



# eHEALTH and mHealth for Chronic Disease Management

- Envisaging the Paradigm- The Unconventional Way

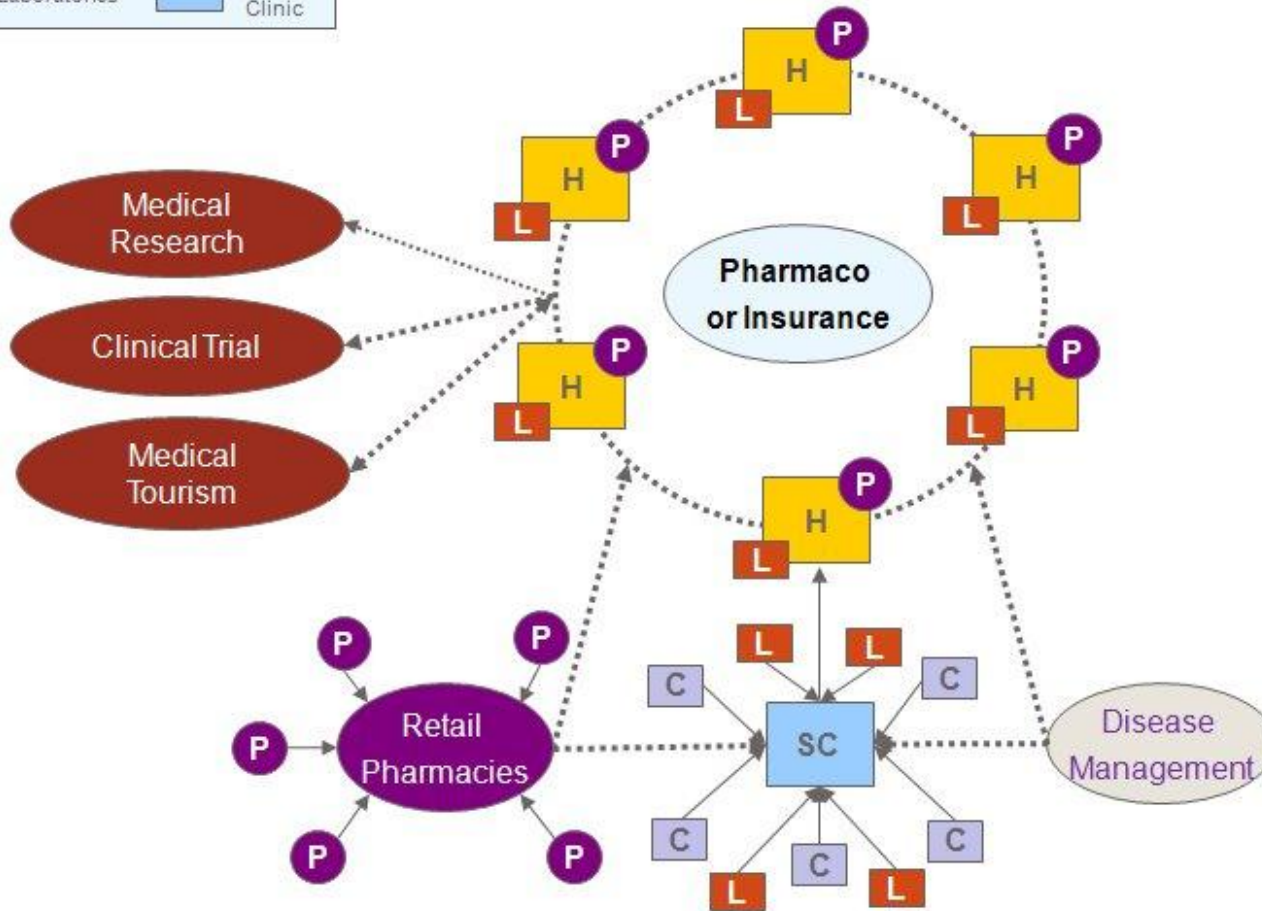
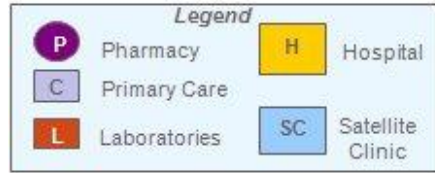
Presented at  
HOSPIKON 2011, Pune  
05th Feb 2011



**Dr Pankaj Gupta**  
eHealth Business Executive



# Emerging trends – Encounter based medicine is moving towards a Healthcare contract for disease management.



Its in the interest of Pharmaco and Insurance to fund the Disease Management programs because only the Pharmaco and Insurance have the incentive to improve the health of the chronic disease patient.



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# **Disease Burden**

- Dr Pankaj Gupta

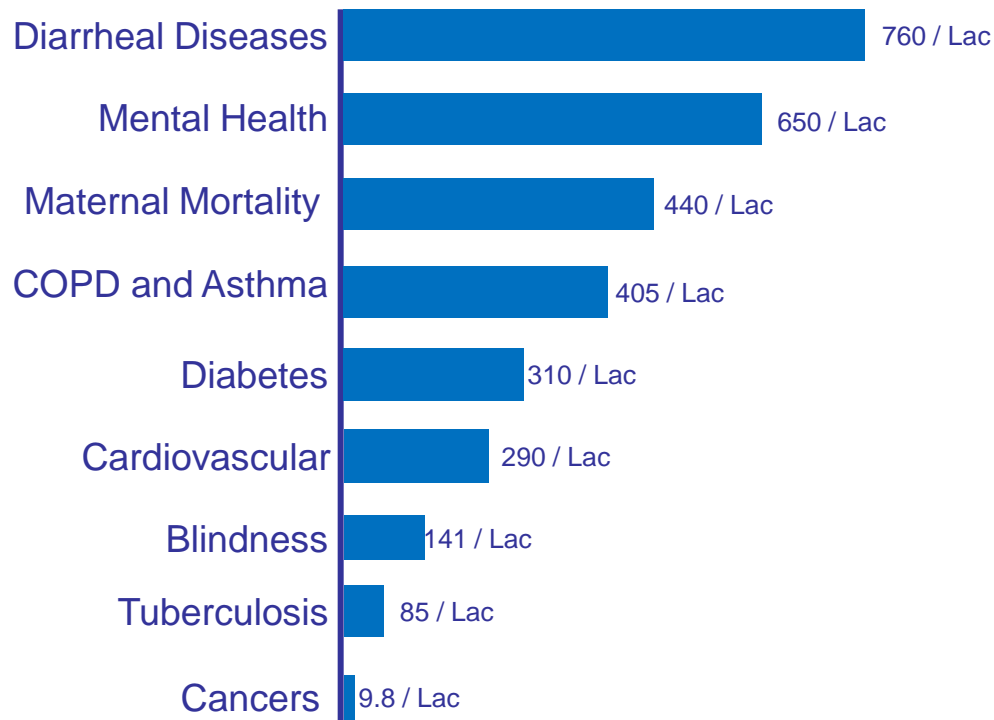


# Mental Health, COPD, Asthma, Diabetes and Cardiovascular disease remain the top non-communicable diseases important to Indians



