# Make your model a function

DARTH workgroup

December 7th

# Functions in R

Created to repeat a calculation several times in the exact same way

```r
calculateMean <- function (x){
  mean <- sum(x)/length(x)
}
```

```r
calculate_CE_out <- function (Your Arguments){

  # YOUR DECISION MODEL #

  # Calculate your outcomes

  # create a dataframe with our outcomes

  return (df_ce)
}
```

# Remember: Structure of our code

NOTE: old coding convention

Specify all the input parameters

- transition probabilities, cycle length etc

Generate sample with individual (baseline) characteristics $X$

- age, sex etc

Specify functions

- $Probs(m, x)$
- $Costs\ (m, x)$
- $Effs\ \ (m, x)$

$MicroSim( )$

$C_0 = Costs(M_0, X_0)$

$E_0 = Effs(M_0, X_0)$

for $t = 1$ to $nt$ do

$p = Probs(M_t, X_t)$

$M_{t+1} \sim samplev\ (n, p)$

*Update* $X_{t+1}$

$C_{t+1} = Costs(M_{t+1}, X_{t+1})$

$E_{t+1} = Effs\ (M_{t+1}, X_{t+1})$

End $MicroSim$

Run $MicroSim$

# Remember: Structure of our code

NOTE: old coding convention

Specify all the input parameters
- transition probabilities, cycle length etc

Generate sample with individual (baseline) characteristics $X$
- age, sex etc

Specify functions
- $Probs(m, x)$
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End $MicroSim$

Run $MicroSim$

Wrap it in a function

```
calculate_CE_out <- function (Your Arguments){

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  # create a dataframe with our outcomes

  return (df_ce)
}
```
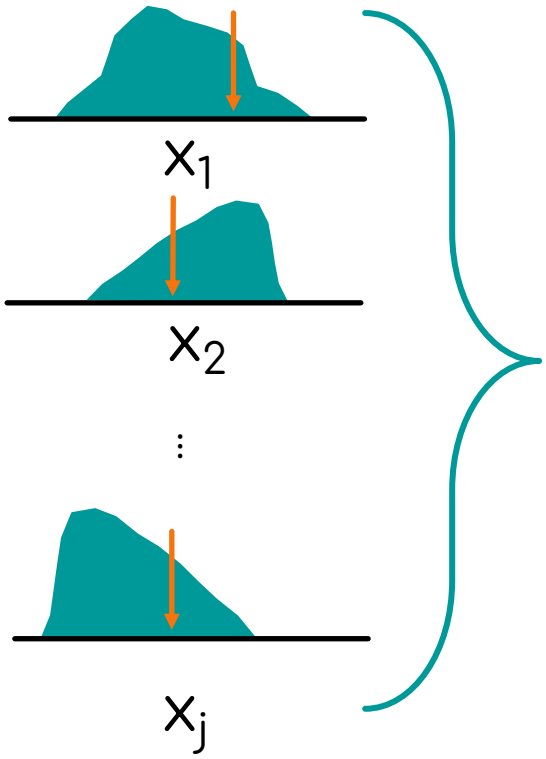

