

Figure 1 Treatment Sector Stock-Flow Diagram

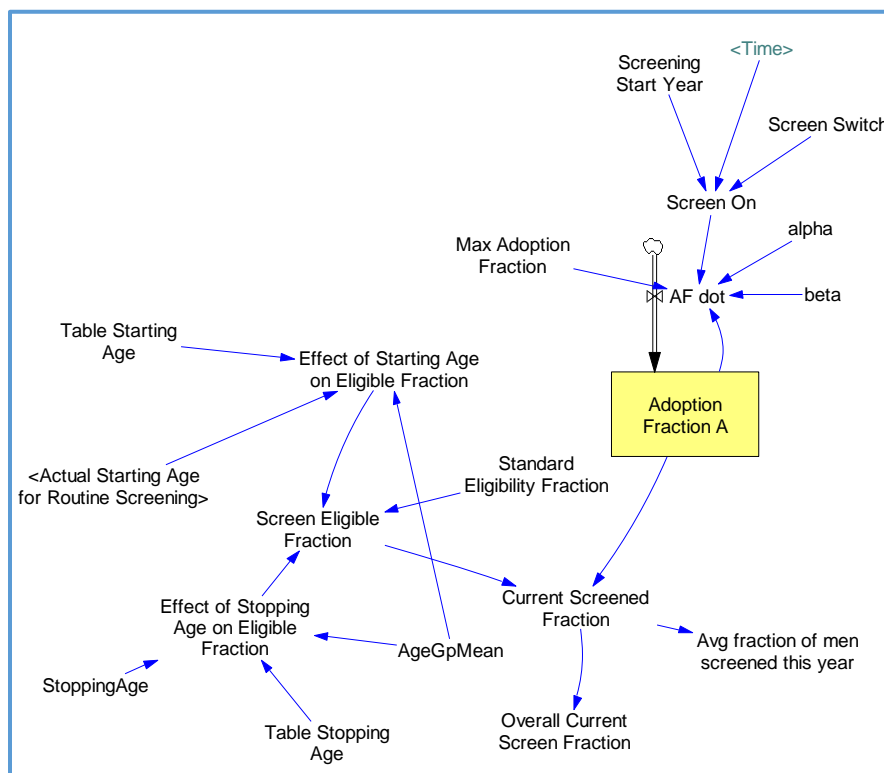


Figure 2 Screening Dissemination Sector

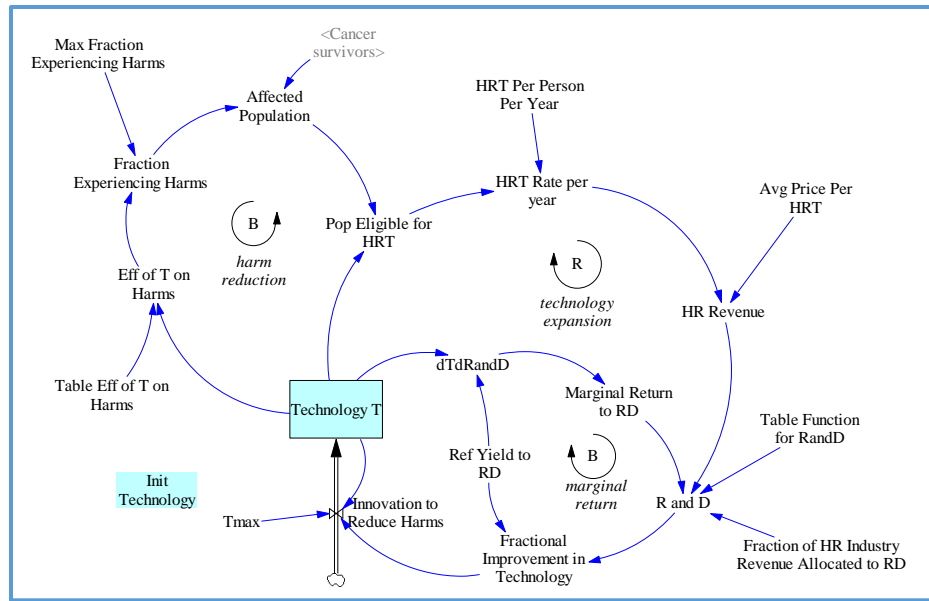


Figure 3 Harm Reduction Technology (HRT) Sector

Table 1 Outcome measures of the model categorized by type

INCIDENCE VARIABLES			PREVALENCE VARIABLES			CUMULATIVES
<b>Prostate Cancer (PCa)</b> 	Real PCa Incidence <Real PCa Incidence, by age>	Estimated Incidence <Reported PCa Incidence>	Real PCa Prevalence (people) <Fract of Real PCa Prevalence>	Estimated Prevalence <Fract of Reported Prevalence or ever diagnosed>	<Fract Reported PCa Prevalence by age> <Reported PCa Prevalence by age>	Cum Nr PCa <Cum Nr PCa Cases Diagnosed>
<b>Screening</b> 	Screening Rate <PSA Screening Rate>	<First PSA Screening Rate> <Repeat PSA Screening Rate>	Screening Prevalence <Nr Men Ever Had PSA>	<Fract of Popn Ever Screened>	% MO-M1 <Fract M0 at Detection>	Cum Nr PSA Tests <Cum Nr PSA Tests>
<b>Biopsies</b> 	Biopsy Rate <Biopsy Rate by age>	<Unnecessary Biopsy Rate by age>	% Healthy with FP <Fract of Healthy Popn Living with FP>	% Ever Had Biopsy <Fract Ever Had Biopsy>	<Fract of PSA Detected>	Cum Nr Biopsies <Cum Nr of Unnecessary Biopsies>
<b>Treatment</b> 	Treatment Rate (people/yr) <TxRate by treatment>	Screen Detected Treatment Rate <TxRateSx>	<Fract Ever Diagnosed by age>	<Treated Total> <Nr Treated by age> <Nr Treated by grade>	<Fract Treated>	Cum Total Treatments <CumTotal TxPCa>
<b>Cost of Care</b> 	Current Cost (\$/yr)    Treat Cost (\$/yr) <Current Cost by grade>    <Cost of Treatment by grade>	% Cost End of Life <Fract of Cost EOL by grade>	N/A	N/A	N/A	Cum Cost Treatment    Cum Cost (\$ to date) <Cum Cost Treatment>
<b>Quality of Life</b> 	Disutility Rate Per Year <duRateTotal by grade>	Disutility Rate Biopsy <duRateBiopsy>	N/A	N/A	N/A	Cum QALY Cum Disutility <Cum Disutility>
