

Summer Training Report

By

Dr. Shiwani Rawat

MBA Hospital and Health Management

2019-2021



Institute of Health Management Research, Jaipur

ACKNOWLEDGEMENTS

I would like to extend my sincere thanks and gratitude toward **IIHMR University** to provide us with this opportunity to work and learn from home during these challenging times of COVID-19.

Foremost I would like to thank **Mr. P.R Sodani (Pro President Dean)** for his continuous encouragement in completion of this project.

A very sincere gratitude towards **Mr Sunil Rajpal (Mentor)** who guided me at every step of the way and was kind enough to spare his valuable time and knowledge for me to finish this project report.

Last but not the least I would like to thank **my parents** who have always guided and supported me and made me able enough to reach wherever I am today.

Thanks to one and all.

Dr. Shiwani Rawat

MBA- Healthcare management (2nd Year)

IIHMR University, Jaipur

TABLE OF CONTENTS

S.no	Topic	Page Number
1.	Abbreviations	4
2.	Report-1 UNRAVELLING ASSOCIATION BETWEEN COOKING FUEL AND CHILD UNDERNUTRITION IN INDIA: EMPIRICAL EVIDENCE FROM NFHS-2016 DATA	5
2.1	Introduction	5
2.2	Methods - Survey data and study population - Indicator - Statistical Tools	8
2.3	Results - Stunting - Underweight - Wasting	9
2.4	Discussion of results	11
2.5	Conclusion	13
2.6	Reference	13
2.7	Annexure	14
3	Report-2 IMPROVING GLOBAL HEALTH: FOCUSING ON QUALITY AND SAFETY	17
3.1	Course Description	17
3.2	Course Objectives	18
3.3	Contents	18
3.4	Learning Methodology	18
3.5	Key Learnings	19
3.6	Conclusion	29

1. ABBREVIATIONS

BMI	Body mass index
CO	Carbon monoxide
COVID-19	Coronavirus disease 2019
e- Health	Electronic health
FAO	Food and Agriculture Organisation of the United Nations
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
IOM	Institute of medicine
IT	Information Technology
JIPMER	Jawaharlal Institute of Postgraduate Medical Education and Research
JQC	JIPMER quality council
LPG	Liquified petroleum gas
NFHS	National Family Health Survey
NHM	National health mission
SDG	Sustainable Development Goals
UT	Union territory

REPORT-1

UNRAVELLING ASSOCIATION BETWEEN COOKING FUEL AND CHILD UNDERNUTRITION IN INDIA: EMPIRICAL EVIDENCE FROM NFHS-2016

2.1 INTRODUCTION-

After 2015 world noticed a slow rise in the number of people battling with hunger after experiencing a steady decline for quite some time. Today, around 821 million people sleep empty stomach almost every day, of whom about 135 million suffer from acute hunger. But the world food problem is far more complex. Although developed nations are already prioritizing food security- to ensure access of food to all yet it is not enough. It is equally important to ensure nutrition safety as well. Globally around 1.02 billion people suffer from undernutrition, 99% of which is covered by developing countries. According to FAO estimates in ‘The State of Food Security and Nutrition in the World, 2019’ report, 194.4 million people (14.5% of population) are undernourished in India itself. Technically, undernutrition is the result of inadequate meals and repeated infectious diseases. It consists of being severely underweight or dangerously skinny (wasted), too brief (stunted), and poor in nutritional vitamins and minerals. Further according to the report, 37.9% of under 5 children in India are stunted (too short for age) and 20.8% are wasted (weight is too low for height). While malnutrition does not discriminate between the rich or the poor, but certainly the poor Indian children are worse off. According to the State of the World’s Children [report](#) released by UNICEF on October 15, 2019, 22% of children belonging to India’s richest households are short for their age – or stunted as compared to over half or around 51% from poorer households.

While it is important to provide nutrition specific interventions to children to improve their individual level behaviours like complimentary foods, feeding practises and breastfeeding, reports suggest that it is equally and sometimes more important to ensure nutrition related interventions like healthy living conditions to reduce undernutrition. According to recent studies, maternal factors (height, BMI, education) and household socioeconomic and environmental factors (wealth, air quality and sanitation) have the most consistent and strongest association with increased risk of child anthropometric failure ([Rockli Kim, et al. 2019](#)) [3]. According to WHO, yearly more than 3 million children under 5 years of age die due to poor household environment which makes it a critical contributor to the global toll of more than 10 million child death annually. Polluted indoor and outdoor air, contaminated

water, lack of adequate sanitation, disease vectors, ultraviolet radiation, are all important environmental risk factors for growth of a child, and in most cases for their mothers as well [4]. These results in diarrhoeal diseases, insect borne diseases, physical injuries etc which in turn causes reduction in overall health of the child. And on top of that unavailability of proper balanced diet during first few years of life makes the situation even worse. The developing countries like India suffer more in this context as the ratio of rich to poor is pretty significant. There have been studies to suggest that a rich household with better food availability and better facilities like proper sanitation, clean drinking water and access to healthcare will perform better and have healthier children as compared to a poorer household with scarcity of resources. Similarly, we have to take in account the diverse variations state wise in India. On one hand, we have better performing Kerala with prevalence of 20% under 5 stunting, while on the other hand Bihar with 48.4% prevalence (according to NFHS 2016).

In September 2015, the United Nations adopted a set of 17 global goals- The Sustainable Development Goals with aim to ensure overall prosperity for all by 2030. SDG 2 laid a specific focus on “Ending hunger, achieving food security and improved nutrition and to promote sustainable agriculture”. Needless to say, improvement in nourishment status of a country like India will play a crucial role in achieving this target. The National nutrition strategy (NNS) released by NITI Aayog in 2017 aims to reduce the prevalence of undernutrition in children (0- 3 years) by 3 percentage points per annum from NFHS 4 levels by 2022. Undernutrition does not only affect child’s physical development but it hampers his/her cognitive abilities, behavioural responses, results in lower IQ, poorer levels of educational attainments and mental deformities. Over the years, various government schemes have been launched which seek to improve the levels of maternal and child nutrition levels in India. Maternal health is invariably important as a malnourished mother gives birth to a low birth weight infant who has higher probability to progress and become malnourished in the absence of proper breastfeeding. Findings from experimental and epidemiological studies suggests that, lack of energy, proteins, and other nutrients during foetal life can result in a poorly developed foetal immune response, increased risk of infections during infancy and consequently in adulthood (Wu, 2012). In India, schemes like ICDS (Integrated Child Development Scheme) provides 500 kilocalories (with 12-15 grams of protein) to every child below 6 years of age and up to 500 kilo calories (with up to 25 grams of protein) to adolescent girls every day. Under NHM, National Rehabilitation Centres are established which aims to provide institutional care for malnourished children and to promote their

