# The fifth annual NOREPOS SEMINAR in

# TROMSØ 27. – 28. SEPTEMBER 2010

**Monday 27/9:**

**1300 – 1320: Welcome and introduction by associate professor Nina Emaus**

Welcome to Tromsø and introduction of all participants, with a special welcome to and introduction of Professor John Eisman, Garvan Institute of Medical Research, New South Wales University, Sydney, Australia and founder of the Dubbo Epidemiological Osteoporosis Study (DOES).

**1320 – 1345: Presentation of NOREPOS by Professor Grethe Tell**

The NOREPOS network was presented in a historical perspective from 1996, emphasising the main ongoing projects which are funded by the Norwegian Research Council.

**1345 – 1500:** ***Osteoporotic fractures in Norway. Chair: Professor Haakon E. Meyer***

**Trine Finnes, M.D, PhD candidate: Mortality after hip fracture 1978-1997**

The aim of the project was a) to estimate the duration of excess mortality b) to investigate determination of excess mortality c) find out whether excess mortality after hip fracture has changed over the past decades. The material was collected from three incidence studies in Oslo, 1978/79, 1988/89 and 1996/97.

**Ragnhild Støen, M.D, PhD candidate: Trends in hip fracture incidence in Oslo**

The aim of the project was to study the incidence of hip fractures in Oslo and compare the 2007 incidence rates with data from 1978/79, 1988/89 and 1996/97, using the same protocol for collection of hip fracture information.

**Siri Forsmo, M.D., Professor: Hip fracture incidence in North-Trøndelag**

The aim of the project was to investigate time-trends and seasonal variation in hip fracture incidence in a population-based cohort of women ≥65 years residing in the county of Nord-Trøndelag and participating in the HUNT studies. The material was collected from a total of 8 362 women, mean age 74.3 years, participating in HUNT 2 1995-97. The results from the study were published in Bone in 2009.

**1530 - 1630:** ***NOREPOS' PhD and postdoctoral research fellow's projects. Chair: Berit Schei***

**Tone Omsland, MSc, PhD: Hip fractures in Norway 1994 – 2008**

The aim of the project is a) to examine the annual incidence of hip fractures in Norway, which has been estimated to be approximately 9000, but the exact number is not known b) to examine whether there are regional differences in hip fracture rates within Norway as indicated by several studies c) to investigated time trends in Norwegian hip fracture incidence. Data on hip fractures has been collected from patient administrative systems (PAS) in every hospital in Norway between 1994 and 2008. These data can be merged with other registry data at the National Institute of Public Health. Presently there are 144 042 records in the file. Among these, there are 100 124 certain hip fractures, 23 250 uncertain

and 20 66 which are unlikely. Before starting analyses, different quality assessment procedures will be performed, and data from two other hospitals will be included.

**Cecilie Dahl, MSc, PhD candidate: Bone health and drinking water - any relation?**

The effect of low, continuous exposure to soft, acidic drinking water on bone health is, for the most part unexplored. In the current project self-reported fractures from CONOR was linked to the waterworks-registry at the Institute of Public Health, using ArcGIS, a mapping program that can link data together based on spatial correlation.

**Kristin Holvik, PhD: Vitamin A, vitamin D and bone health**

The aim of the project is to examine the relationship between vitamins A and D and risk of hip fracture in a case cohort study within NOREPOS. Special attention will be on the interaction between vitamins D and A, as they are thought to compete for the vitamin D receptor and vitamin A may thus reduce the protective effect of vitamin D on bone. All NOREPOS studies will provide data and serum will be analysed at AS Vitas in Oslo.

**1645 – 1800:** ***The Tromsø Studies. Chair Nina Emaus, MSc, PhD, Researcher***

**Nina Emaus: An overview of the Tromsø Studies (TUS)**

The population based Tromsø Study has been conducted with intervals of 6-7 years from 1974, including osteoporosis and fractures as an integrated part from the fourth Tromsø Survey in 1994. All data collected are accessible through NESSTAR, a common database for all projects included in the Tromsø Studies. For more information see: http://www.uit.no

**Bente Morseth, MSc, PhD candidate: Physical activity and fracture risk, TUS**

Based on data from the Tromsø Studies the aim of the PhD project is to study a) seqular trends in physical activity levels in leisure time over the last three decades (Manuscript draft) b) tracking of physical activity over 28 years (Manuscript submitted) c) association between physical activity levels in leisure time at younger age and fracture risk later in life (Manuscript draft) d) association between physical activity levels in adulthood and bone mineral density later in life (Eur J Epidemiol (2010) 25:325–331).

**Guri Grimnes, M.D., PhD candidate: Fit Futures - a part of TUS**

Fit Futures is a newly established health survey among 15-16 years old adolescents, inviting all students in the first grade of high school in the Tromsø region (n=1256),during school time from September 2010 through March 2011. Altogether 13 sub-projects are registered in Fit Futures, most of them are also sub-studies in TUS, including studies on vitamin D, diabetes, overweight, physical activity, bone density, ferritin status, pain, tinnitus, staph aureus and skin diseases, dental health, genetically modified food, environmental pollutants and drop-out from school.

