CEACOV RSA - Paper Graphs

August 14, 2020

[1]:
```
library(ggplot2)
```

```
Registered S3 methods overwritten by 'ggplot2':
  method         from
  [.quosures     rlang
  c.quosures     rlang
  print.quosures rlang
```

[2]:
```
mypath <- getwd()
output_location <- "R33 8.13.20"

folders <- c("BC",
                  "CT",
                  "CT+IC",
                  "CT+IC+MSS",
                  "CT+IC+QC",
                  "CT+IC+QC+MSS")

data_files <- paste("data_",folders,".csv",sep="")
filepaths <- paste(mypath,output_location,folders,data_files,sep="/")
```

[3]:
```
# Read in data and scale to population of KZN

KZN_pop <- 11531628

#df1 <- read.csv(kieran_filepaths[1])
#df2 <- read.csv(kieran_filepaths[2])
#df3 <- read.csv(kieran_filepaths[3])
#df4 <- read.csv(kieran_filepaths[4])
df5 <- read.csv(filepaths[5])
df6 <- read.csv(filepaths[6])

#df1[,3:ncol(df1)] <- round(df1[,3:ncol(df1)]/1e5*KZN_pop)
#df2[,3:ncol(df2)] <- round(df2[,3:ncol(df2)]/1e5*KZN_pop)
#df3[,3:ncol(df3)] <- round(df3[,3:ncol(df3)]/1e5*KZN_pop)
#df4[,3:ncol(df4)] <- round(df4[,3:ncol(df4)]/1e5*KZN_pop)
df5[,3:ncol(df5)] <- round(df5[,3:ncol(df5)]/500000*KZN_pop)
df6[,3:ncol(df6)] <- round(df6[,3:ncol(df6)]/500000*KZN_pop)
```

[5]:
```
#nday <- length(df1$day)
nday <- length(df5$day)

#df1$detected.cases <- cumsum(df1$test.1.pos)
#df2$detected.cases <- cumsum(df2$test.1.pos)
#df3$detected.cases <- cumsum(df3$test.1.pos)
#df4$detected.cases <- cumsum(df4$test.1.pos)
df5$detected.cases <- cumsum(df5$test.1.pos)
df6$detected.cases <- cumsum(df6$test.1.pos)

df5$mild.moderate.to.QC <- cumsum(df5$test.5.pos)
df5$mild.moderate.to.SQ <- cumsum(df5$test.5.neg)
df6$mild.moderate.to.QC <- cumsum(df6$test.5.pos)
df6$mild.moderate.to.SQ <- cumsum(df6$test.5.neg)

#df1$strategy <- rep("HT",nday)
#df2$strategy <- rep("HT+CT",nday)
#df3$strategy <- rep("HT+CT+IC",nday)
#df4$strategy <- rep("HT+CT+IC+MSS",nday)
df5$strategy <- rep("HT+CT+IC+QC",nday)
df6$strategy <- rep("HT+CT+IC+QC+MSS",nday)

#df <- rbind(df1,df2,df3,df4,df5,df6)
df <- rbind(df5,df6)

df$PCR.total <- df$test.1.pos + df$test.1.neg + df$n_pc_ILI_or_ct
df$PCR.positivity <- df$test.1.pos/df$PCR.total
df$fraction.detected <- df$detected.cases/df$cumulative.infections
df$IC_occupancy <- df$resource.untilization.3
df$QC_occupancy <- df$resource.untilization.4 + df$n_qc_extra
```

