

A Study of Healthcare Quality Measures across Countries to Define an Approach for Improving Healthcare Quality

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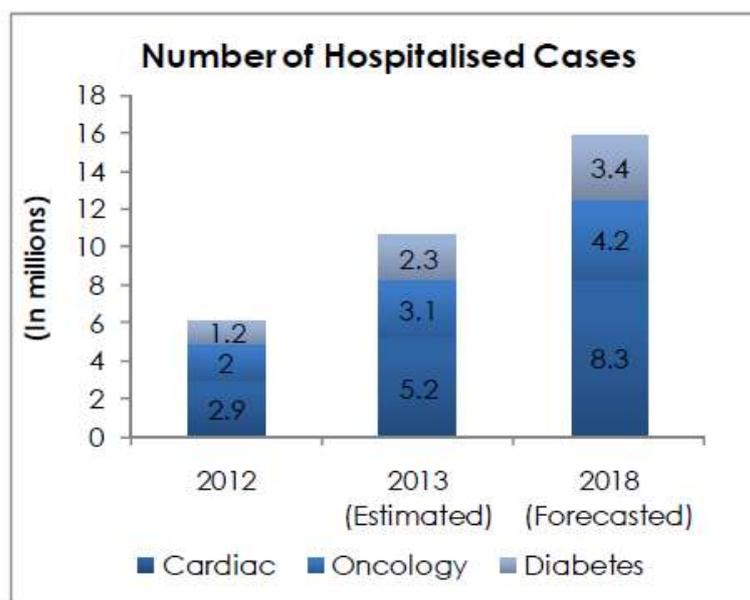
Abstract: Assessing healthcare quality is a dire need on account of huge costs of mistakes by healthcare practitioners. The growth in world population as well as change in illness patterns among populations while the availability of doctors as well as healthcare indicators are not the same across the world adds another dimension to challenges faced by the healthcare sector in different countries. Maintaining or improving healthcare quality is an aim that national governments as well as hospital managements are keen on. However, the metrics employed for measuring healthcare quality would vary greatly depending upon the perspective of measurement i.e., whether it is the perspective of patients/customers, doctors/practitioners or employers. This study is in the nature of a desk study and discusses the path from research to finalized quality measures and then presents metrics employed in different parts of the world as well as approaches that are employed for successfully enhancing healthcare quality.

Key words: Healthcare quality, metrics, health care indicators.

I. Introduction

Healthcare is among the most ancient human needs. As regards India, the Indian healthcare sector is extremely large in terms of revenue as well as employment it offers. ONICRA Credit Rating Agency of India (2013) placed the valuation in 2011-12 at USD 74 Billion with the hospital industry contributing over 80% to this. The challenges faced by Indian healthcare sector include inadequate infrastructure, inadequate investments to meet the huge demand and inadequate trained resource for the need at hand. Factors like a growing population, growing economy, urbanization, growing middle class, increasing incidence of certain diseases as well as improved health awareness have led to increasing demand for healthcare. The figure below shows estimates of these changes from 2012 onwards.

Figure 1: Increasing Demand for Care of Hospitalized Patients (Estimated)



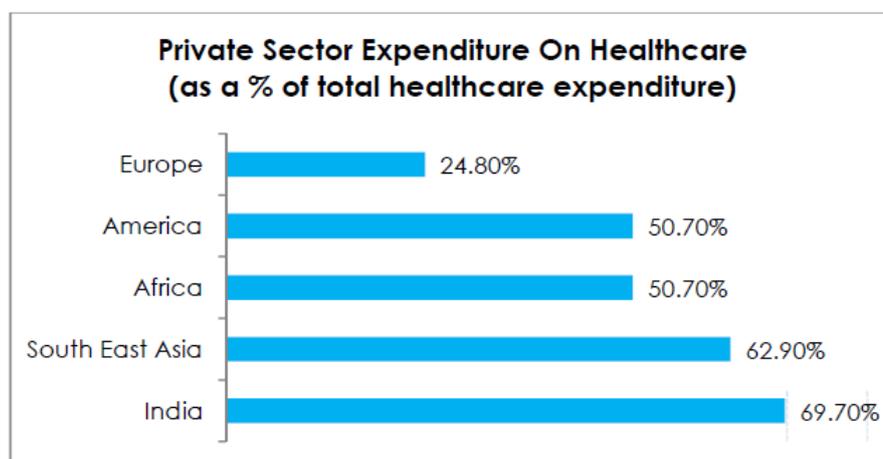
Source: Health Ministry

Source: ONICRA Report (2013). Emerging Trends: Indian Health Care Industry, pp 4.

