



SUMMER TRAINING

Report on

PART 1: a review article on

**A review of supply shortage strategies in hospitals in
India during COVID 19 pandemic**



PART 2: an online course offered by KLX: Karolinska Institutet
via edx_

eHealth: Opportunities and challenges

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PART 1

A REVIEW OF SUPPLY SHORTAGE STRATEGIES IN HOSPITALS IN INDIA DURING COVID 19 PANDEMIC

INTRODUCTION

You have to keep on changing your strategies in order to sustain, as people, circumstances, situations and conditions are continually changing. The pandemic COVID-19 has already shown its impact on economy, education, services, business, agriculture, health sector and all others. Hospitals are situated more or less centrally in relation to the most resource-determined organizations in our economy, producing virtually nothing while consuming a steady stream of supplies from outside sources. Due to sudden and acute arising of COVID-19 cases in India, hospitals faced drastic shortage of essential supplies, personal protective equipment, diagnostics and clinical management. Fighting with this pandemic is our first priority, but we need to overcome this instability in health care supply chains, that will definitely come out, as supplies are exhausted and manufacturers grapple to meet intense demand. With this pandemic and rapid rising of COVID-19 cases, hospitals are extremely under the pressure of stocks but they have also followed the strategies to get to grips with. The equitable supply chain strategies and management practices is the high priority to cope up with scarce resources and shortages and to expand the capacity with no delay. Also improvement and advancement in supply management is desired. Shortage of N95 Masks, PPE, Drugs, Diagnostics are from the major concern in hospitals. This article will give insights to understand the effective supply shortage strategy to culminate the world threat COVID-19 in India.

METHODOLOGY

1. STUDY OBJECTIVE

The primary objective of the study is: To explore the supply shortage strategies followed by hospitals to combat the COVID 19 pandemic in India.

The secondary objectives are as follows;

- a. To understand the existing demand of PPE, vaccines, oxygen, drugs and diagnostics arise due to COVID 19 pandemic.
- b. To explore the strategies used for the management of supply shortages and demands of PPE, vaccines, oxygen, drugs and diagnostics.
- c. To recommend the supply chain strategies if the condition prevails.

2. TYPE OF RESEARCH DESIGN: Descriptive study design

3. DATA COLLECTION

Currently, the focus of our entire world is on COVID-19, flattening the curve and trying to find a vaccine for this global pandemic. Under these circumstances, the internet is the mainstream media for delivering the information regarding this. Data is collected from the secondary data source available like Research articles, Newspaper article, Government reports etc.

There were huge number of News articles and reports are available and releasing every day. Few steps were followed to sort out from these articles,

- i. Framing the subject with the categories of how, why and what.
- ii. Secondly, consider the questions to generate specific ideas about the topic.
- iii. Thirdly, refine the articles by relevant and accurate information, by similarities and repetition and most importantly with the official information.

Hence, succeeding these steps, the data collection end up with 24 secondary data sources which includes Research articles, Newspaper article, Government reports and guidelines. All the background information along with the keys facts collected.

4. REVIEW OF LITERATURE: Published Literature

TYPE OF ARTICLE	NAME AND DATE OF THE ARTICLE	KEY FACTS AND LINK
News article (Financial Express)	COVFID-19: Personal Protection Equipment essential for ICUs, OPDs! PPE usage in hospitals explained; details April 11, 2020	Personal protective equipment or a PPE is a part of complete protection gear used by any doctor or a worker during an outbreak of any disease which is transmitted. https://www.financialexpress.com/lifestyle/health/covid-19-personal-protection-equipment-essential-for-icus-opds-ppe-usage-in-hospitals-explained-details/1925606/
News article (Times of India)	From zero, India now produces around 2 lakh PPE kits per day May 5, 2020	As of now, the Central Government has distributed about 21.32 lakh PPE kits to the central and state run hospitals, at least 15.96 lakh PPE kits are in the Centre-State buffer stock. https://timesofindia.indiatimes.com/india/from-zero-india-now-produces-around-2-lakh-ppe-kits-per-day/articleshow/75556879.cms
News report (The Indian express)	Ban on PPE export lifted, limit set at 5 million a month June 30, 2020	The Centre Monday partially lifted its ban on exports of personal protective equipment (PPEs), allowing medical textile manufacturers here to ship up to five million units of such equipment to other nations seeking global suppliers during the ongoing COVID-19 pandemic. https://indianexpress.com/article/india/govt-allows-export-of-covid-19-ppe-medical-coveralls-monthly-quota-fixed-at-50-lakh-units-6481526/
News report (The Economic Times)	Government tightens PPE testing, certification norms April 20, 2020	Unique Certification Code (UCC) will apply to PPE garments and fabric which pass the laboratory tests. https://m.economictimes.com/industry/healthcare/biotech/healthcare/government-tightens-ppe-testing-certification-norms/articleshow/75298657.cms#:~:text=New%20Delhi%3A%20The%20government%20on,body%20coveralls%20manufactured%20in%20India.&text=Unique%20Certification%20Code%20(UCC)%20will,which%20pass%20the%20laboratory%20tests.
News report (India today)	Have enough PPEs, HCQ stock in India: Health ministry April 9, 2020	The health ministry official claimed that even as the government has arranged for a sufficient supply of PPEs to all health workers, it has also issued guidelines to use them rationally. “For example, an N95 mask can be used by a doctor for 8hours. But, if a doctor will use one mask per patient and then dispose it off, or uses four-

