



# Optimizing Healthcare Organization Performance via Comparative Studies: Global Trends, Challenges and Future Research Directions in Health Economics

Wan TTH\*

School of Global Health Management and Informatics, University of Central Florida, USA

\*Corresponding author: Thomas TH Wan, Ph.D., MHS, Professor Emeritus, School of Global Health Management and Informatics, University of Central Florida, USA, Email: Thomas.Wan@ucf.edu

Commentary

Volume 2 Issue 1

Received Date: July 23, 2024

Published Date: September 03, 2024

DOI: 10.23880/oajda-16000141

## Abstract

Health economics research and evaluation has demonstrated its key role in shaping global health. Patient care quality and safety measures coupled with the balance of equity of care and cost efficiency are essential to help countries to achieve high quality and productivity in their performance. Furthermore, data science coupled with artificial intelligence plays a pivotal role in conducting rigorous comparative studies guided by sound theoretical perspectives in selecting appropriate data and predictive models. With the assistance of quantum computing technology, it is promising that new insight could be gained from longitudinal study design and analysis of both micro- and macro-predictor variables of efficiency and effectiveness to optimize health organization performance.

**Keywords:** Global Trends; Health Economics; AI; Artificial Intelligence; ChatGPT

## Abbreviations

DEA: Data Envelopment Analysis; AI: Artificial Intelligence; CMS: Centers for Medicare and Medicaid Services.

## Introduction

Research on how to incentivize and optimize efficiency and effectiveness of health resource allocation and utilization plays a pivotal role in promoting public management of limited resources. This commentary signifies the importance of performing objective assessments of health policies and economic-based strategies implemented in varying countries. This mini-review article portrays varying theoretical and methodological approaches to valuation and observation

of added-value health services guided by organizational strategies and management principles. The exposition of principles of health economics in patient care and hospital performance has shed light on the design and implementation of both macro- and micro-economic research endeavours for healthcare. The diverse quantitative and qualitative methods used in conducting empirical research have demonstrated how integrative and collaborative approaches reflect multiple views on how strategies in facilitating efficiency and effectiveness of healthcare organizations are able to optimize their performance. Furthermore, the mission of best performing healthcare organizations reflects the commonly shared responsibility in enhancing patient satisfaction and, in turn, accentuating better patient care outcomes. With the emphasis on patient-centered care under the movement



of promoting population health management [1], it is imperative to finetune the psychometric properties of the patient satisfaction and outcome measurement instruments. Thus, the adoption of innovative patient care interventions such as multidisciplinary care or integrated care could be further expanded in the implementation of cost reduction activities.

The two-fold purpose of this commentary is to synthesis what we have observed from the recent literature, particularly gleaning from the review of articles for the special topic on “Hospital Management and Healthcare Policy: Financing, Resourcing and Accessibility”, regarding the principal economic constructs, major health evaluation methodologies, and global trends in health economics research and evaluation [2]. Thus, the insight gained from this commentary enables us to articulate the importance of developing effective and efficient public health policies for achieving optimal population health in the globe.

## Principal Health Economic Constructs

### Principal Constructs of Health Economics

The principal concepts of health economics include the scarcity of resources, supply and demand, distinctions between need and demand, opportunity cost, discounting, time sensitive measures, profit margins, efficiency, and equity. The authors included in this special issue have shared a common goal in identifying multi-criteria optimization strategies to promote not only how to use resources (inputs), generate production processes in the delivery system, and deliver adequate healthcare outcomes (outputs). In addition, innovative community-based health interventions also reveal the need for presenting specificities and formulating future health economics research in the globe. Here are cited information sources relevant to optimizing healthcare performance via public health management with the implication for future research.

### Behaviour Economics

Behavioural economics has gained popularity in recent decades in health economics research. Rice T [3] stated that health care behaviours are not rational. Thus, how people make their help-seeking behaviour or utilization of healthcare services are not always predictable. The application of behavioural economics in health and healthcare offers opportunities to gain experience of how healthcare choice and medical decisions are being made by people with varying backgrounds. The cultural, contextual, and ecological factors associated with the study population must be considered if healthcare transactional behaviours are to be predicted. Recently, the shared medical decision-

making movement has shaped both patients and providers in improving communications and medical decisions. The efficacy of behavioural interventions can be enhanced if researchers could incorporate behaviour economics and its principles in the evaluation design.