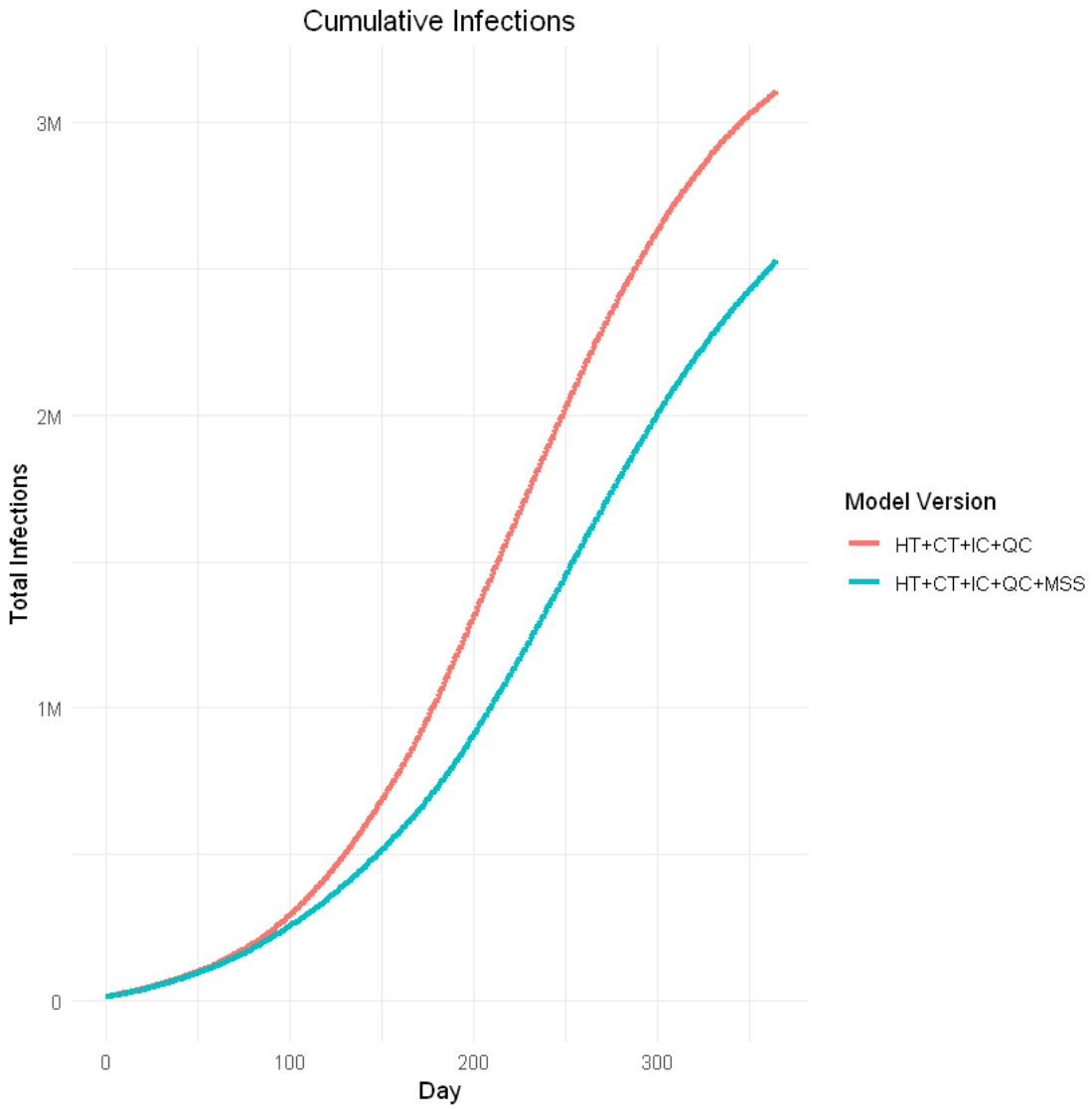
[35]:
```
to_QC_5 <- df5$mild.moderate.to.QC[nday]
to_SQ_5 <- df5$mild.moderate.to.SQ[nday]
fraction_5 <- to_QC_5/(to_QC_5+to_SQ_5)
infections_5 <- df5$cumulative.infections[nday]

to_QC_6 <- df6$mild.moderate.to.QC[nday]
to_SQ_6 <- df6$mild.moderate.to.SQ[nday]
fraction_6 <- to_QC_6/(to_QC_6+to_SQ_6)
infections_6 <- df6$cumulative.infections[nday]
```