Retrieved from: www.onicra.com/images/pdf/Healthcare-industry-report-Transparent.pdf

All the three categories above are often referred to as life style diseases. Their increasing incidence places an enormous burden on family budgets, partly, because of a higher share of private sector in health care delivery in India as compared to several other countries. The report cites World Bank estimates of private sector accounting for 64% of hospital beds, 80-85% of doctors, 80-% of out-patients and 75% on in-patients in 2012. The overall share of private sector in Indian healthcare is around 69.7% and expected to grow to 81% by 2015. Private sector expenditure of healthcare as percentage of total healthcare expenditure is compared for different parts of the world and presented in the figure below.

Figure2: Private Sector Expenditure as Percent of Total Healthcare Expenditure in Different Parts of the World



Source: World Health Statistics 2012, published by World Health Organisation (WHO)

Source: **ONICRA Report (2013)**. Emerging Trends: Indian Health Care Industry, pp 9. Retrieved from: www.onicra.com/images/pdf/Healthcare-industry-report-Transparent.pdf

Dhawan (2015) in Deloitte report on 2015 Health Care Outlook placed the health care spending in 2013 at 96.3 Billion USD with a projected growth rate of 12% taking this figure to 195.7 Billion USD by 2018. The large numbers may not necessarily reflect the limitations of the Indian public health care system that is described as, “..... patchy, with underfunded and over crowded hospitals and clinics, and inadequate rural coverage.....”. KPMG Report on Healthcare: Reaching out to the masses (2010) highlights India’s lower status on healthcare indicators.

Figure 3: Comparison of Select Countries on Healthcare Indicators

Source:

Indicator	Year	Developed Economies				Emerging Economies		
		India	US	UK	Japan	Brazil	Russia	China
Life expectancy at birth (years)	2008	64	78	80	83	73	68	74
Infant mortality rate (probability of dying by age 1 per 1000 live births)	2008	52	7	5	3	18	9	18
Maternal mortality rate (per 100000 births)	2000-09	254	13	7	3	77	24	34
Hospital bed density (per 10000 population)	2000-09	9	31	39	139	24	97	30
Doctor density (per 10000 population)	2000-09	6	27	21	21	17	43	14
Births attended by skilled health personnel (percent)	2000-08	47	99	NA	100	97	100	98

Source: World Health Statistics – 2010

Source: KPMG Report on Healthcare: Reaching out to the Masses at PanIIT Conclave 2010, pp 3. Retrieved from: https://www.kpmg.de/docs/Healthcare_in_India.pdf

Even within India, there is a big disparity across states. Given below is a comparison on healthcare indicators across select states within the country.

Figure 4: Comparison of Healthcare Spending Patterns at Select Countries

Indicator	India	US	UK	Japan	Brazil	Russia	China
Total expenditure on health as a percent of GDP (2007)	4.1	15.7	8.4	8	8.4	5.4	4.3
Government expenditure as a percent of total health expenditure (2007)	26.2	45.5	81.7	81.3	41.6	64.2	44.7
Private expenditure as a percent of total health expenditure (2007)	73.8	54.5	18.3	18.7	58.4	35.8	55.3
Per capita total expenditure on health (PPP int. USD)	109	7285	2992	2696	837	797	233
Per capita government expenditure on health at average exchange rate (USD 2007)	11	3317	3161	2237	252	316	49
Per capita government expenditure on health (PPP int. USD 2007)	29	3317	2446	2193	348	512	104

