

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

**Var161 - week 53**

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

---

## **Branching stochastic processes as models of Covid-19 epidemic development : Var161 - 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 Var161. 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

---

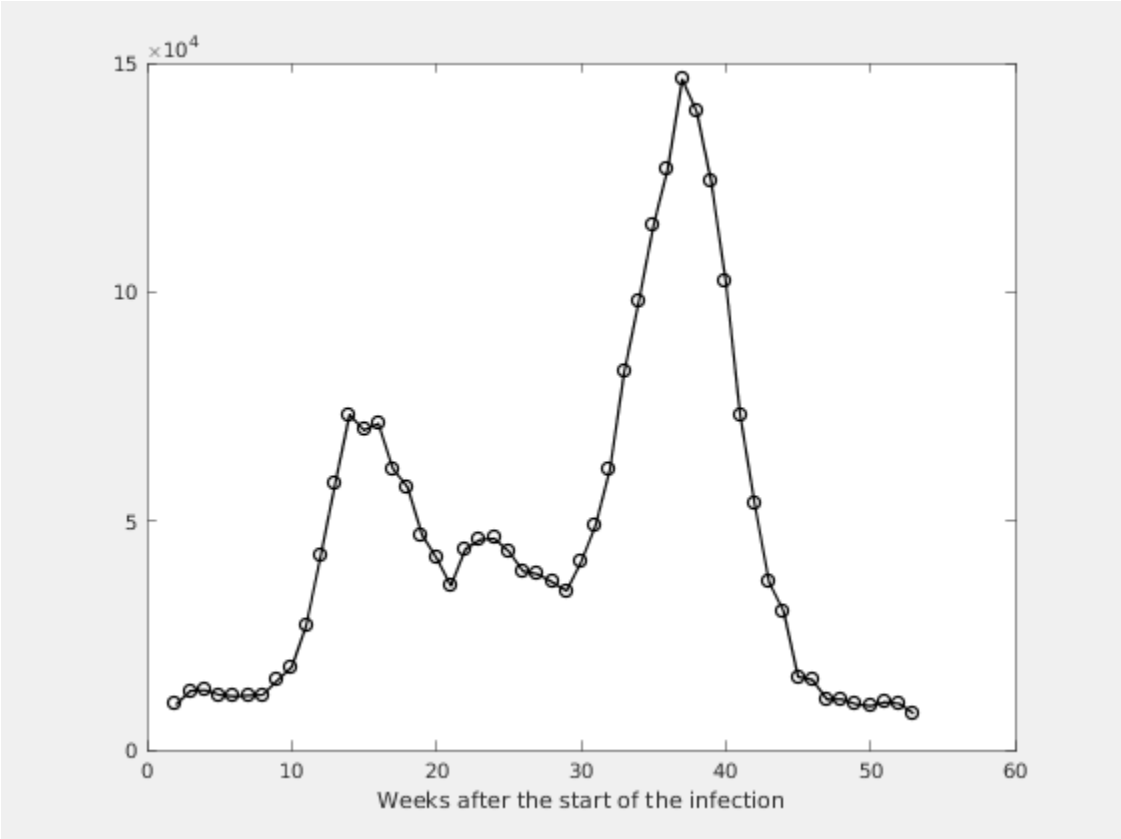
## List of Figures

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

