Branching stochastic processes as models of Covid-19 epidemic development

Zimbabwe - 20201214

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Abstract

The results presented here are obtained using the methologi proposed in the paper https://arxiv.-org/abs/2004.14838 for the country Zimbabwe. The data comes from European Centre for Disease Prevention and Control available at https://opendata.ecdc.europa.eu/covid19/casedistribution/csv.

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Chapter 1. Observed Infection data

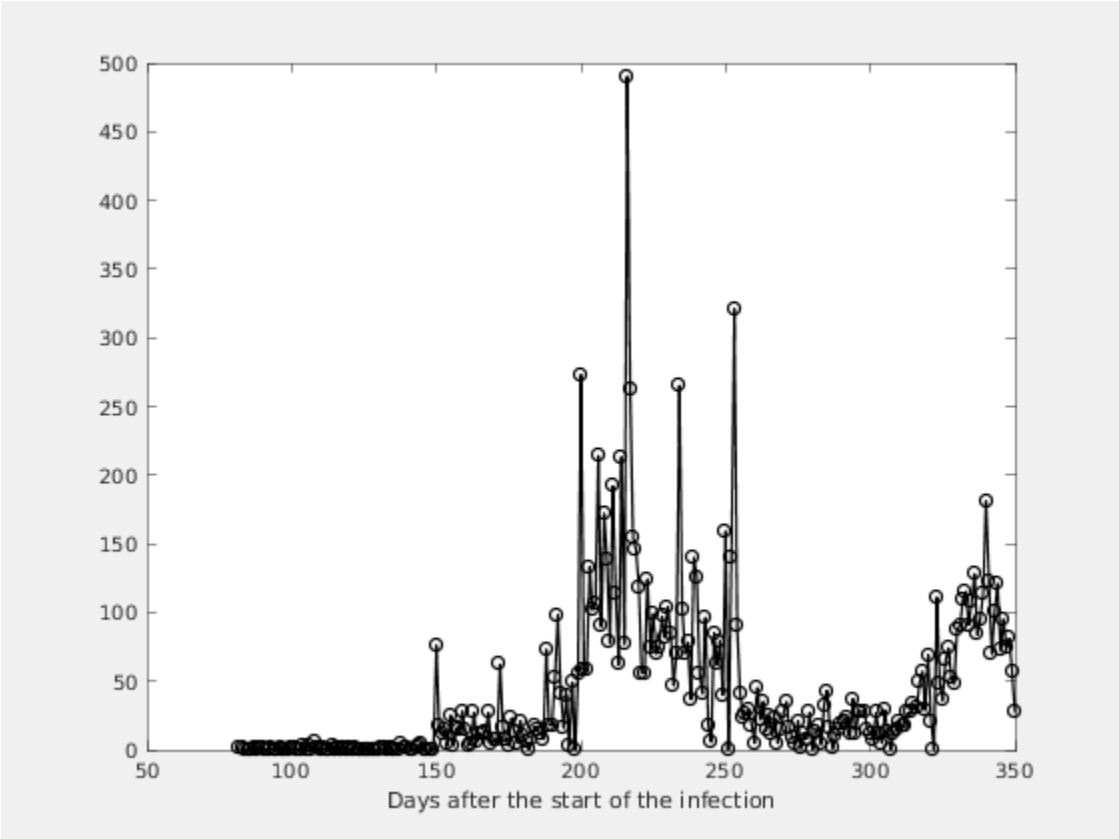**Figure 1.1. Number of the daily reported laboratory-confirmed cases**
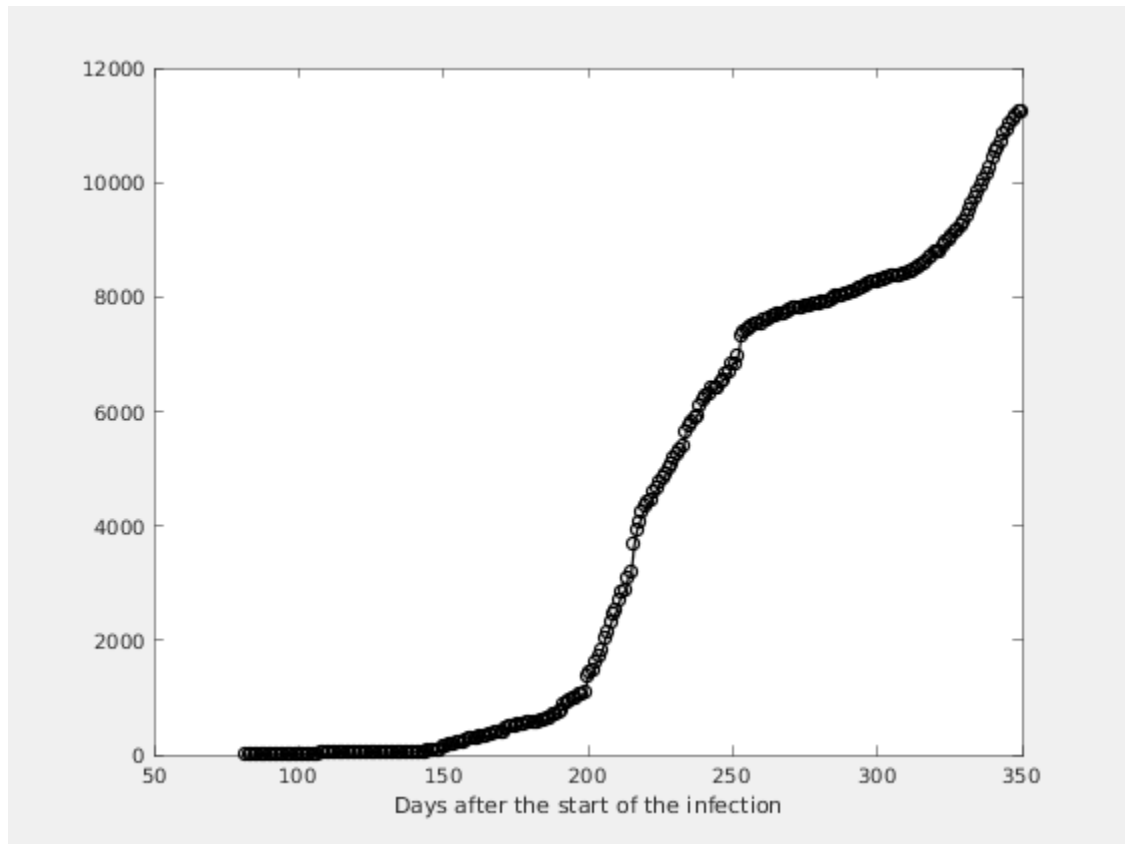
Figure 1.2. Number of the total registered cases

