```r
#Costs parameters


#Declare input parameters for costs
cDrg2016Mean<-42081
cDrg2016Se<-cDrg2016Mean/10
wDrg907A<-0.038
wDrg856G<-0.2
wDrg907O<-0.059
wDrg199<-3.678
wDrg203<-1.147
wDrg202<-1.51
wDrg480<-26.215
wDrg711O<-0.047
wDrg806P<-0.035
cFee2ad<-143
cFee2dd<-94
cRefUltra<-30
cOwnUltra<-227
cOwnOutpat<-320
cFee704e<-23
cFee701b<-51
cFee701c<-84
cFee701e<-27
cFee701g<-221
cFee704q<-120
cFee707a<-4
cCapFee<-427

#Run simulations for cost parameters. Logic based on Tollefsen report, Oslo Economics
cDrg2016<-rgamma(n,(cDrg2016Mean^2)/(cDrg2016Se^2),cDrg2016Mean/(cDrg2016Se^2))
pPaydByPat<-0.4 #40% standard percentage
nAvgVisit<-rgamma(n,(4^2)/(0.4^2),4/(0.4^2)) #Assume SE=mean/10
n707aLab<-rgamma(n,(6^2)/(0.6^2),6/(0.6^2)) #Assume SE=mean/10
nRnaPcr<-rgamma(n,(2^2)/(0.2^2),2/(0.2^2)) #Assume SE=mean/10
nAcuteGp<-rgamma(n,(1^2)/(0.1^2),1/(0.1^2)) #Assume SE=mean/10
nAcuteOutpat<-rgamma(n,(1.5^2)/(0.15^2),1.5/(0.15^2)) #Assume SE=mean/10
nAcuteLabR<-rgamma(n,(2^2)/(0.2^2),2/(0.2^2)) #Assume SE=mean/10
pChronTreat<-0.17
pMild<-rbeta(n,16180,7020) #Oslo Economics report, p37
pComp<-rbeta(n,2080,520) #Oslo Economics report, p37
nMildTreatGP<-rgamma(n,(4.5^2)/(0.45^2),4.5/(0.45^2)) #Assume SE=mean/10
nMildTreatOutpat<-rgamma(n,(4.5^2)/(0.45^2),4.5/(0.45^2)) #Assume SE=mean/10
nMildTreatLabRna<-rgamma(n,(1^2)/(0.1^2),1/(0.1^2)) #Assume SE=mean/10
nMildNoLabRna<-rgamma(n,(1.5^2)/(0.15^2),1.5/(0.15^2)) #Assume SE=mean/10
nModTreatGP<-rgamma(n,(4.5^2)/(0.45^2),4.5/(0.45^2)) #Assume SE=mean/10
nModTreatOutpat<-rgamma(n,(4.5^2)/(0.45^2),4.5/(0.45^2)) #Assume SE=mean/10
nModTreatLabRna<-rgamma(n,(3^2)/(0.3^2),3/(0.3^2)) #Assume SE=mean/10
nModTreatLabPck<-rgamma(n,(3^2)/(0.3^2),3/(0.3^2)) #Assume SE=mean/10
nModNoLabRna<-rgamma(n,(1^2)/(0.1^2),1/(0.1^2)) #Assume SE=mean/10
nCompTreatGP<-rgamma(n,(5.5^2)/(0.55^2),5.5/(0.55^2)) #Assume SE=mean/10
nCompTreat907<-rgamma(n,(10^2)/(1^2),10/(1^2)) #Assume SE=mean/10
nCompTreatLabRna<-rgamma(n,(5^2)/(0.5^2),5/(0.5^2)) #Assume SE=mean/10
nCompTreatLabPck<-rgamma(n,(5^2)/(0.5^2),5/(0.5^2)) #Assume SE=mean/10
nCompTreatUlt<-rgamma(n,(1^2)/(0.1^2),1/(0.1^2)) #Assume SE=mean/10
nCompTreatGas<-rgamma(n,(0.5^2)/(0.05^2),0.5/(0.05^2)) #Assume SE=mean/10
nCompNoGP<-rgamma(n,(3^2)/(0.3^2),3/(0.3^2)) #Assume SE=mean/10
nCompNo907<-rgamma(n,(2^2)/(0.2^2),2/(0.2^2)) #Assume SE=mean/10
nCompNoLabRna<-rgamma(n,(1^2)/(0.1^2),1/(0.1^2)) #Assume SE=mean/10
nCompNoLabPck<-rgamma(n,(1^2)/(0.1^2),1/(0.1^2)) #Assume SE=mean/10
nCompNoUlt<-rgamma(n,(1^2)/(0.1^2),1/(0.1^2)) #Assume SE=mean/10
nCompNoGas<-rgamma(n,(1^2)/(0.1^2),1/(0.1^2)) #Assume SE=mean/10
nDeCompGP<-rgamma(n,(5.5^2)/(0.55^2),5.5/(0.55^2)) #Assume SE=mean/10
nDeComp907<-rgamma(n,(9^2)/(0.9^2),9/(0.9^2)) #Assume SE=mean/10