physical, mental and social growth. The Mid-day meal scheme, operational in Government schools, Special training centres and Madrasas focuses on enhancing the enrolment, retention and attendance of children in schools while at the same time providing them nutritious meals to improve their nutrition standards. Other policies include Janani Suraksha Yojana and Matritva Sahyoj Yojana, both of which focus on maternal care to improve both maternal and neonatal health and reduce mortality while delivery. While POSHAN Abhiyaan is designed to cover all the states/UTs and districts in three phases, it is important to note that customising the level and type of care to be provided in each district is very important as all of them have different demographic, socioeconomic and cultural variables. But, if the data collected is not interpreted and utilized at state, district and local levels, a major opportunity to fine tune actions would have been lost.

In recent times of COVID-19 pandemic, experts suggest that at least 10 crore Indians will be pushed down the poverty line in India. It is to be noted that >90% of India's workforce is employed in informal sectors as daily wage workers, rickshaw pullers, street vendors etc. and millions of people working as migrants away from their home. When India experienced the nationwide lockdown, these people were forced with dual burden of protecting them from the virus and to make arrangements for their daily sustenance. During this time thousands of migrant workers came on road and started walking back to their hometowns. The government was unable to ensure food safety amidst the crisis and many poor lost their lives due to hunger. It is to be noted that all the government policies and measures have taken a big hit due to the pandemic and pushed us years behind. Thousands of people today suffer from scarcity of food, many have complete absence of it. This is going to impact the overall health of not only children but adults as well. Will India be able to achieve the SDG goal 2 in time is now the question? This is why it is important to analyse the current situation with the help of the data available and try to find out the variables which affects the overall health of a child directly or indirectly.

The release of the 4th NFHS conducted in 2015-16 provides the opportunity to update our understanding of current child anthropometric failures and the factors which affect them. Like other household factors for instance sanitation, there would be others as well which affects the nutritional status of child indirectly. The objective of this study is to examine the prevalence of child undernutrition by household cooking fuel capacity. Though fuels like kerosene and LPG are major source of cooking energy in urban India, a large population of rural households still use biomass such as firewood, dung and charcoal. Reports suggest that

indoor air pollution associated with use of biomass fuels kills nearly one million children annually, mostly as a result of acute respiratory infections. An understanding of the relationship between the use of cooking fuel and risk of under-five death is therefore essential. This report aims to find out if usage of clean fuel like LPG or biomass has any difference in effect on the nutritional status of the child and is based on data collected from NFHS 2016.

2.2 METHODS-

SURVEY DATA AND STUDY POPULATION

NFHS-4 covered all the 36 states and UT's and 640 districts in India. A stratified 2 stage sampling frame was used to select the survey responders. The final analytic sample size was 225002 children after excluding missing observations for age, sex, height, weight and flagged cases.

INDICATOR

The weight of the child (below 24 months) was measured using digital solar powered weighing scales along with adjustable Shorr measuring boards for recumbent length measurement by trained healthcare professionals. For older (above 24 months) children standing height was obtained. Anthropometric measures for children were recorded by field investigators, and NFHS is known for high quality data with accurate sampling of participants and high response rates. Using these height and weight measurements three failure outcomes were constructed.

- Stunting, defined as retarded skeletal growth as a result of chronic undernutrition measured as height for age z score < 2 standard deviations below WHO child growth standards.
- Underweight defined as weight for age z score < 2 standard deviation
- Wasting, signalling acute malnutrition defined as weight for height z score < 2 standard deviations.

STATISTICAL ANALYSIS

Based on existing studies on determinants of child nutrition we identified a set of correlates – Availability of clean cooking fuel and separate kitchen in the household. The prevalence of households with access to clean cooking fuel like kerosene or LPG and a 95% confidence interval was calculated. Similarly, prevalence of households with separate kitchen was also calculated. Further on, for better understanding measurements were done by combining these 2 factors which resulted in prevalence of household with clean fuel but no separate kitchen, with clean fuel and separate kitchen, without clean fuel & separate kitchen and without clean fuel but with separate kitchen. Measurements for all these correlates were done and 3 outcomes were calculated, prevalence of children with stunting, wasting and underweight. If the score of the child comes to lie within the normal range, he was considered to be healthy but if it falls below the limit, the child was undernourished.

2.3 RESULTS-

Of the total 140,444 households analysed, 27.1% had a separate kitchen while 19.2 % did not. Moreover 29.1% household had access to clean cooking fuel while 19.8% did not (Table-1). The results are evident as the prevalence of having a separate kitchen in a house is around 7.90% more in India. Also, the data suggests that number of households having access to clean cooking fuel is actually 9.30% higher.

2.3.1 STUNTING

The data suggests that the prevalence of having a stunted child is 43.64% [CI- 43.4; 43.9] in houses which do not have access to clean cooking fuel as compared to a prevalence of 28.20% [CI- 27.8; 28.5] in houses which use clean cooking fuel. Out of all the children who had a separate kitchen in their house 32.3% [CI- 32.0; 32.5] had stunted growth. While children without access to separate kitchen showed higher prevalence of 44.7 % [CI- 44.4; 45.0]. The magnitude of association with stunting substantially increases if we see the prevalence of having a stunted child in a household with absence of both separate kitchen and clean cooking fuel which accounts for 48.1% [CI- 47.7; 48.4] means every second child. On the other hand, if a house has both a separate kitchen and access to clean cooking fuel, the prevalence of having a stunted child is lesser 25.9% [CI- 25.6; 26.3] (Table-2).

Moreover, the prevalence of stunting in below 5 children is 71% in absence of clean cooking fuel in their household as compared to 29% if it is used (Figure-1).

2.3.2 UNDERWEIGHT

All the correlates show significant association with higher risk of prevalence of underweight in children. Where absence of clean cooking fuel results in prevalence of 40.8% [CI- 40.5; 40.9] underweight child, using fuel like kerosene and LPG corresponds to a much lower prevalence rate of 26.1 % [CI- 25.7; 26.4] only. This shows a significant difference of 14.7% between the two (Table-2). Association of having a separate kitchen with underweight child in the household is also significant with 30.3% [CI- 29.9; 30.5] as opposed to 41.5% [CI- 41.1; 41.8] in the absence of a separate kitchen. On simultaneously adjusting these correlates, it is found that the prevalence is highest with 44.6% [CI- 44.2; 45.0] in the absence of both clean fuel and separate kitchen, while lowest in the presence of both 23.9% [CI- 23.6; 24.3].

