IASIS is an EU funded project that seeks to pave the way for precision medicine approaches by utilising insights from patient data. It aims to combine information from medical records, imaging databases and genomics data to enable more personalised diagnosis and treatment approaches in two disease areas – lung cancer and Alzheimer’s disease.

Precision medicine promises to transform the delivery of healthcare to patients. Healthcare is evolving from a reactive “one-size-fits-all” system towards a system of predictive, preventive, and precision care. A personalised medicine approach is expected to lead to better health outcomes, improved treatments, and reduction in toxicity due to variable or adverse drug responses.

The goal of Project IASIS is to seize the opportunity provided by a wave of data heading our way and turn this into actionable information that would match the right treatment with the right type of patient. A current challenge is that there are large, heterogeneous sets of data ranging from different sources, which if combined would enable the best decisions to be made, allowing for diagnosis and treatment to be personalised to each individual. IASIS is testing this approach in two disease areas – lung cancer and Alzheimer’s disease – but with the longer-term ambition that this approach will be more widely applicable to other disease areas.

The ambitious vision of IASIS will be achieved by following specific objectives:

Objective 1: Design a unified conceptual schema to represent all the diverse sources of available data.

Objective 2: Build an adaptive system able to manage data and content collected incrementally.

Objective 3: Provide actionable knowledge about disease diagnosis, prognosis, and treatment to policy makers.

Objective 4: Promote cooperation among clinicians and policy makers.

Objective 5: Define strategies for working that protect privacy and engender trust.

The approach being adopted in IASIS is to build a system that automatically integrates both unstructured and structured data analysis, image analysis, sequence analysis, and integrating all this knowledge to a big data infrastructure. This system will then create a platform that will facilitate an innovative question and answer capacity that can be used by clinicians to support more efficient and personalised diagnosis and treatments for patients.

IASIS will test this approach in two disease areas – lung cancer and Alzheimer’s disease – but with the longer-term ambition that this approach will be more widely applicable to other disease areas.

Expected Results and Impact

The outputs from IASIS will have significant impacts on the EU healthcare system, ICT industry, individual patients and wider society. In this context IASIS aims to achieve the following objectives:

- Comprehensively map big data in a reachable and manageable way by applying principles for sharing and reusability, creating a network of knowledge by linking heterogeneous data sources for public health strategy.

- Emerging data driven analytics and advanced simulation methods to study causal mechanisms and improve forecasts of spatial and temporal development of ill-health and disease.

- Develop innovative approaches to improve current risk stratification methodologies.

- Turning large amounts of data into actionable information to authorities for planning public health activities and
implementation of an approach "health in all policies".

- Placing prevention strategies on evidence base, evaluation of the efficiency and effectiveness of implemented strategies, feedback of results into the development of methods

- Analysing the efficiency of patient pathway management both at primary care (prevention and early detection) and secondary care.

- Aligning big data and advanced simulation methods in order to provide high-leverage policy analysis for public health officials, across a range of epidemiology challenges.

- Cross-border and networking coordination and technology integration facilitates interoperability among the components of Big Data value chain.

Logo:
IASiS
Big Data for Precision Medicine

Project abstract:
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Project duration:
2020

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URL:
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Research Area:
E-Science

Status of the Project: