

## Søknadsinformasjon

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<b>Utlysning</b>	Nordic Cancer Union Research Grant, 2014
<b>Søknad</b>	Lifestyle and occupational cancer risk - adjusting for alcohol and tobacco
<b>Søknadsid</b>	154963
<b>Innsendt av</b>	Kristina Kjærheim

## Oppgave: Progress report

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<b>Tilordnet</b>	Kristina Kjærheim
<b>Status</b>	Arkivert
<b>Opprettet</b>	04.02.2016

## RAPPORT

### Briefly describe the project in a language understandable to non-scientists

In the present project, we will develop and test a novel method to cope with the problem of unmeasured confounding from alcohol and tobacco use. We will use the observed pattern of cancer at sites associated with tobacco alone or alcohol and tobacco in combination as indicators of smoking and drinking. The underlying assumption is that the unobserved smoking pattern in an occupational group is reflected in the observed risk of cancer at sites with an established association to tobacco. If for instance, the standardized incidence ratio (SIR) for bladder cancer in a given occupation were elevated, while the other tobacco related cancers are not; one would commonly argue that this suggests the presence of an occupational carcinogen. With the proposed analytical method, based on the use of generalized models for confirmatory factor analysis, we aim to formally evaluate this common sense based way of arguing.

### Summarize the major findings of the project

The suggested methods were applied on data including men in Denmark, Finland, Norway, and Sweden from the time period between 1960 and 2005, and for all the countries combined, to be able to present the overall occupational risks adjusted for tobacco and alcohol.

For each country, separate factor models for tobacco smoking only and for the combined effect of alcohol and tobacco were found. The eight models include a latent common factor and unique factors that seemed necessary to include for achieving a correct picture of relationships between the latent factor and incidence of cancer sites. In some cases were correlations between unique factors included in the models. The models were also used for prediction of latent factors for each occupational group.

The estimated relative strength of the effect from tobacco and alcohol on relevant cancers was found to be in general accordance with what was expected based on prior knowledge. In occupations with few known and suspected carcinogens, the adjusted SIRs were closer to the expected values (i.e. the population average). The relative bias in the unadjusted estimates ( $(SIR_{unadjusted} - SIR_{adjusted}) / SIR_{adjusted}$ ) was between -50% and +65% for lung cancer and tobacco. For alcohol and tobacco related cancers of the upper aero-digestive tract, the relative bias was between -70% and +400%, although for 50 occupational groups the bias was between -55% and +40%.

We will further examine the results of adjustment on national and Nordic level for the 53 defined occupational groups. To summarize, our results so far indicate that several occupational groups have deviant habits with respect to smoking and use of alcohol and that unadjusted SIRs might give a biased picture of occupational risks. We thus consider the method useful for achieving less confounded estimates of cancer risk in large cohort studies with no information on smoking and alcohol consumption.

### Describe how the project has increased our knowledge of the prevention, cause and/or cure for cancer

We expect this novel method of adjusting for alcohol and tobacco to greatly increase the quality of results from register-based studies, and thus enhance the possibilities for identifying occupational risks with greater confidence. Identifying such risks is an important part of prevention, as it will give direct and useful information on preventive strategies in choosing between regulations of work conditions and/or advice on personal habits. In future studies, the proposed methods should also be tested using data from the Nordic job-exposure matrix developed in the NOCCA study, or other similar settings, to investigate dose-response relationships adjusted for alcohol and tobacco

### Outline how Nordic cooperation has added value to this project

The inclusion of the NOCCA data from the four Nordic countries implies that more persons are included (15 mill) and gives a longer follow-up period (up to 45 years) and the benefits of data from several countries. This ensures more stable estimates and makes it possible to evaluate possible national differences. The project also benefits scientifically from the long-standing collaboration within the Nordic work group.

### List the publications resulting from the NCU research grant

Author(s), title, journal and edition	PMID (8 digits, only if possible)
Tor Haldorsen, Jan Ivar Martinsen, Kristina Kjærheim, Tom K. Grimsrud. Adjustment for tobacco smoking and alcohol consumption by simultaneous analysis of several types of cancer. (Submitted)	

**Brief overview of expenditures for last year** 1 vedlegg (20160223 Brief overview of expenditures for 2015.docx)