

Erratum: Modeling 2018-2020 North Kivu and Ituri Ebola Outbreak

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Besides, the EVD spilled over to South Kivu Province (DRC) and to Uganda (**with 6 confirmed cases in the South Kivu** and 3 confirmed cases in the neighbouring country)

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Table 2. *An overview of modeling studies of Ebola outbreaks in DRC over the last five years* (**page 1/5**)

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Table 2. *An overview of modeling studies of Ebola outbreaks in DRC over the last five years* (**page 2/5**)

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Table 2. *An overview of modeling studies of Ebola outbreaks in DRC over the last five years* (**page 3/5**)

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Table 2. *An overview of modeling studies of Ebola outbreaks in DRC over the last five years* (**page 4/5**)

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Table 2. *An overview of modeling studies of Ebola outbreaks in DRC over the last five years* (**page 5/5**)

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The system of Ordinary Differential Equations (ODEs) is solved for each θ_i to obtain the model curves. For each time-point t , the pointwise 95% CIs are built with the use of **2.5%** and **97.5%** quantiles from the bootstrap samples.

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Data from situation reports (from WHO and MoH), which include data covering the period from 4 August 2018 to the end of the epidemic, can be downloaded directly from the Humanitarian Data Exchange (HDX) website (a platform related of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) Services) (130). **Data includes also the 6 confirmed cases from the South Kivu Province.** Data covers the period from April 30, 2018 to June 25, 2020 (See Figure 2).

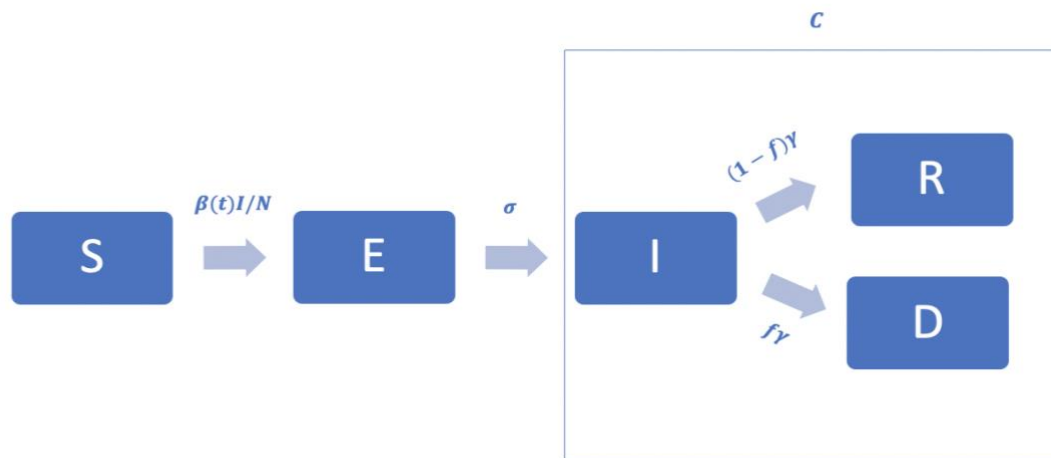


Figure 1. Flow diagram SEIRD. Schematic representation of the EVD transmission model. Susceptible individuals **S** become exposed by infectious individuals **I** at rate $\frac{\beta(t)I}{N}$. Exposed individuals move through an incubation period at rate σ before becoming infectious individuals **I**. Then, infectious individuals **I** recover at rate $(1-f)\gamma$ and die at rate $f\gamma$. The case fatality rate is given by **f** and **C** is the cumulative number of infectious individuals.

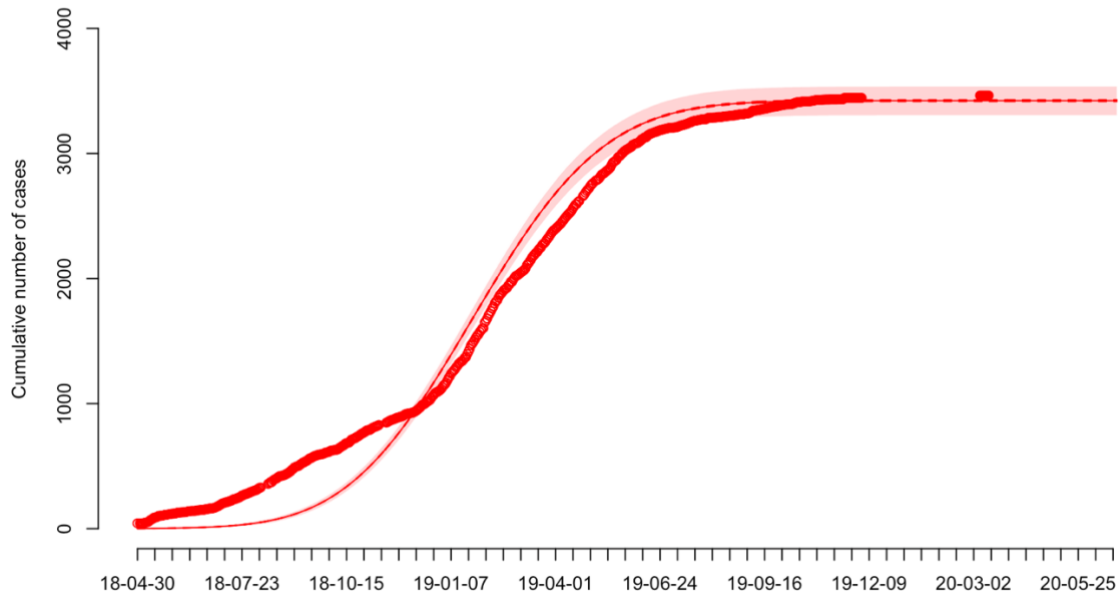


Figure 4. Cumulative number of cases. Red curbs represent cases. The solid line corresponds to the best-fit model, it is surrounded by the 95% confidence intervals in dashed lines while the shaded area illustrates the 95% prediction intervals.