# Input

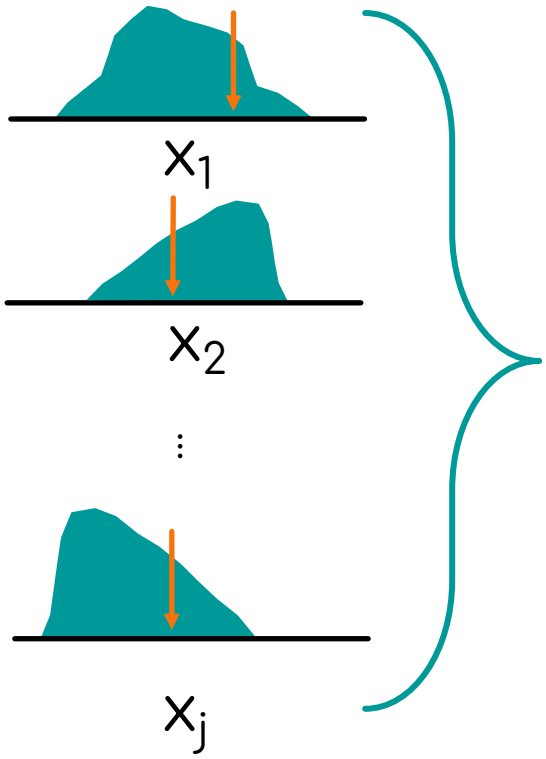



# Data

Population characteristics and model parameters

| age | sex | height | p_HS |
|---|---|---|---|
| 30 | Female | 1.55 | 0.3 |
| 28 | Female | 1.68 | 0.4 |
| 36 | Male | 1.89 | 0.5 |

# Input

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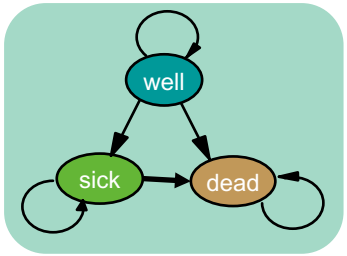
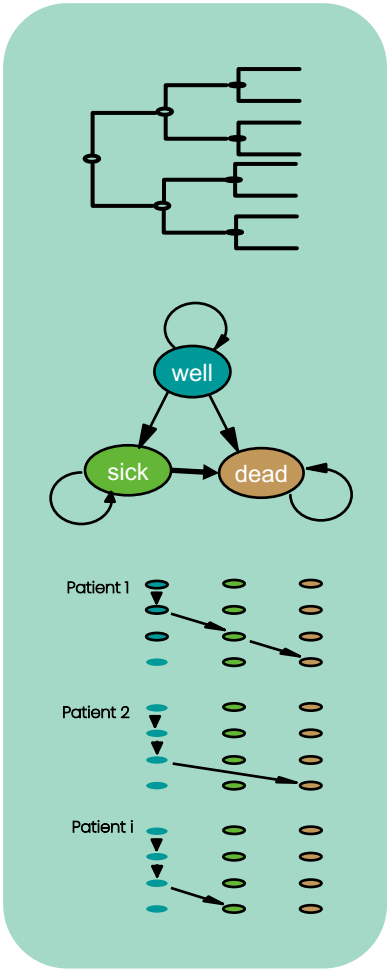
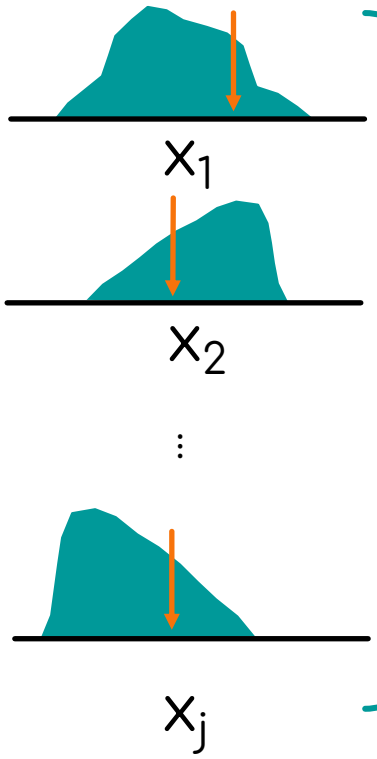



# Model

# Input

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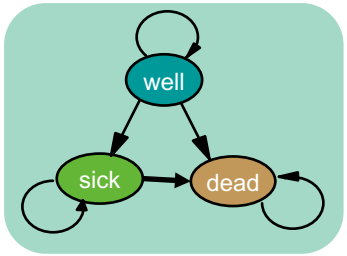



