

# DATA BRIEF: COLORECTAL CANCER SIMULATION MODEL

APRIL  
2018

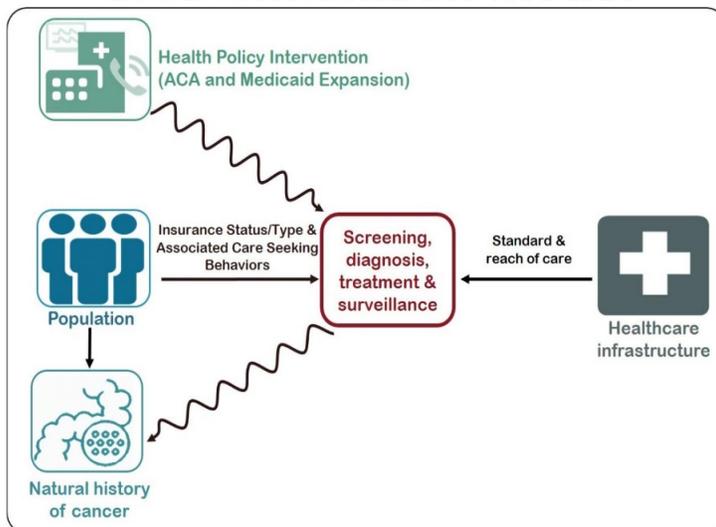
## The Model:

Our microsimulation model was designed to simulate colorectal cancer (CRC) risk, screening behaviors, treatment, and cancer outcomes under a variety of scenarios. Our model supports stakeholder learning and decision-making by comparing the costs, resource implications (e.g., increased colonoscopy demand), population health impacts, and efficiency of competing intervention and policy approaches designed to improve CRC screening implementation. Model application in specific settings can help address CRC screening and outcome disparities at state, local, and sub-population levels.

## Current Applications:

- Estimate statewide and sub-population-specific effects of health insurance expansion on costs and benefits of CRC screening over time in North Carolina (NC) and Oregon (OR)
- Compare evidence-based interventions for improving CRC screening in particular counties, sub-populations and regional care coordination entities in NC and OR
- Identify the combination of evidence-based interventions, policies, and length of time required to achieve specified screening goals (e.g. 80% screened by 2018)

## CRC Simulation Model



## Primary Objectives:

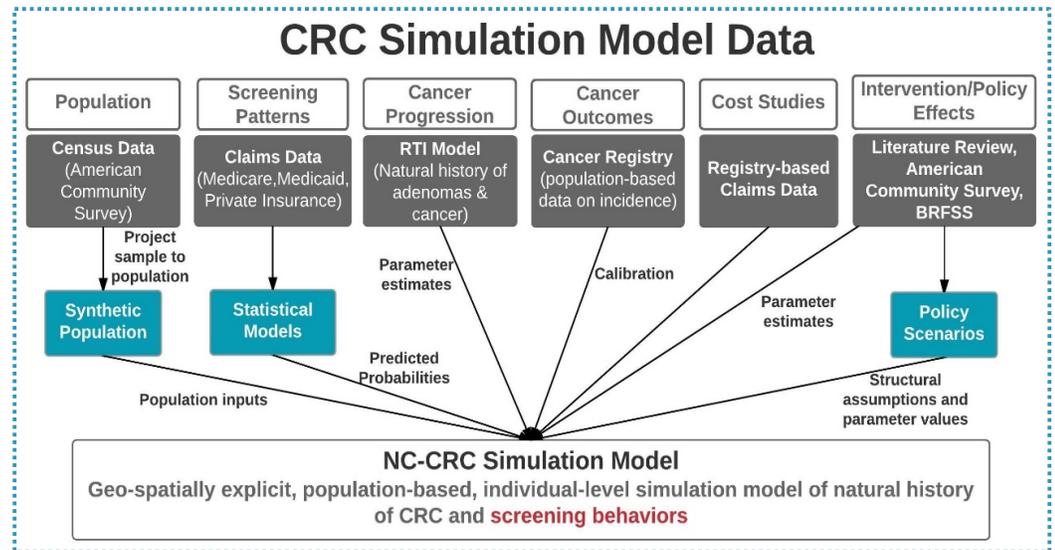
- To determine the most effective and efficient approaches for closing gaps in CRC screening and outcomes in specific settings and sub-populations (e.g., rural, minority, low-income, uninsured/under-insured) and understand how impacts vary based on the local context
- To identify how healthcare systems, screening intervention, and implementation strategies can be optimized to ensure that people receive CRC screening at the lowest cost
- To gain greater insight into uncertainties, capacity implications, and unintended consequences of specific CRC screening interventions on diverse populations

## Colorectal Cancer Quick Facts:

- Third most common type of cancer among men and women
- Multiple screening modalities are effective at reducing CRC morbidity and mortality
- Largely preventable, but screening is underutilized nationally (66% of adults up-to-date)
- Screening rates especially low among uninsured, rural, low-income, and minority populations

## How it Works:

The model is an individual-level simulation environment that contains 6 modules. The model was initially built to evaluate CRC patterns in North Carolina, and has been adapted for Oregon. The model is geo-spatially explicit and can be extended for use in other geographic regions and sub-populations as well as for other types of cancer.



## Capabilities:

- Integrates multiple data sources to evaluate the effects of specific policies and interventions
- Simulates the behaviors, experiences, and outcomes of realistic and diverse populations
- Accounts for local nuances and differential impact of interventions in different contexts
- Quantifies the expected uptake and health & economic impact of specific interventions and policies in specific contexts, settings and sub-populations
- Forecasts outcomes over long time periods, with attention to uncertainty
- Models combinations of interventions to understand potential interacting, synergistic, or ceiling effects when attempting to encourage specific health behaviors within a population
- Assesses the full continuum of cancer care outcomes, such as: quality adjusted life years (QALYs), cost per person screened, cost per cancer case averted, and cost per QALY gained

Develop and refine clinical/public health practice guidelines

Identify benefits/tradeoffs of public health interventions

Understand expected impact of quality improvement efforts

Demonstrate value of research in addressing gaps in knowledge

Achieve maximum health impact with minimal cost burden and clinical harms

## Use in Decision-Making:

This approach provides opportunities to inform policies, interventions, and strategies related to CRC prevention, screening, and treatment among a variety of stakeholders.

Additionally, this approach supports selection and implementation of interventions best suited for local contexts and sub-populations.

### For More Information:

- Hassmiller Lich K, Cornejo DA, Mayorga ME, Pignone M, Tangka FK, Richardson LC, Kuo T-M, Meyer AM, Hall IJ, Smith JL, Durham TA, Chall SA, Crutchfield TM, and Wheeler, SB. Cost-Effectiveness Analysis of Four Simulated Colorectal Cancer Screening Interventions, North Carolina. *Prev Chronic Dis* 2017;14:160158. [https://www.cdc.gov/pcd/issues/2017/16\\_0158.htm](https://www.cdc.gov/pcd/issues/2017/16_0158.htm)
- Check out our current activities via the Cancer Prevention and Control Research Network (CPCRN), <http://cpcrn.org/workgroups/#workgroup-27176>
- Contact us! Study Coordinator: Sarah Drier, [wjsarah@email.unc.edu](mailto:wjsarah@email.unc.edu); Principal Investigator: Stephanie Wheeler, [Stephanie\\_Wheeler@unc.edu](mailto:Stephanie_Wheeler@unc.edu)