<b>Mortality</b> 	Real PCa Death Rate (people/yr) <XXpcbyAge> <PCa Deaths as a Fraction of Total Deaths>	Estimated PCa Death Rate <XXpcEstimatedTotal>	N/A	N/A	N/A	Cum PCa Deaths <Cum Total PCa Deaths of Men with PCa>

Table 2 Table of extreme condition tests with the corresponding qualitative behavior

Extreme Condition Test	Qualitative Behavior
Screening switch turned off	PSA screening tests go to zero, % Ever had PSA goes to zero, % of Screen detected cancer goes to zero, % of Clinically detected cancer goes to %100, Reported PCa prevalence goes down, % of men healthy with a FP goes to zero, no detection, and treatment of latent (indolent) disease
Clinical detection switch turned off	% of Cancer clinically detected goes to zero, All cancer detection is through PSA screening
Both screen and clinical detection switches turned off	Reported PCa incidence goes to zero, Reported PCa prevalence goes to zero, no new PCa cancer survivors
Treatment switch turned off	% Ever treated goes to zero, There are no survivors with primary treatment
Treatment is 100% effective	No one dies of prostate cancer, M0 and M1 PCa deaths go to zero
Metastasis switch turned off	M0 loco-regional disease doesn't get metastasized, no distant M1 cases, no M1 prostate cancer deaths
All-cause mortality turned off	Mean population age increases, only deaths are PCa deaths
Decrease in mortality trend is removed	Overall deaths increase, population's mean age goes down
All disease is indolent	No prostate cancer deaths, 100% overdiagnosis
<b>Other logic tests</b>	
% PSA detected	% of disease detected by screening is 100% for indolent disease (Latent cancer cannot get detected clinically)
PCa incidence/prevalence	Reported PCa incidence is higher for older age groups
% Loco-regional at detection	100% for latent disease, as latent disease cannot get metastasized to M1 disease
% Distant at detection	0% for latent disease, higher for higher grade cancer