Communicable diseases can be treated but non-communicable diseases remain for a life-time and need to be managed

## Disease Burden Estimates 2005



## Key Findings

- Large proportion of urban India is very or somewhat concerned about the growing risk from non-communicable diseases.
  - Urban Indians are significantly more likely than rural Indians to suffer from non-communicable diseases
  - Rural India is more likely to suffer from communicable, maternal and peri-natal diseases
  - Estimates for the disease burden for **2015** show a significant jump in **Cardiovascular diseases** (640 cases/ Lac), **Mental Health** (800 cases/ Lac), **COPD** and **Asthma** (596 cases/ Lac) and **Diabetes** (460 cases/ Lac) while the top communicable diseases with the exception of diarrheal diseases are expected to show a significant drop.

# Disease burden due to non-communicable diseases continue to be a major cause of morbidity in India

India's Most Ignored Health Problem: Cardiovascular Disease, COPD, Asthma and Diabetes

India spends only 4.8% of its GDP on Healthcare

People between the age group of 50-59 have the highest prevalence of Cardiovascular disease and Diabetes

The estimated episodic cost of treating heart disease, diabetes, and asthma/COPD is Rs. 11,000, Rs. 5000, and between Rs. 20,000 - 32,000 respectively

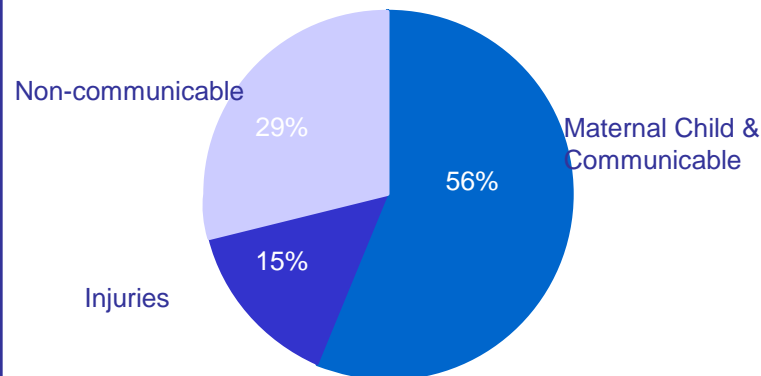
With the government and external funding agencies focusing on communicable disease little or no attention is paid to the threat of communicable diseases.

A Below Poverty Line [BPL] family study shows 333 days of wages lost due to a single episode of Heart disease; 100 days for Diabetes and between 650-900 for COPD and Asthma

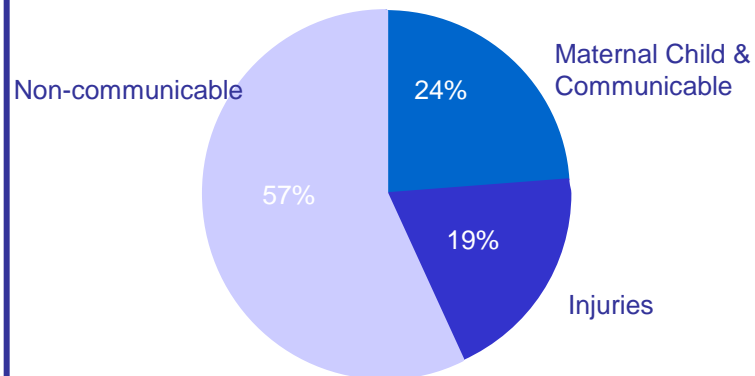
Cardiovascular diseases are expected to increase by 120% through 2015

Source: Report of the National Commission on Macroeconomics and Health, Ministry of Health and Family Welfare, Government of India, 2005

### Disease Burden 1990



### Disease Burden 2020



Source: Chapter 2.8, 10<sup>th</sup> Five Year Plan, Planning Commission, Government of India



# Antibiotics, Cardiac, CNS, Vitamins, NSAIDs and Respiratory are major pharmaceutical revenue generators

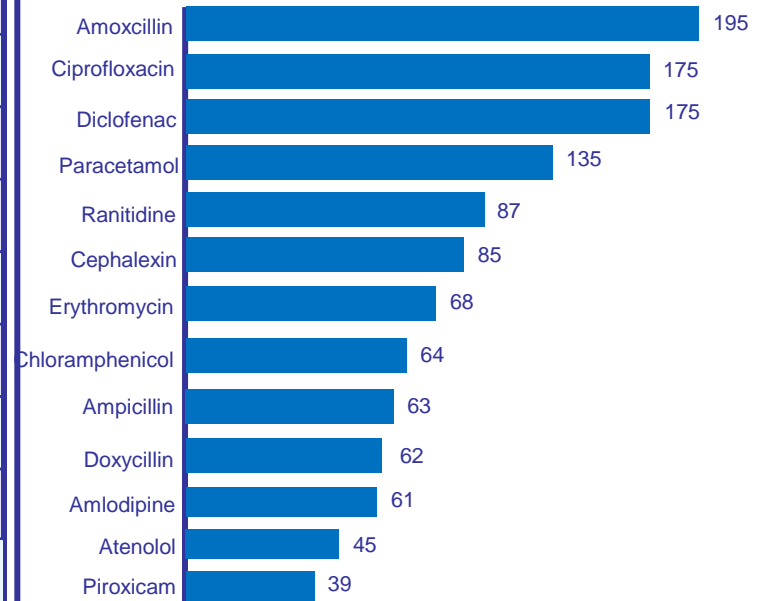


A Therapeutic View of the Most Important Diseases

Leading Therapeutic Classes - 2005	Sales (Bil.INR)	Market Size (%)	Therapeutic Area
Antibiotics	33	15.7	Anti-Microbial
Cardiac Therapy	10.2	6.9	CVD
CNS & Psychiatric Therapy	9.6	6.5	CNS
Vitamins	8.9	6.1	Anabolic
NSAIDs & Anti-Rheumatism	8.8	6.0	Anti-Inflammatory
Respiratory Ailments	7.8	5.3	Respiratory
Antacids & Anti-Ulcerants	6.2	4.3	Gastrointestinal
Anti Anemic	3.7	2.8	Anabolic
Anti Diabetic	3.7	2.7	Endocrine
Anti TB	3.6	2.5	Anti-Mycobacterium
<b>Total</b>	<b>95.5</b>	<b>58.8</b>	