### Patient Experience Research

Patient perceptions of the service quality should be systematically assessed. Concerted efforts have been made in developing assessment tools to review and evaluate patient experience after services rendered by healthcare providers and systems [4,5]. The Centers for Medicare and Medicaid Services (CMS) has adopted patient experience as an important criterion for gauging the quality improvement strategies. On August 1, 2012, CMS issued a rule that updated Medicare payment policies and rates for inpatient stays in acute-care hospitals under the Inpatient Prospective Payment System and hospitals paid under the Long-Term Care Hospitals Prospective Payment System in Fiscal Year 2013 (CMS, 2012). These health policies also guide the development of incentive or value-based payments for rewarding better performance in both hospital care and ambulatory surgical services.

### Health Information Technology

The adoption of electronic medical records has improved the delivery of healthcare (Tien T; Menachemi N, et al. [6]. Gurupur V, et al. [7] commented on information technology innovations that have reduced in time and cost for healthcare delivery, produced key decision tools for clinicians, and improved the efficiency of medical practices. The innovation and diffusion of artificial intelligence (AI) in healthcare via the design and application of data analytics and predictive modeling methods may further signify the importance of the evidence-based and data-driven approach to the performance improvement and outcome maximization assisted by AI and ChatGPT applications to healthcare [8].

### Values of Population Health Management

The identification and segmentation of targeted patient populations with polychronic conditions is an important cost-saving strategy for population health management [1,9]. The reduction of health expenditure coupled with the improved quality of hospital care will generate added values of healthcare services.

### Tradeoff between Efficiency and Quality of Healthcare

Although health services management researchers have considered a reciprocal relationship existed between the

two performance variables such as efficiency and quality of care [10]. The causal inquiry regarding the efficiency-quality trade-off requires a longitudinal study design with autoregressive latent growth curve modeling of the determinants of the two performance variables.

## Health Economics Research and Evaluation Methodologies

### Types of Economic Analysis and Evaluation in Health

Drummond and his co-authors wrote an evaluation research book entitled “Methods for the Economic Evaluation of Health Care Programmes,” first published in 1987 and then produced the fourth edition in 2015. They illustrated how benefit cost analysis and cost effectiveness analysis could be performed when specific programs were assessed. The quantification of costs and benefits is the essence of performing cost-benefit analysis. When the benefits could not be quantified in the monetary sense, one must rely on the measurement of effectiveness such as the present goal (i.e., the level or percentage of people immunized for a particular vaccine in preventing the outbreak of an infectious disease) for a public health program under evaluation.

### The Cost Consequence or Impact Analysis

This approach has often been used by public health officials to delineate program- or policy-specific interventions. For instance, if the cost reduction is attributable to the instigation of day care program for the frail elderly, the consequence of cost savings accrued from the avoidance of institutionalization of frail elders in the community represents the achievement of a non-institutional or community-based program such as day care for the frail elderly.

### The Comparative Cost-Effectiveness Analysis

Wilensky G [11] wrote an interesting editorial in response to the American College of Physicians’ position on the establishment of the National Clinical Effectiveness Center. She correctly noted that clinical effectiveness analysis requires the data based on clinical trial studies, whereas the comparative cost-effectiveness analysis is designed to compare different choices or options in implementing health policy.

### The Cost Utility Analysis

It uses a single summary ratio to provide information on incremental cost per quality adjusted life year gained for a specific technology compared to a currently operative best

practice [12]. In a non-randomized clinical study on stroke rehabilitation of 240 patients, Chen YC, et al. [13] reported that the quality-adjusted life year was significantly improved in the treatment group receiving multidisciplinary post-acute care than the non-treatment group. Direct costs were estimated and adjusted by the annual discount rate of 3%.

