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DEN TRETTENDE NORSKE EPIDEMIOLOGIKONFERANSEN

TROMSØ, 24-25. NOVEMBER 2005

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Den trettende norske epidemiologikonferansen

Tromsø 24.-25. november 2005

Forkurs 23. november

Forkurs

**Nøstede kasus-kontroll og kasus-kohort studier: en introduksjon
og noen nyere metoder.**

Ved Sven Ove Samuelsen og Ørnulf Borgan

Konferanseprogram

TORS DAG 24. NOVEMBER

- Ordstyrere:** Merethe Kumle og Magritt Brustad
- 10:30-11:15 Registrering og kaffe
- 11:15-11:20 Velkommen
- 11:20-12:05 Knut-Inge Klepp "Overvektsepidemien – den tunge folkehelseutfordringen"
- 12:05-12:20 Spørsmål og diskusjon til Knut-Inge Klepp
- 12:20-12:30 Rombytte før frie foredrag
- 12:30-13:00 Innsendte foredrag á (10+5) min (tre parallelle rom)
- 13:00-14:00 Lunch
- 14:00-15:30 Innsendte foredrag á (10+5) min (tre parallelle rom)
- 15:30-15:45 Strekk på beina m/kaffe og te
- Ordstyrer:** Bjørn Straume
- 15:45-17:00 Framtiden i norsk epidemiologisk forskning
Camilla Stoltenberg (Folkehelsa) og Eiliv Lund (UiTø) innleder til debatt
- 17:15-18:00 Årsmøte i NOFE m/valg
- 20:00 Middag på Rica Ishavshotell

FREDAG 25. NOVEMBER

- Ordstyrer:** Lars Christian Stene
- 09:15-10:15 Dr. Franco Berrino "Kostholdseksperimenter"
- 10:15-10:30 Rombytte før frie foredrag
- 10:30-11:45 Innsendte foredrag á (10+5) min (tre parallelle rom)
- 11:45-12:00 Pause
- 12:00-13:00 Innsendte foredrag á (10+5) min (tre parallelle rom)
- 13:00-14:00 Lunch
- Ordstyrer:** Inger Torhild Gram
- 14:00-15:00 Dr. John D Potter "The last cohort"
- 15:00-15:15 Avslutning

Muntlige presentasjoner torsdag 24. november

ROM 1: ERNÆRING

Ordstyrere: Guri Skeie og Magritt Brustad

- 12:30-12:45 O1 Effect of dietary and antismoking advice on body weight, dietary intake and serum lipids and s. fatty acids in a male high risk population. A 25-year follow-up of the Oslo Diet and Antismoking study. *Ingrid Ellingsen*
- 12:45-13:00 O2 Serumnivå av aktivt vitamin D-hormon og ionisert kalsium hos pakistanske innvandrere og etniske nordmenn. Helseundersøkelsen i Oslo 2000-2001. *Kristin Holvik*
- 13:00-14:00 **Lunsj**
- 14:00-14:15 O3 Association of dietary patterns and anaemia in adults in Jiangsu, China. *Zumin Shi*
- 14:15-15:30 O4 Middelhavskost har en fordelaktig effekt på risikofaktorer for hjerte-karsykdom i en normal svensk populasjon – forskningsprogrammet INTERGENE. *Elisabeth Strandhagen*
- 14:30-14:45 O5 Spisemønster og risikofaktorer for hjerte-karsykdom: Data fra forskningsprogrammet INTERGENE. *Christina Berg*
- 14:45-15:00 O6 Persistent environmental toxicants in human milk among Norwegian mothers. The MUNIS Study. *Merete Eggesbø*
- 15:00-15:15 O7 Does the pesticide HCB influence infant growth? *Hein Stigum*
- 15:15-15:30 O8 Dietary patterns among immigrants from the Indian Subcontinent in Oslo may be an important factor in explaining high rates of Diabetes and Obesity. *Gerd Holmboe-Ottersen*

ROM 2: KREFT

Ordstyrere: Merethe Kumle og Inger Torhild Gram

- 12:30-12:45 O9 Increased head circumference at birth indicates increased risk of childhood brain cancer. *Sven Ove Samuelsen*
- 12:45-13:00 O10 Breast cancer risk and pregnancies in women with a familial excess risk. *Grethe Albrektsen*
- 13:00-14:00 **Lunsj**
- 14:00-14:15 O11 Long term smoking among non-drinking women and breast cancer risk. *Inger Torhild Gram*
- 14:15-15:30 O12 The Natural History of Invasive Breast Cancers Detected by Screening Mammography. *Per-Henrik Zahl*
- 14:30-14:45 O13 Exposure to polio vaccine possibly contaminated with simian virus40 and subsequent risk of malignant mesothelioma. *Kristina Kjørheim*
- 14:45-15:00 O14 Nese-bihulekreft i en kommune med nikkelverk. *Tom K. Grimsrud*
- 15:00-15:15 O15 Prophylactic Quadrivalent Human Papillomavirus (HPV) (Type 6, 11, 16, 18), L1 Virus-Like Particle (VLP) Vaccine Reduces Cervical Intraepithelial Neoplasia (CIN) 2/3 Risk. *Finn Egil Skjeldestad*
- 15:15-15:30 O16 Is there an association between SV40 contaminated polio vaccine and lymphoproliferative disorders? An Age-Period-Cohort analysis on Norwegian data from 1953 to 1997. *Tom Grotmol*

ROM 3: DIVERSE**Ordstyrer:** Bjørn Straume

- 12:30-12:45 O44 Saminor. *Tove Nystad*
- 12:45-13:00 O45 Self reported health among former North Sea divers. *Ågot Irgens*
- 13:00-14:00 **Lunsj**

METODE**Ordstyrer:** Bjørn Straume

- 14:00-14:15 O17 Evaluation of methods for local spatial cluster detection in epidemiological studies. *Geir Aamodt*
- 14:15-15:30 O18 Association studies in genetic epidemiology. *Bettina Kulle*
- 14:30-14:45 O19 Case-Control and Case-Only Design to Assess Apolipoprotein E polymorphism and Cigarette Smoking Interaction Effect on Coronary Heart Disease Risk. *Leyla Nunez*
- 14:45-15:00 O20 Identification and evaluation of genes that modulate the susceptibility to atherosclerosis. (The INTERGENE macrophage study). *Dag S. Thelle*
- 15:00-15:15 O21 Health technology assessment of indoor exposures: methodology and challenges. *Torbjørn Wisløff*

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- 10:30-10:45 O22 Validity of self-reported physical activity in Nord-Trøndelag Health Study (HUNT 1) *Nanna Kurtze*
- 10:45-11:00 O23 The association between level of physical activity and lung function among Norwegian men and women. The HUNT Study. *Wenche Nystad*
- 11:00-11:15 O24 Occupational physical activity, overweight and 24-years mortality. *Sidsel Graff-Iversen*
- 11:15-11:30 O25 Urovekkende høy forekomst av uoppdaget type 2-diabetes og nedsatt glukosetoleranse hos voksne i Nord-Trøndelag. *Kristian Midthjell*
- 11:30-11:45 O26 Endring i høyde, vekt og kroppsmasseindeks: Et longitudinelt studium med data fra Helseundersøkelsen i Nord-Trøndelag (HUNT). *Wenche Brenne Drøyvold*
- 11:45-12:00 **Pause**

KRONISKE SYKDOMMER**Ordstyrere:** Lone Jørgensen og Bjarne Koster Jacobsen

- 12:00-12:15 O27 Assosiasjon mellom antigener for fire orale bakterier og hjerteinfarkt. *Lise Lund Håheim*
- 12:15-12:30 O28 Er det sammenheng mellom personlige trekk og stress-atferd registrert i 1972/73 og symptomer på psykiske plager 28 år senere? Osloundersøkelsene 1972/73 og 2000. *Odd Steffen Dalgard*
- 12:30-12:45 O29 Occupational status, powerlessness and health. *Odd Steffen Dalgard*
- 12:45-13:00 O30 Childhood asthma under the North Face of Mount Everest. *Per Nafstad*

ROM 2: FARMAKOEPIDEMIOLOGI**Ordstyrer:** Kjersti Bakken

- 10:30-10:45 O35 Changes in blood pressure lowering treatment: Do we reach treatment goals? The Tromsø Study 1994 and 2001. *Anne Elise Eggen*
- 10:45-11:00 O36 Does implementation of the European guidelines bases on the SCORE model double the number of Norwegian adults who need cardiovascular drugs for primary prevention? The Tromsø Study 2001. *Ingeborg Hartz*
- 11:00-11:15 O37 Utilisation of analgesics containing codeine: geographic variation between counties in Norway. *Svetlana Skurtveit*

DIVERSE**Ordstyrer:** Kjersti Bakken

- 11:15-11:30 O46 Hvor benytter man seg av fritt sykehusvalg? *Birgitte Espehaug*
- 11:30-11:45 O47 Intervention and recovery for individuals on long term sick-leave for low back pain. *Stein Atle Lie*

11:45-12:00

Pause**KRONISKE SYKDOMMER****Ordstyrer:** Nina Emaus

- 12:00-12:15 O31 Hyppighet av rotavirus infeksjon og risiko for cøliaki-relatert autoimmunitet blant barn: longitudinell nøstet kasus-kontrolstudie. *Lars C. Stene*
- 12:15-12:30 O32 Self-rated health, forearm BMD and bone loss in men and women, a longitudinal study. *Siri Forsmo*
- 12:30-12:45 O33 Haemoglobin predicts total mortality in a general young and middele-aged male population. The Tromsø Study. *Tove Skjellbakken*
- 12:45-13:00 O34 Long-term effect of residential outdoor air pollution on lung function in school children in Oslo. *Bente Oftedal*

ROM 3: BLODTRYKK**Ordstyrer:** Tove Nystad

- 10:30-10:45 O38 The ability of the SCORE risk modell to predict 10-year cardiovascular disease mortality in Norway. *Anja Schou Lindman*
- 10:45-11:00 O39 Higher blood pressure in ethnic Norwegians compared to non-western immigrants in Oslo. *Haakon E. Meyer*
- 11:00-11:15 O40 Environmental effects on blood pressure among participants in the Oslo Health Study (HUBRO). *Christian Madsen*

11:45-12:00

Pause**REPRODUKTIV HELSE****Ordstyrer:** Merethe Kumle

- 12:00-12:15 O41 Tidligere chlamydiainfeksjoner og risiko for svangerskap utenfor livmor. *Inger Johanne Bakken*
- 12:15-12:30 O42 Adiponectin as a pre-clinical marker of pre-eclampsia. *Nancy Odden*
- 12:30-12:45 O43 Redusert fekunditet blant kvinnelige frisører som ikke røyker. *Valborg Baste*

DIVERSE

- 12:45-13:00 O48 Virkninger av snusbruk. *Ida-Kristin Ø. Elvsaaas*

O1

Effect of dietary and antismoking advice on body weight, dietary intake and serum lipids and s. fatty acids in a male high risk population. A 25-year follow-up of the Oslo Diet and antismoking study

Ellingsen I, Hjerkin EM, Arnesen H, Seljeflot I, Arnesen H, Hjerkmann I, Tonstad S

Objective: To test the long-term effect of diet and antismoking intervention on diet and cardiovascular risk factors 20 years after cessation of intervention.

Design: Prospective, randomised controlled trial.

Setting: The Oslo Diet and Antismoking study, initiated in 1972-3.

Subjects: The original cohort included 1 232 high coronary risk men aged 40-49 y.

563 of 910 survivors (62 %) were re-examined in 1997-99. Of these, 558 (99%) completed questionnaires about food intake and attitudes to health and diet.

Results: Cigarette smoking was nearly halved. BMI increased by 1.4 ± 2.6 kg/m² and 1.6 ± 2.6 kg/m² in the intervention and control groups, respectively ($P < 0.001$ within groups; *NS* between groups). Serum total cholesterol and triglyceride concentrations decreased substantially in subjects treated or untreated with statins ($P < 0.001$ within groups; *NS* between groups). The intervention group reported a less atherogenic fat quality score and lower intakes of fat, saturated fat and cholesterol, higher PS- ratio, lower n-6:n-3- ratio, higher beta-carotene intake and greater attention to lifestyle and change of diet than the control group (all $P < 0.05$). Intake of long-chain polyunsaturated fatty acids (% of energy) was correlated with serum docosahexanoic and eicosapentanoic concentrations (Spearman's $\rho = 0.26$ and 0.44 , respectively; $P = 0.01$).

Conclusion: Lifestyle intervention still influenced the dietary intake and attitudes two decades after the end of the trial. Lipid concentrations improved in both the intervention and control groups despite the increase in BMI.

Sponsorship: This study was supported by the Norwegian Cardiovascular Council and by the Norwegian retail company RIMI.

Descriptors: Dietary intervention, dietary intake, BMI, lipids, serum fatty acids.

Accepted September 2005 for publication in European Journal of Clinical Nutrition.

O2

Serumnivåer av aktivt vitamin D-hormon og ionisert kalsium hos pakistanske innvandrere og etniske nordmenn. Helseundersøkelsen i Oslo 2000-2001

Kristin Holvik¹, Haakon E. Meyer^{1,2}, Anne Johanne Søgaard², Egil Haug³ og Jan A. Falch³

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Bakgrunn: Helseundersøkelsen i Oslo har vist at pakistanske innvandrere har minst like høy benmineraltetthet som etniske nordmenn (1), til tross for at de har et mye lavere lager av vitamin D (25-hydroksyvitamin D) (2). Det har derfor vært spekulert om pakistanere kompenserer for dårlig vitamin D-status ved å øke produksjonen av det biologisk aktive vitamin D-hormonet (1,25-dihydroksyvitamin D), og på den måten opprettholder kalsiumbalansen i kroppen uten økt nedbrytning av benvev.

Formål: Å undersøke om pakistanske innvandrere og etniske nordmenn i Oslo har ulike serumnivåer av aktivt vitamin D (1,25-dihydroksyvitamin D) og ionisert kalsium.

Materiale og metode: Helseundersøkelsen i Oslo (HUBRO) er en stor befolkningsbasert tverrsnittsstudie som ble gjennomført i 2000-2001. Våre data er basert på et underutvalg som deltok i osteoporosestudien og består av 161 pakistanske menn og kvinner med alder 30-60 år samt 560 norske menn og kvinner med alder 45-60 år. Høyde og vekt ble målt, og serumnivåene av vitamin D-metabolitter og ionisert kalsium ble analysert.

Resultater: Gjennomsnittlig (95% CI) serumnivå av 1,25-dihydroksyvitamin D var 123 (120, 126) pmol/l hos nordmenn og 94 (88, 99) pmol/l hos pakistanere ($p < 0.0005$). Gjennomsnittlige (95% CI) serumnivåer av ionisert kalsium var 1.26 (1.26, 1.26) mmol/l hos nordmenn og 1.27 (1.27, 1.28) mmol/l hos pakistanere ($p < 0.0005$). Serumnivåene varierte ubetydelig med alder og kjønn, og justering for disse variablene endret lite på resultatene.

Konklusjon: I motsetning til hva vi forventet, har pakistanske innvandrere i Oslo med dårlig vitamin D-status også betydelig lavere nivå av det aktive vitamin D-hormonet, men høyere nivå av ionisert kalsium i serum sammenliknet med etniske nordmenn. At pakistanerne har like høy benmineraltetthet som nordmenn til tross for dårlig vitamin D-status kan ikke forklares av en kompensatorisk økning i 1,25-dihydroksyvitamin D.

1) Alver K, Meyer HE, Falch JA, Søgaard AJ (2005) Osteoporosis International 16:623-630.

2) Meyer HE, Falch JA, Søgaard AJ, Haug E (2004) Bone 35:412-417.

O3

Association of dietary patterns and anaemia in adults in Jiangsu China

Zumin Shi^{1,2}, Gerd Holmboe-Ottesen¹

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2 Jiangsu Provincial Center for Disease Control and Prevention, Nanjing, China.

Objective: To investigate the association between food patterns and anaemia among Chinese adults.

Design: Cross-sectional household survey in 2002

Subjects: The sample contained 2849 participants aged 20 above with a response rate of 89.0%.

Method: Principal component/factor analysis was used to identify food patterns based on food frequency questionnaire. Logistic regression was used to relate food patterns to anaemia.

Results: A four-factor solution derived from 33 food groups explained 30.5% of the total variance. Men from first quartile of traditional rice food pattern (rice, vegetable and meat) had the lowest prevalence of anaemia (7.7%), compared with 24.8% in the fourth quartile group. The highest prevalence of anaemia (42.4%) was found in the group of women in first quartile of 'healthy food' (whole grains, fruits and vegetables). After adjusted for socio-demographic factors, 'traditional rice food' pattern, 'sweet tooth' food pattern (drinks and cake) and 'healthy food' pattern were independently associated with anaemia in both genders. 'Traditional rice food' pattern and 'sweet tooth' pattern were positively associated with anaemia. Compared with the lowest quartile (Q1) of traditional rice food pattern, all the other three quartiles had higher risk of anaemia (men: OR: 1.90, 1.87, 2.60; women: OR: 2.27, 3.18, 3.40 for Q2, Q3 and Q4 respectively). For 'sweet tooth' pattern, compared with the lowest quartile (Q1), the OR of highest quartile is 2.34 for men and 2.02 for women. 'Healthy food' pattern was inversely associated with anaemia. The fourth quartile of healthy food was associated with lower risk of anaemia (men: OR: 0.50, 95% CI: 0.31-0.79; women: OR: 0.51 95% CI: 0.34-0.75). No association was observed between 'macho' food pattern (meat and alcohol) and anaemia. Women in the north had higher risk of anaemia (OR: 2.49, 95%CI: 1.80-3.43).

Conclusion Food patterns were associated with anaemia in the area with high prevalence of anaemia. Education on promoting healthy eating is encouraged in the prevention of anaemia.