Antibiotics are the major sales because of high incidence of Communicable diseases in India. However sales of cardiac, CNS and respiratory are the next big category of drug sales

India has process copyright but no IP protection, hence, multiple brands of same drug are often available



Source: Developing Innovative Capacity in India to Meet Health Needs, Dr. HR Bhojwani, Advisor to Minister of State for Science and Technology, Government of India



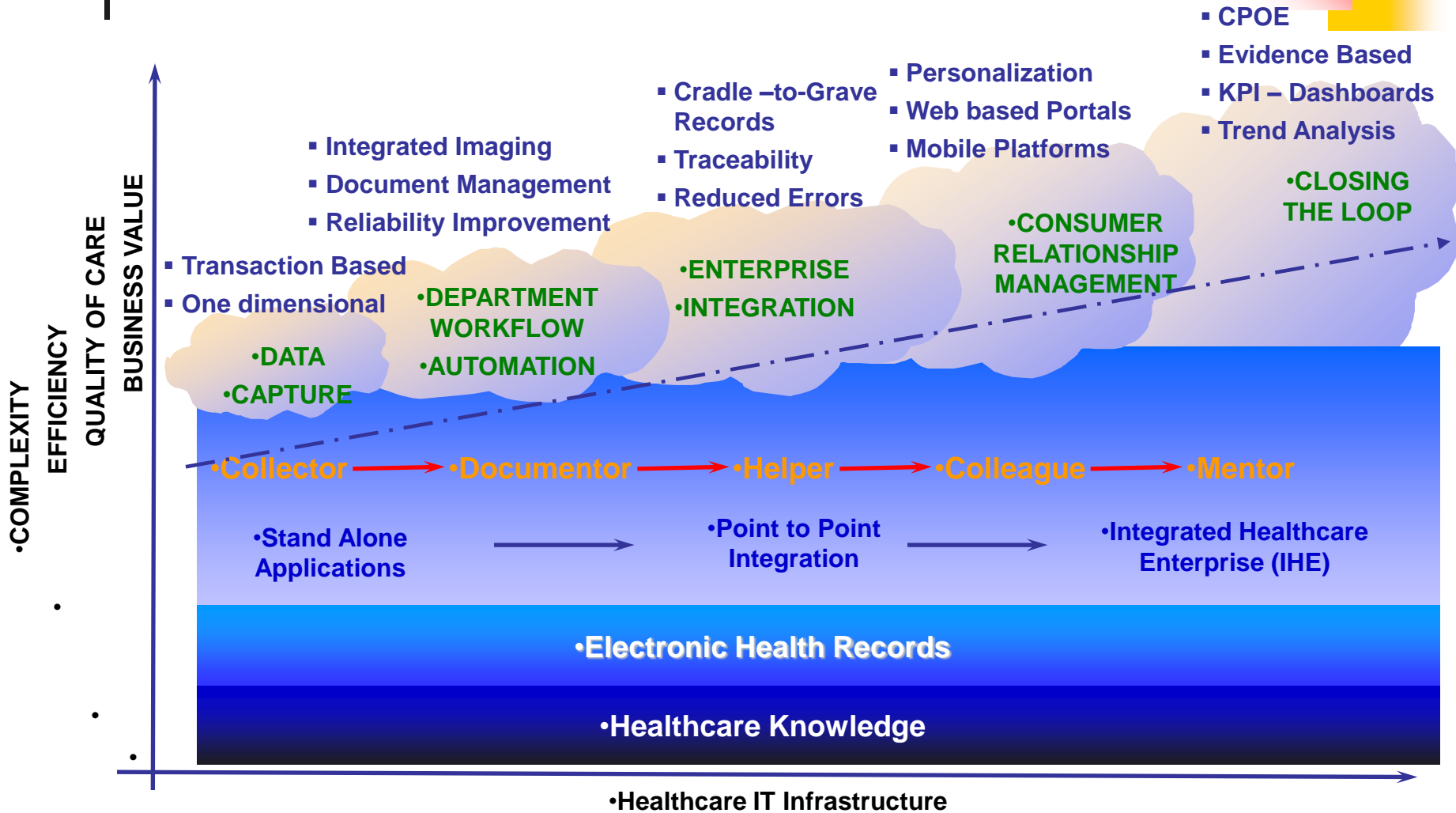
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# **eHealth and mHealth Solutions**

- Dr Pankaj Gupta



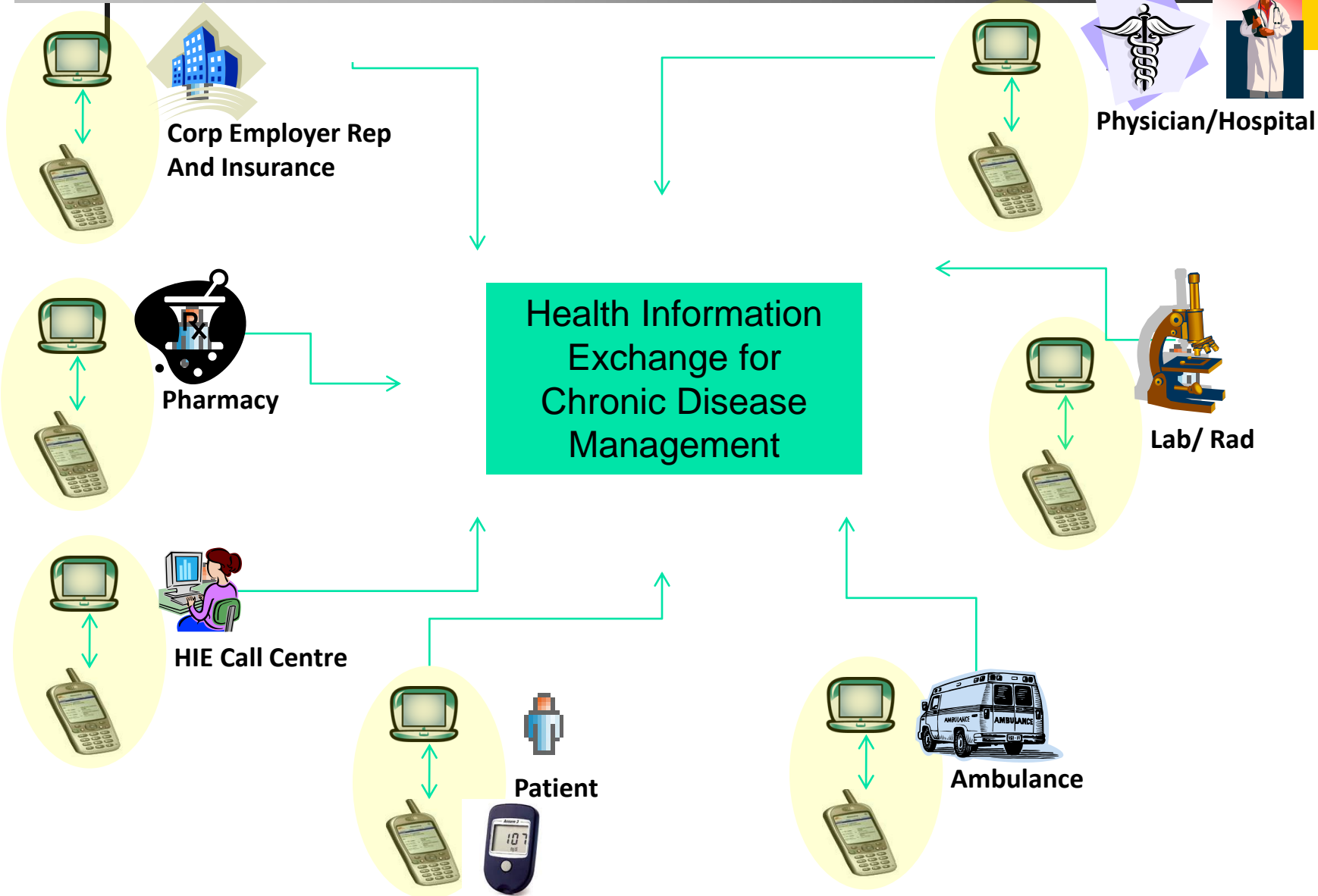
# Health delivery has changed with time and so have electronic systems to support health delivery. However closing the loop remains a challenge..



