Review Article

iMedPub Journals
http://www.imedpub.com

Journal of Health and Medical Economics
ISSN 2471-9927

2022
Vol. 8 No. 5

Classifying Health Programs Based on their Value for Money and Role in Societal Welfare: An Explanatory Review

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Citation: Sorato MM, Davari M (2022) Classifying Health Programs Based on their Value for Money and Role in Societal Welfare: An Explanatory Review. J Health Med Econ Vol:8 No:5

Abstract

Background: The current health policy or program classification systems solely based on the cost-effectiveness threshold are unable to address the concerns of health policy decision-makers and has a lot of limitations. Therefore, it is important to look into different classification systems that can incorporate the value for money and health intervention outcomes.

Methods: This explanatory review was conducted to generate information on classifying health programs based on their value for money and role in health outcomes of patients and societal welfare

Results: A total of 46 articles were included in this explanatory review. During our evidence generation on the type of classification to use, we first looked into the existing three-label health program classification system (*i.e.* very cost-effective, cost-effective, and not cost-effective). Secondly, we addressed the limitations of this threshold-based classification. By incorporating the above two pieces of information, we developed five label health program classification system based on value for money and role in societal welfare. These include favorable, fine, sad, bad and (5) mad programs.

Conclusion: Classifying health policies based on value for money and their role in patient outcomes and social welfare could help policymakers and researchers for implementation or reimbursement of health services.

Keywords: Value for money; Health policies and programs; Patient outcomes; Societal welfare

Received date: April 27, 2022, Manuscript No. IPJHME-22-13328; **Editor assigned date:** May 02, 2022, PreQC No. IPJHME-22-13328 (PQ); **Reviewed date:** May 17, 2022, QC No. IPJHME-22-13328; **Revised date:** June 27, 2022, Manuscript No. IPJHME-22-13328 (R); **Published date:** July 05, 2022, DOI: 10.36648/2471-9927.8.5.075

Introduction

Health policy is defined as decisions, plans, and actions that are undertaken to achieve specific health care goals within a society. Evidence based health policies can improve the well-being of society they focus on clinical effectiveness, economic efficiency, quality of care, and equitable distribution of service. The effectiveness of health policy is measured by the extent it has achieved the desired objectives and the required health outcomes. The following criteria can be applied to evaluate the effectiveness of health policy; clearly stated and measurable outcomes, clear and explicit assumptions and expectations linked to organizational direction, evidence based development process including relevant stakeholders, given high priority for a public interest, likely to be both efficient and effective, capacity to evaluate outcomes, appropriate funding and resource, clear accountability and transparency, and enforceable. All health care demands of society cannot be met by the currently limited health resource available. Therefore, policymakers in the health system should prioritize available interventions based on value for money and use their limited resources efficiently [1,2].

A well-functioning health system responds in a balanced way to a population's needs and expectations by improving the health status of individuals, families, and communities; defending the population against what threatens its health; protecting people against the financial consequences of ill-health; providing equitable access to people centered care; and making it possible for people to participate in decisions affecting their health and health system. Thus, health policy analysis should also be undertaken from the perspectives of efficiency and equity [3].

Value can be generated at many different levels within the health system, both in terms of health benefits and non-health benefits. The concept of "value for money" is central to the development of

health policy and the delivery of healthcare. A healthcare system that delivers value for money is defined as one that maximizes efficiency, enabling the population to attain the highest possible level of health given the level of expenditure. Value for money can be ensured through health benefits package selection processes, strategic purchasing, and an Integrated People Centered Health Services approach (IPCHS) [4].

A 'good' policy should be economically efficient and geared towards public interest accountability. In addition to economic efficiency, health policy decisions should consider equity, ethics, and political feasibility. One cannot help but feel a sigh of relief at the thought that the federal funding will go towards clinical services. Despite the apprehension that practitioners may pass the administrative cost burden to patients, it is refreshing that the quality may improve. The policy is, however, a blanket statement by an aspiring opposition and it would have been prudent for them to indicate that they will invite various stakeholders for consultations and deliberations [5,6].

