Support for shape of the (1 round) %reduction function

JA Hanley[1], Z (Amy) Liu[1], O Saarela[1], N Dendukuri[1,2], E Strumpf[1,3]

[1]Dept. of Epidemiology, Biostatistics & Occupational Health
[2]Dept. of Medicine, and Technology Assessment Unit
[3]Dept. of Economics

McGill University, Montréal, Québec, CANADA

Appendix to Special Presentation to ERSPC Steering Committee
prepared April 9, 2014

(From presentation at 2013 Annual Meeting, Statistical Society of Canada)

Simplified model of how screening reduces mortality, 1 round at time

- focus on cancers that, screening absent, proved to be fatal

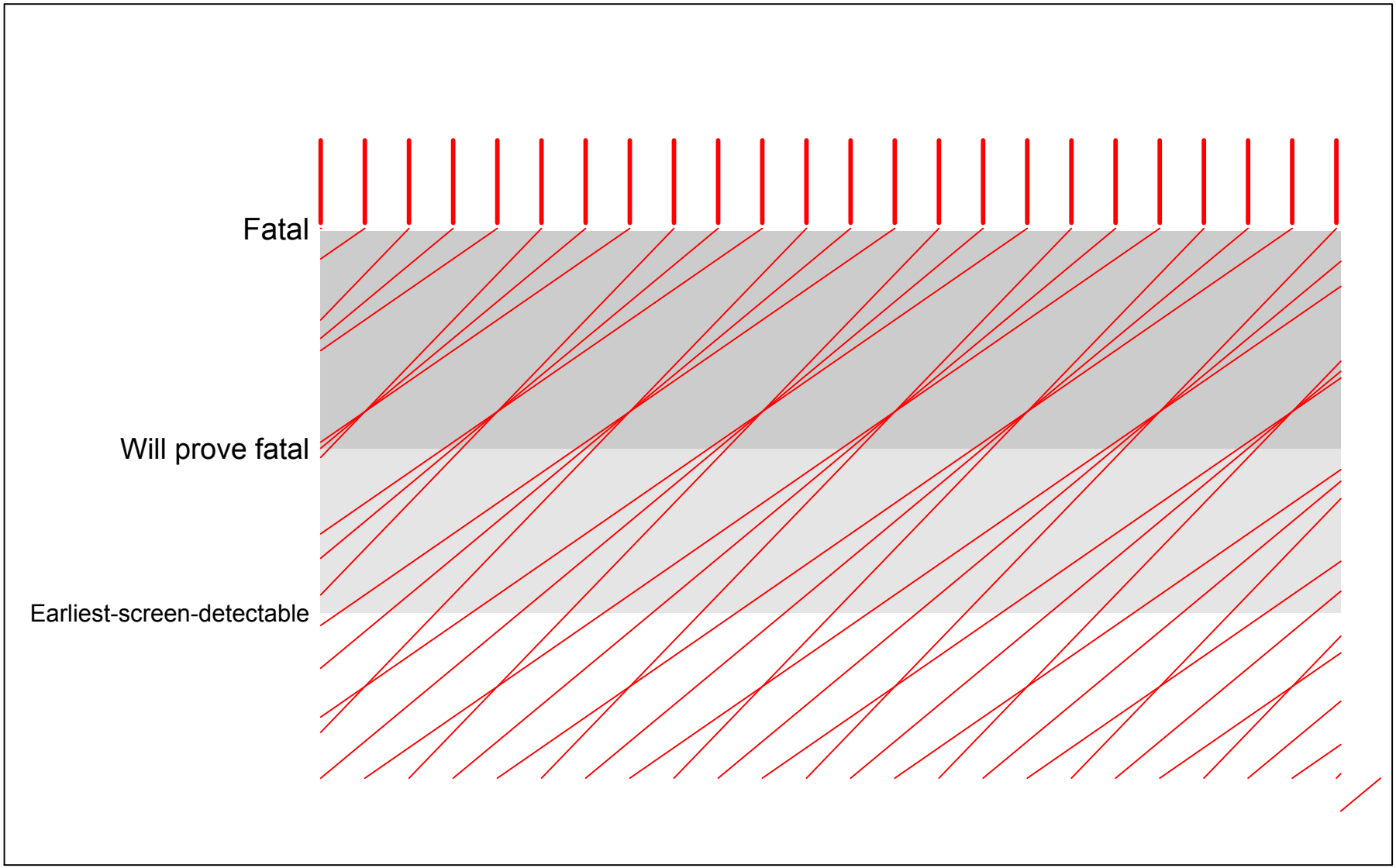
  (they did so because they were detected/treated too late)

