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Review Article

Maximization of Resources in Health Care Facilities: Simple Review Article

Hamed Salem S Albalwei[1*]

[1]Director of the Maternal and Child Health Center, Tabuk, Saudi Arabia

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***Corresponding author:** Hamed Salem S Albalwei
Director of the Maternal and Child Health Center, Tabuk, Saudi Arabia

Abstract

Internationally, public health systems are under pressure to fulfill rising healthcare demand while facing increasing financial constraints. The amount of health outcomes that can be obtained with public healthcare spending must consequently be maximized. The debate of resource allocation in medical systems is crucial because, in systems with various financing sources, resources used to treat one sickness or person cannot be used to treat another condition or person. Initiatives to improve quality and safety are essential throughout the health care system. It is crucial to use a variety of process improvement strategies to spot inefficiencies and provide patients with unnecessary, yet preventable, carousing various techniques and tools for quality improvement, including as Plan-Do-Study-Act (PDSA), Six Sigma, and others. Several of the Global Sustainable Development Goals have included the idea of fairness in the delivery of health services, particularly the goal of universal health coverage. The efficiency of healthcare delivery at both the operational and system levels continue to be a topic of study as a result of rising healthcare expenditures and limited resources. Therefore, given little resources and complex population health needs, health planners and managers have had to struggle with striking a balance between the two.

Keywords: Administration, hospital administration, resources, quality, healthcare system.

INTRODUCTION

Improvements in health-care quality can help to make populations healthier. However, many international and national health policies do not give enough thought to the challenges of assessing and enhancing the quality of healthcare in low resource environments [1]. There are major barriers to providing high-quality care in various health systems. However, in contexts with limited resources, the degree and processes by which these constraints affect quality improvement strategies may vary [2]. Without ongoing quality improvement, investments in bolstering health systems are viewed as futile. On the other hand, it is of little value to solely concentrate on quality improvement in a context of limited resources without enlisting the assistance of the larger health system [3]. Therefore, both regions need to be developed at the same time.

Public health systems, which are those that provide publicly funded healthcare, are under a great deal of pressure to fulfill rising health care demand in conditions of significant and rising financial resource constraints [4]. Budget constraints, rising demand, an increase in the burden of diseases on infrastructure, technology improvements, shifting service models, rising customer expectations, and shifting service accessibility are just a few of the pressures that are affecting health systems worldwide [5]. The public health systems of many highly industrialized nations around the world are consequently characterized by a continual state of inefficiency within an environment of what seems like constant improvement [6, 7]. This is made worse by a frequent tendency in which the pace of growth in health care expenditures is higher than the rate of funding growth, putting additional strain on public health systems that are already underfunded [8, 9].

Policymakers, managers, and health-care professionals working at all levels of health-care systems should refocus on quality improvement of health-system delivery. We suggest a method that

emphasizes systems thinking, which sees health-care systems holistically and is frequently described as operating at the micro- (clinical team), meso- (health facilities), and macro-levels (healthcare system). Systems thinking also provide a helpful framework for addressing the interdependency of these various levels that affect health-care delivery and health outcomes. The participation of stakeholders is a further component, which emphasizes that local workers and communities ought to be involved in a systems improvement intervention's planning stage. Stakeholders routinely participate in the improvement of healthcare procedures in many high-income nations. Stakeholder involvement and participation can be influenced by a health system's corporate culture and readiness. For stakeholder involvement, participation, and eventual attainment of results, a deeper understanding of the culture and practice for improvement is necessary. Before implementing a quality improvement intervention in a healthcare context, it is crucial to establish the organizational readiness [10].

Improved accountability mechanisms are another factor that promotes efficiency and ownership of service delivery by professionals and communities. The goal of accountability mechanisms is to guarantee that health-care practitioners have the assistance they need from other levels of the health-care system in order to offer high-quality care. One mechanism for achieving accountability is the use of research within the health system, which is accomplished through the bottom-up collection of quality data and the visual presentation of data to decision-makers. Additionally, this technique incorporates strong iterative feedback at several stages of the health system [11].

