Development of a Web-Based Colorectal Cancer Risk Assessment Model

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The aim of this project is to develop an aid for assessing risk based on well-established epidemiologic risk factors. Some risk factors, such as smoking and red meat consumption, are modifiable. Others, such as family history and previous history of nonsteroidal anti-inflammatory drug (NSAID) use, cannot be changed. This model will be potentially useful for physicians, genetic counselors, and the lay public in making informed decisions regarding screening and lifestyle changes.

To begin building the model, we conducted a literature review on factors potentially contributing to or decreasing the incidence of colorectal cancer. Experts in the areas of clinical gastrointestinal cancer prevention, epidemiology, and biostatistics reviewed the evidence for 15 factors and identified age, gender, race, smoking, alcohol use, obesity, red meat consumption, inflammatory bowel disease, and family history of colorectal cancer as risk factors to include in the model. The protective factors identified were hormone replacement therapy, aspirin/nonsteroidal anti-inflammatory drugs, and screening. The review of the literature was inconclusive on the use of calcium and folate and physical activity, and therefore, these variables are not included in our model.

Relative risks for the factors that exhibited a monotonic relationship between cancer incidences were determined, and averages from national survey data were used to represent bounded and midpoint categories obtained from the results of the literature [search]. The various studies were weighted by their sizes as reflected by numbers of cases. The relative risks have been stratified by gender when possible.

Prevalence rates for the various risk factors were determined through national survey data when available and through literature review otherwise. The prevalence rates in the U.S. population, along with the SEER cancer rates, have been built into the model to estimate the future risk of colorectal cancer within 10-year windows.

Developing a tool such as the colorectal cancer risk assessment model and posting it to the World Wide Web will provide the lay public—and potentially genetic counselors and physicians—with a tool for accurate risk assessment. The tool will be tailored to individual characteristics and will provide general and individualized screening and risk information.