HEALTHCARE INFORMATION TECHNOLOGY-PERSPECTIVES, OPPORTUNITIES, ISSUES & CHALLENGES

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TODAY'S TALK

- WHAT IS HIS/HIT/DIGITAL HEALTH?

- TECHNOLOGY IN INDIA

- DURING & POST COVID DIGITAL TRANSFORMATION

- CURRENT ISSUES

- TRENDS LEADING TO DISRUPTIVE HEALTHCARE

- CHALLENGES

- OPPORTUNITIES

- WHERE CAN IIHMR CONTRIBUTE?

HEALTHCARE INFORMATION SYSTEMS

- *HEALTHCARE INFORMATION SYSTEMS* REFERS TO SUCH SYSTEMS THAT ARE USED TO PROCESS DATA, INFORMATION AND KNOWLEDGE IN HEALTHCARE ENVIRONMENTS (HAUX, WINTER, AMMENWERTH, & BRIGL, 2004).

- *COMPUTERIZED PATIENT RECORDS, ELECTRONIC MEDICAL RECORDS, ELECTRONIC HEALTH RECORDS, EVEN HOSPITAL INFORMATION SYSTEMS*

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TRENDS LEADING TO HIS

- TREND 1: FROM PAPER-BASED SYSTEMS TO COMPUTER-BASED SYSTEMS

- TREND 2: FROM LOCAL TO GLOBAL INFORMATION SYSTEMS

- TREND 3: FROM HEALTHCARE PROFESSIONALS TO PATIENTS AND CONSUMERS

- TREND 4: FROM USING DATA FOR PATIENT CARE TO RESEARCH

- TREND 5: FROM TECHNICAL TO STRATEGIC INFORMATION MANAGEMENT ORIENTATION

- TREND 6: FROM NUMERIC DATA TO MORE COMPLEX FORMS OF DATA

Healthcare Information Technology (HIT)

HIT - Holistic management of health information across computerized systems and its secure exchange between consumers, providers, government and quality entities and insurers

Digitization of Patient health records

Reaching remote parts of country -Telemedicine

Advanced patient monitoring and tracking

Address scarcity of doctors and hospital beds issue

Knowledge management - vaccination, hygiene maintenance, healthy lifestyle, etc., could be spread easily

The term "health information technology" (health IT) refers to the electronic systems health care professionals – and increasingly, patients – use to store, share, and analyze health information.
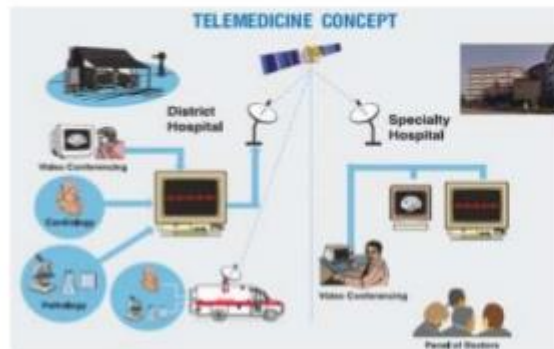Currently it includes all tools and technology that relates to patient health

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5

Telemedicine

Telemedicine is the utilization of medical information exchanged from one site to another, via electronic communication tools for improving a patient's clinical health status

Unwillingness of doctors to work in the rural areas

Large number of patients in rural India travel to cities

TELEMEDICINE CONCEPT

District Hospital

Specialty Hospital

Facilitating Accessibility & Affordability

Providing treatment at Par with Metropolitans

Overcoming the Scarcity of Paramedics & Hospital Beds

Health Information Management System (HIMS)

HIMS

Laboratory
Primary Physician & Specialty Physician
Hospitals
Employer
Payer
Pharmacy
Radiology
Physician Network

Patient's data/test records are accessible at any point of time, anywhere

Patient's movements could be tracked with data centralization

Saves a lot of space in physical terms

Enables Patient/Vendor accounting (insurance or other claims) and smoothens the whole process

HIMS automates it all

M-health - Delivery of healthcare services/information via mobile phones
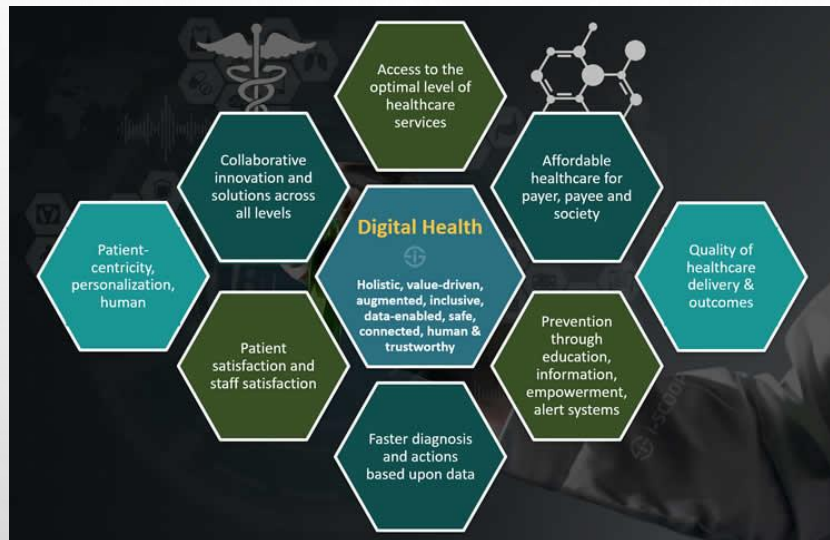
AR/VR

