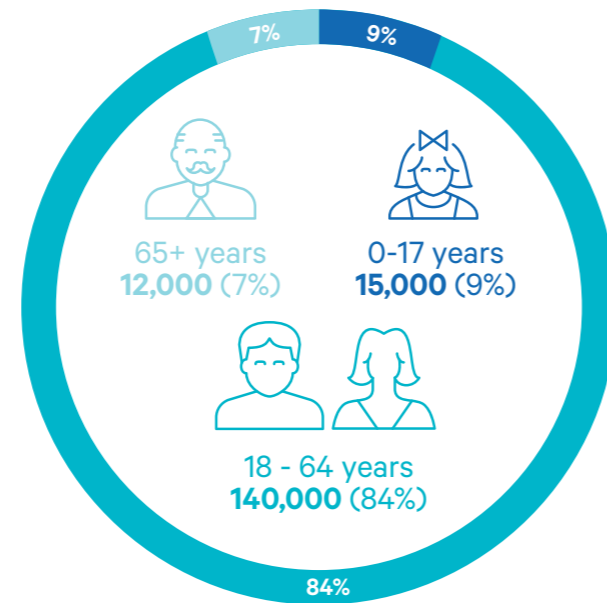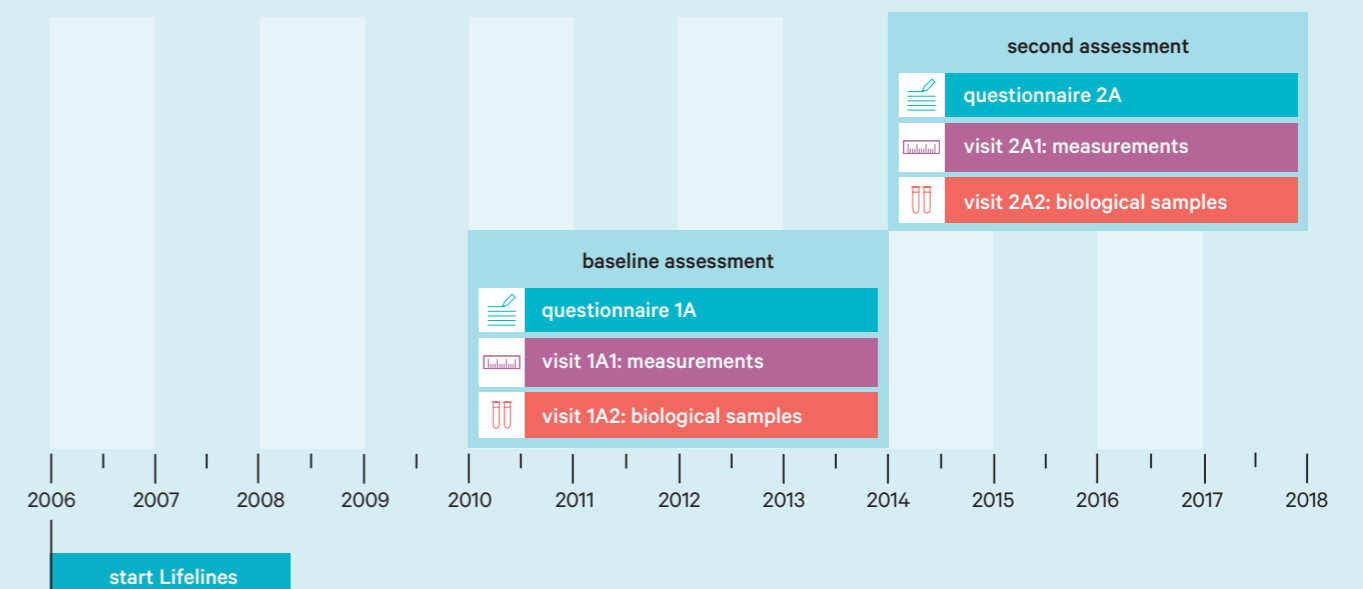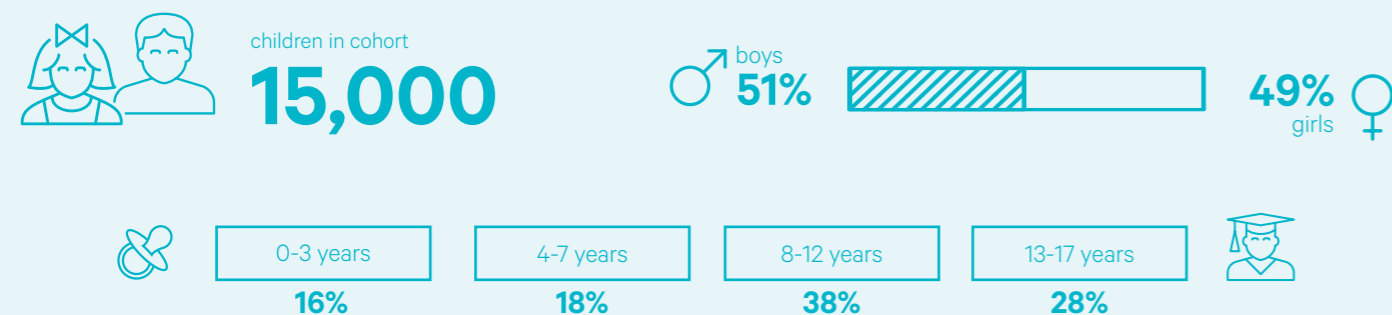# lifelines children