		five masks a day then that's misuse," https://www.indiatoday.in/india/story/have-enough-ppes-hcq-stock-in-india-health-ministry-1665136-2020-04-09
News report (DU express)	PPE production in India June 20,2020	India has an inventory of about 16 lakh PPE kits of all kinds, and there are 2.22 crore kits against firm orders by the industry. https://duexpress.in/ppe-production-in-india/
News report (Hindustan Times)	'Buy PPE only from approved producers': Govt advisory May 26, 2020	The government is working to ensure all manufacturers register with the online market place portal called 'Government e-Marketplace (GeM)' so that information on quality manufacturers is easily accessible for people . https://www.hindustantimes.com/india-news/buy-ppe-only-from-approved-producers-govt-advisory/story-sdQvfl7FRP1YPdQdH1VJgJ.html
News Report	COVID-19: How India Became A PPE Kit Manufacturing Hub June 8, 2020	India is now the second-largest manufacturing hub for PPE kits in the world. https://www.boomlive.in/videos/fact-file/covid-19-how-india-became-a-ppe-kit-manufacturing-hub-8408
News Report (NDTV)	From Zero, India Now Manufactures 4.5 Lakh PPE Suits A Day To Fight Coronavirus May 19, 2020	India started manufacturing PPE kits within two months of the coronavirus outbreak. Earlier, all PPE kits were being imported. https://www.ndtv.com/india-news/from-zero-india-now-manufactures-4-5-lakh-ppe-suits-a-day-to-fight-coronavirus-2231742

REVIEW OF LITERATURE: Grey Literature

TYPE OF ARTICLE	NAME AND DATE OF THE ARTICLE	KEY FACTS
Mohfw (Government guidelines)	Guidelines on rational use of Personal Protective Equipment	Guidelines for health care workers and others working in points of entries (POEs), quarantine centers, hospital, laboratory and primary health care / community settings for the rationale use of PPE. https://www.mohfw.gov.in/pdf/GuidelinesonrationaluseofPersonalProtectiveEquipment.pdf
PHM India	Statement On the Personal Protection Equipment for Healthcare Workers in the Light of Increasing Numbers of COVID-19 Patients	Health workers those at higher risk like those collecting samples or those in the frontline of care provision have far more extensive and stringent requirements of PPE as compared to others. http://phmindia.org/2020/04/03/statement-on-the-personal-protection-equipment-for-healthcare-workers-during-covid19-pandemic/
Mohfw (Government guidelines)	Additional Guidelines on rational use of Personal Protective Equipment	All hospitals should identify a separate triage and holding area for patients with Influenza like illness so that suspect COVID cases are triaged and managed away from the main out-patient department. https://www.mohfw.gov.in/pdf/AdditionalguidelinesonrationaluseofPersonalProtectiveEquipmentsettingapproachforHealthfunctionariesworkinginnonCOVIDareas.pdf