Source: World Health Statistics 2010

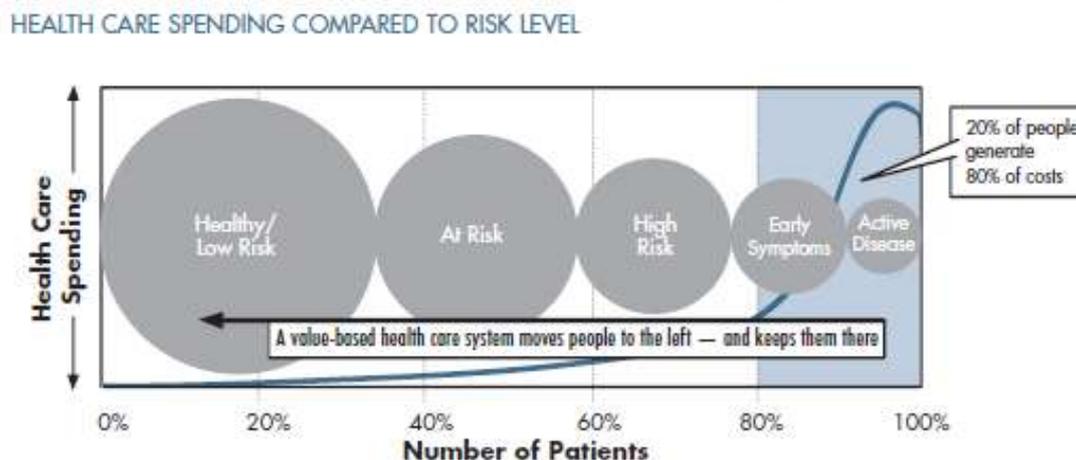
Source: KPMG Report on Healthcare: Reaching out to the Masses at PanIIT Conclave 2010, pp 8. Retrieved from: https://www.kpmg.de/docs/Healthcare_in_India.pdf

For a sector as large and diverse as the Indian healthcare sector, ensuring high quality of service and care remains a herculean challenge. Healthcare quality provides enormous benefits to society all across the world just as errors in treatments place huge costs on victims. Merry and Crago (2001) cite Institute of Medicine’s report, “To Err is Human” that placed the number of annual hospital deaths due to medical errors between 44000 and 98000. Quality healthcare could be achieved through the: (a) Regulatory route that revolves around rules, regulations and associated penalties; (b) Learning Science route encompassing the earlier route on rules, regulations, penalties and research at academic institutions; and (c) Management Science route incorporating the best values of medicine’s learning route, building an organizational culture, developing leadership practices to deal with the challenges of healthcare sector, developing necessary communication techniques that come close to eliminating human imperfection as a source of error, and developing a review mechanism to help interested organizations achieve six sigma quality.

An understanding of quality of healthcare requires defining quality in the context of health care. Buttel, Hendler and Daley (2007) discuss the prevalence of multiple definitions of quality of health care. The choice of definition depends upon the perspective of the constituent and these could be patients themselves, their family members, practitioners or their employers besides others. The authors present a definition by expanding upon the IOM (Institute of Medicine) definition of 1990, “Quality consists of the degree to which health services for individuals and populations increase the likelihood of desired health outcomes (quality principles), are consistent with current professional knowledge (professional practitioner skill), and meet the expectations of healthcare users (the marketplace).” Successful implementation of high quality healthcare requires ensuring high standards of leadership, healthcare quality based on metrics, reliability of healthcare, practitioner skills and sensitivity to marketplace to manage costs, volume and revenues.

National Commission on Quality Assurance’s The Essential Guide to Health Care quality quotes IOM’s (Institute of Medicine) definition of quality healthcare in 2001 as, “safe, effective, patient-centered, timely, efficient and equitable”. The healthcare quality problems in the US fall into three categories: (a) Underuse or not receiving required care; (b) Misuse or getting erroneous care; and (c) Overuse or receiving care that is either not needed or has a much lower cost alternative. The objective of high quality healthcare is to utilize resources in a manner that shifts people to a low risk state and keeps them there as shown in the figure below:

Figure 5: Health Care Quality in Terms of Spending and Risks



Source: NCQA Report on The Essential Guide to Health Care Quality. Retrieved from: https://www.ncqa.org/Portals/0/Publications/Resource%20Library/NCQA_Primer_web.pdf

Measuring health care quality presents a big challenge for researchers as well as practitioners. Morris and Bailey (2014) discuss the existence of hundreds of different quality measures in healthcare and that these can broadly be classified into four categories: (a) structure; (b) process; (c) outcome; and (d) patient experience.

Table 1: Types of Quality Measures for Healthcare

TYPE	DESCRIPTION	EXAMPLE
Structure	Assesses the characteristics of a care setting, including facilities, personnel, and/or policies related to care delivery.	Does an intensive care unit (ICU) have a critical care specialist on staff at all times?
Process	Determines if the services provided to patients are consistent with routine clinical care.	Does a doctor ensure that his or her patients receive recommended cancer screenings?
Outcome	Evaluates patient health as a result of the care received.	What is the survival rate for patients who experience a heart attack?
Patient Experience	Provides feedback on patients' experiences of care.	Do patients report that their provider explains their treatment options in ways that are easy to understand?

