



## Quality of Health Care in Coimbatore District: The Donabedian- TNHSP Matrix Perspective

Dr B Prasanna  
Soundari

Assistant Professor, G R Damodaran Academy of Management,  
Neelambur, Coimbatore -641062.

### ABSTRACT

*World Health Organisation's millennium report ranked India's health care system at 112 out of 190 countries and triggered the Indian health care transition. Having recognised health as an inalienable human right that every individual can justly claim the Government intervention focuses on Universal Health Coverage that assures to benefit the sixth of the world's population at an estimated cost of Rs.1.6 trillions and is driven by the nation's low cost of treatment. The cost of a surgery in India is just one tenth when compared to United States or Western Europe and has shaped India as a global medical destination. Further the nation follows state administered health care enabling a global orientation.*

*Tamilnadu a state in South India has excelled itself in providing healthcare at low cost and is acknowledged as a benchmark for the developing world backed by Chennai's and Coimbatore's scientific and management temper. Leveraging on the presence of super speciality hospitals the Indian Chamber of Commerce and Industry- Coimbatore has envisaged the metro to be a health city like Dubai and has initiated plans propelled by huge investments. The visualisation of Coimbatore as an ideal city for health care warrants monitoring of the existing environment. The Donabedian-Tamilnadu Health Systems Project matrix applied to scrutinise Coimbatore's quality of care sets the course for strategic action to realise the districts vision.*

**KEYWORDS :** Donabedian Model, Hybrid Matrix, Quality of Care, Tamilnadu Health Systems Project Model.

### 1. Introduction.

Quality of care as defined by Lohr is the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge (Lohr, 1997)<sup>10</sup>. This definition has the ability to absorb the traditional and emerging ideas and is widely accepted (Friedman, 1995)<sup>6</sup>. The pioneer of quality framework Avedis Donabedian contributed the structure-process-outcome model and it continuous to be widely adopted for scientific researches (Best & Neuhauser, 2004)<sup>1</sup>. This basic model smoothly adapts with dimensions like effectiveness, acceptability, efficiency, access, equity and relevance as defined by Maxwell aiding in the formulation of Donabedian- Maxwell matrix during 1992 (Hirst & Hewison, 2001)<sup>9</sup>. Such orientation and evolution of knowledge have resulted in hybrid models and the current study access the quality of care in Coimbatore district through administration of one such matrix, the Donabedian-Tamilnadu Health Systems Project matrix. The feedback regarding the system performance will help the health care leaders in policy formulation. Further the health care community will benefit from quality of care improvement.

### 2. Donabedian Model: The Critical Model.

The literature skim indicates the model proposed by the father of modern quality of care, Avedis Donabedian is a must include while gauging the health care scenario. The Donabedian model is the foundation of modern health care measurement and is holistic in approach (Dimick, 2010)<sup>3</sup>. Donabedian is known for his structure process and outcome model that he developed during 1966 and published under the banner "Evaluating the Quality of Medical Care". Later in 1980 he proposed an in-depth perspective that comprehends quality dimensions across the structure-process-outcome framework. Structure process and outcome are not attributes of quality but categorisation of information and the seven quality attributes conceptualized by Donabedian are efficacy, effectiveness, efficiency, optimality, acceptability, legitimacy and equity (Donabedian, 1990)<sup>4</sup>.

**Efficacy:** The ability of care, at its best, to improve health.

**Effectiveness:** The degree to which attainable health improvements are realised.

**Efficiency:** The ability to obtain the greatest health improvement at the lowest cost.

**Optimality:** The most advantageous balancing of costs and benefits.

**Acceptability:** Conformity to patient preferences regarding accessibility, the patient-practitioner relation, the amenities, the effects of care, and the cost of care.

**Legitimacy:** Conformity to social preferences concerning all of the above.

**Equity:** Fairness in the distribution of care and its effects on health.

The Donabedian's model is generic and flexible enough for application in diverse healthcare situations with or without revisions.

