EpiHealth
The EpiHealth cohort study

Information:
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The EpiHealth cohort
30,000 Swedish subjects aged 45-75

Collaboration between Uppsala and Lund Universities

Primary aim is to explore interactions between environmental factors and genes on future common diseases in the elderly
Disease areas

- Cardiovascular – myocardial infarction, stroke, heart failure, atrial fibrillation, aortic aneurysm, hypertension
- Pulmonary – chronic obstructive pulmonary disease, sleep-apnea syndrome
- Osteoporosis – Bone fractures
- Cancer – different incident cancers
- Diabetes/obesitas – diabetes, BMI, Metabolic syndrome
- Cognitive function – Dementia
- Psychiatry – Depression
- Pain – Self-assessed pain, osteoarthritis, joint replacement
- Functional capacity - Self-assessed by questionnaire
- Quality of Life – Self-assessed QoL by questionnaire
Exposures included in the questionnaire

- Family structure
- Social group
- Education
- Reproduction
- History of diseases
- Medication usage
- Food intake
- Alcohol consumption
- Smoking/snuff history
- Physical activity
- Work life history
- Pain history
- History of injuries
- Environmental exposures
Links to registers for exposures and outcomes

- **Swedish Population Registry**; regarding address, place of birth, parents place of birth and marriage
- **Swedish Censuses (1960-90)**; regarding social group, income, living conditions, education
- **Longitudinell integrationsdatabas för sjukförsäkrings- och arbetsmarknadsstudier (LISA) (from 1990)**; regarding employments and sick leave
- **Swedish National Insurance Agency**; regarding sick leave.
- **Utbildningsregistret (UREG)**; regarding education
- **Swedish Multi-Generation Register**; regarding family members
- **Medicinska födelseregistret (MFR)**; regarding pregnancies and deliveries, birth-weight
- **Swedish Patient Registry**; regarding in-hospital care
- **Swedish Prescription Registry**; regarding use of medication
- **Swedish Cause-of Death Registry**; regarding vital status and cause of death
- **Swedish Cancer Registry**; regarding cancer
- **Outpatient Registries**; regarding care in primary care facilities (includes Day Surgery Registry)
- **Swedish military service conscription register**; regarding blood pressure, exercise capacity, body height and weigh
- **Swedish Information System on Occupational Accidents and Work-related Diseases**; regarding occupational accidents and work-related diseases
The EpiHealth cohort

300,000 Swedish subjects aged 45-75 years
Initially recruited in Uppsala/ and Lund/Malmö

IT-based history of diseases and life-style factors
(Diseases, medications, diet, smoking, social network, exercise, QoL, occupational exposure, etc)

Visit: Blood, DNA, Blood pressure, weight, height, waist circumference, fat mass, Glucose and lipids, TMT B, Lung function, ECG

Follow-up through registers: Death, hospitalization, cancer

Invited groups:
1. Random sample
2. Parents and grandparents to LifeGene participants
Biobank

**DNA** från 400 µl; snitt 11 µg
Medel 76 ng/ul, medelvolym 145 ul DNA

EDTA-helblod för **EDTA-plasma** -> 16 st alikvoter om 225 ul (medel 7.9/rör; 15.8/individ)

LiHep-helblod för **LiHep-plasma** -> 8 st alikvoter om 225 ul (medel 7.8/individ)

**Citratplasma** (centrifugering och avhällning sker på testcenter) -> 8 st alikvoter om 225 ul (medel 7.8/individ)
Investigations in EpiHealth

- Height, weight, WC, fat mass
- Blood pressure
- Lung function (VC, FEV1)
- ECG (A fib)
- Trail making test A & B
- Fasting glucose
- Lipids (LDL and HDL-cholesterol, triglycerides)
24,000 subjects included in Jan 2018

Recruitment in Malmö still on-going!

At present 17 scientific publications using Epihealth data
How to get access to data/samples

- Short research proposal together with two Excel files (test center data and questionnaire)
- If approved, application to Ethics Committee
- If approved, short description as an advertisement at the web-page for 1 month
- DTA/MTA signed
- All documentation sent to the data manager at KI
- Cost taken by the research group (3-4000 SEK)
- All forms at the web-site
Omics substudy

- GWAS chip in 2500
- Proteomics: CVDI & CVDII & Metabolism
- Metabolomics: Nightingale, MRS-based, 200 metabolites, focus on lipoprotein classes
249 proteins vs fat mass or WHR
Related to fat mass, but not WHR

SPON-2 påverkar cellmotilitet, association till colorectal cancer
TIMP-4 metalloproteinase inhibitor
TLT-2 membran receptor, ffa myeloida celler, upopreglera CD8+ T celler
Related to WHR, but not fat mass

Cadherin-5 Ca beroende glykoprotein som medierar celladhesion
TINAGL-5 peptidas i adrenomedullära celler associerad till nefrit
uPA urokinasplasminogen activator
PET/MRI substudy - "imiomics"
Fat fraction, volume and glucose uptake
vs insulin sensitivity, n=100
Viktutveckling och sömn

Rapporterade sömnproblem är relaterat till viktökning och obesitas. Störst effekt av viktökning sags hos personer med lågt BMI i ungdom/medelålder.

Cai et al, 2017
Fett massa är mer relaterat till MetS hos män än kvinnor, men abdominell fettdistribution är starkare relaterat till MetS hos kvinnor

Lind et al 2016
Collaboration with LifeGene
Same protocol for many variables
Covering 20-75 years, n=50,000
Livsstilsfaktorer och IBS-liknande symptom - EpiHealth

- Fysisk inaktivitet
- Oregelbundna måltider
- BMI
- Rökning

*Lundström et al. Scand J Gastroenterol 2016; 51:914-22,
Association rökning och IBS

<table>
<thead>
<tr>
<th>Study</th>
<th>Odds ratio</th>
<th>95% confidence intervals</th>
<th>Relative contribution to pooled estimate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locke et al. 2000 (21)</td>
<td>0.82</td>
<td>0.40-1.67</td>
<td>9.0</td>
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<tr>
<td>Parry et al. 2005 (59)</td>
<td>4.05</td>
<td>1.42-11.58</td>
<td>5.8</td>
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<tr>
<td>Han et al. 2006 (49)</td>
<td>0.64</td>
<td>0.37-1.12</td>
<td>11.2</td>
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<tr>
<td>Nam et al. 2010 (51)</td>
<td>1.31</td>
<td>1.00-1.71</td>
<td>15.4</td>
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<tr>
<td>Kubo et al. 2011 (57)</td>
<td>1.97</td>
<td>1.24-3.14</td>
<td>12.6</td>
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<tr>
<td>Fujiwara et al. 2011 (58)</td>
<td>2.26</td>
<td>1.40-3.66</td>
<td>12.3</td>
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<tr>
<td>Yamamoto et al. 2015 (54)</td>
<td>0.83</td>
<td>0.76-0.91</td>
<td>17.2</td>
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<tr>
<td>Lundström et al 2016 (46)</td>
<td>1.30</td>
<td>1.08-1.57</td>
<td>16.4</td>
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</tbody>
</table>

Pooled risk estimate
I-squared: 88%, p<0.001

Ohlsson B. Best Practice & Res 2017