Chapter 2. Estimating of the main parameter and some predictions

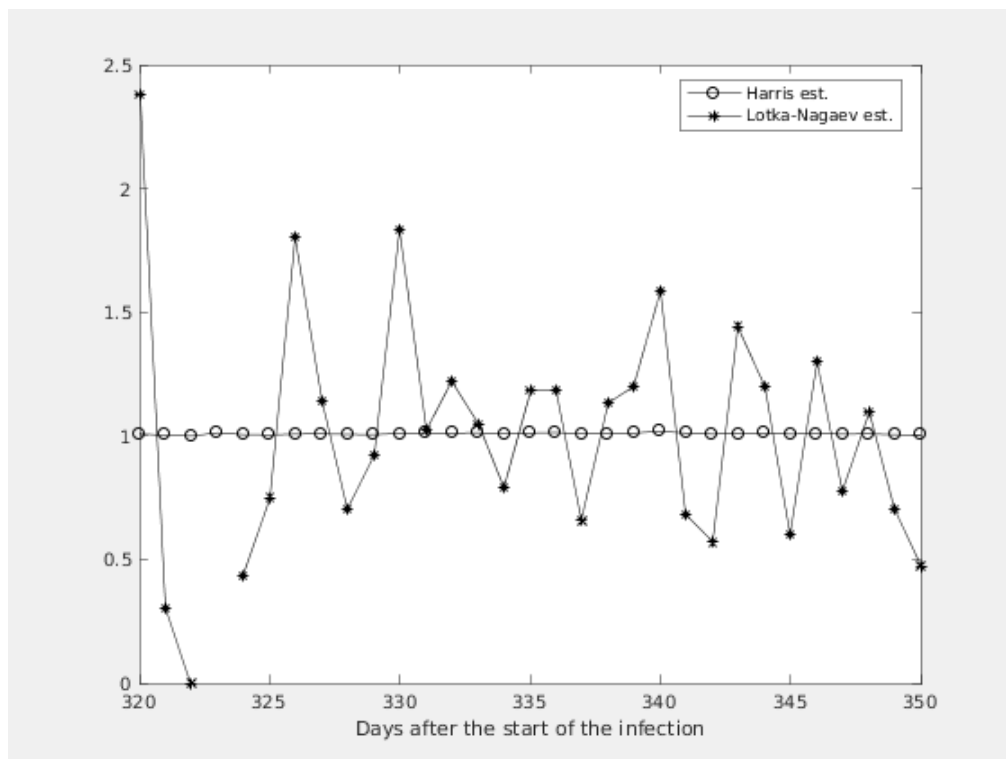**Figure 2.1. The Lotka-Nagaev and the Harris type estimator of the growth rate**
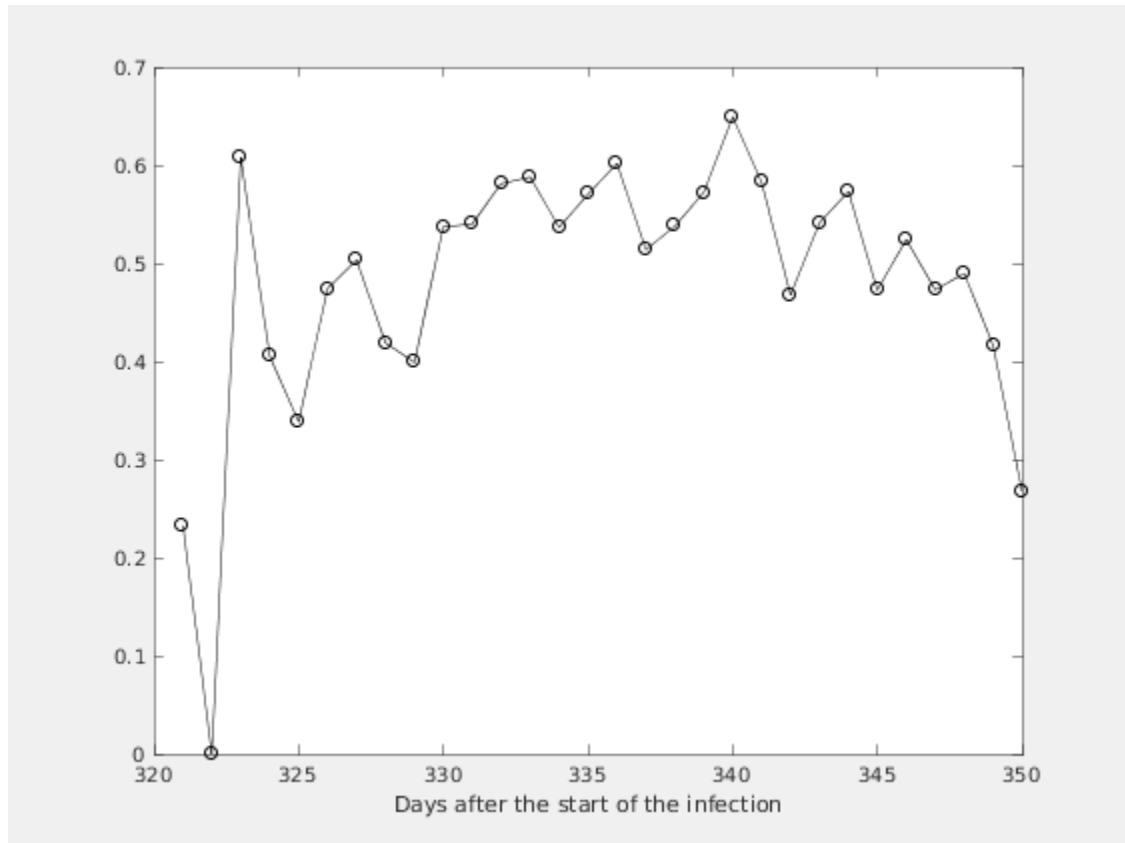
Figure 2.2. Figure

