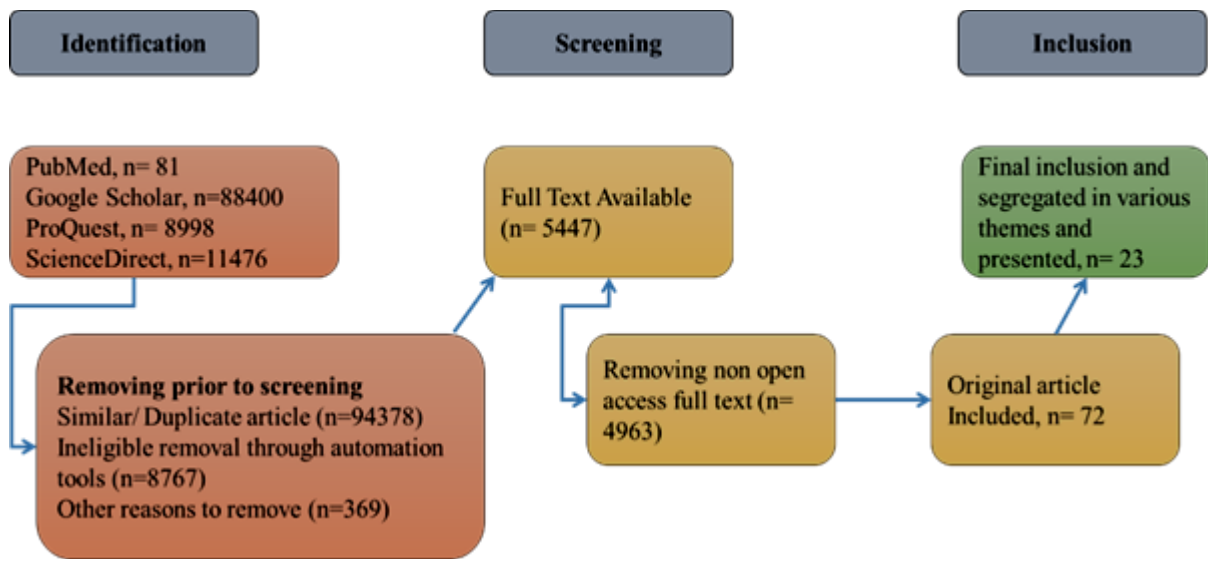
Our study rigorously employed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) framework, ensuring a comprehensive and standardized approach to conducting this investigation, enhancing its reliability and transparency.

SEARCH STRATEGY

The study has considered the most relevant search databases for literature such as Google Scholar, Scopus, PubMed, and Science Direct to find the relevant original research articles. The research papers are segregated as inclusion and exclusion that are published from 2015 to 2022, language as English, full text and original work while

double or duplicate publications are removed respectively, which is presented in Figure 1.

FIGURE-1 FLOW CHART OF PRISMA FOR EXCLUSION AND INCLUSION NAME



From Figure1 it can be clearly understood that by using the keywords like out-of-pocket, Health Technology Assessment and health care system, the search platforms like PubMed resulted in 81, Google scholar gives 88,400, ProQuest gives 8,998 and Science Direct gives 11,476. In total it gives a result of 108,955 articles that are filtered with inclusion and exclusion criteria mainly focusing on years, full text, language and no duplications.

RESULT OVERVIEW

The government has attempted to offer monetary assistance for medical treatment by various insurance programs, including since 1952 and 1954 are ESIS (Employees State Insurance Scheme) and (CGHS) the Central Government Health Scheme (Table 1). Even after its popularity within and between Indian people, these plans just intended to aid handpicked beneficiaries to acquire healthcare coverage at the regional or central stage, and UHC might not be of benefit to individuals on their own. Individuals that were not qualified for such plans remained to pay out of pocket for their medical requirements.

