

# **Branching stochastic processes as models of Covid-19 epidemic development**

**Var218 - week 53**

**N. Yanev, V. Stoimenova, D. Atanasov**

---

## **Branching stochastic processes as models of Covid-19 epidemic development : Var218 - week 53**

### **Abstract**

The results presented here are obtained using the methodology proposed in the paper <https://arxiv.org/abs/2004.14838> for the country Var218. The data comes from European Centre for Disease Prevention and Control available at <https://opendata.ecdc.europa.eu/covid19/casedistribution/csv>.

---

## Table of Contents

1. Observed Infection data .....	1
2. Estimating of the main parameter and some predictions .....	3

---

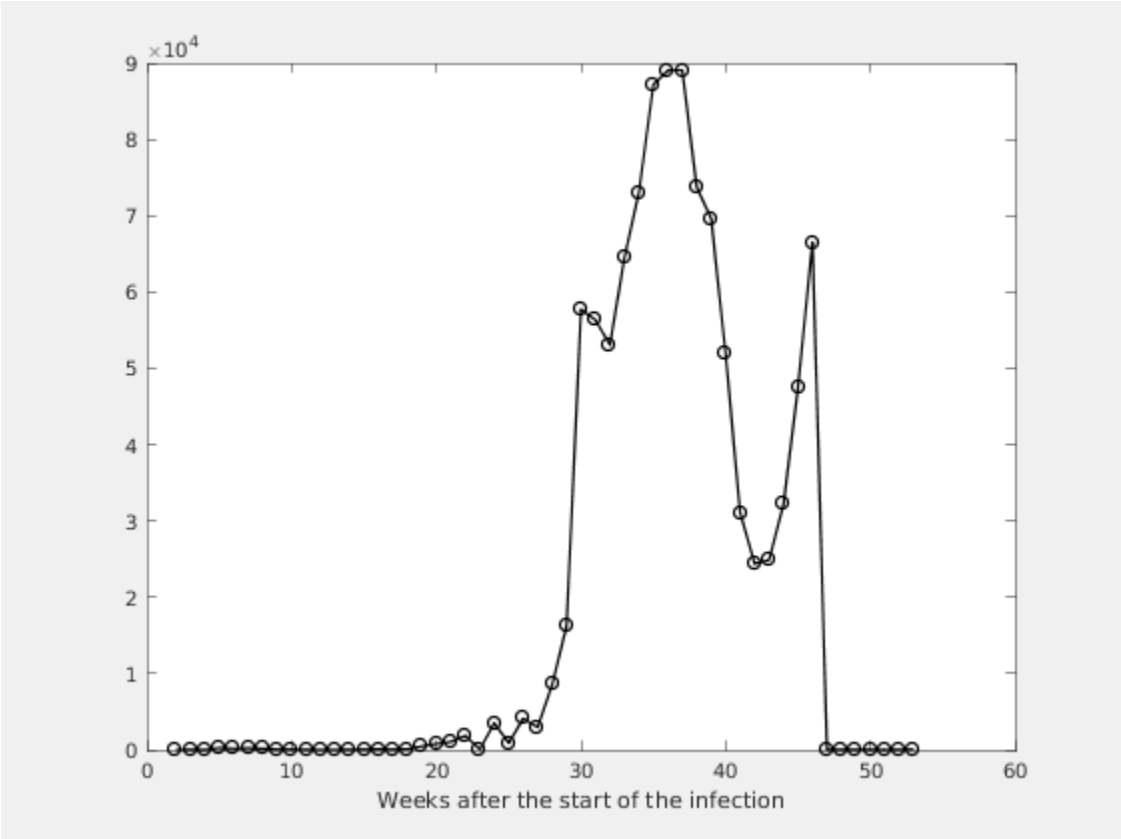
## List of Figures

1.1. Number of the weekly reported laboratory-confirmed cases .....	1
1.2. Number of the total registered cases .....	2
2.1. The Lotka-Nagaev and the Harris type estimator of the growth rate .....	3
2.2. Figure .....	4
2.3. Expected number of the nonregistered infected individuals without immigra- tion .....	5
2.4. Expected number of the nonregistered infected individuals with immigration .....	6

