

Genetic risk score to predict the likelihood of dental caries in Finnish adolescents

Nitin Agrawal, Elina Engberg, Jussi Furuholm, Emma Dahlström, Heli Viljakainen
Folkhälsan Research Center, Helsinki, Finland

Background

Dental caries is a widely prevalent disease with an early onset. It is likely a multifactorial disease involving both genetic and environmental factors. We have previously identified marginal differences in saliva microbiota between children with and without caries (1). A recent meta-analysis of 33000 children (2), identified two genome-wide significant hits (in *ALLC* and *NEDD9*) for caries. Genetic variants may be more prominent in genetically homogenous cohorts with well-defined caries traits.

Objectives

We aim to incorporate known caries causing genetic variants into a genetic risk score (GRS) and investigate its association with caries in a homogenous cohort.

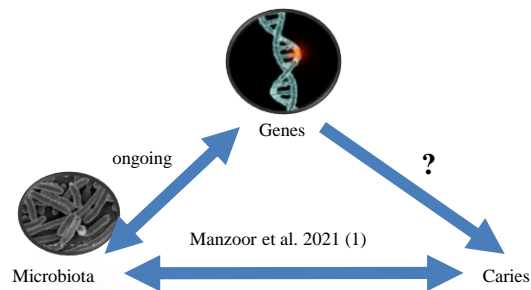


Figure 1: A schematic overview of the project

Conclusions

GRS for caries will help identify children with an elevated risk for caries, which might have clinical relevance. We will verify our results with the longitudinal data and also test the association of GRS with other factors such as saliva microbiota and body mass index (BMI).

Materials and methods

In total, 1000 participants were randomly chosen from **the Finnish Health in Teens (Fin-HIT) cohort**. They were genotyped on Illumina 610Quad array and imputed to generate up to 10 million variants (tbd). The GRS will be generated using PLINK v 1.9. Caries is defined with a sum of Decayed, Missing, and Filled Teeth (DMFT) obtained from the national register for primary healthcare. We have a replication cohort (The PANIC Study) to validate the findings.

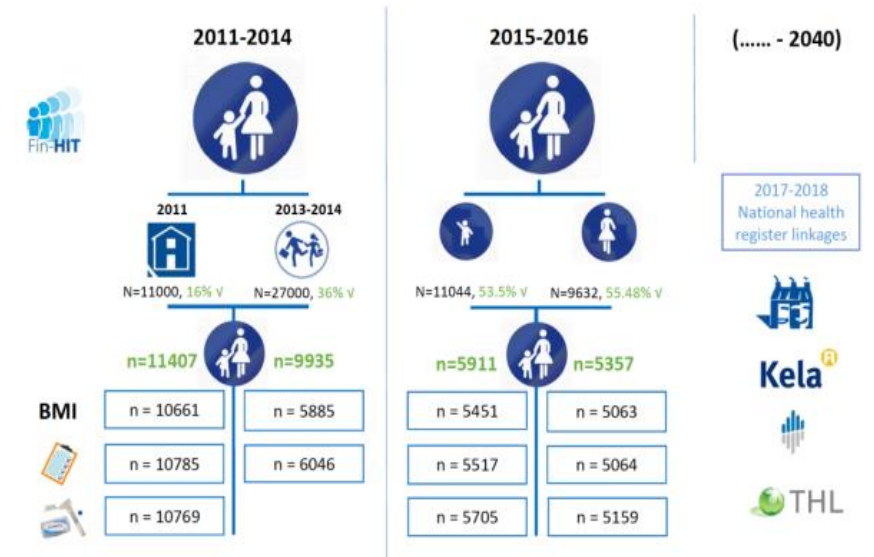


Figure 2: Description of the Fin-HIT cohort. For this project, we will utilize the data collected at baseline including register data and saliva samples.

References 1. Manzoor M, et al. *Sci Rep*. 2021;11(1):4424. 2. Haworth S, et al. *Human molecular genetics*. 2018 Jan 01;27(17):3113-27.