TABLE-1 INDIAN HEALTHCARE SCHEMES FOR GENERAL PUBLIC

State or National Scheme	Scheme Name	Year	Scheme Plans
National	Employees State Insurance Scheme (ESIS) [8]	1952	Employees earning up to Rs. 21,000 can avail maternity benefit, health coverage and disablement benefit
	Central Government Health Scheme (CGHS) [7]	1954	Pension holders and employees of Central government to avail medical care comprehensively
	Rashtriya Swasthya Bima Yojana [9], [10]	2008	Below poverty line families to get hospitalization expenses assistance for per family per year up to Rs. 30,000 and addition to transportation expenses

	Ayushman Bharat [11]	2018	Health insurance coverage for vulnerable and poor family up to Rs. 5 lakh per family per year
Maharashtra	Mahatma Jyothiba Phule Jan Arogya Yojana [12]	2012	Per family per year to receive cashless hospitalization expenses up to Rs. 1.5 lakh
Tamil Nadu	Chief Minister's Comprehensive Health Insurance Scheme [13]	2012	A yearly to every family with an annual income below to Rs. 72,000 to receive cashless hospitalization expenses up to Rs. 1.5 lakh
Odisha	Niramaya Scheme [14]	2012	Health insurance for specially abled people
Odisha	Biju Swasthya Kalyan Yojana [15]	2018	A health insurance facility for all residents of the state with Rs. 5lakhs per family and 7 lakhs per women of that family

Several Indian states have adopted medical coverage plans and promote public-private commercial dealings for medical coverage. Such a plan in Andhra Pradesh was Rajiv Aarogyasri Yojana initiated in 2007. As of 2013, the Rajiv Aarogyasri Yojana (a government community health insurance scheme) has reached as much as 87% of the nation's poor individuals just 6 years of its launch (\$USD 1,009 as of October 2019). Furthermore, since 1995, in Tamil Nadu medications have been made available with no cost in public hospitals. [16] Achievement of such plans is evidenced by the core that out-of-pocket cost of medical expenses in Tamil Nadu is indeed the cheapest by many Indian states. A further prosperous nation health plan in Maharashtra is the Mahatma Jyothiba Phule Jan Arogya Yojana. Another medical coverage was introduced by the Ministry of India in 2008 to offer monetary assistance against destructive medical expenses, minimize OOP spending for hospital treatment, and achieve better accessibility for low-income households and some other weaker sections of the society in the disorganized sector is the Rashtriya Swasthya Bima Yojana (RSBY). The business of insurance is outsourced, and the governments, state (25%) and central (75%), split the cost. In essence, the insurance firm agreements with a network of private and public healthcare institutions to provide free outpatient assistance to the beneficiaries. The insurance firm compensates a specified sum as deals per business category to the empaneled clinics. As of December 2020, members pay a processing charge of INR 30 (\$USD 0.41). [9] This strategy was supposed to reduce OOP expenditure. But nevertheless, successive findings confirmed that RSBY did, in assertion, maximize the chances of OOP medical funding by 30%. The major causes for such an assertion were recommended to be low uptake, poor registration habits, unsatisfactory medical insurance, an absence of insurance

for ambulatory care expenses, useful for classification of arraigned amenities, insufficient control and reporting, fixed component premiums, and an absence of a great execution plan. On September 23, 2018, the Indian Government introduced the Ayushman Bharat plan, gaining out from failures of RSBY. The country's greatest publicly financed medical insurance program and it is divided into two parts: wellness and health clinics and the PM-JAY (Pradhan Mantri Jan Arogya Yojana) exist for delivering complete demand medical care including preventative, therapeutic, and outpatient treatment in India's tertiary, secondary and primary, level health facilities. The wellness and health facilities provide complete medical assistance, maternity and paediatric welfare facilities, and chronic non - transmittable diseases care. [10] The PM-JAY benefits over 500 million people from poor and vulnerable households of 107.4 million, without any household size restrictions. This policy offers an overall medical insurance in December 2020 of INR 5 lakh (\$USD 6,810) per household for tertiary and secondary care treatment in India, spanning governmental and non - governmental arraigned facilities. All pre-existing issues are included in PM-JAY since day one. There is already coverage for expenses up to three days beforehand and up to fifteen days afterwards treatment and beneficiaries can use the plan's benefits in any arraigned governmental or non - governmental hospital in the nation. The plan covers all expenditures for roughly 1400 treatments, and qualifying beneficiaries can receive these treatments totally free. The government compensates medical costs, and medical facilities are funded at the same rate as private hospitals. National Health Authority [17] stated that the benefits of installing PM-JAY are split among the federal and state governments. There at moment, Indian residents are enthusiastic about Ayushman Bharat. Approximately

recipients of 90 million since around July 2019 had been recognized, and over 3.6 million claimants had indeed successfully treated in even further 16 000 arraigned hospitals. Additionally, and over 9000 medical facilities throughout India were arraigned there under PM-JAY as of December 2019. Further recipients are recognized by referring to the 2011 Social economic Caste Survey and the very first part will encompass the lowest 40% of the poor and unprotected community. Possible options, nevertheless, are necessary to lower the OOP medical spending of the people who are currently ineligible for enrolment in PM-JAY. However, one technique is to increase medical coverage enrolment in India.

