



LongITools Project

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on behalf of the LongITools Consortium

About LongITools

LongITools is a Horizon 2020 funded European research project studying the interactions between the environment, lifestyle and biological factors to determine the risks of chronic cardiovascular and metabolic diseases.

The consortium is led by the University of Oulu, Finland and includes 18 partners across 8 countries:



Project Context

Cardiovascular diseases are the leading cause of deaths in Europe, and metabolic diseases, such as type 2 diabetes and obesity, have reached epidemic proportions worldwide and continue to become more prevalent. Together, they put significant strains on healthcare budgets and services, and affect the daily lives millions of EU citizens. It is essential that we understand more about the causes of these diseases to aid in developing policies and interventions to both reverse and prevent them.



Objectives

Using a large resource of life-course data, LongITools is studying how exposure to air pollution, noise and the built environment, lifestyle and biological factors collectively contribute to the risk of developing disease. This holistic or exposome approach aims to define the disease pathways and the points at which to best intervene during the life-course to reduce the risks.

LongITools also aims to generate new monitoring and prediction methods and tools which can also translate into innovative healthcare and policy options.

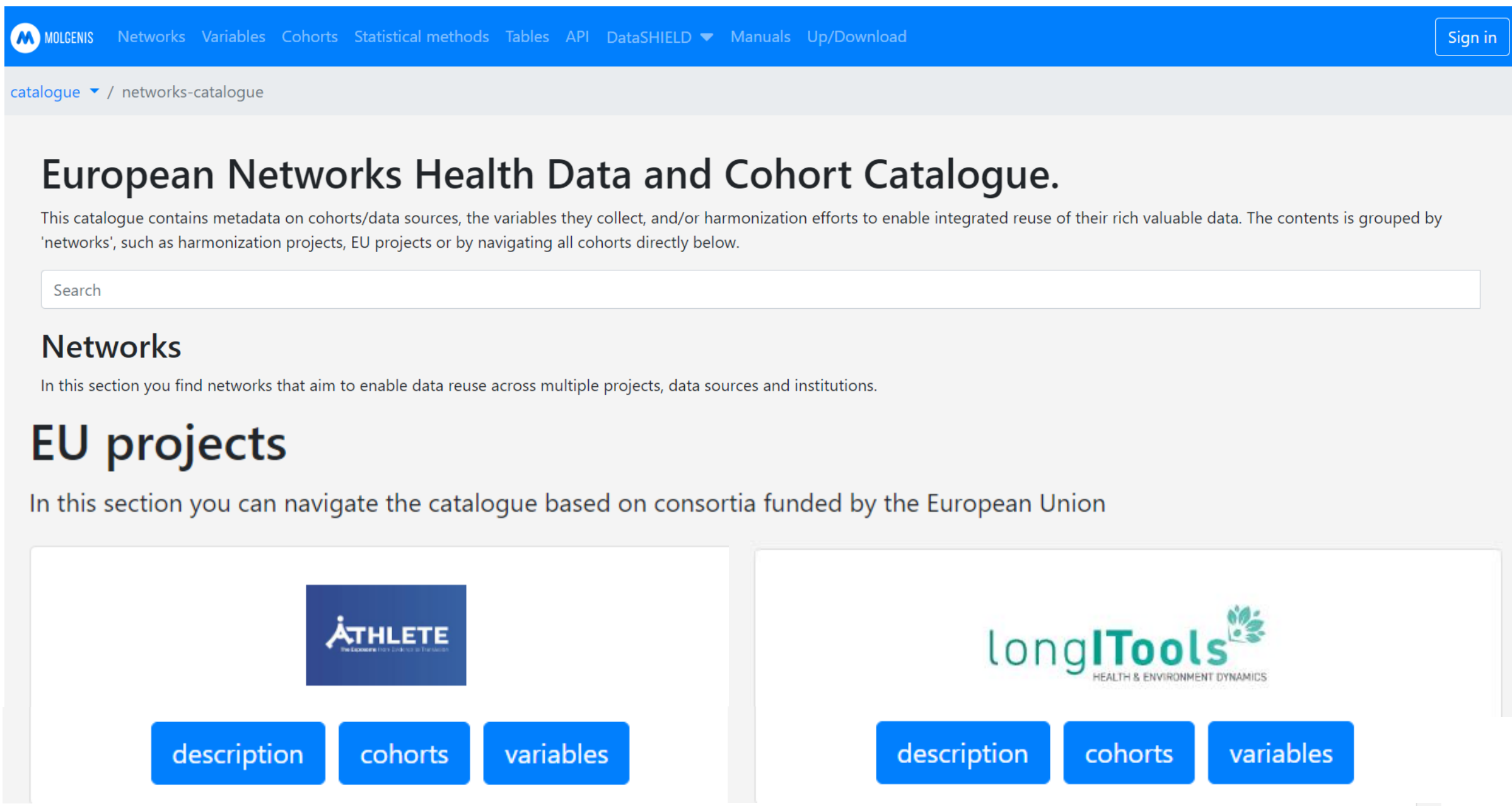


Expected Key Outputs

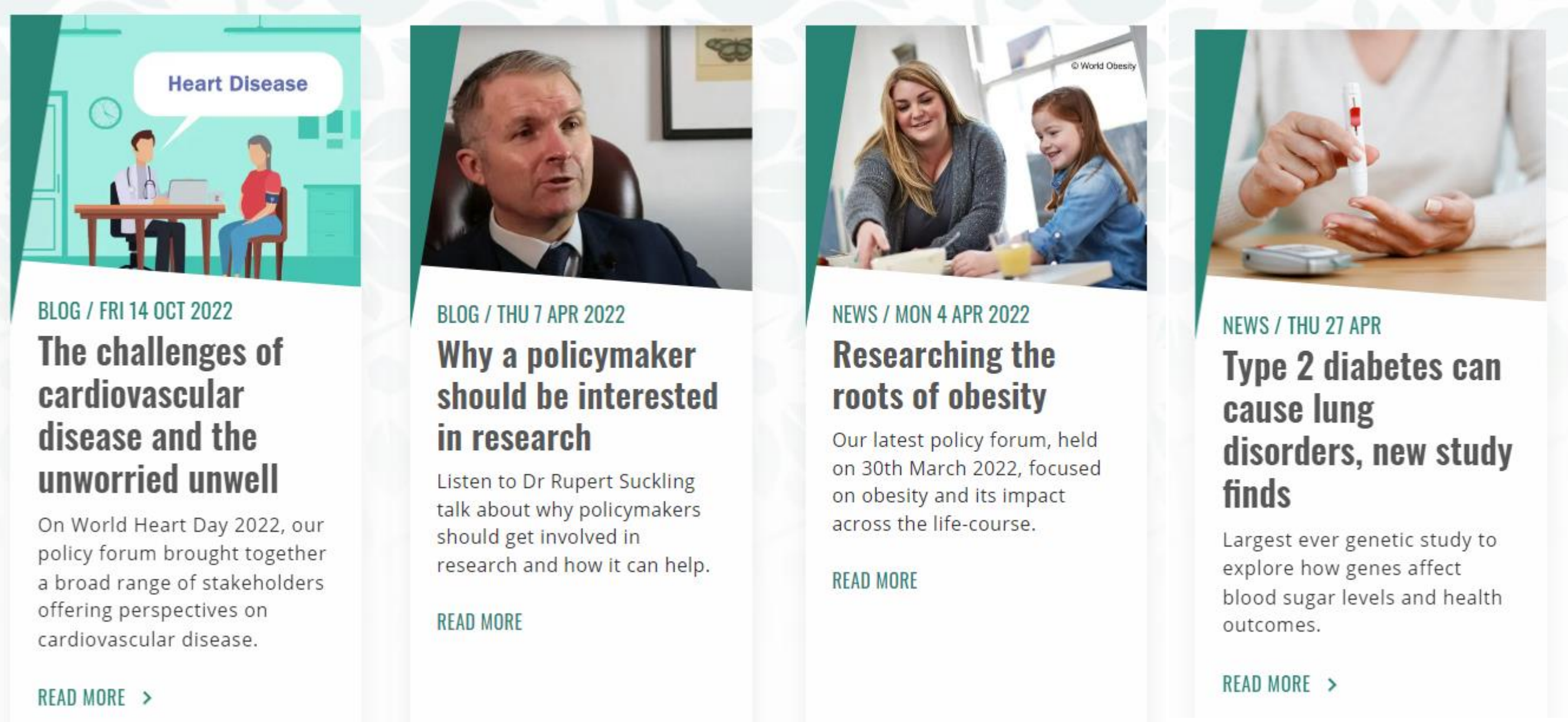
- Metadata Catalogue**