nDeComp202<-rgamma(n,(3.5^2)/(0.35^2),3.5/(0.35^2)) #Assume SE=mean/10
nDeCompRna<-rgamma(n,(2^2)/(0.2^2),2/(0.2^2)) #Assume SE=mean/10
nDeCompLab<-rgamma(n,(5^2)/(0.5^2),5/(0.5^2)) #Assume SE=mean/10
nDecompUlt<-rgamma(n,(1^2)/(0.1^2),1/(0.1^2)) #Assume SE=mean/10
nDeCompGas<-rgamma(n,(0.5^2)/(0.05^2),0.5/(0.05^2)) #Assume SE=mean/10
nDeCompAsc<-rgamma(n,(0.5^2)/(0.05^2),0.5/(0.05^2)) #Assume SE=mean/10
nHccGp<-rgamma(n,(5^2)/(0.5^2),5/(0.5^2)) #Assume SE=mean/10
nHcc856<-rgamma(n,(12^2)/(1.2^2),12/(1.2^2)) #Assume SE=mean/10
nHcc199<-rgamma(n,(3^2)/(0.3^2),3/(0.3^2)) #Assume SE=mean/10
nHcc203<-rgamma(n,(6^2)/(0.6^2),6/(0.6^2)) #Assume SE=mean/10
nHccRna<-rgamma(n,(2^2)/(0.2^2),2/(0.2^2)) #Assume SE=mean/10
nHccLab<-rgamma(n,(5^2)/(0.5^2),5/(0.5^2)) #Assume SE=mean/10
nTxGp<-rgamma(n,(18^2)/(1.8^2),18/(1.8^2)) #Assume SE=mean/10
nTx907<-rgamma(n,(2.5^2)/(0.25^2),2.5/(0.25^2)) #Assume SE=mean/10
nTx202<-rgamma(n,(2^2)/(0.2^2),2/(0.2^2)) #Assume SE=mean/10
nTxRna<-rgamma(n,(1^2)/(0.1^2),1/(0.1^2)) #Assume SE=mean/10
nTxLab<-rgamma(n,(1^2)/(0.1^2),1/(0.1^2)) #Assume SE=mean/10
nTrGp<-rgamma(n,(10^2)/(1^2),10/(1^2)) #Assume SE=mean/10
nTr907<-rgamma(n,(10^2)/(1^2),10/(1^2)) #Assume SE=mean/10
nTr480<-rgamma(n,(2^2)/(0.2^2),2/(0.2^2)) #Assume SE=mean/10
salaryNurse<-rgamma(n,(471600^2)/(4716^2),471600/(4716^2)) #SSB.no for mean, assume SE=1/100th of mean
salaryDoctor<-rgamma(n,(830400^2)/(8304^2),830400/(8304^2)) #SSB.no for mean, assume SE=1/100th of mean
pIndirect<-rep(0,n)
if(perspective=="healthcare") pIndirect<-rbeta(n,214,1000-214) #Estimate 21.4% from SSB.no, SE is guesstimate
cNurse<-salaryNurse/(1-pIndirect)
pNurseIvdu<-rbeta(n,5,100-5) #Olav Dalgard estimated 1 nurse treat 20 per year. SE based on assumption (wide uncertainty)
cDoctor<-salaryDoctor/(1-pIndirect)
pDoctor<-rbeta(n,5,1000-5) #Olav Dalgard estimated 1 nurse treat 20 per year. SE based on assumption (wide uncertainty)
pNurseOther<-rbeta(n,5,300-5) #Olav Dalgard estimated 1 nurse treat 20 per year. SE based on assumption (wide uncertainty)

#Calculate sub costs. Logic based on Oslo Economics report (Tollefsen et al.)
cCapFeePat<-cCapFee/nAvgVisit
cGpConsult<-cCapFeePat+cFee2ad+cFee2dd
cLabPck<-n707aLab*cFee707a/pPaydByPat
cLabPckRna<-(cFee704e+nRnaPcr*(cFee701b+cFee701c+cFee701e+cFee701g)+cFee704q+n707aLab*cFee707a)/pPaydByPat
cUltraGal<-cRefUltra+cOwnUltra
cGastro<-cDrg2016*wDrg711O+cOwnOutpat
cAscites<-wDrg806P*cDrg2016+cOwnOutpat
pChronMildTreat<-pChronTreat*pMild
pChronMildNo<-(1-pChronTreat)*pMild
pChronModTreat<-pChronTreat*(1-pMild)
pChronModNo<-(1-pChronTreat)*(1-pMild)
pCirrCompTreat<-pComp*pChronTreat
pCirrCompNo<-pComp*(1-pChronTreat)
pCirrDeComp<-(1-pComp)

#Calculate health state costs. Logic based on Oslo Economics report (Tollefsen et al.)