Social media

Digital health, which includes digital care programs, is the convergence of digital technologies with health, healthcare, living, and society to enhance the efficiency of healthcare delivery

Digital health refers to the usage of digital technologies to enable universal healthcare access, improve healthcare quality/outcomes and enhance the health and physical and emotional well-being of populations.

TECHNOLOGY IN INDIA

- DIGITAL INDIA CAMPAIGN – 2015

- SECOND-FASTEST DIGITAL ADOPTER IN THE WORLD

- HALF A BILLION INTERNET USERS AND 350 MILLION SMART PHONE USERS

- REMARKABLE ACHIEVEMENTS IN ISRO

- RISE OF INDIA TRAINED CEO'S IN TECHNOLOGY COMPANIES

- WOMEN ENTREPRENEURS GLOBALLY ACCLAIMED

- RISE OF AI/ML APPLICATIONS, ECOMMERCE APPLICATIONS

WHAT IS HAPPENING IN INDIA?

Digital India Campaign 2015

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National Health Policy 2017

National Health Stack 2018

National Digital Health Blue Print

National Digital Health Mission

Digital Standard, PDP act

13

INTEROPERABILITY AND PORTABILITY

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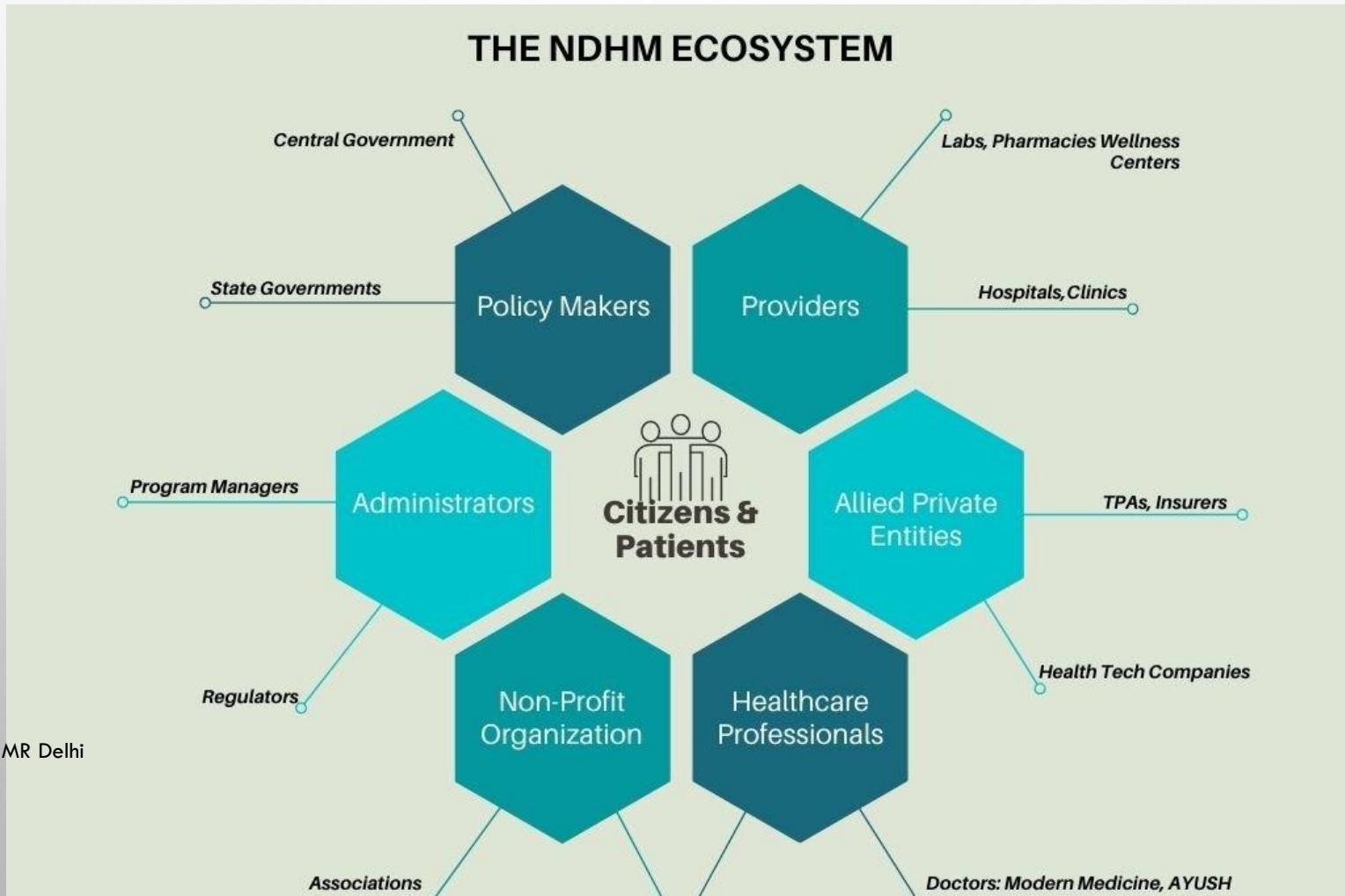
BENEFITS OF NDHM