O4

Middelhavskost har en fordelaktig effekt på risikofaktorer for hjerte-karsykdom i en normal svensk population – forskningsprogrammet INTERGENE

Elisabeth Strandhagen¹, Christina Berg², Georg Lappas³, Alicja Wolk⁴, Lauren Lissner⁵, Annika Rosengren¹, Kjell Torén⁶, Dag Thelle³

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⁶ Avdelningen för arbets- och miljömedicin, Institutionen för invärtesmedicin, Göteborgs Universitet

Formål: Å vise om data fra forskningsprogrammet INTERGENE stemmer overens med de kliniske studiene som har vist at den tradisjonelle Middelhavskosten har en positiv effekt på risikofaktorer for hjerte-karsykdommer og de epidemiologiske studiene som har vist en minsket dødlighet til følge av denne kosten.

Materiale og metode: 3602 sluppmessig utvalgte personer (1904 kvinner og 1698 menn), 25-75 år, deltok i forskningsprogrammet INTERGENE og ble undersøkt med tanke på blodlipider, blodsukker, blodtrykk, kroppssammensetning og EKG. De fylte også ut et omfattande spørreskjema som inneholdt bl.a. spørsmål om matvaner. Middelhavskost ble definert som å bruke olivenolje i matlagning og dressing spise grønnsaker 2 ganger/dag spise frukt 1 gang/dag spise fisk eller fiskeolje 1-2 ganger/uke oppfylle 3 av følgende kriterier: spise nøtter 1-2 ganger/uke, spise kylling el. l. 1-2 ganger/uke, spise belfrukter 1-2 ganger/uke, drikke vin 1-2 ganger/uke.

Resultater: 17% av kvinnene og 9% av mennene oppfylte kriteriene for Middelhavskost. Kvinnene som spiste Middelhavskost hadde lavere serum-triglycerider (1.10 ± 0.57 mmol/l mot 1.25 ± 0.70 mmol/l, $p = 0.005$), lavere BMI (24.9 ± 3.7 mot 25.7 ± 4.4 , $p = 0.01$) og høyere, men ikke signifikant, serum-HDL-kolesterol. For de øvrige risikofaktorene for hjerte-karsykdom, totalt serum-kolesterol, plasma-glukose och blodtrykk var det ingen signifikante forskjeller. For menn var det ikke noen signifikante forskjeller mellom gruppene.

Av dem som spiste Middelhavskost var det 12 % som var røykere, av de øvrige var det 18%.

Konklusjon: 9-17% av deltagerne i forskningsprogrammet INTERGENE oppfylte kriteriene for Middelhavskost, som ser ut at ha en liten men signifikant effekt på noen av risikofaktorene som er assosiert med hjerte-karsykdom.

O5

Spisemønster og risikofaktorer for hjerte-karsykdom: Data fra forskningsprogrammet INTERGENE

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⁶ Avdelningen för arbets- och miljömedicin, Institutionen för invärtesmedicin, Göteborgs Universitet

Formål: Studien baserer seg på data fra det tverrvitenskaplige forskningsprogrammet INTERGENE. Dette populasjonsbaserte programmet har som overgripende mål å studere interaksjonen mellom genetisk sårbarhet og faktorer i omgivelsene som har betydning for kroniske sykdommer, bl.a. hjerte-karsykdom, blant innbyggerne i Västra Götaland. Formålet med denne studien er å studere forskjellige typer av matvarevalg og måltidsmønster og hvordan disse er relatert til risikofaktorer for hjertkarsykdom.

Materiale og metode: Deltagerne er et slumpmessig utvalg av innbyggerne i Västra Götalandsregionen i alderen 25-74 år. Datainsamlingen ble gjennomført 2001-2004 og omfattet en medisinsk underøkelse og spørreskjemaer for 3602 individer. Med hjelp av klusteranalyse ble forskjellige vanlige mønster for kostintak beskrevet, dvs. kluster av lav- respektive høykonsumenter i følge matvarefrekvensformulæret. Hvordan kostintaksmønsteret var relatert til blodlipider og antropometri ble undersøkt i separate regresjonsmodeller for menn og kvinner og ble justert for andre livsstilsvariabler.

Resultater: Fem tydelige kluster ble identifisert og blant dem utmerket seg ett som mer ”sunt” enn de andre med høyere konsumsjon av lettprodukter og fiberrike matvarer og lavere konsumsjon av matvarer rike på fett og sukker. Tre av de øvrige klustrene skilte seg signifikant fra det ”sunde” med hensyn til blodlipider og antropometri. For eksempel var midje/hofte-kvote og BMI høyere i klusteret med ”tradisjonelt” matvarevalg og måltidsmønster.

Konklusjon: Det er mulig å skille ut matvarevalg og måltidsmønster som er relatert til risikofaktorer for hjerte-karsykdom. Denne kunnskap kan være underlag i arbeidet mot mer helsefremmende kostvaner.

O6**Persistent environmental toxicants in Human milk among Norwegian mothers. The HUMIS study**

Merete Eggesbø, Hein Stigum, Georg Becher, Anuschka Polder, Janneche Utne Skaare, Cathrine Thomsen, Per Magnus

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Introduction: Although PCB has been forbidden for more than 20 years now, and its levels in human milk is declining, it remains among the chemicals in human milk causing most concern with regard to its possible detrimental effects on the fetus and the breastfed child. Due to our industry, amongst others, the Norwegian population has been rather heavily exposed to PCB. Furthermore, new environmental toxicants are steadily entering the scene, such as the Brominated flame retardants. The level of Brominated flame retardants in human milk has shown an exponential increase during the last ten years, and this group of chemicals, are causing increasingly more concern. There is great need for more knowledge of the effects of these toxicants on child health, and the need for prospective exposure data and interdisciplinary approaches has been specifically targeted. In response to this a prospective birth cohort was established at Norwegian Institute of Public Health (HUMIS) which aims to recruit 6000 mother/child pairs. The aim of this presentation is to describe this project in more detail and to give some preliminary results.

Materials and Methods: Mothers are consecutively recruited after birth and breast milk samples collected when the child is between 2 weeks and 2 months old. When the container is filled it is posted by the mothers, and stored at -20 degrees in a Biobank upon arrival. Information on health outcomes is obtained by questionnaires sent to the families when the child is 1, 6, 12 and 24 months and 7 years of age. 1300 mothers have been recruited so far. In the first phase of the study the level of PCBs, chlorinated pesticides and brominated flame retardants (BFRs) will be determined in 400 of the breast milk samples and related to common outcomes. We are here reporting preliminary results from the 222 samples analyzed so far for chlorinated pesticides and PCBs. Concentrations of HCB, β -betahexachlorocyclohexane (β -HCH), p,p'-DDE, the sum of 10 indicator PCBs, IUPAC #: 28, 52, 74, 99, 101, 138, 153, 170, 180, 194 and 8 mono-ortho PCBs #: 105, 114, 118, 123, 156, 157, 167, 189 were measured at the Norwegian School of Veterinary Science. The determination of organochlorine pesticides and PCBs on a GC-ECD were done according to methods described earlier. In bivariate analysis, medians are given and non-parametric tests (Kruskal Wallis) were used to test for significance.

Results and Discussion: As yet, the concentration of HCB has been determined in 222 milk samples, their mean and median being 12.2 and 11.5 $\mu\text{g}/\text{kg}$ milkfat, respectively, and with a minimum and maximum value of 3.6 and 35.2, respectively. The level of HCB in human milk was significantly influenced by maternal age ($p=.000$), first born child ($p=.038$) and maternal bodyweight at the start of the pregnancy ($p=.021$). There was a non significant tendency for higher levels among daily smokers ($p=.088$), while no apparent differences in HCB levels were shown between different counties in Norway, child gender and maternal height. An association with dietary factors is also seen but these analysis have not yet been completed, but will be presented at the conference. Corresponding analysis will be performed for PCBs and Brominated flameretardants presented as well.

O7**Does the pesticide HCB influence infant growth?**Hein Stigum¹, Anuschka Polder², Janneche Utne Skaare^{2,3}, Merete Eggesbø¹¹ Norwegian Institute of Public Health, P.O.Box 4404 Nydalen, NO-0403 Oslo, Norway, hein.stigum@fhi.no² Norwegian School of Veterinary Science, Oslo, Norway³ National Veterinary Institute, Oslo, Norway

Purpose: Hexachlorobenzene (HCB) was formerly mainly used as a pesticide, but is now present in the environment as a contaminant from chlorine production and waste incineration. It is persistent, toxic and is globally dispersed. It follows the lipid state and is transferred to infants via breast milk. HCB has been associated with restricted fetal growth such as low birth weight and low birth length (Schade, 1998 and Ribas-Fito, 2002). The purpose of this analysis is to study whether there is an association between exposure to HCB and postnatal growth.

Materials and Methods: The study is based on a prospective birth cohort at the Norwegian Institute of Public Health (HUMIS). Mother and child pairs living in five selected counties in Norway are consecutively recruited after birth. The five counties represent northern, southwestern, and eastern parts of Norway, and include both coastal and inland areas. Breast milk samples are collected when the child is between 2 weeks and 2 months old, preferable by hand milking.

This paper includes data from 300 mothers where HCB have been measured in the breast milk. The analyses were performed by solvent extraction, clean-up and determination by GC-ECD (Becher et al. 1995). The weight of each child was measured at birth, and at up to 6 consecutive health control visits, with age ranging up to 440 days.

The (adjusted) association between HCB and infant growth was modeled with a linear mixed model in Stata. This model is very flexible; it allows separate predictors for birth weight and for growth, and it models individual growth by including random terms for birth weight and for growth.

Results: This is work in progress.

O8**Dietary patterns among immigrants from the Indian subcontinent in Oslo may be an important factor in explaining high rates of diabetes and obesity**G. Holmboe-Ottesen¹, M.K. Råberg², S.T. Natland¹, B.N. Kumar¹, M. Wandel²¹ Institute of General Practice and Community Medicine, University of Oslo² Department of Nutrition, University of Oslo

Background and Aim: A high prevalence of overweight/obesity and diabetes has been found among 1st generation immigrants from Sri Lanka and Pakistan living in Oslo. More than 2/3 in the age range 30 – 60 yrs are overweight (BMI>25kg/m²) and the prevalence of diabetes is 12% and 19% in Sri Lankans and Pakistanis, respectively. Apart from physical activity, diet is an important factor in the etiology of obesity and diabetes. However, there is no information on dietary patterns of immigrants collected from large population based surveys in Norway. This presentation aims at describing the most important features of the diet of Sri Lankan and Pakistani minority groups in Oslo and comparing these findings with the ethnic Norwegian population of Oslo.

Design and methods: The cross sectional, population based, Oslo Immigrant Health Study was conducted in 2002. Immigrants residing in Oslo aged 31-60 years from five different countries, including Sri Lanka and Pakistan, were invited to the screening. 1006 (50.9%) and 448 (31.7%) from the two groups, respectively, completed a health questionnaire. The questionnaire contained a short food frequency list without portion sizes, containing food items known to be commonly eaten in Norway. In addition, a two day 24 hour recall was performed on husband and wife in 68 Pakistani households (133 persons) in order to estimate nutrient and energy intake in this group.

Results: Fruit and vegetables were consumed less often by Pakistanis than by Sri Lankans, but also compared to Norwegians of low social status in Oslo. Full fat milk was consumed daily by about 30% of the Pakistanis, by 1/5 of the Sri Lankans and by 1/10 of the Norwegians. Fatty fish was eaten more often by the Sri Lankans than by the Pakistani. Daily intake of soft drinks was similar in all ethnic groups, but was more common among men in all groups. Daily intake of cod liver oil and vitamin supplements was less frequent in the two immigrant groups than among the Norwegians. The Pakistanis had however a much lower proportion using cod liver oil than the Sri Lankans. The 24-hr recall also showed that Pakistani had a lower intake of fruit and berries (in grams) than ethnic Norwegians (participating in the *Norkost* national survey in 1997). The proportion of energy from fat (41%) among the Pakistani women was higher than the Norwegian recommendations (30%) and higher than what was found in the ethnic Norwegian women (31%) in *Norkost*.

Conclusions: The Pakistani had the unhealthiest diet; eating less frequently fruits & vegetables, dietary supplements and fatty fish, but more frequently high fat foods. Differences in dietary patterns between Sri Lankans and Pakistanis may contribute to the differences found in Diabetes prevalence.

O9**Increased head circumference at birth indicates increased risk of childhood brain cancer**Sven Ove Samuelsen^{1,2}, Leiv S Bakketveig^{1,3}, Steinar Tretli⁴, Per Magnus^{1,2}¹ Norwegian Institute of Public Health² University of Oslo³ University of Southern Denmark⁴ Norwegian Cancer Registry

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Background: Studies have found only weak or no association between birth weight and childhood brain cancer. Previous studies have, however, not focused on the effect of head circumference at birth on brain cancer. The effect of head circumference is the objective of this study.

Methods: We investigated the association between incidence of brain cancer in childhood and perinatal factors such as head circumference, birth weight and gestational age based on the Norwegian birth registry from 1978-1998 linked to the Norwegian Cancer Registry from 1978-2002. The study population consists of 1,010,366 subjects and there were 453 cases of brain cancer in the age group 0-15 years.

Findings: The risk of brain cancer increased with 27 % per centimetre increase in head circumference (95% confidence interval 16-38%) when it was adjusted for birth weight, gestational age and sex.

Interpretation: Head circumference is positively associated with incidence of childhood brain cancer. Our findings strongly indicate that brain pathology originates during foetal life.

O10

Breast cancer risk and pregnancies in women with a familial excess risk

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Aims: Women with an inherited elevated risk of breast cancer may be more susceptible to a potential promoting effect of pregnancy hormones. In the present study we explore whether a family history of breast cancer modifies the time-related effects of a childbirth on breast cancer risk.

Material and methods: Results were based on follow-up information for 1,067,289 Norwegian women aged 20-74 years, including 7377 breast cancer cases, 828 with a family history of breast cancer and 6549 without. Information on family history, reproductive history and cancer diagnosis was obtained from nationwide registers with compulsory registrations. Family history was defined according to whether a woman had a first degree relative (mother or sister) with a breast cancer diagnosis. We also take into account age at diagnosis of the relative. Incidence rate ratios were estimated by Poisson regression analyses of person-years at risk.

Results: Women with a family history of breast cancer had a 2-3 fold higher risk of breast cancer than women without any affected family member. The highest risk was seen among those with a relative diagnosed before the age of 50 years. Nevertheless, increasing parity was associated with an overall protective effect among women with a familial predisposition, regardless of age at diagnosis of the relative. However, those with a relative diagnosed at a young age seemed to experience a more pronounced short-term adverse effect after first birth. Among women with a familial excess risk, a transient increase in risk was also seen after a first birth at a young age, whereas an adverse effect was seen only after late age births in women without a family history of breast cancer.

Conclusions: The present results support the hypothesis of a promoting effect of pregnancy hormones, since women with a family history of breast cancer are probably more likely to have pre-malignant breast cells already at a young age.

O11

Long term smoking among non-drinking women and breast cancer risk

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Objective: To examine the association between long-term cigarette smoking and breast cancer risk among women who reported to be non-drinkers in our large population-based cohort.

Background: The relationship between smoking and the risk of breast cancer has been unclear for several decades. A recent pooled analysis of 53 epidemiologic studies found that the positive relationship with smoking was present only among those consuming alcohol, an established cause of breast cancer (Collaborative Group on Hormonal Factors in Breast Cancer, 2002).

Material and methods: We used questionnaire data from 102,098 women, aged 30-49 years, enrolled in the Swedish/ Norwegian "Women, Lifestyle, and Health Study" cohort in 1991/1992. The cohort data were linked to the national registries of cancer and statistics in Norway and Sweden, to identify all incident cancer cases and deaths/ emigrations, respectively. In the present report we included only women who reported to be non-drinkers. We excluded women diagnosed with any invasive cancer prior to the start of follow-up leaving 19, 288 women i.e. 18.9% of the entire cohort. Altogether 214 incident cases of primary invasive breast cancer were identified. All cases were confirmed by histology. We also categorized women according to smoking duration, number of cigarettes smoked daily, pack-years of smoking (i.e. number of cigarettes smoked per day, divided by 20, multiplied by the number of years smoked), and years of smoking latency (i.e., age at cohort enrolment minus age of smoking initiation). Woman-years were calculated from the start of follow-up to the date of breast cancer diagnosis, the date of emigration, death, or the end of follow-up, i.e., December 31, 2000, whichever occurred first. We estimated relative risks of breast cancer associated with different measures of smoking exposure as described by Cox. We tested for trend and examined potential confounding variables. Those of importance i.e., age at enrolment, age at menarche, age at first full-term pregnancy, number of children, menopausal status, body-mass-index at enrolment, hormonal contraceptive use, were included in the final model. Women were classified as post-menopausal when they reached 50 years of age during follow-up. We conducted analyses among all non-drinkers and separately among ever smokers smoking at least 20 years referred to as long-term smokers. Women reporting neither active smoking nor being exposed to passive smoking at home are classified as never smokers. The reference group is never smokers throughout the presentation.

Results: Those who smoked for at least 20 years, and commenced smoking prior to their first full term pregnancy (relative risk = 1.75; 95% confidence interval 1.02-2.99), before menarche (relative risk 1.66; 95% confidence interval 0.79-3.49), or before age 15 (relative risk = 2.20; 95% confidence interval 0.92-5.30) presented increased risk. In contrast, women who commenced after their first full term pregnancy did not have an altered breast cancer risk (relative risk = 0.97; 95% confidence interval 0.44-2.12).

Conclusion: Our study indicates that non-drinking women who start smoking at young ages, and continue to smoke for at least twenty years increase their breast cancer risk.

O12

The Natural History of Invasive Breast Cancers Detected by Screening Mammography

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Background: Recent observations suggest that the introduction of screening mammography is associated with increased breast cancer incidence. The natural history of these screen-detected cancers is not well understood.

Materials and Methods: We compared cumulative breast cancer incidence in age-matched cohorts of women residing in four Norwegian counties before and after the initiation of biennial mammography. The screened group included all women who were invited for all three rounds of screening during the period 1996-2001 (age 50 through 64 in 1996). The control group included all women who would have been invited for screening had there been a screening program during the period 1992-1997 (age 50 through 64 in 1992). All women in the control group were invited to undergo a one-time (prevalence) screen at the end of their observation period. Screening attendance was similar in both groups (screened 78.3%, controls 79.5%). Counts of incident invasive breast cancers were obtained from the Norwegian Cancer Registry (in-situ cancers were excluded).

