



## RESEARCH PAPER

## DIGITAL DIVIDE IN ELECTRONIC/ DIGITAL TOOLS OF COMMUNICATION: EXPERIENCE FROM GRASS ROOT LEVEL.

**Dr. Neeta Kumar** Indian Council of Medical Research, New Delhi-110029

**Dr. Neeru Gupta** Indian Council of Medical Research, New Delhi-110029

**Dr. Tulsi Adhikari** Indian Council of Medical Research, New Delhi-110029

**Jiten KH** Indian Council of Medical Research, New Delhi-110029

**Dr. Nidhi Tiwari** Indian Council of Medical Research, New Delhi-110029

**Dr. Shweta** Indian Council of Medical Research, New Delhi-110029

**Dr Vishnu V Rao** Indian Council of Medical Research, New Delhi-110029

**Dr V M Katoch** Indian Council of Medical Research, New Delhi-110029

### ABSTRACT

**Background:** The need do a situation analysis of the availability of the electronic mode of communications in the community is required for information generation, derive policy inputs, imparting knowledge/ education, and increase the outreach of health programs, ensuring connectivity with community and "Health for All". Such communication channel between health care providers and the users is being explored under ICMR Task force study of Health Account Scheme to generate authentic, utilizable, real time consumer generated health information. During the study baseline situation of availability of electronic tools among study population was evaluated and presented in this paper along with review of other electronic medium-based health programs and factors affecting their acceptability/utilization.

**Materials And Methods:** To explore what mode of e-communication is available at households so that feasibility check of community generated health information using digital tools can be initiated, this cross-sectional survey documents availability of modes of e-communication i.e. internet, television, phone and computer at household level. After ethical approvals and informed consent, in depth interviews were conducted during 2013-16 by door to door visits in all the houses of study blocks and a total of 2479 heads of houses of the north and northeast India were covered.

**Results:** A population of 7484 was covered among 2479 houses at 3 sites -528 Tribal, 1011 slum and 940 rural houses. Among modes of e-communication, internet was found available in 8.5% houses in rural, 13.4% slum in metropolitan, 7.8% in tribal houses while Television was more available at rural, slum, and tribal site 44.8%, 88.2%, 86.6% respectively. Mobile phones were highest available mode in Rural n-563,60.1%, Urban slum n-897, 88.2%, Tribal n-292,55.3%. Community knowledge of information technology-IT based health program in the study area was abysmal. Literature Reviews show low acceptability (6%) of IT-based health programs like Mother and Child Tracking. Factors like infrastructure, affordability, family income, education and occupation were found affecting availability of e-mediums.

**Conclusions:** Digital tools of communication with community as partner in health programs is required however there is heterogeneity in distribution of electronic mediums and ground situation of IT tools indicate need of strengthening of logistics where it is beyond reach of masses. Hybrid solutions for setting channel of communication and continuous situation analysis to assess IT based program's impact, acceptability and availability in community is recommended.

**KEY WORDS :** electronic tools in health care, e-communication in health programs

### BACKGROUND:

One of the key recommendations from Committee on the Quality of Health Care in America, Institute of Medicine (IOM) in 1998 was to identify strategies for improving the quality of health care in the United States and information and communication technology (IT) identified as integral in achieving substantial quality improvement and support evidence-based decision making. The committee called for a national commitment to building an information infrastructure to support health care delivery, consumer health, quality measurement and improvement, public accountability, clinical and health services research, and clinical education<sup>1</sup>. In India efforts are being done to make public accountable and partner in generating health information under ICMR Task Force study of health Account Scheme. There is provision of monthly updating by the people themselves about their health.

Whether the medium of self reporting can be on Mobile phone with internet, or there is need of hybrid solution like digital as well as individual's paper health diary. To get that answer and acceptability among people, this baseline survey of situation was required and

conducted by door to door interviews with head of the Family. Data of availability of e-mediums is presented in this paper to enable/get an idea about distribution of such mediums and factors affecting availability, so that actions can be planned on the basis of grass root situation.

A study in Pune and found that total urban population is much lower than total rural population, the Urban-Rural Digital divide is actually more acute than what the penetration numbers portray. Does this divide also exist in other modes of communication? Like television, phone, computers? The future growth policies focused on bridging the digital divide that exists between urban and rural India today, may take some time to show changes hence can there be use of other available resources to implement "Health for all".