Arunima Rajan

- DIGITAL HEALTH RECORDS
- CONTINUUM OF CARE
- EASE OF DOING BUSINESS
- EASY ACCESS TO HEALTHCARE
- EVIDENCE BASED PLANNING AND POLICIES
- INNOVATION IN DIGITAL HEALTH SERVICES
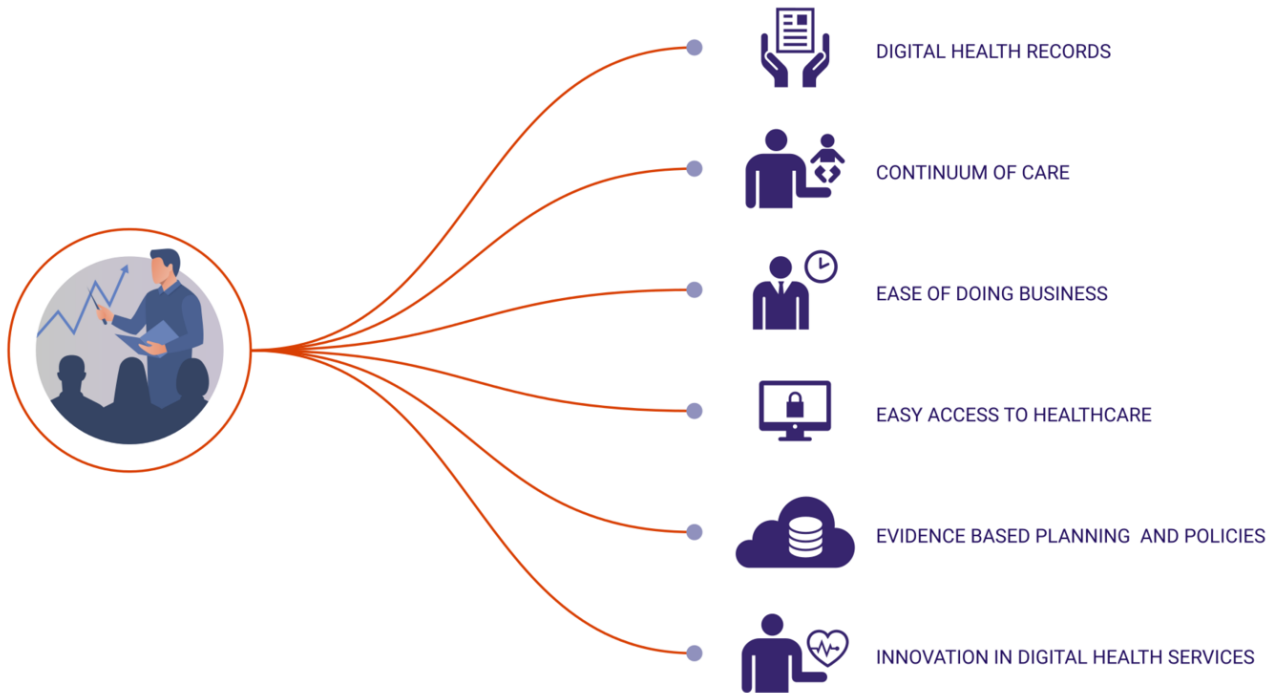
News Reports

DURING COVID

- EXTENSIVE USE FOR MONITORING & SURVEILLANCE LIKE THERMAL CAMERAS, M-APPS

- INNOVATIONS IN MEDICAL DEVICES , THERAPEUTIC KITS

- WIDESPREAD USE OF SOCIAL MEDIA, ECOMMERCE AND COLLABORATION PLATFORM

- EXPLOSION IN THE ADOPTION OF VIRTUAL CONSULTATION

- USE OF TELEMEDICINE

- ROBOTS, DRONES AND AUTONOMOUS VEHICLES

- ARTIFICIAL INTELLIGENCE AND MOBILE APPLICATIONS

RECENT REPORT RELEASED BY BCG AND FICCI

85% — Clinicians used teleconsultation and digital platforms during the lockdown

50% — Doctors found digital platforms to be an effective tool for patient interactions