•Source: CPOE: Way Forward, paper presented by Dr Pankaj Gupta in ICMIT, IIT Kharagpur, 2005



# Convincing all the stake holders to share the data on a cloud is the biggest challenge in building a health information exchange





# Alerts and reminders can ride on the HIE and CDM backbone to improve compliance



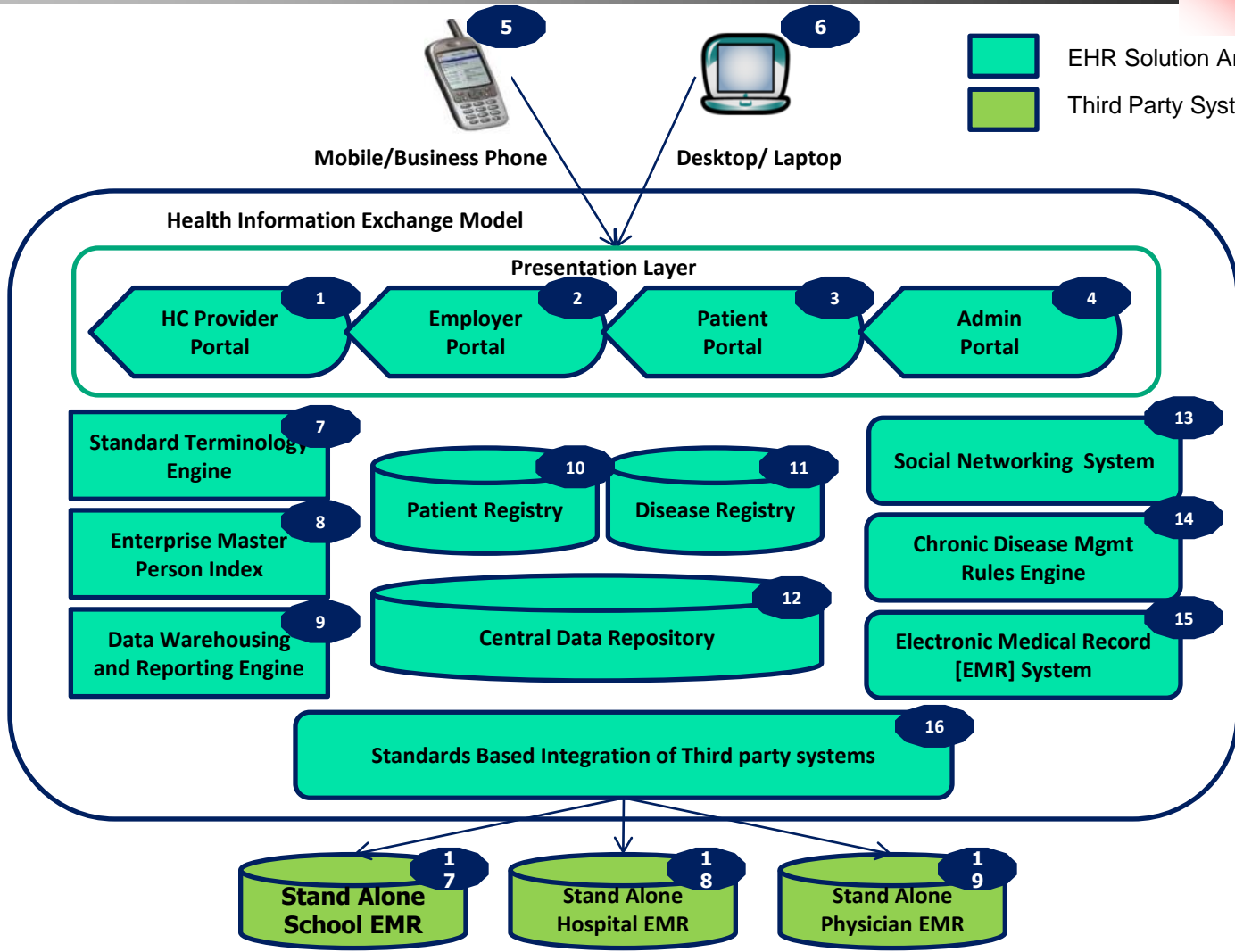
Presenting a conceptual system for Disease management through mobile platforms

	Call-in	Call-in	Call-out	Call-in	Call-out	Call-out	Call-in/Out
	IVR	Call Centre	Call Centre	SMS/MMS	SMS/MMS	Voice Mail	Mobile Modem
Lab Reminder			Y		Y	Y	
Lab Report Upload	Y	Y	Y		Y	Y	Y
Physician Appointment Reminder			Y		Y	Y	
Medical Record Upload		Y	Y				Y
Medicine Dose Reminder			Y		Y	Y	
Medicine Refill Reminder			Y		Y	Y	
Refill Confirmation Upload	Y	Y	Y	Y#	Y#		Y
Diet Reminders			Y*		Y	Y	
Exercise Reminder			Y*		Y	Y	
Home Monitor Reminder			Y*		Y	Y	
Upoad Home Monitor Data - integrated				Y			Y
Upoad Home Monitor Data - manual	Y	Y	Y	Y#	Y#		
Disease Education material	Y				Y	Y	Y