Results: As expected, before the age-matched controls were invited to screening the cumulative incidence of invasive breast cancer was significantly higher in the screened group (4-year cumulative incidence: 1268 vs. 810 per 100,000; RR = 1.57; 95% CI: 1.44 - 1.70). Even after prevalence screening in controls, however, the cumulative incidence of invasive breast cancer remained 22% higher in the screened group (6-year cumulative incidence: 1909 vs. 1564 per 100,000; RR = 1.22; 95% CI: 1.16 - 1.30). Higher incidence was observed in screened women at each year of age.

Conclusion: Because the cumulative incidence among controls never reached that of the screened group, it appears that some breast cancers detected by repeated mammographic screening would not persist to be detectable by a single mammogram at the end of six years. This suggests that the natural history of some screen-detected invasive breast cancers is to spontaneously regress.

O13**Exposure to polio vaccine possibly contaminated with simian virus40 and subsequent reisk of melignant mesothelioma**K Kjørheim¹, OD Røe², YD Hong², P Boffetta³, M Pawlita⁴¹ The Cancer Registry of Norway, Oslo, Norway² St. Olavs Hospital, Trondheim, Norway³ International Agency for Research on Cancer, Lyon, France⁴ The German Center of Cancer research, Heidelberg, Germany

Malignant mesothelioma (MM) is associated with asbestos exposure. Recent evidence has however linked disease risk also to infection with simian virus 40 (SV40), a possible contaminant of polio vaccine during 1956-63. The aim of the study was to investigate risk of MM associated with the presence of pre-diagnostic SV40 antibodies and DNA fragments. Eighty MM cases who had donated blood to the Janus serum bank 0.4-30 years prior to diagnosis were identified by linkage to the Norwegian Cancer Registry, and 239 age and gender matched controls were selected from the study base. Data on occupation were obtained from national censuses. Glutathion-S-Transferase (GST) capture ELISA combined with Luminex was used to detect antibodies to the major capsid protein VP1, and to the large T antigen of primate polyomaviruses SV40, BKV and JCV. Viral DNA fragments were analyzed by PCR designed to recognize the Enhancer and Tag C-terminus of SV40. Conditional logistic regression analysis was used. High correlations between SV40 Tag, BKV and JCV indicated cross-reactivity. Risk of MM was 50 % higher in the group testing positive for SV40 VP1 (OR 1.5, 95% CI.0.89-2.53) compared to the group with negative test. DNA fragments of SV40 were not detected in the sera. No evidence of an association between SV40 and risk of MM was seen in this study using pre-diagnostic sera. The high level of correlation between SV40 Tag, JCV and BKV may indicate that no SV40 antibody is present.

O14

Nese-bihulekreft i en kommune med nikkilverk

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Formål: Å vurdere forekomsten av nese-bihulekreft blant innbyggerne i en kommune der det er påvist en yrkesbetinget sterkt forhøyd risiko for samme kreftform hos tidligere ansatte ved en lokal bedrift.

Materiale og metode: Fra Krefregisterets database hentet vi frem aldersjusterte rater for kommunen (Kristiansand), de omliggende fylker (Aust-Agder og Vest-Agder), og for landet som helhet i perioden 1953–2002. For å justere for yrkesrelatert kreft diagnostisert blant arbeidstakere fra det lokale nikkilverk tabulerte vi de forventete og observerte antall tilfeller for menn og kvinner i to 25-årsperioder.

Resultater: I forhold til nasjonale tall var den aldersjusterte raten for Kristiansand kommune nesten fire ganger økt for menn i perioden 1953–1977 (basert på i alt 23 tilfeller), og tilsvarende nesten tre ganger økt for kvinner (basert på i alt 11 tilfeller). I de øvrige deler av Agder-fylkene var forekomsten omtrent som forventet for både kvinner og menn. Tilfeller diagnostisert blant tidligere ansatte ved det lokale nikkilverk kunne i sin helhet forklare den observerte overhyppighet for menn i Kristiansand, men ikke for kvinner. Vi fant ingen sannsynlige holdepunkter for at overhyppigheten blant kvinner i Kristiansand kunne henge sammen med arbeid ved nikkilverket, verken for kvinnene selv eller for deres ektefeller.

Konklusjon: Den økte forekomsten av nese-bihulekreft blant kvinner bosatt i Kristiansand i perioden 1953–1977 sammenfaller i tid og sted med en tilsvarende overhyppighet av samme kreftform blant menn. I motsetning til risikoen for menn, kunne kvinnenes risiko ikke forklares av yrkesaktivitet ved det lokale nikkilverket.

O15**Prophylactic Quadrivalent Human Papillomavirus (HPV) (Types 6, 11, 16, 18) L1 Virus-Like Particle (VLP) Vaccine Reduces Cervical Intraepithelial Neoplasia (CIN) 2/3 Risk**

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Background: HPV 16/18 cause 70% of CIN 2/3 and cervical cancer. This study evaluated the impact of an HPV (Types 6/11/16/18) L1 VLP vaccine on the rates of these diseases. It is part of a program to assess the vaccine's impact on cervical cancer, CIN 1-3, and genital warts.

Methods: 12,XXX women (16-26 yrs) were randomized to vaccine or placebo given at day 1, months 2 and 6. Pap tests and HPV swabs were obtained at day 1 and months 7, 12, 24, 36 and 48. Colposcopy referral was algorithm-based. Biopsies were HPV-typed. Cytology, histology, and HPV detection were conducted centrally. The primary endpoint was the incidence of HPV 16/18-related CIN 2/3, Adenocarcinoma In Situ (AIS), or cancer (as read by a blinded pathology panel). The primary analyses were done in a per protocol (PP) population (subjects received 3 doses and were HPV 16/18 negative through month 7) and in a modified intention to treat (MITT) population (subjects received ≥ 1 dose and were HPV 16/18 negative at day 1). Endpoint counts began at Month 7 and 30 days postdose 1 in the PP and MITT analyses, respectively.

Results: The table shows primary endpoint results. In the MITT population, X HPV 16/18-related CIN 2-3/AIS or cancers were seen. All were in the placebo group. Vaccination was generally well tolerated.

	Vaccine			Placebo			Efficacy (%)	Confidence Interval
	n	Cases	Rate [†]	n	Cases	Rate [†]		
PP	4444	XX	X.X	4444	XX	X.X	XX	XX, XX [‡]
MITT	5555	XX	X.X	5555	XX	X.X	XX	XX, XX [‡]

[†]Rate = n/Subject years at risk*100%

[‡]P < 0.001

Conclusion: In this study, prophylactic quadrivalent HPV vaccination prevented HPV 16/18-related CIN 2/3. This intervention may greatly reduce the risk of cervical cancer.

The study is sponsored by Merck Inc., USA

O16

Is there an association between SV40 contaminated polio vaccine and lymphoproliferative disorders? An Age-Period-Cohort analysis on Norwegian data from 1953 to 1997

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Between 1955 and 1963, an estimated number of 150 million people in various parts of the world, including Norway, received poliomyelitis vaccine possibly contaminated with infectious simian virus 40 (SV40). Human studies have investigated the hypothesised association between SV40 and various cancers, but the results have so far been contradicting. The aim of the present study was to examine Norwegian cancer incidence data to assess a possible association between birth cohorts assumed to have been subjected to the vaccine and the incidence rate of lymphoproliferative disorders (excluding Hodgkin lymphoma), further subdivided into non-Hodgkin lymphoma, lymphocytic leukemia, and plasma cell neoplasms. Between 1953 and 1997, the incidence rate of lymphoproliferative diseases combined, increased about three-fold in both males and females. Subgroup analysis showed that this increase was largely attributable to non-Hodgkin lymphoma. Age-period-cohort modelling of the subgroups, as well as of all groups combined, showed that the cohort effect was more prominent than the period effect. However, the variations in incidence patterns across the birth cohorts did not fit with the trends that would be expected if a SV40 contaminated vaccine did play a causative role. Thus, our data do not support the hypothesis of an association between the vaccine and any subgroup of lymphoproliferative diseases.

O17**Evaluation of methods for local spatial cluster detection in epidemiological studies**

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Cluster detection is an important part of spatial epidemiology. The results from such studies will aid in identifying environmental factors associated with disease and can help epidemiologists to investigate the aetiology of disease. In this article we study three models suitable for detecting local spatial clusters. The methods are 1) a spatial scan statistic (SaTScan), 2) a generalized additive model (GAM) based on smoothing techniques and 3) a model originally developed for Bayesian image restoration (BYM), but which is also applicable for estimating relative risk in disease mapping and to estimate effects in ecological studies. To compare the three models, six different clusters were produced. The clusters are hypothetical areas of contamination or pollution in Norway, and they reflect different scenarios such as radioactive rainfall or pollution parallel to a river. A simulation study was conducted where the sensitivity and specificity was computed for each realisation. The results suggest that the GAM model is not suitable for identifying clusters at all. Both the BYM model and the SaTScan model works well, the BYM model performing somewhat better than the SaTScan model.

O18

Association studies in genetic epidemiology

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Genome-wide association studies became more popular at least since the improvements in SNP genotyping technology and the growth of public SNP databases. They also overcome natural limitations underlying family-linkage studies. Simulation studies show that depending on the number of markers, the number of individuals, the expected effect and the adjustment method the power might be low. We performed 1000 simulated association study using the hapmap data with ~1 million single nucleotide polymorphisms distributed throughout the human genome to show what can be expected if you increase the density as much as possible. The results show that the probability to detect a disease in this kind of genome-wide scan is very high (>0.95) while there is a huge percentage of false positives (between 60 and 90%). We suggest the use of a meaningful collected subset of markers (tagSNPs), the development of adjustment methods for this purpose and more powerful tests which might take into consideration neighbour SNPs.

O19**Case-Control and Case-Only Design to Assess Apolipoprotein E polymorphism and Cigarette Smoking Interaction Effect on Coronary Heart Disease Risk**

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Objective: In assessing the role of susceptibility genotype in disease risk, there are a number of different ways to consider effects of the gene-environment (G-E) interaction. Assuming independence between exposure and genotype, case-only studies offer better precision for estimating G-E interaction than case-control studies. This is due to elimination of control group variability. Case-only approach has been performed, emphasizing on its assumptions, strengths, and limitations, in the study of Apolipoprotein E (APOE) polymorphism and cigarette smoking interaction effect on coronary heart disease (CHD) risk. The main objective is to make a comparison of the results obtained from the case-only approach with the results using traditional case-control methods.

Methods and results: 575 cases with acute coronary symptoms and an equal number of healthy, unrelated controls are enrolled in a population based case-cohort study, acquired from a large research program, INTERGENE. The upper age limit is 75 years and both genders are included. Logistic regression models are used to evaluate the effect of APOE genotype and smoking on risk CHD, after adjusting for the effects of age and gender. Using non-smokers, ϵ_3/ϵ_3 homozygotes as a referent group, the case-only approach reveals the presence of minor statistical interaction between ϵ_4 (ϵ_4/ϵ_4 or ϵ_4/ϵ_3) carriers and smoking, where the adjusted odds ratio (OR) is 1.59 (95% CI, 1.01-1.81, $p = 0.047$). However, ϵ_4 carriers and smoking effect is not observed in the traditional case-control analyse, OR 1.12 (95% CI, 0.62-2.05). Interaction between ϵ_2 (ϵ_2/ϵ_2 or ϵ_2/ϵ_3) carriers and smoking on CHD risk was not observed.

Conclusion: This study not only supports the findings of previous studies that examined the relationship between APOE polymorphism and smoking on risk of CHD through cohort and case-control study designs, but also includes an analytic design not often used in such studies - the case-only approach. Regardless of the limitations of the case-only approach, it does provide insight into possible associations that are concealed in a case-control data with otherwise insufficient power. The case-only design might best be viewed as a screening tool for identification of promising G-E interactions in epidemiological research.

Keywords: Case-control, case-only, gene-environment interaction, APOE polymorphism, smoking, coronary heart disease

O20

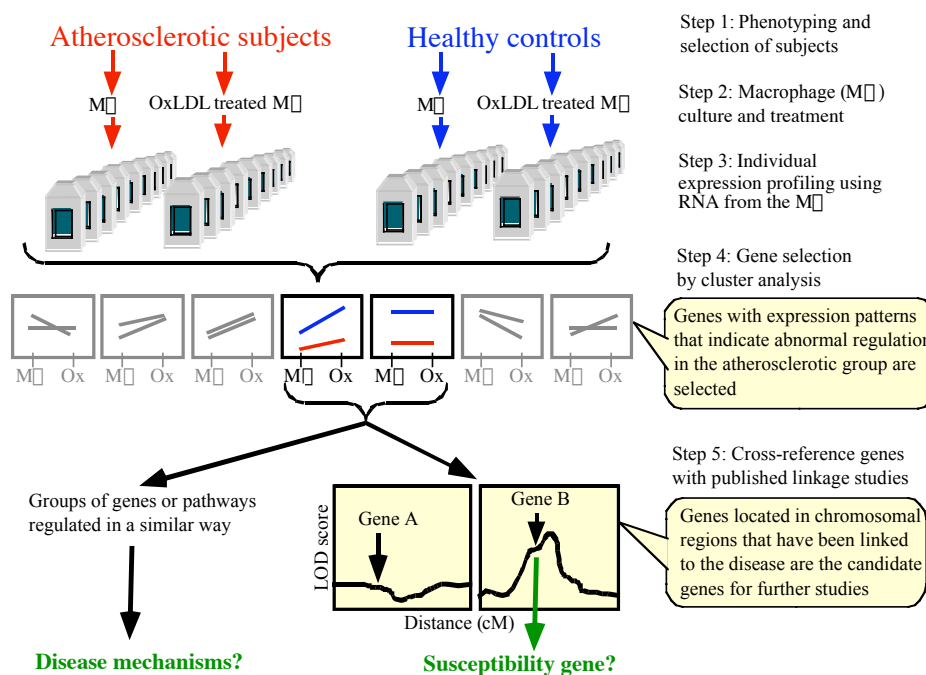
Identification and evaluation of genes that modulate the susceptibility to atherosclerosis (The INTERGENE macrophage study)

Thelle DS, Svensson PA, Englund MC, Snackstrand MS, Hagg DA, Ohlsson BG, Stemme V, Mattsson-Hulten L, Fagerberg B, Wiklund O, Carlsson LM, Carlsson B

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Atherosclerosis is a complex disease with a significant genetic component that may be caused by a large number of interacting genes. Although linkage studies have identified several susceptibility loci for atherosclerosis, both in humans and in mice the loci may contain hundreds of genes and the identification of the disease gene is difficult and time-consuming. In this project, expression profiling will be used as a tool to pinpoint disease genes among the large number of genes located in published loci for atherosclerosis. Potential susceptibility genes for atherosclerosis will therefore be searched for

by a strategy that combines expression profiling with information about chromosomal regions of the genome that have been linked to atherosclerosis. To accomplish this, expression profiles have been obtained from human macrophages from thirty first-degree relatives of patients with acute coronary syndrome. Fifteen of the relatives had atherosclerosis assessed by carotid artery ultrasound and fifteen were without carotid atherosclerosis. By



selecting subjects with family history of atherosclerosis and isolating a single cell type that is cultured *in vitro* and exposed to oxLDL (to reduce environmental and life style differences between the subjects) the study has been carefully designed to optimize the possibilities to identify genetic differences and thereby susceptibility genes. The susceptibility gene identification strategy presented here is based on the idea that single nucleotide polymorphisms (SNPs) in regulatory regions alter the expression of the affected gene. It has been estimated that 6% of the genes contain SNPs that affect the expression level. It is therefore likely that there are differences in the macrophage gene expression pattern in subjects with atherosclerosis and healthy controls. Preliminary data includes the identification of 4 genes that will be further evaluated as susceptibility gene and the verification of 5-lipoxygenase, a recently published susceptibility gene. The possible role of these genes will be assessed as factors modifying the influence of exposure variables such as smoking, dietary habits and physical activity as well as antropometric variables.

O21

Health technology assessment of indoor exposures: methodology and challenges

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Background: Health effects of indoor exposures are difficult to assess due to large variation in populations at risk, different health outcomes measures, different ways to characterise exposures, and the complexity and interactions of several exposures. Systematic reviews have been implemented as the gold standard to assess health care interventions, but have less often been applied when assessing the association between exposures and health outcomes.

Objectives: To undertake a systematic review of observational studies that assessed the association between indoor exposures and asthma or allergy, and interventional studies that assessed effects of interventions to reduce indoor exposures on asthma or allergy.

Methods: Medline and Embase were searched for relevant publications (1966- July 2005) by combining several terms for exposures, indoor locations and health outcomes associated with asthma or allergy. Literature was reviewed according to Health Technology Assessment principles. Data which could be combined in meta-analyses were extracted and analysed.

Results: The literature search yielded 11,641 publications, 2,175 abstracts were reviewed and 1,080 publications retrieved for full text assessment. Studies with a randomised, controlled, cohort or case-control design that provided both exposure data and clinical effect data were included. 362 relevant publications were included in the final assessment, 169 on allergen exposure, 141 on environmental tobacco smoke exposure, and 95 studies on dampness or chemical exposures. Studies were evaluated for qualitative or quantitative synthesis. Results are presented separately for high risk and low risk populations.

Our analysis showed that: Exposure to environmental tobacco smoke increased risk of asthma or wheeze with 35-104%. Anti-mite interventions seemed to provide little benefit. Exposure to damp or mould was associated with increased risk of asthmatic or allergic symptoms.

Methodological issues: Many studies were small and had obvious methodological weaknesses

There are important differences on several issues. For example in the definition of asthma and in the characterization of exposure. Selection bias appears probable with pet exposure. Publication bias appears to be a problem for studies on ETS exposures. The studies are heterogeneous and are hence difficult to combine.

Conclusion: In spite of the high number of publications on indoor exposures and allergy and asthma, it appears difficult to perform studies meeting the methodological challenges in this research area. We found in our review that many studies were too small and had obvious methodological weaknesses that future studies should try to avoid. There is a risk that useful interventions may have been discarded because of type II error.

There is a strong need for more well-planned multidisciplinary studies combining expertise from all relevant areas with objective assessment of both exposures and health outcomes.