Figure-1 depicts the outcome where 70% children (no access to clean fuel) were found underweight as opposed to only 30% children (had access to clean fuel).

2.3.3 WASTING

The prevalence of wasting is 22.1% [CI- 21.8; 22.3] in household without access to clean cooking fuel while it is 19.1% [CI-18.7; 19.3] in houses that uses kerosene or LPG.

Availability of a separate kitchen however does not show much differences in prevalence of wasting in a child. There is 21.9% [CI- 21.6; 22.2] occurrence of wasting in absence of it, while 20.3% [CI- 20.1; 20.6] occurrence in the presence of a separate kitchen. Households with lack of both clean cooking fuel and separate kitchen has higher prevalence of wasting of 22.6% [CI- 22.2; 22.8] as opposed to 18.9% [CI- 18.5; 19.2] in presence of both (Table-2).

All in all, 64% wasted children represent the strata with no access to clean cooking fuel while 36% represent those who use clean fuel for cooking food (Figure-1).

2.4 DISCUSSION-

This study provides certain significant findings to assist the NNS-related policy discussion and formulation in India. First, household socioeconomic factor like access to affordable clean cooking fuel has a significant relationship with child anthropometric failure hence this should be kept in mind while planning to achieve better nutrition standards and overall health for all. Second, availability of a separate kitchen also shows a relationship with child undernutrition. Hence breaking the cycle of multi-generational poverty and improving both indoor and outdoor environmental factors are promising investments in order to improve child health, promote healthy growth and ensure overall development.

The findings make it clear that households who had access to clean cooking fuel were at comparatively lower risk of having an undernourished child (stunted, wasted or underweight). But houses who are still using biomass like coal, firewood or cow dung have higher prevalence of an unhealthy, undernourished child. Figure-2 shows a scattered graph which plots the correlation between percentage of households with clean cooking fuel and prevalence of child anthropometric failures across states in India. The reason behind this could be inability to afford an LPG cylinder especially in rural areas where about 2/3rd of Indian population resides. Children from richer households and who had access to LPG were at a lower risk of being undernourished. Poorer households are more inclined to using solid pollutant fuels, and hence they were at a higher risk of undernourishment. Pradhan Mantri Ujjwala yojana, launched by the government in 2016 provided about 72 million new LPG connections to rural households in 714 districts of India. According to a report published by Petroleum Planning and Analysis Cell (PPAC), India's Liquefied Petroleum Gas (LPG) penetration reached 97.5 per cent as on 1 April 2020 as a result of this scheme. The country's active LPG domestic consumers have almost doubled in the last five years, from 14.86 crore in April 2015 to 27.87 crore in April 2020. While the growth in domestic LPG consumers has been robust in this period, enrolment of non-domestic LPG consumers has also witnessed strong growth from 21.1 lakh in 2015 to 32.4 lakh on 1 April 2020.

Using biomass fuel for cooking generates smoke and produces high level of indoor air pollution like CO, particulate matter and hazardous pollutants like soot that can penetrate deep into lungs and result in pulmonary oedema. Studies suggests that these toxins can interfere with our immune system by increasing cytotoxic T-cell and decreasing helper T-cell numbers, which in turn may result in increased risk of infections such as TB [5]. Pollutants

such as CO produced due to wood burning impairs oxygen delivery to the foetus by forming carboxyhaemoglobin in placenta-foetal circulation, which may result in perinatal mortality and reduced birth weight of child [6]. The risk increases many folds when there is no separate kitchen in the house and all the smoke is generated and concentrated in the same room where the family, especially the child stays the entire day. Many a times the mother carries the small child while cooking and exposes them to harmful pollutants. The risk of exposure and potential harmful effects is more to the woman and the child as they spend more time in close proximity to the smoke and we have already established the fact that an unhealthy mother gives birth to an unhealthy low birth weight child. The results indicate that the risk of under-five anthropometric failure can be possibly reduced with a kitchen separate from the main house, even while using pollutant cooking fuels like biomass and wood (Table-2).

Nevertheless, due to multiple intangible factors since poorer households may not always afford and immediate shift to LPG or house redesigning, several behavioural changes can be implemented to reduce exposure to toxic indoor air pollutants. Low-cost or no-cost behavioural modifications such as keeping children away from exposure to toxic substances and fumes generated while cooking, reducing cooking time by use of lids or using improved cooking pans, opening doors and windows to allow proper ventilation should be implemented. These require public health promotion and educating women of rural areas as they are the housemakers. Lack of information can act as a barrier because using solid fuel like coal or dung has been a common practice in rural India from ages, and to educate people about the harmful effects of it and make them switch to LPG can prove to be difficult. Hence, policy-makers should consider reviewing the existing measures and modify them accordingly to reach and constantly educate the population regarding child health, nutrition, balanced diet and preventive measures to exposure to harmful indoor pollutants. The use of mass media here can offer a platform for behavioural modifications and it is easily accessible to all as well. Apart from preventive and educational measures, it is important to ensure accessibility of healthcare services to all and to encourage parents to avail benefits for their child either undernourished or not, provided by the government.

This study had not tried to make any causal inference, but just to show a relationship between the two. Moreover, identifying children that may have slow growth but recovered by the time of the survey or children that have gained weight/height later on cannot be identified as a result of limited scope of the data. Ultimately, there is a need to have a broader systemic

perspective and consider multidimensional explanations for child undernutrition while planning to fight undernutrition in India.

2.5 CONCLUSION-

The use of unclean cooking fuel increases the risk of undernutrition (stunting, wasting or underweight) in under 5 children in India. Combination of unclean cooking fuel and absence of a separate kitchen makes the situation even worse. Generating public health awareness on the health risks of using pollutant cooking fuels, overall economic development, safer household layout and developing public health policies accordingly is likely to improve child's nutritional status and will make his life and country's future healthier.