80% — Tele-consultation services were from first time users

44% — Tele-consultations were from non-metro cities

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17

POST-COVID DIGITAL TREND

- NEW NORM – DIGITAL HEALTHCARE

- ADOPTION OF TECHNOLOGY FOR A RANGE OF CLINICAL, ADMINISTRATIVE, AND FINANCIAL WORKFLOWS

- TELEMEDICINE AS INTEGRAL PART OF PATIENT CARE

- REMOTE MONITORING

- SMART HEALTHCARE DEVICES

- ROBOTICS
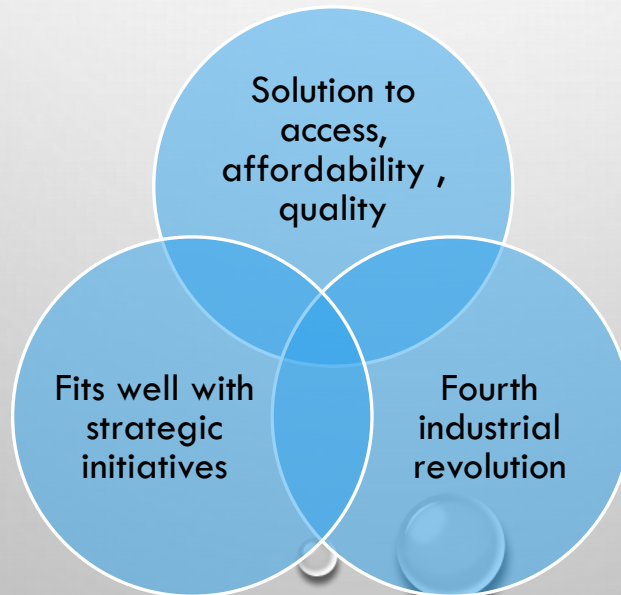
- INTERNET/ SOCIAL MEDIA ADOPTION

WILL THE DIGITISATION OF HEALTH DATA MAXIMISE HEALTH OUTCOMES OR ACHIEVE THE GOAL OF "HEALTH FOR ALL"?

CURRENT ISSUES

- FRAGMENTED HEALTHCARE

- HUMAN RESOURCE INADEQUATE HUMAN RESOURCE IS LACKING QUALITY (HEALTHCARE ACCESS AND QUALITY (HAQ) INDEX, IT IS RANKED A DISMAL 145 OUT OF 195 COUNTRIES) [3]

- LACK OF ADEQUATE HEALTHCARE FINANCING AND STAFFING
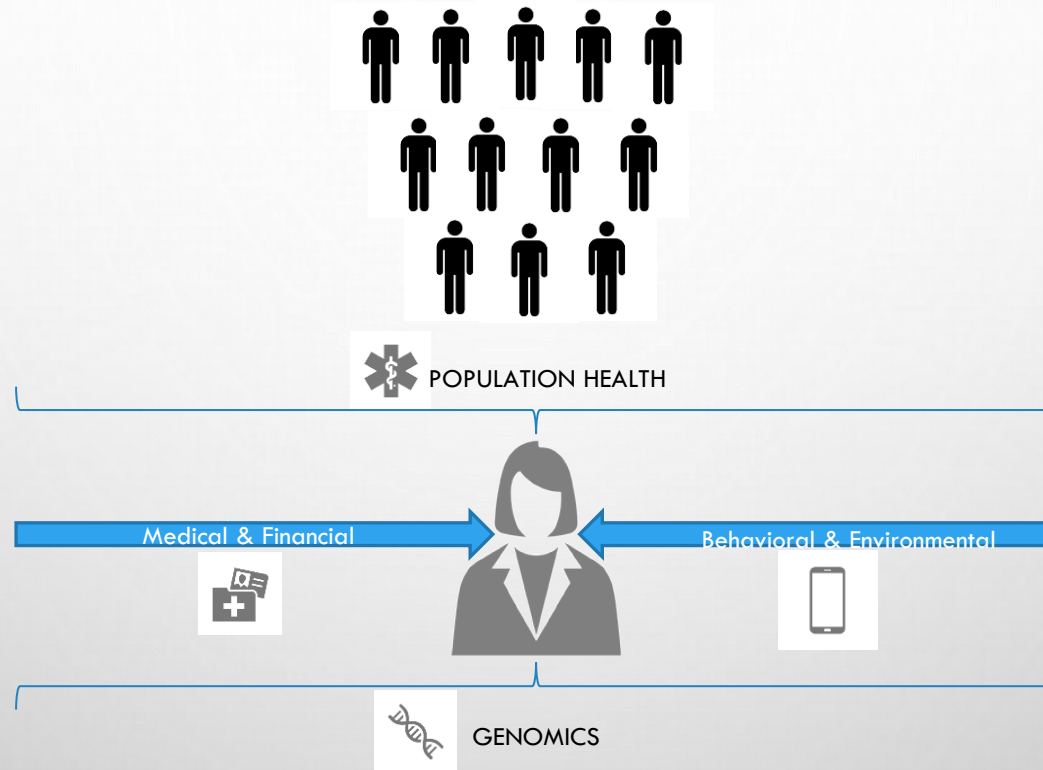
WHAT SHOULD BE DONE?