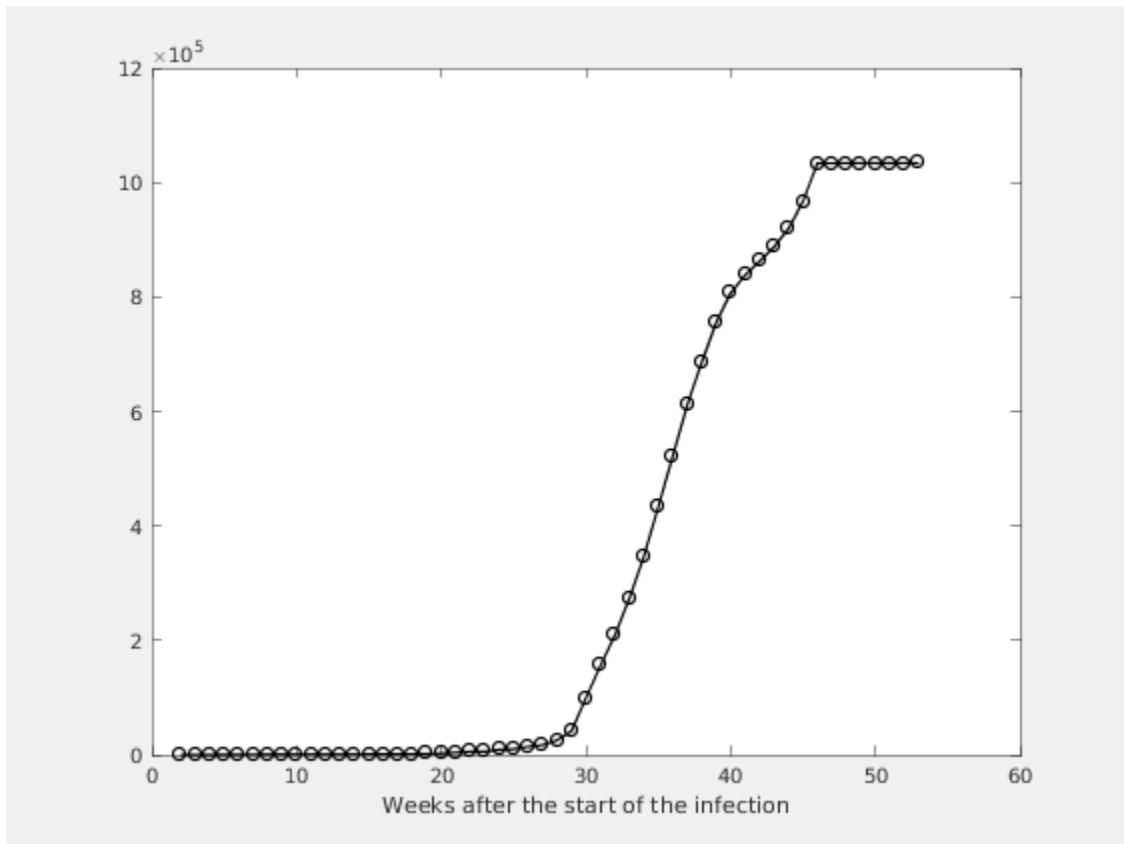
---

# Chapter 1. Observed Infection data

Figure 1.1. Number of the weekly 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