**Digital tools** are increasingly relied and being developed to implement National Health Mission in India. Currently over four sixty millions internet users make India the 2<sup>nd</sup> largest online market ranked only behind China in internet penetrations in urban India and increasing with time as there were 64.8% internet users in

Article History	Received	Accepted	Published
	06/07/2018	02/08/2018	20/09/2018
*Corresponding Author Dr. Neeta Kumar			
Indian Council of Medical Research, New Delhi-110029 neetakumar50@gmail.com			

December 2017 as compare to 60.6% in 2016. Rural internet penetration is expected reaching 80% in 2018 while it was 20.62% in December in 2017. Its public acceptability / participation for use in health programs are still need to be assessed. This 2013-16 study data has provided baseline to assess the further impact. The internet connection that India does have, were found pretty unevenly distributed. TRAI data<sup>3</sup> recognizes that while urban India has 61.6 internet subscribers per 100 people rural India gets by with just 13.7%. There's also a yawning gap in connectivity between states depending on the state of their network infrastructure and relative affluence. While the city of Delhi alone boasts 2.2 crore internet connections, the entire north east has just 4.3 lakh. In urban India Delhi, Mumbai and Kolkata are the top three cities that have the highest penetration, while Fatehpur, Jagdalpur and Imphal are on the bottom among the list of over 170 cities covered under the survey.

Despite growing use, there is reported **Digital divide in India**. Urban Indian with estimated population of 455 million already has 295 million using the internet, but rural India with an estimated population of 918 million as per 2011 census had only 186 million internet users a leaving out 732 users in rural in India. According to statista only 26% of Indian population had the internet in 2015 which was 10% of 2011 (71% Man, 29% women users). The TRAI data capturing the number of internet connection in India, states that it is not the number of houses with internet access. India had 36.74 crore internet subscribers (Sept. 2016) based on a population count of 127.7 crore, it translates this into 28.77 internet subscribers per 100 population. But that's wrong interpretation of these statistics. 36.7 crore internet subscription does not mean 36.7 crore Indians connected to the internet the actual proportion of houses may be half, even one third due to digital divide. One house may have 5 internet users while another doesn't have any. A sizeable number are stuck with slow speeds. And two thirds or 24.7 crore of the connections are in cities, 47.6 % connection are narrow bend. Therefore a question arises that how many houses in India have at least one internet connection or one medium of electronic communication. Though things have move far ahead from 2011 census reporting availability of internet among 3% households and guesstimate that the actual internet penetration in India is currently somewhere between 3% and 28%.

**Table 1: Availability of various e-communication mediums in study population**

Variable	Subgroup	Tribal N =528, %	Urban Slum N=1011, %	Rural N = 940, %	P value
Gender of head of family	Male	221, 41.9	817, 80.8	819, 87.1	
	Female	307, 58.1	194, 19.2	121, 12.9	
Availability of e medium of communication at home					
Computer	Yes	84, 15.9	86, 8.5	44, 4.7	0.001*
	No	444, 84.1	925, 91.5	896, 95.3	
Radio	Yes	28, 5.3	31, 3.1	26, 2.8	0.05
	No	500, 94.7	980, 96.9	914, 97.2	
Television	Yes	457, 86.6	897, 88.7	420, 44.7	0.001*
	No	71, 13.4	114, 11.3	520, 55.3	
Phone	Yes	292, 55.3	897, 88.7	653, 60	0.001*
	No	236, 44.7	114, 11.3	377, 40	
Internet	Yes	41, 7.8	135, 13.4	3, 0.3	0.001*
	No	487, 92.2	876, 86.6	937, 99.7	

\*p<0.05 statistically significant, p < 0.001 highly significant, p>0.05 Not significant

Availability of Internet in Delhi slum dwelling was found highest (13.4%) as compared to 0.3% in rural, and 7.8% in tribal area. We started with the assumption of having a homogenous distribution of electronic mediums among various groups. On running the X<sup>2</sup> (Chi- squared test) with level of significance @5%, we find that our data is significantly different from our assumption and therefore the data is heterogeneously distributed. The electronic mediums of communications are heterogeneously distributed across the groups of occupation, income and education. Though television, mobile's availability was good, Internet

Listening of Radio or watching TV is common among internet users however its physical sets are may not be available, hence low availability of radio sets or TV does not imply to low penetration of radio/TV. There is hybrid availability of resources and requires hybrid solution to establish channel of communication with community. Heterogeneity of resource distribution should be taken in to account before policy and service planning and this situation analysis provides distribution pattern and related factors.

#### METHODS:

If electronic medium is available and used by the consumers themselves to update health status, it will ensure authenticity, completeness, relevance and timeliness. This cross sectional door to door community survey was conducted in the block of 500 houses after getting permission of the state authorities to conduct pilot testing of Health Account Scheme- HAS . This was part of baseline situation analysis of availability of mediums of electronic communications majorly the internet, computer and phone, TVs, since these were being considered to be used to generate community driven health data from each individual to document monthly health status, covering whole population without need to omit those who do not attend Government health facility or not part of any registry/ project/ program/ surveys.