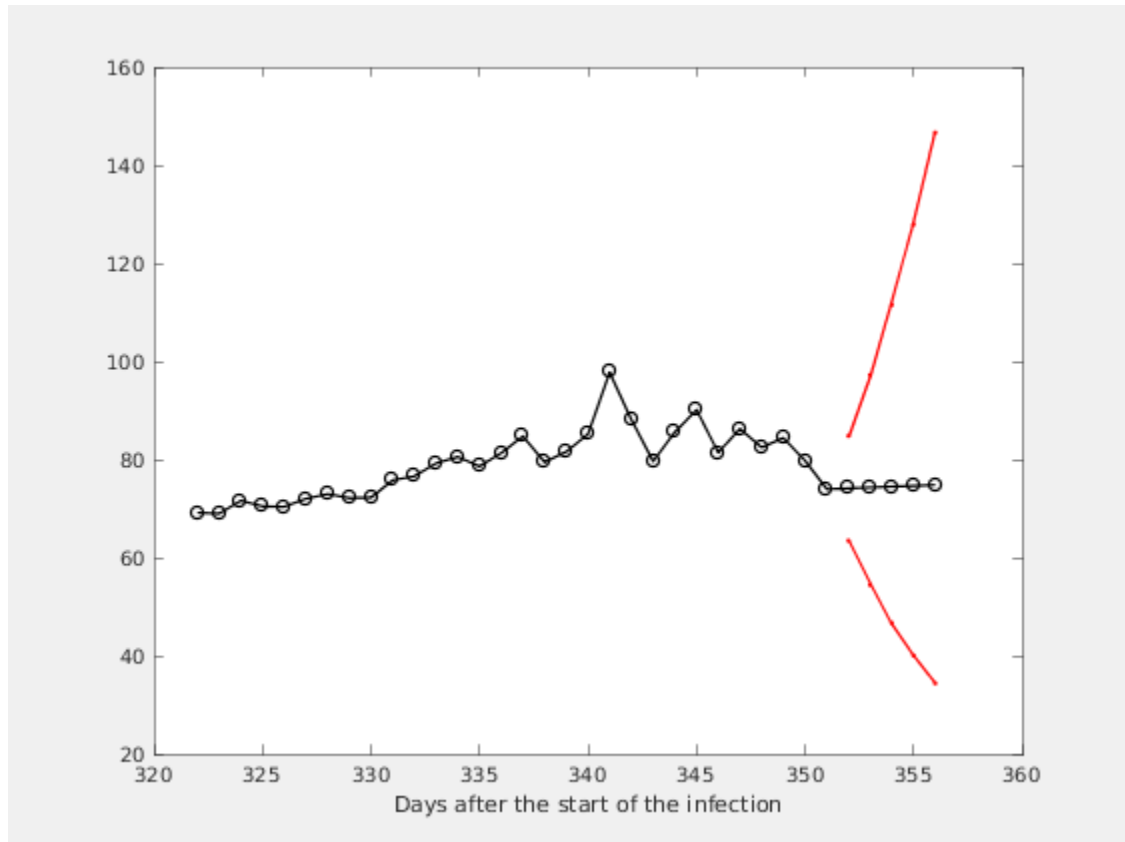**Figure 2.3. Expected number of the nonregistered infected individuals without immigration**
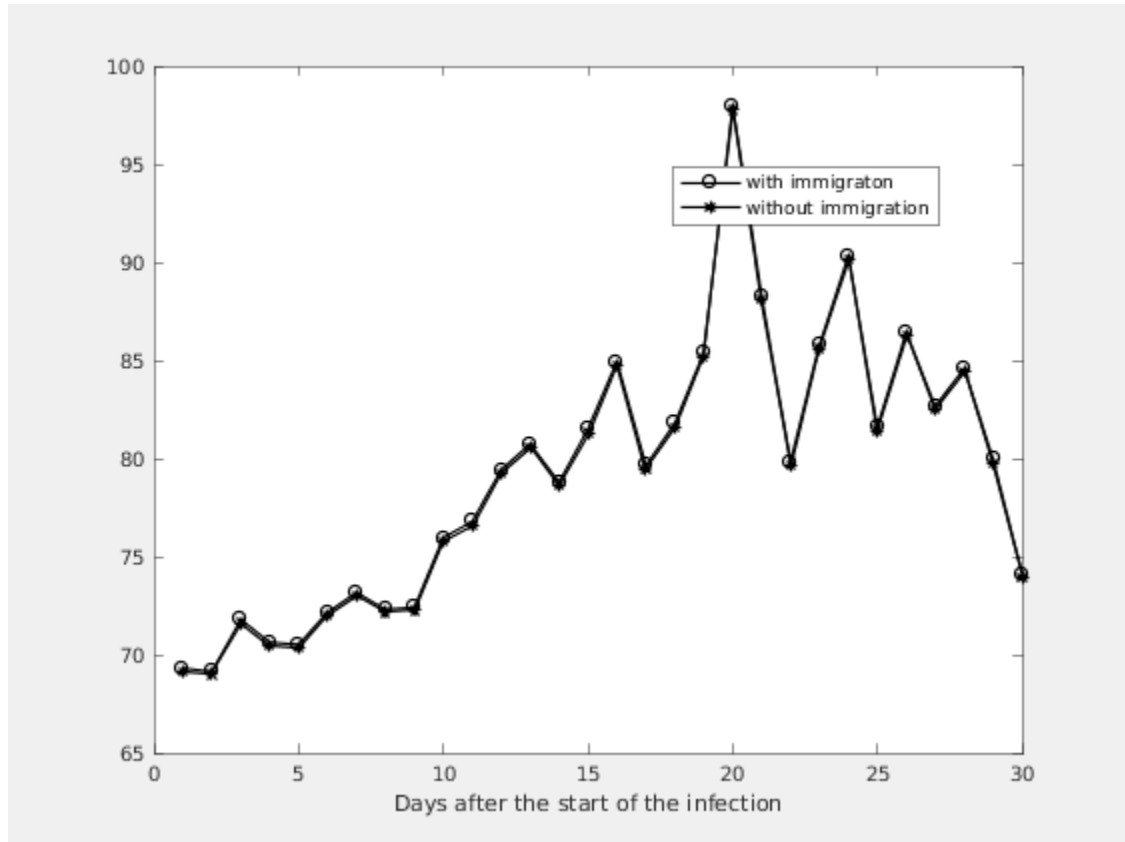
Figure 2.4. Expected number of the nonregistered infected individuals with immigration

Estimation of the model parameters.

```
k |    m    |          ci         | alpha  | M1  |  A1  |
-------------------------------------------------------
4  |  1.0086 | 0.8592 - 1.1581 | 0.5731 | 90 | 90  |
3  |  1.0066 | 0.8582 - 1.1550 | 0.4727 | 81 | 82  |
2  |  1.0072 | 0.8596 - 1.1548 | 0.5242 | 86 | 86  |
1  |  1.0050 | 0.8584 - 1.1517 | 0.4729 | 82 | 83  |
0  |  1.0023 | 0.8565 - 1.1481 | 0.4897 | 84 | 85  |
```