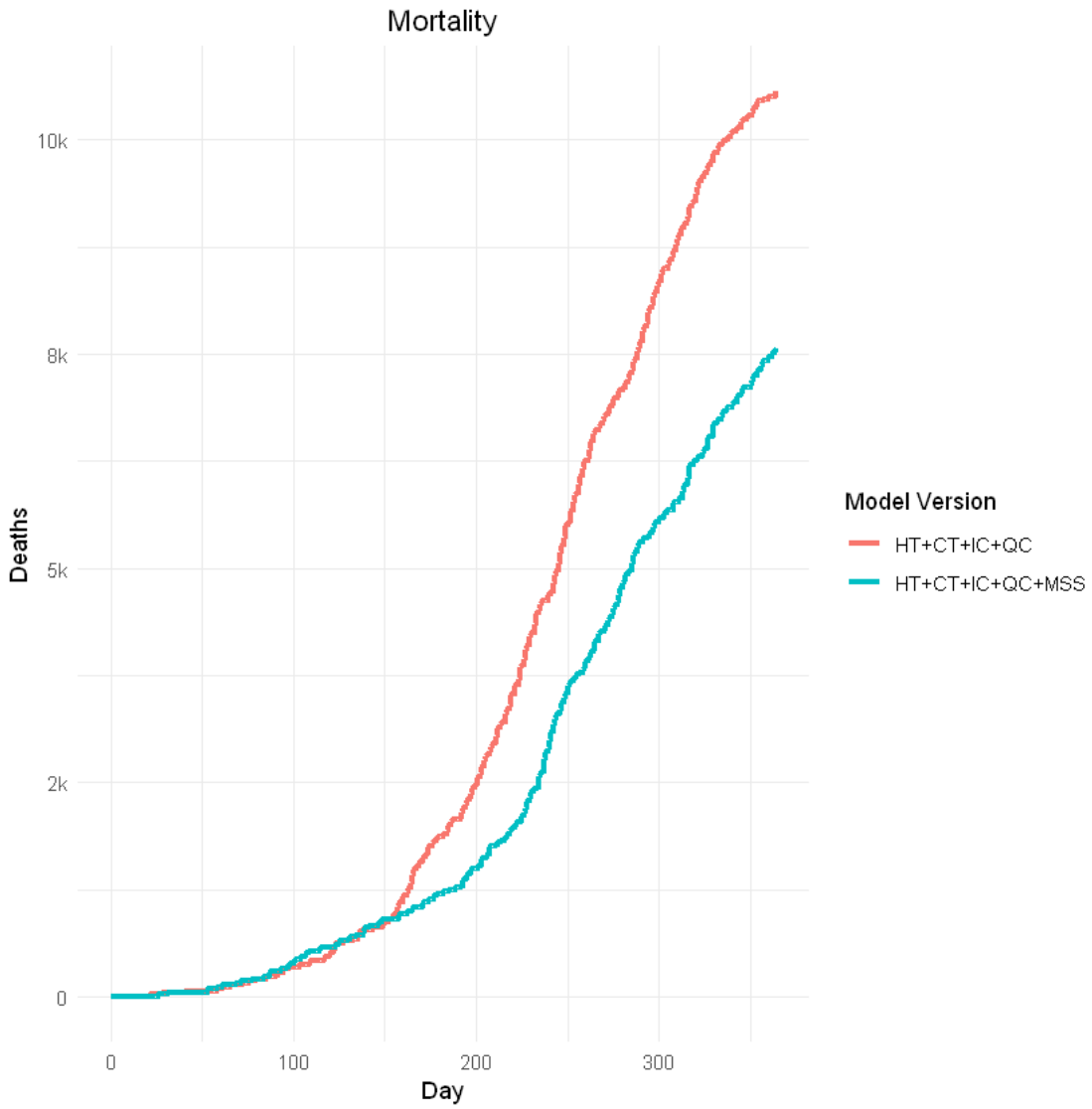
[61]:
```
myscale <- function(x){
  n <- length(x)
  mylabel <- numeric(n)
  for (i in seq(1,n)){
    if(is.na(x[i])){
      mylabel[i] <- NA
```

```
    } else if (x[i] < 1e3){
      mylabel[i] <- sprintf("%.0f",x[i])
    } else if (x[i] < 1e6){
      mylabel[i] <- sprintf("%.0fk",x[i]/1e3)
    } else{
      mylabel[i] <- sprintf("%.0fM",x[i]/1e6)
    }
  }
  return(mylabel)
}
```

[63]:
```
p2 <- ggplot(df,aes(x=day,y=cumulative.infections,color=strategy))+
geom_step(size=1.25)+
labs(x="Day",y="Total Infections",color="Model Version",title="Cumulative␣
 ↪Infections")+
scale_y_continuous(labels=myscale)+
theme_minimal()+
theme(plot.title=element_text(hjust=0.5))
p2
```



[64]:
```
p3 <- ggplot(df,aes(x=day,y=dead,color=strategy))+
geom_step(size=1.25)+
labs(x="Day",y="Deaths",color="Model Version",title="Mortality")+
scale_y_continuous(labels=myscale)+
theme_minimal()+
theme(plot.title=element_text(hjust=0.5))
p3
```



[99]:
```
print(max(df[df$strategy == "HT+CT+IC+QC","dead"]))
print(max(df[df$strategy == "HT+CT+IC+QC","cumulative.infections"]))
print(max(df[df$strategy == "HT+CT+IC+QC","PCR.total"]))
print(max(df[df$strategy == "HT+CT+IC+QC","IC_occupancy"]))
print(max(df[df$strategy == "HT+CT+IC+QC","QC_occupancy"]))
```

```
[1] 10563
[1] 3106298
[1] 19557
[1] 32565
[1] 46473
```

[100]:
```
print(max(df[df$strategy == "HT+CT+IC+QC+MSS","dead"]))
print(max(df[df$strategy == "HT+CT+IC+QC+MSS","cumulative.infections"]))
print(max(df[df$strategy == "HT+CT+IC+QC+MSS","PCR.total"]))
print(max(df[df$strategy == "HT+CT+IC+QC+MSS","IC_occupancy"]))
print(max(df[df$strategy == "HT+CT+IC+QC+MSS","QC_occupancy"]))
```

```
[1] 7565
[1] 2527318
[1] 18958
[1] 27814
[1] 41237
```

	HT+CT+IC+QC	HT+CT+IC+QC+MSS
Deaths	10,563	7,565
Infections	3,106,298	2,527,318
Peak PCR	19,557	18,958
Peak IC	32,565	27,814
Peak QC	46,473	41,237

[ ]:

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