Source: **Morris, C. and Bailey, K. (2014).** Measuring Healthcare Quality: An Overview of Quality Measures. FamiliesUSA: The Voice for Health Care Consumers, pp 3. Retrieved from: http://familiesusa.org/sites/default/files/product_documents/HSI%20Quality%20Measurement_Brief_final_web.pdf

Structure measures help assess the healthcare centre's capacity, process measures help assess the healthcare centre's consistency in providing patient specific services as per recommended guidelines for care, outcome measures help assess the intended/unintended effects of the treatment/care received on the patient and patient experience measures help assess the patient's experience while under care. Meyer et.al. (2004) discuss factors that contribute to the development of high performing hospitals. These include internal elements like: (a) developing the right culture; (b) retaining the best people; (c) establishing the right in-house processes; and (d) giving staff appropriate tools including IT based tools for the job as well as external elements like (a) market competition; and (b) health quality standards. The study observes that 'racial' and ethnic minorities are more likely to receive lower quality health care as seen through higher death rates through HIV, cancer or heart disease even though income status, insurance status, age as well as severity of ailment are comparable. This points to a very high need for quality measures that can be the basis of ensuring consistently high quality. Evolution of quality measures is an extended process that involves several steps. Given below are the steps for evolving specific quality measures.

Figure 6: Evolution of Quality Measures for Health Care



Source: **Morris, C. and Bailey, K. (2014)**. Measuring Healthcare Quality: An Overview of Quality Measures. FamiliesUSA: The Voice for Health Care Consumers, pp 9. Retrieved from: http://familiesusa.org/sites/default/files/product_documents/HSI%20Quality%20Measurement_Brief_final_web.pdf

Availability as well as utilization of health care vary enormously across countries and economies with quality being one of the contributing factors.

II. Utilization Of Health Care Facilities And Need For Suitable Metrics

Bernstein et.al (2003) include the following factors as contributing to increased utilization of US health services:

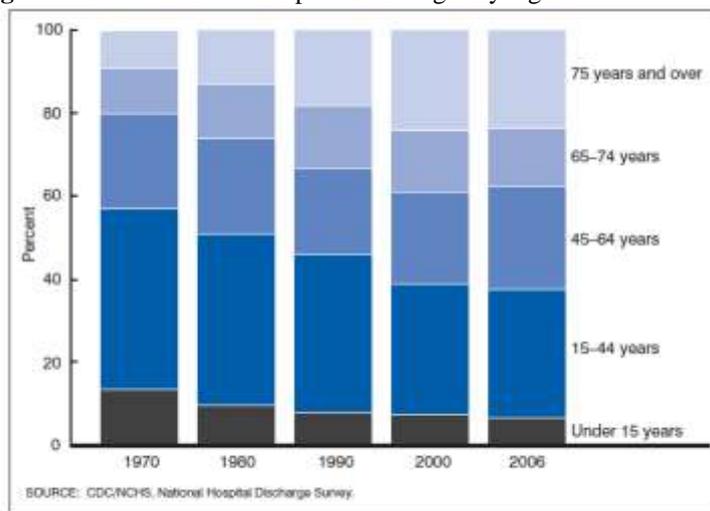
- a. Increase in availability of health services;
- b. Increase in population especially the elderly population;
- c. Availability of new procedures and technologies (eg. Knee/hip replacement, MRI etc.);
- d. New disease entities (eg. HIV/AIDS or bio terrorism);
- e. Increased coverage of health insurance;
- f. Availability of new drugs and enhanced use of existing drugs; and
- g. Consumer preferences for some specific treatments (eg. Cosmetic surgery)

The study highlight changing pattern in health care and associated facilities in the US. For instance, while the number of community hospitals in US declined from 5384 in 1990 to 4915 in 2000 and number of beds/1000 population fell from 4.2 to 3.0 in the same period, there was a quantum jump in out-patient department visits from 860 to 1852/1000 persons in the same period caused, at least partly, by an aging population. Further, there was also an increase in full time equivalent personnel from about 3.42 Million to 3.91

Million from 1995 to 2000 though a large number of these were being employed for management or administration and not patient care.

DeFrances et.al (2008) show the changing pattern in inpatient care in USA on account of an aging population.

Figure 7: Distribution of Hospital Discharges by Age from 1970 to 2006



Percent distribution of hospital discharges by age: United States, selected years 1970-2006

Source: **DeFrances, C.J., Lucas, C.A., Buie, V.C. and Golosinskiy, A. (2008).** 2006 National Hospital Discharge Survey. *National Health Statistics Reports*, No. 5, July 30, 2008, pp 1. Retrieved from: <http://www.cdc.gov/nchs/data/nhsr/nhsr005.pdf>.