O22**Validity of self-reported physical activity in Nord-Trøndelag Health Study (HUNT 1)**Nanna Kurtze¹, Vegar Rangul², Bo-Egil Hustvedt³, Dana Flanders⁴1) HUNT forskingssenter, Institutt for samfunnsmedisin, Det medisinske fakultet, NTNU, nanna.kurtze@ntnu.no2) Avdeling for sykepleier-, ingeniør- og lærerutdanning, Høgskolen i Nord-Trøndelag, vegar.rangul@hint.no3) Institutt for medisinske basalfag, avdeling for ernæringsvitenskap, UiO, b.e.hustvedt@medisin.uio.no4) Institutt for samfunnsmedisin, Det medisinske fakultet, NTNU, dana.flanders@ntnu.no

Background: A large health survey was previously conducted in 1984-86, the Nord-Trøndelag Health Study (HUNT 1), and another in 1995-97, (HUNT 2). A third, HUNT 3, will start in 2006. However, the physical activity questionnaires have not yet been validated.

Purpose: To validate the physical activity questionnaire in the Nord-Trøndelag Health Study (HUNT 1).

Methods: The HUNT 1 questionnaire was administered twice to a sample of 108 men aged 20-39, randomly selected from two Norwegian communities. Repeatability was assessed after one week, and criterion validity by comparing questionnaire results with direct measurement of VO₂ during maximal work on a treadmill and with ActiReg, an instrument that measures physical activity and energy expenditure (EE).

Results: Spearman correlation coefficients indicated strong, statistically significant agreement by test-retest (frequency, $r=0.87$, intensity, $r=0.87$, and duration, $r=0.76$) and weighted Kappa ($R=0.80$, 0.82 and 0.69 , respectively). We found a moderate and significant correlation $r=0.48$ ($p \leq 0.01$) between a previously-used summary index ("Index-2") from the questionnaire and VO_{2 max}. METs values 6 or more from ActiReg most strongly correlated with "Index-2" $r=0.39$, though associations of other measures obtained from ActiReg with questionnaire measures were weaker.

Conclusions: Our results indicate that the physical activity questionnaire in HUNT 1 is reproducible and provides a useful measure of leisure time physical activity for men. A derived index most strongly correlated with VO_{2 max}. They also provide guidance about which aspects of physical activity most strongly associate with responses. The questionnaire should, therefore, be an appropriate tool for use in further epidemiological studies, particularly when interest is in aspects of physical activity reflected in fitness or METs greater than 6.

O23**The association between level of physical activity and lung function among Norwegian men and women. The HUNT Study**Wenche Nystad¹, Sven Ove Samuelsen^{1,2}, Per Nafstad^{1,3}, Arnulf Langhammer⁴¹ Division of Epidemiology, Norwegian Institute of Public Health² Department of mathematics, University of Oslo³ Department of General Practice and Community Medicine, Medical Faculty, University of Oslo, Norway⁴ HUNT Research Centre, Norwegian University of Science and Technology, Verdal, Norway

Aim: The objective of the present study was to estimate the association between self-reported level of physical activity in 1984-86 and 1995-97 and lung function in 1995-97 among Norwegian men and women aged from 28 years to about 80.

Material and methods: In 1984-86 and 1995-97 all residents of the Nord-Trøndelag County, Norway, aged at least 20 years were invited to the Nord-Trøndelag Health Study, HUNT 1 and HUNT 2. The present analysis included a sample taking part in HUNT1 and HUNT2 and that conducted spirometry (n=8047). The data were analysed by linear regression models for FEV₁ with covariates combined activity level in 1985 and 1995, smoking status in 1985 and 1995, health status in 1995, BMI (kg/m²), height and year of birth. The analyses were stratified by sex and by age groups 28-49 years, 50-69 years and 70+ years.

Results: The study population consisted of 3886 men and 4161 women taking part in HUNT1 (1985-87) and HUNT2 (1995-97). Mean age and the level of physical activity was similar among men and women. The proportion of never-smokers was higher among women than among men, while the prevalence of current smokers was alike.

Men and women who reported to be physical active both in 1985 and 1995 had the highest lung function in both sexes and all age groups. Using those who reported that they were physically active in 1985 and 1995 as the reference category adjusting for potential confounders, lung function tended to decline with decreasing level of physical activity in all age groups (<50, 50-69, 70+) in men and women. The reduction in FEV₁ ranged from 0.2 to 1.7 dl being similar to 1-7 % of predicted values. Lung function was also associated with BMI, height, smoking and subjective health.

Conclusion: The present findings indicate that a high level of physical activity may correspond to about 3-5 years of normal decline in FEV₁ (30 ml/year), and may thus overcome some of the age related decline in FEV₁ by increasing age.

O24**Occupational physical activity, overweight and 24-years' mortality**Graff-Iversen S¹, Selmer R¹, Skurtveit S¹, Sørensen M², Gjertsen F¹¹ Norwegian Institute of Public Health, Oslo, Norway² The Norwegian University of Sports and Physical Education, Oslo, Norway

Objective: The aim was to evaluate the effect of occupational physical activity (OPA) on overweight (BMI > 27kg/m²) and cardiovascular disease (CVD) mortality.

Methods: In 1974-78 all inhabitants aged 35-49 years were invited to health surveys in Finnmark, Sogn og Fjordane and Oppland and 90 % participated. OPA was measured by self-reports as sedentary, light, moderate heavy or heavy. Information on education and occupation was obtained from census and vital status and causes of death from the Population register and the Causes of Death Register. Subjects with known CVD, disability pension or death prior to 1980 were excluded. In all 23,884 men and 23,521 women were included, and half of these attended a similar survey in 1985-88. The cohort was followed to the end of 2000. In all 1971 men and 592 women included had died from CVD.

Associations (OR with 95-% CI) were evaluated by logistic regression. Relative risk (RR with 95-% CI) for mortality was computed by Cox regression. Sedentary work was used as the reference.

Results: In unadjusted data there was no significant difference in overweight by OPA in men. When adjusting for age, education, county, smoking and leisure time PA (LPA), OPA at any level was associated with lower odds of overweight, most pronounced by light OPA (OR 0.81; 0.74-0.89). No difference was suggested between the counties. In men, OPA in 1974-78 showed no association with overweight in 1985-88. When including only men that gave exactly the same reports of OPA in both surveys, the odds for overweight in 1985-88 was lower than the reference by light and moderate heavy OPA (adjusted ORs 0.82; 0.72-0.93 and 0.85; 0.74-0.99), while heavy OPA did not carry a different risk.

In women the association of OPA with overweight was positive with 20 % increase of the OR by one level increase of OPA. The association was consistent by county and similar when comparing baseline OPA with overweight 10 years later.

In contrast, the association of LPA with overweight was strongly negative in both genders.

The all-cause and CVD mortality of subjects with light or moderate heavy OPA was similar to the reference. In men with heavy OPA (farming, fishing or industry) adjusted RRs for all-cause and CVD mortality were 0.84 (0.76-0.93) and 0.86 (0.74-0.99), respectively. However, a lower CVD mortality was found in one of the counties, only (Sogn og Fjordane, RR 0.70; 0.50-0.96).

In women with heavy OPA (farming or domestic work), adjusted RR for total and CVD mortality was 0.78 (0.57-1.06) and 1.12 (0.57-1.92). A somewhat lower all-cause mortality risk seemed to be consistent by county and was present also in unadjusted data.

Conclusions: This cohort study did not suggest a convincing protective effect of physical compared with sedentary work with respect to overweight or CVD mortality.

O25**Urovekkende høy forekomst av uoppdaget type 2-diabetes og nedsatt glukosetoleranse hos voksne i Nord-Trøndelag**

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Formål: Diabetes, spesielt type 2-diabetes, øker dramatisk i store deler av verden, og ses ofte sammen med en betydelig økning i fedme og reduksjon i fysisk aktivitet. Man kan ved intervensjon med kostomlegging og fysisk aktivitet redusere insidensen av diabetes hos de som har nedsatt glukosetoleranse med 50%. Forekomsten (prevalensen) av kjent diabetes i var 3,2% ved helseundersøkelsen i Nord-Trøndelag 1995-97. Ingen har i Norge tidligere gjort større undersøkelser for å finne andel med ukjent diabetes etter moderne diagnostiske kriterier (WHO 1999).

Materiale og metode: For å etablere prevalens av ukjent diabetes ble høsten 2004 2000 tilfeldig utvalgte innbyggere i Verdal kommune i Nord-Trøndelag, 20 år og eldre, invitert til en glukosebelastning. 1123 deltok. I tillegg ble 266 ikke uttrukne, men som selv ønsket å møte, undersøkt. I tillegg til prevalensundersøkelsen ble det gjort flere tilleggsundersøkelser, der man bl.a. kartla kosthold, fysisk kondisjon og jernstatus.

Resultater: Foreløpige tall viser at prevalensen av tidligere ukjent diabetes var mer enn 5%, og betydelig høyere enn prevalensen av kjent diabetes. I tillegg hadde over 8% nedsatt glukosetoleranse. I aldersgruppen over 70 år hadde tilsammen over 40% av de undersøkte diabetes eller nedsatt glukosetoleranse. De som møtte etter eget initiativ hadde ikke større samlet forekomst av diabetes og nedsatt glukosetoleranse enn de som var i det tilfeldige utvalget selv om de gjennomgående var noe eldre.

Konklusjon: Forekomsten av diabetes og nedsatt glukosetoleranse var i denne undersøkelsen meget høy, og tilsier at man i allmennpraksis legger større vekt på å lete etter ukjent diabetes ihvertfall i risikogrupper. Dette funnet aktualiserer den pågående debatt om screening av og intervensjon overfor risikotilstander i allmennpraksis.

Denne undersøkelsen har mottatt økonomisk støtte fra Norges Diabetesforbund, sentralt og lokalt, Norske Kvinners Sanitetsforening, HUNT forskningssenter, Dr. Egil Kjeldaas' legat til medisinsk forskning og Glaxo Norge AS.

O26**Endring i høyde, vekt og kroppsmasseindeks: Et longitudinelt studium med data fra Helseundersøkelsen i Nord-Trøndelag (HUNT)**

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Formål: Studere endring i høyde og vekt for de som deltok i både i den første (HUNT 1) og den andre (HUNT 2) helseundersøkelsen i Nord-Trøndelag, samt studere hvordan endring i kroppshøyde påvirker utviklingen av kroppsmasseindeks (KMI).

Material og metode: HUNT 1 og HUNT 2 ble gjennomført i henholdsvis 1984-86 og 1995-97. Alle som var 20 år eller eldre i HUNT 1, og som deltok både i HUNT 1 og HUNT 2, utgjorde studiepopulasjonen. Alder ved HUNT 1 ble stratifisert i 10-års aldersgrupper (20-29, 30-39,....70+). KMI ble kategorisert ved å benytte Verdenshelseorganisasjon (WHO) sin definisjon på henholdsvis undervekt (KMI<18.5 kg/m²), normal vekt (KMI 18.5-24.9 kg/m²), overvekt (KMI 25.0-29.9 kg/m²) og fedme (KMI≥ 30 kg/m²). For å studere hvordan høydeendringen påvirker utviklingen av kroppsmasseindeksen ble KMI ved HUNT 2 regnet ut både med høyde i HUNT 1 og i HUNT 2. Resultatene er fremkommet ved bruk av deskriptive analysemetoder og regresjonsanalyser.

Resultater: Med unntak av aldersgruppen 70+ både hos kvinner og menn så hadde alle en økning i vekt mellom HUNT 1 og HUNT 2, og deltakere som var 50 år eller yngre hadde den største økningen. Blant kvinner og menn i aldersgruppen 20-29 år var vektøkningen på henholdsvis 7.9 kg (SD 6.4) og 7.3 (SD 7.3) kg. Forekomsten av overvekt (KMI 25.0-29.9 kg/m²) og fedme (KMI≥30 kg/m²) økte derfor mellom undersøkelsene. I gjennomsnitt økte prevalensen av fedme fra 6.7% til 15.5% hos menn, og fra 11.0% til 21.0% hos kvinner. Noe av økningen i forekomst av overvekt og fedme var forårsaket av tapt høyde, og dette var mest fremtredende hos de eldre.

Konklusjon: Den observerte fedmeepidemien er nyansert hvis man differensierer på kjønn og alder. Noe av økningen i overvekt og fedme definert ved KMI kan tilskrives tapt kroppshøyde.

O27**Assosiasjon mellom antigener for fire orale bakterier og hjerteinfarkt**

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Bakgrunn. Orale bakterier er kjent for å være assosiert ved hjertesykdom og er funnet i aterosklerotiske lesjoner. Vi ville studere assosiasjonen mellom bakterier som forårsaker marginal periodontitt og selvrappert hjerteinfarkt.

Metode. Studien er basert på menn som deltok i Oslo-undersøkelsen 1972/73, og dens oppfølging Oslo II i år 2000. Ved screening i 2000 ble det innhentet selvrappert informasjon om tannhelse og sykdomsstatus. Det er gjennomført en nøstet kasus-kontroll studie ved at kasus er de menn som rapporterte å ha hatt et hjerteinfarkt (n=548). Det ble trukket aldersmatchete kontroll (n=625). Restserum fra blodprøven i 2000 ble lagret og ble senere analysert for antistoffer for fire bakterier: *Porphyromonas gingivalis* (PG), *Actinobacillus actinomycetemcomitans* (AA), *Bacteroides forsythus* (BF) og *Treponema denticola* (TD). PG, BF og TD utgjør det røde kompleks som er assosiert med marginal periodontitt. AA er også assosiert. Prøvene ble analyser med ELISA-metoden. I tillegg ble C-reaktiv protein analysert.

Resultater. Resultatene som vises, er de første eksplorative analyser. Gjennomsnittlig nivå av antistoffer var høyere for alle med hjerteinfarkt enn de som ikke hadde hatt hjerteinfarkt, for alle bakteriene, men forskjellene var ikke signifikante. Standard avvik for bakteriemålingene var store. Bakteriene BF og TD, og PG og BF var signifikant korrelerte. Kji-kvadrat-test av kvartilverdier for AA, men ingen andre bakterier, viste en trend (p=0,078). Ingen av bakteriene var signifikante prediktorer for hjerteinfarkt når bakterieresultatet var en kontinuerlig variable. Det ble brukt en analysemodell for øvre kvartil (n=726) versus lavere verdier (n=447). Ved en analysemodell der en av fire bakterier var i øverste kvartil, var sammenhengen signifikant. (p=0,032). Ved en analysemodell der en av tre bakterier var i øverste kvartil, var sammenhengen signifikant hvis BF (p=0,036) eller TD (p=0,040) ikke var med i modellen. Hvis to bakterier var med, så var modellen signifikant når BF og TD var inkludert (p=0,031).

Det er signifikant forskjell i CRP-nivå mellom kasus og kontroll ved analyse av kvartilverdier i en Kji-kvadrat-test (p=0,010). CRP og orale bakterier (1 av 4 bakterier) er uavhengige prediktorer for hjerteinfarkt i logistisk regresjons analyser. Ved CRP grupper som <1, 1-3, 3-10 og >10, finner vi at ingen bakterier er signifikant prediktorer for CRP<1, AA er signifikant for CRP mellom 1 og 3, PG er signifikant mellom 3 og 10 og BF er signifikant for CRP >10.

Konklusjon. Det er funnet assosiasjon mellom antistoffer for orale bakterier og hjerteinfarkt. Sammenhengen mellom bakteriene i det røde kompleks er ikke tydelig. Betydningen og egenskapene til de forskjellige bakteriene reflekteres i CRP-nivå.

O28**Er det sammenheng mellom personlige trekk og stress-atferd registrert i 1972/73 og symptomer på psykiske plager 28 år senere? Osloundersøkelsene 1972/73 og 2000**

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Formål: Å undersøke sammenhengen mellom personlige trekk og stress-atferd registrert blant unge og middelaldrende menn i Oslo i 1972/73 - og symptomer på angst, depresjon (HSCL-10) og hjelp-søkingsatferd rapportert ved Andre runde av Oslo-undersøkelsen i 2000.

Materiale og metode: Alle menn bosatt i Oslo 40-49 år (n=25,915) og et 7% utvalg av menn 20-39 år (n=4,110) ble invitert til en hjerte-kar undersøkelse i 1972/73. I alt deltok 17,972 (60%). Alle som ble invitert i 1972/73 og som fortsatt bodde i Oslo/Akershus i år 2000, ble invitert til Andre runde av Oslo-undersøkelsen/Oslo II. Totalt deltok 7,157 av dem som deltok første gang.

Ved den første undersøkelsen ble mennene foruten opplysninger om symptomer på hjerte-kar sykdom og livsstil, stilt spørsmål: 1) om de hadde vært mer anspent og irritert siste år enn før, 2) om det hadde vært mer enn vanlig press på jobben, 3) om de regnet seg som en person som presser seg selv og velger et høyt tempo, og 4) om de regnet seg som en person som heller velger fredelige og rolige dager. Disse 4 spørsmålene er valgt ut fra et større spørreskjema for kartlegging av type A og type B atferd. Ved Andre runde av Oslo-undersøkelsen 28 år senere svarte mennene på 10 spørsmål om symptomer på angst og depresjon (Hopkins Symptom Check List – HSCL-10). Grensen for symptomer på angst/depresjon er satt ved HSCL \geq 1.85. Deltakerne i oppfølgingsundersøkelsen ble også spurt om de har eller har hatt psykiske plager som de har søkt hjelp for.

Resultater: Justert for alder, utdanning, sivilstatus, røyking og fysisk aktivitet i arbeid og fritid, hadde menn som var mer anspent og irritert siste år enn tidligere, en OR =2.6 (KI 2.0-3.5) for symptomer på angst/depresjon. Også de som presset seg selv og valgte et høyt tempo (OR=1.4, KI 1.04-1.6) og de som hadde mer enn vanlig press på jobben (OR=1.4, KI 1.1 -1.9) hadde økt risiko for symptomer på angst/depresjon 28 år etter. Det var ingen sammenheng mellom det å velge et liv med mer fredelige og rolige dager – og senere symptomer på angst/depresjon.

