

## Development and validation of a cardiovascular disease risk-prediction model using population health surveys and dietary indices: the Cardiovascular Disease Population Risk Tool – Nutrition (CVDPoRT-Nutrition).

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### Objective

Only a few cardiovascular risk prediction models have been developed based on modifiable exposures and even fewer utilize complex dietary factors. Our objective was to develop and validate the Cardiovascular Disease Population Risk Tool (CVDPoRT)-Nutrition as a tool for estimating 5-year risk of incident cardiovascular disease (CVD) using lifestyle factors and dietary pattern scores.

### Approach

The CVDPoRT developed and validated using the Canadian Community Health Survey (CCHS) linked with health administrative databases was modified to remove limited measures of dietary intakes (i.e., fruit and vegetable, potato, and juice intake frequency) and instead incorporate 5 different dietary pattern scores (i.e., Dietary Guidelines for Americans Adherence Index, Dietary Approaches to Stop Hypertension, Healthy Eating Index, Alternative HEI, and Mediterranean Style Dietary Pattern Score). Outcome data (i.e., CVD events and CVD-related mortality) came from linkage with the Canadian Vital Statistics – Death Database and Discharge Abstract Database. CVDPoRT-Nutrition was tested in 61 policy-relevant subgroups.

### Results

Performance after adding in each dietary pattern score was similar to the original CVDPoRT (Brier score=2.6%, Harrell's c-stat=0.87(0.85-0.88) for female models; Brier score=1.6%, Harrell's c-stat=0.82(0.81-0.84) for male models). The algorithm was calibrated in 53 (female models) and 57 (male models) of 61 policy relevant subgroups. The most important predictors of CVD and CVD-related mortality were age, sex, and smoking.

### Conclusions

Altering the dietary measures included in the CVDPoRT algorithm did not greatly improve the predictive capacity. The original CVDPoRT can continue to be used for predicting CVD and CVD-related mortality, while CVDPoRT-Nutrition may be used for predicting CVD incidence associated with poor dietary patterns.