INDIA'S MEDICAL COVERAGE AND PAYMENT SITUATION

Owing to the prevalence of many medical coverage programmes given among both commercial and public medical coverage companies, coverage consumption in India remains low. There are several explanations for this circumstance: Observations of persons who have been protected by a private medical coverage program but did not receive the advantages that have been guaranteed. According to Healthcare Use Survey in the year 2014-2015, just 1.3% of private coverage families received compensation for healthcare expenses. Thus, raising funding levels is critical to increasing medical enrolment in India. Choosing the best coverage plan and determining the appropriate benefits from the accessible selection of programs is normally unclear for the common Indian individual. Inadequate medical infrastructure and a lack of insurance knowledge building in the countryside. Many commercial healthcare plans in India are "topped" health plans with predetermined limitations on a certain product, and they primarily focus the middle-class people instead of improving the coverage to meet the much more recent needs and technology [18]. Difficulties with health insurance: many private medical insurance firms pay back only handpicked medical care, such as hospital treatment, and doesn't include ambulatory care counselling in their regular insurance cover. As a result, patients who require ambulatory care counselling are frequently expected to devote cash, even after being protected by medical insurance. Private health insurance companies are given greater motivation to participate. Individuals with the least health hazards seem to be more able to obtain medical insurance than those with greater health hazards. This disparity in client selection strategy has the potential to disrupt insurance sectors [19]. [20] A patient who is additionally not a client of any public healthcare system

bears a large out-of-pocket expense for every medical treatment, also with majority of the out-of-pocket expense being for drug purchasing. [21] Although having spent tremendous sums of pay on medical out of pocket, Indians are hesitant to obtain health care coverage. A most major explanation for this discovery is that many medical coverage plans exempt ambulatory care expenses from payment and only make the payments after admission. [22] States that as a consequence, there is an increased occurrence of needless treatment and "carrier requirements" in order to collect health coverage. [23] This scenario, in which a great percentage of Indian residents generally do not have exposure to necessary medications or must pay exorbitant OOP prices for them, contrasts sharply with the established reality that India sells drugs to over 200 nations worldwide and is lauded as the "pharmacy of the world."

Nandi [24] stated that, the significant issues that impact India's medical care scheme have an inadequate Medicare spending plan, wide variations in medical exercise all over areas or clinics, all public failed to qualify for government medical insurance plans, low utilisation of medical insurance plans, health coverage that does not properly support ambulatory care, and an inadequately formalized Medicare payment process, all of which contribute to high OOP care costs. One possible method for resolving the majority of these issues and ensuring optimal resource utilization in India is to enhance, that is the payment through evidence-based and applying HTA (health technology assessment) [25].

COMPENSATION THROUGH EVIDENCE-BASED AND HTA

Medical payment, distinct as how a covered individual gets reimbursed for medical expenditure, is determined by how much insurers are ready to reimburse for authorized items and services on favour of their coverage scheme subscribers [26]. [20] Despite the fact that companies work in a strictly controlled setting in terms of innovation, production, and marketing, their primary goal is to maximize profit by delivering medications, medical tests, and hospital instruments. Profit is crucial for the business, but it must not be used to discredit scientific findings. This is how the EBH as an idea gets into play.

It attempts to increase the level of medical treatment and happiness of patients while lowering medical expenses by combining research-based medical expertise, professional competence, and the individual's preferences and beliefs.

These findings, derived from the analysis of evidence gathered in a specified method, substitute commonly proposed therapies dependent on empirical and experienced viewpoints with novel therapies that are greater efficient, reliable, dependable, efficacious, faster, healthier, and less expensive.