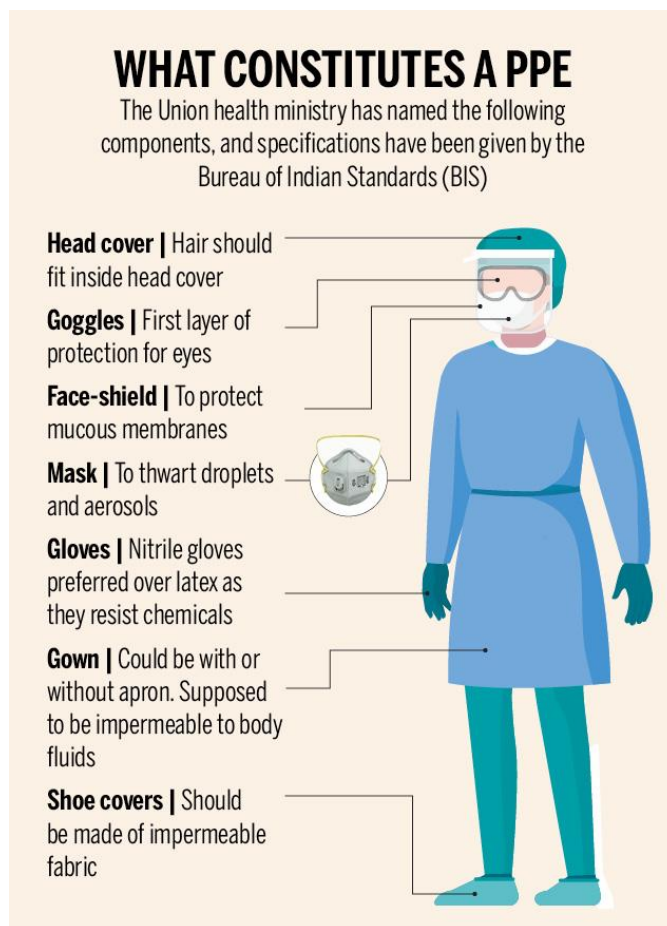
RESULT

1. Types of PPE available to Hospitals & Existing PPE available to Hospitals in India
2. COVID 19 Cases increase and demands of PPE in India
3. Strategies used by other countries
4. Strategies used by Hospitals in India
5. Recommendation by comparing two countries.

TYPES OF PPE AVAILABLE TO HOSPITALS

The different types of Personal Protective Equipment are:

- Face shields
- Gloves
- Goggles
- Masks
- Gown
- Shoe cover
- Head cover



EXISTING PPE AVAILABLE TO HOSPITALS

The first case of COVID 19 pandemic in India was reported on January 30, 2020, which was originated from China. In January, there were only 2.75 lakh PPE kits available in the country which was actually the imported ones. May 2, 2020, recorded as a highest single day production of 2.06 lakh PPE in India. On average, domestic production is about 1.5 lakh per day. The PPE kits include- masks, triple layer surgical or N95 mask depending on requirements- gloves, goggles, face shield, coveralls, head covers and shoes covers, according to health ministry guidelines. ⁽ⁱⁱⁱ⁾

DEMAND OF PPE WITH INCREASED COVID 19 CASES

Initially, the first month of the lockdown was tough. But now orders are happening, systems are in place, transport issues have been sorted out, materials and manufacturers are in place. Though many of the PPE products require for frontline health workers are banned for exports currently. Still the demand is on the market, so Health ministry has generated guidelines on the rational use of PPEs.

Every month, frontline health responders around the world need these supplies (and more) to protect themselves and others from #COVID19 [®]

- 89 million masks
- 30 million gowns
- 1.59 million goggles
- 76 million gloves
- 2.9 million liters hand sanitizer



#COVID19
#coronavirus



STRATEGIES USED BY OTHER COUNTRIES

US health systems and hospitals are using to disinfect, reuse, and create their own PPE when they are dealing with shortage of PPE. Also hospitals have taken to creating PPE using office supplies, or reusing existing supplies.

PPE shortage has forced the hospitals to use lower-protection PPEs, in Italy.

In Spain, hospital are left with few options but to reuse gowns when treating different patients, and doubling up on cheap masks in the absence of more sophisticated respirator masks.

STRATEGIES USED BY HOSPITALS IN INDIA

Doctors were using raincoats and helmets in place of N95 masks when nothing was the step to deal with shortage. Efficient use of resources at the systems level, unconventional solutions for PPE at local hospitals, such as plastic garbage bags for gowns and plastic water bottle cut outs for eye protection. This is settled with the following:

- Wherever feasible, use telemedicine, so that it can minimize the need for patients to go to health care facilities for evaluation and less use of PPE.
- Use of physical barriers to lessen exposure to the COVID-19 virus, for example, glass or plastic windows.
- Postpone elective, non-urgent procedure, and hospitalizations, reduce prevalence of visits for chronic patients, so that PPE can be redistributed to services in which COVID-19 patients receive care.
- Limit the number of health care workers from entering the rooms of COVID-19 patients if they are not involved in providing direct care.
- Consider using specific PPE only if in direct close contact with the patient or when touching the environment

Reuse-by sterilization, reduce non-essential services, reduce patient contact are some of the measures taken in India.

India has started with the manufacturing of PPE within the country.

