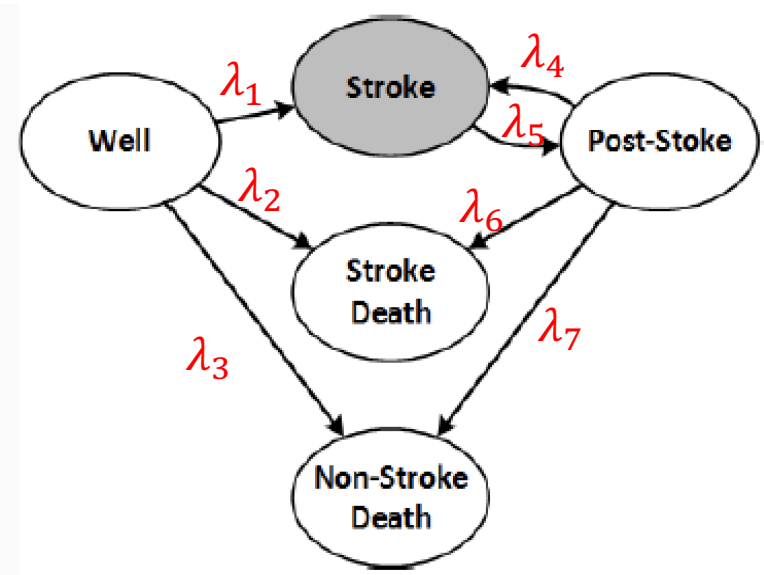

Problem 1

Part1 :

The rate of stroke-associated mortality is:

$$1 - e^{-(x)} = \frac{36.2}{100{,}000}$$

$$x = -\ln\left(1 - \frac{36.2}{100{,}000}\right) = 0.0003620655$$

The rate of non-stroke associated mortality is:

$$1 - e^{-(x)} = \frac{18}{1{,}000} - \frac{36.2}{100{,}000}$$

$$x = -\ln\left(1 - \left(\frac{18}{1{,}000} - \frac{36.2}{100{,}000}\right)\right) = 0.0177954$$

$\lambda_3 = 0.0178$, $\lambda_7 = 0.0178$

Part2:

The annual rate of stroke event is:

$$1 - e^{-(\lambda_1 + \lambda_2)} = \frac{15}{1{,}000}$$

$$\lambda_1 + \lambda_2 = -\ln\left(1 - \frac{15}{1{,}000}\right) = 0.01511364$$

Part3:

$\frac{\lambda_1}{\lambda_1 + \lambda_2} = 0.9$, $\frac{\lambda_2}{\lambda_1 + \lambda_2} = 0.1$

The annual rate of transition from “Well” to “Stoke” is:

$\lambda_1 = 0.9 * 0.01511364 = 0.01360228 \approx 0.0136$

The annual rate of transition from “Well” to “Stroke Death” is:

$\lambda_2 = 0.1 * 0.01511364 = 0.00151136 \approx 0.0015$

Part4:

The annual rate of recurrent stroke events is:

$-\ln(1-0.17)/5 = 0.03726592$

Part5:

$\frac{\lambda_4}{\lambda_4+\lambda_6}$ =

The ann ti ost-stroke" to "Stroke" is:

λ_4 =0.8 5 0298

The ann ti ost-stroke" to "Stroke Death" is:

λ_6 = 0.2 5 0075

Part6:

The ann f ke" to "Post-stroke" is:

$\frac{1}{\lambda_5}$ =7/3 1

The M ra using anticoagulation:

	oke	Post-Stroke	Stroke Death	Non-Stroke Death
Well	136	0	0.0015	0.0178
Stroke	0	52.14	0	0
Post-S	298	0	0.0075	0.0178
Stroke	0	0	0	0
Non-S tl	0	0	0	0

Problen

Part1 :

The rat e- s:

=

55

The rat tr ity is:

$1 - e^{-(x)}$ =

= - ln(1-(— - —) ∗ 1.05) = 0.01869354

λ_3 =0.0187, λ_7 = 0.0187

Part2:

The annual rate of stroke event is:

$1 - e^{-(\lambda_1+\lambda_2)} = \frac{15}{1{,}000}$

$\lambda_1 + \lambda_2$ = -ln(1- $\frac{15}{1{,}000}$) = 0.01511364

Part3:

$\frac{\lambda_1}{\lambda_1+\lambda_2}$ = 0.9, $\frac{\lambda_2}{\lambda_1+\lambda_2}$ = 0.1

The annual rate of transition from "Well" to "Stoke" is:

λ_1= 0.9*0.01511364=0.01360228 ≈ 0.0136

The annual rate of transition from "Well" to "Stroke Death" is:

λ_2=0.1*0.01511364= 0.00151136 ≈ 0.0015

rt4:
e annual rate of recurrent stroke event
(1-0.17)/5= 0.03726592

rt5:
$\frac{\lambda_4}{+\lambda_6}$ =0.8, $\frac{\lambda_6}{\lambda_4+\lambda_6}$ =0.2
e annual transition rates from state "P" to "Stroke" is:
λ_4 =0.8* 0.03726592*0.75= 0.02235955≈ 0.0224
The annual transition rates from state "Post-stroke" to "Stroke Death" is:
λ_6 = 0.2*0.03726592=0.007453184≈ 0.0075

Part6:
The annual rate of transition from "Stroke" to "Post-stroke" is:
$\frac{1}{\lambda_5}$ =7/365*1=0.01917808, $\lambda_5 = 52.14$

The Matrix of transition rate with anticoagulation

	Well	Stroke	Post-Stroke	Stroke Death	Non-Stroke Death
Well	0	0.0136	0	0.0015	0.0187
Stroke	0	0	52.14	0	0
Post-Stroke	0	0.0224	0	0.0075	0.0187
Stroke Death	0	0	0	0	0
Non-Stroke Death	0	0	0	0	0