- FULL IMPETUS IN DELIVERING, CONSUMING DIGITAL HEALTH SERVICES

- MEASURE THE IMPACT OF HEALTH SERVICES

- DIGITAL SOLUTIONS ACROSS THE CARE PATHWAY OF PREVENTION, DIAGNOSIS AS WELL AS CURE IS THE SMARTEST ROUTE

Solution to access, affordability , quality

Fits well with strategic initiatives

Fourth industrial revolution
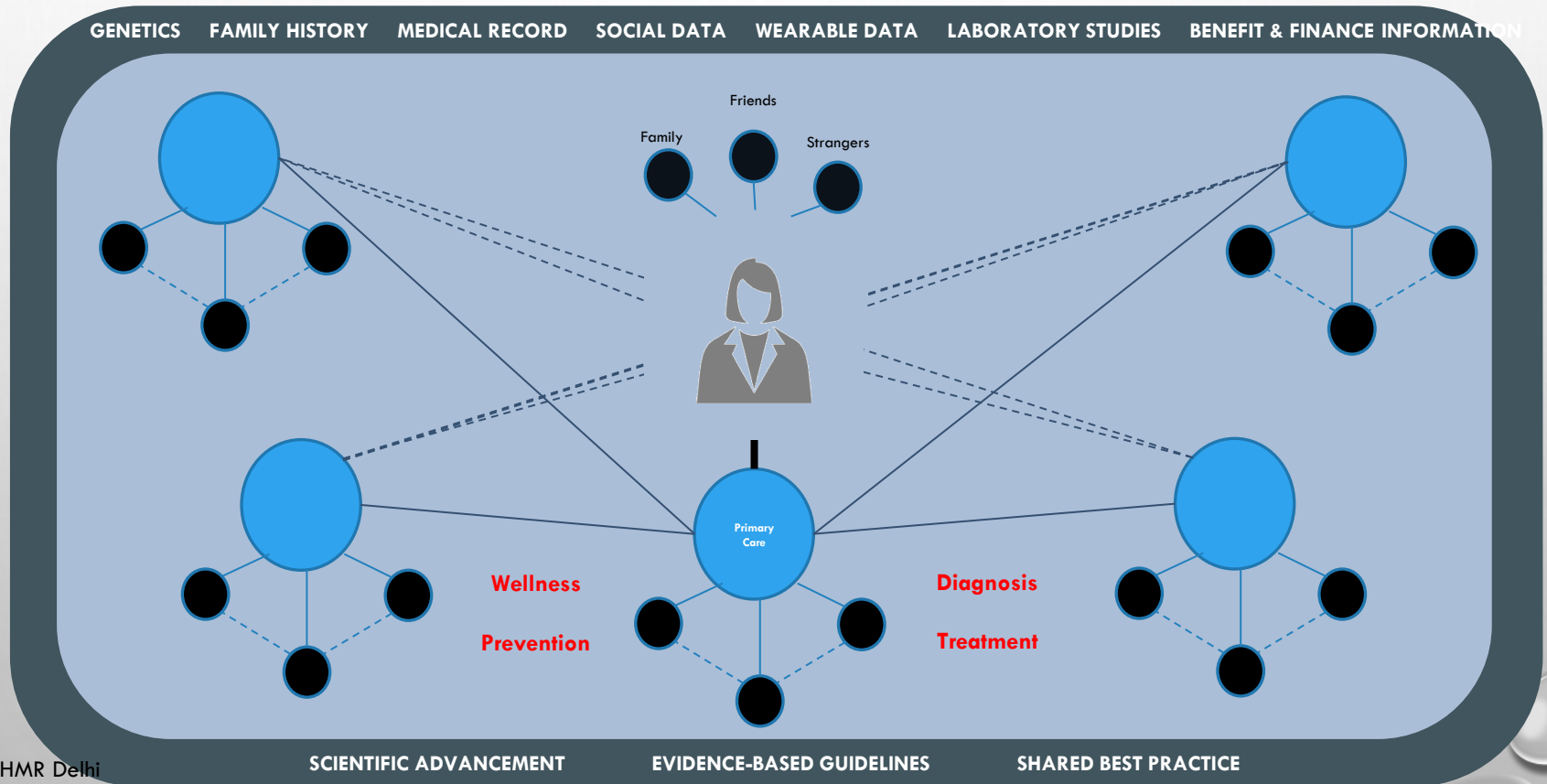
TRENDS LEADING TO DISRUPTIVE HEALTHCARE

