There are many unmet needs to diagnose, prevent and treat disease. Therefore, it is important to understand why some people stay healthy in old age, while others are affected by disease. Many risk factors for disease have their origin in early life. This is why we collect a large selection of data and biological samples from adults as well as from children. This overview provides information about the data that we collected from adults, age 18 and up, between 2006 and 2017.

Lifelines is a large, multi-generational cohort study that includes over 167,000 participants from the northern population of the Netherlands. Lifelines works with a combination of questionnaires, measurements and biological samples; thus, providing a unique source for research purposes. Participants from three generations are followed for at least 30 years, to obtain insight into healthy ageing and the main factors relating to the onset and progression of diseases. Every 15 years, participants complete a questionnaire, in which they provide a wide variety of data. In addition, once every 5 years, participants are invited to visit a Lifelines location for a physical examination. During this visit, biological samples are collected and several measurements and tests are conducted. Biological samples are stored at -80 °C to ensure high quality and long-term preservation.
## baseline assessment 1A

**questionnaires**
- activities (physical activity, TV watching, informal care)
- birth
- body weight
- demographics (education, living situation)
- family composition
- family health history
- health status
- health perception
- medication use
- surgery
- independency (65+)

**measurements**
- skin autofluorescence
- anthropometry
- blood pressure
- ECG
- lung function
- SF-36

**interviews**
- MMSE (65+)
- MINI

**laboratory assessment: blood**
- ALAT
- ASAT
- albumin
- alkaline phosphatase
- anti-CCP
- anti-dsDNA
- apolipo A1
- apolipo B100
- basophilic granulocytes
- CTD screen
- calcium
- cholesterol
- creatinine

- eosinophil granulocytes
- erythrocytes
- free T3
- free T4
- gamma-GT
- glucose
- HDL cholesterol
- HbA1c
- hematocrit
- hemoglobin
- high-sensitivity CRP
- LDL cholesterol
- leukocytes

- lymphocytes
- monocytes
- mononuclear cells
- neutrophil granulocytes
- phospholipids
- potassium
- SSA prep
- sodium
- TSH
- thrombocytes
- triglycerides
- urea
- uric acid

**laboratory assessment: urine**
- albumin
- creatinine

**biological samples**
- blood (fasting sample)
- 24h urine
- spot urine (morning)
- DNA

## second assessment 2A

**questionnaires**
- abdominal discomfort
- activities (physical activity, informal care)
- alcohol and drug use
- body weight
- demographics (education, living situation)
- vision
- family composition
- family health history
- fatigue
- food allergies
- health status

**measurements**
- anthropometry
- blood pressure
- Cogstate cognitive tests
- ECG
- jump test
- lung function

**interviews**
- MINI (digital)

**laboratory assessment: blood**
- HDL Cholesterol
- LDL cholesterol
- creatinine
- glucose
- HbA1c
- hematocrit
- hemoglobin
- potassium
- sodium
- triglycerides

**laboratory assessment: urine**
- creatinine

**biological samples**
- blood (fasting sample)
- 24h urine
- faeces
- scalp hair

## follow-up questionnaire 1B

**questionnaires**
- activities (physical activity, mobile phone use)
- birth
- body weight
- demographics (ethnecity, living situation)
- family composition
- family health history
- health status
- health perception
- medication use
- surgery
- independency (65+)
- health care
- living environment
- mental health (stress)
- nutrition and diet
- personality

- quality of life
- sleeping
- smoking
- somatisation
- social support
- work

## follow-up questionnaire 2B

**questionnaires**
- activities (informal care, physical activity, sedentary behaviour, internet use)
- alcohol and drug use
- body weight
- childhood traumas
- demographics (education, marital status)
- earthquakes
- family
- food behaviour
- biological food

**measurements**
- anthropometry
- blood pressure
- Cogstate cognitive tests
- ECG
- jump test
- lung function

## biological samples in storage

**blood**
- serum (septum separated tube, tube with clot activator, plasma (K2-EDTA)
- tube, citrate tube), buffycoat (K2-EDTA)
- tube, -80°C storage

**faeces**
- mixed with ascorbic acid) -80°C storage

**scalp hair**
- room temperature

**urine**
- 24 hour (native, mixed with ascorbic acid) early morning/fasting (native, mixed with ascorbic acid), -80°C storage