Appendix 1 (as submitted by the authors): Models

To project incidence and mortality, we used CANPROJ an R package that uses a decision tree algorithm to select the best fitting projection model. CANPROJ was previously developed through a collaboration led by the Canadian Partnership Against Cancer to unify modeling approaches for cancer incidence trends in Canada.(1) Using the decision tree algorithm, CANPROJ has the flexibility to iteratively select the most appropriate model based on the presence of age and cohort effects as well as significant drift and over dispersion. The algorithm is shown in Poirier et al., 2019.(2)

The models that are included for selection in CANPROJ include: age-only, age-period (including common trend and age-specific trend), age cohort and Nordpred (age-drift-period cohort), negative binomial and Poisson (when over-dispersion is present). Detailed statistical descriptions for each of the models are provided in the Appendix from Poirier et al, 2019 (link to article). Previous validation analyses have shown that the CANPROJ algorithm-based approach is more flexible and can out-perform other traditional approaches such as the joinpoint methods, Poisson regression, the polynomial regression and natural spline methods(3) as well as more complex approaches such as the Bayesian Markov Chain Monte Carlo methods.(4) Of particular note was the previous validation study that suggested the CANPROJ approach outperformed the Nordpred (age-period-cohort generalized linear model) and hybrid (age-period) models when examining short and long-term cancer incidence trends.(5) It was also previously showed that CANPROJ-selected models perform well on short-term incidence projections of site-specific trends in Canada when applying it to historical data up to 2012 and then examining the observed and projected data from 2012-2015 in a blinded fashion. (2)

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Appendix to: Brenner DR, Weir HK, Demers AA, et al. Projected burden of cancer in Canada in 2020. *CMAJ* 2020. doi: 10.1503/cmaj.191292.