

DESCRIPTIVE STUDY ON TECHNOLOGY INTEGRATION IN PUBLIC HEALTHCARE IN INDIA

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Abstract

This is a descriptive and documental study focusing on the integration of technology in public healthcare and involves addressing various aspects such as the current relevance of technology in public health, its impact, challenges, and potential future developments. The research also concentrates on the ethical considerations which are associated with the privacy and security concerns of electronic healthcare records. This leads to disparities in the adoption of E-Healthcare. The technological impact of health services has developed and is parallel to various societal and regulatory factors that have collectively transformed the healthcare landscape, making it more connected, efficient, and patient-centric especially after the Covid 19 pandemic. This paper explores how technology enhances healthcare, focusing on accessibility, patient engagement, data-driven decision-making, and overall service quality. Focusing and comparing the complex relationship between healthcare and technology reveals the potential for a revolutionary future—a healthcare industry that is not only efficient but also more personalized and centered around the patient. The fast pace of individual's daily routines has made it essential for having easy access to healthcare which has led to the growth of technological integration in healthcare. Due to the immense populations who utilise public healthcare options, technological tools, applications, and software have proved to be a huge boon for record-keeping and effective time management. The main purpose of the study, hence, revolves around technological application and integration in public healthcare.

Key Words: *Technology, E-Healthcare, Electronic Health Records, Telemedicine, Health Information Exchange*

Introduction

In today's rapidly advancing world, technological growth has significantly had an impact on healthcare services, becoming a fundamental aspect of the industry. Over time, notable developments have transformed hospitals into comprehensive healthcare service units, influencing how services are delivered, patient outcomes, and medical practices. This transformative impact emphasizes the necessity of innovation.

The transition from maintaining physical health records to Electronic Health Records (EHRs) has played a pivotal role in this evolution, fostering the growth of artificial intelligence and telemedicine. These technological advancements have redefined the landscape of healthcare services. Several key factors and technological advancements have driven the development of E-Healthcare. The broader digital transformation across industries, including healthcare, has enhanced efficiency, accessibility, and communication by shifting from traditional paper-based systems to digital formats.

Advances in information technology, such as electronic devices, improved connectivity, and faster internet speeds, have facilitated the seamless exchange of health information, laying the foundation for E-Healthcare solutions. The widespread adoption of EHRs has allowed healthcare providers to electronically store, manage, and share patient information.

Telecommunication advancements have facilitated the rise of telemedicine and remote patient monitoring, enabling healthcare professionals to conduct video consultations, virtual check-ups, and monitor patients' health remotely, thereby enhancing

accessibility to healthcare services. A shift towards patient-centered care, where individuals actively participate in their health management, has been a driving force in traditional health centers. E-Healthcare tools empower patients with information, enabling them to make informed decisions about their well-being.

Regulatory initiatives supporting the adoption of technology in healthcare, such as meaningful use incentives for EHR adoption, have encouraged healthcare providers to embrace electronic solutions. Moreover, the study addresses global health challenges, including pandemics, highlighting the accelerated need for innovative healthcare solutions. E-Healthcare has played a crucial role in managing and responding to public health crises.

Objectives of the Study

The study focuses on the following objectives:

- Importance of the massive use of E-Health care services.
- New treatments and medical procedures many healthcare business processes had immense growth and development.
- Most of the people enjoy the convenience of scheduling online appointments, assessing results and records.
- Users can also easily access and send their feedback to providers through online platforms.
- Helps to explore the role of technology in public health.
- Assess the impact on healthcare delivery and outcomes.
- Most people enjoy the conveniences of scheduling online appointments, assessing test results and records.
- Helps in the Growth and utilization of new technologies.
- In the present world the State of Technological Integration in Public Health has increased immensely.
- Monitoring real-time interventions.

Literature Review

India has a population of 1.3 billion distributed across urban and rural areas, India definitely faces challenges to establish a uniform and efficient healthcare system.