An online, searchable tool enabling exposome researchers to access rich metadata about data sets for example, the type of data set (e.g., cohort), the population, number of participants, and harmonised data variables. Users are able to assess the suitability of the data sets to answer specific research questions.
- Life-course Causal Models**
Novel statistical software to explore, understand and describe the associations/pathways between environmental, lifestyle and biological factors and risk of cardiovascular and metabolic disease.
- Exposome Data Analysis Toolbox**
An online toolbox that enables researchers to search for and use multiple exposome data analysis tools and visualisation methodologies via a single platform.
- Policy and Regulation Database**
Details of the major policies, laws and regulations in the LongITools data set countries (Finland, France, Netherlands, Norway and the UK) which can affect the external exposome e.g., pension rules, state benefits, healthcare reforms.
- Health Risk Assessment System**
Personalised and precise monitoring system integrating exposome-based data from users, environmental sensors and wearables to estimate, using an artificial intelligence model, an individual's risk of developing cardiovascular and metabolic diseases.
- Economic Simulation Model**
A model for assessing, projecting and visualising the economic burden related to non-communicable diseases. Understanding the economic burden may help determine the amount of resources that may be saved due to early prevention or intervention.
- Policy Options**
Translation of the LongITools research, including economic modelling, to inform current policies and future policy development.