2.6 REFERENCES-

1. Wu G, Imhoff-Kunsch B, Girard AW. Biological mechanisms for nutritional regulation of maternal health and fetal development. *Paediatr. Perinat. Epidemiol.* 26, 4–26 (2012). •• Provided information on role of maternal nutrients in pregnancy and dietary sources. Crossref, Medline, Google Scholar
2. Abu-Saad K, Fraser D. Maternal nutrition and birth outcomes. *Epidemiol. Rev.* 32(1), 5–25 (2010). Crossref, Medline, Google Scholar
3. https://www.researchgate.net/publication/333909508_Assessing_associational_strength_of_23_correlates_of_child_anthropometric_failure_An_econometric_analysis_of_the_2016_National_family_health_survey_India
4. <https://www.who.int/ceh/publications/factsheets/fs284/en/>
5. <http://www.ncbi.nlm.nih.gov/pubmed/12162869/>
6. Ritz B, Yu F. The effect of ambient carbon monoxide on low birth weight among children born in southern California between 1989 and 1993. *Environ Health Perspect.* 1999; 107: 17–25. [PubMed Abstract] [PubMed CentralFull Text].

2.7 ANNEXURE-

Table 1: Prevalence of Minimum dietary Diversity by Household's Cooking Fuel, India, NFHS, 2016

	Prevalence (%)	95% CI
Clean Cooking Fuel		
Yes	29.1	[28.4; 29.7]
No	19.8	[19.4; 20.2]
Difference - Absolute - Yes - No	9.30	
Difference - Relative - Yes/No	1.47	
Separate Kitchen		
Yes	27.1	[26.5; 27.5]
No	19.2	[18.6; 19.5]
Difference - Absolute - Yes - No	7.90	
Difference - Relative - Yes/No	1.41	
Clean Cooking Fuel*Separate Kitchen		
Clean Fuel & Separate Kitchen	31.3	[30.5; 32.1]
Clean Fuel and No Separate Kitchen	23.1	[21.8; 24.2]
No clean Fuel and Separate Kitchen	22.1	[21.7; 22.9]
No Clean Fuel and No Separate Kitchen	17.8	[17.3; 18.4]

Table 2: Prevalence of Child Anthropometric Failures by Household's Cooking Fuel, India, NFHS, 2016

	Stunting		Underweight		Wasting	
	Prevalence	95% CI	Prevalence	95% CI	Prevalence	95% CI
Clean Cooking Fuel						
Yes	28.20	[27.8; 28.5]	26.1	[25.7; 26.4]	19.1	[18.7; 19.3]
No	43.64	[43.4; 43.9]	40.8	[40.5; 40.9]	22.1	[21.8; 22.3]
Difference - Absolute - No - Yes	15.44		14.7		3.00	
Difference - Relative - No/Yes	1.55		1.56		1.16	
Separate Kitchen						
Yes	32.3	[32.0; 32.5]	30.3	[29.9; 30.5]	20.3	[20.1; 20.6]
No	44.7	[44.4; 45.0]	41.5	[41.1; 41.8]	21.9	[21.6; 22.2]
Difference - Absolute - No - Yes	12.4		11.2		1.60	
Difference - Relative - No/Yes	1.38		1.37		1.08	
Clean Cooking Fuel*Separate Kitchen						
Clean Fuel & Separate Kitchen	25.9	[25.6; 26.3]	23.9	[23.6; 24.3]	18.9	[18.5; 19.2]
Clean Fuel and No Separate Kitchen	33.9	[33.2; 34.6]	31.4	[30.7; 32.1]	19.8	[19.2; 20.5]
No clean Fuel and Separate Kitchen	39.3	[38.9; 39.7]	37.3	[36.7; 37.7]	22.1	[21.6; 22.3]
No Clean Fuel and No Separate Kitchen	48.1	[47.7; 48.4]	44.6	[44.2; 45.0]	22.6	[22.2; 22.8]

FIGURE-1

Distribution of Stunted, Underweight and Wasted Children by Household's Cooking Fuel, India, NFHS 2016

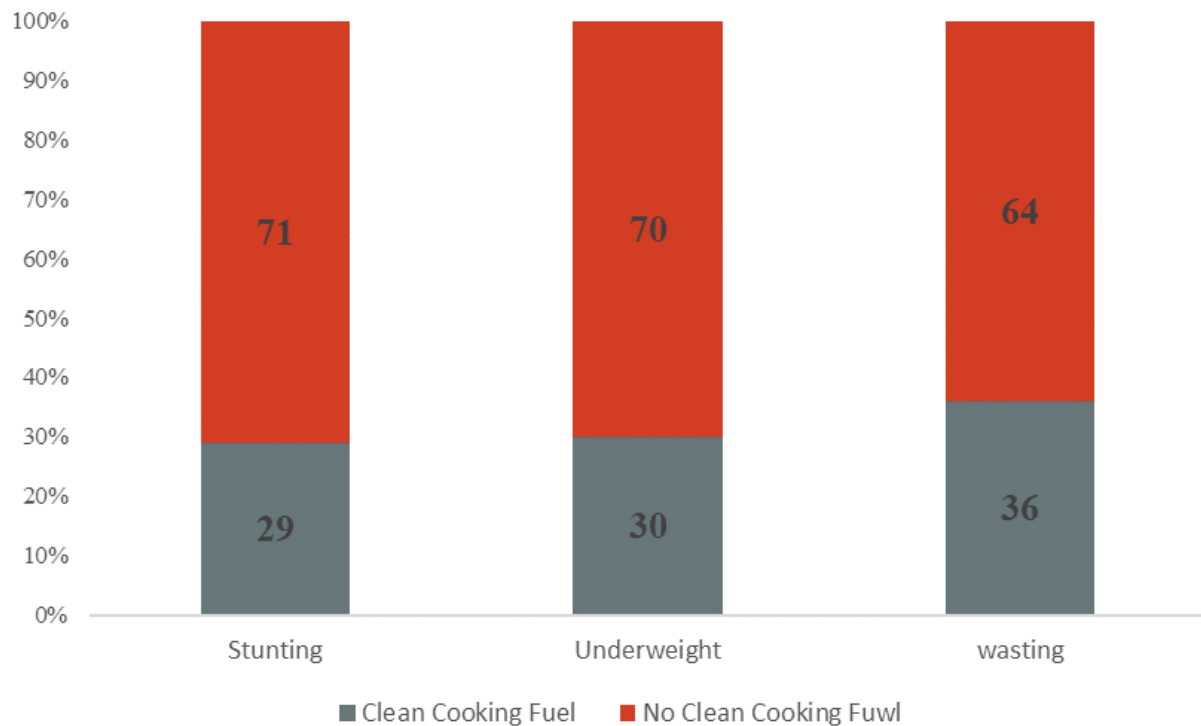
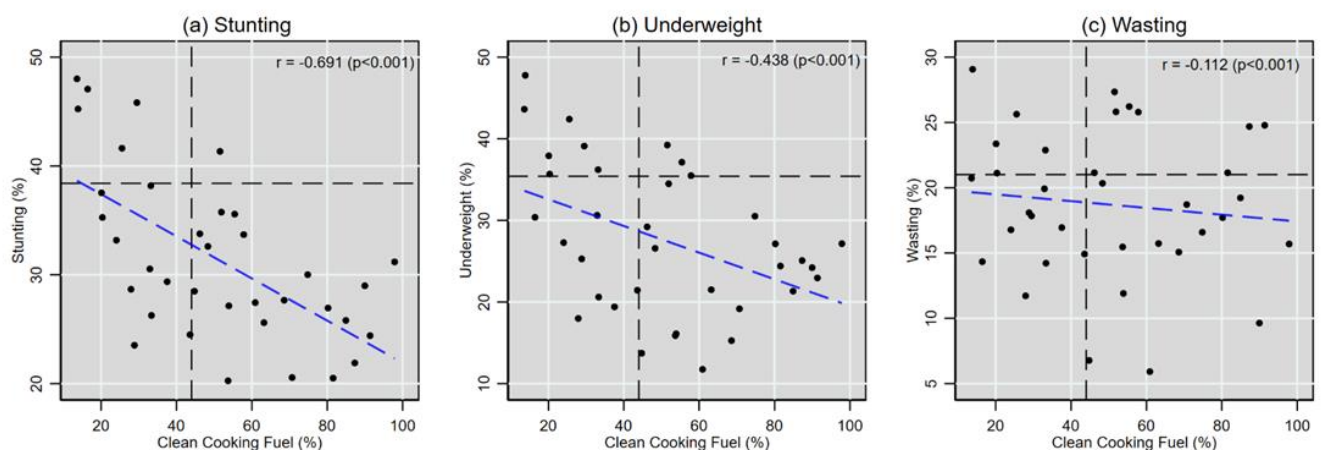