- allow each fatal cancer to *have had* a faster/slower course

- (possibly) alter their courses by earlier detection/treatment

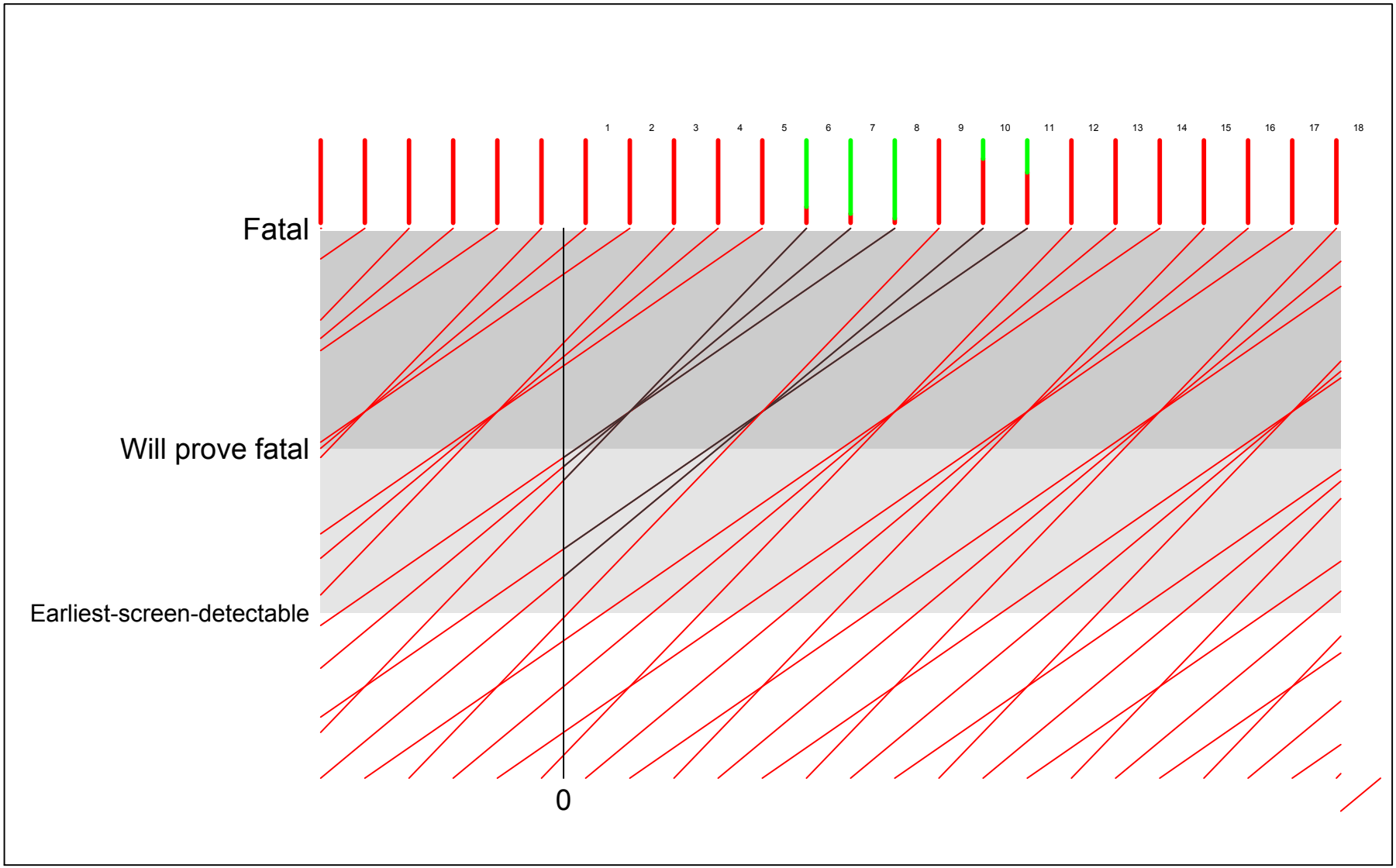
- posit latest date still curable & earliest date detectable

