

# RESEARCH FOCUS IN MEDICAL INFORMATICS IN SAUDI ARABIA

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Ahmed Albarrak, PhD, MSc.

Professor of Medical Informatics

Founding Chairman, Medical Informatics and e-learning,  
College of Medicine, King Saud University

Founding Former Dean of Health Sciences College, and Vice  
Rector for Planning Quality and Development, SEU

[albarrak@ksu.edu.sa](mailto:albarrak@ksu.edu.sa)

@aalbarrak2



# Outline

- Definition
- Knowledge management
- Why Knowledge management in Healthcare
- Examples of research in medical informatics:
  - Evidence based medicine
  - Medical records
  - Tele-health
  - Students
  - Public health
- What is next?
- Facts and conclusions



# Medical informatics

- *"Medical informatics is a rapidly developing **scientific** field that deals with the storage, retrieval, and optimal use of biomedical **information**, **data**, and **knowledge** for **problem solving** and decision making."*

*Blois, M.S., and E.H. Shortliffe. in Medical Informatics: Computer Applications in Health Care, 1990, p. 20.*

- *"Medical informatics is the application of computers, communications and information technology and systems to all fields of medicine - **medical care**, **medical education** and **medical research**." definition by MF Collen (MEDINFO '80, Tokyo, later extended).*



# Knowledge

- Data, information and knowledge are often used interchangeably, however, they are not the same
- Data, in itself is not knowledge, nor is information. Data *is without a meaningful relation to anything else*” (Bellinger, 2004).
- *“Knowledge is the full utilization of information and data, with the potential of people's skills, competencies,.....* (Grey, 2009\*7)



# Knowledge

- Knowledge *Involves interpreting information received, adding relevance and context to clarify the insights the information contains*” (Audit Commission, 2007)
- Knowledge: is the understanding and interpretation of information and its settings within a meaningful context
- There are numerous theories existence regarding not only the creation of knowledge, but also the different types of knowledge that exist.
- Cook and Brown (1999) define four types of knowledge: individual/explicit; individual/tacit; group/explicit; group/tacit.



# Data?

- **Data:** “*data are numbers, words or images that have yet to be organised or analysed to answer a specific question*” (Audit Commission, 2007).
- What makes numbers, words and images all data? rawness. No exact meaning or context.
- **Information:** Information is the result of *processing, manipulating and/or organising data* or combinations of data *to answer question*.
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# Environment public health KM

	Data	Information	Knowledge
Asthma	Number of hospital visits due to asthma	Asthma case data organized by geographic location, population, etc.	Understanding of the times and places to alert asthma patients due to risks posed by air quality
Air Quality	Ambient air quality monitoring data	Air quality measurements organized by geographic location and time.	