With enhanced use of IT to collect as well as process data relating to healthcare, Padman and Tzourakis (1997) highlight the need to assess the quality of data gathered for it to describe quality of healthcare accurately. The data needs to be complete, correct, consistent and timely to provide a suitable feedback on quality of healthcare. Campbell et.al (2002) discuss factors that are important in developing healthcare indicators: (a) Clearly identify the stakeholder whose perspective the indicator reflects; (b) Identify aspects of healthcare being measured; (c) Actual data relating to the indicator. Besides the systematic process for defining quality indicators described in Figure 6 above, quality indicators can also be developed using non systematic approach like the case study method though it does suffer from a shortcoming of not tapping into all available evidence. Raleigh and Foot (2010) list the uses of healthcare quality indicators as including: (a) Local teams using measures for day-to-day monitoring and benchmarking; (b) Organizations reporting on quality to local communities/authorities; (c) Health authorities driving improvements; and (d) National authorities comparing performance across countries and setting priorities.

III. Practices In Achieving Achieveing High Quality

The challenges nations face in raising healthcare quality comes, at least, partly from the sheer magnitude and size of the sector. WHO lists the features of a well-functioning health care that responds in a balanced way to population's requirements and expectations by: (a) improving health status of communities and its members; (b) defending the population against threats to its health; (c) mitigating against the financial consequences of ill health; (d) providing equitable access to health care; and (e) developing ways whereby people can participate in making decisions impact their health as well as health systems. National healthcare systems could be subjected to forces that do not necessarily facilitate rational decision making. These include disproportionate focus on specialist curative care, fragmentation on account of multiple competing projects, programs, and institutions, and increasing commercialization of health care delivery especially in poorly regulated systems.

Kumaraswamy (2012) carried out a study of corporate and non-corporate health care centres to find that the important service quality factors in health care centres are: (a) atmospheric; (b) operational performance; (c) physician behavior; and (d) supportive staff with supportive staff and atmospheric being the important discriminating factors as regards service quality. Mosadeghrad (2014) worked on identifying factors that healthcare quality in Iran through in-depth individual and focus group interviews with 222 stakeholders to find that healthcare quality is a function of personal factors of the provider and patient as well as factors related to health care , .

WHO report on Quality of Care aims to provide national decision makers with a generic process to design and implement effective interventions aimed at promoting high quality in health care systems by optimizing use of available resources. The figure below present a process for building a strategy for quality:

Figure 8: Generic Process for Building a Strategy for Quality



Source: WHO Report on Quality of Care: A Process for Making Strategic Choices in Health Systems, pp 14.

Retrieved from: http://www.who.int/management/quality/assurance/QualityCare_B.Def.pdf

An effective strategy for quality in health care, thus involves detailed analysis as well as implementation that in turn includes an implementation process and monitoring of progress against established goals of the process. Various domains come into play in achieving this. These include leadership at the health care centre that influences use of appropriate information and quality measures, engagement with patients and the population at large, conformance to regulatory standards, building organizational capacity for improved health care and putting in place a model of health care ideally suited to the market place and local conditions. The figure below shows these linkages with leadership being the core of all quality interventions and different domains being interconnected to each other, thus influencing each other making high quality care a bigger challenge than any unidirectional approach can achieve.

Figure 9: The Different Domains of Quality Intervention



Source: WHO Report on Quality of Care: A Process for Making Strategic Choices in Health Systems, pp 21.

Retrieved from: http://www.who.int/management/quality/assurance/QualityCare_B.Def.pdf

The Position Statement of Health and Public Policy Committee and Office of Health Policy (2012) highlights the complexities in attaining quality because of different perspectives on it besides the parameters themselves being multi-dimensional and inter-related. The Position Statement lists the following ten principles for achieving high quality health care:

- i. The specific dimensions of quality need to be relevant to stakeholders and actionable by them for stakeholders to contribute to improvements;

- ii. The improvement in quality need to be quantifiable and measurable besides being linked to desired goals;
- iii. Quality improvement systems must not be just another bureaucratic layer nor should they impede or detract from health professionals' duties or interfere with health professionals' ability to provided required services throughout the continuum of health care;
- iv. Outcome of the treatment/care as well as services provided need to reflect a culture of safety;
- v. Healthcare quality improvement necessarily requires a learning culture, upgrading competencies and professional development to invigorate quality practices;
- vi. Health care quality improvement can be greatly facilitated by governments through incentives, investments and collaboration among government agencies for improved knowledge sharing;
- vii. Health care quality improvement is critically dependent upon collaborative sharing of knowledge, transparency as well as accountability;
- viii. Health care service providers must conform to a patient centered systems approach;
- ix. The responsibility for health care quality improvement lies at an individual as well as group level as regards physicians and others engaged in providing health care services;
- x. Quality improvement systems need continuous and active involvement of physicians and others engaged in providing health care services.

