Study name: Genetics and Environmental Risk Factors for Complex Diseases: The Northern Sweden Population Health Study (NSPHS)

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Abstract

This project is a component of the International IPY *Artic Human Health Initiative* (AHHI) (Activity ID 167). As part of the IPY activity we will a) be able to establish research networks with other groups conducting similar projects in other Artic populations, b) compare the environmental and genetic risk profiles between different Arctic populations by sharing data and performing comparative analyses to identify health problems that are common to Arctic populations, c) share our experiences regarding the organization of such projects, the development of common strategies for communication of results to individual participants and the local community, and finally, finding optimal means for implementation of medical health recommendations. In this way we will contribute to the establishment of similar medial health projects in other Artic populations.

The basis for this is our project on the identification of environmental and genetic risk factors for common diseases in Swedish Sami. Population-based health surveys are conduced in cohorts from Västerbotten and Norrbotten and include medical information, medical history and detailed diet and lifestyle information. Genetic profiling of genes identified as risk factors in other populations is also performed. The populations have been chosen on the basis of genealogical information and the dietary exposures in terms of diet (high meat intake) and lifestyle (reindeer herding versus other occupations). Comparisons will be made with other European populations.

Project Status: Active

Project Progress 2008:

During 2008 we have performed additional analyses of the information collected in 2007 and 2008 for a number of variables. These analyses have been carried out in the context of the EUROSPAN network (European Special Population Research Network). A number of papers are being prepared based on these data spanning different parts of the disease spectrum including:

- population history and epidemiology
- research ethics in local populations,
- BMI,
- hypertension,
- lung-function,
- diabetes and other clinical traits.
- effect of diet (heavy intake of game meat) on blood lipids, hypertension and BMI.

A very large study on blood-lipids has been conducted within the EUROSPAN and in the context of other consortia. The first of a series of papers from this work has appeared recently in Nature Genetics.

A series of meeting have been conducted with the community to share the information obtained and to discuss various ways to improve your health.

Preliminary results (if applicable):

A large number of publications are in the process of being submitted or under review. The ones published in 2008 are listed below.

- Aulchenko YS, Ripatti S, Lindqvist I, Boomsma D, Heid IM, Pramstaller PP, Penninx BW, Janssens AC, Wilson JF, Spector T, Martin NG, Pedersen NL, Kyvik KO, Kaprio J, Hofman A, Freimer NB, Jarvelin MR, Gyllensten U, Campbell H, Rudan I, Johansson A, Marroni F, Hayward C, Vitart V, Jonasson I, Pattaro C, Wright A, Hastie N, Pichler I, Hicks AA, Falchi M, Willemsen G, Hottenga JJ, de Geus EJ, Montgomery GW, Whitfield J, Magnusson P, Saharinen J, Perola M, Silander K, Isaacs A, Sijbrands EJ, Uitterlinden AG, Witteman JC, Oostra BA, Elliott P, Ruokonen A, Sabatti C, Gieger C, Meitinger T, Kronenberg F, Döring A, Wichmann HE, Smit JH, McCarthy MI, van Duijn CM, Peltonen L; ENGAGE Consortium.
- Loci influencing lipid levels and coronary heart disease risk in 16 European population cohorts.
- Nat Genet. 2009 Jan;41(1):47-55. Epub 2008 Dec 7.
- Johansson A, Marroni F, Hayward C, Franklin CS, Kirichenko AV, Jonasson I, Hicks AA, Vitart V, Isaacs A, Axenovich T, Campbell S, Dunlop MG, Floyd J, Hastie N, Hofman A, Knott S, Kolcic I, Pichler I, Polasek O, Rivadeneira F, Tenesa A, Uitterlinden AG, Wild SH, Zorkoltseva IV, Meitinger T, Wilson JF, Rudan I, Campbell H, Pattaro C, Pramstaller P, Oostra BA, Wright AF, van Duijn CM, Aulchenko YS, Gyllensten U; EUROSPAN Consortium.
- Common variants in the JAZF1 gene associated with height identified by linkage and genome-wide association analysis.
- Hum Mol Genet. 2009 Jan 15;18(2):373-80. Epub 2008 Oct 24.
- Jacobsson JA, Klovins J, Kapa I, Danielsson P, Svensson V, Ridderstråle M, Gyllensten U, Marcus C, Fredriksson R, Schiöth HB.
- Novel genetic variant in FTO influences insulin levels and insulin resistance in severely obese children and adolescents.
- Int J Obes (Lond). 2008 Nov;32(11):1730-5.
- Jacobsson JA, Danielsson P, Svensson V, Klovins J, Gyllensten U, Marcus C, Schiöth HB, Fredriksson R.
- Major gender difference in association of FTO gene variant among severely obese children with obesity and obesity related phenotypes.
- Biochem Biophys Res Commun. 2008 Apr 11;368(3):476-82. Epub 2008 Feb 4.

Plans 2009:
A series of joint analysis of data is ongoing and will be completed in 2009 and prepared for publication. We have recently initiated a second field period and expanded the area studied. This will be ongoing during the spring of 2009 and include health investigations, sample collection and meetings with the community.

Expected Completion Date: Ongoing