EBH enables health workers and individuals to make more educated decisions, which leads to higher value, patient experience, and controlled price. EBH also assists authorities in determining which strategies succeed and which do not. The use of EBH concepts in defining medical insurance compensation ensures that people receive the most adequate therapy for every given set of conditions while also protecting people from extraneous fees associated with hospital treatment, medical tests, medications, and other supporting requirements.

Most authorities concerned in medical compensation are not substantially involved in the formation of modern science. They acquire medical facts for deciding compensation rates employing the similar techniques and resources that professionals and other medical players use to determine the optimal therapy for individuals. The information for setting compensation policies in the United States is mainly obtained by the Agency for Healthcare Research, Quality's National Guideline Centre and the Cochrane Database of Systemic Reviews. The information is then examined by initiatives of the US Preventive Services Task Force and the Blue Cross and Blue Shield Association's Technology Evaluation Centre. The scenario is comparable in industrialized nations such as Australia, United Kingdom, and Canada. In reality, an institute based in UK as the National Institute for Health and Care Excellence has been a trailblazer in the use of EBH in drug compensation and the development of scientific proof standards. Furthermore, these nations encourage the development of statistical evidence concerning the security, efficacy, and quality of medical innovation in order to determine the kind and amount of drug compensation. This technique of evaluating the cost to profit ratio of HTA, employs EBH concepts to reduce the expense and variances in healthcare system, hospital equipment spending, and the total medical care cost. HTA also minimizes patients' out-of-pocket expenses and streamlines healthcare compensations methods.

HTA is slowly making inroads in poor nations. The International Decision Support Initiative (iDSI) holds a vast link of medical, regulatory, and leading economists, takes

on added relevance. The iDSI was established to assist moderate - income and low-income nations in building decent judgments on how taxpayer funds should be invested on medical care in order to get the greatest potential results. iDSI's operations involve addressing medical concerns, building medical practices and structures, creating and utilising facts, and intelligent buying for attaining UHC, with the goal of obtaining the best use for expenditure in order to provide sustainability. As of 2019, the iDSI is constantly assisting UHC in further than ten nations, notably India.

INDIA'S HTA

Even in India, HTA activity is progressively growing up. The Ministry of Health and Family Welfare, Department of Health Research (DHR) and Government of India, devised a framework to adopt HTA in India by integrating specialists in healthcare finance to encourage evidence-based planning in health coverage. International Decision Support Initiative [27] in February 2017 was supported by the National Health System Resource Centre that focuses on HTA for the price limiting of cardio stent by the Indian government. As a consequence, the estimated price of drug-eluting stents has been reduced by approximately five times as of December 2020, from USD 1,648 (INR 1.21 lakh) to a limit of USD 403 (INR 29,600). Such a result of this accomplishment, an HTA committee in India has been created by the DHR that is called as the Health Technology Assessment in India (HTAI). The establishment has indeed combined the HTAI with increased expert support from the iDSI.

The HTAI is now in charge of procuring, creating, quality standards, and endorsing HTA findings in India, as well as being meant to provide as a link among HTA information providers (such as study associates, HTA hubs, and similar entities) and its consumers (such as financial safety schemes, regulatory assistances, insurance corporations, and health packages). The HTAI primary goals are to maximize healthcare, reduce OOP spending, and reduce medical inequity. The HTAI is made up of a professional evaluation panel, local research centres, and expert collaborators, as well as the HTAI secretariat, the HTA Board (HTAB) manages the operation of each of these elements. Figure 2 depicts the present HTAI structure. In some circumstances, the HTA administration can begin HTA research even when there is lack of a written application from a customer. The results of all HTA investigations are preserved in a database that is accessible to all parties [27].

The HTAB is planned to serve as a state-wide advisory committee for delivering rigorous research for making decisions on healthcare resources and treatments, developing medical, population health, and care home recommendations, and evaluating excellence in the social and health sectors. The HTAB is indeed anticipated to give direction on how to use EBH to improve the efficiency and quality of public health services, as well as strive to UHC by building cooperation among the states and the federal government. Just at time of writing, the proposal of the HTAB law is already being distributed around diverse participants, and its passage is anticipated to provide a well support to HTA operations in India, hence increasing

the adoption of EBH concepts in healthcare coverage and payment [27].