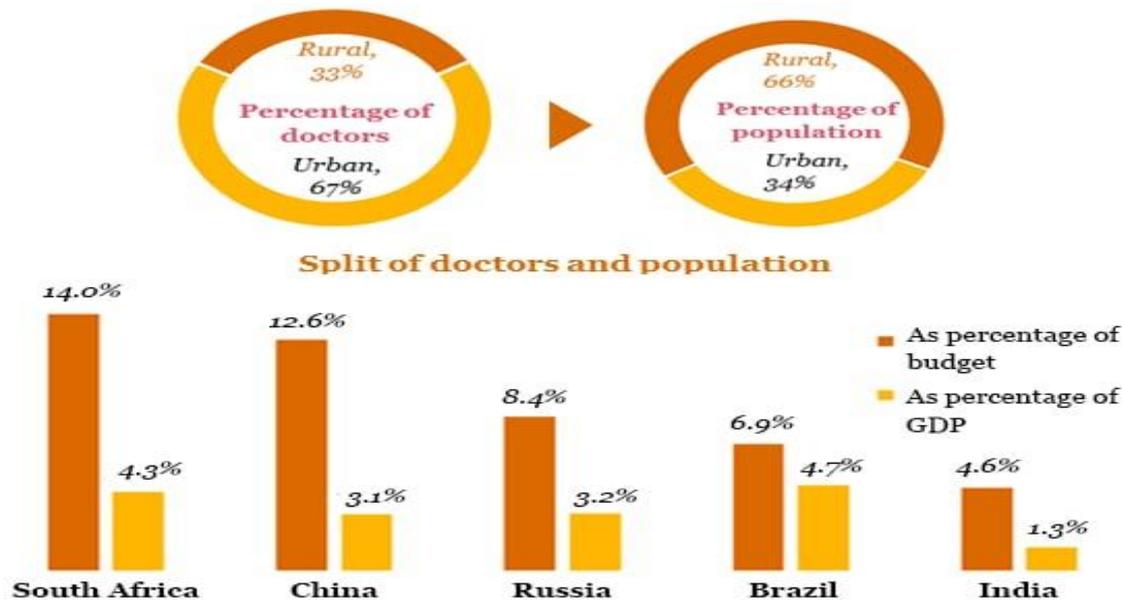
Urban Healthcare concentration (infrastructure, medical specialists and doctors)	Urban Population	Rural Healthcare concentration (infrastructure, medical specialists and doctors)	Rural Population
75%	27%	25%	73%

As displayed in the above Table, 75% of all healthcare amenities, including medical specialists and doctors, is concentrated in urban areas in proportion to the residing population of 27% according to a United Nations report. Well-equipped hospitals and quality healthcare are restrained to urban areas. 73% of the population, or approximately 716 million people, residing in rural areas experience chronic lack of primary healthcare facilities. One of India's complex challenges is providing world-class healthcare to all its citizens under the purview of the population's affordability and attaining uniformity.

Technology is definitely evolving India's healthcare system to resolve crucial processes that currently pose a significant hindrance to the delivery of quality healthcare. These include reaching millions who are geographically dispersed across the horizons of the

country, providing accurate and clear diagnosis, managing operations and logistics, and bridging the gap between doctors and healthcare professionals.

Description of Data



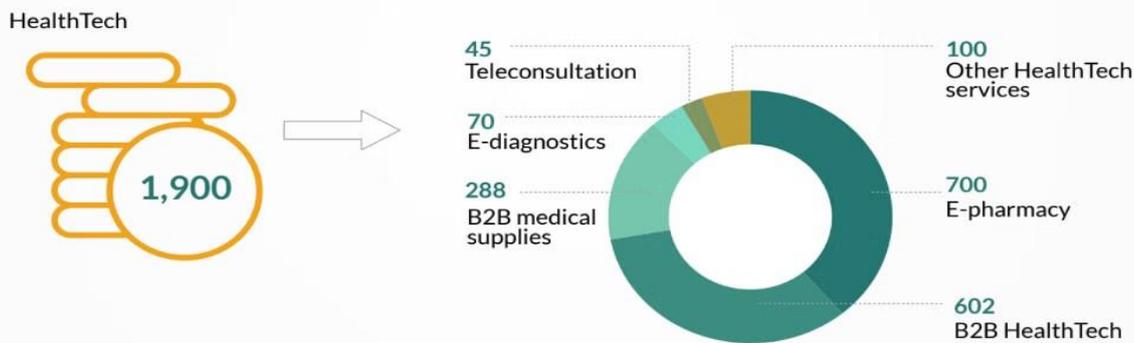
The reason we need to analyse data is to comprehend the integration of technology across various demographics. From the above graph we can infer the following-

1. All the countries mentioned above are developing countries, so they are justifiably compared for public healthcare.
2. There is a discrepancy in the ratio of doctors available in rural areas (33%) versus the population residing in the rural areas (66%).
3. As per budget, the allocation of funds is higher, however, the actual utilisation as per GDP is in a declining trend.
4. Brazil is the only country as per the above statistics which has the least difference margin between the budget for healthcare and the actual utilisation as per GDP.

