

## **Research program – AGE-It The AIRCLIMACT project**

The intensification of ongoing climate change is increasingly putting public health at risk. Among the factors with the most serious effects, the increase in frequency and intensity of heat waves represents the most dangerous and urgent. One of the most vulnerable population groups is the elderly, who are more exposed to the consequences of extreme events. However, evidence on the combined effects of climate change and pollution on these health risks is still scarce and insufficient to clarify the underlying biological mechanisms, especially in elderly populations. In this regard, population cohorts are invaluable as they have both individual data on lifestyles (such as smoking, diet, physical activity) and socio-economic factors that are difficult to find in administrative health databases.

This project aims to harmonize and integrate climate and pollution data in two cohorts of the Italian population (30,000 men and women), representative of the North and South, in order to estimate the possible joint effects on incidence and mortality of the main chronic diseases in cohorts of the Italian older adults population.

For the purpose of the project, maps of climate indices such as temperature peaks and seasonal variability indices will be developed, through carrying out a careful survey of the sources of publicly available climate and environmental data, with high spatial and temporal resolutions, and integrating them with the maps already available at the European level. These will be integrated with data on airborne environmental pollutants (PM10 and PM2.5, NO2, O3), and the climate and pollution data will be attributed to each individual subject of the cohort through geo-referencing their residential address.

Targeted analyses will then be carried out to investigate the joint influence of air pollution and climate change indices on the risks of chronic-degenerative diseases related to ageing, using both traditional statistical techniques and artificial intelligence (machine learning).

The project is highly innovative with respect to the current knowledge on the effects of climate change on health risks, due to the diversity and characterization of the cohorts included. The potential of the study to identify population groups at greater health risk related to climate and pollution, as well as to draw up guidelines for the prevention and/or mitigation of such risks, represents a strong element of transferability of the project results.