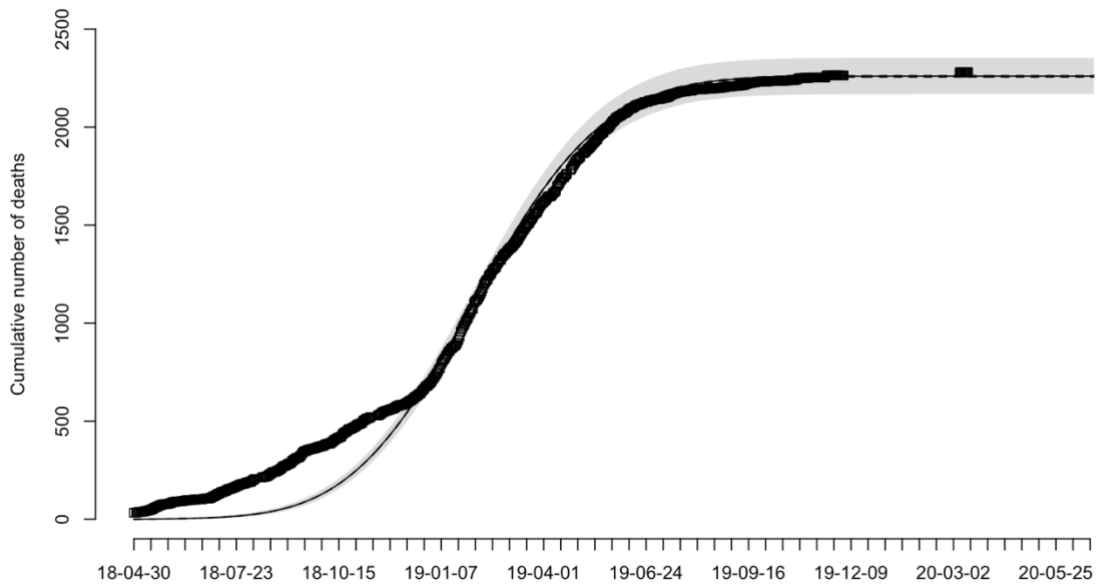


Figure 5. Cumulative number of deaths. Dark curbs represent deaths. The solid line corresponds to the best-fit model, it is surrounded by the 95% confidence intervals in dashed lines while the shaded area illustrates the 95% prediction intervals.

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Table 4:

1.83 (**variable** symptoms model)

1.90 (**constant** symptoms model)

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Calculate the point-wise quantiles to construct an approximate 95% CI and a 95% prediction interval (cases).

```
mod_sim <- mod_sim_C_Cum
```

```
obs_sim <- obs_sim_C_Cum
```

```
x_grid <- timepoints
```

```
mod_q <- apply(mod_sim, MAR = 1, FUN = quantile, probs = c(0.025, 0.975))
```

```
obs_q <- apply(obs_sim, MAR = 1, FUN = quantile, probs = c(0.025, 0.975))
```

```
simulation <- as.data.frame(ode(init,x_grid,SEIR,parms=trans(coef(fit))))
```

```
plot(x_grid, mod_q[2,], ylim = c(0,4000), ty="l", lty=2, lwd = 1, col = "red", xlab=NA, ylab="Cumulative number of cases",frame=FALSE,axes=FALSE)
```

```
axis(1, weeks - begin, weeks)
```

```
axis(2)
```

```
polygon(x = c(x_grid, rev(x_grid)), y = c(obs_q[1,], rev(obs_q[2,])), col = rgb(1, 0, 0, alpha=0.2), border = NA)
```

```
lines(x_grid, mod_q[1,], lty = 2, lwd = 1, col = "red")
```

```
lines(x_grid, simulation$C, lwd = 1, col = "red")
```

```
points(data$times[1:728],(data$cases)[1:728],col="red")
```

```
mod_sim <- mod_sim_D_Cum
```

```
obs_sim <- obs_sim_D_Cum
```

```
x_grid <- timepoints
```

```
mod_q <- apply(mod_sim, MAR = 1, FUN = quantile, probs = c(0.025, 0.975))
```

```
obs_q <- apply(obs_sim, MAR = 1, FUN = quantile, probs = c(0.025, 0.975))
```

```
plot(x_grid, mod_q[2,], ylim = c(0,2500), ty="l", lty=2, lwd = 1, xlab=NA, ylab="Cumulative number of deaths",frame=FALSE,axes=FALSE)
```

```
axis(1, weeks - begin, weeks)
```

```
axis(2)
```

```
polygon(x = c(x_grid, rev(x_grid)), y = c(obs_q[1,], rev(obs_q[2,])), col = grey(0.7, alpha=0.5), border = NA)
```

```
lines(x_grid, mod_q[1,], lty = 2, lwd = 1)
```

```
lines(x_grid, simulation$D, lwd = 1)
```

```
points(data$times[1:728],(data$deaths)[1:728],pch=0)
```