3-speed model - no screening



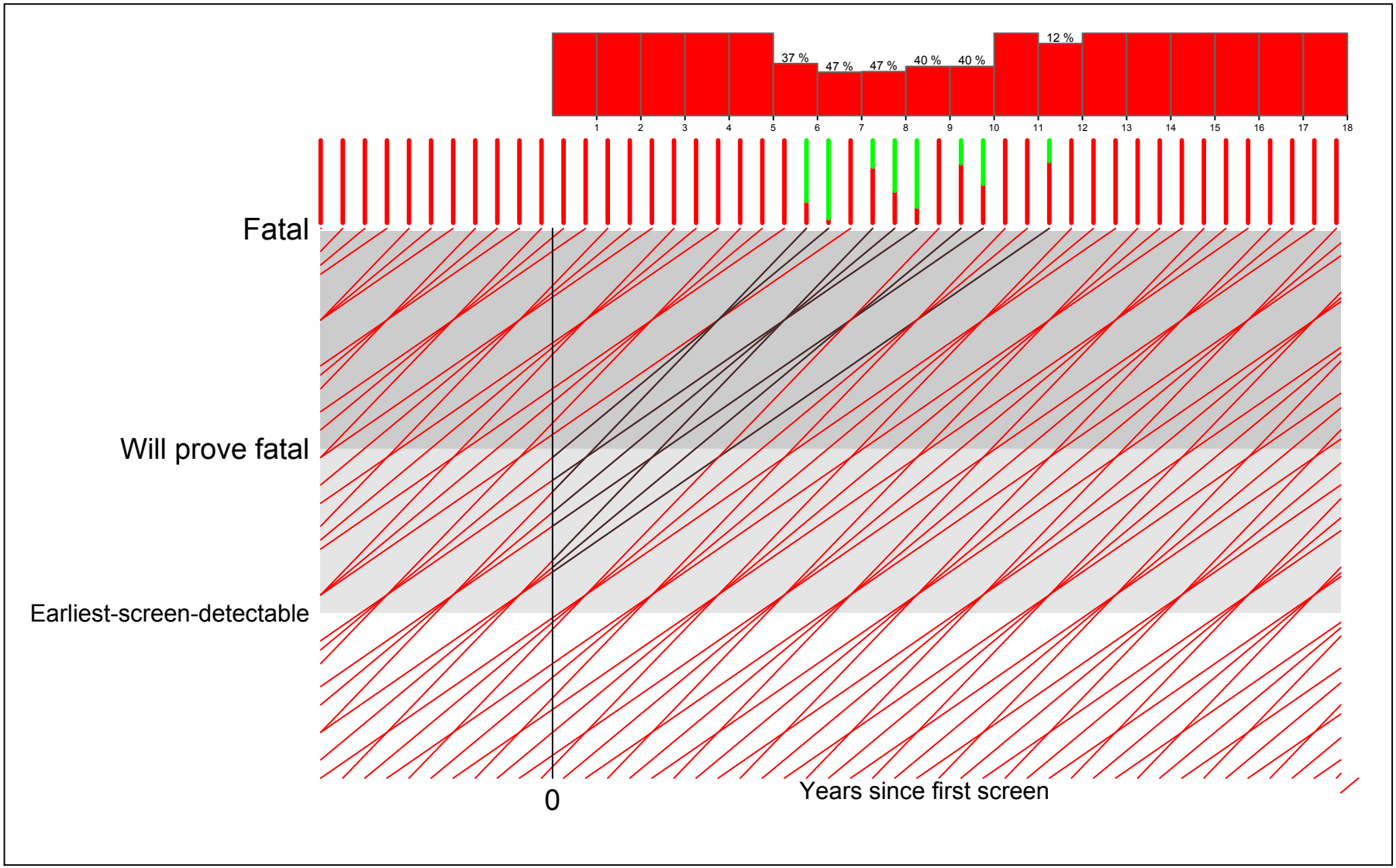
y-axis: ‘stage’; x-axis: time ; diagonal line: progress of cancer