Vi fant en klar sammenheng mellom det å være mer anspent og irritert siste år - og rapporterte psykiske plager som man hadde søkt hjelp for. I alt 10.4 % av dem som rapporterte dette i 1972/73 hadde oppsøkt hjelp for psykiske plager, mens 6.7 % av dem som svarte nei på dette spørsmålet, hadde søkt hjelp senere (OR=1.6 KI 1.3-2.0 – justert for konfundere).

Konklusjon: Type A atferd har i tidligere studier vist positiv sammenheng med hjerte-kar sykdom og kreft, men ingen har, så langt vi kjenner til, vist en sammenheng med senere angst og depresjon i en prospektiv studie – slik vi fant for 3 av indikatorene på type A atferd.

O29**Occupational status, powerlessness and health**Odd Steffen Dalgard¹, Michael McCubbin² and Bjørgulf Claussen³

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Objective: To investigate to which extent psychosocial variables, including perceived powerlessness, can explain the social gradient in health

Material and method: Cross-sectional survey of 11798 employed adults from Oslo as part of the Oslo Health Survey 2000/2001. Self-administered questionnaire with questions about somatic disorders, psychological distress (HSCL-10), BMI, smoking, physical exercise, social support, perceived powerlessness, control at work and negative life events. Social status was measured by occupational status according to Erikson-Goldthorpe. The overall response rate in the Oslo Health Survey was 46%, but study of possible attrition bias showed that the associations between social variables were not much influenced by the low response rate.

Results: Having one or more somatic disorders (chronic disease, musculoskeletal pain and/or skin disease), as well as all indicators of life style and psycho-social conditions, showed a significant social gradient. When adjusting for psychosocial variables, the social gradient of somatic disorder was reduced below the level of significance. Life style factors contributed a smaller part to explain the social gradient when adjusting for psycho-social variables.

Conclusion: Psychosocial variables, in particular sense of powerlessness, contribute strongly to the social gradient in health, and should be taken into consideration in preventive work.

O30

Childhood asthma under the North Face of Mount Everest

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Background: The aim of the study was to assess the prevalence of symptoms of respiratory and allergic diseases among school children in rural Tibet with an environment widely different from what is experienced in most developed countries.

Material and Methods: A total of 2026 12-14 year old school children living in Shigatze district of Tibet answered a Tibetan version of the International Study of Asthma and Allergy in Children's questionnaire and video questionnaire, including questions about respiratory and allergic symptoms and environmental exposures. All the invited children accepted to participate in the study and filled in and returned the questionnaire.

Results: Ever asthma was reported by 2.4% of the children and 2.8% had ever wheezed and 0.5 % wheezed severely as demonstrated in the video that was presented to them. Boys reported in general more respiratory symptoms than girls. Indoor dampness problems increased the risk of most symptoms (odds ratio: 2.0-2.5). Coming from a large family did not protect against diseases or symptoms. Wood and animal dung were used energy sources for heating and cooking and it was common to keep cats and dogs indoor. Child mortality was high.

Conclusion: In spite of substantial indoor air exposure, a low O₂ saturation and poor medical services, few children reported asthma and allergy related symptoms and diseases. The findings are well in accordance with the view that the hygienic western lifestyle in some way increases the risk of these symptoms/diseases. The high child death rate could also have contributed to the low disease occurrence.

O31**Hyppighet av rotavirus infeksjoner og risiko for cøliaki-relatert autoimmunitet blant barn: longitudinell nøstet kasus-kontrollstudie**

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Formål: Å undersøke om økt hyppighet av rotavirus infeksjoner, en vanlig årsak til mage- og tarminfeksjoner hos barn, predikerer økt risiko for cøliaki-relatert autoimmunitet.

Materiale og Metode: En kohort på 1931 barn fra Denver området som hadde HLA alleler som disponerer for cøliaki ble fulgt fra spedbarnsalder med hensyn til utvikling av cøliaki relatert autoimmunitet, definert ved gjentatt positivitet for autoantistoffer mot enzymet vevs-transglutaminase (målt med et radioimmunoassay med humant rekombinant vevs-transglutaminase). Blodprøver ble tatt ved alder 9, 15 og 24 måneder, og deretter en gang hvert år. Rotavirus antistoffer ble målt med et indirekte enzymimmunoassay hvor alle serumprøver fra samme kasus-barn og dets to matchede kontroller ble målt samtidig (på samme mikrotiter-brett). Antall infeksjoner i oppfølgingsperioden ble estimert med en a priori definert algoritme der rotavirus antistoff over grenseverdi ved første blodprøve talte en og hver økning (>2 assay variasjonskoeffisient) mellom to klinikkbesøk talte som en infeksjon.

Resultater: Femtifire barn utviklet cøliaki-relatert autoimmunitet ved median alder 4.4 år. Det ble tatt tynntarmsbiopsi av 36 av disse, hvorav 27 (75%) viste klar cøliaki (Marsh skåre 2 eller 3). Hyppig rotavirus infeksjon predikerte høyere risiko for cøliaki-relatert autoimmunitet (rate-ratio=1.94 for en infeksjon, rate-ratio=3.76 for ≥ 2 infeksjoner, sammenlignet med null, P(trend)=0.037). Estimaten ble i liten grad påvirket av justering for kjønn, etnisk gruppe, mors utdanning, ammevarighet, om barnet hadde gått i barnehage før to års alder, antall søsken, sesong ved fødsel, og antall *HLA DR3-DQ2* haplotyper (disponerende gener).

Konklusjon: Denne første prospektive studien av en spesifikk infeksjon og cøliaki viser at økt hyppighet av rotavirusinfeksjoner kan være med å øke risikoen for cøliaki-relatert autoimmunitet hos barn.

O32**Self-rated health, forearm BMD and bone loss in men and women, a longitudinal study**Siri Forsmo¹, Solfrid E. Lilleeng, Arnulf LanghammerDept. of Public Health and General Practice, Norwegian University of Science and Technology, Trondheim, Norway. ¹siri.forsmo@ntnu.no

Purpose: Several studies have shown that self-rated health represents a good predictor of morbidity and mortality. Less is known whether self-reported health status and longitudinal change in self-reported health correlate with bone mineral density (BMD) and bone loss. The aim of this study was to investigate the association between perceived health status, its change and forearm BMD and bone loss in a non-selected sample of adult men and women.

Material and methods: In 1995-97 all citizens aged >19 years (about 92,000) in the county of Nord-Trøndelag were invited to a multipurpose health survey (HUNT). About 18000 individuals were invited to forearm bone densitometry, and among them a 5% random population sample from which 2779 (60%) men and women met. In 2001, 4.6 years after the first screening, follow-up densitometry was performed, and 1734 (62%) men and women from the 5%-sample attended. BMD measurements were performed by single X-ray absorptiometry (Osteometer DTX 100) at the distal and ultradistal non-dominant forearm provided no previous fracture. Subjective health status was rated in four categories (1: poor, 2: not so good, 3: good and 4: very good) based on identical questions at baseline and follow-up.

Results: Mean age at baseline and at follow-up was 50.1 (range 20-85) and 54.6 years (range 24-89), respectively. At follow-up 30% women and 22% men rated their health as poor or not so good ($p < 0.001$). Change in self-rated health status between baseline and follow-up was categorised as deteriorated, unchanged and improved. No statistically significant difference was found between the sexes for change in health status, in about two-third there was no change, deterioration in 18% and improvement 16%. In linear (men) and quadratic (women) regression models, a strong and positive association was found for self-rated health status and BMD (distal and ultradistal radius), adjusted for age and body weight. Statistically significant bone loss was found in both men and women older than 40 years at baseline. Bone loss was more pronounced at ultradistal than distal site until the age of 60 years in women and 65 years in men. The association between change in self-rated health and bone loss was assessed in linear and polynomial regression models in men and women <80 years adjusting for age, body weight and interval of measurements. A statistically significant association was found at ultradistal radius in men ($p < 0.05$), somewhat weaker ($p < 0.1$) at distal forearm indicating that improvement in self-rated health status is followed by reduced bone loss and vice-versa. No statistically significant association could be found in women.

Conclusion: Poor self-rated health is associated with low bone mass. Improvement in perceived health seems to reduce bone loss in men, but not in women.

O33**Haemoglobin predicts total mortality in a general young and middle-aged male population. The Tromsø Study**

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Objective: The prognostic value of haemoglobin within normal references is seldom emphasized. The relationship between haemoglobin and mortality has been questioned due to possible confounding of other risk factors. We investigated the relationship between haemoglobin and total mortality, and evaluated the possible modifying effects of smoking, body mass index, total cholesterol and systolic blood pressure.

Study Design and Setting: In a population study from Tromsø, Northern Norway, 6,541 men aged 20-49 years were examined in 1974. During 20 years follow-up (127,120 person years), 495 deaths were identified.

Results: We found a U-shaped relationship between quintiles of haemoglobin and total mortality. Among the 35-49 years old the multiple adjusted hazard ratios (95% CI) were 1.83 (1.31-2.57) in quintile 1 and 1.72 (1.23-2.41) in quintile 5, compared to quintile 3 of haemoglobin. Compared to the age adjusted hazard ratios, the multiple adjustments tended to non-significantly enhance the association in the lowest quintiles and non-significantly attenuate the association in the highest quintiles. The relationship was most pronounced in smokers in a dose response manner, but also present in non-smokers.

Conclusion: Haemoglobin level had prognostic value. Smokers in quintile 1 and quintile 5 of haemoglobin were at increased risk of dying.

O34**Long-term effect of residential outdoor air pollution on lung function in school children in Oslo**Bente Oftedal¹, Wenche Nystad¹, Sam-Erik Walker², Per Nafstad^{1,3}

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Introduction: Some studies have reported associations between ambient air pollution and lung function. However, most of these studies used exposure on aggregated level, and not on a more individual level.

Aim: The aim is to study the relation between long-term exposure to outdoor air pollution, at the home address, and lung function for 9-10 year old children in Oslo.

Methods: The study population was all children born in Oslo in 1992/93 which lived in Oslo in 2001/02. The pulmonary function variables peak expiratory flow (PEF), forced expiratory flow at 25% of FVC (FEF_{25%}), forced expiratory flow at 50% of FVC (FEF_{50%}), forced vital capacity (FVC), and forced expiratory volume in the first second (FEV₁), were measured for 2524 children at their schools. Outdoor air pollution exposure was assessed by the EPISODE model, a dispersion model based on emissions, meteorology, topography, and background air pollution concentrations. The model calculates concentrations for each km² and at thousands of receptor points. Exposure was given according to the location of each child's home address. Long-term exposure of nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}) was calculated as the mean concentration in the calendar year preceding the lung function examination. We used the general linear model to study the relation between lung function and air pollution levels stratified by sex, and adjusted for height, body mass index, age, birthweight, parents' ethnicity, parents' education, parents' smoking habits, and any asthma or allergy confirmed medically.

Results: The annual mean residential concentration ranged from 1.5 µg/m³ to 67.1 µg/m³ for NO₂, from 6.1 µg/m³ to 24.3 µg/m³ for PM₁₀, and from 6.1 µg/m³ to 17.3 µg/m³ for PM_{2.5}. The pollutants were highly correlated (Spearman's correlation coefficients $\rho = 0.82-0.97$). All the pollutants were associated with PEF for girls; 10 µg/m³ increase of NO₂, PM₁₀, and PM_{2.5} were associated with 0.32 dl/s (-0.64, -0.01) (95% CI), 1.39 dl/s (-2.64, -0.14), and 1.67 dl/s (-3.24, -0.10) decline in PEF respectively. For boys however, we found no long-term effects. Similar results were found for FEF_{25%} and FEF_{50%}. We found no long-term effects on FVC and FEV₁.

Conclusion: Moderate levels of long-term exposure to outdoor residential air pollution were associated with expiratory flow for 9-10 year old girls in Oslo, but not for boys. However, no associations were found with expiratory volumes. High correlation between the pollutants involves careful considerations of which pollutant was most important.

O35**Changes in blood pressure lowering treatment: Do we reach treatment goals? The Tromsø Study 1994 and 2001**Anne Elise Eggen¹, Inger Njølstad¹ and Frode Skjold²¹ Dep of Community Medicine, University of Tromsø, Tromsø² Dep of Pharmacy, University of Tromsø, Tromsø

Objectives: There has been a great focus on preventive treatment of cardiovascular disease and blood pressure lowering drug (BPLD) treatment for years. The sales of BPLD in Norway increased from 109 to 223 defined daily doses/1000/year from 1994 to 2002. The aim of this study is to describe the change from 1994 to 2001 in BPLD use, use of other cardiovascular drugs, and explore how the recommended treatment goals are reached.

Material and methods: The Tromsø Study is a population based cohort study where the population has been invited to five consecutive health surveys, focusing mainly on chronic and lifestyle-related diseases (response rates about 80 %). See <http://uit.no/med-befolkning/tromso/>. The Tromsø IV and V Study were carried out in 1994 and 2001, respectively. Tromsø V was primarily designed to follow up persons already in the cohort. Responders completed questionnaires on drug use and diseases, underwent clinical measurements, blood tests and interviews. Regularly used drugs were registered on the 5th level of ATC. We compared two surveys of subjects between 60-84 years attending in 1994 (n=4019) and 2001 (n=4952). All figures were adjusted using the European Standard Population as standard population. All analyses and t-tests were done using SAS software package (SAS Institute Inc. version 9.1).

Results: The prevalences of BPLD treatment (60-84 years) increased markedly from about 18% to 29% in both genders (p<.0001) with a strong age-trend in 2001 (Figure 1). Mean SBP decreased significantly in both users and non-users of BPLD in both genders, indicating that pharmacological treatment is only one part of the picture. The differences in BMI and smoking were modest. Women had higher levels of SBP compared to men, however, the gender difference decreased in the period (table 1 and 2).

We compared BPLD treated persons with and without cardiovascular risk conditions. The total cardiovascular drug treatment (use of LLDs, low-dose acetylsalicylic acid (ASA)) increased strongly in all groups. BPLD monotherapy decreased, however, significant in men with risk conditions only (tables 4). The systolic blood pressure indicators showed a marked difference to tighter BP control, but a significant proportion was still outside the range of the target values. In subjects with risk conditions the proportions with SBP above 170mmHg were halved to 14% and 20% in men and women, respectively.

Conclusions: BPLD use increased steeply from 1994 to 2001 as have LLD and ASA use. Only modest differences were observed for smoking and BMI. However, the drop in SBP in subjects not on BPLD treatment was in the same order of magnitude as the treated subjects. The treatment indicators showed a tighter control of SPB and se-chol. Despite all this effort the treatment goals are not satisfyingly reached. According to current European guidelines all participants in The Tromsø Study above 60 years of age should be on drug treatment.

O36**Does implementation of the European guidelines based on the SCORE model double the number of Norwegian adults who need cardiovascular drugs for primary prevention? The Tromsø Study 2001**Ingeborg Hartz¹, Inger Njølstad² and Anne Elise Eggen¹¹Department of Pharmacy, University of Tromsø, Tromsø, Norway, ingeborg@farmasi.uit.no²Department of Community Medicine, University of Tromsø, Tromsø, Norway

Background: Recent European guidelines on CVD prevention in clinical practice recommend the use of preventive strategies at high-risk individuals, such as patients with established CVD or diabetes, or asymptomatic individuals with a 10-year risk of 5% or more of having a fatal CVD event. To identify asymptomatic high-risk individuals the recently developed SCORE (Systematic Coronary Risk Evaluation) risk model are recommended as a tool in everyday practice (1,2). Accordingly, antihypertensives and/or lipid-lowering drugs (LLD) for primary prevention are recommended in those with SCORE \geq 5%, in combination with systolic blood pressure and/or total cholesterol above target values. The guidelines do not specify an upper age limit for primary prevention.

Objectives: To present the cardiovascular risk profile distribution in a Norwegian population, according to European guidelines. Further, to study the implications of European guidelines on the use of antihypertensives and/or LLDs for primary prevention in a Norwegian population.

Material and methods: The Tromsø Study is a population-based study of chronic diseases, risk factors and drug use in the municipality Tromsø in Northern Norway (1974-). This analysis includes the 45-79 year old participants in 2001 (n=6362, attendance rate 86%).

The population was stratified in primary and secondary prevention subgroups according to CVD risk level. Participants in the primary prevention subgroup who reported use of antihypertensives and/or LLDs were included as current users in the analyses. Eligible for primary prevention according to European guidelines: those with a 10-year risk \geq 5% of having a fatal CVD event, together with systolic blood pressure \geq 140 mmHg and/or total cholesterol \geq 5.0 mmol/l. Using prevalences of CVD morbidity and drug use from our study population, we estimated the implications of European guidelines in the primary prevention subgroup of the 45-64 and the 65-79 year olds registered in Norway.

Results: From the age of 60 years in men and 70 years in women, almost all participants were defined as high-risk individuals according to the European guidelines, with established CVD, diabetes, or a 10-year risk score of \geq 5%.

In the primary prevention subgroup of the 45-64 year olds, recommended antihypertensive and/or LLD use would be higher in men only, 42% compared with 12% on current medication. Among the 65-79 year olds, over 90% would be eligible for antihypertensives and/or LLDs in both sexes, compared with current treatment rates of below 30%. In total, 40% of all participants aged 45-79 years would be candidates for primary prevention, compared with 15% on current medication.

Conclusion: The implementation of European guidelines could imply a doubling of the numbers of Norwegian adults on cardiovascular medication for primary prevention. Contributors to the increase would be more frequent drug use in men and elderly people, particularly for LLD use.

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O37**Utilisation of analgesics containing codeine: geographic variation between counties in Norway**

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Background: Fixed combinations of analgesics containing codeine and paracetamol are widely prescribed in Norway and large inter-county differences have been observed. Data from wholesalers have been used as the source for drug consumption statistics in Norway. Sales figures are normally presented in number of Defined Daily Doses (DDD) per 1000 inhabitants per day and give a good basis for studying the long term trends in drug use. However, it is often difficult to calculate the number of users by using the DDD methodology, especially for therapies that are used intermittently (e.g. analgesics) or in short periods and where the dosages actually used differ from DDD.

In 2004 the Norwegian Prescription Database (NorPD) has been established, and data have been collected since January 2004. Using this database it is possible to trace the prescription drug history of an individual user and thereby describe drug use by epidemiological parameters.

