
RICK DURRETT, Duke

A branching process model of ovarian cancer

Ovarian cancer is usually diagnosed at an advanced stage, rendering the possibility of cure unlikely. To date, no cost-effective screening test has proven effective for reducing mortality. To estimate the window of opportunity for ovarian cancer screening, we develop a branching process model for ovarian cancer growth and progression accounting for three cell populations: Primary (cells in the ovary or fallopian tube), Peritoneal (viable cells in peritoneal fluid), and Metastatic (cells implanted on other intra-abdominal surfaces). Growth and migration parameters were chosen to match results of clinical studies. Using these values, our model predicts a window of opportunity of 2.9 years, indicating that one would have to screen at least every other year to be effective. The model can be used to inform future efforts in designing improved screening and treatment strategies.