BigMedilytics
Big Data for Medical Analytics

George Paliouras
Athens
11/7/2018
Four profound trends are shaping the future of health technology

Global resource constraints

Healthcare sector: 10% of EU’s GDP
EU-28's total healthcare spending: €1.39 trillion
Four profound trends are shaping the future of health technology

**Effectiveness of healthcare system:**

**Quality:** Determined by efficacy, value and efficiency

**Access:** Those who can receive care when needed

**Cost:** Actual expense of patient care

Global resource constraints

Aging populations and the rise of chronic illness

In 2060 Healthcare sector: 30% of EU’s GDP

Chronic diseases result in loss of 3.4 million potential productive years; equivalent to €115 billion annually

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Creates more opportunities to focus on healthy living and prevention
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Digitization
Extract knowledge from already existing large amounts of generated medical data
Big Data: Medical data currently estimated around 1 Zettabyte (152 Million years, UHD, 8K video)
BigMedilytics aims to use *state-of-the-art Big Data technologies* in order to *improve the productivity of the Healthcare sector* by *reducing cost to the patient*, *improving quality through better patient outcomes* and *delivering better access*. 
Percentage of deaths from non-communicable diseases in Europe

BigMedilytics covers all the major disease groups in Europe which cause 78% of the deaths:

- Cardiovascular disease
- Cancer
  - Breast cancer
  - Lung cancer
  - Prostate cancer
- Chronic respiratory disease
- Diabetes
- Kidney disease
- Comorbidities

- Other (e.g. injury)
- Oral conditions
- Digestive diseases
- Neuropsychiatric conditions
- Digestive diseases
- Oral conditions
- Cardiovascular disease

59%

19%
THEME 1: Population Health & Chronic Disease Management

THEME 2: Oncology

THEME 3: Industrialization of healthcare
Challenges: Technical/Non-technical

Enabling collaborative innovation across all key players in the Healthcare and Data Value Chains

- Patients
- Healthcare Providers
- Payers
- Vendors (Medical diagnostics and Services, Pharmaceuticals, HealthcareIT)
- Knowledge Institutions
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Business Model Innovation
Legal
Ethics

Scale concepts across Europe
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12 pilots across 3 themes
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Lung cancer pilot: vision

**Present**
- Standardised treatment protocol
- Same reference ratios for all patients
- Imprecise: diagnosis, treatment duration, toxicities, & comorbidities

**Future**
- Improve management of patients: treatment, follow-up, palliative care
- Improve experience and main outcomes
- Reduce healthcare costs

**Key Performance Indicators (target 20% improvement)**

**Process**
- Improved risk estimation
- Reduction of visits to ER due to minor adverse events
- Reduction in length of hospital stay
- Reduction of unscheduled visits due to toxicities

**Patient experience and outcomes**
- Reduction of toxicity incidences in polimedicated patients
- Increased patient satisfaction and information

**Financial**
- Reduced cost per patient and projected total cost over 10 years
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Lung cancer pilot: big data approach

**Big Data**
- Patient data
  - Electronic Health Records
  - Call center logs
  - Mobile app logs
- Open Data
  - Publications
  - Databases
  - Ontologies

**Artificial Intelligence**
- Data Analysis
  - Text mining
  - Statistical learning
- Data Integration
  - Knowledge graph
  - Meta-analysis

**Precision Medicine**
- Improved risk stratification
- Discovery of potential toxicities
- Explanation of adverse effects
# The BigMedilytics Community

35 organizations from 12 countries

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<th>HealthTech/IT</th>
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