### Outcomes Evaluation

Health outcomes research emerges as a mainstream for economic inquiries about the preference or desirability of being in a healthy and functional state of mind and body. A phenomenon growth of the interest and the literature exists as reflected by the membership size (19,000+) and interdisciplinary focus of individual and regional-group members of the International Society for Pharmacoeconomics and Outcomes Research. Annually, international conferences are held to feature outstanding research presentations and publish timely research articles via its flag-ship journal, Value Health. The global health mission to promote effective and efficient medical care decisions has highlighted important contributions of healthcare research.

### Global Trends in Health Economics Research

Healthcare research is evolving from an inductive (problem-solving) approach to a deductive (hypothesis testing and theory driven) approach. However, voluminous published articles in health economics have employed a mixture of inductive-deductive orientations in performing health economic analysis and evaluation. In conducting a systematic review on health economics research, Barbu presented global trends and future directions that will investigate health economics pertaining to inequality, cost expenditure, health technologies, transparency, population, public policy, and behavioural economics associated with financial incentive. Most importantly, we believe that the global trend is evolving in shaping how pay-for-performance strategies may yield definitive improvements in cost containment, patient care outcomes, and quality of care.

It is interesting to learn that the continuing trends of collaborative research in health economics will center in the following ten areas, as noted in a recent World Health Organization’s report Coate A, et al. [14]: 1) real-world evidence of preventive practice and disease control efforts; 2) assessment or valuation of services; 3) equity of healthcare; 4) healthcare financing; 5) patient engagement; 6) drug and healthcare pricing; 7) public health; 8) health technology assessment; 9) health data sharing and use; and 10) AI health applications. The scope of national and international pursuits in global public health may vary by nation. The establishment of a rigorous scientific and experimental design of healthcare

evaluation is imperative if evidence of public health impacts is to be systematically documented and shared.

## Challenges and Opportunities in Global and Collaborative Research

### Measurement

The multi-dimensional measurement of patient functioning as an outcome has long been an interest of health economics researchers. Although a comprehensive set of physical, mental, social functioning, and environmental health scales exists, we need to standardize the commonly used measurement instruments. Furthermore, it is imperative for standardizing and implementing self-reported health and clinically assessed health measures. The conversion of physical, mental, and social capabilities into a quantifiable value will facilitate the systemic valuation of functional status. Furthermore, the challenge in transforming the validity, reliability, and applicability of health status measurement for multi-national comparison must be overcome by developing more consensus among those who are interested in performing global health comparison studies.

Michael G [15] advocated the need for examining the economic perspective of the determinants of health. One of the critical challenges is the selection of health capital or health status measurements for assessing healthcare performance of multiple nations. In his earlier work, Grossman used infant mortality rates, supplemented by other health indicators, as performance or outcome measures. To date, even though OECD nations have documented global health improvement, we are still struggling with a limited number of measurement instruments available for performing international comparison of healthcare quality.

### Methodology

Data envelopment analysis (DEA) has gained popularity in health management science research [16]. The availability of input and output data in healthcare operations enables us to apply varying DEA models in health economics and management science research. The most attractive feature of DEA software applications is its capability to perform quantitative analysis of the productivity measure calculated as a summary index, namely the technical efficiency score based on the ratio of weighed inputs and weighed outputs. For comparing the performance of global hospitals, DEA has potential to generate useful information for performing multicriteria optimization of hospital productivity and quality [10,17]. Furthermore, a quality-adjusted DEA approach has been recommended by Sherman and Zhu in the evaluation of service performance.

## Predictive Modeling of the Determinants of Population Health

Population health is influenced by societal and individual predictors. The usefulness of predictive analytics is contingent upon the comprehensiveness of relevant predictor variables selected. Ideally, both main effects and interaction effects should be included in the examination of causal effects of personal and ecological (contextual) factors on the valuation of public health policies and programs.