lifelines cohort and biobank

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 1.5 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.

7%

9%

65+ years
12,000 (7%)

0-17 years
15,000 (9%)

18 - 64 years
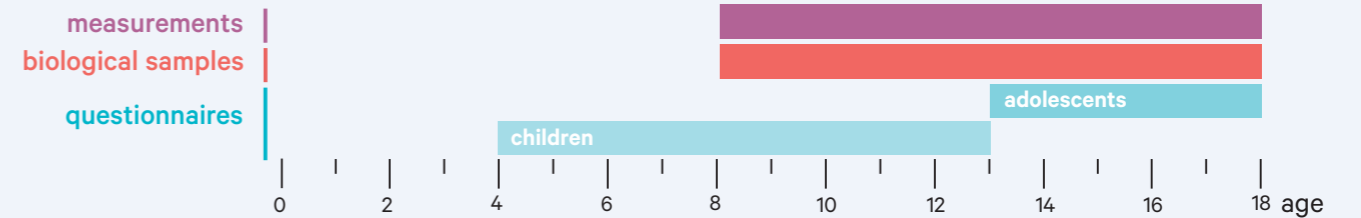**140,000 (84%)**

84%

total: 167,000 participants

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 children up to and including age 17, between 2010 and 2017.

children in cohort (baseline assessment)

children in cohort
15,000

♂ boys **51%**

49% ♀ girls

0-3 years	4-7 years	8-12 years	13-17 years
16%	**18%**	**38%**	**28%**

second assessment
- questionnaire 2A
- visit 2A1: measurements
- visit 2A2: biological samples

baseline assessment
- questionnaire 1A
- visit 1A1: measurements
- visit 1A2: biological samples

2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

start Lifelines

lifelines children

Lifelines data are available to researchers, worldwide, in the field of healthy ageing. If you are interested in the possibilities Lifelines has to offer for research or policy development, please see our website: www.lifelines.nl, or contact us directly at research@lifelines.nl

/lifelinesNL   /lifelinesNL   /lifelinesNL

second assessment (2014 - 2017)

measurements
biological samples
questionnaires

children
adolescents

0 2 4 6 8 10 12 14 16 18 age

children (4-12)
- activities (physical activity, screen time, sleep)
- behaviour
- demographics
- learning and education
- family relations
- fatigue
- health status
- respiratory health
- eczema
- allergies
- health perception
- medication use
- nutrition
- physical development (also specific for boys and girls in puberty)
- living environment
- stress
- (passive) smoking
- alcohol and drug use
- vision and hearing