- Call-in: When a patient, clinician or pharmacist calls into the DM system
- Call-out: When the DM systems calls out to the patient, clinician or pharmacist
- Y\*: Call centre can't call too often else the patient will feel overwhelmed.
- Y#: Call-out and Call-in combo for SMS
- Mobile Modem: System at the point of use is connected to the central repository through mobile modem



# Health information exchange [HIE] is required to integrate healthcare entities and enable chronic disease management [CDM]



Solution Architecture of an Electronic Health Record System [EHRs] from a functional perspective

Source: <http://healthcareitstrategy.blogspot.com>



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# Behavior Change Challenges

- Dr Pankaj Gupta

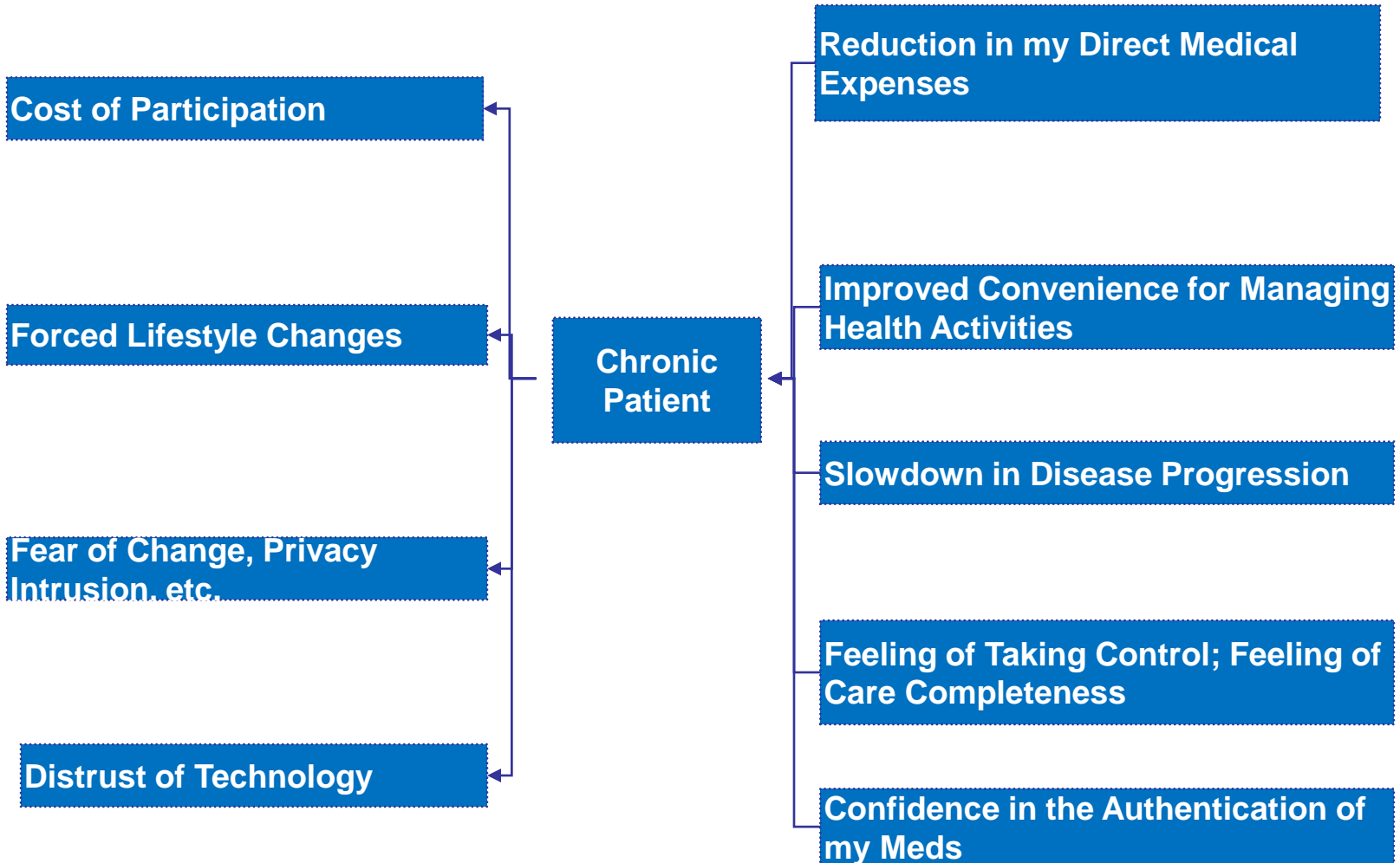