The HTAIn has successfully conducted multiple HTA trials in various domains, including eye surgery, cervix cancer, long-acting flexible contraception, and breast cancer monitoring. [27] The findings of an HTA research done by HTAIn using expert support from the iDSI on laser technology for cataract treatment and safe injection were applied to influence the concept and price of the PM-JAY health benefits package.

FIGURE 2: HEALTH-CARE TECHNOLOGY EVALUATION SYSTEM IN INDIA [27]



HTA remains in its initial phase in India. The adoption of HTA offers enormous opportunity to enhance India's present medical system and laws. In India, one of the biggest crucial uses of HTA is to guide strategic planning in several domains. For instance, evidence of HTA research may be utilized by state and national healthcare systems to focus and locate one of the most price-effective plans of treatments, locate and aid in the purchase of the least expensive price equipment and medicines, and optimize the allotment of budgeted funds, therefore optimizing health benefits and thoroughly achieving aims. Various funding security plans could use HTA knowledge to build clinical parameters that are both cost-efficient and scientifically successful, as well as to take skilled decisions regarding creating limitations for beneficiary payment. Sourcing authorities can indeed utilize HTA data to improve price and rationalise inventory. Governing bodies may utilize HTA data to rationalize the National List of Essential Medicines (NLEM) and to develop more rigorous medicine and equipment costing. HTA may also aid in the development of quality measures that can then be utilized to assure compensation for effectiveness.

Thus, the uses of HTA are numerous that can bring the Indian medical industry one step nearer to UHC if effective operation of HTA are implemented.

THE SIGNIFICANCE OF HTA IN ENHANCING INDIA'S EXPOSURE TO BASIC MEDICATIONS

Among the critical elements of UHC is ensuring global exposure to necessary medications at fair price. To accomplish this, Indian government issues a medication grade and compositions known as the NLEM by the collaboration of the Indian Ministry of Health and Family Welfare, and the National Pharmaceutical Pricing Authority enforces cost controls on such specified goods. These price stabilization initiatives are intended to reduce OOP medical expenditure in India by improving accessibility to vital drugs for everybody. Nevertheless, this was discovered that perhaps the provision of necessary pharmaceuticals is indeed poor, including both private and public institutions. [28] This remark is based on the notion that when the manufacturing of value pharmaceuticals gets unsustainable for the medicinal producers, the pharmaceutical corporations opt to terminate manufacturing (Singh et al.,

2021). Maiti (2015) HTA can serve a significant contribution in avoiding such a negative effect of restricted availability to pharmaceuticals designated within NLEM due to its unprofitable status. Handled correctly HTA of critical pharmaceuticals could be utilized to identify suitable valuation costing for such medicines that are never too high for the people nor too cheap for such producers to just be viable [29], [30].

APPLYING EVIDENCE-BASED PRICING IN INDIA: TOWARDS UNIVERSAL HEALTH CARE

Each effort towards UHC that is supported by EBH seems to be more certain to succeed. This seems to be true including both commercial medical coverage schemes and government-sponsored coverage and payment programs. If the payment schemes in a medical coverage program or payment system are still not effectively organized, such systems will never be well received, particularly by private clinics. The WHO has stated that it will give expert advice for the execution and transformation of Ayushman Bharat in India as per the 2019-2023 the WHO India National Cooperation Strategy. Considering findings from HTAs, the evidence-based compensation plans that are competitively valued can be achieved through the collaborative effort of both WHO and the DHR.

This information emphasizes the relevance of HTA and EBH in determining payment schemes that is critical for attaining UHC in India. Several other suggestions in the similar vein are as follows:

1. Expand the coverage of PM-JAY beneficiaries to encompass the whole Indian community. The wealthy populace might well be registered in the plan paying greater registration costs and sometimes even premiums.
2. Employ HTA to precisely calculate payment schemes for health facilities within PM-JAY and some other current public medical plans, including the CGHS and the ESIS. A well-planned compensation structure that will not lead in loss to medical centre operations would increase the participation and interest of all health care professionals in such medical plans. Additionally, when residents get conscious that commercial organizations also offer treatment below a government medical program, the program's enrolment increases.
3. Utilize HTA to compute healthcare costs and payment limits. Similarly, consider HTA required for medical coverage. This will increase payment efficiency,

assisting in increasing the nation's acceptance of medical coverage.