Additionally, evidence ought to be used to guide quality improvements, which is another component. However, it has proven difficult to produce high-quality data in environments with limited resources. Numerous data sets, such as those from common health information systems, project monitoring data, data on improvements, and data on evaluations, are rarely converted into persuasive evidence. Although pertinent parties both inside and outside of health ministry’s work to enhance the quality of data from regular monitoring systems, more has to be done to harmonize data from multiple data sources and improve the translation of data for the creation of an evidence basis. Stakeholders, especially health ministries and implementing agencies, must make considerable expenditures in data management and quality [4]. Innovative assessment is critical component for understanding and progressing the science of quality improvement while also evaluating specific intervention efforts. Recent research has shown the utility of creative assessment methods for interventions aimed at quality improvement [10].

Increasing Value and Efficiency in Healthcare

A program implementation hierarchy: The health care system is characterized by high and rising healthcare expenditures, as well as gaps in quality, safety, equity, and access. Federal and state policymakers, commercial payers, and system leaders are looking for ways to decrease waste, improve healthcare delivery efficiency, and manage resources to improve health care value. Additionally, customers look for advice on how to get the most out of their health care dollars, especially now that their financial risk has increased due to various payer innovations. The Agency for Healthcare Research and Quality (AHRQ)'s goal in this situation is to contribute to the establishment of a solid foundation of scientific evidence and validation for the notions of efficiency and value. How can we save wasteful spending and unnecessary costs while preserving or enhancing quality? Helping hospitals advance progressively up a hierarchy of improvement projects is essential for successful change. Inversely, a hospital will always experience more inefficiency and waste if it seeks to implement a program that is above its capacity [12].

How to Determine Why a System or Program Is Failing. An intervention named "Leveraging Front-Line Expertise" was devised and implemented in 20 hospitals in "Front-line Staff Perspectives on Opportunities for Improving the Safety and Efficiency of Hospital Work Systems" by Anita Tucker, Sara Singer, Jennifer Hayes, and Alyson Falwell to determine what front-line workers might truly tell about hospital patient safety system failures. Frontline employees stated that equipment/supply breakdowns or facility failures accounted for 36% of the failures. This conclusion is crucial since quality improvement programs often do not prioritize looking into frontline-reported problems. As a result, campaigns to monitor and track facility and equipment failures may be a profitable next step for substantially raising system safety and efficiency in hospitals [12].

Tools and Techniques for Patient Safety and Quality Improvement

Measurement of quality improvement activities is necessary to show whether they affect the primary end point in the desired direction, cause unexpected effects in other areas of the system, or necessitate further work to return a process to acceptable levels [13]. The justification for assessing quality improvement is the idea that excellent performance is a reflection of good practice and that performance comparison between organizations and providers will lead to better performance [14-16]. There has been an increase in recent years in the measurement and reporting of the effectiveness of healthcare systems and procedures [17]. While identifying areas that require improvement and assigning national, state, or other level benchmarks can be done using public reporting of quality performance. Consumers, a

different audience for public reporting, have had difficulty deciphering the data in reports and, as a result, have not utilized the reports to the amount that was anticipated for in order to make educated decisions for improved quality care [18].

The complexity of health care systems and service delivery, the unpredictable nature of health care, and vocational difference and interdependence among doctors and systems make quantifying quality difficult [19, 20]. The attribution variability associated with high-level cognitive thinking, discretionary decision making, problem-solving, and experiential knowledge is one of the obstacles in employing metrics in health care [21, 22]. Another measurement problem is determining whether a mistake could have caused injury or whether an unexpected outcome was an uncommon occurrence or likely to reoccur [23].

Quality and safety metrics can be used to track the progress of quality improvement projects by comparing them to external benchmarks. When analyzing organizational performance, benchmarking in the health care industry is the continuous and collaborative discipline of measuring and comparing the outcomes of important work processes with those of the best performers [24]. To assess patient safety and performance in terms of quality, there are two different types of benchmarking that can be employed. Internal benchmarking is used to locate best practices within a company, to compare best practices within a company, and to compare existing practice over time. The data and information could be plotted on a control chart with upper and lower control limits that were calculated statistically. Utilizing purely internal benchmarking, however, may not accurately reflect best practices worldwide. Competitive or external benchmarking is the use of comparison data between firms to measure performance and find improvements that have proven to be successful in other organizations [15].

Quality techniques used to describe and assess health-care problems were viewed as useful in prioritizing quality and safety issues [25] and focusing on systems rather than people [26]. In order to change provider practices and address errors and rising costs [27], a variety of tools were used. Several of the initiatives combined the use of more than one quality improvement tool, such as starting with root-cause analysis and then implementing process change using Six Sigma, the Toyota Production System/Lean, or Plan Do-Study-Act [28]. Pretesting or pilot testing was conducted as part of almost every initiative included in this analysis. Several initiatives' researchers and leaders reported benefits of using particular categories of high-quality tools [25]. Following is a discussion of these: ROOT-CAUSE ANALYSIS has been shown to be beneficial for assessing reported errors/incidents and distinguishing between active and latent problems, identifying the need for modifications to procedures, policies and serving as a foundation for suggesting system modifications, such as increasing risk communication [29].