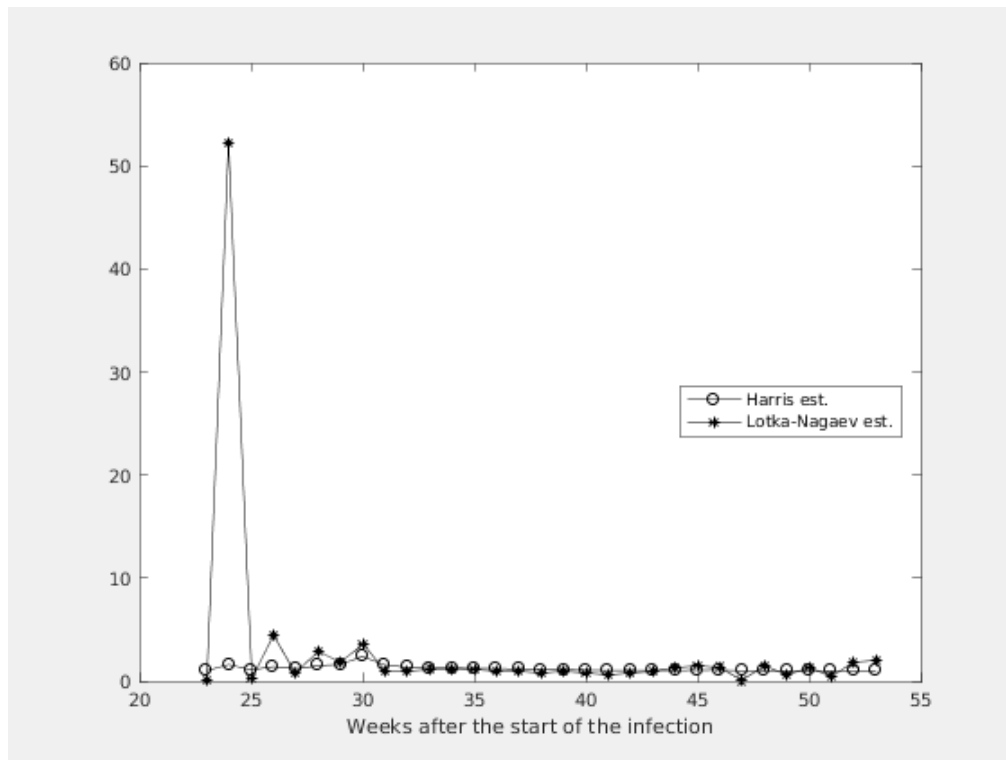
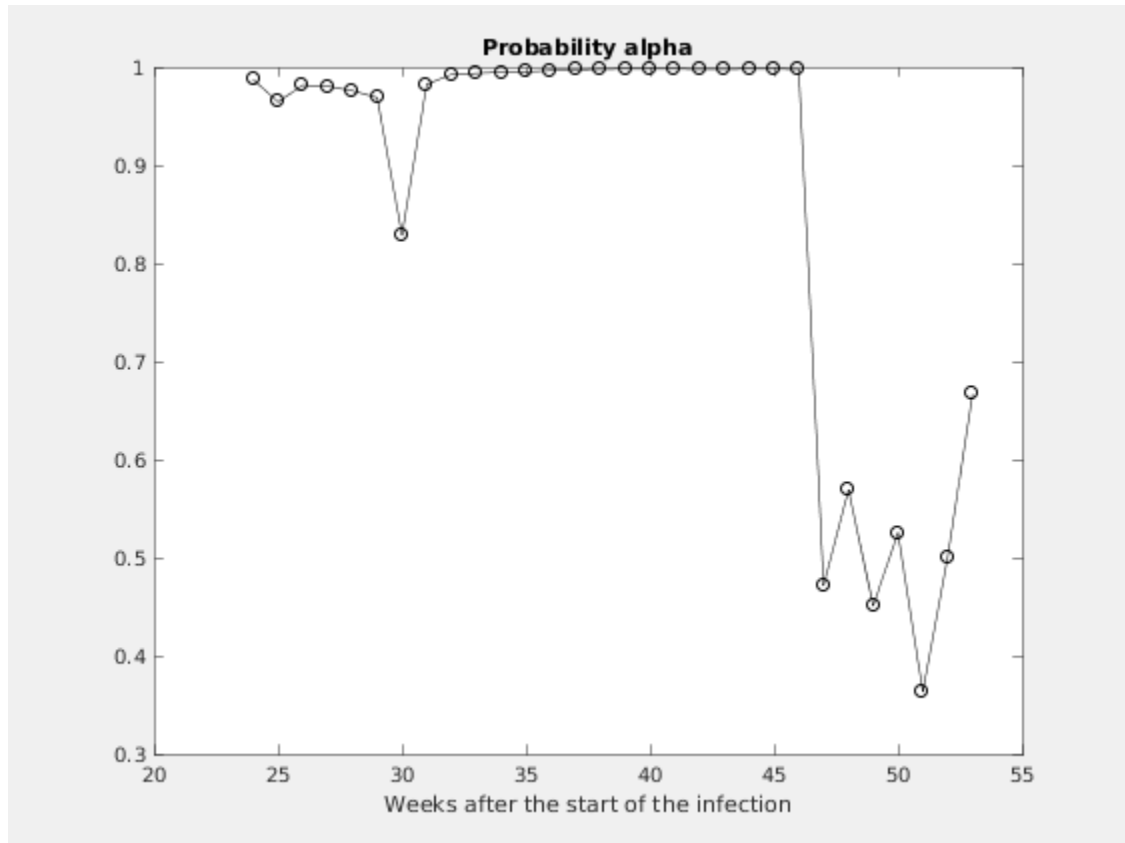
