**Supplementary Material 3. Statistical Interaction Analyses**

For the estimation of interaction, it is assumed that the distribution of disease risk is equally distributed in individuals with and without disease. The excess risk or risk difference is measured identify the existence of an interaction.

The reference group is compared to three other groups using Cox proportional hazard model and are denoted as RR11, RR10 and RR01. (The reference group comprises of individuals with no exposure to family history or lifestyle factors).

RR11 is the notation for the HR of developing bladder cancer when exposed to both family history and a given lifestyle factor. RR10 is the HR of disease when having family history only, and finally RR01 is the HR of disease when exposed to the lifestyle factor only. All of the HRs are based on comparing individuals with the reference group. This results in the RR00 being equal to 1.

For additive interaction, there are three measures that are used to estimate the excess risk: relative excess risk due to interaction (RERI), attributable proportion due to interaction (AP) and synergy index (SI).1 The SI and the AP are based on the calculation of RERI.

RERI was calculated according to the following formula: RERI = RR11 – RR10 – RR01 + 1. This equation states that an interaction is present between the risk factors (family history and given lifestyle risk factor) if RERI is greater than zero, more precisely, if the lower limit of the confidence interval is larger than zero.

1. Rothman KJ, Greenland S, Lash TL. Modern epidemiology. Lippincott Williams & Wilkins; 2008