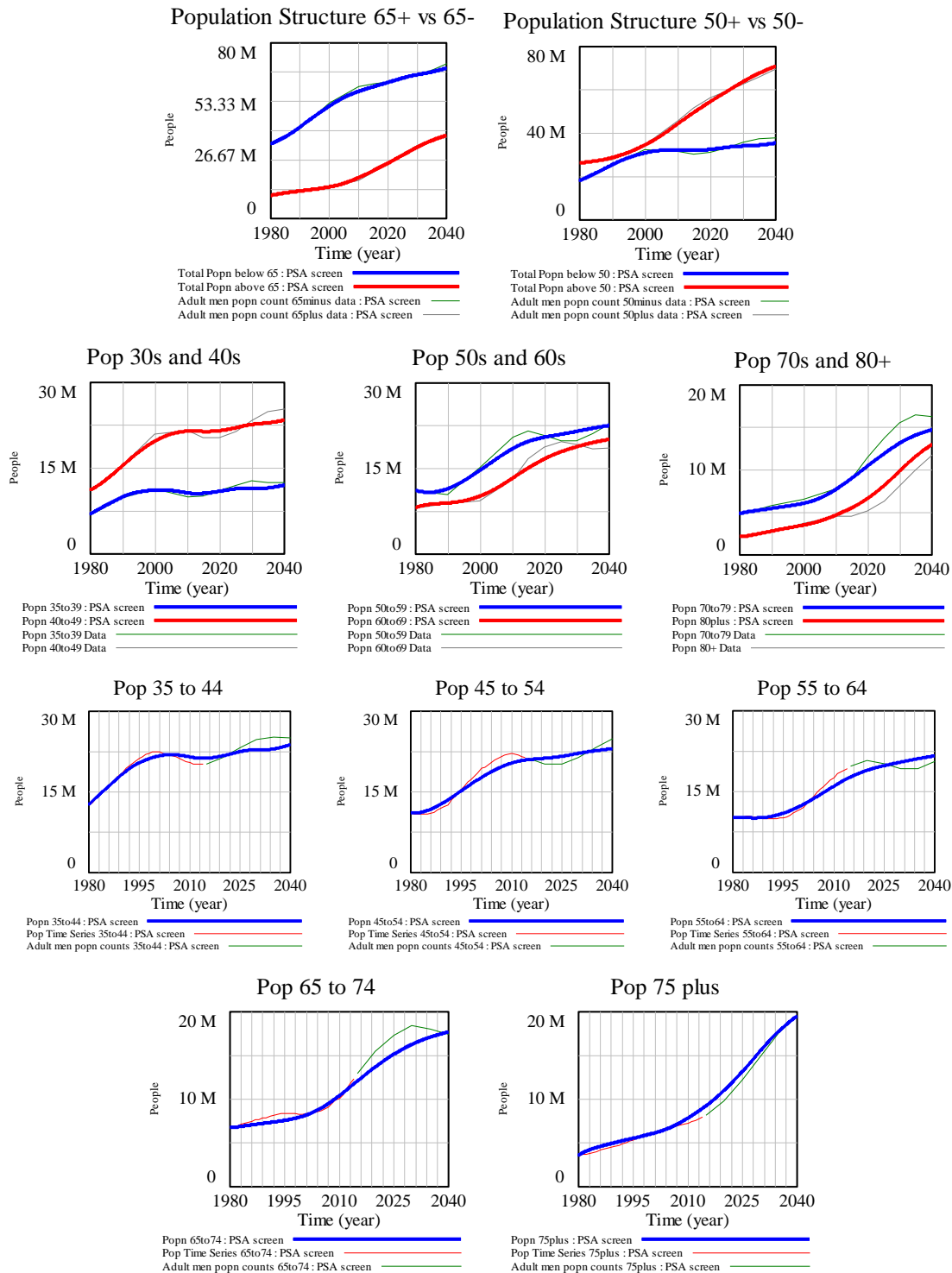


Figure 4 Population counts history and projection for various age groups

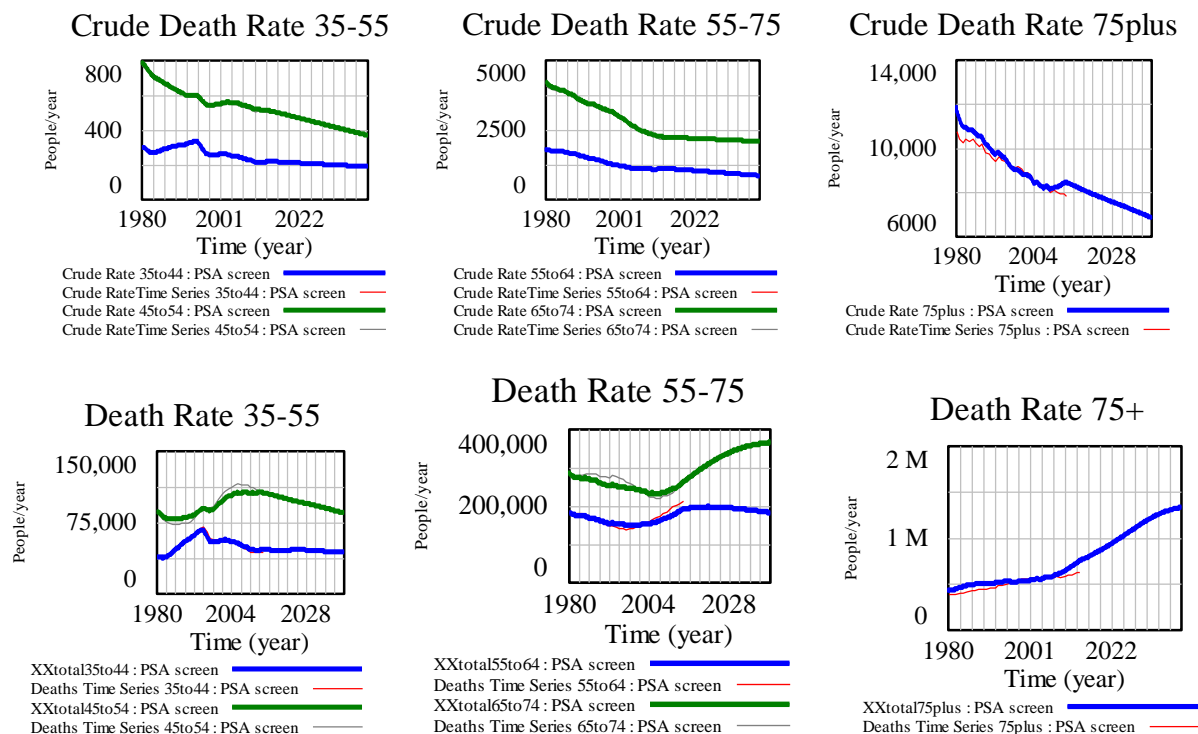


Figure 56 Death rate and crude death rate counts history and projection for various age groups