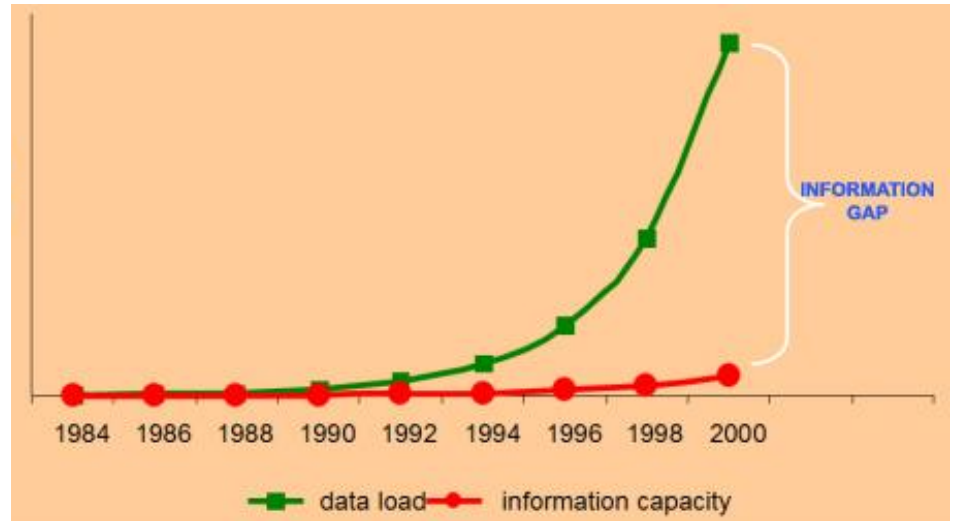
# Why Knowledge in Health care



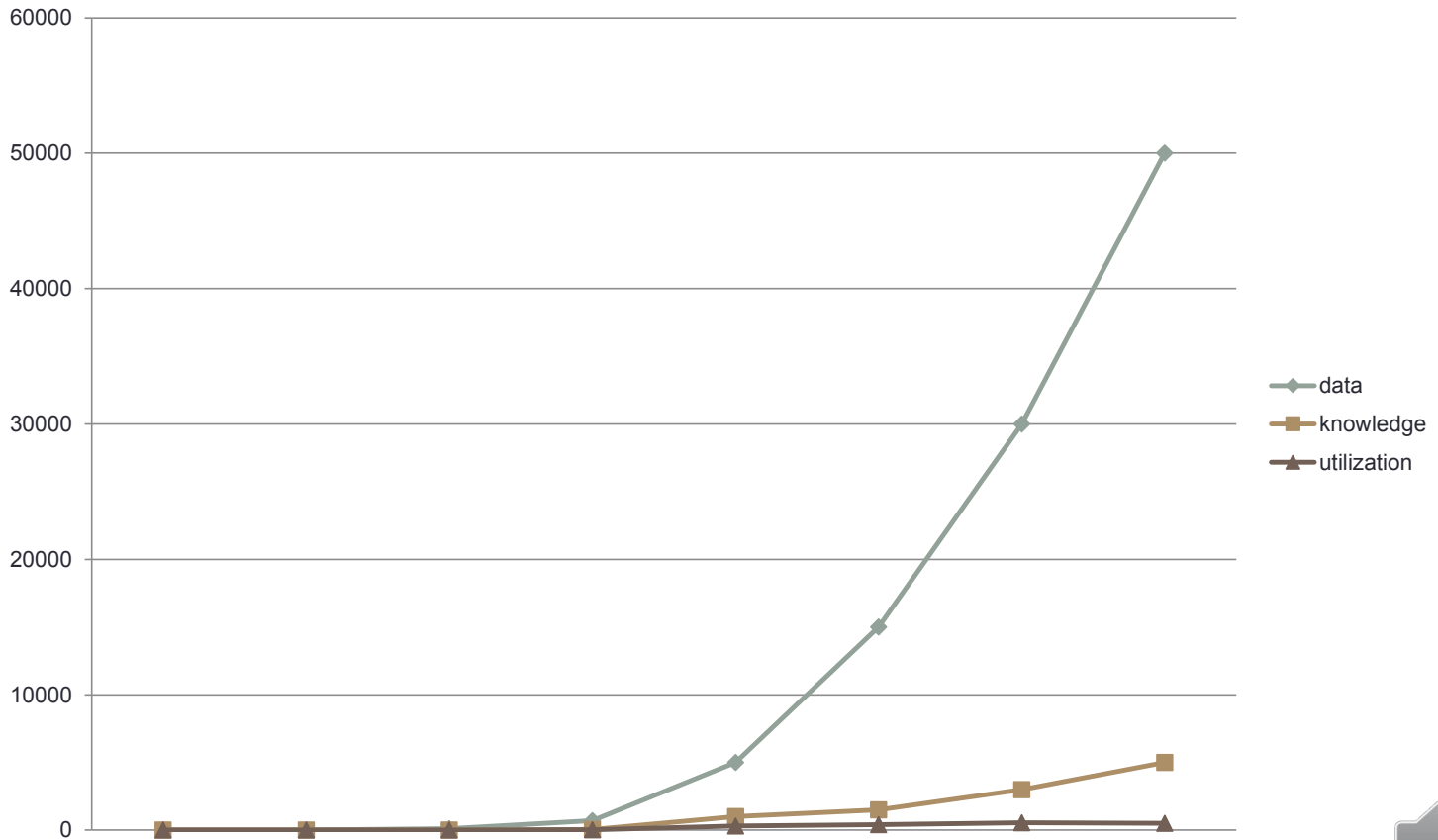


# Flood of Information

- Huge gap in data acquisition and information → knowledge capacity



# Data – knowledge - utilization



- Institute of Medicine (IOM) estimated that around **98,000** patients die each year as a consequence of preventable errors. Likewise, a study of two UK hospitals found that 11% of admitted patients experienced adverse events of which 48% of these events were most likely preventable if the **right knowledge was applied**.
- The **under-utilization** of healthcare knowledge contributes to improper clinical decisions, medical errors, under-utilization of resources and raise in healthcare delivery costs



# Examples

## Research in Medical Informatics

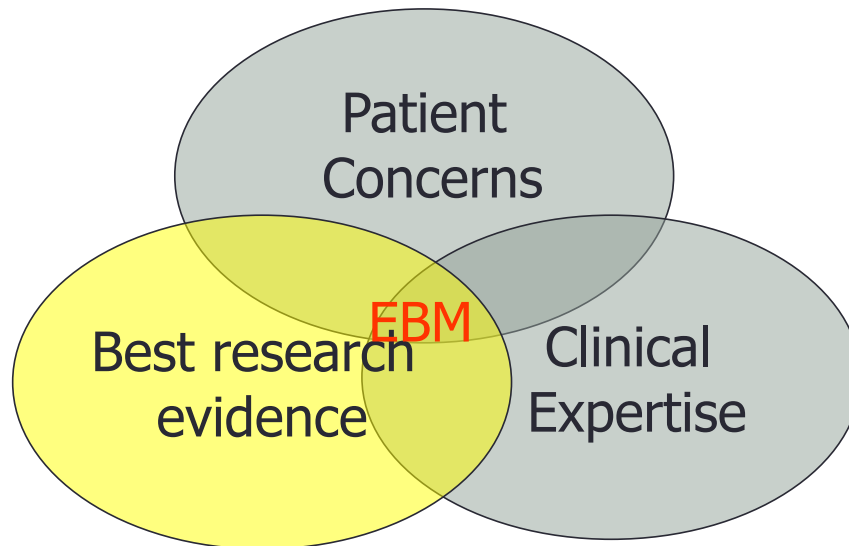


# Evidence Based Medicine (EBM)



## Evidence based medicine definition:

- Evidence based medicine (EBM) is the integration of best research evidence with clinical expertise and patient values.



# History of EBM

- The name of EBM appeared in 1992 by group led by **Gordon Guyatt** at McMaster University in Canada.
- Since then the number of articles about evidence based practice has grown exponentially from one publication in 1992 to about 1000 in 1998 and international interest has led to the development of six evidence based journals that summarize the most relevant studies in clinical practice and have a combined worldwide circulation of over 175000.