FIGURE-2

Scatter Plot showing Correlation between Percentage of Household's with Clean Cooking Fuel and Prevalence of Child Anthropometric Failures across States, India, NFHS, 2016



REPORT-2

ONLINE COURSE

IMPROVING GLOBAL HEALTH: FOCUSING ON QUALITY AND SAFETY

3.1 COURSE DESCRIPTION-

7.3 billion people, 195 countries, 164,500 hospitals in the world, yet 57 million people died in 2015. The reasons may be many: old age, life threatening disease, accidents etc. Or maybe a misdiagnosis, inability to get food, medicine, no money to pay for surgery. But whenever we plan to make the world a safer place to live, and we choose to work on healthcare, our focus always jumps onto scary diseases like HIV, Tuberculosis or Diabetes. No doubt these diseases exert a huge burden on world health and while these are important as they result in lots of suffering, there is one more thing which needs to be addressed and that is poor performing healthcare system.

Approximately 43 million people around the world are injured every year due to unsafe medical care that too in hospitals. Why does this happen? Who is responsible for this? Is it inevitable and unavoidable? What needs to be done to avoid this? These are certain questions which needs to be addressed if one aims to improve healthcare system. And since health is a holistic concept, improving healthcare must be in a holistic matter as well. So, it is not about improving medicine and hospitals of one area or a state or a country, but the entire world (hence the global approach is must). The recent COVID-19 outbreak is a great example that a disease or a microbe does not limit to geographic boundaries. This course presented by Harvard University tries to find out exactly what is going wrong and how healthcare can be the part of the solution and not the problem in order to improve global health. Improving access to healthcare is only as useful as the quality of care provided. Many agree that quality is important – but what is it? How do we define it? How do we measure it? And most importantly, how might we make it better?

3.2 COURSE OBJECTIVES-

1. To study the relationship between quality and population health
2. A framework for understanding and thinking about healthcare quality
3. Understanding global approaches to quality measurement
4. Analysing the role of information and communication technology in assessing and improving quality
5. Study various tools and contextual knowledge to improve the quality delivered in health systems.

3.3 COURSE CONTENTS-

- A) What is healthcare quality?
- B) Safety in healthcare
- C) Tuberculosis in India: A case study
- D) Measuring Healthcare quality in low- and middle-income countries
- E) Surveillance system
- F) Role of IT in healthcare
- G) Management in healthcare
- H) Patient centred care to ensure quality
- I) Conclusion

3.4 LEARNING METHODOLOGY-

This is a self-paced course of 10 weeks duration available on edx. Various methods of teaching were used in this course by the instructor which includes video lectures, discussion forums, regular quizzes, case studies, final assignment and reading materials. Course instructor Ashish Jha from Harvard Global Health Institute invites various eminent speakers from health industry to study and understand global healthcare quality and safety.

3.5 KEY LEARNINGS-

A) WHAT IS HEALTHCARE QUALITY?

According to the Institute of Medicine, US, healthcare quality has 6 aims i.e. safe, effective, efficient, timely, patient- centred, and equitable.

- **SAFE:** Healthcare, which is intended to help, should not harm the patient.
- **EFFECTIVE:** Providing services based on scientific knowledge to those who could benefit from it and refraining these services from those who would not benefit (Avoiding underuse and misuse)
- **EFFICIENT:** Avoid wastage (manpower, equipment, supplies etc)
- **TIMELY:** Avoiding delays for both the care giver and the receiver
- **PATIENT CENTRED:** Providing care which aligns with the patient needs, preferences, values and involving him/her in all the clinical decisions
- **EQUITABLE:** Providing care which is equal to all, i.e. not varying based on caste, gender or geographic location.

Imagine using a Laptop with superior configurations but it would explode occasionally. Now it could be very effective but not so safe to use. Similarly, a healthcare facility providing vaccinations to only school going children is everything but not equitable as those who don't go to schools will not be able to receive this care. Or if a lady in labour in a rural area must wait hours before a doctor comes for consult, is neither efficient nor timely.

B) SAFETY IN HEALTHCARE-

By definition, we do not have a safe health care system if we are out there hurting people and injuring them in hospitals and clinics. According to WHO, adverse events due to unsafe medical care is one of the 10 leading causes of death around the world. In LMIC, 134 million adverse events take place every year because of unsafe care resulting in 2.6 million deaths. The scenario is not very different for HIC where 1 in every 10th patient is likely to have an

adverse event and almost 50% of these occurrences are preventable. These events may range from a minor injury to a life-threatening phenomenon eg- hospital acquired infections, falls, DVT etc.

