The role of statisticians and quantitative thinking in cancer prevention and screening

Although prevention and screening prevent more cancer deaths than treatments, controversies abound about what screening guidelines ought to be. I present screening as a stochastic process parameterized by latent quantities that are usually difficult to directly observe, which is the source of common misunderstandings about screening by non-quantitative researchers. The future of screening will use statistical and AI prediction models that are integrated into a patient's Electronic Health Record to identify who should be screened, what test they should select, when they should return for the next visit, and when they should exit lifetime screening. I present examples from my career that progress towards this future, and highlight opportunities for further research and clinical implementation.