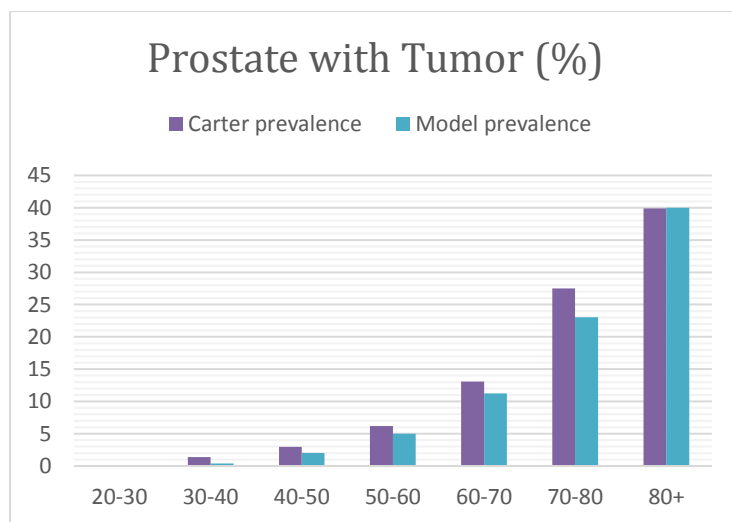


Figure 6 Age-specific prevalence of asymptomatic prostate cancer among symptom-free men based on autopsy studies published between 1941 and 1966 ([Carter et al., 1990](#))