### 3. Tamilnadu Health Systems Project Model (TNHSP Model): The Glocal Model.

Established in 2005, the Tamilnadu Health Systems Project (TNHSP) is an initiative of the Government of Tamilnadu, in partnership with the World Bank, to create a health system in Tamilnadu that is highly accessible, and effective (TNHSP, n.d)<sup>11</sup>. The World Bank sanctioned Rs. 597.15 crores for the effective implementation of the project. The TNHSP under the umbrella of Health and Family Welfare Department has incorporated two Millennium Development Goals, reducing child mortality and improving maternal health. To accomplish the set target a strategic team steered by the health secretary was formed by the Tamil Nadu Government.

The project team that devised the implementation plan advocated developing a geocentric model as the prioritized agenda. The model evolved after intense research was christened as TNHSP model, as revealed by **Dr. (Capt) M. Kamatchi, Expert Advisor, Tamilnadu Health Systems Project- Quality Issues** during an interview conducted for the current study. The model confines to social principal and defines quality in an eight dimensional glocal framework. The eight quality dimensions are access, appropriateness, acceptability, equity, efficiency, effectiveness, interpersonal relation and technical performance. The attributes acceptability, equity, efficiency and effectiveness are similar to Donabedian model while technical performance, accessibility and interpersonal relation are more in line with Bruce's framework an quality of care model that focus on women's issues. (Bruce, 1990)<sup>2</sup>. The quality attributes as defined by Tamilnadu Health Systems Project are as follows.

**Access:** The degree in which healthcare services are unrestricted by geographic, organisational and linguistic barriers. **Appropriateness:** The degree to which healthcare provided is appropriate to the illness.

**Acceptability:** The degree in which health care is based on the perceived needs of the people.

**Equity:** The degree to which health care are not hampered by gender, age, marital status or socio economic background. **Efficiency:** The ratio of the out puts of services to the associated costs of producing those services. **Effectiveness:** The degree to which desired outcomes of care are achieved.

**Interpersonal relation:** Trust, respect, confidentiality, courtesy, responsiveness, capacity, effective listening and communication between providers and clients. **Technical performance:** The degree

in which the tasks carried out by health workers adhere in existing standards.

The dimensions judged to fit the local circumstances are allied with international models, some rephrased, some adapted and some with added perspectives to suit the Indian conditions.

#### 4. Donabedian-TNHSP Matrix: The Hybrid Matrix Approach.

The TNHSP dimensions of care are studied across the structure, process and outcome indicator as prescribed by Donabedian for an all-inclusive approach. At global level such syntheses of knowledge has proved to be valuable and are not uncommon. The Donabedian Maxwell matrix or Wright matrix that have been verified in a physiotherapy settings at United Kingdom has set the frame work for Donabedian -TNHSP matrix (Higginbottom & Hurst, 2001)<sup>8</sup>. The structure- process-outcome is the guiding principle with regard to quality of care as they classify the attributes of quality (Ellis & Whittington, 1998)<sup>9</sup>.

Donabedian TNHSP	Structure	Process	Outcome
Access	Infrastructure to help children, elderly and disabled ( <i>scope for future research</i> )	Distance from home to hospital / Transport used to reach the hospital/ Financial access/ Privacy	Children, disabled and elderly avail service  ( <i>Secondary data from hospitals</i> )
Appropriateness	Infrastructure Amenities	Quality of treatment	Unnecessary test and frills avoided ( <i>scope for future research</i> )
Acceptability	Clinics at appropriate time ( <i>scope for future research</i> )	No unacceptable test insisted ( <i>scope for future research</i> )	Overall satisfaction
Equity	Resources and records in various language ( <i>scope for future research</i> )	Social status , gender, age, marital status, religion not an issue	All categories of people turn up ( <i>Secondary data from hospitals</i> )
Efficiency	Skill mix of care provider ( <i>Secondary data from hospitals</i> )	Timely availability of supporting staff. Continuous supply of drugs / Timeliness of medical reports.	Smooth functioning with less problem that reduces cost ( <i>Secondary data from hospitals</i> )
Effectiveness	Equipments in good working order	Inefficient test not incorporated Right prescription	Benefit availed from drugs Patients correctly reassured over concerns
Interpersonal relation	Information technology for communication ( <i>scope for future research</i> )	Reassurance, interaction of doctor Attitude of hospital staff	More patients turn up ( <i>Secondary data from hospitals</i> )
Technical performance	Sign boards, pamphlets for safety awareness	Preventive measures. Patient rights and education	Patient participation and reduction in hospital acquired infection ( <i>Secondary data from hospitals</i> )