SIX SIGMA/TOYOTA PRODUCTION SYSTEM has been claimed to be successfully used to reduce leakage and operating costs while improving results in a number of health care settings and processes. It was discovered that Six Sigma was a thorough procedure that distinguished clearly between the causes of variations and process result measures [30]. One benefit of applying Six Sigma was that it made workarounds and rework challenging because the pre- implementation processes' core causes were targeted. Investigators also noted that the further teams used this approach, the more proficient they grew at using it and the more successful the outcomes [27]. However, it was recognized that in order to implement this method effectively, a significant investment of leadership time and resources was related with enhanced patient safety, lower costs, and higher work satisfaction [31]. Six Sigma was a significant technique for problem-solving and incremental improvements, as well as communicating effectively about the problem, guiding the implementation process, and providing outcomes in a clear, concise, and objective manner [32].

PLAN-DO-STUDY-ACT (PDSA) method was used to gradually deploy initiatives while enhancing them as needed. The rapid-cycle portion of PDSA began with testing a single new procedure, followed by reviewing findings and responding to what was learnt through problem-solving and making improvements, before initiating the next PDSA cycle. Because launching the initiative progressively allowed the team to make modifications early in the process and not be distracted or diverted by every detail and too many unknowns, the majority of quality improvement efforts employing PDSA reported more success using a number of modest and quick cycles to meet the intervention's aims. The team's capacity to apply the PDSA process successfully was increased by offering education and training on the use of PDSA cycles, using feedback on the outcomes of the baseline measurements, meeting on a regular basis, and boosting the team's effectiveness by collaborating with others, including patients and families, to reach a common goal. On the other hand, several teams found it challenging to use rapid-cycle change, gather data, and create run charts. One team even said that utilizing straightforward PDSA cycles could have been more effective in a complicated system [33].

Allocation of Resources in Public Health

The distribution of resources in medical systems has received a lot of attention, both locally and abroad in the United States. The topic is mostly motivated by rising expenses and the budgetary challenges that emerge for publicly financed systems as well as for both the public and private parts of mixed

health systems. Because resources used to treat one sickness or person cannot be used to treat another, resource allocation is a significant concern in some publically supported systems. In medical systems with various funding sources, some of the same worries surface. The topic of how to allocate resources in medicine has received a lot of attention, but public health has received less attention. Budgets for federal, state, and local public health in the US limit such levels of health investment. How to spend (and allocate) public health resources in the context of domestic budget cuts and in many countries responding to an economic downturn is an urgent problem [34].

Most public health investments attempt to minimize population health risks, but some risks are worse than others, and resource allocation decisions must take these risks into account. When allocating resources, certain decisions are made with an eye toward the immediate benefits of lowering the chances of contracting a particular disease, while other decisions have an impact on the infrastructure required to address health hazards over time. The distribution of risks, rather than just their overall impact, matters, and resource allocation decisions may also affect which parties suffer risks. Thus, selecting which risks to minimize and how to reduce them are the main concerns of resource allocation in public health, which is influenced by the seriousness of the hazards as population variables and who is at risk [34].

Allocating Health Resources with Equity and Efficiency

The concept of fairness in health service delivery is expressed in various Global Sustainable Development Goals (SDGs), including the goal of universal health coverage (UHC). At the same time, rising healthcare expenditures and limited resources continue to spark debate about the efficiency of healthcare delivery at both the operational and system levels.

Therefore, given little resources and complex population health needs, health planners and managers have had to struggle with striking a balance between the two. Without a doubt, the ideas of equity and efficiency are fundamentally significant in the healthcare industry. While equity encourages their fair and ethical usage, efficiency mandates a "economic" use of the few healthcare resources. This has been used by some to support the claim that one must be sacrificed in favor of the other. Improved accountability mechanisms are another factor that promotes efficiency and ownership of service delivery by professionals and communities. The goal of accountability mechanisms is to guarantee that health-care practitioners have the assistance they need from other levels of the health-care system in order to offer high-quality care. One mechanism for achieving accountability is the use of research within the health system, which is accomplished through the bottom-up collection of quality data and the visual presentation of data to decision-makers. Additionally, this technique incorporates strong iterative feedback at several stages of the health system [45].