Objectives: The purpose of this study was to use prescription data to analyse and assess the differences in the level of consumption of analgesics containing codeine and paracetamol. The analysis has been focused on the four Norwegian counties with the highest and lowest sale. Estimates of prevalence may be calculated by using prescription data.

Material and methods: The NorPD is a research database that includes all prescriptions dispensed from Norwegian pharmacies since January 2004. The database covers all individuals in Norway. The identity of the patients and prescribers has been encrypted. However, each individual is linked to unique person-identifier, making it possible to follow the patient over time. Data collected are age and sex (patient and prescriber), demographic information, date of dispensing, pharmacy identifier, and information regarding the dispensed product. Age and gender-specific 1-year periodic prevalence was measured as number of individuals receiving at least one prescription in one calendar year per 100 inhabitants. Dispensed quantity per prescription and dispensed quantity per identified user in 2004 was measured as total number of DDDs. All individuals receiving drugs in ATC-code N02AA59 were extracted from NorPD.

Results: The inter-county variations in sales of codeine analgesics in Norway have been large and persistent. We found differences in 1- year prevalence of codeine analgesic and the prevalences were higher for both sexes and in all age groups in counties with high sale of codeine analgesics. Dispensed quantities per person in 2004 were higher for older age groups in the county with highest sale compared to the lowest sale county. Number of prescription per person per year of codeine analgesics was also higher in counties with high sale compared to low sales counties.

Conclusions: The higher prevalence of users in all age-group and genders and higher prescribed quantities per prescription and per person (number of DDDs) in high sale counties are probable both contributing factors to explain the differences in sales of codeine analgesics between counties in Norway.

O38**The ability of the SCORE risk model to predict 10-year cardiovascular disease mortality in Norway**Lindman AS^{1,2}, Selmer R¹, Tverdal A¹, Eggen AE³, Pedersen JI⁴, Veierød MB²

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Background: The SCORE risk model was developed based on European cohort studies and is aimed to identify subjects at high risk of cardiovascular disease (CVD) based on age, gender, total cholesterol level, blood pressure and smoking habits. The model is targeted at individuals clinically free of CVD. The risk charts developed from the SCORE model were included in the European guidelines on cardiovascular disease prevention in clinical practice (2003), and individuals with a 10-year risk of fatal CVD $\geq 5\%$ are by definition at high risk and eligible for primary prevention. However, Norway has experienced a considerable decline in CVD mortality during the last decades and the Norwegian Society of Cardiology has not recommended implementing the new guidelines before the prediction ability of the SCORE risk model has been investigated in a Norwegian population.

Aims: To study the prediction ability of the SCORE model in Norway. Moreover, to investigate the number men and women that will be identified as high risk individuals by the SCORE model in the study population.

Materials and Methods: Population surveys conducted in Norway in several different time periods were used. Population surveys conducted in 1985-1994 were used to investigate the prediction ability of the model, with linkage to the national mortality register (age 40-69). Predicted number of deaths according to the SCORE model, were compared with observed 10-year CVD mortality. Recent population surveys (2000-2003) were used to study the number of individuals at high risk (age groups 30-31, 40-41, 45-46, 59-61, 75-77).

Results: The predicted number of CVD deaths was 836 in women while that observed was only 386 (ratio 2.2). In men 2866 events were predicted and only 1372 were observed (ratio 2.1). Using the SCORE risk model on the recently examined Norwegian population show that among men aged ≥ 59 , more than 80% had a 10-year risk $\geq 5\%$. In our study population, few women and practically no men younger than 46 years can be considered at high risk according to the risk prediction model.

Conclusion: The preliminary results from our study suggest that the SCORE risk model overestimate the number of CVD deaths in Norway, both for women and men. Before implementation in clinical practice, proper adjustments to national levels are required.

O39**Higher blood pressure in ethnic Norwegians compared to non-western immigrants in Oslo**Haakon E. Meyer^{1,2}, Kathleen Glenday¹, Aage Tverdal², Bernadette N. Kumar¹¹Department of General Practice and Community Medicine, University of Oslo and²Norwegian Institute of Public Health, Oslo, Norway

Objective: We investigated differences in blood pressure among ethnic Norwegians and five of the major immigrant groups living in Oslo, Norway.

Methods: The Oslo Health Study and the following Oslo Immigrant Health Study were population based, cross sectional studies conducted in 2000-2002. In the current analysis, persons aged 30-60 years and born in Norway (n=9842), Turkey (n=465), Iran (n=649), Pakistan (n=643), Sri Lanka (n=1013) or Vietnam (n=567) attending one of the two studies were included. In both studies, the screening involved a clinical assessment (including measurement of blood pressure and collection of non-fasting blood samples) and completion of a questionnaire. Hypertension was defined as systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg, and/or currently taking antihypertensive medications.

Results: In both men and women, systolic blood pressure was higher in those born in Norway compared to any of the other groups. While this trend was similar for diastolic blood pressure, the differences were less prominent than for systolic blood pressure. Blood pressure was not related to length of stay in Norway in any of the immigrants groups. There were large differences in the prevalence of obesity between the different groups, especially in women, with Norwegians, Iranian and Vietnamese being the slimmest. Therefore, adjusting for body mass index increased the differences in BP between ethnic Norwegians and some of the migrant groups. After adjusting for age and body mass index, the odds ratios for hypertension, with ethnic Norwegian men as the reference group, were 0.45 (95% CI 0.30-0.68) for Turkish men, 0.34 (95% CI 0.23-0.50) for Iranian men, 0.67 (95% CI 0.49-0.91) for Pakistani men, 0.81 (95% CI 0.59-1.10) for Sri Lankan men and 0.50 (95% CI 0.32-0.78) for Vietnamese men. The corresponding odds ratios in women were 0.33 for Turkish, 0.24 for Iranian, 0.53 for Pakistani, 0.59 for Sri Lankan and 1.02 for Vietnamese women.

Conclusions: Men and women with ethnic Norwegian background had higher blood pressure and a higher prevalence of hypertension compared to immigrants in Oslo. These differences increased when adjusting for body mass index.

O40

Environmental effects on blood pressure among participants in the Oslo Health Study (HUBRO)

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Background: It is well known that environmental conditions are related to the risk of developing cardiovascular diseases and events. However, the mechanisms behind these relations are not well understood. One mechanism could be elevation of blood pressure. In this study we assessed associations between blood pressure and environmental conditions among citizens in Oslo, Norway.

Material and methods: We used the Oslo Health Study (HUBRO), a population based study of about 19 000 Oslo citizens, to assess associations between blood pressure and environmental conditions including season, weekday, time of day, education, alcohol intake, outdoor temperature and air pollution.

Results: A 10 °C reduction in outdoor temperature the day blood pressure was measured was related to an increase in blood pressure for both men (SBP: 1.5 mmHg (95% CI, 0.6 to 2.3); DBP: 1.3 mmHg (95% CI, 0.1 to 1.8)) and women (SBP: 2.4 mmHg (95% CI, 1.6 to 3.2); DBP: 1.8 mmHg (95% CI, 1.3 to 2.3)). Blood pressures were highest when measured on Monday mornings and reduced gradually until Friday. No convincing relation was found between indicators of air pollution exposure and blood pressure.

Conclusion: Several environmental conditions were related to blood pressure, and have similar associations with cardiovascular diseases or mortality. This could indicate that some of the effect these exposures have on the cardiovascular system is by increasing blood pressure.

O41**Tidligere chlamydiainfeksjoner og risiko for svangerskap utenfor livmor**Inger Johanne Bakken¹, Finn Egil Skjeldestad^{1,2}, Svein Arne Nordbø³¹ Avdeling for epidemiologi, SINTEF Helse² Institutt for laboratoriemedisin, barne- og kvinnesykdommer, NTNU³ Avdeling for medisinsk mikrobiologi, St. Olavs hospitalKorrespondanse til Inger Johanne Bakken, Avdeling for epidemiologi, SINTEF Helse, 7465 Trondheim; inger.bakken@sintef.no.

Prosjektet er finansiert med EXTRA-midler fra Helse og Rehabilitering gjennom Forening for Ufrivillig Barnløse.

Formål: Genital chlamydiainfeksjon forløper vanligvis asymptomatisk og oppdages derfor oftest ved screening. Flere tidligere studier har vist høyere forekomst av antistoff for chlamydia blant kvinner med svangerskap utenfor livmor sammenliknet med kvinner med intrauterin graviditet. Prospektive studier av følgene av påvist og behandlet chlamydiainfeksjon mangler. Hensikten med denne studien var å undersøke betydningen av diagnostisert chlamydiainfeksjon for senere svangerskap utenfor livmor.

Materiale og metode: Denne populasjonsbaserte næstede pasient-kontroll-studien bygger på to ulike datakilder. Chlamydiadatabasen inneholder informasjon om alle chlamydiaprøver avlagt i Sør-Trøndelag i perioden november 1990-desember 2003. Databasen over svangerskap utenfor livmor inneholder informasjon om alle verifiserte diagnoser i fylket 1970-2004. Fødselsnummer ble benyttet for sammenkobling. Av de 792 pasientene registrert med sitt første ekstrauterine svangerskap i perioden 1991-2004 var 616 registrert med tidligere chlamydiaprøver og inngikk i studien. For hver pasient ble det selektert tre kontroller. Det ble matchet for fødselsår, dato for første prøve (\pm en måned) og antall tidligere prøver. Betinget logistisk regresjon ble benyttet for estimering av oddsforhold, med 0 positive chlamydiaprøver som referanse.

Resultater: Påvist chlamydiainfeksjon var forbundet med en svak økning i risiko for senere svangerskap utenfor livmor (oddsforhold 1,4; 95 % konfidensintervall 1,0-2,0). Registreringen av tidligere chlamydiaprøver var mest komplett for de yngste kvinnene. I en modell begrenset til kvinner født 1970 og senere (N=193) var det estimerte oddsforholdet 2,0 (95 % konfidensintervall 1,2-3,1) for kvinner med én positiv prøve og 2,6 (95 % konfidensintervall 1,1-5,7) for kvinner med to eller flere positive prøver.

Konklusjon: Påviste chlamydiainfeksjoner er forbundet med forhøyet risiko for svangerskap utenfor livmor.

O42**Adiponectin as a pre-clinical marker of pre-eclampsia**

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Context: As pre-eclampsia (PE) is associated with considerable morbidity and with mortality for mother and child, there is a great need for a predictive marker for the disorder. Serum levels of adiponectin - an anti-inflammatory protein - are elevated in established PE, but when this increase occurs in pregnancy, or even before, is still unknown.

Objective: The aim of this study was to assess whether adiponectin could be a useful marker in women who subsequently develop PE. Design: A retrospective nested case-control study was conducted to compare the serum levels of adiponectin of women who later developed PE to those of women who completed a normal full term pregnancy. Setting: This study was performed at Rikshospitalet-Radiumhospitalet University Hospital.

Methods: Subjects: By means of a direct access to the hospital's patient register, 201 nulliparous women with coded diagnosis of PE and 9452 women without PE were identified, all giving birth at Rikshospitalet during the period 01.01.1999-31.05.2004. The recruitment to the study and the matching of the participants were performed as follows: Exclusion due to non-availability of serum samples, wrong parity, diagnostically coded medical diseases, and non-Caucasian ethnicity as well as the subsequent recruitment of 4-5 controls for each case left us with 57 cases and 264 control individuals who were invited to participate in the study. Written information about the project was distributed to the selected individuals; 96.5 % and 73.5% in the PE and control group respectively agreed to participate and gave written consent to obtain medical information from their medical records. From these, further exclusion was done due to conditions not coded in the patient register, but found in the patient medical record: diabetes, cardiovascular diseases, thyroid and renal disorders, inflammatory and other serious organic diseases. From these, one case and two control individuals were tentatively matched with respect to pre-pregnancy BMI, gestational length at blood sampling, storage time of sample and maternal age. Finally, the PE- and control group consisted of 43 and 86 pregnant women respectively.

Serum samples: Serum samples were obtained in a retrospective way from 4 different hospital microbiological serum banks (storage temperature - 20 °C). The samples had been taken from the pregnant women during first and second trimester as a routine screening for antibodies against rubella, HIV and toxoplasmosis. Total serum adiponectin was measured by means of a commercially available iodine 125-labelled human adiponectin radioimmunoassay (RIA) kit

Statistical methods: None of the variables (pre-pregnancy BMI, gestational length, storage time, maternal age, and adiponectin concentration), with the exception of log(adiponectin) values, were normally distributed. Data are therefore presented as medians and inter quartile ranges. Case-control differences in all descriptive demographic parameters as well as adiponectin concentrations were compared by means of the 2-tailed Mann-Whitney U-test. Comparisons of proportions were performed by χ^2 -tests (with Yates' correction for 2x2 frequency tables and with test for trend in 2xk tables). Spearman correlation coefficients (R_{sp}) were used to examine correlations between variables. P-values < 0.05 and were considered statistically significant.

Results: Results will be presented.

O43**Redusert fekunditet blant kvinnelige frisører som ikke røyker**

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Formål: Frisører er utsatt for mange kjemikalier i yrket. I tillegg til hårfarge, permanentolje, blekemiddel og spray inneholder også sjampo, balsam, styling produkter og hårspray kjemiske forbindelser. Disse produktene kan blant annet inneholde aromatiske aminer, ammoniakk, ftalater, formaldehyd, nitrosaminer og organiske løsemidler. For noen av disse stoffene er det funnet negativ effekt på reproduksjonsutfall. Formålet med denne studien var å undersøke hvorvidt kvinnelige frisører har ulik fekunditet, tid til graviditet, forekomst av spontanaborter eller fertilitet enn annen yrkesaktiv befolkning.

Material og metode: HUSK undersøkelsen var en generell helseundersøkelse av alle mellom 40 - 44 år og et tilfeldig utvalg av 46 og 47 åringer i Hordaland, og ble gjennomført i 1997-1999. Materialet til denne studien baserer seg på det første spørreskjemaet i denne undersøkelsen og kun de kvinnelige deltagerne. Svarprosenten var 71 % og totalt deltok 12.054 kvinner. Klassifisering av frisør var basert på spørsmål om nåværende yrke, (kodet 5141 fra International Standard Classification of Occupations; ISCO-88), og i tillegg spørsmål om 'Har du tidligere i ditt liv hatt inntektsgivende arbeid som frisør?' I samme spørreskjema ble det også spurt om 'Har du noen gang hatt regelmessig samliv uten prevensjon i ett år eller mer uten at det har ført til graviditet?', og for dem som hadde opplevd å være gravid ble det spurt om antall måneder det tok før de ble gravide. I tillegg ble det spurt om de hadde opplevd spontan aborter, om de hadde fått barn og eventuelt hvor mange. Det ble også spurt om røykevaner, alkohol forbruk og BMI. Forskjeller mellom frisører og generell yrkesbefolkning ble testet med kji-kvadrat tester, og for å justere for andre kjente risikofaktorer ble det brukt logistisk regresjon.

Resultater: Totalt 10.521 kvinner gav informasjon om yrke hvorav 221 (2.1 %) frisører. Blant frisørene rapporterte 37.9 % at de hadde prøvd å bli gravid i over ett år uten å lykkes, for resten av populasjonen var det 27.8 % som oppgav dette (OR: 1.6, 95 % KI: [1.2 - 2.1]). For dem som hadde opplevd å ha vært gravid, men brukt mer enn 6 måneder på å bli gravid var OR = 1.4 (95 % KI: [1.0 - 2.0]) for frisørene i forhold til resten av populasjonen. Når det gjaldt forekomst av spontan aborter var det også en øket risiko blant frisørene (OR=1.4; 95 % KI: [1.0 - 1.9]). Det var en høyere andel av røykere blant frisørene, men justering for røyking, alkohol forbruk og BMI endret ikke estimatene. Men ved å se på røykerne, tidligere røykere og aldri røykere i separate grupper var det blant aldri røykerne vi fant en signifikant høyere risiko blant frisørene for redusert fekunditet (OR=2.9, 95 % KI [1.6 -5.4]), tid til graviditet (OR=2.5, 95 % KI: [1.3 - 5.5]) og spontanaborter (OR=2.8, 95 % KI: [1.6 - 5.1]). Når det gjelder fertilitet, hvorvidt de har fått barn og hvor mange barn de har fått var det ingen forskjell mellom frisørene og den generelle yrkesaktive befolkningen.

Konklusjon: Arbeid som frisør ser ut til å være assosiert med redusert fekunditet, lengre tid til graviditet og høyere andel av spontan aborter, dette er mest uttalt blant de som oppgir å aldri ha røykt.

O44

SAMINOR

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Etter anmodning fra Helsedepartementet gjennomførte Senter for samisk helseforskning, Universitetet i Tromsø, i samarbeid med Folkehelseinstituttet en helse og levekårsundersøkelse, Saminor, i perioden 2003-2004. Denne undersøkelsen er gjennomført i områder med samisk og norsk bosetting og er designet spesifikk for å studere etnisitet og spesielle livsstils faktorer blant samer.

Studien er en populasjonsbasert tverrsnitts undersøkelse i kommuner hvor mellom 5 til 10 % av innbyggere definerte seg som same i 1970.

Alle i aldersgruppen 30 år og fra aldersgruppen 36-79 år ble invitert, til sammen 28071 personer.

Undersøkelsen innbefattet både et spørreskjema og en klinisk undersøkelse knyttet til hjerte kar screening. Det ble også tatt blodprøver. Spørreskjemaet inneholder spørsmål om språk, etnisitet, om enkelte sykdommer og selv rapportert helse. Det er også spørsmål om livsstils faktorer som røyking, alkohol og diet.

Formålet er å presentere studien og noe preliminaire resultater.

O45**Self reported health among former North Sea divers**

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Introduction: Complaints about deteriorated health have for several years been raised among former North Sea divers, initiating in 2000 a study at request of the Norwegian Health authorities.

Methods: Ninety-six out of the 375 former Norwegian North Sea divers were through their medical doctor referred to Haukeland University Hospital (HUS) where a thorough examination was performed. A case-control design was used with two control groups. One was a random sample of the male general population (151) matched by age and the other comprised the former North Sea divers not referred to HUS. The three groups filled in a questionnaire that gave personal background data, data on diving education, diving activity, social and economic status. Former and present disease as well as actual health status was recorded using a modified SF36 and Fatigue Severity Scales.

