WinBUGS code and Data for the 2-rate model

```
model {
# likelihood
for (i in 1:studnum) {
 for (j in 1:studobs[i]) {
  r[i,j] ~ dbin(theta[i,j],n[i,j])
  }
 }

# model
for (i in 1:studnum-2) {
 for (j in 1:studobs[i]) {
  theta[i,j] <- ((z[i,j] / n[i,j]) * (1 - exp(-lambda.C[1] * t[i,j]))
+                    (1 - (z[i,j] / n[i,j])) * (1 - exp(-lambda.C[2]
* t[i,j])))
                / (psi / (1 - ((1-psi) * equals(seind[i,j],0))))
  }
 }
# Left-truncated studies with repeat observations
for (i in 8:9) {
 for (j in 1:studobs[i]) {
  temp[i,j,1] <- ((z[i,1] / n[i,1]) * exp(-lambda.C[1] * T[i,j]) /
                 ((z[j,1] / n[i,1]) * exp(-lambda.C[1] * T[i,j]) +
                 (1 - (z[i,1] / n[i,1])) * exp(-lambda.C[2] *
T[i,j]))) *
                 (1 - exp(-lambda.C[1] * t[i,j]))
  temp[i,j,2] <- ((1 - (z[i,j] / n[i,1])) * exp(-lambda.C[2] *
T[i,j]) /
                  (0.00001+(z[i,1] / n[i,1]) * exp(-lambda.C[1] *
T[i,j]) +
                  (1 - (z[i,1] / n[i,1])) * exp(-lambda.C[2] *
T[i,j]))) *
                  (1 - exp(-lambda.C[2] * t[i,j]))
  theta[i,j] <- (temp[i,j,1] + temp[i,j,2]) /
                (psi / (1 - ((1-psi) * equals(seind[i,j],0))))
  }
 }

# priors
p1 ~ dbeta(1,1)
lambda.C[1] <- 120
lambda.C[2] ~ dexp(0.001)
psi ~ dbeta(78,8)  #sensitivity of culture given initial positive
# culture

# Class proportions
# t=0 studies
for (i in 1:4) {
 for (j in 1:studobs[i]) {
  z[i,j] ~ dbin(p1,n[i,j]) # start at t=0
  }
 }

# Left-truncated studys
for (i in 5:studnum) {
 for (j in 1:studobs[i]) {
  z[i,j] ~ dbin(w1,n[i,j])
  }
```

```
 }

# deviance
for (i in 1:studnum) {
 for (j in 1:studobs[i]) {
   dev[i,j] <- 2 * (r[i,j] * log(r[i,j] / (theta[i,j] * n[i,j])) +
                    (n[i,j] - r[i,j]) * log((n[i,j] - r[i,j]) /
                    (n[i,j] - (n[i,j] * theta[i,j]))))
   }
 dev.stud[i] <- sum(dev[i,1:studobs[i]])
 }
sumdev <- sum(dev.stud[])

# left truncation
w1 <- (p1 / lambda.C[1]) / (p1 / lambda.C[1] + (1 - p1) /
lambda.C[2])

# summary statistics
dur <- 1 / lambda.C[2]

# Predicted values for Forest plot
for (i in 1:studnum) {
 for (j in 1:studobs[i]) {
  stud.lambda.Cexpect[i,j] <- -log(1 - theta[i,j]) / t[i,j]
  stud.dur.expect[i,j] <- 1 / stud.lambda.Cexpect[i,j]
  }
 }
}

# Data
list(

# duration
# study order
# 1 Johhanisson
# 2 Joyner
# 3 Geisler
# 4 Paavonen
# 5 Rahm
# 6 Sorensen
# 7 McCormack
# 8 Morre
# 9 Mollano

r = structure(.Data=c(
10,7,6,6,NA,
2,7,1,0,3,
23,NA,NA,NA,NA,
3,NA,NA,NA,NA,
17,0,0,NA,NA,
8,NA,NA,NA,NA,
3,NA,NA,NA,NA,
2,2,4,0,2,
44,23,7,2,NA
),.Dim=c(9,5)),

n = structure(.Data=c(
23,14,14,8,NA,
12,28,4,8,6,
129,NA,NA,NA,NA,
15,NA,NA,NA,NA,
```

```
93,1,1,NA,NA,
13,NA,NA,NA,NA,
7,NA,NA,NA,NA,
20,5,15,1,13,
82,37,14,6,NA
),.Dim=c(9,5)),

t=structure(.Data=c(
0.038,0.058,0.077,0.125,NA,
0.012,0.03,0.049,0.088,0.274,
0.045,NA,NA,NA,NA,
0.083,NA,NA,NA,NA,
0.25,0.5,0.75,NA,NA,
1,NA,NA,NA,NA,
1.375,NA,NA,NA,NA,
0.083,0.5,0.417,0.917,0.5,
1,1,1,1,NA
),.Dim=c(9,5)),

seind = structure(.Data=c(
1,1,1,1,NA,
0,0,0,0,0,
0,NA,NA,NA,NA,
1,NA,NA,NA,NA,
1,1,1,NA,NA,
0,NA,NA,NA,NA,
1,NA,NA,NA,NA,
0,0,0,0,0,
0,0,0,0,NA
),.Dim=c(9,5)),

T=structure(.Data=c(
NA,NA,NA,NA,NA,
NA,NA,NA,NA,NA,
NA,NA,NA,NA,NA,
NA,NA,NA,NA,NA,
NA,NA,NA,NA,NA,
NA,NA,NA,NA,NA,
NA,NA,NA,NA,NA,
0,0,0.083,0.083,0.5,
0,1,2,3,NA
),.Dim=c(9,5)),

studnum = 9,
studobs = c(4,5,1,1,3,1,1,5,4),
)

# Initial values - 1
list(
psi = 0.9,
lambda.C = c(NA,0.7),
p1 = 0.2,
)

# Initial values - 2
list(
psi = 0.6,
lambda.C = c(NA,0.1),
p1 = 0.5
)
```