TABLE-1 Most common Adverse events due to lack of proper medical care

ADVERSE EVENT	PREVALENCE	PREVENTABLE
1. Adverse Drug Reaction	7-15%	70%
2. Hospital acquired infections (HAI)	3%	>80%
3. Falls	1%	20-30 %
4. Pressure ulcer	3%	80-95%
5. Surgical complications	2%	50%
6. Deep venous thrombosis (DVT)	3%	70%

Source- Harvard online course Improving global health: Focusing on quality and safety , Prevention of falls in hospital
 PMID: <https://www.ncbi.nlm.nih.gov/pubmed/28765417>, <https://www.guidelinesinpractice.co.uk/skin-and-wound-care/the-majority-of-pressure-ulcers-are-avoidable/352646.article>, <https://www.ncbi.nlm.nih.gov/pubmed/22634659>,
https://www.hopkinsmedicine.org/armstrong_institute/improvement_projects/infections_complications/VTE/

The prevalence of these events might look smaller as a number but in reality, it accounts for a major proportion of population and many studies done around the world suggest that majority of these events and mortality due to these are preventable. If the doctor, hospital and the organisation would make avoiding these events their top priority, majority of these preventable deaths could be avoided. Hand washing is a very basic yet very important precautionary measure in this regard. CDC reports suggests that doctors wash their hands almost half as much as they should. This results in spread of infections from one patient to another. Improperly sterilised hands or equipment then causes surgical complications as well. Next, it is important to segregate people based on risk factors like people on drugs or heavy medications or children should be kept away from heights as they are most susceptible to falls. People who are bed ridden for longer durations should be given proper mechanical prophylaxis like compression devices and anti-clot medications to avoid thrombosis. While this data and numbers reflect more of higher income countries like America, Canada or England. The scenario in low- and middle-income countries is similar moreover a bit worse for obvious reasons.

In LMIC the risk of acquiring a hospital acquired infection is way higher due to reasons like poor infrastructure, bad hygiene, lesser qualified practitioner (sometimes quacks), lesser

doctor-patient ratio, overcrowded ICU and no up to date medical technology. While the data available with regard to outpatient safety and adverse effects is very limited but somewhere it does suggest that the occurrence of adverse drug events is 7 times more common than in inpatient setting. This can be explained by the factor that most of the patients in a hospital are dealt in the OPD, and majority of medications are dispensed. The patient then leaves and goes unattended, he takes the pills on his own and then it relies on the knowledge and will of the patient to take the medicines in the right manner. If not, like in case of an illiterate or ignorant person or a dependent child and they don't follow the prescription the chances of adverse events increase. Hence there should be a system in place to keep a check on these patients.

C) TUBERCULOSIS IN INDIA: A CASE STUDY

According to WHO statistics 2011, India dominates the globe with an estimated incidence figure of 2.2 million cases out of the global incidence of 9.6 million. Tb in India is the biggest health issue. But what makes it more and more difficult is that the causative bacteria are getting resistant to treatment, resulting in Multi drug resistant Tb (MDR-Tb), Extremely drug resistant (XDR-Tb) and the most dangerous form situated in India itself Total drug resistant (TDR-Tb). However, it is difficult to manage resistant tuberculosis, but treatment for drug sensitive Tb is available, and in all parts of the world. But according to Dr Madhukar Pai, Director, Global Health Program, McGill, sadly we lose more people from drug sensitive Tb than drug resistant tb around the globe. They have either received care too late, or they did not receive care at all, or they've been just mismanaged in the various sectors of health care. The mortality is staggeringly high, and today actually, the WHO says TB has surpassed the death burden of HIV and malaria combined.

So where do we stand now?

As of 2015, WHO reported an average of 10.4 million cases and 1.8 million deaths with over half a million drug resistant cases in India every year. Over years, death rate has declined by 20% but at the same time incidence rate has gone up. This is not because India has suddenly discovered Tb. But now the private sector has started reporting these cases. We're actually starting to identify, and capture cases that have been there before, but we just didn't know about it. That's even true for drug resistance. All of these decades we were underestimating drug resistance because we never even tested for it. We were using sputum smears which cannot detect drug resistance. That was the dominant diagnostic tool for TB. Now that we are

starting to use molecular test like gene export, suddenly we are seeing much more rifampicin in MDR resistance. The underlying disease of course is problematic, but we know how to manage it. So the problem is not really what needs to be done, the dominant problem really is in the execution of what we do, and how comprehensively, and effectively we do it. The problem lies in Quality.

Public Sector in Tb Care in India:

India is a vast country where quality of care varies dramatically. While some urban cities like Mumbai and Delhi tend to offer world class healthcare, the rural areas of Bihar thrive to struggle for basic facilities like a doctor and a clinic. India in the public sector and the private sector, aren't the same. The public sector on paper is 100% DOTS coverage. Which means that anybody in the country at any time if visits the facility with signs and symptoms of Tb, he will be provided with guaranteed free diagnosis and treatment. But that does not happen otherwise. While we start off with the total number of people affected, and then by the time diagnosis happens we are already at 60%. Then treatment is about 50%, and only about 40% go all the way to the finish line. Why are so many people dropping out?

Firstly, the diagnostic test used under the DOTS program in India is a basic ZN staining of sputum sample which is only 50% sensitive, that too if the amount of mycobacterium in the sample is very large. So, half a million cases become false negative. There is a different algorithm for such patients where they are given antibiotics and chest Xray is taken after few weeks. Sometimes the patient gets tired of waiting and goes to someplace else. So, the whole doctor shopping is extraordinarily common. In fact, that is the dominant theme of TB in India. TB in India, according to systematic review being published, takes 60 days almost to be diagnosed and three different health care providers to be seen. We can only imagine what the transmission consequences of this is. But on the brighter side once diagnosed the system really takes care of the patient; Free medications, a DOTS supervisor, home visits & patient recalls. For drug resistant TB, then the public sector struggles, because there are very few sites in India which have the capacity to hospitalize and administer the toxic second line therapy, which invariably means you have to go up to the state headquarters, or to a big city hospital. This is when a lot of patients struggle and end up dying.

Private Sector in Tb Care India:

Unlike Public sector, unfortunately we do not have specific data regarding Private sector care in Tb. But according to a study published in Lancet which focuses on drug sales data of anti-

Tb medication, 2/3rd of the anti-Tb medication is being consumed by Private sector with the private- public sector holding only 1/3rd margin. Since antibiotic abuse is a relevant issue so, whether all of them have TB or not is all a matter of discussion. Pharmacists in India are de facto health care providers. There are numerous amounts of pharmacies across all of India- millions of people are walking to pharmacists with complaints of cough, fever, diarrhoea etc and they are dispensing antibiotics, no questions asked. Although they don't dispense anti-Tb medication (hence thankfully not generating MDR-Tb in India) but they don't refer the patient to a nearby DOTS facility either.

