**Cost-Effectiveness Analysis in the Healthcare**

**Cost-Effectiveness Analysis**

Through the years, the inclusion of an economic perspective when evaluating health and health care services has increasingly become an accepted element of healthcare policies and planning. The acceptance has been attributed to the fact that most health systems have a high demand. However, there is a limited budget available to provide necessary services to the population. One of the vital aim of the health system is identifying the appropriate use of the allocated funds and utilization to promote health. Also, provide quality health care and maximize money value. Over the last century, human health and health care improved dramatically; however, grave inequality in the health sector persists. For the state to make further health progress and address challenges, it must deploy available resources effectively (Hoomans & Severens, 2014). There is a need to identify neglected opportunities by evaluating relatively inexpensive interventions to reduce ailment burdens to achieve allocative efficiency. One of the tools applicable is Cost-Effectiveness analysis (CEA). This article will provide an in-depth definition of CEA and motivation to use CEA in the health sector. Furthermore, the report may provide my decision-making process when employing CEA. Lastly, if or if not, policymakers should rely solely on CEA when prioritizing health care services.

**Definition**

CEA in healthcare is an economic evaluation approach. CEA is a technique employed to examine and address efficiency issues during the allocation of scarce health resources. The analysis entails expressing costs and results of alternative healthcare interventions in cost per unit results (Manaf, 2017; McEwan, 2012). The tool compares presented interventions by estimating the cost to gain a health outcome unit such as death prevented or life-year gained. Similarly, it is also concerned with resource distribution. The technique gets used to identify an appropriate non-monetary measurable criterion such as health and health care outcomes (McEwan, 2012). Also, it can determine the most effective alternative for a fixed amount allocated to achieve a policy objective. Hence, the fundamental principle is maximizing the value of funds by choosing the optimal alignment of healthcare services subject to the budget constraints experienced by the health system.

Therefore, the rationale highlights that finances are always limited. Thus, not every intervention worth implementing can be employed, and not every intervention used is worth implementing. However, policymakers must make decisions like other societal sectors, and CEA is essential in making rational choices. Thus, it is suitable in situations where clear and defensible goals exist and can measure in units. These conditions are crucial because CEA sets budget or expenditure limits and does not tell policymakers what to choose. Therefore the use and application of the tool information guide the priority-setting process of government intervention (Gustavsson, E., & Tinghög, 2020). The standard strategy for resource allocation is to perceive that policymakers decide to maximize allocative efficiency subject to financial constraints.

**The motivation to use cost-effectiveness analysis**

CEA has been employed in different countries and levels. The World Bank has used it at an international level to decide disease control priorities in developing nations and essential healthcare packages for countries at varying levels of economic development. The motivation to use CEA has been attributed to several factors. One of the fundamental factors is CEA's contribution to decision-making. It identifies the costs and consequences of the treatment and considers their magnitude (Gustavsson, E., & Tinghög, 2020). Quantifying the intervention provides a better perception of their amount and significance. The approach employs natural units such as diseases, deaths, and life-years gained from the treatment. Therefore policymakers would use this analysis in their decision-making process to determine which alternative makes more sense from a health perspective.

Additionally, CEA is a type of economic evaluation that uses a standard unit measure that captures the utility of outcomes (Gustavsson, E., & Tinghög, 2020). Therefore allows the analysis to include an increase in quality and quality of life simultaneously. This principle aligns with welfare economics. Also, this analysis applies to different levels in the health care sector, including choosing medication for specific medical conditions, selecting optimal mix to enhance medical center services, etc. Similarly, stakeholders can consider social perspectives, which is a requirement in measuring CER. The process involves a comprehensive analysis of individual utility value and preferences ensuring allocation that maximizes societal welfare.

Furthermore, CEA assists in identifying neglected opportunities through reflecting interventions/treatments that are relatively cost-effective. However, have a high potential to improve outcome. The analysis provides a strategy to redirect resources to maximize the budget constraint. The tool demonstrates funds allocation utility from less infective to more effective interventions and from more minor to cost-effective treatments. Therefore helps public policymakers save more lives by promoting the neglected opportunities by reallocating to more cost-effective treatments. Based on research at Harvard University, the research examined various ways of allocating funds. The life expectancy could increase if the health system assigns more funds to more cost-effective interventions (Jamison, 2006).

Moreover, the CEA principle to maximize health and health care subject to budget constraints makes the analysis applicable in various contexts. One of the contexts would be in states searching to implement treatment packages that the public could publically fund. The stakeholders or decision-makers would employ CEA of the alternative treatments and rank them in increasing order of their CER. Finally, choose interventions until the available financial resource gets exhausted.

**Decision-making process**

CEA over the past years has been publicized as an aid for the decision-making process. The scenario presented provides two alternative uses of health care funds. The first healthcare service intervention aims to extend life where the funds will offer fifty children per year a highly effective life-saving treatment for pediatric cancer. On the other hand, the other alternative is to improve functional ability by assigning the funds to offer highly effective psychotherapy to twenty-five thousand adults suffering from mild depression. Both options get measured in terms of utility. Therefore by utilizing CEA, my decision-making process will entail the following procedure.