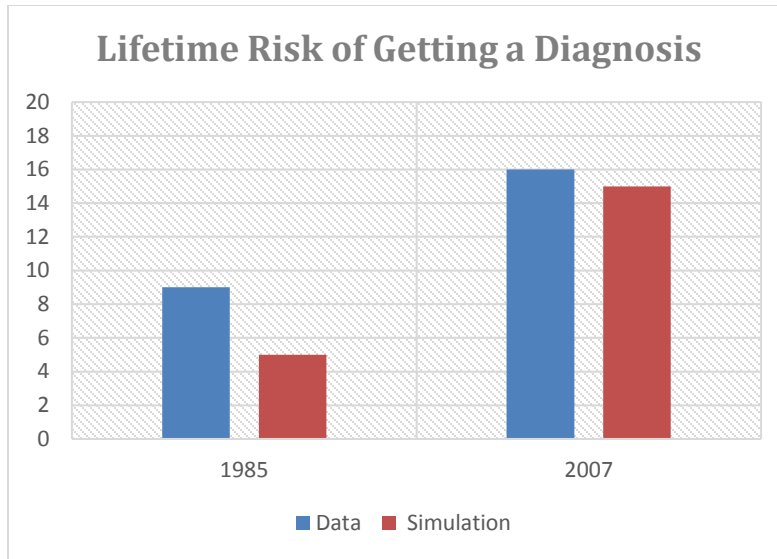


Figure 21 Lifetime risk of getting a diagnosis

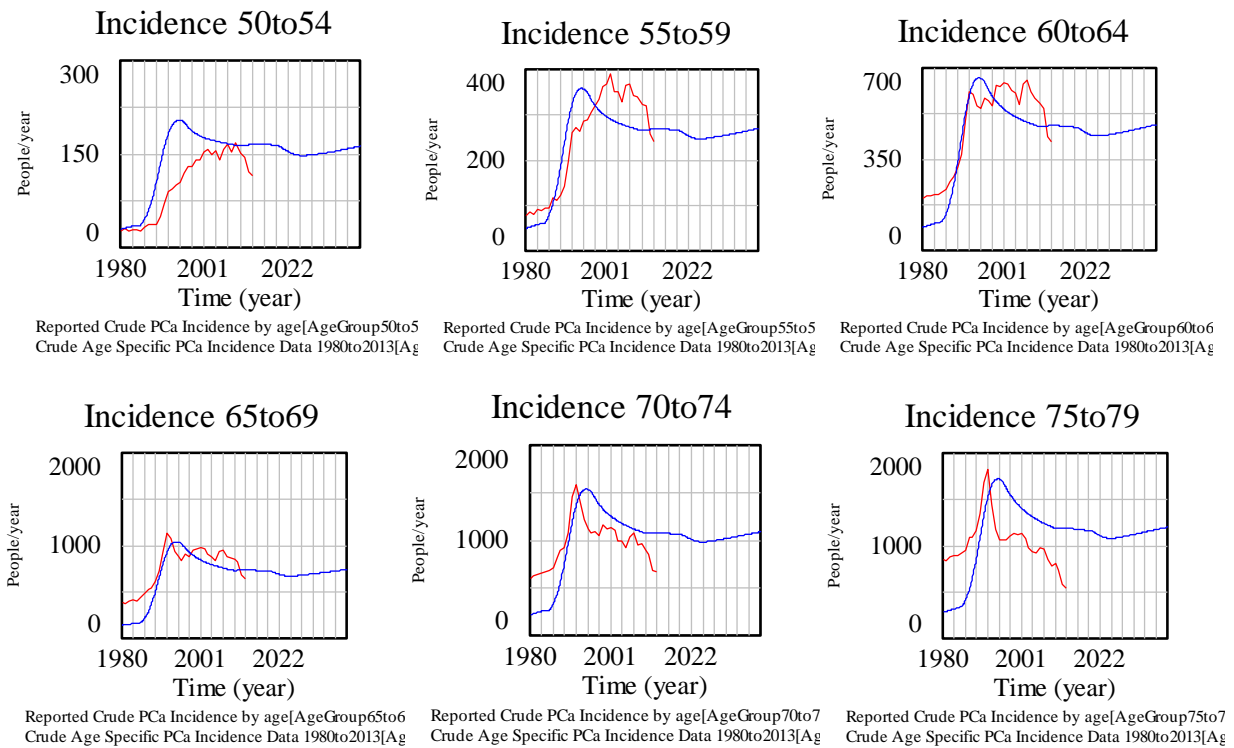


Figure 22 Prostate cancer incidence data and projection in base case simulation

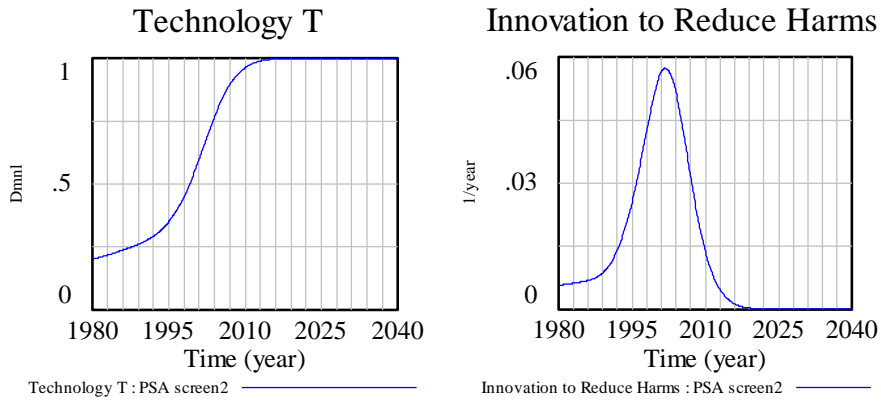


Figure 23 Reference behavior of harm reduction technology and innovation to reduce harms

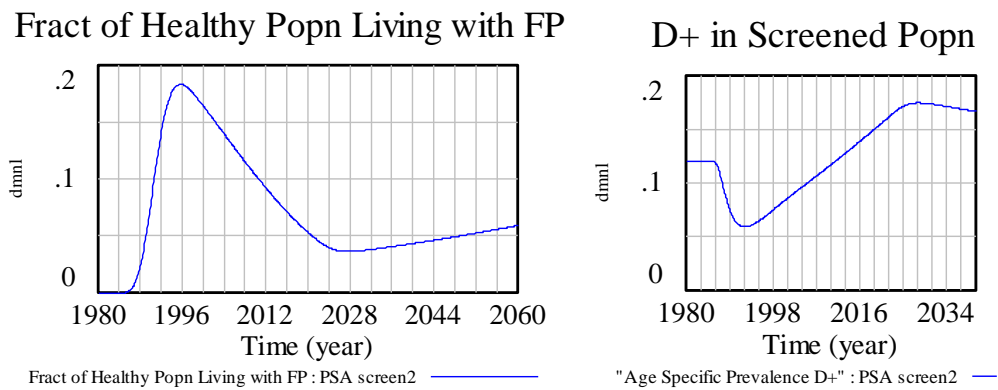


Figure 7 a) Fraction of healthy 35+ male population living with a False Positive result b) Target population disease prevalence