4. Establish HTA essential for the pharmacy and equipment firms. Project budget, in contrast to effectiveness and safety data, must be mandated by law ahead to commercial clearance. This one will promote accountability in medication and equipment costs.
5. Apply HTA guidelines to improve current tender-based acquisition of drugs and equipment through different state- and national-level medical systems.
6. Use HTA to price critical drugs on a value-based basis. It will give a motivation for medical businesses to produce important drugs, therefore alleviating shortages and enhancing accessibility to individuals that need it at affordable prices.
7. Determine the nation's essential medical problems and perform HTA research in these areas with both the goal of developing representatives of government for the diagnostic, monitoring, and treatment of different critical illness problems. This will improve the availability of medical and move our nation forward to UHC by bringing standardization of treatment throughout diverse venues in the nation.

CONCLUSIONS

Substantial OOP costs in India demonstrate not just the country's over-reliance on the private medical plans, as well as that UHC still needs to be implemented. Regardless of the accessibility of a huge range of medical coverage policies across various medical insurers, Indians generally hesitant to enrol in a policy, resulting in a significant OOP spend.

A joint approach by private and public sectors is important to overcoming this challenge. By establishing medical initiatives such as Ayushman Bharat, the government is assisting UHC and boosting healthcare availability. To improve medical coverage acceptance, commercial players must encourage health insurers to employ HTAs when structuring policy plans, rates, and payments. The formation of HTA in is a positive move in that direction. In comparison to most established HTA organizations all over the world, India's EBH-based HTA system remains in its immaturity. The strengthening of HTA in India is necessary stages that can assist reduce OOP expenditure on medical requirements by the typical Indian population, hence assisting to the achievement of the vision of UHC in India.

References

1. World Health Organization. (n.d.). World Health Organization. Available: <https://apps.who.int/nha/database/> (Accessed 14/12/2022).
2. Xu, K. Distribution of health payments and catastrophic expenditures methodology. World Health Organization 1970 Jan 1. Available: <https://apps.who.int/iris/handle/10665/69030> (Accessed 14/12/2022).
3. Pandey A, Ploubidis GB, Clarke L, Dandona L. Trends in catastrophic health expenditure in India: 1993 to 2014. *Bulletin of the World Health Organization*. 2018 Jan 1;96(1):18.
4. Sen L, Kumar A, Hota S, Biswal SK, Panda K. A profile view of healthcare service sector organizations through integration with organizational culture and subculture. *Asia Pacific Journal of Health Management*. 2022 Jun 1;17(2):1-7. DOI: <https://doi.org/10.24083/apjhm.v17i2.1823>
5. Sharma DC. Concern over private sector tilt in India's new health policy. *The Lancet*. 2015 Jan 24;385(9965):317.
6. Pujari P, Pujari P, Kumar A. Impact of covid-19 on the mental health of healthcare workers: Predisposing factors, prevalence and supportive strategies. *Asia Pacific Journal of Health Management*. 2021 Dec 1;16(4):260-5. DOI: 10.24083/apjhm.v16i4.1303
7. Central Government Health scheme. Home – CGHS. Available: <https://www.cghs.gov.in/> (Accessed 14/12/2022)
8. Employees' State Insurance Corporation, Ministry of Labour & Employment, Government of India. Available: <https://www.esic.nic.in/> (Accessed 14/12/2022).
9. Thakur H. Study of awareness, enrollment, and utilization of Rashtriya Swasthya Bima Yojana (national health insurance scheme) in Maharashtra, India. *Frontiers in public health*. 2016 Jan 7;3:282.
10. Karan A, Yip W, Mahal A. Extending health insurance to the poor in India: An impact evaluation of Rashtriya Swasthya Bima Yojana on out of pocket spending for healthcare. *Social Science & Medicine*. 2017 May 1;181:83-92.
11. Health Technology Assessment in India (Htain) - health technology Available: <https://htain.icmr.org.in/images/pdf/htain%20manual.pdf> (Accessed 14/12/2022).
12. Mahatma Jyotirao Phule Jan Arogya Yojana. Available: <https://www.jeevandayee.gov.in/MJPJAY/index.jsp> (Accessed 14/12/2022).
13. Chief minister's Comprehensive Health Insurance Scheme. Available: <https://www.cmchistn.com/features.php> (Accessed 14/12/2022).
14. Economic Times. Patient care in govt-run hospitals to be digitised in Ganjam - et healthworld 2019 30th October. Available: <https://health.economictimes.indiatimes.com/news/hospitals/patient-care-in-govt-run-hospitals-to-be-digitised-in-ganjam/71820256> (Accessed 14/12/2022).
15. Biju Swasthya Kalyan yojana: Latest News & videos, photos about Biju Swasthya Kalyan yojana: The Economic Times - page 1. The Economic Times. Available: <https://economictimes.indiatimes.com/topic/biju-swasthya-kalyan-yojana> (Accessed 14/12/2022).
16. Bose M, Dutta A. Health financing strategies to reduce out-of-pocket burden in India: a comparative study of three states. *BMC health services research*. 2018 Dec;18(1):1-0.
17. National Health Authority. National Health Authority | GOI. Available: <https://nha.gov.in/PM-JAY> (Accessed 14/12/2022).
18. Kumar A, Madaan G, Sharma P, Kumar A. Application of disruptive technologies on environmental health: An overview of artificial intelligence, blockchain and internet of things. *Asia Pacific Journal of Health Management*. 2021 Dec 1;16(4):251-9. DOI: <https://doi.org/10.24083/apjhm.v16i4.1297>
19. Sen L, Kumar A. Causal relationship among three components with organisation commitment-An empirical analysis on insurance professional in India. *International Journal of Management, IT and Engineering*. 2019;9(5):165-75.
20. Pandey A, Ploubidis GB, Clarke L, Dandona L. Horizontal inequity in outpatient care use and untreated morbidity: evidence from nationwide surveys in India between 1995 and 2014. *Health Policy and Planning*. 2017 Sep 1;32(7):969-79.
21. Garrison Jr LP, Towse A. Value-based pricing and reimbursement in personalised healthcare: introduction to the basic health economics. *Journal of personalized medicine*. 2017 Sep 4;7(3):10.
22. Selvaraj S, Farooqui HH, Karan A. Quantifying the financial burden of households' out-of-pocket payments on medicines in India: a repeated cross-sectional analysis of National Sample Survey data, 1994–2014. *BMJ open*. 2018 May 1;8(5):e018020.