The Centres for Medicare and Medicaid Services (CMS), an agency within the Department of Health and Human Services (HHS) in USA identified 33 measures across four domains, namely, Patient experience of care received, Care and coordination on patient safety, Preventive health and At-risk population. Data for these is collected through surveys (7 measures), claims (3 measures), CMS Web Interface (22 measures) and HER Incentive Program Reporting (1 measure).

A Report prepared by the CMO Office Department of Health for the Irish Health System by examining various quality metrics derived from Hospital In-patient Enquiry (HIPE) data to ascertain possibility of monitoring healthcare quality based on these. The Hospital In-patient Enquiry System provides discharge data from publish funded acute hospitals in Ireland. The list of indicators included number of in-hospital mortality cases:

1. Within 30 days after AMI (acute myocardial infarction)
2. Within 30 days after ischaemic stroke
3. Within 30 days after haemorrhagic stroke
4. Within 30 days following hip fracture surgery
5. Within 30 days after colectomy for emergency admissions

The other measures included:

6. Time to hip fracture surgery measuring time from diagnosis to surgery for patients 65 years or more.
7. Age at orchidopexy

Rosenthal et.al (2012) present the recommendations of over 75 researchers coming together to identify a core set of standardized measures aimed at evaluating patient centered medical homes with focus on clinical quality and cost/utilization.

Table 2: Core Cost and Utilization Measures for Cross Study Comparison of Patient-Centered Medical Home

Utilization
Emergency department visits, ambulatory care-sensitive (ACS) and all Acute Inpatient admissions, ACS and all Readmissions within 30 days
Cost
Total per member per month costs Total per member per month costs for high-risk patients
<i>Technical issues: all utilization and cost issues should be risk-adjusted; method of pricing should be transparent and standardized if possible</i>
Source: Commonwealth Fund Patient-Centered Medical Home Evaluators' Collaborative.

Source: **Rosenthal, M.B., Abrams, M.K., Bitton, A., and The Patient Centered Medical Home Evaluators' Collaborative (2012).** Recommended Core Measures for Evaluating the Patient-Centered Medical Home: Cost, Utilization, and Clinical Quality, pp 3.

Based on a modified Delphi process, the researchers came up with the consensus metrics given in the table below. Mere metrics do not suffice as regards measuring quality since such evaluation requires applying a validated measure for collecting data and it is important to use an appropriate mix of process and outcome measures for evaluating patient-centered medical homes.

Table 3: Core Recommended Technical Quality Measures for Adults for Patient Centered Medical Homes