- THE RISE OF EMPOWERED PATIENTS

- BIOLOGY-BYTES-BANDWIDTH

- PERSONALIZED AND DATA DRIVEN MEDICINE

- INCREASING ADOPTION OF AI/ ML

IMPACTING THE INDIVIDUAL

POPULATION HEALTH

Medical & Financial

Behavioral & Environmental

GENOMICS

Individual to Community

PATIENT-CENTRIC INFORMATION UNIFICATION

GENETICS   FAMILY HISTORY   MEDICAL RECORD   SOCIAL DATA   WEARABLE DATA   LABORATORY STUDIES   BENEFIT & FINANCE INFORMATION

Friends

Family   Strangers

Primary Care

Wellness   Diagnosis

Prevention   Treatment

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SCIENTIFIC ADVANCEMENT   EVIDENCE-BASED GUIDELINES   SHARED BEST PRACTICE

PRECISION MEDICINE TECHNOLOGY INGREDIENTS

- Information systems governance

- Widely adopted & integrate EMR

- Genetic sequencing

- High Performance Computing

- HIPAA compliant data security and informed consent

- Discrete phenotype/research data warehouse

- Unstructured data mining

- Enterprise clinical trial informatics

- Molecular decision support

- Remote patient data capture/monitoring & biometrics

- Health Information Exchange

- The whole patient

"In Girl's Last Hope, Altered Immune Cells Beat Leukemia"

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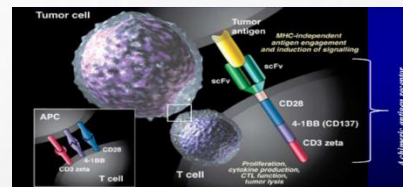
"An emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person" - predictive, preventative, personalized, participatory (P4)
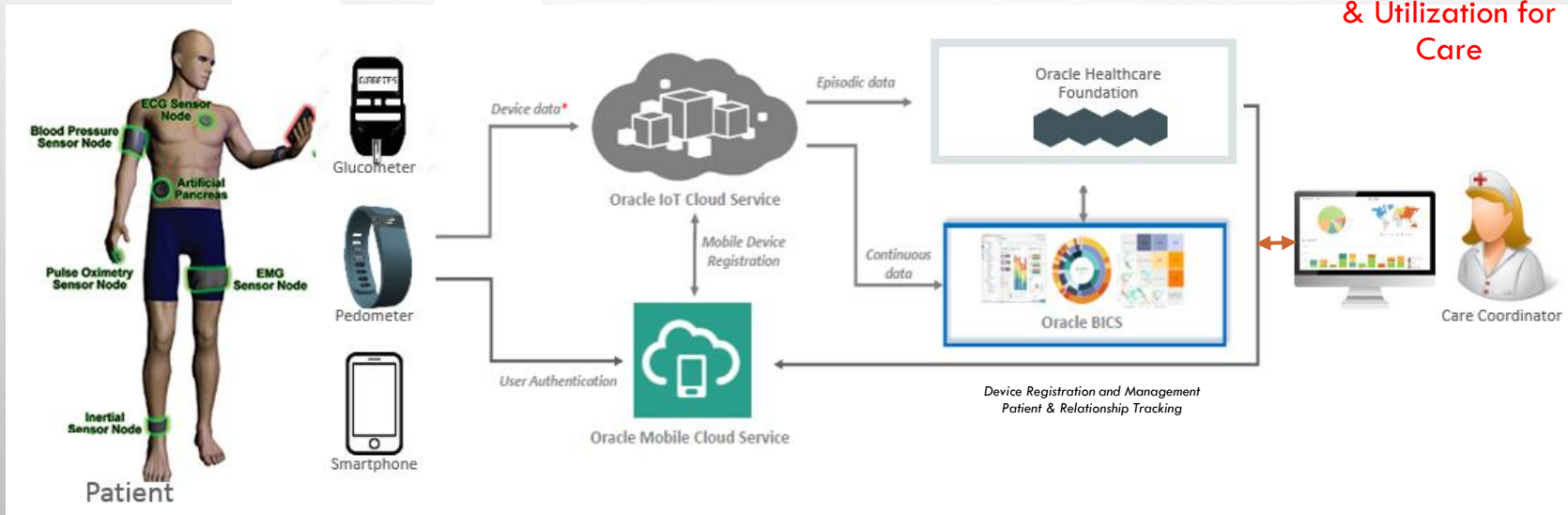
ENTERPRISE REMOTE PATIENT ENGAGEMENT

