

## Research Project

# SAPALDIA 3 - Swiss Cohort Study on Air Pollution and Lung and Heart Diseases in Adults

### Third-party funded project

**Project title** SAPALDIA 3 - Swiss Cohort Study on Air Pollution and Lung and Heart Diseases in Adults

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### Organisation / Research unit

Swiss Tropical and Public Health Institute (Swiss TPH) / Genetic Epidemiology of Non-Communicable Diseases (Probst-Hensch)

Swiss Tropical and Public Health Institute (Swiss TPH) / Air Pollution and Health (Künzli)

Swiss Tropical and Public Health Institute (Swiss TPH) / Environmental Exposures (Liu)

### Department

**Project start** 01.04.2011

**Probable end** 31.03.2014

**Status** Completed

Objective: the SAPALDIA study is a multi-center study in eight geographic areas representing the range of environmental, meteorological and socio-demographic conditions of Switzerland. Summary of measurements: in 1991, 9'651 subjects, aged 18 to 60 years, were recruited for detailed interview and more than 90% of them underwent lung function and allergy testing. During a first follow-up, in 2002, 8'047 (83%) provided health information, 6'528 underwent physical re-examination, and 6'345 provided blood samples. Subjects aged 50 or older had 24h monitoring of electrocardiogram to assess for heart rate variability, a sensitive parameter of cardio-vascular health. In 2010, a second follow-up was launched, and will be completed by July 2011. In addition to repeated interviews and measurements, a large subsample of the participants undergoes measurement of the thickness of their carotids as well as measurement of pulse wave velocity, a reflection of the state of their arteries. They also complete extensive questionnaires on health care utilization, level of physical exercise, and the type of food they are eating. Since 1991 SAPALDIA has also been carefully following address histories of the participants. Based on actual measurements of fine particles and gaseous pollutants, it was possible through validated calculations to ascribe to each participant of the cohort the level of pollution at his/her home address and its variation over the years. Results: they allowed to assess for prevalence and development of major respiratory and allergic diseases in the Swiss population, as well as age-related decline in lung function. Then it was possible to study the association of these health indicators as well as heart rate variability with individual long term exposure to air pollution, other toxic inhalants, life style and molecular factors. The bio-bank has allowed studies on the association between some genetic profiles (gene polymorphism) and the propensity to develop asthma, allergic diseases, or accelerated lung function decline with age. SAPALDIA has numerous collaborations with research groups dealing with similar population cohorts. Signification: ongoing studies are focusing on gene-environment interactions a crucial question to understand why some persons suffer more from the effect of air pollution than others. Furthermore, beyond the effects of air pollution, the current studies will provide important information on the occurrence of chronic cardio-respiratory diseases in general as a result of interrelations between life style, environment, socio-demographics, gender and genetic susceptibility.

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