After institutional ethical approval for the site, one pre tested in-depth questionnaire to elucidate household availability of Telephone, Computer, Television and Internet was recorded by interview of the head of the family in each house at their door step after verbal explanation and written informed consent. Information related to education, occupation and income profile was also a part of demographic profile so that was also recorded.

#### RESULTS:

A total of 940 houses in rural-Hardoi, UP (year 2013), 528 houses in tribal site- Doimukh, Arunachal Pradesh (year 2014) and 1011 Houses in Delhi slum-Kalyaan puri (year 2016) were covered. 2479 houses with 7484 persons were covered. The period of survey was different at all 3 sites since study was not started simultaneously at all 3 sites.

connections found beyond the reach of masses. Logistics for uninterrupted internet supply was not available at all the sites so web-based entry by people for authentic health information, envisaged in Health Account Scheme was paralyzed. Initially web based entry was planned but could not executed due to technical and logistical glitches delaying data entry. Hence this data was also entered in excel sheet and hard copy of health diary was distributed to generate health data.

Distribution of electronic mediums across group of income (Table 2), education (Table 3) and occupation (Table 4) is being presented to understand the pattern of availability of e-mediums across different groups.

**Table 2: Distribution of availability of e-mediums and monthly family income according to kuppuswamy scale updation for 2015**

Family income Rs. Per month n,%	<2101	2102-6297 N, %	6298- 10495	10496- 15705	15706- 20991	20992- 41984	>41985	Total 100%	P value
<b>Tribal Arunachal, Total</b>	0	75, 14.2%	129, 24.4%	112, 21.2%	100, 18.9%	08, 20.5%	4, 0.8%	528	
Computer	0	3 3.6	11, 13.1	19, 22.6	20, 23.8	29, 34.5	2, 2.4	84	0.00*
Radio	0	8, 28.6	7, 25.0	5, 17.9	4, 14.3	4, 14.3	0,	28	0.24
Television	0	53, 11.6	104, 22.8	103, 22.5	90, 19.7	103, 22.5	4, 0.9	457	0.00*
Phone	0	27, 9.2	66, 22.6	75, 25.7	63, 21.6	58, 19.9	3, 1.0	292	0.00*
Internet	0	3, 7.3	5, 12.2	11, 26.8	8, 19.5	13, 31.7	1, 2.4	41	0.78
<b>Hardoi, total</b>	186, 19.8%	383, 40.8%	88, 9.4%	68, 7.2%	56, 6.0%	115, 12.2%	43, 4.6%	939	
Computer	0, 0.0	5, 11.6	4, 9.3	4, 9.3	3, 7.0	18, 41.9	9, 20.9	43	0.0*
Radio	1, 3.8	11, 42.3	3, 11.5	3, 11.5	4, 15.4	1, 3.8	3, 11.5	26	0.2
TV	6, 1.4	105, 25.1	56, 13.4	56, 13.4	52, 12.4	104, 24.8	40, 9.5	419	0.0*
Phone	75, 13.3	201, 35.7	62, 11.0	51, 9.1	48, 8.5	93, 16.5	33, 5.9	563	0.0*
Internet	0	0	0	0	0	2, 66.7	1, 33.3	3	Fisher's exact=0.03*
<b>Delhi slum total</b>	20, 2.4%	156, 18.6%	276, 32.9%	161, 19.2%	86, 10.3%	108, 12.9%	32, 3.8%	839	
Computer	1, 1.4	7, 10.1	13, 18.8	12, 17.4	9, 13.0	18, 26.1	9, 3.0	69	0.0*
Radio	0	9, 36.0	5, 20.0	2, 8.0	3, 12.0	5, 20.0	1, 4.0	25	0.16
TV	17, 2.3	127, 17.3	237, 32.2	148, 20.1	75, 10.2	101, 13.7	30, 4.1	735	0.1
Phone	15, 2.0	138, 18.5	243, 32.5	146, 19.5	78, 10.4	98, 13.1	29, 3.9	747	0.02*
Internet	2, 1.9	14, 13.6	23, 22.3	17, 16.5	10, 9.7	27, 26.2	10, 9.7	103	0.03*

\*p<0.05 statistically significant, p<0.001 highly significant, p>0.05 Not significant

The availability of internet is 7.8%, radio 5.3% in Arunachal Pradesh, and was not statistically significantly affected by income (p=0.07). Availability of computer (p=0.0), TV (p=0.0), phones (p=0.0) was affected statistically significantly across different income groups, while radio did not show such trend for which availability was anyway low (5.3%).