The cost-Effectiveness analysis process seeks to identify how much dollars on the costs of medical intervention. Hence assess if its costs justify the outcome of an intervention. The first step would be arranging the alternatives from less expensive to most expensive. Based on the question, psychotherapy treatment costs less than pediatric cancer treatment. Therefore primarily relying on total cost, psychotherapy treatment would be preferable. The following step would be the outcome (QALYS) of the interventions; psychotherapy treatment presents 0.2 while pediatric cancer treatment presents 1 QALYS. Therefore compare the two alternatives through CER (Total Cost / total effectiveness measure). Pediatric cancer treatment would be $106.67, while psychotherapy would be $0.032. Therefore, since both interventions have positive outcomes, both interventions would benefit the North Carolina population. However, since a policymaker has to choose one out of the two, the psychotherapy treatment has a lesser ratio. So based on CER, psychotherapy intervention is the highest cost-effective alternative.

The next step would include calculating the incremental cost-effectiveness ratio (ICER) for the alternatives.

ICER= Cost A- Cost B

Effectiveness A- Effectiveness B

The increment would be 399,200 ($400000-$800=399,200), while the incremental effect would be 0.8 (1QALYS-0.2QUALYS). Therefore the incremental cost would be $499,000 per QALYs gained. Thus for every $499,000 spent on pediatric cancer treatment than psychotherapy treatment, we attain one more QALYs.

**Cost pediatric cancer treatment**

$499,000/QALY

**Psychotherapy treatment**

Therefore based on CER, psychotherapy is a better alternative than pediatric cancer treatment. However, based on ICER, vice versa is appropriate. Thus the following step would be identifying the utility value/function (QALYs/years of life). The involvement of the individual utility functions would ensure maximization of societal welfare value, therefore, enhancing allocation efficiency. For psychotherapy intervention, the utility value would be 0.04 (0.2 QALYs/5years), while pediatric treatment would be 0.013 (1QALYs/75years). Therefore based on the findings, the psychotherapy intervention would be a better alternative for the North Carolina Medicaid Program to receive the $20,000,000 funds.

**Policymakers' decision to rely solely on CEA to prioritize health care services**

Several nation experiences show that policymakers can utilize CEA information alongside other forms of information to aid the government make better-informed policy decisions. Therefore policymakers should refrain from relying solely on CEA when prioritizing health care services (McEwan, 2012). One of the key reasons is the realization that health is not primarily dependent on medical care but the general environment of the population (Teutsch & Fielding, 2013). There are multiple opportunities to enhance life expectancy and functional ability within the available resources. CEA is tailored to serve this purpose; however, mainly used to assess interventions within the health systems. However, outside the health industry, cost-benefit analysis is used to conduct a comprehensive analysis. Therefore using a mix of CEA and other types of economic evaluation will ensure choosing an intervention that creates value for a wide range. As the IOM report states, "the valuation of community-based prevention intervention should be done with a comprehensive perspective; that is, the measurement of benefits, harms, and resources should include impacts on all members of the community as well as on stakeholders who may be outside the community," (Russell & Sinha, 2016).

Furthermore, similar to other tools, CEA's use and implementation may experience some limitations due to potential reasons such as political expediency and systematic barriers. Also, its application may experience technical shortcomings such as a data unavailability gap, particularly for the under-served population. Similarly, CEA implementation may experience limited transferability of finding beyond their original study. The shortcoming may occur due to a country's incapability to support a wide priority setting in the health industry. This limitation may also be fostered due to limited implementation capacity, especially in lower-income countries in terms of technical expertise and political willingness to translate and apply findings in health care practice. Using other tools alongside the CEA may ensure allocative efficiency in the healthcare sector.

Additionally, policymakers may also experience a lack of generalizability since findings may insufficiently travel through different systems. There may be a context problem because most of the researchers carry out studies at the national level. Therefore issues may arise when considering effectiveness as requiring diversity and cannot be detailed in terms of what functions when employing a particular standard. By using CEA with other evidence-based tools, policymakers can effectively address priority setting, which causes distinctive ethical challenges.

Priority setting addresses issues of health care high demand despite the limited budget allocated for the purpose. As Goddard et al. state, "Priority-setting seeks to address these problems by proposing rules to decide which groups of patients or disease areas should secure favored access to limited health care resources" (2009). Therefore able to strike a balance between equality, needs, and health and health care maximization. Through this, the policymakers can address both the controversial and less controversial principles on priority setting (Gustavsson & Tinghög, G., 2020). Hence even though CEA primarily concentrates on the outcome and value maximization. Using other tools would also consider health needs, and care needs principles as necessary components in decision making.

**Conclusion**

Health economic evaluation is vital, particularly in the current growing development of the health intervention era to enhance the population's health and health care system. There is an increasing awareness that the enhancement and development of the healthcare system have fundamental implications for the other industries in the economy. Stagnation of the health budget in the country primarily influences awareness. Using the CEA technique assists policymakers and analysts in identifying the most cost-effective intervention option with promising results by comparing monetary units and outcomes. The analysis presents several factors that encourage its usage in economic evaluation. However, solely relying on the analysis when prioritizing health care services would not be effective. Since the allocation of resources should also consider other factors apart from the outcome.