Results: Cerebral/spinal decompression sickness (DCS) (OR 6,84 [CI 2,37-20,1]) and other types of DCS were more frequent (OR 5,99 [CI 2,69-14,28]) among referred divers compared to non-referred. Referred divers reported more years of diving exposure, more air-dives and days in saturation, and a higher maximal depth than non-referred divers. They also reported more symptoms from the nervous system and the musculoskeletal systems and had more psychological complaints, forgetfulness, attention deficiency, joint pain and tiredness were the most prevalent symptoms. The prevalence of complaints was significantly higher than in the general population. The non-referred divers also reported a higher occurrence of such complaints than the general population, but the frequencies were lower. The divers experienced reduced quality of life, constraining their life at work and spare time.

Conclusion: Both groups of divers had more complaints and illness than the general population with impact on quality of life. The differences between the groups suggest a dose-response association.

O46

Hvor benytter man seg av fritt sykehusvalg?

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Formål: Vi har sett på om introduksjon av fritt sykehusvalg faller sammen med endringer i hvor pasienter blir operert, og om dette har hatt større aktualitet for enkelte landsdeler. Vi har derfor sammenlignet bosted og operasjonssted for pasienter med leddprotesekirurgi i årene 1997 til 2004. Fritt sykehusvalg, som del av pasientrettighetsloven, trådte i kraft 01.01.2001.

Materiale og metode: Nasjonalt Register for Leddproteser (NRL) ble startet i 1987. Informasjon om pasientens bostedskommune ble innhentet fra Folkeregisteret og koblet med data fra NRL. Andel proteseoperasjoner utført 1) i pasientens hjemstedsfylke, 2) i annet fylke, men innenfor pasientens regionale helseforetak og 3) utenfor pasientens regionale helseforetak, ble beregnet for primæroparasjoner og reoperasjoner. En reoperasjon er en operasjon der protesen tas ut eller skiftes.

Resultater: I perioden 1997 til 2004 ble 77.931 leddproteseoperasjoner meldt til NRL, 71 % var proteser i hofte, 23 % i kne og 6 % i andre typer ledd. Av utførte operasjoner var 87 % førstegangsinnsettelse av leddprotese.

Andelen primæroparasjoner utført i pasientens bostedsfylke avtok, fra 87 % i 1997 til 81 % i 2004. Denne reduksjonen falt sammen med en økning av operasjoner utført utenfor bostedsfylke, men innenfor egen helseregion (6.8 % i 1997, 12 % i 2004), mens andelen operasjoner utført utenfor egen helseregion økte svakt (6.2 %, 7.0 %). For reoperasjoner var andelen utført i hjemstedsfylket lavere enn for primæroparasjoner i hele perioden, og med en sterkere reduksjon (83 %, 75 %). Økningen i andelen reoperasjoner utført utenfor bostedsfylke men i egen helseregion var svak (11 %, 13 %), mens den var størst for reoperasjoner utført utenfor egen helseregion (6.3 %, 12 %).

For pasienter med hjemsted i helseforetakene Nord og Midt-Norge var det liten endring fra 1997 til 2004 i andelen primæroparasjoner utført i eget fylke. For de andre regionale helseforetakene fant vi en reduksjon tilsvarende den observert i totalmaterialet. Størst reduksjon ble observert for Helse Øst RHF, der 88 % av primæroparasjonene ble utført i pasientens bostedsfylke i 1997 mot 77 % i 2004. For reoperasjoner var det liten endring blant pasienter med bosted i Helse Midt-Norge RHF. For de andre helseforetakene fant vi en tydelig reduksjon, og størst for Helse Nord RHF med 70 % i 1997 og 51 % i 2004.

Konklusjon: Vi fant en økning i andel leddproteseoperasjoner utført utenfor pasientens bostedsfylke i perioden 1997 til 2004. Operasjonene ble likevel i stor grad utført innenfor pasientens regionale helseforetak. Vi observerte dette både for primæroparasjoner og reoperasjoner, men andelen reoperasjoner utført i hjemstedsfylket var i hele perioden lavere enn for primæroparasjoner og med en sterkere reduksjon over tid. Det ble observert betydelig variasjon mellom de regionale helseforetakene.

O47**Intervention and recovery for individuals on long term sick-leave for low back pain**Stein Atle Lie¹, Hege R. Eriksen^{1,2}, Holger Ursin^{1,2}, Eli Molde Hagen²

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Aim: Long-term sick leave for back pain is a severe condition which may lead to serious consequences for the individual and the society. Thus, to find efficient therapy for such conditions are crucial. Furthermore, analyzing the outcome from such studies may not be straight forward.

Material: In this study we look at 456 individuals on long term sick leave (for more than 8 weeks, for low back pain), which were randomized to intervention or control. The intervention consisted of an examination at a spine clinic by a treatment team consisting of a physician (specialist in physical medicine and rehabilitation) and a physiotherapist. The patients were given information about the good prognosis and given advice to stay active. The control group was treated within the primary health care. Outcome in the study was measured as being in either of the states: "sick leave", "recovered", or on "disability pension". Maximum follow-up was 3 years.

Statistical methods: The intensity to shift between the three states were modelled using a proportional hazards model (Cox-model), stratified for the different paths between the three possible states. Furthermore non-parametric estimates for the effect of intervention were calculated. Last, transition probabilities for the different states were calculated.

Results: The individuals shifted between the three possible states between 1 and 22 times, with an average of 6.4 times. We found that there was an effect of the intervention on the intensity to leave the state *sick-leave* and shift to the state *recovered* (RR=1.27, 95% CI: [1.09-1.47]). There was no overall effect on the intervention to shift to the state *sick-leave* or to *disability pension*. There was a lower risk for males than females to shift back to the state *sick-leave* (RR=0.80, 95% CI: [0.64-0.99]), and there was an increasing risk for *disability pension* for increasing age (RR=1.15, 95% CI: [1.11-1.19]). The non-parametric estimates showed that the effect of the intervention on the risk for leaving *sick-leave* and shift to *recovered* were highest the first 6 months, furthermore there seemed to be en protective effect of the intervention to shift back to *sick-leave* between 6 and 18 months. Inspecting the transition probabilities we found that the probability to stay in the state *recovered* were not different between the intervention and control group at the end of this study.

Conclusion: This very simple intervention decreased not the probability to be on sick leave at the end of this study, however, the intervention decreased the time individuals were on sick leave.

O48

Virksomheter av snusbruk

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Bakgrunn: I løpet av de siste ti årene har salget av snus økt, mens salget av røyketobakk har gått tilbake. Dette har skjedd parallelt med innføring av røykerestriksjoner i offentlige rom og økt oppmerksomhet omkring helsefarene ved røyking. I 2003-2004 var det ca 300 000 snusbrukere i Norge, av disse brukte omkring 140 000 snus daglig. Menn under 45 år utgjør majoriteten av snusbrukerne. Debutalderen er synkende. Andel kvinnelige brukere er ennå lav. En situasjon hvor forbruket øker og helsefarene ikke er avklart, gir nye utfordringer. Sosial- og helsedirektoratet ga derfor Kunnskapsenteret i oppdrag å utrede kunnskapsgrunnlaget om virkninger av snusbruk.

Formål: Formålet med utredningen var å systematisk identifisere, kritisk vurdere og sammenfatte de foreliggende vitenskapelige epidemiologiske studier om helseeffekter og avhengighet ved bruk av snus, samt den funksjon bruk av snus har ved oppstart av røyking og ved opphør av røyking.

Metode: Det ble gjennomført søk i relevante databaser frem til februar 2005. Litteratursøkene ga 1040 treff. Sammendragene (abstracts) av de 1040 studiene ble gjennomgått, og 207 publikasjoner ble vurdert i fulltekst. Skandinavisk og amerikansk røykfri tobakk ble vurdert hver for seg fordi innholdet av tobakksspesifikke nitrosaminer og nikotin er forskjellig. Kunnskapsgrunnlaget for utredningen er hovedsakelig epidemiologiske studier. Det ble ikke foretatt vurdering av dyreeksperimentell dokumentasjon om snus og innholdsstoffer i snus. Det var dissens om dette i utredningsgruppen.

Resultat: Én systematisk oversikt, seks randomiserte og/eller kontrollerte studier samt 23 kohort og kasus-kontroll studier ble inkludert i kunnskapsgrunnlaget. I flere av de inkluderte studiene om helseeffekter var det få deltakere som utelukkende brukte snus, og dobbeltbruk av snus og sigaretter forekom ofte. De fleste studiene manglet i tillegg informasjon om eksponeringstid og eksponeringsdose. Studiene om avhengighet fant at opphør av jevnlig snusbruk ga abstinenssymptomer, men studiene syntes i liten grad å ha undersøkt viktige aspekter ved avhengighet som grad av sug etter snus og frekvens av tilbakefall etter avsluttet bruk. I tillegg manglet informasjon om hvor stor andel av snusbrukere som oppfylte diagnostiske kriterier for avhengighet. For studiene som omhandlet snusens betydning for senere oppstart av røyking og snusens betydning for opphør av røyking, var resultatene sprikende. Noen av studiene hadde kort oppfølgingstid, andre hadde et selektert utvalg. Litteraturgjennomgangen viste også at én kohort analysert med forskjellige regresjonsmodeller ga ulike konklusjoner.

Konklusjon: Gjennomgangen av den epidemiologiske dokumentasjonen viser at kunnskapsgrunnlaget om helseeffektene ved bruk av snus er svakt. Litteraturen gir ikke grunnlag for å konkludere at snus øker risikoen for kreft eller hjerte- og karsykdommer. Bruk av snus fører både til reversible (snuslesjoner) og irreversible (gingivale retraksjoner) endringer i munnslimhinnen. Litteraturgjennomgangen viser at jevnlig bruk av snus vil følges av abstinensplager etter avbrudd. Dokumentasjonen vedrørende snusens funksjon for senere oppstart av røyking og snusens funksjon ved røykeavvenning er ikke sammenfallende.

P1

Single measurement of physical activity in relation to energy intake and body mass index

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Introduction: In studies with large questionnaires like the Norwegian Women and Cancer study (NOWAC) it is especially desirable to reduce the number of questions asked, but still collect a sufficient amount of information. We wanted a short and concise way to rank the present physical activity among the women in our study.

Aim: Assess the validity of our ranking of present physical activity among women in the NOWAC study.

Material and methods: Our data is a representative sample comprising 68518 Norwegian women included in the NOWAC study. They were born 1927-1957, and have all answered questionnaires on lifestyle and dietary habits. Daily energy intake and body mass index (BMI) were calculated. To rank our participants' level of activity, we asked them to report, on a scale ranging from one to ten, how physically active they regard themselves. If this way of recording physical activity reflects the "true" picture, our measurements should be positively correlated with energy intake, and negatively correlated with BMI. These assumptions have been checked graphically, and p-values for trends (linear) were calculated using the *plotmeans* and *abline* functions in R.

Results: The graphs and p-values found are in support of our way of ranking present physical activity. The graphs and p-values for trends clearly indicate that physical activity is correlated positively to energy intake, and negatively to BMI.

Discussion: This was a crude analysis, no age- or other kinds of adjustments were done. Systematic measurement errors, like for instance tendencies for the obese to underreport their energy intake or weight can potentially compromise the results.

Conclusion: One expects a good measure of physical activity to increase with increasing energy intake, and to decrease with increasing BMI. This is how our simple ranking method behaves. Our ranking discriminates well between the NOWAC study participants' level of physical activity.

P2

Changes in patterns of dyspepsia, peptic ulcer disease and the role of *Helicobacter pylori* in a general population: the Sørreisa II study

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Objective: To study changes of patterns of dyspepsia and peptic ulcer in a population-based study, as well as the role of *Helicobacter pylori* for these conditions during the last 17 years.

Background: The first Sørreisa Gastrointestinal Disorder study (The Sørreisa I Study) took place in 1987. The study addressed the prevalence of dyspepsia, peptic ulcer and the role of *Hp* infection. The presented study is a follow-up of the Sørreisa I Study.

Method: A survey on dyspepsia and its possible risk factors was carried out among the total population aged 18-85 years in the municipality of Sørreisa in Norway in 2004. Together with a questionnaire we obtained stool samples for the detection of *Hp* infection. A subgroup of 572 persons underwent gastroscopy. 961 of 2387 persons (40.2%) answered the survey, and 918 of 2387 (38.4%) persons gave stool samples. Dyspepsia was defined, using the same definition as in The Sørreisa I study, as either “ever had abdominal pain located in the upper abdomen for at least two weeks”, or “ever had heartburn or acid regurgitation almost daily for at least one week”, or both.

Results: By the above definition dyspepsia was reported by 34% of the men and 33% of the women (In The Sørreisa I study, 31% of the men and 25% of the women reported dyspepsia).

Hp infection in women: Hp was found 22% of non-dyspeptics and in 30 % of dyspeptics (In The Sørreisa I study Hp was found in 41% of non-dyspeptics and in 50 % of dyspeptics).

Hp infection in men: Hp was found 29% of non-dyspeptics and in 18 % of dyspeptics (On the contrary, in The Sørreisa I study Hp was found in 33% of non-dyspeptics and in 47 % of dyspeptics).

13 gastric ulcers and one duodenal ulcer were found among 572 persons who underwent gastroscopy, giving a peptic ulcer prevalence of 2.4%, and were equally distributed between *Hp +ve* and *Hp -ve* persons (In The Sørreisa I study the prevalence of peptic ulcer was somewhat higher, 3.6% in men and 4.3% in women and duodenal and gastric ulcers were equally prevalent).

Conclusion: Dyspeptic symptoms are still common, affecting about 1/3 of the adult population of both genders, despite an overall fall in *Helicobacter pylori* prevalence. The association between *Helicobacter pylori* infection and dyspeptic symptoms is less clear now than in 1987. Other risk factors for peptic ulcer than *Helicobacter pylori* may be equally important.

P3**Association of birth size, gestational age, and adult height with intelligence – evidence from a cohort of 317 761 Norwegian men**Martha G Eide¹, Nina Øyen^{1,2}, Rolv Skjærven^{1,2}, Tor Bjerkedal³

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Background: Intelligence is associated with birth size, height, and socioeconomic conditions, but the interplay between these factors is not fully evaluated. We examined the associations of birth weight, birth length, and gestational age, with intellectual performance at age 18, while controlling for the contribution of height and maternal education.

Methods: In this nationwide cohort study, birth records of 317 761 male infants in Norway (1967-1979), were linked to the National Conscript Service (1984-1999). Intelligence test score at conscription was the main outcome measure. We analyzed birth weight, birth length, and height using absolute and standardized (z-scores) values.

Results: Mean score increased by gestational age, birth weight and birth length. A peak in performance followed by a significant decline was observed for gestational age 40-41 weeks and birth weight 4250 g. After adjusting for height the associations of birth weight and birth length with intelligence were strongly reduced. There was no evidence of interaction on intelligence between birth size and attained height. Maternal education strongly influenced intellectual performance, but only slightly attenuated the association with birth size. Birth size explained much less of the variation in intelligence than height and maternal education ($R^2=0.1-0.2\%$, 1.0% and 8.4% , respectively).

Conclusions: The association between birth size and intelligence may be mediated partly through prenatal growth, and to a larger extent through postnatal growth, but still intellectual performance is dominated by maternal education. Social and biological influences on intelligence are likely to follow different pathways.

Intellectual ability is associated with birth size, adult height, and socioeconomic conditions, but the interplay between these factors is not fully evaluated. In this nationwide cohort study, the influence of birth size, gestational age, attained height, and maternal education on intellectual performance at age 18 years was examined. Birth records of 317,761 male infants in Norway (1967-1979), were linked to the National Conscript Service (1984-1999). Intelligence test scores were presented as standard nine (“stanine”) scores. Birth weight, length, and attained height were analyzed using absolute and standardized (z-scores) values. Mean score increased by gestational age, birth weight and length; with a peak in performance followed by a significant reduction for gestational age 40 weeks and birth weight 4500 g. Birth size explained much less of the variation in intelligence than height and maternal education ($R^2=0.1-0.2\%$, 1.0% and 8.4% , respectively). The influence of birth size on intelligence was attenuated, although still present, after controlling for gestational age, height, parity, maternal age and education. Maternal education did not attenuate the effects of birth size on intelligence to the same extent as height, indicating that the social and biological influences on intelligence follow different pathways.

P4

The Norwegian Prescription Database (NorPD) – a new register for pharmacoepidemiologic research covering a whole nation

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Background: Norway has a long tradition of wholesale statistics on drugs and was the first country to produce public drug statistics in the sixties. In 2003 the Norwegian government decided to establish a national register based on computerised prescriptions from all the pharmacies.

Objectives: To describe the new Norwegian Prescription Database (NorPD).

Methods: From 1st January 2004 Norwegian Institute of Public Health receives monthly electronic data on dispensed prescriptions from all the 550 pharmacies in Norway. NorPD contains information from all prescription drugs, reimbursed or not, dispensed at pharmacies to individual patients living outside institutions. Regarding patients in nursing homes and hospitals; the register only receives figures on drug use at the level of the individual department. Drugs prescribed by dentists and veterinarians are also collected. Non-prescription drug use will not be recorded in NorPD. The identity of patients and prescribers has been encrypted according to Norwegian legislation. Each record contains a unique person identifier, so that is possible to identify all prescriptions over time for individual persons. Data collected are: patients sex, age, and place of residence; prescribers sex, age, and speciality; pharmacy identifier and the date of purchase, and drug information: brand name, package size, number of packages, dose unit, ATC-code, Defined Daily Dose, and price. Area of utilisation and the prescribed dosage are recorded in free-text and not yet available for research. The indication for prescribing is not recorded in the database. However, the code of reimbursement is recorded and this may in some cases function as a proxy of indication.