## Future Global and Collaborative Research on Hospital Performance and Health Policy

### The Scope of Collaborative Research

The pay-for-performance strategy has generated many large-scale health services research and evaluation in Taiwan Chiu M; Chen TT, et al. [18], in 9 European countries on the provision of financial incentives for coordinated care [19], and the US hospital incentives and quality improvement programs, such as the CMS Hospital Readmission Reduction Program [20], a Value-Based Purchasing Program [21]. The scope of work has been expanded from the investigation of hospital-based experiment to community-based innovations, particularly related to the design and evaluation of care management interventions for hospital readmissions of patients with chronic conditions such as diabetes, heart failure, stroke, COPD, major joint replacement, and chronic kidney disease [1]. For those who are interested in individual country studies on the P4P policies or program evaluations could review the P4P Research Clearinghouse Website at the University of Minnesota ([p4presearch.umn.edu](http://p4presearch.umn.edu)).

### The Extent of Transdisciplinary Studies

Patient engagement emerges as an important hospital quality improvement initiative in the United States. The transdisciplinary approach to patient engagement has been extended from a hospital's adoption of a standardized survey on patient satisfaction (known as HCAHPS, the first national, standardized, publicly reported survey of patients' perspectives of hospital care) to provider-patient shared decision-making models that could enhance patient experience as a recipient of care.

### The Design and use of Incremental Cost-Effectiveness Analysis of Patient Care Outcomes

The difference in costs divided by the difference in outcomes constitutes a ratio and enables the investigators to determine the cost-effectiveness of multiple or alternative public health programs or approaches. The availability of

the quality-adjusted year as a health outcome makes the comparison more meaningful. However Donaldson C, et al. [22] cautioned researchers that the incremental cost-outcome ratio should also consider resource allocation and efficiency. Nevertheless, public health practice has often used the incremental cost-effectiveness analysis to demonstrate the benefits associated with the implementation of competitive prevention strategies.

### **The Comparative Clinical Effectiveness Analysis using Economic Values as the Basis for Investigation**

Collaborative studies designed for evaluating disease-specific clinical effectiveness have not been executed in a large scale for four reasons: 1) the high cost for launching an international and comparative study; 2) the difficulties in conducting policy research that is not based on randomized controlled trials; 3) the lack of general consensus with the outcome measurement, used to assess the proximal, intermediate and distal outcomes; and 4) the uncertainty and inadequacy in establishing the total amount of financial incentives required to change both healthcare provider and system behaviours. To date, numerous care management interventions have been designed, particularly related to patient-centered care with clinical decision support systems. This is a promising area for evaluation studies designed for comparing the effectiveness of clinical care innovations.

### **The use of Complex Factorial Design in performing the Evaluation of Incentive Payments or Pay for Performance in Healthcare**

Wan TTH [23] advocated the use of a quasi-experimental design to evaluate the concomitant implementation of three incentive bonuses for improving the quality coupled with reducing the cost of nursing home care. This constitutes a complex factorial design with main effect and interaction effect components in a study of nursing homes with a small number of non-profit nursing homes in California.

### **Conclusion**

Health economics research and evaluation has demonstrated its key role in shaping global health in different spheres of preventive and curative activities. We would like to echo White, Frank, and Greenberg's persuasive population health view that the ecology of medical care should be the center for promoting public health practice and research on more than 95% of the population in the community, nation, and globe [24,25]. Health policies should cover both institutional and non-institutional components with a commonly shared goal for delivering integrated and coordinated care for those in need of care. Patient care quality

and safety measures coupled with the balance of equity of care and cost efficiency are essential to help countries to achieve high quality and productivity in their performance. Furthermore, data science coupled with artificial intelligence plays a vital role in conducting rigorous comparative studies guided by sound theoretical perspectives in selecting appropriate data and predictive models. With the assistance of quantum computing and high-speed computer technology it is promising that new insight could be gained from the longitudinal design and analysis of both micro- and macro-predictor variables of efficiency and effectiveness for optimizing health organization performance.