**Table 3: Availability of e-mediums and Education of Family Head**

Education	Illiterate, N, %	Primary, N, %	Middle N, %	High school, N, %	Graduate N, %	Post Graduate, N, %	Professional/Honors N, %	Total N, 100%	P value
<b>Arunachal- tribal</b>									
Computer	3, 3.6	2, 2.4	6, 7.1	32, 38.1	33, 39.3	7, 8.3	1, 1.2	84	0.0*
Radio	7, 25.0	4, 14.3	3, 10.7	5, 17.9	8, 28.6	1, 3.5	0	28	0.2
TV	54, 11.8	52, 11.4	81, 17.7	163, 35.7	84, 18.4	22, 4.8	1, 0.2	457	0.06
phone	33, 11.3	30, 10.3	62, 21.2	99, 33.9	51, 17.5	16, 5.5	1, 0.3	292	0.42
Internet	4, 9.8	0	4, 9.8	17, 41.5	13, 31.7	3, 7.3	0	41	0.05
Total n,%	70, 13.3	57, 10.8	97, 18.4	180, 34.1	97, 18.4	25, 4.7	2, .4	528,	
<b>Hardoi- rural</b>									
Computer	0	0	0	1, 2.3	3, 6.8	28, 63.6	12, 27.3	44	0.00*
Radio	0	0	3, 11.5	2, 7.7	4, 15.4	16, 61.5	1, 3.8	26	.01*
TV	2, 0.5	9, 2.1	37, 8.8	42, 10.0	51, 12.1	171, 40.7	108, 25.7	420	0.00*
Phone	10, 1.8	17, 3.0	80, 14.2	70, 12.4	80, 14.2	208, 36.9	98, 17.4	563	0.00*
Internet	0	0	0	0	0	2, 66.7	1, 33.3	3	Fisher's exact=0.05
Total n,%	42, 4.5	79, 8.4	186, 19.8	126, 13.4	128, 13.6	257, 27.3	120, 12.8	940	
<b>Delhi slum</b>									
Computer	11, 12.8	7, 8.1	14, 16.3	18, 20.9	19, 22.1	14, 16.3	3, 3.5	86	0.00*
Radio	5, 16.1	3, 9.7	5, 16.1	11, 35.5	5, 16.1	2, 6.5	0	31	Fisher's exact 0.2
TV	229, 25.7	138, 15.5	164, 18.4	192, 21.5	86, 9.6	76, 8.5	7, 0.8	892	0.01*
Mobile	231, 25.8	132, 14.7	176, 19.6	190, 21.2	85, 9.5	76, 8.5	7, 0.8	897	0.05

Internet	20, 14.8	15, 11.1	25, 18.5	35, 25.9	19, 14.1	17, 12.6	4, 3.0	135	Fisher's exact 0.00*
Total n, %	270, 26.7	157, 15.5	196, 19.4	209, 20.7	92, 9.1	80, 7.9	7, .7	1011	

\*p<0.05 statistically significant, p<0.001 highly significant, p>0.05 Not significant

At Tribal site Internet and computer showed increasing availability with increasing education. Radio does not show rising trend with rising education level, it was more prevalent among less educated groups. Phone and TV found equally available across all education groups in tribal site. The rising trend of availability of all mediums with rising education of family head at rural and slum site's is not reflected in tribal.