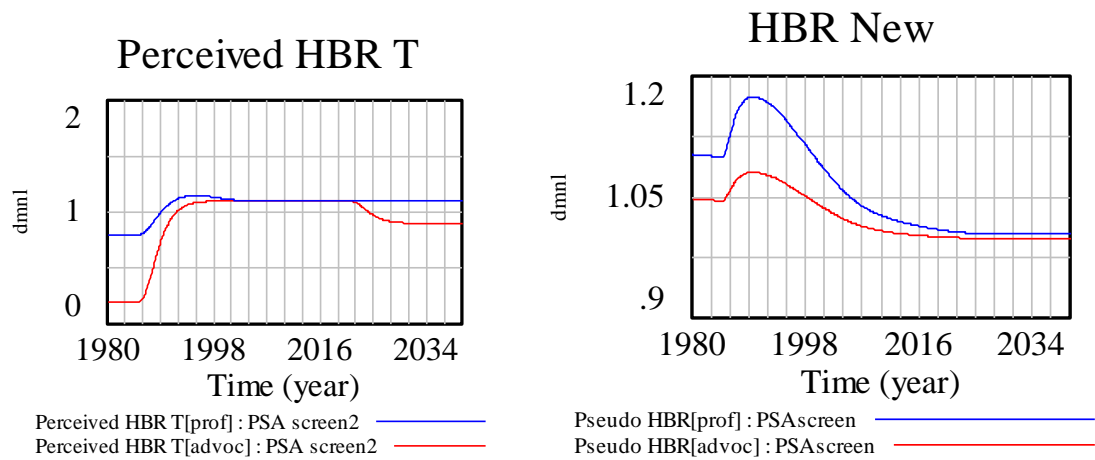


Figure 8 Base case simulation a) Perceived HBR and b) Pseudo-HBR

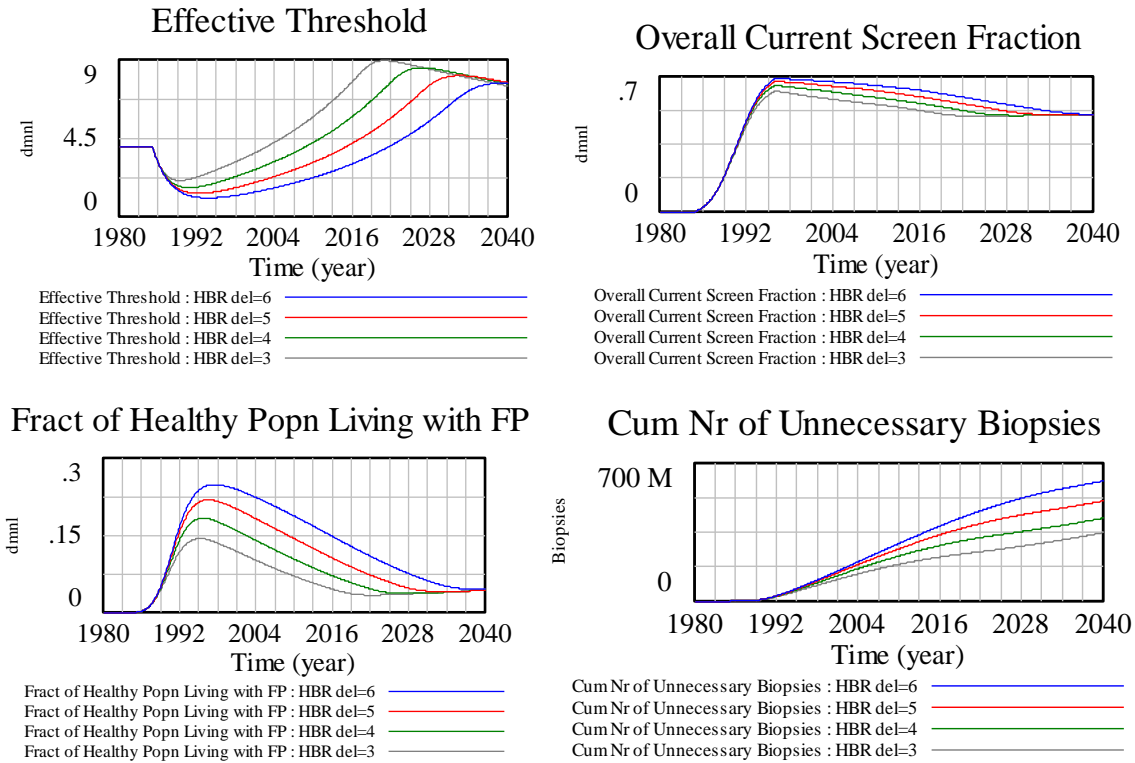


Figure 28 Effect of HBR translation delay

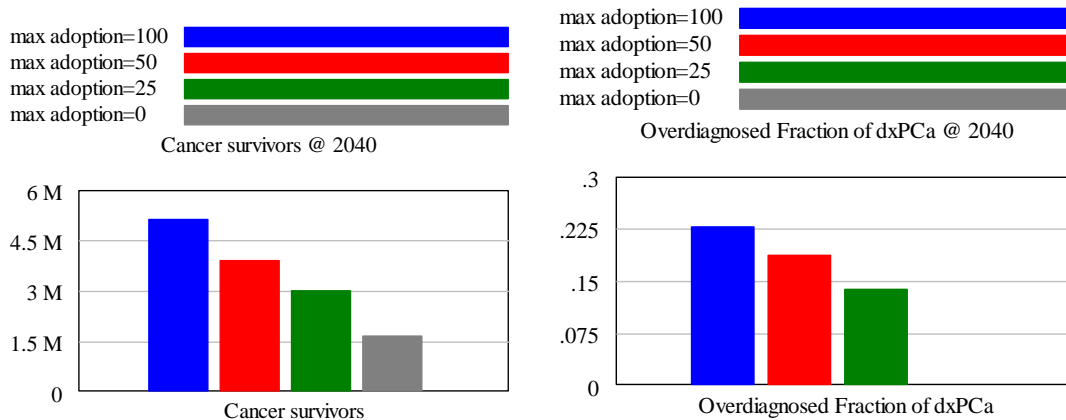