# The Chronic Patient perspective - fears over the benefits



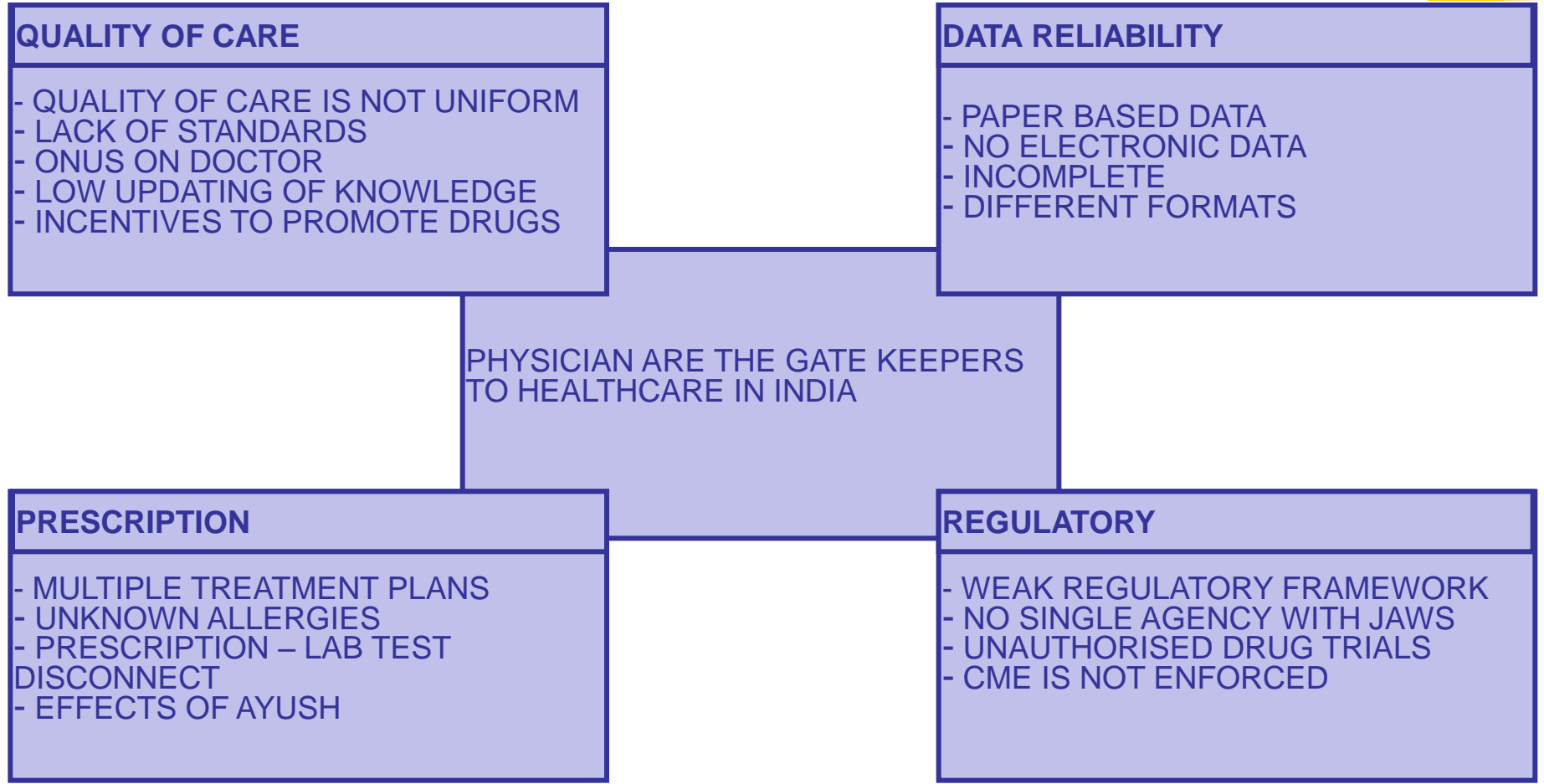
## Detractors

## Key Benefits





# Physicians are the HC Gate Keepers, but there is evidence to suggest that they are ill-equipped to deliver consistent Quality of Care [QoC]





# Today, in India, Patients tend to lack any real influence over their QoC



## PHYSICIAN SWITCHING

- DOCTOR – PATIENT FACE TIME
- PATIENT WANT HUMAN TOUCH
- PATIENTS NEED INSTANT RELIEF
- MULTIPLE PHYSICIANS
- MULTIPLE TREATMENT PLANS

## MEDICATION HABITS

- APATHY TOWARDS MEDICATION
- ALTERNATIVE MEDICINE
- SELF MEDICATION
- SELF DECISION MAKING

PATIENTS ARE AT RECEIVING END FOR HEALTHCARE IN INDIA

## REGULATION

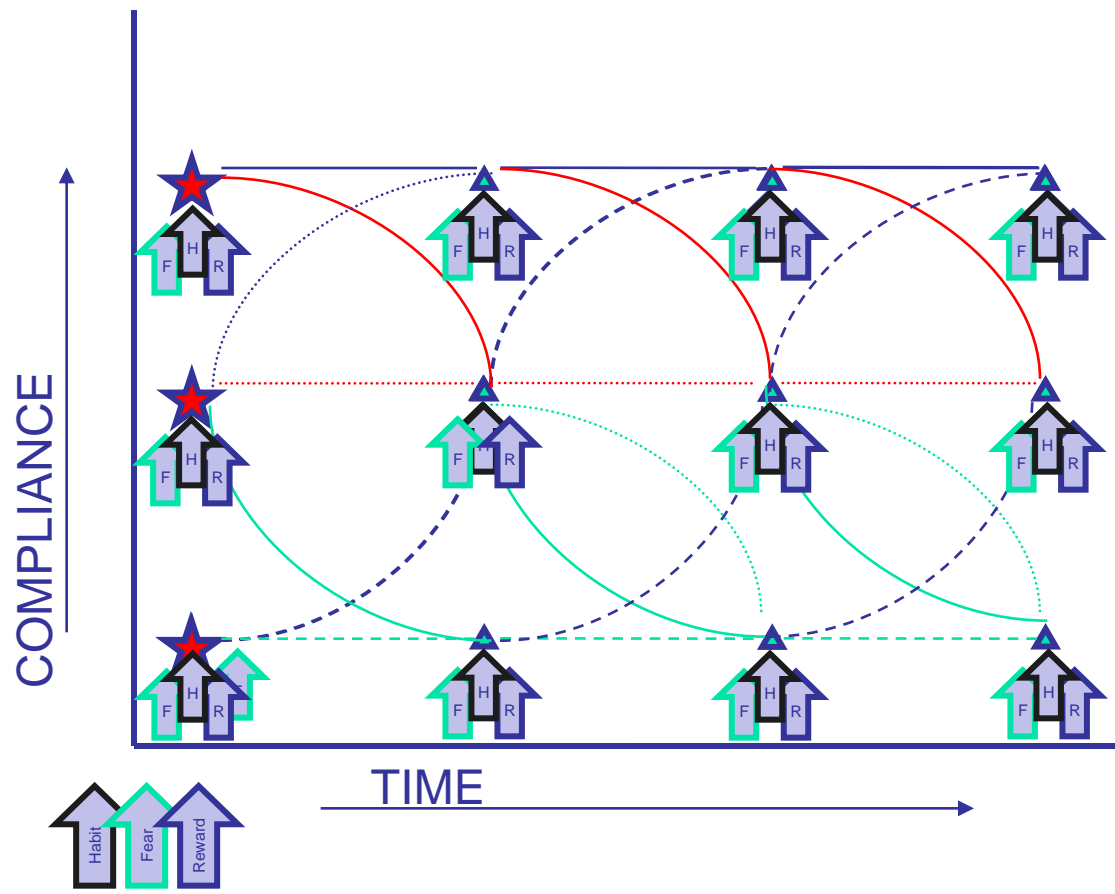
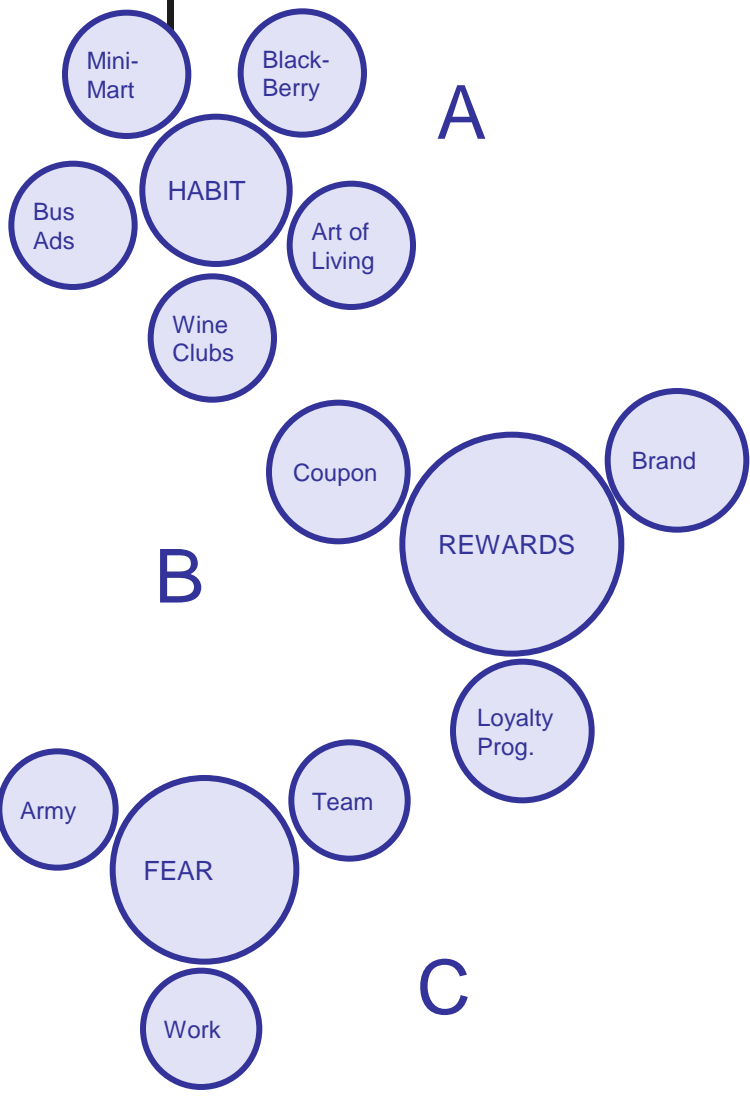
- CONSUMER PROTECTION ACT
- DRUG PROMOTION TO PATIENTS