- Data collected by the Ministry of Family Welfare and Health states that India has about 15.96 lakh PPE kits in the centre-state buffer and orders for another 2.22 crore have been placed. ^{xxii}
- The manufacture of PPE kits in India started within two months of the pandemic rising.

DISCUSSION

India is facing crippling shortages of health safety gear for a number of reasons: the government did not create stockpiles by banning exports and it failed to place orders with manufacturing firms in time. It released the guidelines for safety gear manufacturers on March 24 – the same day it announced the nationwide lockdown. This meant workers in many places have been unable to report to manufacturing units because of restrictions in movement, despite manufacturers being ready to produce.

During this pandemic situation, personal protective equipment (PPE) like-gloves, surgical face masks, air-purifying respirators, ventilators, goggles, face shields, N95 respirators, and gowns are essential in preventing the spread of infection among the patients and health care workers. As in this critical stage, a shortage of all of these PPE is about to develop or has already developed in high demand areas. Previously, PPE was repeatedly used in the hospital environment, is now a scarce and valuable commodity in many locations when it is needed most to care for highly infectious patients.

DEMAND OF PPE WITH INCREASED COVID 19 CASES

Evidently, the demand of PPE has increased with increased COVID19 cases in the country. Before this pandemic, for instance, China produced approximately half the world's face masks. As the infection spread across China, their exports came to a halt and now on an average, domestic production of PPE in India is about 1.5 lakh per day, which is the top most solution to deal with the shortage.^{xi} Beyond increasing the supply, a crucial role for the government is to coordinate efforts to ensure that the areas hardest hit at any given time are receiving needed equipment. The increase in demand for tests results in test shortages. Staff needs protective gear both to perform tests and to treat patients. So, not surprisingly, increase in patient flows creates shortages of masks and other protective equipment.

STRATEGIES USED BY HOSPITALS IN INDIA

India has scaled up local production of PPEs. But the health ministry official claimed that even as the government has arranged for a sufficient supply of PPEs to all health workers, it has also issued guidelines to use them rationally.

Rain wares and cloth mask were used in the hospitals in India during initial days of crisis. Then they were up to the materials such as high density polyethylene film, polypropylene, and polyester are good enough for making coveralls and can be tested for mass production of PPE. Even hospitals allocated raincoats to doctors and healthcare workers to treat coronavirus patients.

A laboratory of the DRDO that works with coating technology and Nano Technology has developed a specific type of fabric to make bio suits that protect one from the virus.

The health ministry of India has generated the guidelines for the rationale use of PPE in which they have documented the use based on the risk profile of the health care worker. In which the full components of PPE is been rationalize to those in need and those who can be protected with other components stated separately.

Major hospitals supplied with some components of PPE from local hospitals and non-health care businesses as per the need.

PPE SHORTAGE AND INCREASED CASES

On developing more healthcare capacity, dealing with more cases at once can be handled. If capacity drops, if doctors and nurses get sick because of a lack of protective equipment, or refuse to work without conditions that can ensure their safety, even a flatter curve will be hard for the system to control.



CONCLUSION

In this review, it is been stated that the rational use and successful reuse of respirators can help in the shortage of PPE during a pandemic. Hospitals announced that widespread shortages of PPE put staff and patients at risk. Also, heavier use of PPE than normal was contributing to the shortage and that the lack of a robust supply chain was delaying or preventing them from restocking PPE needed to protect staff. Hospitals also expressed uncertainty about availability of PPE from State sources and noted sharp increases in prices for PPE from some vendors. But then and there, now we have many indigenous manufacturers in India leads to increased PPE production capacity. Although the hospitals has faced a huge battle with the shortage of PPE in this critical pandemic condition, in which they gone through with many alternatives to protect patients as well as health care workers, of which many has lost their lives due to this scarcity which cannot be payable back.

A global shortage of protective equipment coupled with a lockdown in PPE supplier countries such as China and Hong Kong, led to a shortage. At this point, multiple hospitals resorted to alternatives to resolve the crisis amid increasing case counts, as some protection was better than no protection. The best method for conservation of PPE is using UV disinfection system to sanitize PPE using plastic storage boxes and UV-c bulbs. Also, improving communication lines for better stock management of PPE can be the best possible way to preserve.

The mobile phone app, should be made, which tracks donations, manages the shipping, and ensures the shipping is paid for by the receiving hospital. Donations of masks, face shields, gloves, gowns, and more are matched with hospitals based on need and demand, and they can include a single box of PPE or an entire truckload as per the need, this can conserve many PPEs.