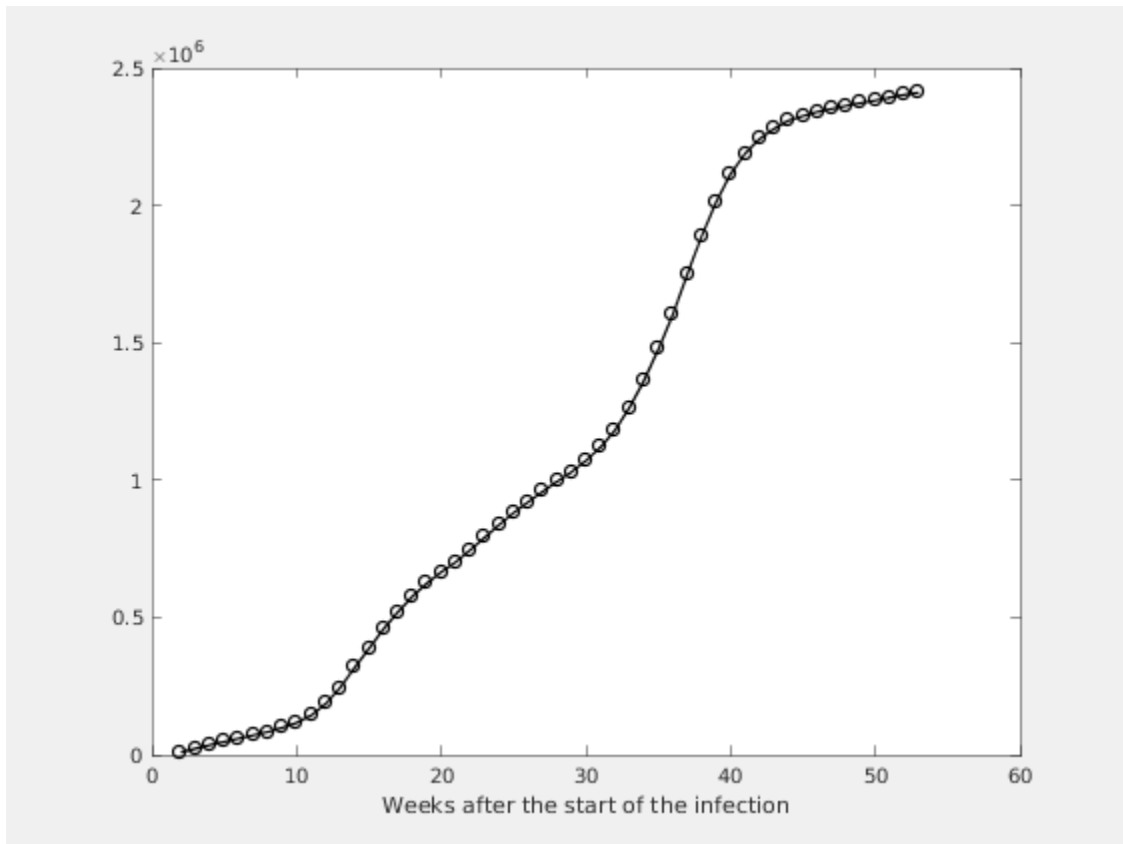
---

# 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

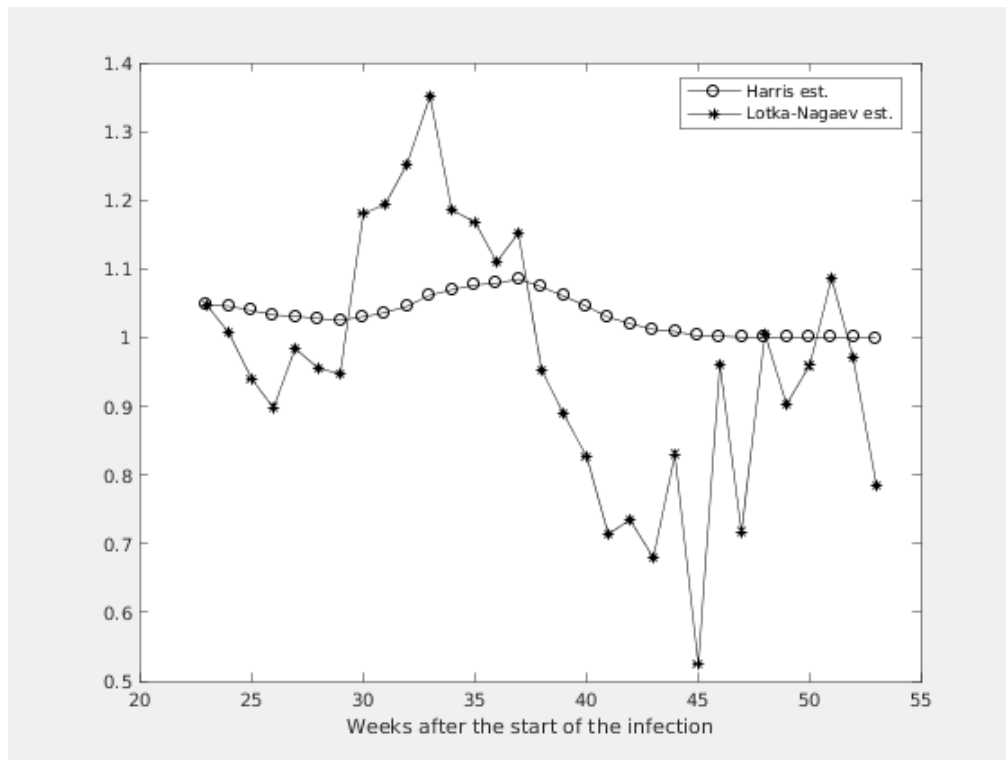
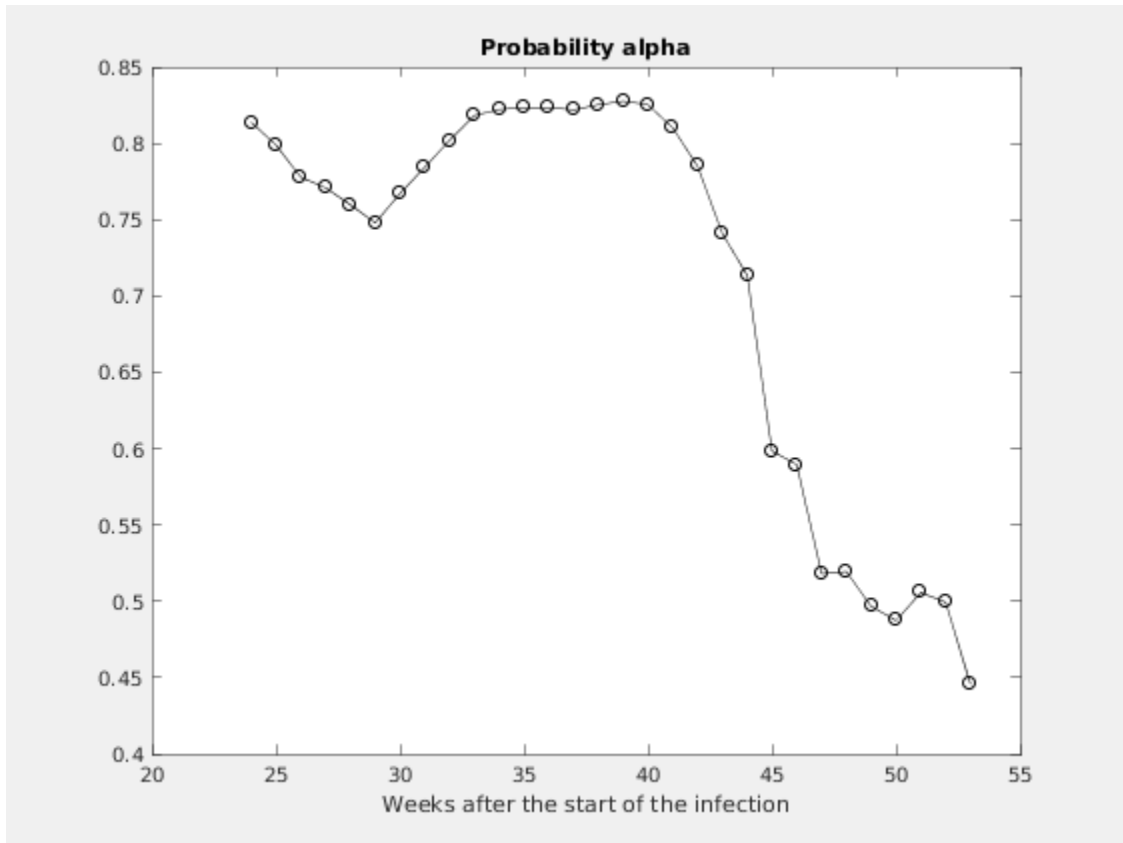
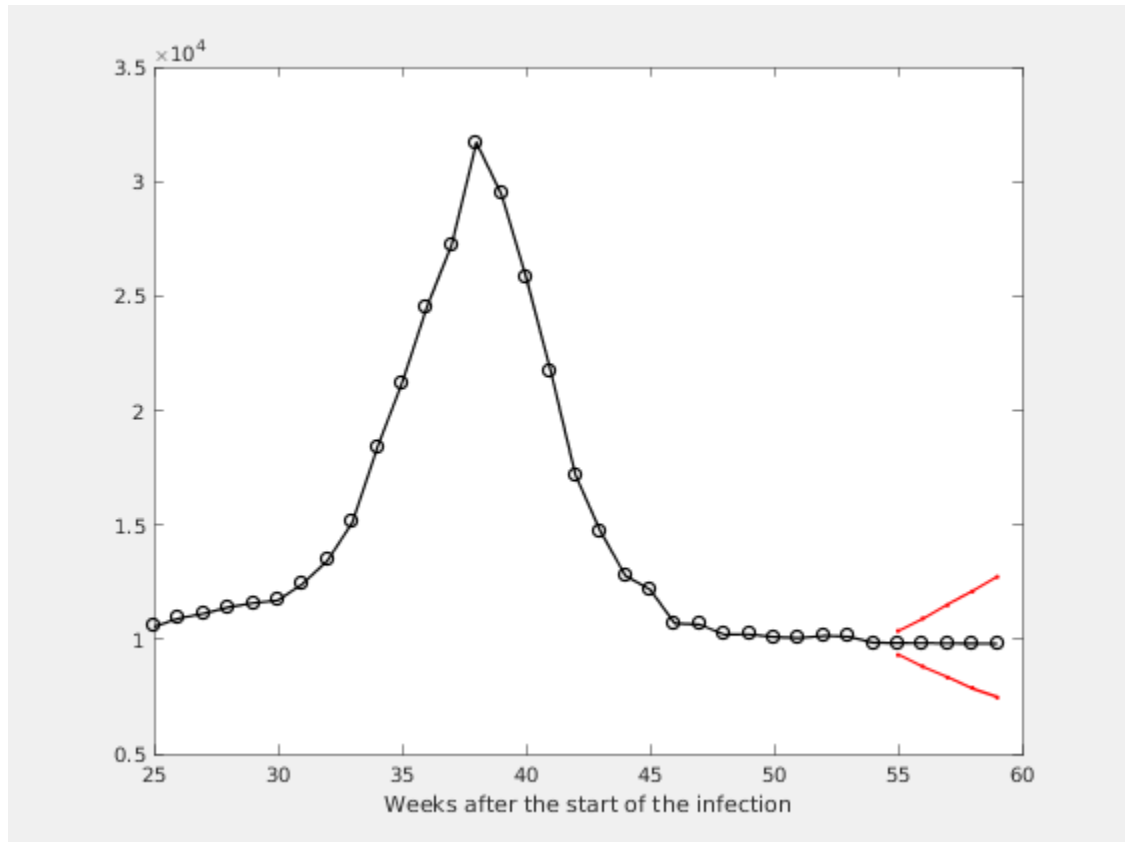