Identify Unique Individual

Register Device to Individual

Match Device & Individual to Health Record

Normalized & Aggregated Data Enables Analysis & Utilization for Care

INTERNAL MODEL SHARED BY ORACLE

PREDICTIVE ANALYTICS

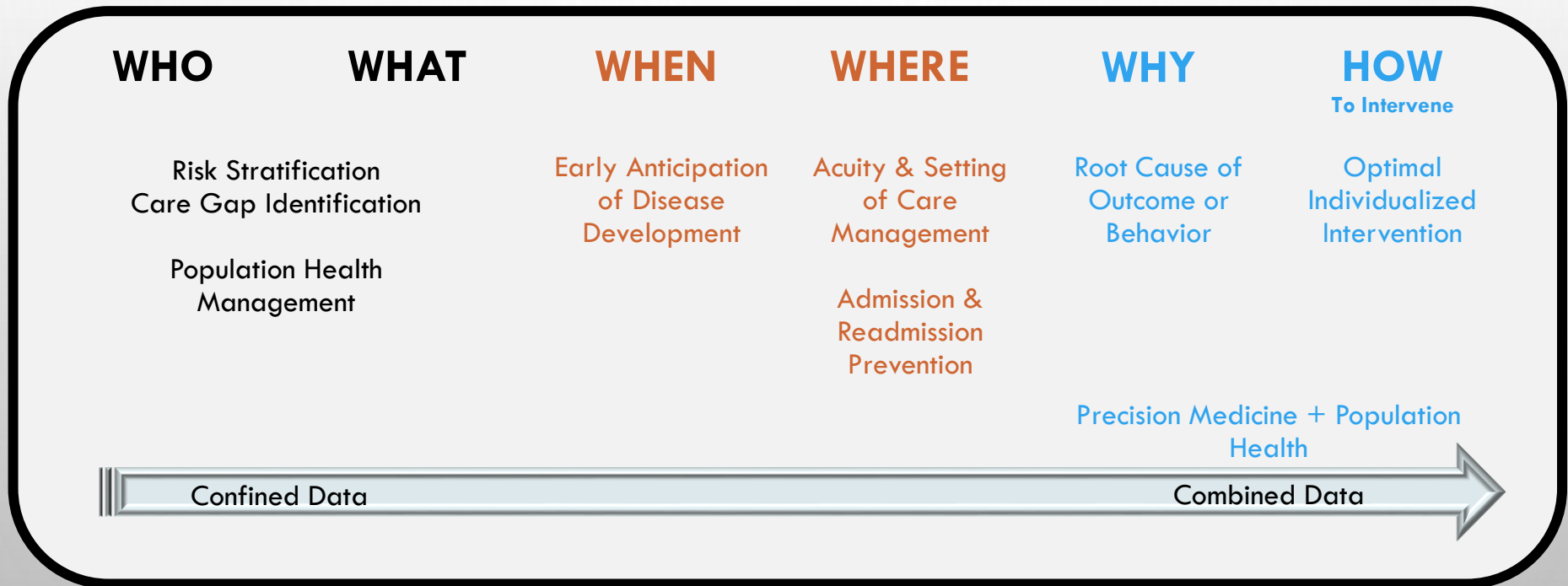| WHO	WHAT	WHEN	WHERE	WHY	HOW To Intervene
Risk Stratification Care Gap Identification		Early Anticipation of Disease Development	Acuity & Setting of Care Management	Root Cause of Outcome or Behavior	Optimal Individualized Intervention
Population Health Management			Admission & Readmission Prevention		
					Precision Medicine + Population Health