Measure	Description	Data Source(s)	Composite Domain	Measure Source
Avoidance of antibiotic treatment in adults with acute bronchitis (AAB)	Percentage of adults ages 18–64 with a diagnosis of acute bronchitis who were not dispensed an antibiotic prescription	Claims	Effectiveness of Care: Respiratory Conditions	NCQA: HEDIS 2012 Measure Set
Adult weight screening and follow-up	Percentage of patients age 18 years and older with a calculated body mass Index (BMI) in the past six months or during the current visit documented in the medical record AND if the most recent BMI is outside the parameters, a follow up plan is documented. Normal parameters: Age 65 and older BMI ≥23 and <30 Ages 18–64 BMI ≥18.5 and <25	Claims EHR	Effectiveness of Care: Prevention and Screening	CMS/ NQF 0421
Medication Management for People with Asthma (MMA)	The percentage of members ages 18–64 during the measurement year who were identified as having persistent asthma and who were dispensed appropriate medications and remained on their medications during the treatment period. Two rates are reported: 1. The percentage of members who remained on an asthma controller medication for at least 50% of the treatment period 2. The percentage of members who remained on an asthma controller medication for at least 75% of the treatment period	Claims EHR	Effectiveness of Care: Respiratory Conditions	NCQA: HEDIS 2012 Measure Set
Breast cancer screening (BCS)	Percentage of women ages 40–69 who had a mammogram to screen for breast cancer	Claims EHR	Effectiveness of Care: Prevention and Screening	NCQA: HEDIS 2012 Measure Set
Cervical cancer screening (CCS)	Percentage of women ages 21–64 who received one or more Pap tests to screen for cervical cancer	Claims Medical record EHR	Effectiveness of Care: Prevention and Screening	NCQA: HEDIS 2012 Measure Set
Chlamydia screening in women (CHL)	Percentage of women ages 16–24 who were identified as sexually active and who had at least one test for chlamydia during the measurement year	Claims EHR	Effectiveness of Care: Prevention and Screening	NCQA: HEDIS 2012 Measure Set
Colorectal cancer Screening (COL)	Percentage of members ages 50–75 who had appropriate screening for colorectal cancer	Claims Medical record EHR	Effectiveness of Care: Prevention and Screening	NCQA: HEDIS 2012 Measure Set
Cholesterol management for patients with cardiovascular conditions (CMC)	Percentage of members ages 18–75 who were discharged alive for acute myocardial infarction (AMI), coronary artery bypass graft (CABG), or percutaneous coronary interventions (PCI) from January 1 to November 1 of the year prior to the measurement year, or who had a diagnosis of ischemic vascular disease (IVD) during the measurement year and the year prior to the measurement year, who had each of the following during the measurement year: LDL-C screening LDL-C control (<100 mg/dL)	Claims Medical record	Effectiveness of Care: Cardiovascular Conditions	NCQA: HEDIS 2012 Measure Set
Antidepressant medication management (AMM)	Percentage of members age 18 and older who were diagnosed with a new episode of major depression and treated with antidepressant medication, and who remained on an antidepressant medication treatment. Two rates are reported: 1. Effective acute phase treatment: the percentage of newly diagnosed and treated members who remained on an antidepressant medication for at least 84 days (12 weeks) 2. Effective continuation phase treatment: the percentage of newly diagnosed and treated members who remained on an antidepressant medication for at least 180 days (6 months)	Claims EHR	Effectiveness of Care: Behavioral Health	NCQA: HEDIS 2012 Measure Set
Comprehensive diabetes care: Hemoglobin A1c (HbA1c) testing	Percentage of members ages 18–75 with diabetes (type 1 and type 2) who had HbA1c testing	Claims Medical record EHR	Effectiveness of Care: Diabetes	NCQA: HEDIS 2012 Measure Set
Comprehensive diabetes care: HbA1c poor control (>9.0%)	Percentage of members ages 18–75 with diabetes (type 1 and type 2) who had poor HbA1c control (>9.0%)	Claims Medical record EHR	Effectiveness of Care: Diabetes	NCQA: HEDIS 2012 Measure Set

Source: **Rosenthal, M.B., Abrams, M.K., Bitton, A., and The Patient Centered Medical Home Evaluators' Collaborative (2012).** Recommended Core Measures for Evaluating the Patient-Centered Medical Home: Cost, Utilization, and Clinical quality, pp 5 Contd.