Model

# Outputs

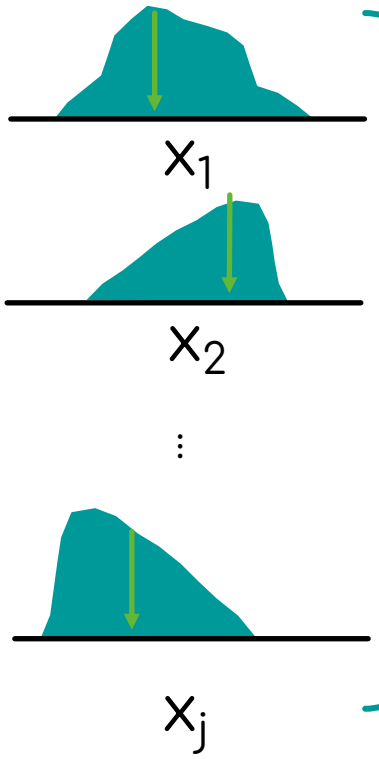
Effect

Cost

NMB

NMB: Net monetary benefit

# Input

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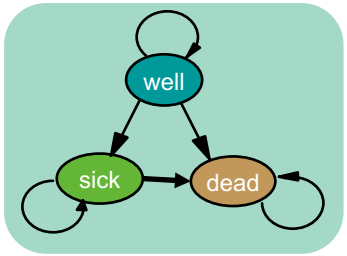



Model

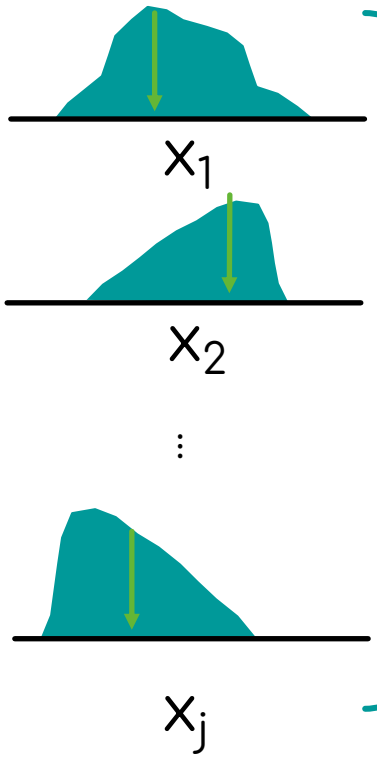
# Outputs

Effect

Cost

NMB

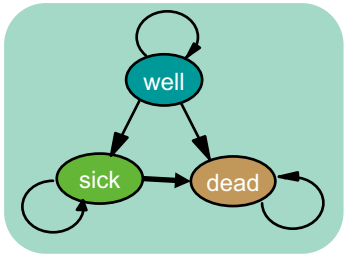
# Input




# Data

Population characteristics and model parameters

| age | sex | height | p_HS |
|---|---|---|---|
| 30 | Female | 1.65 | 0.09 |
| 22 | Male | 1.80 | 0.2 |
| 46 | Male | 2.00 | 0.3 |

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# Outputs

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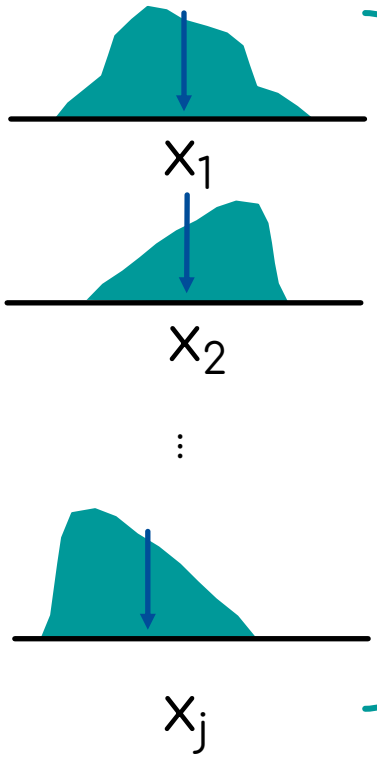
Cost

NMB

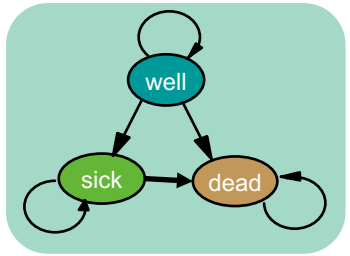
# Input




# Data

Population characteristics and model parameters

| age | sex | height | p_HS |
|---|---|---|---|
| 45 | Male | 1.95 | 0.39 |
| 35 | Female | 1.64 | 0.43 |
| 22 | Female | 1.78 | 0.11 |