COVID 19 will reshape our world, we don't know when the crisis will end but we can be sure that by the time it does, our world will look very different. The ultimate measure of a man is not where he stands in moment of comfort and convenience but where he stands in times of challenges, as this pandemic has given to the whole world. So, the goals are simple, safety and security.

RECOMMENDATIONS

Stock usage: this can be monitored by using PPE mobile phone app, which includes the database to save all information on PPE stock and distribution running in the country.

Respirators: Reprocessing respirators helps conserve respirator supplies.

In the Republic of Ireland, an eco-friendly, namely vaporized hydrogen peroxide (VH₂O₂) is using, such as for filtering face piece respirators and UV irradiation and High-level liquid disinfection (Actichlor+) is also been pursued in Ireland.

The technology can be integrated into face masks for self-sterilization, including the N95 respirator mask.

Approaches to treating patients in an effort to further protect them and to conserve their scarce PPE include practicing telemedicine over personal interactions, setting up physical barriers like acrylic sneeze guards, and minimizing the exposure of healthcare workers caring for Covid-19 patients to other hospital staff and patients.

An engineering and design company in Italy, recently has developed a 3D-printed adapter that turns a mass-market snorkeling mask into a noninvasive ventilator for COVID-19 patients.

The sourcing, manufacturing and distribution of PPE should be designated as separate department to ensure the efficient sourcing of PPE to different levels of healthcare needs.

Government should legislate to ring-fence the production of PPE equipment in the country so that we would have sufficient amount for the local production and which cannot be the reason for lack of PPE in future.

Decreasing the PPE standards that are implemented for low-risk exposure protection and increase the utilization of available PPE prioritized for higher risk exposure protection.

Extended use of PPE which refers to the practice of wearing the same PPE, it may be implemented when multiple patients are infected with the same respiratory pathogen and patients are placed together in dedicated waiting rooms or hospital wards.

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PART 2

About this report

This paper aims to build a comprehensive view of eHealth and its opportunities and challenges.

During the course there were different concepts that are used in the field and learn how it developed historically. This basic knowledge helps to understand the opportunities and challenges of the field. Different stakeholders from various countries are introduced and get to know their views on the opportunities and challenges of eHealth.

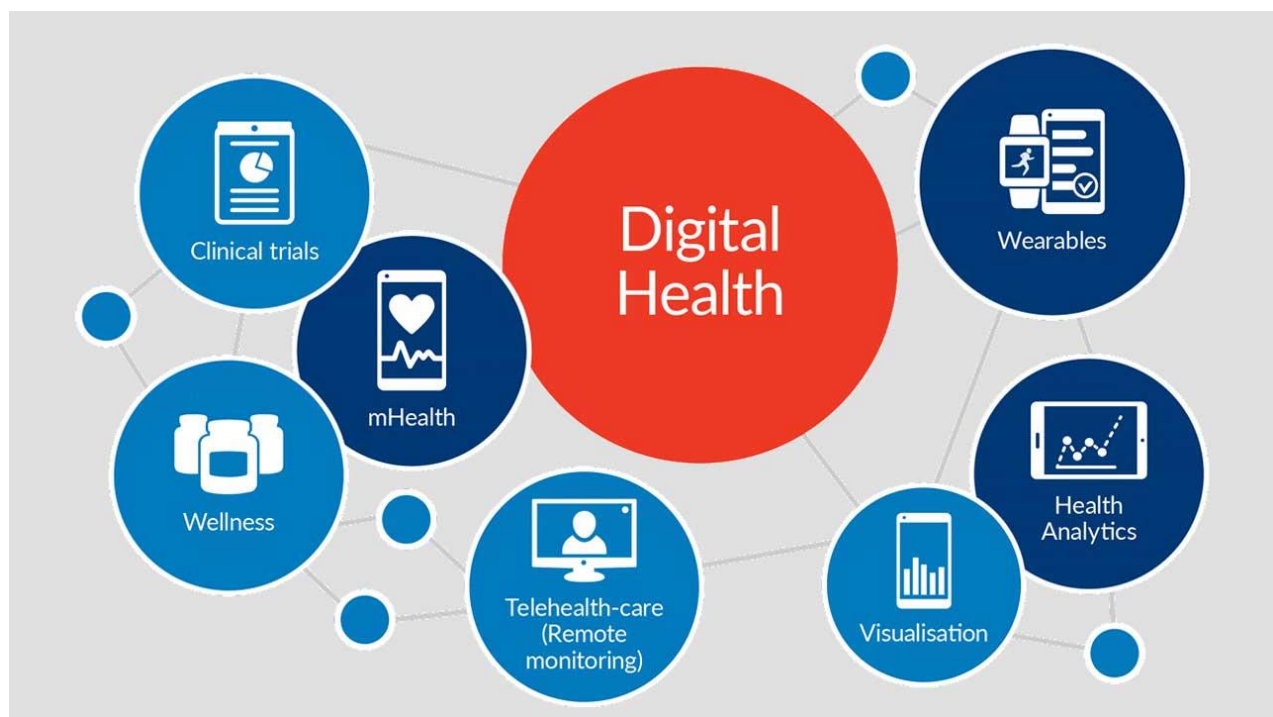
This course introduced eHealth strategies and frameworks for developing and analyzing them. Also the methods for eHealth service development.