**Figure 1 : Donabedian-TNHSP Matrix.**

The matrix (Figure: 1) format helps the managers to dissect information across two dimensions i.e. categorisation of quality and attributes of quality. The attributes of quality chosen adheres to Tamilnadu Health Systems Project model as it is a global model developed for Tamilnadu and obviously extends to Coimbatore. Data from the entire environment are essential as the matrix is holistic in approach, but the existing research confines the assessment by relying exclusively on user perspective as customer centricity is of paramount priority. In the present hyper competitive market driven economy user involvement are highly regarded as a significant factor in advancing

the overall quality of health care provision (Gott , Stevens, Small & Ahmedzai, 2002)<sup>7</sup>. More over considering the fact that the study does not restricts to a particular ailment or disease and the inclusion of seventy health care centers as samples to cover the entire Coimbatore district the collection of secondary data from individual organisations was eluded. The cells highlighting "scope for future research" are aspects that require elaborate discussion with patients as sensed during the pilot study and have been avoided so as not to overwhelm the respondents during data collection.

#### 5. Research Methodology.

A descriptive study was undertaken to understand the quality of care in Coimbatore. After a systematic review the health of allopathic care was examined by administering a structured questionnaire (English/ Vernacular language) to the patients. A pilot study conducted by selecting 50 rural and 50 urban respondents revealed a Cronbach's alpha score of 0.682, which is more than 0.6 that assures a reliable data. The time spent by the researcher to collect information from one respondent was around twenty five to thirty minutes.

##### 5.1. Sampling Process

###### 5.1.1. Population.

Elements : Patients.  
Sampling Units: Hospitals, then Patients.  
Extent : Coimbatore District.

**5.1.2. Sampling Frame:** Indian Medical Association-Coimbatore Branch Register, Primary Health Center – Coimbatore District list and Coimbatore Corporation Urban Post/ Dispensary list.

**5.1.3. Sample Size:** 350 respondents comprising of 175 samples from urban Coimbatore and the remaining 175 samples from rural Coimbatore.

**5.1.4. Sampling Method:** A Two stage sampling with stratification was adopted. The sampling frame identified 280 hospitals out of which 131 was located within the city and treated as urban hospitals. The remaining 149 hospitals were representative of rural Coimbatore i.e. outside the city limits. 35 hospitals each from urban and rural stratum were selected at the first stage and from these 70 hospitals, 5 respondents were selected for exit interview based on judgment of the care providers to generate 350 samples.

##### 5.2. Measuring Quality of Care: A Customer Centric Approach.

Patient centric approach improves the clinical outcomes and customer satisfaction, directing a move away from the physician centric approach to health care. Aligning with the global scenario the current study has been greatly driven by the user information. The opinion of Coimbatore patients are collected using a Likert type scale to understand the agreeability or satisfaction towards the eight quality factors as defined by the TNHSP model. Accessibility aspect was understood by measuring the agreeability towards ease of information availability at the register counter, acceptability of waiting time to meet the doctor and the pace of doctor patient interaction. The interpersonal relation are verified by consolidation of the opinion towards reassurance provided by the doctor, interaction of the doctor with the patient, the coordination between various departments /care providers, attitude of various staffs and attention to patient's privacy. In the case of understanding technical performance as a structural indicator the employment of sign boards for safety awareness was referred. The cleanliness of the toilet, hygiene of the building, corridors & premises, precautions taken to reduce the problems of mosquitoes, use of disposable needle and gloves for test procedure, disposal method of hospital waste, the organisations smoking limitation policy, sterilization of lab, focus to reduce unnecessary risk and aspects related to patient rights and education are probed when technical performance are measured as a process indicator. Appropriateness as a process indicator is gauged by collecting patient's opinion on thoroughness of examination, doctor's prescription, the amount of medicines prescribed, periodical check up on progress of inpatient condition and follow ups during daily rounds and the skill/experience of nursing staffs. Appropriateness as a structural indicator draws on respondents attitude regarding the organisations displays of the services provided, adequate ventilation, availability and use of generator in the ward, adequate space in the outpatient waiting room, availability of mod-