## COST

- OUT-PATIENT IS OUT-OF-POCKET
- DESIRE FEELING OF WELL BEING
- DON'T WANT TO PAY EXTRA



# Behavior change occurs in small steps and requires constant reinforcement to result in healthier behavior





# Personalization and convenience are key factors in behavioral modification cases - a blend of high tech and "high touch" is the most effective



No single communication channel will be effective for all individuals. Some demographic groups can't (or won't) access the Internet, others lack phone service, and still others prefer to receive services directly from employees at local insurance offices rather than use self-service kiosks.

Evaluate communication channel options in terms of four criteria: sensitivity of data, need for timeliness, consumer preference and consumer access to technology. The biggest challenge for payers is learning about consumer preferences. Payers have limited knowledge of their members and must invest in market research to understand communication preferences, along with other attributes, to design effective communication programs.

Technology investments must include advanced analytics to draw insight into patient behavior and clinical requirements beyond predictive modeling and gaps in care to take advantage of disease management, psychosocial and other personal attributes.

Payers should adopt a patient-centric, physician-involved proactive care management strategy. Payers should invest in integrated technology that increases analytic capabilities and automates rules that drive a shared workflow that leads to multi-channel communication.

Err on the side of simplicity. Nearly everyone has a telephone, but not all consumers have access to the Internet (or wish to use it). Don't get swept away by the wonders of new technology.





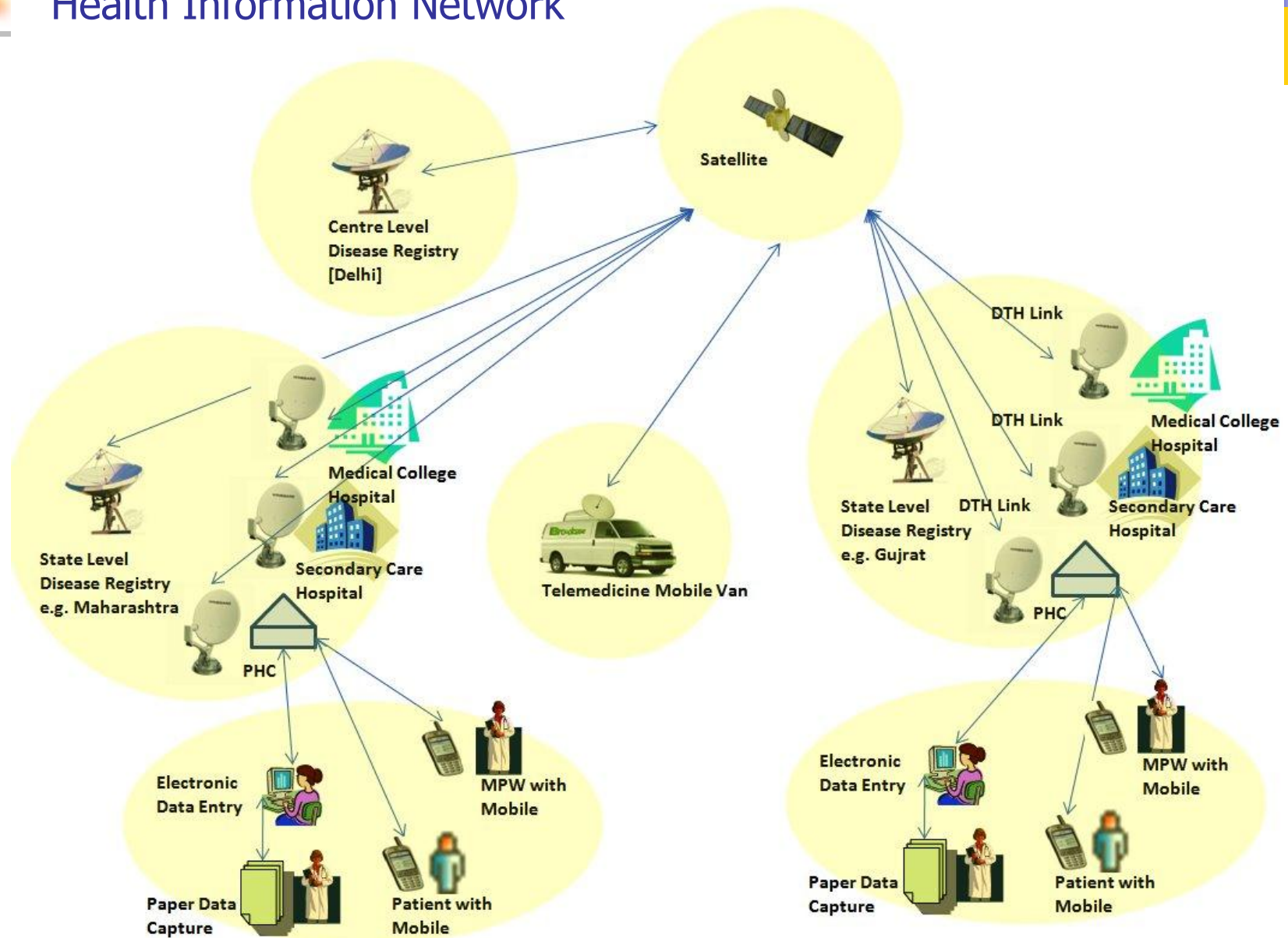
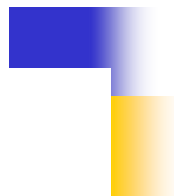
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# **Disease Registries and National Health Information Network**