The health care system can be also measured in terms of quality of care (effective, safe, coordinated, patient centered), access (availability, affordability, accessibility, and acceptability), efficiency, equity, and health related quality of life and life expectancy, and health expenditures. To achieve this policy goal health services should be organized rationally. Different scholars classify health services differently. For example, one scholar classified the National Health Service (NHS) in the United Kingdom based on effectiveness to guide for optimum use, organization, and funding as proven effective, completely ineffective, ineffective for certain people, of low cost-effectiveness, inappropriate, and appropriate [7].

So far health policies/programs were valued based on cost-effectiveness threshold values. However, these threshold values with international (like WHO choice less than 3 GDP/capita/DLAY averted) or local (country specific thresholds like 50,000 USD/DALY averted in the USA) have limitations. Every cost-effective intervention is not reimbursed by insurance companies or funded by the government. These limitations include, important comparisons are obscured (budget and technical capacity of the health system are important), thresholds are too easily attained (without considering availability), assumptions on which this approach is based are untested (difference in social willingness to pay), affordability is not adequately appraised (lack of knowledge about amount budget assigned to health interventions). Because of this, cost-effectiveness information should be used alongside other considerations (like budget impact and feasibility considerations, equity analysis, or multi criteria decision making) [8,9]. This is because of the extent of how cost-effective they are when compared with the least-cost alternative. In addition to this, the above thresholds have little value in assessing the trade-offs that decision makers must confront [10]. Therefore, based on value for money and its role in patient outcomes and social welfare, we classified health policies/programs into five classes. In this explanatory review, we described these programs with supporting examples with aim of opening a new insight to policymakers and future researchers.

Literature Review

We searched articles written in English language from the following databases and search engines: PubMed/Medline, Ovid/Medline, Embase, Scopus, Web of Science and Google scholar with systematic search query, health policy or program classification system based on value for money. A total of 46 articles were included in this explanatory review. During our evidence generation on the type of classification to use, we first looked into the existing three-label health program classification system (i.*e.* very cost-effective, cost-effective, and not cost-effective). Secondly, we addressed the limitations of this threshold based classification. By incorporating the above two pieces of information, we developed five label health program classification system based on value for money and role in societal welfare.

Classification of health policies or programs based on based value for money

Our value for money and their role in patient outcomes and society's welfare-based classification, classified health policies/programs into five. These include favorable (very cost-effective with very good value for money); fine (cost-effective with good value for money); sad (clinically effective but not cost-effective); bad (not effective and pay for nothing); and mad (pay for buying suffering and pain) (Table 1).

Table 1: Classification of he alth po licies or programs ba sed on cost-effectiveness and value for money.

Health policies or programs		
Old classification	**New classification**	**Definition**
Very cost-effective	Favorable	Highly cost-effective with very good value for money
Cost-effective	Fine	Cost-effective with good value for money
Not cost-effective	Sad	Clinically effective but not cost-effective, expensive
	Bad	Not effective, pay for nothing
	Mad	Not only ineffective but also injurious, pay for buying suffering and pain

Favorable policies or programs

The cost-effectiveness of an intervention is measured by using the Incremental Cost-Effectiveness Ratio (ICER) (i.*e.* additional cost required to obtain each incremental unit of benefit). Intervention cost per QALY gained or DALY averted should be compared to the threshold value (*i.e.* value of investing the same dollars in others sectors) [11]. The Cost-effectiveness of any intervention is subjective and dependent on threshold level, type of comparator used, and country context including income and healthcare expenditure. All cost-effective interventions may not be affordable to a given health system from the context of budget and available funding [12].