Confined Data → Combined Data
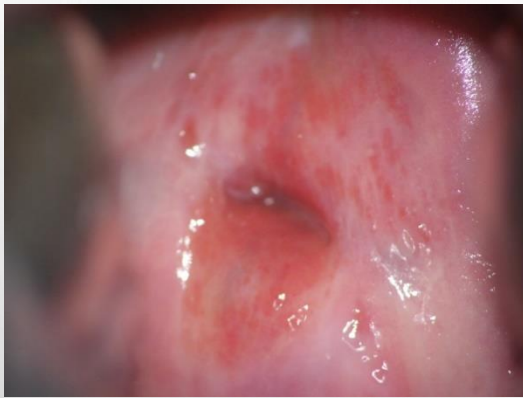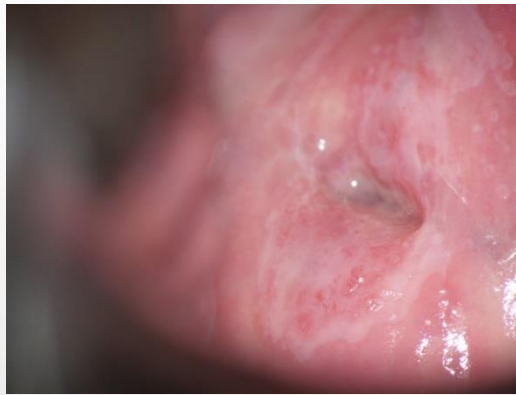
DATA-DRIVEN INTELLIGENT CARE
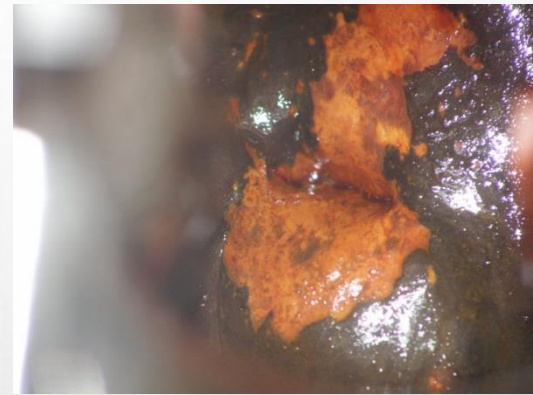
IMAGE PATTERN RECOGNITION

DIGITAL CERVICOGRAPHY

Standard Visualization

Acetic Acid

Lugol's Iodine

Resource-constrained environments struggle to do Pap smears
Machine learning applied to cervical images taken with digital camera
Enhanced detection of suspicious lesions to enable biopsy and additional care

Images courtesy of Dr. Simon Manga, Cameroon Baptist Convention Health System

Deep Tech in Human Biology

Genetic Engineering and Biotech Innovations

Digital Therapeutics and Diagnostics

ICT Advances- cloud computing, 3 D printing, VR/AR

AI/ML/Block chain

CHALLENGES TO ADOPTION

- INADEQUATE HUMAN RESOURCE

- FORMER BARRIERS TO DIGITAL TRANSFORMATION MAY RETURN

- EHR ADOPTION IS STILL LAGGARD – FILTER TO ADVANCE DIGITAL SOLUTIONS

- NDHA NOT IN PLACE – PDP BILL

- DATA GOVERNANCE IS STILL A PROBLEM

- INFRASTRUCTURE IS STILL A PROBLEM – ROBOTICS & DRONES??

CHALLENGES TO ADOPTION

- AI APPLICATIONS– POC NOT YET KNOWN

- REGULATION SOFTWARE AS MEDICAL DEVICE – NOT COVERED

- HEALTH TECHNOLOGY ASSESSMENT

- TELEMEDICINE EVALUATIONS ARE IN SILOS NO BROAD FRAMEWORK

- STANDARDS ARE STILL TO BE ADOPTED

- INNOVATIONS MANY – SUSTAINABILITY & SCALABILITY IS LESS

- OBSOLESCENCE OF TECHNOLOGY IS A FACT OF LIFE

KEY CONSIDERATIONS

- EMPOWERING OUR FRONTLINE HEALTHCARE WORKERS WITH KNOWLEDGE AND DIGITAL LITERACY THAT WILL AID THEIR DIGITAL HEALTH ADOPTION JOURNEY

- DATA POLICIES SHOULD BE ROBUST TO PROTECT THE RIGHTS OF CITIZENS

- HARMONIZATION ACROSS VARIOUS GOVERNMENT POLICIES TO SUPPORT THE GROWTH OF DIGITAL HEALTH

- ABILITY AND EASE OF ACCESS TO GLOBAL MARKETS, TALENT, DATA, AND TECHNOLOGIES TO DELIVER VALUE TO CLINICIANS AND PATIENTS LOCALLY

- CLEAR POLICY AND LEGISLATION FOR DELIVERY AND REIMBURSEMENT OF SERVICES, SUCH AS VIRTUAL CONSULTATIONS, DIGITAL PRESCRIPTIONS AND VIRTUAL ICU MANAGEMENT FOR CRITICAL CARE

WHERE CAN IIHMR CONTRIBUTE

- ACADEMIC

- RESEARCH

- TRAINING

- THINK TANK

HERCULEAN TASK

- CURRICULUM STANDARDISATION

- JOB OPPORTUNITIES

- RESEARCH AREAS

- TRAINING HUMAN WORKFORCE

- INDUSTRY COLLABORATIONS

"

CARE SHIFTING FROM THE HOSPITAL TO THE CLINIC, FROM THE CLINIC TO THE HOME AND FROM THE HOME TO A 24/7, UBIQUITOUS ACCESS TO CARE, DRIVEN BY THE MOBILE PHONE

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FUTURISTIC HEALTHCARE IN INDIA