3-speed model - 1 round of screening



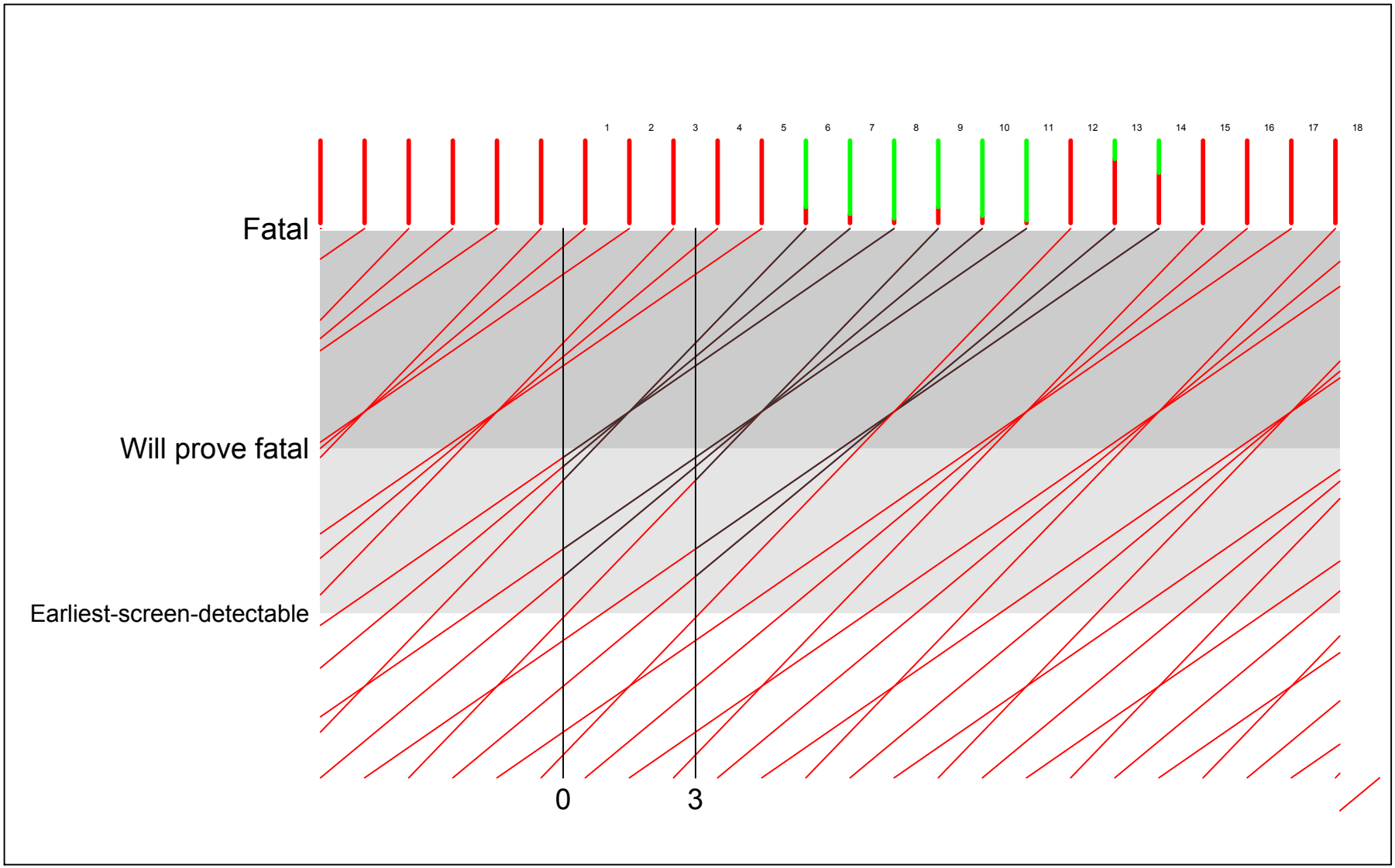
vertical line: 1 screen: diag. line: progress possibility arrested; | probability

1 round of screening, smoother example



w.l.o.g. 2 ’otherwise fatal’ cancers/year; %↓ would apply whatever no./year

2 rounds of screening



cancer has 2 chances to be detected & have its course altered;

2 rounds of screening, smoother example