Next big chunk of Private healthcare in India is AYUSH providers. Again, they don't dispense anti-Tb medicines but they too fail to refer. They will repeatedly try multiple nonspecific therapies -antibiotics, steroids, coughs syrups, bronchodilators, antipyretics, cocktail of all sorts of empirical therapies, and hope that whatever the patient have disappears. After losing a considerable amount of crucial time they will finally consider Tb and start with a Chest X-ray. Private sector for some reason does not use sputum samples (basic diagnostic measure). Maybe they don't trust it, maybe its cumbersome, or maybe it just doesn't make enough money. When they finally become desperate, that is when the referral process starts (to public sector- DOTS clinic majorly and sometimes to private sector). Qualified practitioners come into play and handle the patient in correct manner. But even they fail to catch the diagnosis in first visit unless all classical signs and symptoms are present. So, everyone delays Tb diagnosis.

Improvement in Post Diagnostic Tb care-

A chunk of the quality failures is happening because people are failing to think about TB early and trying a whole bunch of other stuff, the other chunk of it is that the diagnostic tests we're using are obsolete. All of this is leading to substantial diagnostic delay. So once treatment begins in private clinic, there is no mechanism in place to keep a check if the patient is actually taking the medicine and completing the course. The adherence or treatment completion is quite poor in the Indian private sector, which might well explain why so many people are dying, because they are partially treated. But if government intervenes and provides them with all sort of support system like encouraging patient to come back, smart pill boxes, regular counselling via call centres, free drugs etc, the private practitioner will be quite happy. Dr Madhukar suggests that with all these interventions, we can bring treatment completion to about 75-80%.

On the other hand, public sector has a system in place. There are home visits and a supervisor. There have been some beautiful innovations as well.

- 1) The Smart Pill box- It features 4 compartments for daily medications, an audible alarm and LED indicators to guide you to the correct compartment. It connects to a mobile device which displays your daily medication schedule.
- 2) 99 DOTs blister pack- Using 99DOTS, each anti-TB blister pack is wrapped in a custom envelope, which includes hidden phone numbers that are visible only when doses are dispensed. After taking daily medication, patients make a free call to the hidden phone number, yielding high confidence that the dose was “in-hand” and has been taken. If the patient has not touched the medicine for 2 weeks, that is when the system calls to check.

So first of all, public sector needs QI, quality improvement because we know where the biggest gaps in the cascade of care are. Secondly, public sector has to go with the sputum smears. They cannot set the bar so low for diagnosis. Thirdly, the Indian program underspends on health which is why the new national health policy is so important.

D) MEASURING HEALTHCARE QUALITY IN LOW- AND MIDDLE-INCOME COUNTRIES-

Jishnu Das, an economist at world bank has been into studying the quality variations in lower- and middle-income countries like India. According to him, the state of healthcare quality in India is not good and the reasons may be that the country's bifurcated in two. There's a better-performing south and a worse-performing north and this bifurcation carries over to the healthcare quality as well. In order to study this, they take standardized patients, people who have been trained, and send them off to different medical practitioners.

So, for instance, we've picked chest pain in a middle-aged man. Which usually, in a place like the US, 98% of the time will be diagnosed correctly. But in a country like India, how many of these patients would receive the right treatment and nothing else? That answer is about 5%. Things still get a little better when we talk about diagnosing right and giving the right treatment, but along with a bunch of others which were not totally correct, as the number jumps up to 40-45%. But we're still left with a majority of doctors not being able to pick up, diagnose, or treat a very textbook case of chest pain that, if not appropriately diagnosed and treated, would lead into a heart attack. The failure may be because-

- 1) Lack of knowledge and training to the doctor-

An analysis was done on a sample of 210 doctors in Delhi, India where doctors were asked about their treatment plan for a patient with specific set of clinical signs and symptoms and their answers were judged by invigilators.

- Surprisingly the knowledge of doctors was fairly low in these settings, where the medications they were prescribing were harmful in long run and could cause antibiotic resistance.
- Doctors who had enough and correct knowledge, posed another issue; “the Know-Do Gap”. So we've asked you about this patient. And then a month later, we send you the same patient. Except this time, doctor doesn't know that they're being tested. Doctor knows that they need to do A,B,C,D and E but in reality they will do only A and B. This Know-Do gap turned out to be about 70% in Indian settings. Only if the doctor spends more time with the patient the gap tends to get smaller. Using checklists can also prove to be very handy in giving accurate treatment in such cases.

2) The doctor does not put in enough effort-

As a matter of fact, doctors in India are more qualified and knowledgeable in the public sector than in private sector but when we send in the standardized patients, the unqualified untrained guys sometimes end up doing better on some measures than the fully trained MBBS doctors in the public sector. Why so?

In the private sector in a place like Delhi, you get about 3 to 3 and a 1/2 minutes with the doctor. Not because the place is crowded, but that's just because that's what they do.

In the public sector, with the same doctor you get about 90 seconds only (just one question). In rural India it's found that usually a doctor spends 30 minutes a day with patients and for rest 7 and ½ hours he does nothing. This is a huge wastage of human resources where the doctor is not even overloaded still chooses to spend lesser time with patient. So, the effort is very limited.

If we talk about other countries, in Paraguay, doctors spend about 10 minutes with patients, in Uganda and Tanzania about 5 minutes.

What to Do?

Since ages, the problem that's been highlighted is shortage of human resources and that we need to train more healthcare professionals, which is correct to a greater extent but we also

need to do a bunch of things to make sure that doctors and the healthcare system work in a way that benefits every patient who comes in. So, it's not just resources, but it's resources with accountability.

In the US, this notion prevails that there is not much of a relationship between how much you spend on health care and the quality of that health care. You can be a fantastic physician and you'll get paid about the same as being a really mediocre physician. But in countries like India where third-party payer settings do not prevail and patients essentially pay out of their pockets, the more the doctor does on the checklist, more he charges. And just to give an idea, if you move from about completing 5% of the checklist items to about 40%, your fee is going to go up four-fold. So, one of the strongest relationships in the data are the better the quality, the higher the price.