Figure 29 Effect of maximum adoption fraction on overdiagnosis and survivors



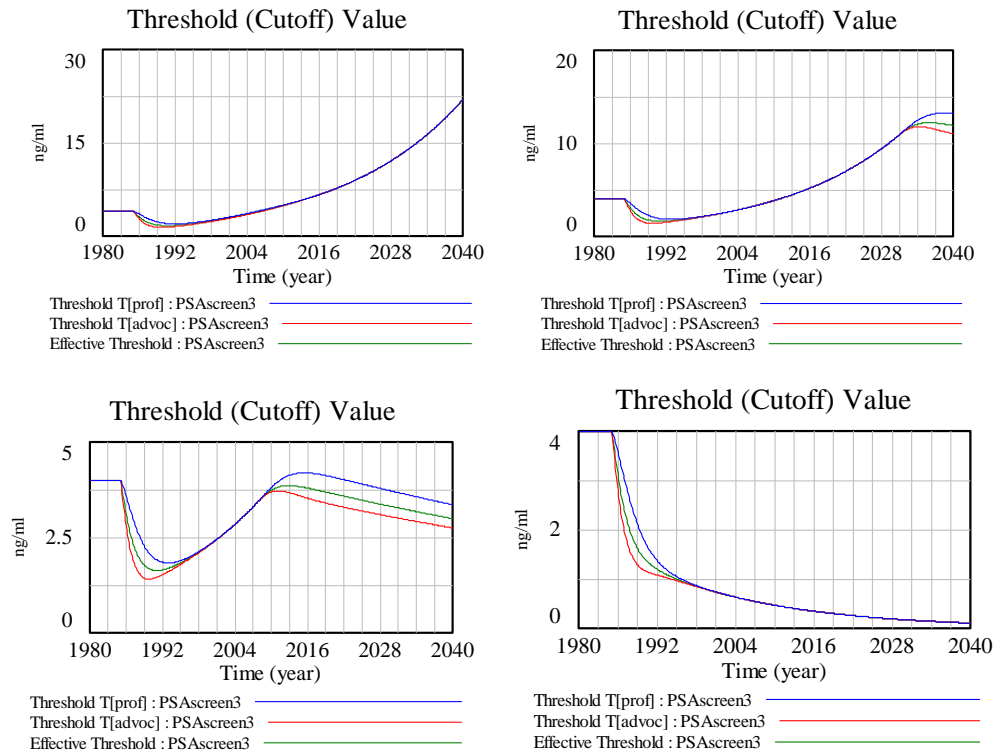


Figure 30 Effect of HRT on age to start routine screening

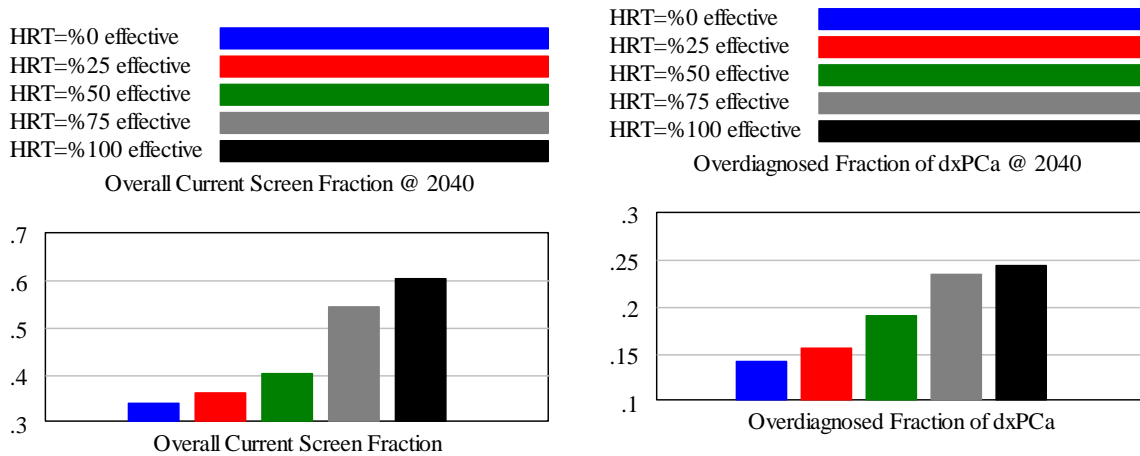


Figure 31 Effect of HRT on overdiagnosis and cancer survivors