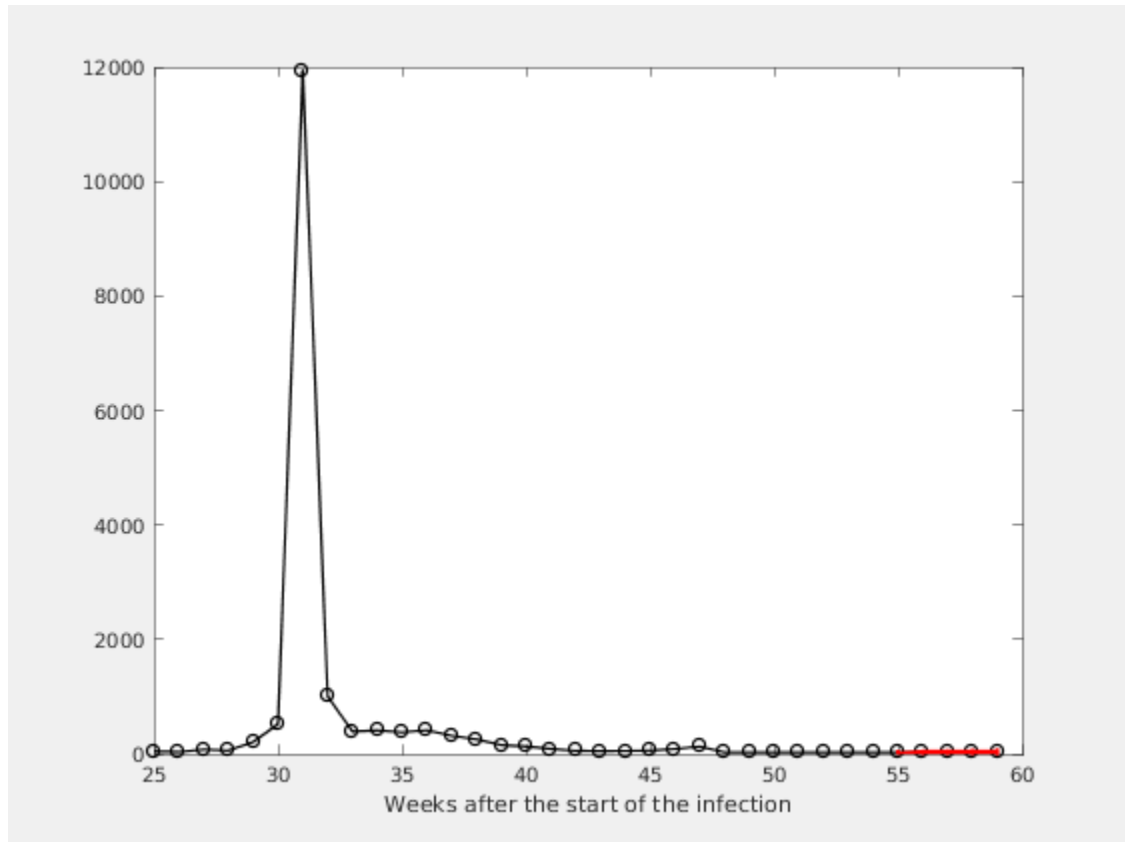