**Table 4: Distribution of e-mediums according to occupation of head of the family n, %**

Occupation	Housewife	Skilled work	Unskilled work	Business	Unemployed	Private service	Government job	Pension	Total	P value
<b>Rural Hardoi</b>										
Computer	0	3,6.8	3,6.8	4,9.1	1,2.3	3,6.8	27,61.4	3,6.8	44	0.00*
Radio	1, 3.8	1, 3.8	13, 50.0	1, 3.8	0	3, 11.5	3, 11.5	4, 15.4	26	0.00*
TV	0	21, 5.0	68, 16.2	72, 17.1	1,,2	44, 10.5	155, 36.9	59, 14.0	420	0.0*
Phone	2, 0.4	29, 5.2	219, 38.9	71, 12.6	1,,2	40, 7.1	141, 25.0	60, 10.7	563	0.00*
Internet				1, 33.3		1, 33.3	1, 33.3		3	0.54
Total n,%	1, 0.1	38, 4.0	478, 50.9	113, 12.0	2, 0.2	58, 6.2	177, 18.8	71, 7.6	940	
<b>Slum LHM</b>										
Occupation groups	Housewife	Skilled work	Unskilled work	Business	Unemployed	Private service	Government job	Pension	Total	P value
Computer- n, %	9, 11.5	26, 33.3	14, 17.9	17, 21.8	1, 1.3	2, 2.6		9, 11.5	78	0.55
Radio	4, 14.3	8, 28.6	8, 28.6	5, 17.9	1, 3.6	1, 3.6		1, 3.6	28	0.98
TV	104, 12	228, 26.4	230, 26.6	156, 18.1	24, 2.8	28, 3.2	2, 0.2	92, 10.6	864	0.62
Phone	100, 11.5	233, 26.9	232, 26.8	158, 18.2	25, 2.9	24, 2.8	2, 0.2	92, 10.6	866	0.55
Internet	16, 12.5	39, 30.5	22, 17.2	31, 24.2	4, 3.1	2, 1.6		14, 10.9	128	0.14
Total n,%	118, 12.1	260, 26.6	262, 26.8	172, 17.6	30, 3.1	29, 3.0	2, 0.2	104, 10.6	977	
<b>Arunachal- Tribal</b>										
<b>Computer</b>	3, 3.6	6, 7.1	3, 3.6	23, 27.4	6, 7.1	3, 3.6	40, 47.6	0	84	0.03*
<b>Radio</b>	1, 3.6	5, 17.9	8, 28.6	10, 35.7	1, 3.6	0	3, 10.7	0	28	0.01*
<b>TV</b>	7, 1.5	59, 12.9	44, 9.6	114, 24.9	40, 8.8	22, 4.8	169, 37.0	2, .4	457	0.37
<b>Phone</b>	5, 1.7	35, 12.0	20, 6.8	65, 22.3	31, 10.6	16, 5.5	120, 41.1	0	292	0.00*
<b>Internet</b>	1, 2.4	3, 7.3	2, 4.9	12, 29.3	5, 12.2	1, 2.4	17, 41.5	0	41	0.69
Total n,%	8, 1.5	68, 12.9	55, 10.4	136, 25.8	47, 8.9	27, 5.1	185, 35.0	2, 0.4	528	

\*p<0.05 statistically significant, p<0.001 highly significant, p>0.05 Not significant

December 2017.

At slum site in Delhi where mobile (88.7%) and internet availability (13.4%) was found good enough the people were given the password and user id for online updating of health status, however only 38 out of 1011 houses opted for online option.

#### DISCUSSION:-

The number of Internet users stood at 481 million in December 2017, an increase of 11.34% over December 2016 said the report titled, "Internet in India 2017. Other reports states that internet penetration in Urban India was 64.84% in December 2017 as compared to 60.6% last December. In comparison, rural Internet penetration has grown from 18% last December to 20.26% in

E-communication channel with community is essential tool to Increase knowledge of intended audience, Influence perceptions and beliefs that could shape norms/policy, Reinforce healthy behavior, Increase demand for services, Refute myths, Advocate a position, Increase surveillance and disease awareness, Distribute emergency messages in a real time manner. The recent proliferation of cost-effective 4G-enabled feature phones in India is likely bringing more people online with inequalities. Not surprisingly, younger and more educated Indian makes up for most of the user base and widen digital divide,,,,,,.

#### DIGITAL DIVIDE:

Official statistics suggest that the internet users are as high as 28% of

the Indian population. But as with most statistics, digging deeper reveals that this estimate could be wide off the mark. The Telecom Regulatory Authority of India's quarterly Performance Indicators Report in the latest report that India had 36.74 crore (367.48 million) Internet subscribers in September 2016. Based on a population count of 127.7 crore, it translates this into 28.77 Internet subscribers per 100 population. TRAI data captures the number of Internet connections in India and not the number of households with Internet access. What's the big difference? **Double-counting: one family in a metro** is likely to own at least five Internet connections per house while there is none in rural/ poor houses. This simple illustration tells that 36.7 crore Internet subscriptions don't equal 36.7 crore Indians connected to the Internet. The previous Census (2011) did this and found that 77 lakh households of the total 2,467 lakh households had it; that's 3% of households. That gets us to the guesstimate that the actual Internet penetration in India is somewhere between 3% and 28%. That's a pretty wide range. TRAI data recognises that while urban India has 61.9 Internet subscriptions per 100 people, rural India gets by with just 13.7. While the city of Delhi alone boasts 2.2 crore Internet connections, the entire North East has just 4.3 lakh. Mumbai alone has almost half of the 3 crore connections in Maharashtra.