ern equipment's, use of information technology and safety issues. Water facility, maintenance of amenities, food provided in accordance to the dietary needs of the patient, food served at the right time, amenities provided to the attendant/relatives of patient also scrutinise appropriateness as a structural indicator.

Efficiency is determined by accessing timely availability/ accessibility of nursing staff, ward boys and ayahs, continuous availability of prescribed drugs, ease of the discharge process and procedure, timeliness of receipt of medical reports and the cost of health care. Equity is studied by interpreting respondents perception towards respect given to patients does not vary according to social status, gender, age, marital status nor religion/caste. Effectiveness monitors opinion

on equipment maintenance as a structural indicator, avoidance of inefficient test as a process indicator and benefits availed from drugs as an outcome indicator. The hospital sector being a service sector and the fact that the hospitals sampled belong to a broad spectrum the process aspects were given significant coverage in the study. The outcomes has been understood from the patient's perception towards effectiveness of drugs and overall satisfaction.

The information is analysed using weighted average and as a five point scale was used a maximum score an attribute can gain is five. The combined data are inspected to construct the hybrid matrix as significant difference between urban and rural strata are not observed.

**Table 1: The relative scores of quality of care dimensions using weighted average.**

Indicator	Opinion	Likert Type Scale	SA/ HS	A/S	N	DA/D	SDA/ HD	Total	WA
	TNHSP Factors	Weights	5	4	3	2	1	-	-
Structural	Appropriateness	Relative Frequency	1386	1758	660	318	78	-	-
		Scores	6930	7032	1980	636	78	16656	3.96
	Technical Performance	Relative Frequency	133	132	26	56	3	-	-
		Scores	665	528	78	112	3	1386	3.96
	Effectiveness	Relative Frequency	140	162	34	9	0	-	-
		Scores	700	648	102	18	0	1486	4.19
Processes	Access	Relative Frequency	441	396	156	57	0	-	-
		Scores	2205	1584	468	114	0	4371	4.16
	Interpersonal Relation	Relative Frequency	1096	1044	550	78	32	-	-
		Scores	5480	4176	1650	156	32	11494	4.10
	Technical Performance	Relative Frequency	1757	2085	732	242	84	-	-
		Scores	8785	8340	2196	484	84	19889	4.05
	Appropriateness	Relative Frequency	756	667	252	60	15	-	-
		Scores	3780	2668	756	120	15	7339	4.19
	Efficiency	Relative Frequency	609	782	214	129	16	-	-
		Scores	3045	3128	642	258	16	7089	4.05
	Equity	Relative Frequency	641	793	205	95	16	-	-
		Scores	3205	3172	615	190	16	7198	4.11
Effectiveness	Relative Frequency	113	131	43	53	10	-	-	
	Scores	565	524	129	106	10	1334	3.81	
Outcome	Acceptability	Relative Frequency	88	169	71	19	3	-	-
		Scores	440	676	213	38	3	1370	3.91
	Effectiveness	Relative Frequency	150	168	28	4	0	-	-
		Scores	750	672	84	8	0	1514	4.32

The perception scores collected using Likert type scales are quantified by use of weighted average (WA). The table no. 1 has employed a weight of 5 for strongly agree/highly satisfied (SA/HS), a weight of 4 for agree/ satisfied (A/S), a weight of 3 for neutral (N), a weight of 2 for disagree/dissatisfied (DA/D) and a weight of 1 for strongly disagree/highly dissatisfied (SDA/HD). Appropriateness and technical performance in terms of structural categorisation has a score of 3.96. The attributes of process categorisation have secured a score of above

four except for effectiveness with an average score of 3.81. Acceptability as an outcome attribute has been awarded a score of 3.91. The table no. 1 clearly highlights that a score of above 4.4 has not been secured by any attribute and the least score is 3.81. The quality attributes when perceived as percentage lie in the range of 76% to 88% in terms of performance. The scores awarded by the patients to the various TNHSP quality attributes are categorised as structure, process and output indicator and mapped as Donabedian-TNHSP Matrix (Figure:2).