cSusceptible<-rep(0,n)
cHcvAcute<-nAcuteGp*cGpConsult+nAcuteOutpat*wDrg907A*cDrg2016+nAcuteLabR*cLabPckRna
cHcvChronic<- pChronMildTreat*(nMildTreatGP*cGpConsult+nMildTreatOutpat*wDrg907A*cDrg2016+nMildTreatLabRna*cLabPckRna)+pChronMildNo*(nMildNoLabRna*cLabPckRna)+
pChronModTreat*(nModTreatGP*cGpConsult+nModTreatOutpat*wDrg907A*cDrg2016+nModTreatLabRna*cLabPckRna+nModTreatLabPck*cLabPck)+pChronModNo*(nModNoLabRna*cLabPckRna)
cCirrhosis<-  pCirrCompTreat*
(nCompTreatGP*cGpConsult+nCompTreat907*wDrg907A*cDrg2016+nCompTreatLabRna*cLabPckRna+nCompTreatLabPck*cLabPck+nCompTreatUlt*cUltraGal+nCompTreatGas*cGastro)+
pCirrCompNo*(nCompNoGP*cGpConsult+nCompNo907*wDrg907A*cDrg2016+nCompNoLabRna*cLabPckRna+nCompNoLabPck*cLabPck+nCompNoUlt*cUltraGal+nCompNoGas*cGastro)+
pCirrDeComp*
(nDeCompGP*cGpConsult+nDeComp907*wDrg907O*cDrg2016+nDeComp202*wDrg202*cDrg2016+nDeCompRna*cLabPckRna+nDeCompLab*cLabPck+nDecompUlt*cUltraGal+nDeCompGas*cGastro+nDeCompAsc*cAscites)

cHcc<-nHccGp*cGpConsult+nHcc856*wDrg856G*cDrg2016+cDrg2016*(wDrg199*nHcc199+wDrg203*nHcc203)+nHccRna*cLabPckRna+nHccLab*cLabPck
cTransplant<-nTrGp*cGpConsult+nTr907*wDrg907O*cDrg2016+nTx202*wDrg202*cDrg2016+nTr480*wDrg480*cDrg2016+nTxRna*cLabPckRna+nTxLab*cLabPck
cTransplanted<-nTxGp*cGpConsult+nTx907*wDrg907O*cDrg2016+nTx202*wDrg202*cDrg2016+nTxRna*cLabPckRna+nTxLab*cLabPck
cTreatedIvdu<-cNurse*pNurseIvdu+cDoctor*pDoctor
cTreatedOther<-cNurse*pNurseOther+cDoctor*pDoctor
```

```
#Utilities
qSusceptibleMean<-0.747+0.09 #McLernon2008+McDonald2012
qSusceptibleSe<-0.03 #McDonald2012
qSusceptible<-rbeta(n,qSusceptibleMean*(qSusceptibleMean*(1-qSusceptibleMean)/(qSusceptibleSe^2)-1),(1-qSusceptibleMean)*((qSusceptibleMean/(qSusceptibleSe^2))*(1-qSusceptibleMean)-1))
qHcvAcuteMean<-0.747 #McLernon 2008
qHcvAcuteSe<-0.014 #McLernon 2008
qHcvAcute<-rbeta(n,qHcvAcuteMean*(qHcvAcuteMean*(1-qHcvAcuteMean)/(qHcvAcuteSe^2)-1),(1-qHcvAcuteMean)*((qHcvAcuteMean/(qHcvAcuteSe^2))*(1-qHcvAcuteMean)-1))
qHcvChronic<-qHcvAcute #McLernon 2008
qCirrhosisMean<-0.747-0.0142 #McLernon 2008
qCirrhosisSe<-0.017 #McLernon 2008
qCirrhosis<-rbeta(n,qCirrhosisMean*(qCirrhosisMean*(1-qCirrhosisMean)/(qCirrhosisSe^2)-1),(1-qCirrhosisMean)*((qCirrhosisMean/(qCirrhosisSe^2))*(1-qCirrhosisMean)-1))
qHccMean<-0.38 #Townsend 2011
qHccSe<-0.184 #Townsend 2011
qHcc<-rbeta(n,qHccMean*(qHccMean*(1-qHccMean)/(qHccSe^2)-1),(1-qHccMean)*((qHccMean/(qHccSe^2))*(1-qHccMean)-1))
qTransplantedMean<-0.747-0.038 #McLernon 2008
qTransplantedSe<-0.017 #McLernon 2008
qTransplanted<-rbeta(n,qTransplantedMean*(qTransplantedMean*(1-qTransplantedMean)/(qTransplantedSe^2)-1),(1-qTransplantedMean)*((qTransplantedMean/(qTransplantedSe^2))*(1-qTransplantedMean)-1))
```