**Anne Winther, Pt, PhD candidate: Bone mass in Fit Futures**

Bone mineral density at the hip and total body will be measured in all Fit Future's participants. In collaboration with Dr. Elaine Dennison from Southampton and Cyrus Cooper's research group, a PhD protocol has been developed and the main aim is to identify high risk patterns of adolescent's behaviour which may lead to low bone density and increased risk of fracture in old age. The PhD candidate will focus on the association

between birth weight and BMD in adolescence, between vitamin d levels and BMD, and between different lifestyle factors, body composition and BMD.

**Tuesday 28/9:**

**0830 – 1000:** ***Morning session chaired by Professor Anne Johanne Søgaard***

**Geir Aamodt, PhD: presentation of Geographic Information Systems (GIS)**

GIS is a system to capture, store, analyze, manage and present data linked to a location (geo-referenced data), merge cartography, for statistical analysis and database technology. In epidemiology GIS can help to assess exposures such as air-pollution and pesticides. GIS is a complicated system still not much used in epidemiology.

**Haakon E. Meyer, M.D., Professor: Case – cohort design**

The NOREPOS vitamin A/D project will be based on a case-cohort design. In this design, a sub-cohort is randomly selected from the complete cohort at the start of the study (baseline). The study utilizes data from the sub-cohort as well as from all relevant cases. The sub-cohort may also contain cases. Strength of the design is that it is cost and recourse saving, statistical models are available, and it is more flexible compared to nested case-control studies. In addition it is simple to reuse the data for other purposes and less sensitive to missing covariate data. Limitations may be that statistical power considerations are similar as for nested case-control studies. However, if heavy censoring, power is reduced.

**Helene Devold: Anti-osteoporosis drug (AOD) use in Norway; prevalence, incidence and persistence**

The PhD project uses prescription data, minimum refill rates, from NorPD (2004 – 2007) in men and women 40+ years old to calculate one-year prevalence and incidence rates, geographical distribution by resident's county. Prescription data from NorPD (2005-2008) are linked with data on socioeconomic factors from Statistics Norway, as marital status, education, household income.

**Åshild Bjørnerem, M.D., PhD, postdoctoral researcher: Bone microstructure decay across menopause and lactation**

In collaboration with Professor Ego Seeman, Melbourne, Australia the aim of the project was to study changes in bone microstructure across childbirth and lactation, and investigate if this approach can elucidate the process of decay during menopause. Pregnant women were recruited to a follow-up study that included pQCT measurements immediately after birth and through the lactation period.

**Ellen Apalset, M.D., PhD candidate: Vitamin K1 and hip fracture risk**

The impact of vitamin K on fracture risk is still controversial. Based on data from HUSK, the aim of the project was to investigate the association between estimated vitamin K and risk of hip fracture in a population based cohort including women and men above 50 years of age.

1030 – 1200: ***Visiting professor John Eisman***

**Introduction by Nina Emaus:** Professor John Eisman, head of the Bone Biology Programme at Garvan Institute of Medical Research, New South Wales University, Sydney, Australia founded the Dubbo Epidemiological Osteoporosis Studies (DOES) in 1989.

DOES is today the longest ongoing epidemiological osteoporosis study in the world. In his work, professor Eisman has however not only focused on epidemiological aspects of fracture risk, but also been working with molecular, biochemical and clinical aspects and has more than 300 publications in the field.

**John Eisman, Professor, Osteoporosis: Its under-recognised adverse outcomes**

There are some misconceptions concerning osteoporosis: Predominantly a condition of little old women; Unimportant in younger women and in men; Therapy inconvenient/unsafe; Long time line to benefit; Human cost/mortality limited to elderly. NOREPOS may challenge these misconcepts by its tremendous data available. In a SWOT analyses the strengths are data on population level, access to in-depth samples, committed researchers, hospital fracture data, prescription data, co-morbidity data, mortality data and linkage to Norway statistics. Possible weakness lie in incomplete data, challenges to co-operation, fracture data confirmation, prescription data reliability, co-morbidity data reliability and delays in linkage data. Opportunities and threats follow in the same lines. The under-recognized scope of the problem comprises among others that it is common in men and women in relatively young old, that any clinical fracture signals increased future fracture risk, mortality increased 2-3 fold in men and women after all types of fragility fractures. In Australia the direct + indirect costs = $1/person/day for every man, woman and child. The majority are at high risk after a fragility fracture not treated to reduce risk of future fractures. Today there are several treatments available that have documented significant reduction in fracture risk. In Australia today there is a 5-30 % uptake in women with prior osteoporotic fracture, in persons above 70 yrs + BMD T-score ≤ - 3.0 (spine or hip), less than 10 % uptake. Public health approaches are largely ignored. Who should be treated: Women (and men) with prior fracture, lower BMD, older, fallers and those with familial/genetic predisposition. How: Nutrition & lifestyle background and specific-osteoporosis treatments. For how long: Efficacy persistence therapy and monitor any therapy interruption. It must be recognized that osteoporotic fracture is a condition of young-old women and men with major morbidity, mortality and costs. Therapy convenient/safe & many options, absolute risk can be estimated, treatment reduces fracture risk and may reduce premature mortality. These are all important themes for NOREPOS to approach in future.

1200 – 1230: ***Summary, evaluation and farewell: Haakon E. Meyer/Berit Schei***

It was concluded that huge steps have been taken within this field of research in Norway since NOREPOS started in 1996 and that the research activity within NOREPOS is impressive. The seminar has been filled with excellent presentations from interesting ongoing research. We all look forward to further collaboration and next year's seminar which will be in the Bergen area.