- Dr Pankaj Gupta



# Government has to play a major role in providing the IT infrastructure for National Disease Registry and National Health Information Network





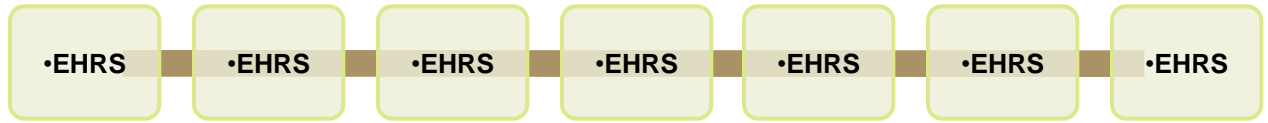
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# **Best Practices from Canada Health Infoway, USA EMR and Meaningful Use**

- Dr Pankaj Gupta



# Chronic Disease Management on an Integrated network



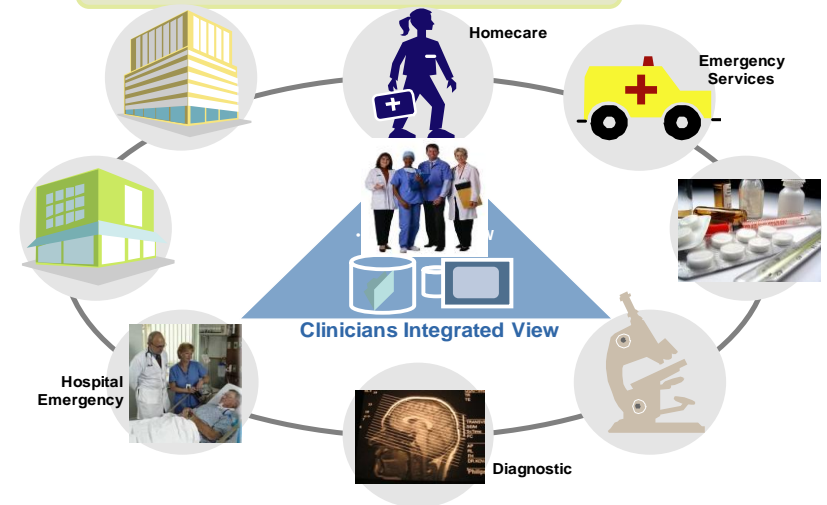
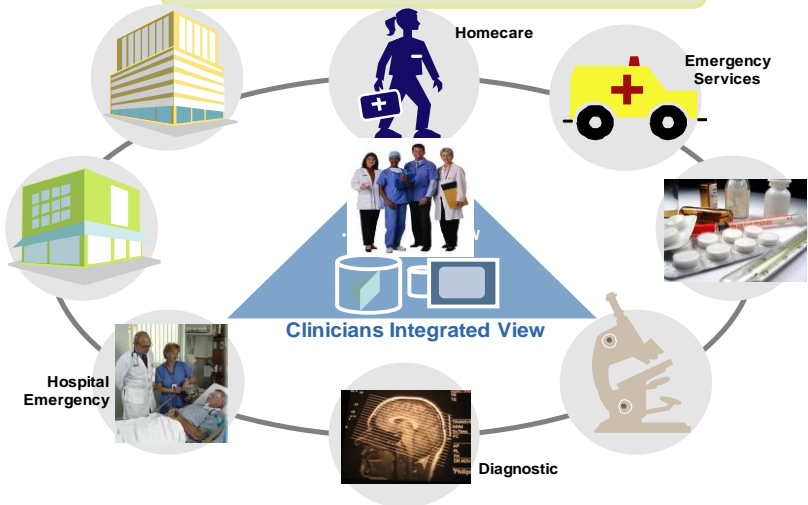
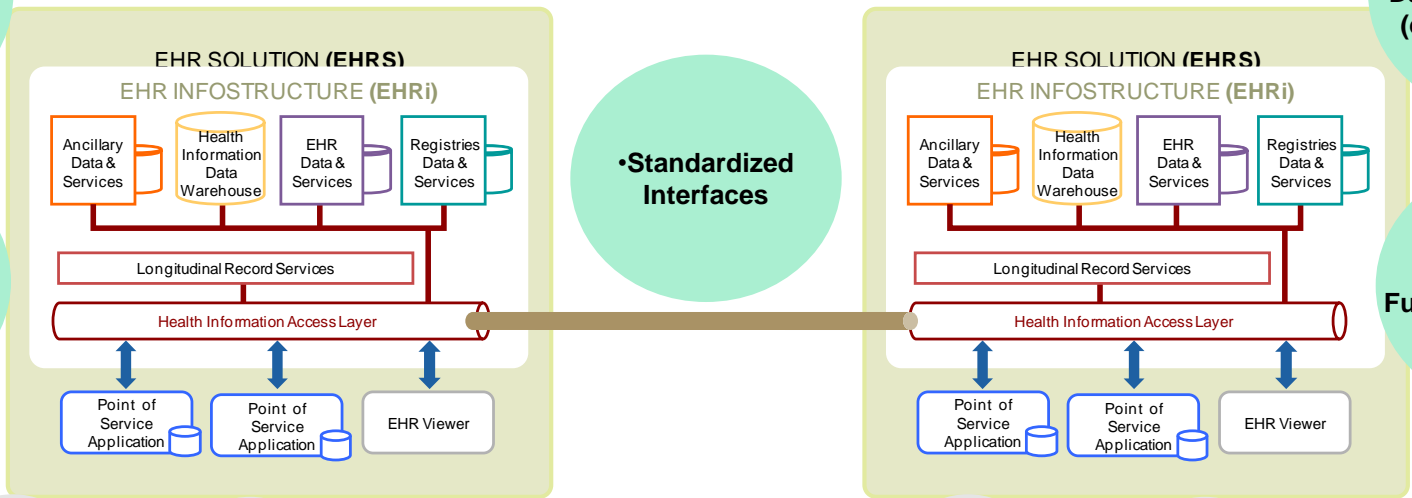
•Standardized Architecture

•Standardized Data Vocabularies (encoding rules)

•Standardized Data Structures

•Standardized Functional Behavior

•Standardized Interfaces





**THANKS!**

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