Figure 2.2. Figure

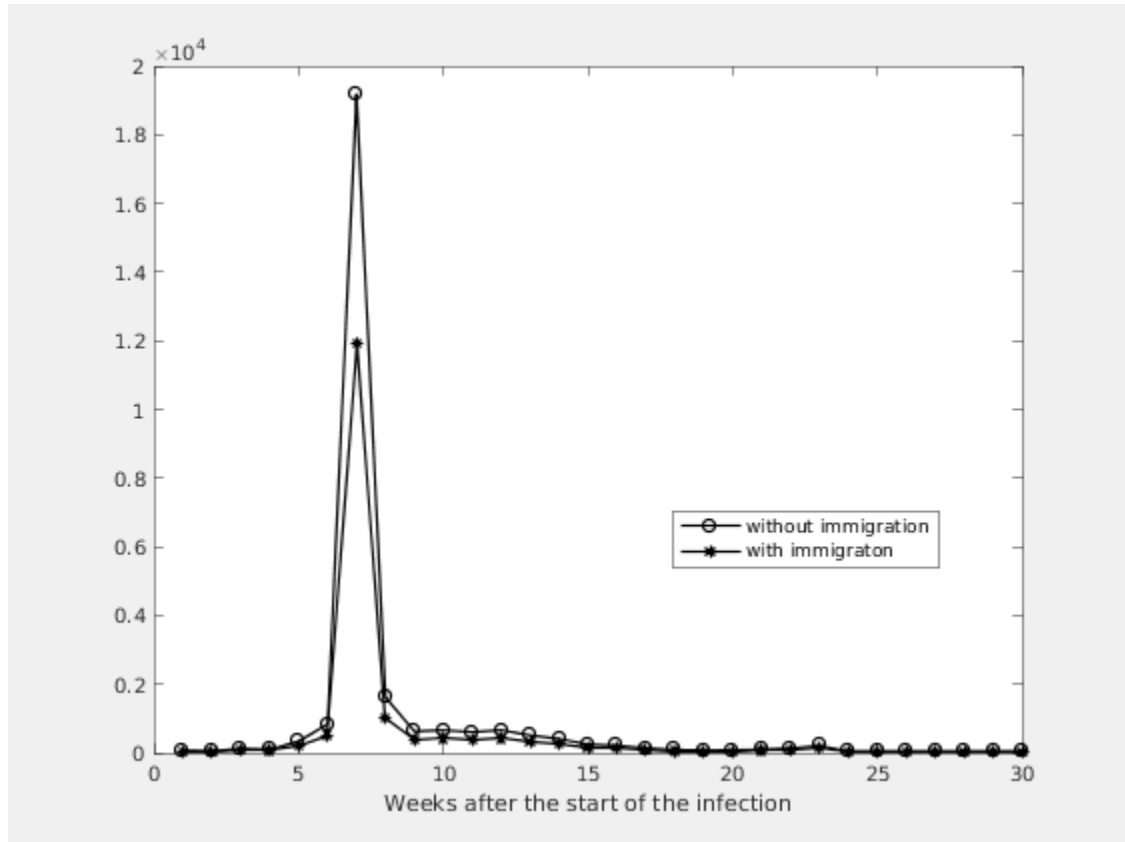




**Figure 2.3. Expected number of the nonregistered infected individuals without immigration**



**Figure 2.4. Expected number of the nonregistered infected individuals with immigration**



**Estimation of the model parameters.**

k	m	ci	alpha	A1	M1
4	1.0000	0.8113 - 1.1887	0.4717	28	45
3	1.0000	0.8134 - 1.1866	0.5691	28	45
2	1.0000	0.8154 - 1.1846	0.4509	28	45
1	1.0000	0.8173 - 1.1827	0.5253	28	45
0	1.0000	0.8192 - 1.1809	0.3636	28	45