23. Gambhir RS, Malhi R, Khosla S, Singh R, Bhardwaj A, Kumar M. Out-patient coverage: Private sector insurance in India. *Journal of Family Medicine and Primary Care*. 2019 Mar;8(3):788.
24. Nandi S, Schneider H, Dixit P. Hospital utilization and out of pocket expenditure in public and private sectors under the universal government health insurance scheme in Chhattisgarh State, India: Lessons for universal health coverage. *PloS one*. 2017 Nov 17;12(11):e0187904.
25. Kumar A, Pujari P, Gupta N. Artificial Intelligence: Technology 4.0 as a solution for healthcare workers during COVID-19 pandemic. *Acta Universitatis Bohemicae Meridionalis*. 2021 Jul 15;24(1):19-35.
26. Roy B, Kumar A, Kumar A, Gowda KR. Ethical conflicts among the leading medical and healthcare leaders. *Asia Pacific Journal of Health Management*. 2022 Mar 1;17(1):165-72. DOI: <https://doi.org/10.24083/apjhm.v17i1.1491>
27. Health Technology Assessment in India (HTAI) - About HTAI. Available: <https://htain.icmr.org.in/about-us/about-htain> (Accessed 14/12/2022).
28. Millard C, Kadam AB, Mahajan R, Pollock AM, Brhlikova P. Availability of brands of six essential medicines in 124 pharmacies in Maharashtra. *Journal of global health*. 2018 Jun;8(1).
29. Mohanty B, Das SM, Mishra US, Shaikh ZH, Kumar A. Effect of patients' attitude on their satisfaction and switching intention in generic medicine industry: An empirical analysis in India. *Asia Pacific Journal of Health Management*. 2022 Jun 1;17(2):1-7. DOI: <https://doi.org/10.24083/apjhm.v17i2.1821>
30. Madaan G, Swapna HR, Kumar A, Singh A, David A. Enactment of sustainable technovations on healthcare sectors. *Asia Pacific Journal of Health Management*. 2021 Aug 1;16(3):184-92. DOI: <https://doi.org/10.24083/apjhm.v16i3.989>