There are three general approaches to set thresholds: based on per capita national incomes; benchmark interventions and league tables. The Cost-Effectiveness Threshold (CET) sets, on average, the maximum financial investment a public payer will commit to generate a unit of health and is typically used alongside other information to inform decisions around resource allocation in

health, particularly around the introduction of new treatments and benefits [13]. Even standard approaches like willingness to pay have their limitations; including valuation of QALY may differ depending on patient demographics (who estimates it) or by health effect. More wealthy countries (and more wealthy patients) put a higher value on a QALY. It also depends on other political, equity, and budgetary factors and considerations [14,15]. For example, the threshold for interventions is critical for suggesting value for money. For example, in the United Kingdom, the National Health Service (NHS), the cost-effectiveness threshold is often between £20,000 and £30,000 (approximately $30 000 to $50 000) per QALY gained [16]. However, the threshold in the USA is USD 50,000 per QALY gained, which was introduced in 1982 and, if adjusted to current dollars, would be more than $120, 000 per QALY gained. A recent analysis that evaluated the cost and benefits of modern health care in the United States found that people have been willing to pay for health care that costs approximately $109, 000 per QALY or more [17].

Threshold-based on per capita income is most commonly used particularly in developing countries. Under this approach intervention that costs less than one GDP per capita per DALY averted is highly cost-effective, and an intervention that costs less than three times the national annual GDP per capita per DALY averted is cost-effective [18]. According to this classification, one intervention could be highly cost-effective in one country and cost-effective or not cost-effective in another country, since it depends on the national wealth status. For example, In Zambia, three public health strategies have dramatically differing cost-effectiveness ratios compared to doing nothing: Expansion of access to insecticide-treated bed nets for malaria prevention (I$ 29/DALYs averted); screening and treatment of syphilis in pregnancy (I$ 127/DALY averted); Antiretroviral Therapy (ART) for patients infected with human immunodeficiency virus (I$ 963 per DALY averted). Therefore investing I$ 1million international dollars spent on these interventions could avert 34,483 DALYs, 7,874 DALYS, and 1038 DALYs, respectively. These interventions are highly cost-effective at the annual per capita GDP (about I$ 1684 in Zambia) per DALY averted. However, compared with investing I$ 1 million in ART, investing the same amount in syphilis screening and treatment in pregnancy or bed nets would avert 7.6- and 33-fold more DALYs, respectively [19].

Limitations of using per capita national income include failure to consider or masking of all available alternatives, thresholds are too easily attained, the presence of untested assumptions on which this approach is based lack of consideration for a willingness to pay, and, failure to consider the affordability of interventions. Five options can replace the GDP-based threshold in the absence of a formal CET when decision-makers are faced with a new intervention that they need to consider. These include; Using existing estimates of national health opportunity cost thresholds derived from cross-country data; using existing evidence from other settings; conducting ICERs and budget impact to inform cost-effectiveness and affordability; using a league table for health benefits package design; and estimating a health opportunity cost CET using within-country data.

Similarly, a limitation of using league tables is that ICERs may not be available for many relevant options or settings, a bare league table omits much of the information that decision makers might want to consider when choosing among options e.g. the size of the affected population, whether the intervention is scalable, the health benefit per recipient and the degree of uncertainty around the ICERs.

World Health Organization (WHO) classified 16 interventions as 'best buys' or cost-effective interventions with ICER of ≤ I$ 100 per DALY averted in low and middle-income countries. These interventions include reduction of tobacco use, reduction of alcohol use, reducing unhealthy diet, reducing physical inactivity, managing cardiovascular diseases, and diabetes, and management of cervical cancer [20-22].

In most cases, the type of policy problems to which economic evaluations have been applied has been conceived as being the flexible allocation of a budget sometimes for one year, often available for use over many years across competing priorities. However, in most countries, health care is primarily a planned sector that is slow to adjust to changing circumstances and for which investments in the core inputs of delivery (e.g. in human resources and capital infrastructures) have long-term implications that are to a degree fixed and often cannot easily be changed in future. In such situations, it is not evident that the unit costs used in economic evaluation studies, which typically are the long-run average costs or prices at which resources are purchased, suitably reflect the true value of resources in terms of their contributions to improving health. This is especially the case where resources are not traded on open, competitive markets that can respond effectively to price signals (such as with the employment).

Fine policies (good value for money)

These are cost-effective health interventions with good value for money. For example, interventions that cost 2 to 3 National GDP per capita per QALY gained are fine policies/programs that can be implemented since higher than 2 to 3 GDP per capita cost is needed to generate similar QALY elsewhere.