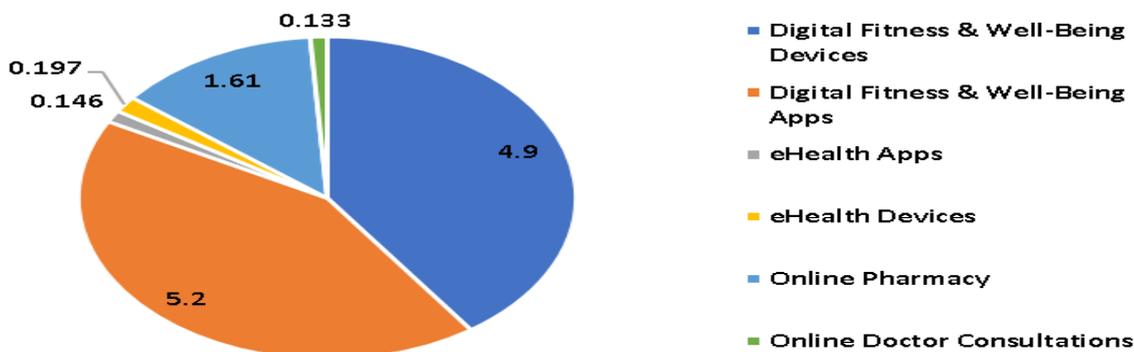
Projections of Technological Integration in India's Healthcare Market

Indian HealthTech market size (2020)

HealthTech market (US\$ M)



Digital Health Market Share by Category, 2023



The above graphs project the drastic increase in technological requirement in health care especially after the Covid 19 Pandemic.

From the above two graphs, we can acquire the following inferences-

- There is an overall change in approach towards personal healthcare.
- Personal well-being has become a major priority especially after Covid-19
- Due to the change in this mindset, there is a shift in demand for various Health tech options like
 - Digital programs for wellness
 - E-Health devices
 - E-health applications
 - Online Pharmacy
 - Mobile/Tele consultations
 - E-Diagnostics
- Such approach for personalized and customized health care has also become a boom to the technical industry in the form of creating codes/applications which can be easily used/ accessed by a basic mobile user.

Positive Impact of E-Healthcare

1. Accessibility to personal/pool of health data
2. User experience enhanced to customized and patient centric
3. Time efficiency and management has improved
4. Record keeping is convenient and easily maintainable
5. Accuracy of reports and records
6. Avoidance of human error
7. Reducing scope for malpractice
8. Eradication of creating and maintaining physical health records
9. Restricts duplication of work.
10. Efficient Risk management systems are effectively incorporated.
11. Mortality rates are minimized due to the response turnaround time from healthcare professionals and easy access to patient's medical history.

Limitations of E-Healthcare

1. Over-dependence on computerized calculations/record-keeping
2. Overlooking expertise of professionals
3. Diluted/generalized conclusions based on data analysis may sometimes prove to be endangering life.
4. Mis-managed/Mis-interpreted data
5. Easy deletion of e-health records (also in error)
6. Maintenance of systems/servers is a costly investment.
7. Awareness/Education of the technical advancements need to be communicated on a regular basis which time consuming.

Potential future developments

1. Integration of Artificial intelligence in telemedicine, e-pharmacy and online health/fitness apps.
2. Inclusion of technical syllabi for those pursuing medical/pharmacy careers.
3. Application of self-aware software to track and maintain e-health records.
4. Technical education for various populations using various methodologies based on their literacy levels.
5. Investing resourceful budgets for technological advancements of healthcare equipment, servers, maintenance and cloud management.
6. Investing in the training and development of the personnel already in the healthcare system.
7. Recruitment of a research and development team, solely to monitor, maintain and revise technological areas of healthcare centers.

Limitations of the Study

This Research paper is descriptive and a research gap as follows exists-

1. The study is descriptive and may not contain updated statistics
2. Does not include data from direct respondents i.e., hospital administrations/staff/personnel/users.
3. The study showcases information based on general observations.
4. The study analyzes people's perception towards healthcare techniques.
5. It also studies the challenges faced by the people to use E-Health service.

Conclusion

Healthcare remains the utmost important criterion for human sustenance. Technology serves as a spine of accessibility and smooth functioning of healthcare, disbaring the barriers of time, place, restricted expertise, and knowledge. Technology also has proven to be the best mediums to disseminate the reach of even the remotest areas of India to receive economical, uniform and world-class healthcare. Therefore, Technological integration in public healthcare is a pre-requisite and a major need in the dynamics of the fast paced global economy.

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