Information Technology sector failed to cure century-old malaises like illiteracy, poverty and unemployment in India. The Digital Divide examines how various demographic and socio-economic factors including income, education play a role. According to a 2015 survey conducted by the internet and mobile association of India, one fifth of responders who lived in urban areas and three quarters of rural residents said they didn't know about the internet and therefore did not use it. Other factors identified by the researchers are infrastructure, speed, cost etc. **Infrastructure** in India simply lacks the routers, fiber optic links and servers needed to expand access. Few public Wi-Fi spots exist and broadband connections with faster speeds require infrastructure that was not found in urban low-income areas, much less rural ones. **Speed:** South Korea ranked 1st where connection speed of internet average is 26.7 MBPS, In Japan it is 17.4 MBPS. The Hong Kong holds the MBPS of 16.8; while the global average internet speed is 5.6 MBPS and India lags at 2.8 MBPS. As per the TRAI report, of the 36.7 crore Internet subscribers, 17.5 crore (48%) are still on narrowband. That means download speeds of less than 512 kbps. **Literacy:** Literacy about the use of e-mediums is low in Rural India. Even in America older with low health literacy have difficulty accessing health information online. Only 9.7% of adults age 65 used the internet to obtain health information, compared with 31.9% of those with average health literacy<sup>9</sup>. There are need to gather more such information In India. **Affordability:** Many users are logged on to poor quality connections too, not allowing for data-intensive applications. As per the TRAI report, 48% users are still on narrowband. That means download speeds of less than 512 kbps. The average GSM subscribers barely can afford spending of Rs 28 per month on mobile data. Half of the mobile phone users (17 crore) are still on the snail-paced 2G. The average GSM subscriber used just 236 MB of data in a month and spent Rs 28 on it. A study surveying low-income people found 82% don't use Internet; 56% of households have no Internet users at all; 41% of non-users have never heard of the Internet; 43% of people between 16-25 years of age do not use Internet. Good quality smartphones below Rs2,700 have been some of the driving factors for JioPhone's growth With over **460 million** internet users still only 22% of the adult population in India uses the Internet, compared to the global median of 67%, according survey by Pew Research Center, a US research institute. India lags behind most major economies and performs worse than Nigeria, Kenya, Ghana and Indonesia, among other countries, the data reveals. There have been some pioneering efforts to increase access to health information in developing countries the right of universal access to information and communication services- Common Service centers, health and wellness centers, 4G services at nominal rates and need situation analysis in current changing scenario.

There is no doubt that use of IT in health care will bring about

savings related to efficiency and improvements in quality. An unprecedented federal effort is under way to boost the adoption of electronic health records and spur innovation in health care delivery. An Overview of Internet Users in India showed increasing pattern-2016 - 34.8 %, 2015 - 27 %, 2014 - 18 % 2010-7.5 %, 2008-4.4 %, 2006- 2.8 %, 2001- 0.7 % Among the countries the developing countries share is 8%. Despite a consensus there are no reliable estimates of the prevalence of adoption of electronic health records. The report also finds that an estimated 281 Million daily Internet users, out of which 182.9 million or 62% access internet daily in urban area, as compared to only 98 million users or 53%, in rural India. There are estimated 143 million Female internet users overall, which is approximately 30% of Total Internet users. "While Digital India is paving its way in rural India, the underlining digital gender gap still persists. Digital literacy is therefore a key to ensure everyone stays informed. Despite the rapid rate of penetration in developing countries, a large digital divide remains between the developed and developing world. This gap is especially pronounced in African countries. For example, in Nigeria there are 0.68 computers and 1.39 Internet users per 100 people in 2004. On the other hand, some developing countries have much higher rates. Among the largest developing countries, Brazil and Mexico have the highest computer rates (11 per 100 people) and Internet use rates (12-13 per 100 people).

The regression analysis reveals that factors such as income, human capital, telecommunications, rule of law, and banking sector development may contribute to the global digital divide. The Internet rate is 47.4% in developed countries compared to 4.8% in developing countries, similar is the observation in our data,,,

A study among rural students found that 72% of female and 63.33% of male students have not used a computer. Most of the students opined that lack of support from teachers and non-availability of computers at home and schools (82.10%= Male, 80.55%= Female) were the main reasons for not using the computer. A notable finding of the study was that 93.68% of male and 95.37% of female students were interested in using a computer.

**User's acceptability of e-mediums health program in India is reported for Mother and Child Tracking System (MCTS) and found very low (6%). Large discrepancy in primary data from different sources is also reported since data is being generated by third party other than consumers themselves,** Despite a consensus that the use of health information technology should lead to more efficient, safer, and higher-quality care, there are no reliable estimates of the prevalence of adoption of technology in India is available,,,

Although the benefits that are associated with mobile technology have been recognized as offering great potential in the healthcare sector, its widespread adoption has been lagging. We propose that fundamental systemic issues are likely to be the main barriers to adoption,,,

#### Combination is the key?

Stories like In rural South Carolina, a combination of a small media campaign and one-on one health education sessions by health volunteers created buzz about the local health clinic's free cancer screening program. Combined with client- and provider-oriented interventions combination of television, radio, social media, and print channels were found more effective.