Measure	Description	Data Source(s)	Composite Domain	Measure Source
Comprehensive diabetes care: blood pressure control (<140/80 mm Hg)	Percentage of members ages 18-75 with diabetes (type 1 and type 2) who had blood pressure control of <140/80 mm Hg	Claims Medical record EHR	Effectiveness of Care: Diabetes	NCQA: HEDIS 2012 Measure Set
Comprehensive diabetes care: Eye exam (retinal) performed	Percentage of members ages 18-75 with diabetes (type 1 and type 2) who had an eye exam (retinal) performed	Claims Medical record EHR	Effectiveness of Care: Diabetes	NCQA: HEDIS 2012 Measure Set
Comprehensive diabetes care: LDL-C screening	Percentage of members ages 18-75 with diabetes (type 1 and type 2) who had an LDL-C screening	Claims Medical record EHR	Effectiveness of Care: Diabetes	NCQA: HEDIS 2012 Measure Set
Comprehensive diabetes care: LDL-C <100 mg/dL	Percentage of members ages 18-75 with diabetes (type 1 and type 2) who had good LDL-C control (<100 mg/dL)	Claims Medical record EHR	Effectiveness of Care: Diabetes	NCQA: HEDIS 2012 Measure Set
Comprehensive diabetes care: Medical attention for nephropathy	Percentage of members ages 18-75 with diabetes (type 1 and type 2) who had medical attention for nephropathy	Claims Medical record EHR	Effectiveness of Care: Diabetes	NCQA: HEDIS 2012 Measure Set
Comprehensive diabetes care	Percentage of members ages 18-75 with diabetes (type 1 and type 2) who had each of the following: hemoglobin A1c testing, HbA1c poor control (>9.0%), HbA1c control (<8.0%), HbA1c control (<7.0%) for a selected population, eye exam (retinal) performed, LDL-C screening, LDL-C control (<100 mg/dL), medical attention for nephropathy, blood pressure control (<140/80 mm Hg), blood pressure control (<140/90 mm Hg)	Claims Medical record	Effectiveness of Care: Diabetes	NCQA: HEDIS 2012 Measure Set
Controlling high blood pressure (CBP)	Percentage of members ages 18-85 who had a diagnosis of hypertension and whose blood pressure was adequately controlled (<140/90) during the measurement year	Claims Medical record	Effectiveness of Care: Cardiovascular Conditions	NCQA: HEDIS 2012 Measure Set
Use of imaging studies for low back pain (LBP)	Percentage of members with a primary diagnosis of low back pain who did not have an imaging study (plain X-ray, MRI, CT scan) within 28 days of diagnosis	Claims EHR	Effectiveness of Care: Musculoskeletal Conditions	NCQA: HEDIS 2012 Measure Set
Annual monitoring for patients on persistent medications (MPM)	Percentage of members age 18 and older who received at least 180 treatment days of ambulatory medication therapy for a select therapeutic agent during the measurement year and at least one therapeutic monitoring event for the therapeutic agent in the measurement year. For each product line, report each of the four rates separately and as a total rate. <ul style="list-style-type: none"> • annual monitoring for members of angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARB) • annual monitoring for member on digoxin • annual monitoring for members on diuretics • annual monitoring for members on anticonvulsants • total rate (the sum of the four numerators divided by the sum of the four denominators) 	Claims	Effectiveness of Care: Medication Management	NCQA: HEDIS 2012 Measure Set
Pneumonia vaccination status for older adults (PNU)	Percentage of Medicare members age 65 and older as of January 1 of the measurement year who have ever received a pneumococcal vaccination	Survey EHR	Effectiveness of Care: Measures Collected Through the CAHPS Health Plan Survey	NCQA: HEDIS 2012 Measure Set via the Medicare CAHPS Survey
Preventive Care and Screening Measure Pair: a) Tobacco Use Assessment, and b) Tobacco Cessation Intervention	a) Percentage of patients age 18 years and older who have been seen for at least 2 office visits who were queried about tobacco use one or more times within 24 months b) Percentage of patients age 18 years and older identified as tobacco users within the past 24 months and have been seen for at least 2 office visits, who received cessation intervention	Claims EHR	Effectiveness of Care: Prevention and Screening	CMS AMA-PCPI

Source: Commonwealth Fund Patient-Centered Medical Home Evaluators' Collaborative.

Source: **Rosenthal, M.B., Abrams, M.K., Bitton, A., and The Patient Centered Medical Home Evaluators' Collaborative (2012)**. Recommended Core Measures for Evaluating the Patient-Centered Medical Home: Cost, Utilization, and Clinical quality, pp 6.

IV. Conclusions And Recommendations

This study highlights the challenges faced in measuring health care quality. These challenges begin with devising appropriate measures that take into account the perspectives of different stakeholders. This is because the metrics that measure quality from the perspective of employers, practitioners and patients are quite different from each other. It is not only the measures themselves that present a challenge, with increased use of IT in collecting healthcare data, its essential to establish that data collected is complete, correct, consistent and timely if it has to provide credible feedback on healthcare quality. After defining metrics, a quality improvement plan formulated after ensuring buy-in of medicare practitioners and driven by leadership that focuses on enhancing staff competencies as well as organizational capacity needs to be put in place. The metrics itself need to take into account country or region specific needs before a programme is put in place for its implementation.

V. Limitations Of The Study And Scope For Further Research

This study was in the nature of a desk study that looked at practices from different parts of the world. Data for this study is secondary in nature. Such data tends to be at a higher level of abstraction than what an individual health care centre often requires. Thus individual health centres striving for improvements may need to review the metrics listed here to establish their appropriateness for the health care centre in question. The same applies at the national level as well with some but not necessarily all metrics being relevant to any given country. These limitations point to the need for a deeper study in the Indian context as well as in the context of any given state in India.

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