A recent review to update 2 existing reviews of cost-effectiveness studies on the prevention of mental disorders or promotion of mental health and well-being showed that although several interventions for mental health prevention and promotion provide good value for money, especially in children, adolescents, and adults demonstrated good value for money is promising [23].

A Markov model-based study conducted to evaluate if a hypertension management program for elderly patients is cost-effective compared to usual care from the perspective of a third-party payer in Buenos Aires, Argentina showed that the comprehensive hypertension program had a high probability of being cost-effective versus usual care [24].

A study conducted to evaluate the cost-effectiveness of intensive blood pressure control (treatment of hypertension to a systolic blood pressure goal of 120 mmHg) showed that intensive blood pressure control cost $23,777 per QALY gained [25]. This program is cost-effective for a given threshold. However, it costs higher than one GDP per capita per QALY gained for most of the countries globally.

A review conducted to evaluate the cost-effectiveness of hypertension management in low-income and middle-income

countries showed that most interventions reported were cost-effective, with costs per averted DALY not exceeding national income thresholds. However, screening for hypertension at younger ages, addressing prehypertension, or treating patients at lower cardiovascular disease risk were not cost-effective [26].

Bad policies (clinically effective but not cost-effective)

Health interventions could have bad value for money. For example, good values in the US are considered to be $100,000- 120,000 per QALY or less. Lung transplantation costs more than $176,817/QALY gained it is an intervention with bad value in the USA [27]. An economic evaluation conducted to determine the cost per quality adjusted life year gained with lung transplantation relative to medical treatment for end stage lung disease in the United Kingdom showed that the costs per quality-adjusted life year gained were $48,241 for single lung, $32,803 for double lung, and $29,285 for heart lung transplantation. Lung transplantation results in survival and quality of life gains but remains expensive, with cost-effectiveness limited by substantial mortality and morbidity and high costs [28].

The study conducted to develop the QALY league table of Iran showed that the cost per QALY gained for Immune Tolerance Induction (ITI) therapy in hemophilia patients was $4,551,521. The program is clinically effective but not cost-effective and it has bad value for money [29]. Such programs can be funded by the government or health insurance companies to answer the questions of equity in health care distribution with due consideration of budget impact analysis.

Cost-effectiveness analysis can guide decision making about health interventions, but the appropriate cost-effectiveness threshold to use is unclear in most countries. The cost-effectiveness of public health interventions examined by NICE from 2011 to 2016 showed that nearly two-thirds (63%) of public health interventions assessed were cost-effective [30]. In other words, 37% of health interventions were not cost-effective or had bad value for money.

A discrete time Markov model simulation done to identify which interventions with the best value for money for the ischaemic heart disease and stroke patients who have never experienced heart disease or stroke event showed that lifestyle interventions aiming to change risky dietary and exercise behaviors are extremely poor value for money and have little population health benefit [31].

A study conducted to evaluate when cost-effective interventions are unaffordable showed that many health interventions deemed cost-effective is not affordable. In some cases, adopting cost-effective interventions would necessitate eliminating other, more beneficial expenditures. For example, example, new medications for chronic hepatitis C were found to be cost-effective in many settings, even at high prices, but the provision of these medications to all potential beneficiaries have been unaffordable, even with discounts. This disconnects between cost-effectiveness and affordability can complicate efforts to identify and adopt high value programs. To say that an investment is cost-effective but not affordable must mean that the "threshold" used to judge cost-effectiveness does not reflect the scale and value of the opportunity costs [32].

Similarly, a study conducted to analyze the costs and outcomes of lung transplants in Portugal showed that the cost of lung transplantation was 77,223 € per QALY gained. Survival improved substantially from 5.15 years over the 2001-2010 periods to 6.94 years for the 2008-2010 periods. When restricting our analysis to the 2008-2010 periods, the cost-effectiveness ratio decreased to €69,241 per QALY. Although above commonly accepted cost-effectiveness thresholds, the economic value of lung transplants holds promise in Portugal due to the large improvement in survival over the 2001-2010 periods [33].