Model

# Outputs

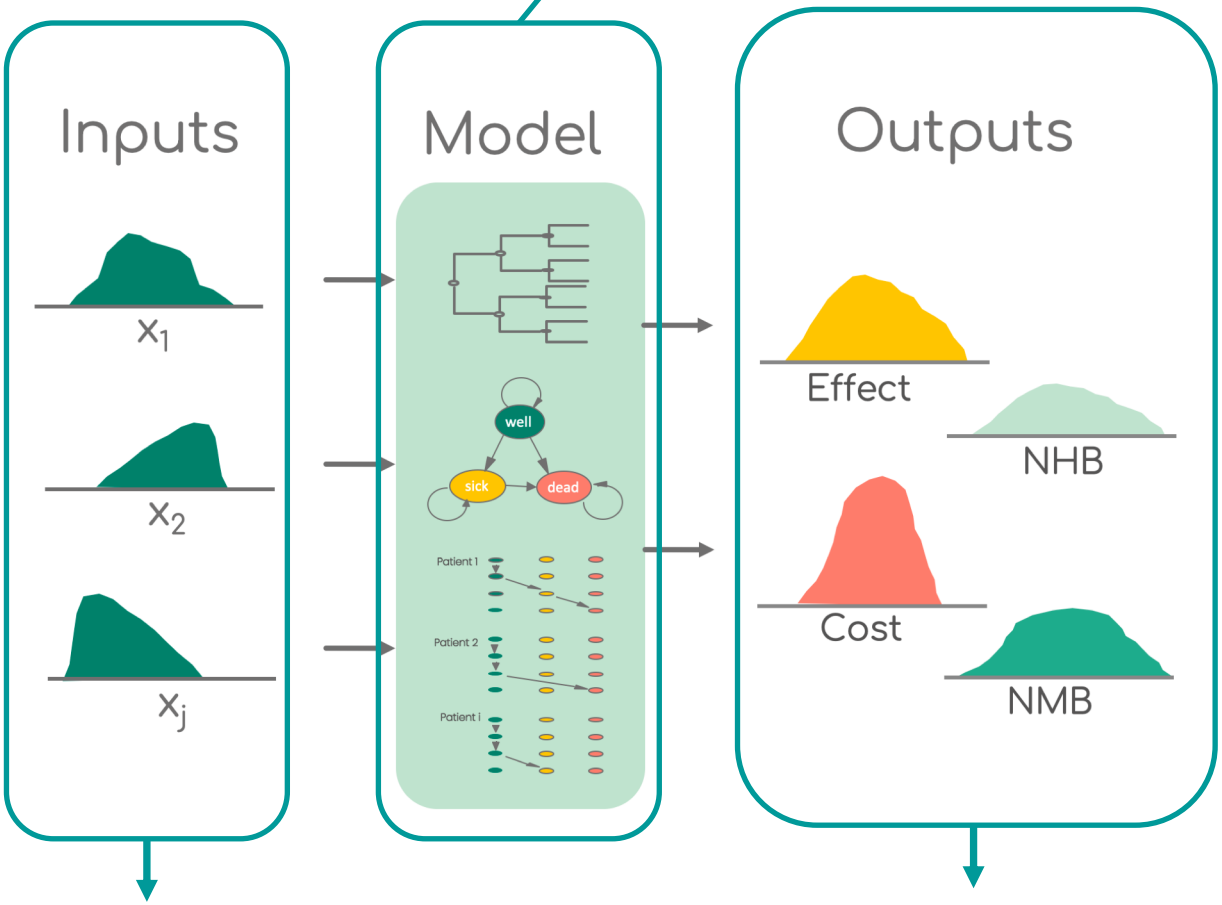
Effect

Cost

NMB

# PSA & R

**Function** which runs the model using the parameter values from the list




**List or data set** with parameter values for each iteration

**Data frame** with model outcome estimates for each iteration

http://darthworkgroup.com/


https://github.com/organizations/DARTH-git

https://www.linkedin.com/groups/8635339

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