Project Achievements

- Worked with the ATHLETE project to develop a novel Metadata Catalogue. This online, searchable catalogue details information about the data sets available within the LongITools consortium.



- Progressed the development of statistical, econometric and economic microsimulation models to support the LongITools research activities.
- Designed and developed a first version of a personalised and precise monitoring system, the LongITools Health Risk Assessment System.
- Planned and conducted numerous exposome based research projects are planned and being undertaken.
- Contributed to the progress and activities of the European Human Exposome Network.
- Published over 50 peer-reviewed articles.
- Organised and hosted one Science Connecting Policy workshop and four Policy Forums to support our engagement with stakeholders.
- Developed and maintained the project website, updating with blogs, videos, news articles and project publications, and regular social media activity.



Publications

LIFE-COURSE PUBLICATIONS MAP

Publications from the LongITools project will be mapped against the life-course below. The coloured bars on the timeline show the ages of the people studied. The categories are either exposures, molecular responses or outcomes of the study.

Publications Map © Beta Technology Ltd 2020

CATEGORY

- Adiposity
- Cardiovascular Health
- Gene Expression
- Metabolomics
- Air Pollution
- E-health
- Epigenetics
- Glycaemic Health
- Modelling
- Built Environment
- Economics
- Food
- Lipids
- Noise Pollution

STAGE

- Early Life (Foetal to 10)
- Adolescent & Young Adult (11-24)
- Adult (25-64)
- Older Adult (65+)



Next steps

- Prepare for LongITools Autumn School, to progress key milestones and capacity building goals for Early Career Researchers.
- Two further policy forums (September 2023 and March 2024) and a Science Connecting Policy Workshop (end of 2024).
- Progress our research projects and translate the results into policy briefings.
- Advance and deliver our key outputs.

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 874739.



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