adolescents (13-17)
- activities (physical activity, screen time, internet use, sleep)
- behaviour
- demographics
- education and work
- family relations
- fatigue
- health status
- respiratory health
- allergies
- health perception
- medication use
- nutrition
- physical development
- living environment
- stress
- smoking
- alcohol and drug use
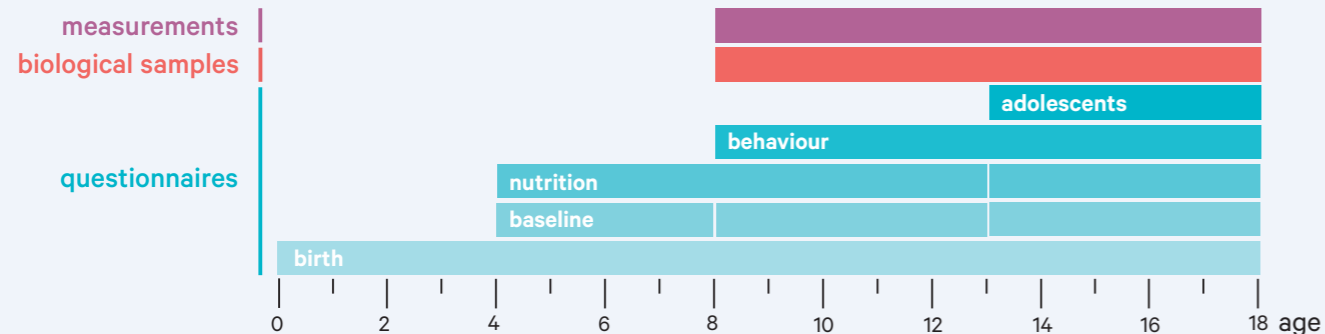- parents
- vision and hearing

biological samples (8-17)
- blood (fasting sample)
- 'timed overnight' urine
- faeces
- scalp hair

measurements (8-17)
- anthropometry
- blood pressure
- jump test
- Cogstate cognitive tests (13-17)

baseline assessment (2007 - 2013)

measurements
biological samples

questionnaires

adolescents
behaviour
nutrition
baseline
birth

0 2 4 6 8 10 12 14 16 18 age

questionnaire birth (0-17)
- delivery
- gestational age
- anthropometry
- birth defects
- hospital admission
- surgery
- infant feeding
- health status first 6 months
- crying
- medication use
- living environment
- Well Baby Clinic data
- vaccination
- pregnancy
- during pregnancy (smoking and alcohol use, health, hospital admission, living environment, medication use, work)

questionnaire baseline (4-7, 8-12, 13-17)
- activities (computer use, physical activity, playing outdoors)
- behaviour
- childcare
- demographics
- living environment
- learning and education
- development
- family relations
- health status
- healthcare
- medication use
- nutrition
- physical development (also specific for boys and girls in puberty)
- (passive) smoking
- alcohol and drug use
- surgery
- vaccination
- vision and hearing
- Well Baby Clinic data
- work

questionnaire adolescents (13-17)
- activities (chores and housework, physical activities)
- demographics
- daytime spending
- living environment
- education and work
- health status
- respiratory health
- medication use
- physical development
- behaviour
- nutrition
- smoking
- alcohol and drug use
- parents

biological samples (8-17)
- blood (fasting sample)
- 'timed overnight' urine
- DNA

measurements (8-17)
- anthropometry
- blood pressure
- ECG (13-17)
- lung function

questionnaire behaviour (8-17)
- behaviour
- stress situations
- mood

questionnaire nutrition (4-12, 13-17)
- drinks
- food
- diet
- regimen

biological samples in storage

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

urine
'timed overnight' (native, mixed with ascorbic acid), -80°C storage

DNA
-80°C and 4°C storage

scalp hair
room temperature

faeces
-80°C storage

laboratory assessment

blood
- ASAT
- ALAT
- Albumin
- Alkaline phosphatase
- Apolipo A1
- Apolipo B100
- Calcium
- Free T3
- Free T4
- Gamma-GT
- High-sensitivity CRP
- Phosphate
- TSH
- Ureum
- Uric Acid
- Monocytes
- Mononuclear Cells
- Thrombocytes
- Leukocytes
- Lymphocytes
- Erythrocytes
- Neutrophil Granulocytes
- Basophilic Granulocytes
- Eosinophil Granulocytes
- Cholesterol
- HDL Cholesterol
- LDL cholesterol
- Creatinine
- Glucose
- HbA1c
- Hematocrit
- Hemoglobin
- Potassium
- Sodium
- Triglycerides

urine
- albumin
- creatinine