### **References**

1. Wan TTH (2018) Population health management for polychronic conditions: Evidence-based research approaches. Springer.
2. Wang BL, Shen J, Hamadi HY, Harrison JP, Wan TTH (2024) Editorial: Hospital management and healthcare policy: Financing, resourcing, and accessibility. *Frontiers in Public Health* 12: 1440141.
3. Rice T (2013) The behavioural economics of health and health care. *Annual Review of Public Health*. 34: 431-447.
4. Beattie M, Shepherd A, Lauder W, Atherton I, Cowie J, et al. (2016) Development and preliminary psychometric properties of the care experience feedback improvement tool. *BMJ Open* 6: e010101.
5. Gleeson H, Calderon A, Swami V, Deighton J, Wolpert M (2016) Systematic review on patient experience studies. *BMJ Open* 6(8): e011907.
6. Menachemi N, Rahurkar S, Harle CA, Vest JR (2014) The benefits of health information technology: A review of recent literature shows positive results. *Health Affairs* 33(3): 464-471.
7. Gurupur V, Wan TTH, Rudraraju RR, Kulkarni SA (2023) Editorial: The need for innovations in healthcare systems using patient experience and advancing information technology. *Journal of Integrated Design and Process Science* 27(4): 1-5.
8. Wan TTH, Wan HS (2023) Predictive analytics with a transdisciplinary framework in promoting patient-centric care of polychronic conditions: Trends, challenges, and Solutions. *Artificial Intelligence* 4: 482-490.
9. Sorin G, Aran M (2019) Population health management: An opportunity to reduce healthcare expenditures while

- improving quality measures in hospital setting. *Journal of Hospital Administration* 8(1): 100-109.
10. Wan TTH, Matthews S, Luh H, Zeng Y, Yang L, et al. (2022) A multi-criteria optimization approach to enhance clinical outcomes evaluation for diabetes care. *Health Services Research and Managerial Epidemiology* 9: 1-9.
  11. Wilensky G (2008) Cost effectiveness information: Yes, it is important, but keep it separate, please. *Annals of Internal Medicine* 148(12): 967-968.
  12. Drummond MF, Sculpher MJ, Torrance GW, Brien BJ, Stoddart GL (2015) *Methods for the economic evaluation of health care programmes*. London: Oxford University Press.
  13. Chen YC, Yeh YJ, Wang CY, Lin HF, Lin CH, et al. (2022) Cost utility analysis of multidisciplinary postacute care for stroke: A prospective six-hospital cohort study. *Frontiers in Cardiovascular Medicine* 9: 826898.
  14. Coates A, Warren KT, Henderson C, McPherson M, Obubah O, et al. (2022) The World Health Organization's Frontline Support to Countries During the COVID-19 Pandemic in 2020. *Front. Public Health* 10: 850260.
  15. Grossman M (2017) *Determinants of health: An economic perspective*. NY Columbia University Press.
  16. Ozcan YA (2008) *Health care benchmarking and performance evaluation: An assessment using data envelopment analysis*. USA.
  17. Nayar P, Ozcan YA, Yu F, Nguyen AT (2013) *Benchmarking urban acute care hospitals: efficiency and quality perspectives*. *Health Care Management Review* 38(2): 137-145.
  18. Chen TT, Oldenburg B, Hsueh YS (2021) Chronic care model in the diabetes pay-for-performance program in Taiwan: Benefits, challenges, and future directions. *World Journal of Diabetes* 12(5): 578-589.
  19. Tsiachristas A, Dijkers C, Boland MRS, Milken MPMH (2016) Impact of financial agreements in European chronic care on health care expenditure growth. *Health Policy* 120(4): 420-430.
  20. Wan TTH, Ortiz J, Du A, Golden A (2017) Variations in rehospitalization of rural Medicare beneficiaries. *Health Care Management Science* 30: 90-104.
  21. McHugh M, Joshi M (2010) Improving evaluations of value-based purchasing programs. *Health Services Research* 45(5 Pt 2): 1559-1569.
  22. Donaldson C, Currie G, Mitton C (2002) Cost effectiveness analysis in health care: contraindications. *BMJ* 325(7369): 891-894.
  23. Wan TTH (1995) *Analysis and evaluation of health care systems: An integrated decision-making approach*. Baltimore: Health Professions Press.
  24. White KL, Williams F, Greenberg BG (1961) The ecology of medical care. *New England Journal of Medicine* 265: 8885-8892.
  25. *Health Economics Review*. BMC.