Results: In 2004 3 million unique patients were recorded in NorPD with at least one prescription. This represents 65 % of the Norwegian population. A total of 24 million prescriptions including more than 30 million ordinations altogether have been collected in the first year. The database makes it possible to do continuous post-marketing surveillance of drug effect and drug dispersion in society, the two core elements in the definition of pharmacoepidemiology. Different epidemiological measures of drug use, including 1-year prevalence, incidence, duration of therapy and different measures of skewness in drug utilisation make it possible to chart the population's drug use from the perspective of individual users. This register opens up access to a new source for pharmacoepidemiologic research, like doing longitudinal studies and record-linkage studies with health surveys and other registers in Norway.

Conclusion: NorPD covers the entire nation, 4.6 million inhabitants, and it will clearly offer unique possibilities for pharmacoepidemiologic research and a sound basis of knowledge for national decision-making in the field of drug utilisation.

P5

Sammenlikning av C-reaktivt proteins assosiasjon til infeksjoner og andre sykdommer

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Bakgrunn. C-reaktivt protein (CRP) er en kjent markør for en pågående infeksjon. Den brukes i diagnostisk øyemed. CRP studeres også med hensyn på sin prediktivitet for hjerteinfarkt. Vi ville sammenlikne nivåer for CRP for forskjellige selvrapporterte sykdommer.

Metode. Analysene er gjort på datamateriale av menn som deltok i Oslo-undersøkelsen 1972/73 og dens oppfølging Oslo II i år 2000. I alt 5323 menn hadde deltatt i begge helseundersøkelsene. Ved screening i 2000 ble det innhentet blant annet selvrapportert informasjon om mennenes sykdomshistorie. Restserum fra blodprøven i 2000 ble lagret ved Nasjonalt folkehelseinstitutt og ble senere analysert for C-reaktiv protein ved Ullevål sykehus.

Resultater. Menn med astma har et CRP-nivå på 5,01 versus 3,47 µg/ml blant menn uten astma. Menn med diabetes har lavere verdier på 4,53 versus 3,53 µg/ml. Benskjørhet har medført en CRP-verdi på 6,53 mot 3,55 µg/ml. CRP-nivå hos menn med fibromyalgi er lavere (4,78 versus 3,56 µg/ml). For menn med en historie om hjerteinfarkt er nivået på 4,27 versus 3,59 hos menn som ikke har hatt hjerteinfarkt. For alle disse sykdommene er forskjellene signifikante. De er ikke det for angina og hjerneslag. Flere analyser vil bli presentert blant annet for orale infeksjoner, kronisk bronkitt/emfysem, hørsnue og psykiske plager.

Konklusjon. C-reaktivt protein synes å være assosiert med andre sykdommer enn infeksjoner. Assosiasjonen til ikke infeksjose sykdommer kan muligens brukes i forebyggende og diagnostisk øyemed.

P6

Metabolsk syndrom predikerer prostata kreft i en 26-årsoppfølging av middelaldrende menn

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Bakgrunn. Formålet med studien var å studere om metabolsk syndrom predikerer insidens av prostata kreft. De siste 20-30-år har det vært en økning i Body Mass Index (BMI) blant menn samtidig som det har vært en økning i insidens av prostata kreft.

Metode. Hypotesen ble testet ved hjelp av datamaterialet fra 26-års oppfølging av den prospektive kohorten av 16.209 menn i alderen 40-49 år som deltok i Oslo-undersøkelsen 1972/73. Menn som hadde diabetes eller kreft som var diagnostisert før helseundersøkelsen, ble ekskludert, og data for 15.933 menn ble analysert. Metabolsk syndrom er her en multifaktor variabel bestående av BMI, ikke fastende glukose, triglyserider og forhøyet blodtrykk eller blodtrykksbehandling. HDL blir vanligvis inkludert, men ble ikke målt ved helseundersøkelsen i 1972/73. Analysene ble utført på to måter der man enten brukte kriterier i henhold til National Cholesterol Education Programme (NCEP) eller kvartilverdier av disse risikofaktorene.

Resultater. Av disse fire risikofaktorene var kun BMI signifikant i univariat aldersjustert Cox-analyse. I tillegg var alder og del-spørsmål om mental stress og fysisk aktivitet i arbeid signifikante. Resultater ved analyser med kvartil-verdier ved en kombinasjon av to av risikofaktorene (RR=1,23; p=0.04) eller tre av risikofaktorene (RR=1,56; p=0.00) var prediktive for innsidens av prostata kreft. Antall kasus ved fire faktorer var for få for analyse. Resultat ved tilsvarende analyser etter NCEP kriterier ga ikke signifikant resultat.

Konklusjon. Resultater av disse analysene indikerer at metabolsk syndrom predikerer prostata kreft gjennom 26-års oppfølging hvilket indikerer en sammenheng mellom insulin resistens og innsidens av prostata kreft.

P7**Effects of omega-3 on gene expression**

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There is a common opinion that cod-liver-oil and its content of polyunsaturated fatty acids (PUFAs) have beneficial effects on health and decreases risks of certain diseases. Omega-3 PUFAs are used to prevent hypertriglyceridaemia, which is a common feature in patients with cardiovascular disease. Omega-3 have also been proposed as a favorable food supplement for a number of diseases. Additionally, omega-3 participates in mechanisms of neurological development and neuronal degeneration. We have conducted an exploratory research using microarray technology to compare the genome wide expression profile in whole blood samples according to omega-3 intake in Norwegian women. Our hypothesis is that expression profiles from blood reflect expression profiles from other tissue types. Is there a difference in gene expression between users of omega-3 and non-users and can a potential difference in gene expression verify statements concerning effects of omega-3 intake?

The study is based on gene expressions from a previous microarray experiment concerning hormone replacement therapy. Blood samples from 100 postmenopausal women born between 1943 and 1949 within The Norwegian Women and Cancer study (NOWAC) were examined. Resampling the study population to concern women with omega-3 intake (35 women) versus women with no omega-3 intake (48 women), made it possible to conduct the analysis. In the preliminary analyses differentially expressed genes were found by Bayesian analysis of variance and Significance analysis of microarrays. These genes were further grouped into functional classes based on functional similarity using a gene annotation database (DAVID).

The preliminary results revealed upregulated olfactory receptor genes participating in the mechanisms controlling smell perception. This is in accordance with previous experiments conducted on rats, showing that lack of omega-3 leads to poor performance in basic olfactory learning tasks. A recently discovered gene, ST18 (Suppression of Tumor in breast carcinoma), was found to be upregulated within omega-3 users. We also found upregulation of an enzyme taking part in the biosynthesis of gangliosides, which are important components in cell membranes of neural tissue. We were not able to find any differentially expressed genes directly participating in the fatty acid metabolism.

Based on these preliminary analyses, it would be necessary to further investigate which biological processes these differentially expressed genes participate in, before any statements of effects of omega-3 can be verified.

P8**Sykepleierens arbeid med livsstilsforandringer i forbindelse med epidemiologiske studier. En litteraturstudie**Pernille Langkilde¹, Annika Jakobsson², Dag Thelle³

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Formål: Å studere litteraturen over sykepleierens rolle i møtet med individer som har deltatt i epidemiologiske studier og vist seg å ha risikofaktorer for hjerte-karsykdom, samt å studere hvordan disse kan støttes i livsstilsforandringer.

Materiale og metode: En granskning av litteratur over områdene ”empowerment”, ”locus of control” og ”coping”. De fleste artiklerne tar for seg nordiske modeller for livsstilsforandringer.

Resultater: Resultet av litteraturgranskningen har gitt et innblikk i hvordan man i Norge, Sverige og Danmark har undersøkt prosesser som kan føre till livsstilsforandringer ved at personer som har fått påvist risikofaktorer selv må ta ansvar og vise samarbeidsvilje for å forandre på sin situasjon. Artiklerne er basert på studier gjort av både leger og sykepleiere. Generelt for artiklene er at de har tatt for seg begrep som empowerment, coping og Locus of Control. Disse metodene for å få deltagerne til å innlede og opprettholde en livsstilsforandring har vært en felles grundholdning. For å kunne lykkes som sykepleier/lege og den enkelte person må det finnes en gjensidig interesse og vilje. Sykepleieren/legen skal være den støttende personen som informerer og opplyser om risikofaktorer og om hvordan personen selv kan endre på sin situasjon. Personen selv skal være den som lytter aktivt, tar initiativ og ansvar for seg selv og sin situasjon. Konkret har sykepleierne/ legene arbeidet med kommunikasjon i form av dialog og informasjon, og patientdagbøker. Livsstilsforandringer er en prosess, og for at den skal lykkes for det enkelte individ må sykepleieren vise respekt og hensyn til det enkelte menneskes bakgrunn og kunnskap. Beslutninger og strategier for livstilsforandringer må som følge av dette foregå i felleskap for å kunne beskrive strategier og handlinger.

Konklusjon: Viser en person interesse for livsstilsforandringer og å ta eget initiativ har sykepleieren god forutsetning for å få et positivt samarbeid og resultat. Sykepleieren må hele tiden være bevisst på at hun ikke skal ta ansvar men implementere ansvaret og initiativet hos personen med risikofaktorer. Sykepleieren må oppmuntre og opplyse om personens sterke sider. Hennes målsetning skal være å få deltageren inn i en prosess der denne føler at han/hun selv har kontrollen og at han/hun selv styrer sitt forløp. Mislykkes dette kan personen få en følelse av å ha tapt kontrollen og dermed ha mislykkes i prosessen. Som resultat får sykepleieren isteden en demotiveret person som ikke tar noe initiativ selv.

P9**Amming og vitamin D-inntak blant spedbarn og deres mødre med innvandrerbakgrunn**Ahmed Madar¹, Haakon E. Meyer^{1,2} og prosjekts referansegruppe

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Bakgrunn: I Norge finnes ernæringsbetinget rakitt fortrinnsvis hos barn med innvandrerbakgrunn. Imidlertid er det lite tilgjengelig kunnskap om vitamin D-status hos (sped)barn med innvandrerbakgrunn samt om sammenhengen mellom vitamin D-status hos disse barna og deres mødre. Det er også stor mangel på kunnskap om andre forhold som påvirker vitamin D-status i denne gruppen, bl.a. hvilken rolle bruk av morsmelkerstatning og barnemat tilsatt vitamin D spiller.

Formål: Å beskrive vitamin D-inntak og mulige prediktorer for vitamin D-status blant 6 uker gamle spedbarn og deres mødre med innvandrerbakgrunn.

Materiale og metode: Baselinedata fra en cluster-randomisert intervensjonsstudie på helsestasjoner i Oslo og Drammen. Datainnsamlingen foregår frem til senhøsten 2005. Vårt datamateriale er basert på 64 spedbarn og deres mødre fra seks forskjellige helsestasjoner som er inkludert i studien så langt. Blodprøver ble samlet både fra spedbarn og deres mødre og vil senere bli analysert mht vitamin D-metabolitter.

Resultater: Ved 6 uker fikk 89 % av spedbarna morsmelk, hvorav 53 % ble fullammet. Vel halvparten fikk morsmelkerstatning og median daglig inntak av morsmelkerstatning var 300 ml/d inneholdende omkring 3 µg vitamin D. Ved 4-5 ukers alder fikk 16 % av spedbarna kosttilskudd daglig i form av tran (sammenlignet med 27 % hos norske barn ifølge Spedkost).

Vedrørende solingsvaner svarte over 80 % av mødrene at de var ute i mer enn 30 minutter når det er sol og fint vær. Mens kun 14 % brukte slør, brukte over halvparten alltid hodeplagg. De aller fleste dekket bein med klær (84 %), mens omkring halvparten (47 %) alltid brukte lange ermer. Omtrent 1/3 av kvinnene dekket både armer og bein, og brukte hodeplagg eller slør. 1/3 av mødrene brukte vitamin D-holdige kosttilskudd. Omkring 2/3 av mødrene oppgav at de spiste fet fisk minst 1 gang per uke og 17 % oppgav at de spiste fet fisk minst 3 ganger i uken.

Konklusjon: Våre foreløpige resultater viser at innvandrerkvinner fullammer i lavere grad enn kvinner med etnisk norsk bakgrunn. Selv om amming er en optimal start i livet som også kan ha betydning for barnas senere helse, får flere spedbarn med innvandrerbakgrunn morsmelkerstatning som er vitamin D-beriket.

Vedrørende mødrene var det mange som var ute i solen, men påkledningsvaner gjør at et begrenset område av huden blir eksponert av sollys. I motsetning til hva vi forventet, bruker en stor andel av mødrene fet fisk (middag og pålegg), og en del bruker også vitamin D-holdige tilskudd daglig. Disse foreløpige resultatene kan tyde på at vitamin D-inntak blant spedbarn og deres mødre er ikke så dårlig som forventet. Resultater fra blodprøveanalysene vil gi en avklaring på dette, samt vise i hvilken grad spørreskjemaopplysningene samsvarer med målte vitamin D-nivå.

P10**Substituting missing values in food frequency questionnaires (FFQs): effects on energy intake in the Norwegian Women and Cancer Study**

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Objective: Missing values are common in self-administered FFQs used in large epidemiological studies and must be handled when calculating energy and nutrient intake. We compare results from different methods for substituting/imputing missing values using data from the Norwegian Women and Cancer study (NOWAC). We include K-nearest neighbors imputation (KNNimpute). This is a widely used method for missing entries in cDNA microarray data, but is here extended and adapted to FFQ data, which is new to our knowledge.

Methods: A FFQ designed to assess habitual diet was mailed twice (test-retest 3 months apart) to a random sample of 1995 women aged 46-75 y from the NOWAC cohort as part of a reproducibility study (75% response). A total of 126 questions were included in the dietary intake calculations. Missing answers to consumption frequencies and portion sizes in the test FFQ were imputed before the calculations using the following methods:

Frequencies=0 (null intake) and portion sizes=smallest for a conservative estimate

The mode value

The median value

Non-missing values in the retest. Remaining missing values were treated as in method 1

KNNimpute using a weighted average of the values for the same question from the K=10 most similar respondents within the same dataset (test). Similarity is evaluated from the closeness of responses to the other FFQ questions.

Results: In the test FFQ 17% of the data matrix was missing. Among respondents (n=1495) 95% had ≥ 1 missing answer. After imputation with retest values (method 4), 10% of the data was still missing and treated as in method 1. The estimated mean energy intake (MJ/day) with 95% CI after imputation according to the different methods was:

6.43 (6.34, 6.53) for null intake and the smallest portion

6.92 (6.83, 7.01) for mode

7.16 (7.06, 7.25) for median

6.93 (6.84, 7.03) for retest

7.52 (7.42, 7.62) for KNNimpute

Conclusion: Exclusion is not practical when most respondents have missing values. However, the calculated energy intake is influenced by the imputation method used. Missing is frequently handled as null intake, but this may not be correct for all foods. This is indicated by the increase in energy when missing is imputed by the other methods, including the retest values from the same respondents 3 months later. KNNimpute gave the highest energy intake, and will be investigated further.

P11

Breast cancer survivors eat slightly different from healthy peers

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Aim: To investigate whether breast cancer survivors ate differently from their healthy peers.

Material and methods: Cross-sectional analyses of the Norwegian Women and Cancer study. A representative sample of Norwegian women born 1927-57 (n=67932) answered an 8-pages questionnaire on lifestyle and diet. Nutrition calculations were performed, and the information was linked to the Norwegian cancer registry. The women were grouped as having had or not having had breast cancer before filling in the questionnaire. Women with other cancers were excluded, as were those reporting heart problems, diabetes, high blood pressure and stroke. This left us with 54980 women, 666 breast cancer survivors and 54314 healthy women. The groups were compared with n-way analysis of variance in the glm procedure of SAS. All analyses were adjusted for categories of age, energy intake, BMI, activity level and type of questionnaire.

Results: Breast cancer survivors ate more fruit and vegetables, including potatoes, (mean 468 vs. 427 grams/day, p<0,001) compared to other women. They also drank less coffee (419 vs. 449 grams/day, p=0,008) and ate less chocolate (4,9 vs. 5,9 grams/day, p=0,009), and more of them took dietary supplements (67 vs. 61%, p=0,005). Intakes of vitamin C (100 vs. 91 mg/day, p=0,0001) and b-carotene (4539 vs. 4237 mg/day, p=0,008) were also higher among breast cancer survivors. No other clinically relevant differences were found.

Conclusion: Breast cancer survivors are at higher risk for e.g. cardiovascular diseases, and should therefore be encouraged to eat healthy and have a healthy lifestyle, independent of the diet-cancer relationship. This investigation shows that there are some small differences in a more healthy direction, these differences should be supported and reinforced.

P12

HPV-kunnskap blant unge norske kvinner

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Formål: Humant papillomavirus (HPV) er den hyppigste seksuelt overførbare organismen. Det er estimert at ca. 70-80 % av alle kvinner vil bli smittet i løpet av sitt seksuelt aktive liv. Få kvinner får kliniske manifestasjoner til tross for at HPV kan forårsake kjønnsvorter og livmorhalskreft. Internasjonale studier viser at kunnskapen om HPV blant kvinner er lav, ca 30 % hadde hørt om HPV tidligere. I denne studien er kunnskap blant unge norske kvinner undersøkt, samt deres åpenhet til å delta i en studie omhandlende det naturlige forløp av HPV-infeksjoner.

Materiale og metode: Fra september 1998 til desember 2000 ble 898 unge kvinner 16-24 år rekruttert til studien. Ved oppstarten ble 323 deltakere ved åtte av de 16 utvalgte legesentra forespurt om å svare på et spørreskjema omhandlende motivasjon for å delta og åpenhet om studien, samt kunnskap om smitteveier for og sykdommer assosiert med HPV.

Resultater: 20 % av deltakerne hadde hørt om HPV før studien. Av de spurte kvinnene var det 15 % som hadde kunnskap om at HPV forårsaker både livmorhalskreft og kjønnsvorter (definert som høy kunnskap). Det var ingen demografiske, sosiale eller atferdsmessige karakteristika (alder, fast partner, seksuell atferd eller tidligere testing/historie med klamydia) som skilte kvinner med høy/lav kunnskap om HPV og sykdom. Det hersket stor åpenhet rundt studiet, nesten alle deltakerne (94 %) hadde fortalt at de deltok i studien til en av sine nærmeste og responsen var positiv.

Konklusjon: Den generelle kunnskapen blant unge norske kvinner om hvordan HPV smitter og hvilke sykdommer HPV kan forårsake er lav.

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