In view of existing digital divide, to improve human connect and generating real time authentic health data, it is required to strengthen logistically feasible and available tools like health diary hard copy and skilling of grass root level man power ,,, , , . The government is on the job, with the ambitious Bharatnet project to digitally connect 2.5 lakh Gram Panchayats, But due to paucity of communication devices as well as human resources we worked on improving on human links in the form of front line health workers/ volunteers educating the community while maintain their personal



health diaries as channel of two way communications.

## CONCLUSION:

despite surge of availability of internet web based entries of health data especially in remote rural and tribal areas are still at large. In view of existing digital divide improved infrastructure is warranted but mostly human connect, skilling of grass root man power in generating real time authentic health data required to strengthen logistically feasible and available tools like personalized health diary.

## REFERENCES

1. As part of this effort, the committee published a seminal report in March 2001, Crossing the Quality Chasm: A New Health System for the 21st Century.
2. Internet access in India; digital inequality in India. <https://digitalequality.in/> accessed on 30 January 2019 3 PM
3. <http://economictimes.indiatimes.com/tech/internet/internet-users-in-india-expected-to-reach-500-million>.
4. Chinn, Menzie D. and Robert W. Fairlie, "ICT Use in the Developing World: An Analysis of Differences in Computer and Internet Penetration," NBER working paper 12382 (2006).
5. Mobile phone internet users in India 2022. Statistic. <https://www.statista.com/statistics/558610/number-of-mobile-internet-user-in-india/>
6. <http://ultraxart.com/internet-penetration-in-india-2018-infographics/> By sandeep Ahirwar 2018-05-07.
7. <http://has.icmr.org.in/>, and <https://has.icmr.org.in/Files/About%20Health%20Account%20Scheme.pdf>
8. Kuppaswamy's Socioeconomic Scale-Update for July 2015. Charu Kohli, Jugal Kishore, Neeta Kumar. Int. J. Preven. Curat. Comm. Med. 2015; 1(2); 26-28.
9. <https://www.statista.com/topics/2157/internet-usage-in-india/>
10. Technology and social inclusion: Rethinking the digital divide. M Warschauer - 2004 - books.google.com
11. The digital divide: The Internet and social inequality in international perspective
12. M Ragnedda, GW Muschert - 2013 - books.google.com
13. Can information and communications technology applications contribute to poverty reduction? Lessons from rural India. S Cecchini, C Scott - Information Technology for Development, 2003 - Wiley Online Library
14. Information and communication technologies and health in low income countries: the potential and the constraints. CP Chandrasekhar, J Ghosh - Bulletin of the world Health ..., 2001 - SciELO Public Health
15. Digital divide, gender and the Indian experience in IT. R Pande - Encyclopedia of gender and information technology, 2006 - igi-global.com
16. Use of e-Health services between 1999 and 2002: a growing digital divide
17. J Hsu, J Huang, J Kinsman, B Fireman... - Journal of the ..., 2005 - academic.oup.com
18. Number of smartphone users in India 2015-2022 | Statistic. <https://www.statista.com/statistics/467163/forecast-of-smartphone-users-in-india/>
19. <http://ultraxart.com/internet-penetration-in-india-2018-infographics/> By Sandeep Ahirwar 2018-05-07. REF; <http://ultraxart.com/internet-penetration-in-india-2018-infographics/>
20. Ref; <https://qz.com/india/1310947/india-ranks-last-in-pew-survey-of-internet-penetration/>
21. "ICT Facts and Figures 2005, 2010, 2017". Telecommunication Development Bureau, International Telecommunication Union (ITU). Retrieved 2018-10-07.. [https://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_number\\_of\\_Internet\\_users](https://en.wikipedia.org/wiki/List_of_countries_by_number_of_Internet_users)
22. [./economictimes.indiatimes.com/articleshow/63000198.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](https://economictimes.indiatimes.com/articleshow/63000198.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)
23. Computer access and use: understanding the expectations of Indian rural students. B T Sampath Kumar (Department of Studies and Research in Library and Information Science Tumkur University, Tumkur, Karnataka, India)
24. Liu, Meng-chun and Gee San, "Social Learning and Digital Divides: A Case Study of Internet Technology Diffusion," Kyklos 59 (2006):307-21.
25. <https://www.thehansindia.com/posts/index/News-Analysis/2016-03-11/Digital-inequality-warning-sounded-for-urban-India/212830>. accessed 30-1-2019 4 pm
26. [https://www.business-standard.com/article/current-affairs/india-is-adding-10-million-active-internet-users-per-month-google-118062700882\\_1.html](https://www.business-standard.com/article/current-affairs/india-is-adding-10-million-active-internet-users-per-month-google-118062700882_1.html)
27. "The Changing Scenario of Internet Users" <https://www.thecommunityguide.org/sites/default/files/assets/What-Works-Health-Communication-Health-Information-Technology.pdf>
28. The usage numbers come from various sources, mainly from data published by Facebook, <https://www.internetworldstats.com/stats3.htm>- Internet World Stats. The Asian Internet Statistics were updated in June 30, 2018.
29. [iamai/printarticle/63000198.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](https://www.iamai.org/printarticle/63000198.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)
30. Disseminating health information in developing countries: the role of the internet
31. BMJ 2000;321:797. Tessa Tan-Torres Edejer,
32. Communities Use Media to Bolster Prevention Efforts For many public health topics covered in The Community Guide, the CPSTF recommends supplementing interventions with health communication activities. [www.thecommunityguide.org/content/the-community-guide-in-action](http://www.thecommunityguide.org/content/the-community-guide-in-action).
33. How Many Indians Have Access To The Internet/Article17669371.Ece, <https://www.statista.com/statistics/27465>
34. Chinn, Menzie D. and Robert W. Fairlie, "The Determinants of the Global Digital Divide: A Cross-Country Analysis of Computer and Internet Penetration," Oxford Economic Papers 59 (2007):16-44.
35. Social Learning and Digital Divides: A Case Study of Internet Technology Diffusion. Liu, Meng-chun and Gee San. Kyklos 59 (2006):307-21.
36. Chinn, M. D. and Fairlie, R. W. (2010), ICT Use in the Developing World: An Analysis of Differences in Computer and Internet Penetration. Review of International Economics, 18: 153-167.
37. Computer access and use: understanding the expectations of Indian rural students. B T Sampath Kumar (Department of Studies and Research in Library and Information Science Tumkur University, Tumkur, Karnataka, India)
38. An in-depth assessment of India's Mother and Child Tracking System (MCTS) in Rajasthan and Uttar Pradesh. Rajeev Gera, Nithiyanthan Muthusamy, Amruta Bahulekar et al. BMC Health Serv Res. 2015; 15:315.
39. The benefits of health information technology: a review of the recent literature shows predominantly positive results. MB Buntin, MF Burke, MC Hoaglin, D Blumenthal - Health affairs, 2011 - healthaffairs.org
40. Use of electronic health records in US hospitals. AK Jha, CM DesRoches, EG Campbell et al. England Journal of ..., 2009 - Mass Medical Soc
41. Costs and benefits of health information technology: new trends from the literature. CL Goldzweig, A Towfigh, M Maglione et al. Health affairs, 2009 - healthaffairs.org.
42. Impacts of information and communication technologies on nursing care: an overview of systematic reviews (protocol). Genevieve Rouleau, Marie-Pierre Gagnon, José Côté. Syst Rev. 2015; 4: 75.
43. Effective use: A community informatics strategy beyond the digital divide. M Gurstin - First Monday, 2003 - ojsphi.org
44. Thakkar J, Kurup R, Laba TL, Santo K, Thiagalingam A, et al. Mobile telephone text messaging for medication adherence in chronic disease. JAMA Internal Medicine 2016; 176(3):340-9.
45. Health Communication and Health Information Technology Evidence-Based Interventions for Your Community.