E) SURVEILLANCE SYSTEM

In the US, and in some other high-income countries, quality-monitoring programs exist. These are basically metrics that are used to make sure the physicians & hospitals, are delivering care of a sufficient quality using a lot of billing data, claims information etc. But these things are not readily available in lower income countries. So, how do we begin to create a surveillance program to measure and monitor the quality of ambulatory care in a more systematic way?

One kind of answer has been in finding a set of small, few things that doctors do in every interaction that predicts, or is correlated, or associated with better quality care. Turns out there are three things that really matter.

- 1) Consultation time,
- 2) Number of questions the doctor asked about your health, and
- 3) Number of physical exams that he or she did.

Legal system also plays a crucial role in ensuring the quality of care being provided in a country in 2 ways- Regulations (pre-set standards which health practitioner should meet to practice) eg- Joint Commission Accreditation and Liability system malpractice (compensate patients for wrongful injuries). The Affordable Care Act—also known as Obamacare (signed into law in March 2010 in USA) was designed to extend health insurance coverage to millions of uninsured Americans. The law includes premium tax credits and cost-sharing

reductions to help lower costs for lower-income individuals and families. Maureen Bisognano, president of IHI-- the Institute for Healthcare Improvement says that patients getting harmed by their care instead of helped by their carers is, unfortunately, all too common. It can be because of failure of complete information of the patient (like- family conditions) and the fact that our system is in fact broken where we're taught to fix it for the individual, not to fix the process and the system. She suggests healthcare workers worldwide to keep a check on their data daily and quarterly and to compare the results with the best performing hospital in the area, this will tell us about the true gap in service delivery. One now needs to develop will to improve and meet these standards. An example of immense improvement lies in Patients Self Dialysis unit in Jonkoping, Sweden where the model of Plan -Do-Study is used. Here patients who are eligible are taught how to perform their dialysis on their own step by step, they do not need to have a nurse to supervise them. These patients now let themselves into this building with an electronic card key. They come in, they do their own treatments, their own dialysis. They even clean up after themselves and leave. This saves hospital waiting time for the patient, and manpower for the hospital staff which can be utilised elsewhere.

F) ROLE OF IT IN HEALTHCARE-

With advances in healthcare reporting, everyday we generate numerous amounts of data and with the help of information technology we can understand what we are doing and what needs to be done to improve. One such example is electronic health records. It is the systematized collection of patient and population electronically-stored health information in a digital format. These records can be shared across different health care settings. It is a better way to organise, protects patient privacy and allows for easy and accurate transfer of patient records when switching hospitals (health information exchange). Although these technologies are available but there is still room for improvements and are not used to a great extent today. Telehealth is another tool for improving access and improving quality for example, things like teleradiology, being able to send images that can be read by radiologists off site or an eICU when a patient admitted in ICU of a small hospital is managed via telemedicine by a intensive care unit physician sitting in some other part of country or maybe world.

Availability of IT in healthcare is very crucial as the amount of data gathered is virtually impossible to manage on paper at a country level forget about global data. Using technological tools, in diseases like Type 1 Diabetes who are required to maintain a log of

their glucose and insulin levels is more preferable. 34% of these patients find it more preferable to use electronics logs in place of paper logs, and over 60% found it more interactive and fun to use. The purpose of this is, of course, not just technology, but also how much of it can we get out. It's about delivering better care, higher-quality care, care that's more effective, safer and more efficient. In another example, mHealth as defined by the National Institutes of Health as “The use of mobile and wireless devices to improve health outcomes, healthcare services and health research.” With over 67% of the world’s population owning mobile phones, mobile phones present an opportunity to expand the reach of medical and public health services to previously unreachable areas. Several studies have found that mobile phones present an opportunity for data collection and diagnostic opportunities have improved with the onset of mobile microscopy applications.

G) MANAGEMENT IN HEALTHCARE-

Like any other industry good management results in a better performing healthcare industry as well. Within the same country you can have hospitals that are very well advanced. They measure everything, are good at motivating and rewarding their employees, know their targets and communicate them effectively. Then there are organizations that are actually very, informal and do very little of standardization work. The differences lie in adoption of basic managerial practices and presence of managers with good leadership qualities in the organisation. There has to be a sense of responsibility at all levels starting from behaviour of CEO in implementing policies to adoption of practices at lower levels in the hierarchy.

Middle level managers play an important role as they are closer to the ground level reality. They are responsible for executing the reforms to meet their organization’s key strategic and quality improvement objectives. Hospital health care Managers must oversee a variety of departments. For this reason, they must be able to create unique approaches to many challenging situations in order to ensure that the hospital is not only successful but also profitable.

In August 2012, under the leadership of Dr. T.S.Ravikumar, JIPMER in India launched an intensive quality strategy. The strategy includes a number of initiatives, such as the multidisciplinary JIPMER Quality Council, Continuing Medical Education (CME) credits and training of the trainer. JQC Monthly meetings are held every month with Director as chairperson to discuss the previous month activities and to decide the activities to be done in the coming month. The group leader not only presents their group activities for knowledge of

other members but also get critical appraisal and feedback from them. This helps in collective growth and improvement of the entire hospital as a whole.

H) PATIENT CENTRED CARE TO ENSURE QUALITY

Patient centered care and patient experience are the key components of quality of care. The IOM defined patient-centered care as the care that is respectful and responsive to the patient needs, and perspectives, and values, and ensuring that patient values guide all clinical decisions. It affects a whole bunch of downstream of things, such as adherence to treatments, patients' own engagement with their own health care. It's all about improving the communication between physician and a patient, your attentiveness to the patient needs, concerns, and expectations, and your engagement with the patient in the care process. All over the world, the main determinants of patient experience are related to clinician-patient interaction.

We have valid tools today, which are used to measure patient care like patient experience survey. And one of the tools is the HCAHPS, as we know. Since March 2008, all the hospitals-- or the majority of hospitals-- in the United States need to use this valid tool, which contain 32 questions which have some domains about nurses, about physicians, about other stuff that's important to the patient while he's in the hospital. All the hospitals have to use the same questionnaire with very strict guidelines how to use this questionnaire and basically, it's creating a benchmark between all the hospitals, which enables the patients and their families compare two or more hospitals and to make a decision where to have their care. While HCAHPS is an inpatient patient care assessment tool, we don't have actually a valid tool in terms of ambulatory care that can actually create a benchmark between hospitals.

I) CONCLUSION-

A key component of achieving universal health coverage is ensuring that all populations have access to quality health care. Examining where gains have occurred or progress has faltered across and within countries is crucial to guiding decisions and strategies for future improvement. Over the years we have improved our systems, yet much more needs to be done.