A prospective observational study conducted to assess whether revascularization that is considered to be clinically appropriate is also cost-effective for the treatment of angina pectoris showed that coronary artery bypass grafting cost £22,000 (€33,000; $43 000) per QALY year gained compared with Percutaneous Coronary Intervention (PCI) among patients appropriate for coronary artery bypass grafting only (59% probability of being cost-effective at a cost-effectiveness threshold of £30 000 per quality-adjusted life year) compared with medical management among those appropriate for both types of re-vascularization (probability of being cost-effective 63%). Among patients rated appropriate for PCI only, the cost per quality-adjusted life-year gained for PCI compared with medical management was £47,000, exceeding the usual cost-effectiveness threshold of £30000 per quality-adjusted life-year [34].

Interventions used for the treatment of rare diseases are the cause of several challenges for health care systems. Treatment of these conditions is costly and impacts the healthcare budget significantly. This is because their treatment relies on orphan drugs. For example, A model based cost-effectiveness analysis calculated the lifetime costs of enzyme replacement therapy for Gaucher disease to 5,716,473 euros for a patient with type 1 Gaucher's disease in a Dutch setting. The intervention resulted in an incremental cost-effectiveness ratio of 884,994 euros per QALY gained [35,36].

Sad (not effective or paying for nothing)

Low-value care refers to treatments or services that don't offer real value for patients. Medical services provide little to no clinical benefit to patients, such as antibiotic use for a likely uncomplicated viral infection or imaging for non-specific low back pain. The use of low-value care is a pervasive problem for every healthcare system. For example, about $760 billion annually is spent on low-value care in the Unites States of America [37]. It is estimated that approximately a quarter of that total ($190 billion) could be eliminated if evidence based strategies were scaled nationally [38]. Due to increasing healthcare expenditure, eliminating low-value care and the associated costs to the health care system is becoming increasingly critical. Low-value care exists across all sectors of the U.S. health care system. Examples of low-value care include diagnostic testing and imaging for low-risk patients before low-risk surgery; Vitamin D screening tests; imaging for low back pain in the first six weeks after onset; Prostate Specific Antigen (PSA) screening in men who are 75 years of age or older; use of more expensive branded drugs when generics with identical active ingredients are available [39,40]. A cross-sectional survey conducted to evaluate how often ineffective interventions are still used in clinical practice in China showed that the mean ineffective prescription rate by

clinicians was 59.0% and 31.2% of patients were taking ineffective interventions. Ineffective interventions were still commonly used [41]. Reducing or withdrawing these interventions are important strategies to reduce exponentially increasing healthcare expenditure, and to improve the quality of healthcare [42].

Mad (paying to buy suffering or pain

Health systems sometimes provide services that are harmful or non-beneficial to patients and families. For example, more than a third 33-38% of dying elderly patients receive invasive treatments that are unlikely to benefit them and could even be harmful in the final weeks of life.

Discussion

Some of these interventions include resuscitation attempts for advanced-stage patients, dialysis, radiotherapy, transfusions and life support treatment for terminal patients, non-beneficial administration of antibiotics, cardiovascular, digestive, and endocrine treatments to dying patients, and non-beneficial tests [43]. Meta analysis showed that pooled prevalence of non-beneficial ICU admission was 10%; chemotherapy in the last six weeks of life was 33%. Therefore, it is important to evaluate the value of interventions to society before making a policy decision to reimburse such services.

Conclusion

Classifying health policies/programs based on value for money and their role in patient outcomes and social welfare as favorable, fine, bad, sad, and mad could help policymakers and researchers for implementation or reimbursement of health services. Therefore, decision makers should not merely look into the cost-effectiveness of policies/programs and focus on value for money and role in patient outcomes and social welfare.

Ethics and Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

All authors read the full version of this manuscript and agreed to publish

Availability of data and materials

All data concerning this min review are available online.

Competing interests

The authors declare that they have no competing interests.

Funding

There is no funding source for the study.

Authors' contributions

All Authors read and approved the manuscript. MD conceived the research, and framed the format design. MM developed that manuscript is publication and polished the language of the manuscript.

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