- <https://www.thecommunityguide.org/sites/default/files/assets/What-Works-Health-Communication-Health-Information-Technology.pdf> accessed on 2 Feb 2019.
46. Mobile technology and healthcare: the adoption issues and systemic problems. Standing S, Standing C. *Int J Electron Healthc*. 2008;4(3-4):221-35
  47. [//economictimes.indiatimes.com/articleshow/63000198.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](http://economictimes.indiatimes.com/articleshow/63000198.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)
  48. From atoms to bits: consequences of the emerging digital divide in India. J Singh - *The International Information & Library Review*, 2002 - Taylor & Francis
  49. Digital divide initiative success in developing countries: A longitudinal field study in a village in India. V Venkatesh, TA Sykes - *Information Systems Research*, 2013 - [pubsonline.informs.org](http://pubsonline.informs.org)
  50. Demystifying the digital divide. M Warschauer - *Scientific American*, 2003 - JSTOR
  51. Digital Divide Network: [www.digitaldividenetwork.org/](http://www.digitaldividenetwork.org/)
  52. Digital divide: Civic engagement, information poverty, and the Internet worldwide
  53. P Norris - 2001 - [books.google.com](http://books.google.com)
  54. Digital divide in India: Measurement, determinants and policy for addressing the challenges in bridging the digital divide. S Singh - *International Journal of Innovation in the Digital ...*, 2010 - [igi-global.com](http://igi-global.com)
  55. Bridging digital divide: Efforts in India. SS Rao - *Telematics and informatics*, 2005 - Elsevier