Figure 2.2. Figure

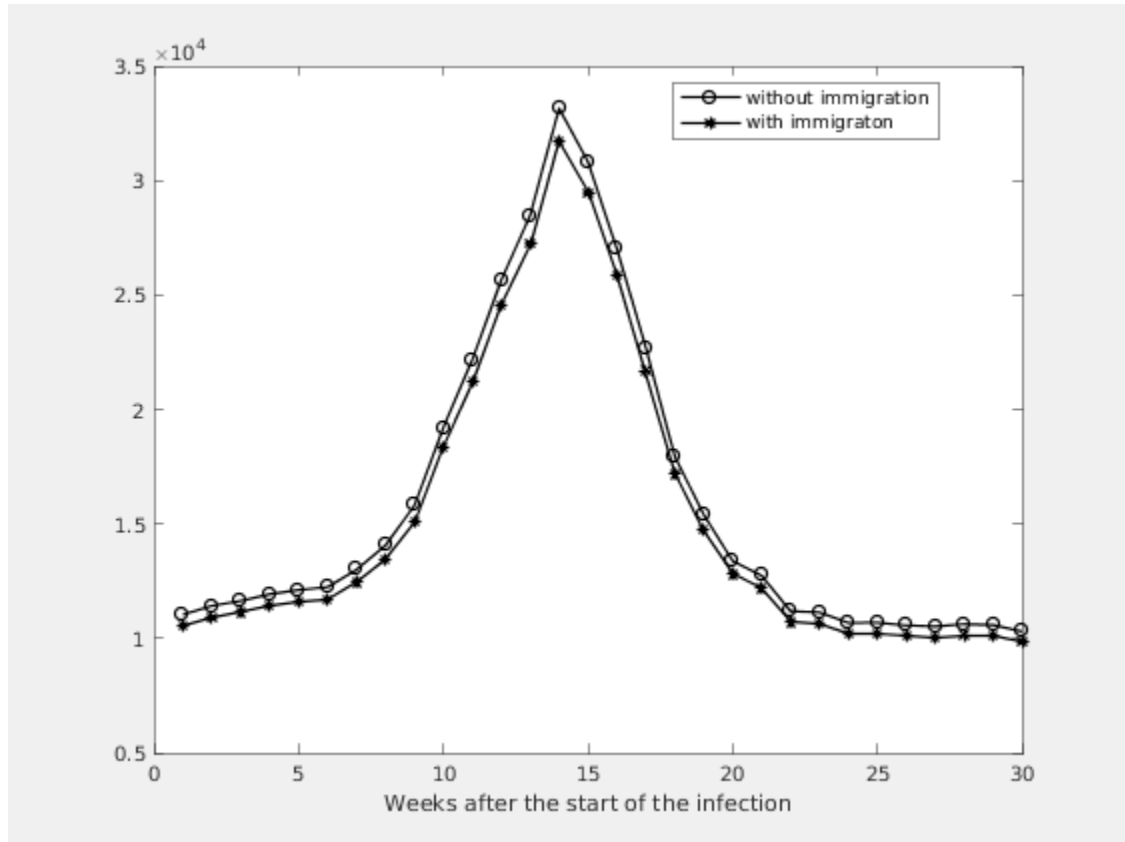




**Figure 2.3. Expected number of the nonregistered infected individuals without immigration**



**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	0.9427 - 1.0574	0.5181	10211	10679
3	0.9999	0.9433 - 1.0565	0.5194	10223	10691
2	1.0002	0.9443 - 1.0561	0.4966	10107	10570
1	1.0001	0.9449 - 1.0553	0.4874	10061	10522
0	0.9992	0.9446 - 1.0537	0.5056	10157	10623