Donabedian TNHSP	Structure	Process	Outcome
Access	(Scope for future research)	4.16	(Secondary data from hospitals)
Appropriateness	3.96	4.19	(Scope for future research)
Acceptability	(Scope for future research)	(Scope for future research)	3.91
Equity	(Scope for future research)	4.11	(Secondary data from hospitals)
Efficiency	(Secondary data from hospitals)	4.05	(Secondary data from hospitals)
Effectiveness	4.19	3.81	4.32
Interpersonal relation	(Scope for future research)	4.10	(Secondary data from hospitals)
Technical performance	3.96	4.05	(Secondary data from hospitals)
Average Score	4.03	4.06	4.11

**Figure 2: Quality of health care in Coimbatore district: The Donabedian-TNHSP matrix perspective.**

The hybrid matrix clearly states that the structural indicator and the process indicator have been perceived in a similar manner as the scores are 4.03 and 4.06 respectively. The study also conveys a score of 4.11 with regard to the outcome the critical dimension of user perception.

## 6. Conclusion.

The 3\*8 matrix has 24 cells and the present study has limited itself to 12 cells where the user perspective dominates. The average of structure, process and outcome scores consolidates as 4.06 out of 5 to reveal the quality of care in Coimbatore district. In the era of total quality management the awarded ratings are distant from the road to excellence. Considering the fact that quality improvement is a continuous process the introspection that defines what Coimbatore stands for charts the way towards the realisation of its vision. *Knowing oneself is the beginning of all wisdom* as reflected by Aristotle.

## References.

- [1]. Best, M. & Neuhauser, D.(2004). Avedis Donabedian: Father of quality assurance and poet. *Quality and safety in healthcare*. 13(6), 472.
- [2]. Bruce, J. 1990. "Fundamental Elements of the Quality of Care: A Simple Framework." *Studies in Family Planning*. 21(2): 61-91.
- [3]. Dimick,C. (2010). "Quality Check: An Overview of Quality Measures and their Uses." *Journal of American Health information Management Association* .81 (9), 34-38.
- [4]. Donabedian, A. (1990). The seven pillars of quality. *Archives of Pathology and laboratory Medicine*. 114(11),1115-8.Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/2241519>
- [5]. Ellis, R. & Whittington,D. (1998) .*Quality Assurance in Health Care : A Handbook*, London. Edward Arnold 1998.
- [6]. Friedman, M. A. (1995). Issues in measuring and improving health care quality. *Health Care Financing Review*, 16(4), 1.
- [7]. Gott, M., Stevens, T., Small, N., & Ahmedzai, S. H. (2002). Involving users, improving services: The example of cancer. *British Journal of Clinical Governance*, 7(2), 81-85.
- [8]. Higginbottom, M. J., & Hurst, K. (2001). Quality assuring a therapy service. *International Journal of Health Care Quality Assurance*, 14(4), 149-156.
- [9]. Hirst, J., & Hewison, J. (2001). Pakistani and indigenous "white" women's views and the donabedian-maxwell grid: A consumer-focused template for assessing the quality of maternity care. *International Journal of Health Care Quality Assurance*, 14(6), 308-316.
- [10]. Lohr, K. N. (1997). How do we measure quality? *Health Affairs*, 16(3), 22-5. Retrieved from <http://search.proquest.com/docview/204625934?accountid=38609>
- [11]. TamilNadu Health Systems Project. (n.d.). Retrieved from <http://www.tnhsp.org/>