Ethical Concerns in Resource Allocation

Healthcare resource allocation is an intractable problem because three major factors must be addressed before attempting to find a solution: There must be a coherent and valid understanding of the nature and role of medicine as a dominant profession and of its members as specialists within that environment, The ethical standing of the products and services offered by those in that profession must be represented by a logical and consistent paradigm; Additionally, there must be a consistent and coherent framework for determining the appropriate place of social values in the creation of allocation algorithms for what is, in large part, a socially sponsored organization [35].

We've already mentioned that a health system's effectiveness has moral repercussions. But what exactly should we consider efficient? Should we use our resources to increase revenue for a hospital, for example, or another part of the healthcare system? By doing this, efficiency would be defined as most firms define it: when all other factors are equal, an allocation that results in a higher return on investment is a more effective use of stockholder or owner resources. As an alternative, we may focus on consequences on the covered population's health. When a certain allocation improves the population's health more than a competing allocation, we can say that it is more efficient [34].

The reason behind creating a health system. In order to give a satisfactory return on investment for those who invest in health services, or in order to meet the health demands of a population? This question is seen to be simpler to answer in a system where providing health care is viewed primarily as a public endeavor aimed at enhancing population health. It would appear that there is only one goal for the healthcare system in such a system. How effectively a system promotes population health should be used to determine the taxpayers' return on investment. However, it appears that we must take into account at least two objectives in systems where resources are privately owned. Private health-care organizations must nevertheless provide a reasonable return on investment for owners, even though they may be required to do so as part of state-imposed health care regulations or, in some people's eyes, as a social obligation of corporations. As a result, private health care organizations' policy makers have a dual responsibility [34].

We believe that a health system should prioritize cost effectiveness above condition severity and that enhancing population health is a worthy and justifiable goal. We also believe that improving

population health should take precedence over growing private sector revenue [34].

The pursuit of overall health maximization and concerns for equity continue to collide. There may be reluctance to include a wider range of stakeholders in discussions on health objectives due to worries about their potential "partiality." This opposition may stem from the idea that more objectivity results in better decision-making. It may be argued that this worry with partiality misses the benefits that partiality frequently offers to deliberation, especially if we know how to manage such deliberation to reduce the risks that partiality occasionally brings. Due to the fact that partiality is inevitable in most situations, we need these management skills in any scenario. The greatest strategy to enhance decision making in situations where reasonable disagreement exists is to manage partiality in discussions as opposed to outright prohibiting what cannot be removed [34].

Maximizing Hospital Capacity during SARS-CoV-2 Vaccine Supply

With Covid-19 vaccines now available, hospital departments must deal with the new issue of having to develop a vaccination program for hospital workers. During this offer, options must be prioritized due to the limited supply of vaccination doses. In the following, we describe the study of the effects of different launch strategies, the main goal being to increase open hospital capacity because it is believed that doing so will benefit patients the most [36].

There are pre-Corona research studies available. Their main goal was to demonstrate the value of vaccination regulations [37, 38]. Lack of vaccine supplies was not one of the main topics; it was known, for example, for yellow fever [39]. Instead, discussions centered on an oversupply and immunization requirements [40]. The World Health Organization (WHO) has already included elements of prioritized choices for a vaccine rollout against the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in its early 2020 vaccination framework. The large-scale Covid-19 vaccine deployment now underway requires vaccine doses, vaccine administering professionals, and a system to distribute the doses to patients [41]. State agencies have created and published deployment plans or rollout recommendations [42] that include information on the decision-making process for vaccine recommendations [43, 44].

There is widespread consensus that vaccines should be used to their greatest ability to mitigate the effects of the pandemic, particularly during the early vaccine rollout phase when vaccine supply constraints prevent an instant full rollout to the entire population. Decision-making in the event of a resource shortage is understood from other significant medical supplies related to the current pandemic. Studies that take into account the entire population have produced insights regarding priority choices and their effects. There have been discussions on ways to lessen the shortfall of vaccines, including delaying a second dosage if the drug schedule calls for it. Despite the information given and specific rollout guidelines, for instance, decisions regarding rollouts to medical staff might still be contentious. When assessing various aspects, such as student status or hierarchical relevance, the rollout plan and hospital staff prioritization may differ. The deployment has been successful thus far in the United Kingdom. However, certain subgroups of a community, including those who are economically disadvantaged or minorities may need special consideration. Nursing personnel must also be remembered in rollout plans and prioritizing since they operate in close proximity to patients by necessity [36].