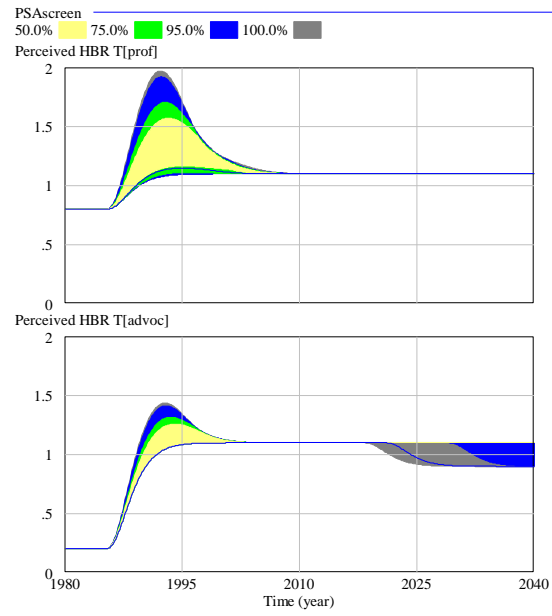


Figure 32 Varying disutilities for health states

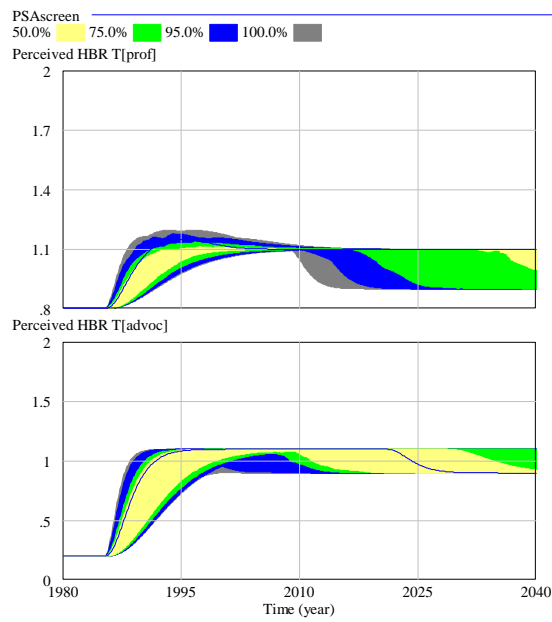


Figure 33 Perceived  $HBR_{advoc}$  and  $HBR_{prof}$

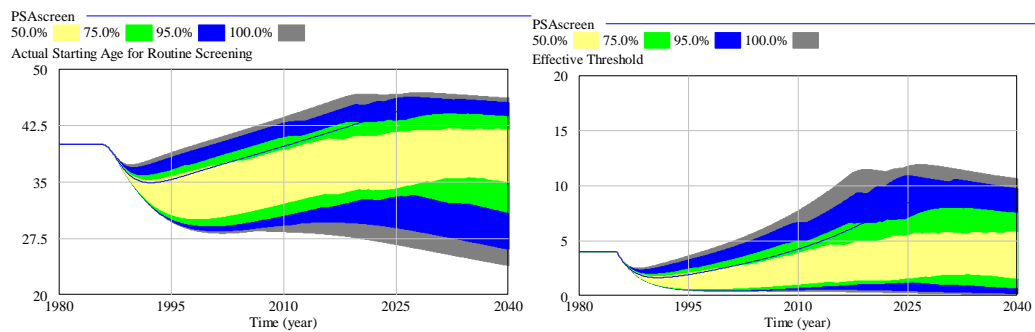


Figure 34 Actual starting age and effective threshold