This paper lays out an aspirational vision for basic requirements that are necessary to achieve sustainable eHealth applications for both clinical professionals and patients.



Executive summary

e-health is an emerging field in the intersection of medical informatics, public **health** and business, referring to **health** services and information delivered or enhanced through the Internet and related technologies. eHealth is a global issue but successful eHealth implementation is very dependent on the local context. A basic understanding what eHealth is and how to set up eHealth strategies and moralize in individual's specific context. Also, to know the success factors and pitfalls for the development of sustainable Health services and their implementation. E-Health can be a promising aspect for providing public health benefits if it integrates with the conventional medical system. More strategic approaches are necessary for the planning, development, and evaluation of e-Health.



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Week 5: **Technical Prerequisites and Opportunities for Innovation**

1. Introduction
2. Technical demands on eHealth systems
3. Health informatics standards and terminologies
4. eHealth Innovations

Week 6: **eHealth Strategies**

1. Introduction
2. Common denominators of eHealth strategies
3. Setting up and implementing eHealth strategies

Introduction

Technology has emerged as a thrust to make life easier in our day to day life. Transformation of technology in the medical sector has appear through different platforms i.e. e-Health, m-Health, and Telemedicine. E-Health technology can be used to disseminate health-related information or services among the health care providers, patients, and clinics. Mobile technology is enabled to provide the remote monitoring benefits for the patients who are restricted in mobility but needs continuous intervention from clinics. It can increase the probabilities to avoid emergency condition by detecting his/her vital signs and bio-signals. e-Health is an umbrella term that combines healthcare and technology to support people in a more efficient way, and it can also reduce health-related costs.

Key learning

- ✓ To define basic eHealth concepts and describe the development of the field
- ✓ What the success factors and barriers are for eHealth implementation
- ✓ To analyze eHealth strategies and adapt them in relation to your specific context
- ✓ The unique factors about the health sector
- ✓ The factors that are important to avoid failures when implementing eHealth
- ✓ The usable tools for care professionals
- ✓ Factors that the patients best organize and use their own health data to improve their condition

What is eHealth?

e-health is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology.

The 10 e's in eHealth

1. **Efficiency** - to increase efficiency in health care
2. **Enhancing quality** of care – to improve quality.
3. **Evidence based** - effectiveness and efficiency should not be assumed but proven by rigorous scientific evaluation.

4. **Empowerment** of consumers and patients - by making the knowledge bases of medicine and personal electronic records accessible to consumers over the Internet
5. **Encouragement** of a new relationship between the patient and health professional, towards a true partnership, where decisions are made in a shared manner.
6. **Education** of physicians through online sources (continuing medical education) and consumers (health education, tailored preventive information for consumers)
7. **Enabling** information exchange and communication in a standardized way between health care establishments.
8. **Extending** the scope of health care beyond its conventional boundaries.
9. **Ethics** - new challenges and threats to ethical issues
10. **Equity** - to make health care more equitable is one of the promises of e-health

eHealth for healthcare Professionals

A very important building block in any health system is the workforce, or the healthcare professionals. Healthcare professionals are of course also important stakeholders when it comes to eHealth, and they are often the users of eHealth too. 

A **stakeholder** is a person or group who will be affected by the eHealth system, directly or indirectly. Stakeholders can be either suffering from the problem that the eHealth system is addressing, or they can be affected by the eHealth solution itself. The **users** are a very important stakeholder group, and the users of eHealth can of course be healthcare professionals or patients, but also e.g. family members, social or community care workers or researchers.

Different types of eHealth for healthcare professionals

The electronic health record or medical record is one of the main eHealth tools used by physicians. Nurses handle a lot of the direct patient contact, and very often, they're the first person you talk to when you seek health care. Also include physiotherapists and occupational therapists, who are involved in different rehabilitation activities, dietitians, who guide patients towards a healthy diet adapted to the patient's individual needs, and counselors or psychiatrists who care for the patient's emotional or mental health issues. Pharmacists are also a very important actor in the handling on prescriptions and medications, and e-prescribing is an important part of eHealth.

eHealth for patients and citizens

Who is the patient?