Human Resource Efficiency

A highly specialized, short-term irreplaceable factor of production, public health's human resources is seen from an economic perspective. Due to the fact that two thirds of the financial resources allocated to public health and healthcare organizations as a whole and to the healthcare system as a whole are spent on labor, this sector is one of the most economically demanding in the country. For this reason, it is crucial to address issues related to human resource efficiency in order to ensure the long-term viability and advancement of healthcare. In this context, it's common to hear about the conflict between effectiveness, quality, and equity. Since investments in public health human capital do not positively correlate with technological efficiency, the usually accepted positive relationship between the potential of human capital and prosperity cannot be confirmed [46, 47].

Human resources in public health are the organizers of healthcare and the carriers of novel and creative therapeutic techniques that affect the health condition and quality of health of the community. According to Huanhuan *et al.*, [48] the quality of health services is improving as a result of having enough of each specific category of workers and the process of lifelong learning for health workers [49].

Healthcare Quality Management

The aim of the healthcare system is to give a specific patient the best care possible from a certified practitioner in the right environment. To put it another way, the patient should receive the best care (i.e., the standard of care based on evidence-based medicine) from a provider with the appropriate level of expertise in a setting that maximizes efficiency and minimizes risk and resource abuse, all the while treating the patient with respect and allowing them to participate in the care plan as they see fit. IOM has recently highlighted six areas that contribute to good quality healthcare delivery: timely, patient-centered, safe, effective, efficient, and equitable [50]. The basic goal of quality

management is to satisfy all of these categories. "Safe" refers to avoiding patient injury as a result of the care they are receiving. "Effective" uses evidence-based treatment and wise resource management. "Patient-centered" refers to care that uses the patient's preferences, requirements, and values as the basis for all clinical judgments. "Timely" emphasizes avoiding care delays. Efficiency has to do with reducing or preventing waste of resources, including time and commodities. Last but not least, "equitable" refers to treating all patients equally, regardless of their values, social standing, or looks. The "five D's"—death (mortality), disability (morbidity), disease (resolution or persistence of disease following treatment), discomfort (the process of providing medical care), and dissatisfaction (the patient's experience during the process of providing care—can be used to measure the success of health care in achieving these quality domains [51].

Quality management in health care is the management of systems designs, policies, and procedures that minimize, if not eliminate, harm while enhancing patient care and outcomes [52]. The service in the organization must consistently fulfill its intended purpose, according to the objective of quality management. In order to create a product or service that is perfect, fulfills the purpose, and satisfies the customer, data is constantly collected and changes are made to the process. Then, more information is collected to ensure that no further adjustments are required. Quality management systems for implementing, organizing, standardizing and enhancing activities involving a consumer-oriented good or service are known as Quality Management Systems (QMS) [52, 53]. Data collection allows identification of systemic problems and the use of resources and evidence-based medicine to design or modify processes that enhance quality of care. The results of the changes are then studied to see if they were successful or if further adjustments are needed. The ultimate goal is to provide consistent, high-quality care that meets or exceeds all six IOM categories while reducing morbidity, mortality, morbidity, discomfort and patient dissatisfaction (safe, effective, patient-centered, timely, efficient and equitable care) [54].

CONCLUSION

The need for efficiency in the provision of public health services keeps growing. For public health system management authorities, addressing the obstacles and enabling conditions represents an evidence-based strategy for integrating efficiency improvement and Maximization of resources in health care facilities. Central health system management bodies can assist efficiency development while simultaneously enhancing health system efficiency and service quality outcomes by dedicating system-wide support for it.

Efficiency and equity are not mutually exclusive because the choice of equity criteria determines what is equitable. It makes sense that fulfilling equality goals may not always be cost-neutral and may call for more resources, but these costs can be compensated by efficiency savings in other facets of the health system. In the long run, the benefits of attaining equitable goals, such as greater population health, will boost the economy's production efficiency. Equity must work for efficiency, and efficiency ultimately gets better as equity does. As a result, for any nation to achieve its health goals, efficiency and equity must work in tandem.

Although health systems in the current global environment will differ, all employees in the health institution must be able to provide high-quality care that both improves the public's health and earns their trust while also maximizing resources in healthcare facilities.

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