

ABSTRAK

Aurelia Anisya Dina Pratiwi. 171414001. 2022. “Pemodelan Matematika Penyebaran Penyakit Virus Covid-19 Di Kabupaten Gunungkidul”. Skripsi. Jurusan Pendidikan Matematika Dan Ilmu Pengetahuan Alam. Fakultas Keguruan Dan Ilmu Pendidikan, Universitas Sanata Dharma Yogyakarta.

Lembaga kesehatan dunia atau *World Health Organization* (WHO) menetapkan secara resmi pandemi global pada tanggal 11 Maret 2020 atas kasus penyebaran virus Covid-19. Temuan kasus pertama di Indonesia terjadi pada tanggal 2 Maret 2020 dan setelah itu penambahan jumlah kasus semakin tinggi setiap harinya. Adapun di Kabupaten Gunungkidul juga mencatat kasus terkonfirmasi per 1 Maret 2020 sebanyak 19.956 kasus. Pemerintah daerah atau instruksi dari Pemerintah pusat sudah menerapkan berbagai kebijakan guna mencegah penyebaran virus Covid-19 semakin meluas atau. Salah satu kebijakan yang diterapkan adalah Pemberlakuan Pembatasan Kegiatan Masyarakat (PPKM).

Tujuan pemodelan matematika pada penelitian ini akan mensimulasikan model penyebaran virus Covid-19 saat penerapan PPKM level 3 dan setelah penerapan PPKM level 3 di Kabupaten Gunungkidul. Model yang digunakan adalah model epidemi SIR (*Susceptible-Infected-Recovered*). Asumsi yang digunakan adalah populasi tertutup sehingga tidak memperhatikan kelahiran dan kematian diluar terinfeksi virus Covid-19. Tahapan metode penelitian yang dilakukan yaitu melakukan studi literatur, membuat asumsi-asumsi, mengkonstruksikan model, mengestimasi parameter, selanjutnya mensimulasikan model dengan bantuan *Ms. Excel*, terakhir akan diperoleh sebuah kesimpulan.

Hasil penelitian yang didapatkan yaitu penerapan PPKM level 3 di Kabupaten Gunungkidul berhasil menekan laju penyebaran virus Covid-19 ditandai dengan melandainya kurva subpopulasi *I*. Hasil simulasi juga sesuai dengan data sesungguhnya yang menyatakan penurunan jumlah kasus terkonfirmasi.

Kata kunci: Pemodelan Matematika, Model Epidemi SIR, Covid-19, PPKM

ABSTRACT

Aurelia Anisya Dina Pratiwi. 171414001. 2022. "Mathematical Modeling of the Spread of Covid-19 Virus Disease in Gunungkidul Regency". Undergraduate thesis. Department of Mathematics and Natural Sciences Education. Faculty of Teacher Training and Education, Sanata Dharma University Yogyakarta.

The World Health Organization (WHO) officially declared a global pandemic on March 11, 2020 for cases of the spread of the Covid-19 virus. The first case finding in Indonesia occurred on March 2, 2020 and after that the number of cases was increasing every day. Meanwhile, Gunungkidul Regency also recorded 19,956 confirmed cases as of March 1, 2020. Regional governments or instructions from the central government have implemented various policies to prevent the spread of the Covid-19 virus from getting wider. One of the policies implemented is the "Pemberlakuan Pembatasan Kegiatan Masyarakat" (PPKM).

The purpose of mathematical modeling in this study will be to simulate the spread of the Covid-19 virus during the implementation of PPKM level 3 and after the implementation of PPKM level 3 in Gunungkidul Regency. The model used is the SIR (Susceptible-Infected-Recovered) epidemic model. The assumption used is that the population is closed so that it does not pay attention to births and deaths outside of being infected with the Covid-19 virus. The stages of the research method carried out are conducting literature studies, making assumptions, constructing models, estimating parameters, then simulating the model with the help of Ms. Excel, finally a conclusion will be obtained.

The results obtained are that the implementation of PPKM level 3 in Gunungkidul Regency has succeeded in suppressing the rate of spread of the Covid-19 virus, which is indicated by the sloping of the subpopulation curve I. The simulation results are also in accordance with the actual data which states a decrease in the number of confirmed cases.

Keywords: Mathematical Modeling, SIR Epidemic Model, Covid-19, PPKM