Patients are the main user group. Very likely all of us will, at some point during our life, take on the role as a patient. Whether we're diagnosed with a chronic disease or taken acutely ill or just going through the normal events of life. The patient role is one that we step into when we interact with health care and health professionals.

Different types of eHealth for patients and citizens

The personal health record, also called PHR. The key features of the PHR is that it is under the control of the subject of care, and that the information it contains is at least partly entered by the subject itself, which may be the consumer or patient.

PHR can be considered in at least four different forms_

- i. as a self-contained electronic health record or EHR-maintained and controlled by the patient or consumer.
- ii. as a self-contained EHR maintained and controlled by a third party-such as, for example, a web service provider
- iii. as a component of an integrated EHR maintained by a health provider and controlled at least partially, that is, at least the PHR component as a minimum, by the patient or consumer
- iv. as a component of an integrated EHR that is maintained and controlled by the patient or consumer.

Patient data and ethics

Since the electronic health record was implemented, this enabled the more systematic use of individual health data, both on the individual perspective and in aggregated form for different kinds of research, which, in turn, has led to legislation and regulations being put in place to protect the individual.

Designing eHealth

1. socio-technical design

The idea was to shape both the technical and the social conditions of work, in such a way that efficiency and humanity wouldn't contradict each other. Has four basic rules_

- i. technical systems have social consequences, which means that we can't really design and implement a technical system that doesn't affect the organization in the social context.
 - ii. social systems have technical consequences, which means that when we are designing technology we also have to consider how the organization and the social context will impact on the design, and how the technology will be used.
 - iii. need to consider both parts of this complex.
 - iv. To understand how people and technologies interact.
- 2. participatory design
- 3. user-centered design

Personas

A persona is a fictional, detailed character that represents distinct user types. Personas are used to describe users of a system or a tool, to identify different types of users, and to make them come alive to the design team.

Health informatics standards and terminologies

The purpose of these standards is to allow different systems that apply them to exchange information and also understand the meaning of the information exchanged automatically. This exchange of meaningful information between health IT systems is called semantic interoperability.

HL7 V2.

- it is a messaging standard.
- It defines structures for all kinds of thinkable messages to be exchanged between different health care information systems.
- The horizontal parts of the message are called segments. For example, PID, PV1, and OBR. And these segments are divided into fields, which in turn, can be divided further into so-called components and sub-components.

openEHR,

- often pronounced open air.
- to standardize the whole structure of electronic health records and have led to the European and ISO standard 13606.
- two-level modeling-Clinical knowledge is captured by clinical experts such as physicians in so-called archetypes.

DICOM

- DICOM stands for Digital Imaging and Communications in Medicine, and it is a standard that accommodates the typical data needs of images, including data related to the image as such, like that is to store the image itself. But also a lot of data about the context around an image such as the unit that produced the image, the imaging technique used and the time the image was ordered, taken, or interpreted.

Other standards are HL7 Version 3, CIMI, short for Clinical Information Modeling

eHealth Strategies

Learning: methods and frameworks for analyzing, developing and implementing eHealth strategies.

eHealth is on the political agenda worldwide and many countries in the world have created national eHealth strategies. The overall goals of most strategies are related to the six domains of health care quality, which are safety, effectiveness, patient-centeredness, timeliness, efficiency and equitability.

