BigMedilytics
Big Data for Medical Analytics

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Four profound trends are shaping the future of health technology

- Aging populations and the rise of chronic illnesses
- Digitization
- Increasing consumer engagement
- Global resource constraints

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

Healthcare sector: 10% of EU's GDP

EU-28's total healthcare spending: €1.39 trillion
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Quality: Determined by efficacy, value and efficiency

Access: Those who can receive care when needed

Cost: Actual expense of patient care

Global resource constraints

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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 – simultaneously.
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
Healthcare continuum

- THEME 1: Population Health & Chronic Disease Management
- THEME 2: Oncology
- THEME 3: Industrialization of healthcare
BigMedilytics
12 pilots across 3 themes

Population Health & Chronic Disease Management
WP2 Leader: Incliva

- 1. Comorbidities
  Pilot Leader: Incliva
  Location: ES

- 2. Kidney Disease
  Pilot Leader: Charite
  Location: DE

- 3. Diabetes
  Pilot Leader: Huawei
  Location: IE

- 4. COPD/Asthma
  Pilot Leader: Southampton
  Location: UK

- 5. Heart Failure
  Pilot Leader: EMС
  Location: NL

- 6. Prostate cancer
  Pilot Leader: Philips
  Location: SE

- 7. Lung cancer
  Pilot Leader: NCSR-D
  Location: ES

Oncology
WP3 Leader: Philips

- 8. Breast cancer
  Pilot Leader: IBM
  Location: FR

- 9. Stroke
  Pilot Leader: ETZ
  Location: NL

- 10. Sepsis
    Pilot Leader: Incliva
    Location: NL

- 11. Asset Management
    Pilot Leader: OLVG
    Location: NL

Industrializing Healthcare Services
WP4 Leader: Philips

- 12. Radiology Workflows

- Hyper-Acute Workflows

- 11. Asset Management
  Pilot Leader: OLVG
  Location: NL

- 12. Radiology Workflows
From Asset Management to Workflow Optimization

Operational decision support
Actionable visual information
Prioritize in real-time

Movement of volumetric pumps, 24 hours, 6th floor @ OLVG
Characteristics of datasets

- Health records of more than 11 million patients across 8 countries in Europe
  - Clinical data
  - Medical images
  - Laboratory data
  - Prescription data
  - Claims data

- Streaming data from IoT connected devices at more than a million records per hour

- Patient generated data from mobile apps
Data & AI Challenges

Data Challenges:
- Interoperability
- Methods and ecosystems for data sharing
- Missing and noisy data
- Data volume
Data & AI Challenges

AI Challenges (6R model):
• Relevant Clinical Question First
• Right Data (representative and of a good quality).
• Ratio between number of patients and their variables should fit the AI method.
• Relationship between data and ground truth should be as direct as possible.
• Regulatory ready; enabling validation.
• Right AI Method.