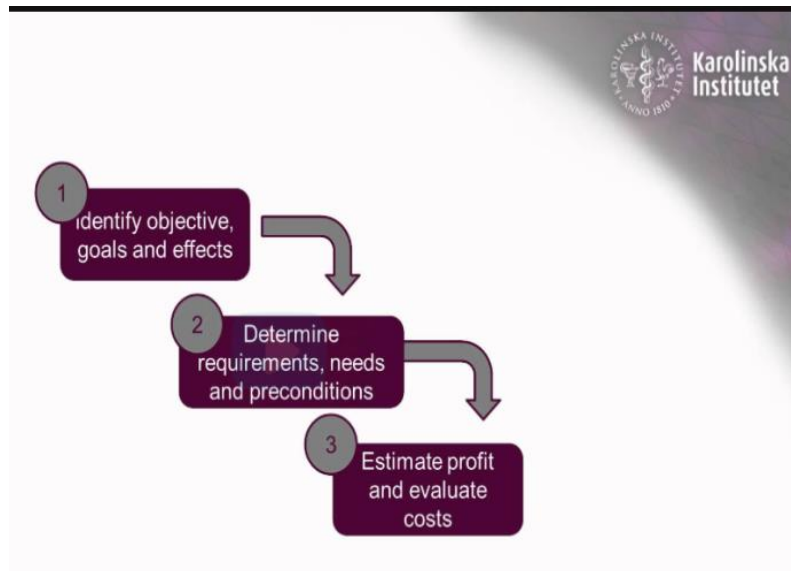
1. The eHealth development in Denmark was centered around primary care. It was focused on the development of electronic medical records and standards for electronic communication.
So the Danish strategy today presents five focus areas, namely healthcare services delivered in new ways, digital workflows and processes, coherent patient pathways, better use of data and governance.
2. Australia's strategy presents seven strategic principles-the national infrastructure, stakeholder engagement, incremental approach, recognizing different starting points- that is, adapting to local capabilities- more effective national leverage of eHealth balancing alignment and independence and relevant skills.
A current focus within the Australian strategy is the so-called PCEHR, the personally controlled eHealth record, which is a secure online summary of each Australian's health information.
3. South Africa is low and middle income country. In their national eHealth strategy, 10 strategic priorities are addressed which are strategy and leadership, stakeholder engagement, standards and interoperability, governance and regulation, investment, affordability and sustainability, benefits realization, capacity and workforce, eHealth foundations, applications and tools to support healthcare delivery, and monitoring and evaluation of the eHealth strategy.
The South African strategy also presents a clear action plan, including deliverables and timeline.

Setting up and implementing eHealth strategies

To set a strategic context, following steps to be consider_

1. Describe the country's state of population health, health system structure, health goals, and priorities, as well as societal and economic development priorities in order to motivate why eHealth is needed.
2. extensive consultation with all stakeholders,
3. Building blocks for an eHealth strategy, namely leadership and governance, strategy and investment, IT services and applications, infrastructure, standards and interoperability; legislation, policy, and compliance; and workforce.
4. The major work areas that are required to deliver the vision like, eHealth foundations or infrastructure, eHealth applications or solutions, and change and adoption.
5. The resource requirements for delivering the action plan and the approach to securing them are determined.
6. Implementation phases to structure and communicate the action plan are defined.
7. Monitoring and evaluation of activities of the action plan.
8. Relevant indicators as well as baseline and target measures for these indicators need to be defined.

Pre-requisites for local eHealth adoption



eHealth is an umbrella term that combines healthcare and technology to support people in a more efficient way, and it can also reduce health-related costs. eHealth can be considered to be a promising vehicle for health care provision. More strategic approaches are necessary for the planning, development, and implementation of eHealth.

KEY LEARNING

- ✓ Basic eHealth concepts and description of development of the field
- ✓ The success factors and barriers responsible for eHealth implementation
- ✓ Analyzing eHealth strategies and adapt them in relation to specific context
- ✓ The unique factors about the health sector
- ✓ The factors that are important to avoid failures when implementing eHealth
- ✓ The usable tools for care professionals
- ✓ Factors that the patients best organize and use their own health data to improve their condition

Technical Prerequisites and Opportunities for Innovation

Learning:

1. able to describe the technical and informatics prerequisites for implementing eHealth solutions.
 2. able to account for technical feasibility when implementing a eHealth solutions in a specific context.
 3. able to describe hinders and opportunities for innovation in the healthcare sector
- a wireless communication infrastructure is necessary.
 - If the computer tomography image that is taken at the radiology department should be viewed by the treating neurologist in the stroke unit, the image needs to be stored and transferred,
 - The drug information could be integrated from different IT systems using a classification system for drugs.
 - electricity should always available.
 - Also in emergency situations, that communication networks are reliable, and not least, that there exists a unique patient identifier.

Implementation of eHealth during COVID19 pandemic:

eHealth and telemedicine has the potential to solve many issues in this situation, simple e-health tools may give severely ill COVID-19 patients the possibility of having peer-to-peer communication and easily obtaining relevant health information, probably leading to maintained quality of life and better mental health. There are many functionality of e-Health Solutions for COVID-19 which can be:

- Communication
- Hygiene and personal protective equipment
- Remote patient monitoring
- Maintaining critical care
- Supply storage monitoring
- Training
- Virtual consultation

In order to improve people's health and strengthen essential services, e health can come up with some of the interventions like,

- Mobile learning for healthcare professionals via mobile devices.
- Digital tracking of health status and customer services;
- Communications with target patients
- Notifications of storage and management of pharmaceutical products via mobile devices
- Web-based tool that simplifies online form creation for data collection.