

**Gunnison County “One Valley COVID-19” Response  
EOC – Investigative Science Section – Situation Unit**

**SARS-CoV-2 and COVID-19  
in Gunnison County**

**Facts for the Past and Present – Predictions of the Future  
Navigating Uncharted Territory – A Scientific Approach**

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## **Acknowledgements**

The author likes to thank everyone who supported and continues to support this project for their outstanding help. A big “Thank you” goes to everyone involved in the tedious task of gathering and continuously updating necessary data. Without your dedication and help this project and research would not have been possible!

## **Preface**

This report generated by the Situation Unit is a living document and provides the most up-to-date information available at its respective release date.

It will be periodically updated when new situations regarding SARS-CoV-2 and COVID-19, with respect to Gunnison County, emerge, new data and predictions become available or new questions and concerns are being raised.

In order to make the maintenance of this document easier and to improve access to the most up-to-date information for all readers, the document is structured in a LOG format. New information is always added to the front of the document, while older entries provide a trace in time.

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# 1 Update: April 20, 2020

Today is day 57 relative to day 0 on February 23, 2020.

## 1.1 Situation in Gunnison County

The following information is based on swab test data results. Albeit limited, they provide the most up-to-date information of the disease status in the population. The current delay between the date the sample was taken and the results are available will further diminish in the future, when more point-of-care and rapid testing methods become available.

### 1.1.1 Cases over time

This data was presented before in two reports and presentations.

Due to the fact that models indicated that different areas in Gunnison County behave differently, the new graphs also show information for Gunnison and Crested Butte, including Mount Crested Butte.

So-called 'indetermined' test results were also included in the confirmed positive data sets, because they represent no clear negatives.

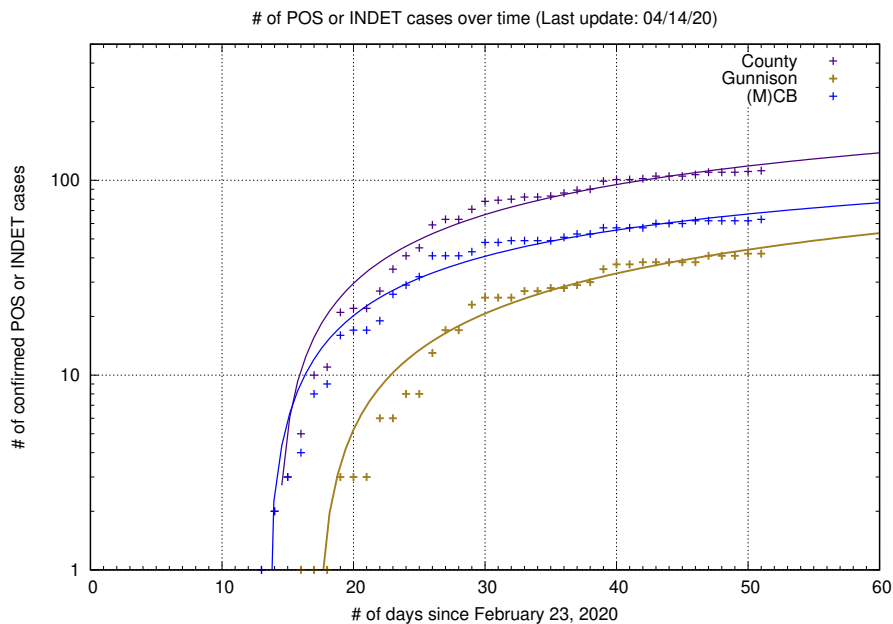


Figure 1.1: Total number of confirmed positive and indetermined swab test results over time and least-error-square fitted curve (Source: Own research)

Figure 1.1 shows the total number of confirmed positive and indetermined swab test results over time and the associated least-error-square fitted curve for Gunnison County, Gunnison and Crested Butte.

As evidenced by this graph, the increase in new infections has greatly diminished over time. Also the data shows that the development in Gunnison is delayed by approximately 3 to 4 days when compared to Crested Butte, meaning that the disease most likely spread from the north through the valley.

The overall developments in Gunnison and Crested Butte are similar, given the margin of error inherent to the data and model.

### 1.1.2 Case doubling times

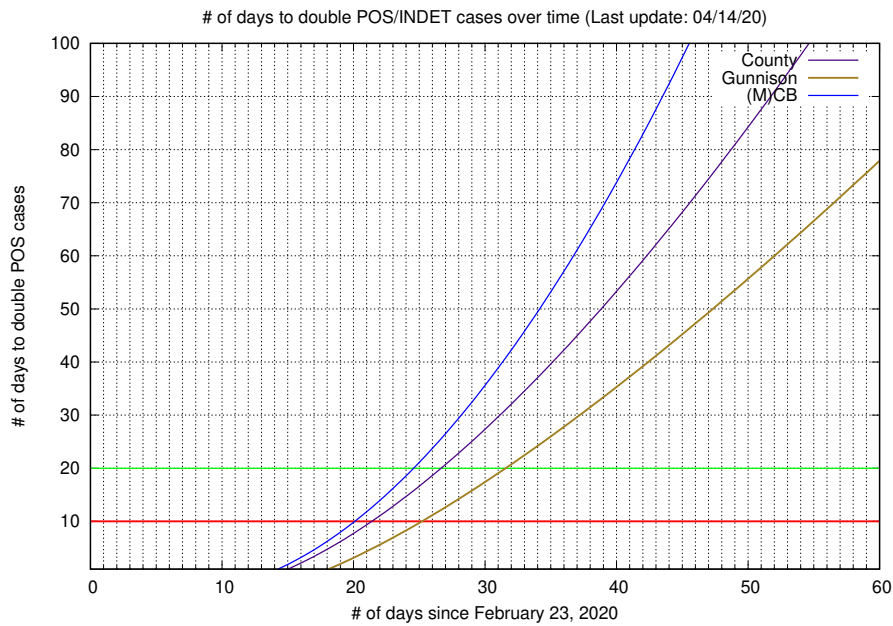


Figure 1.2: Number of days until current number of positive and indetermined swab test results is expected to double and least-error-square fitted curve (Source: Own research)

Figure 1.2 shows the number of days until current number of positive and indetermined swab test results is expected to double and the associated least-error-square fitted curves.

The first threshold relevant for the current pandemic, marking a larger than 10 day time range for case doubling and being an indication that the spread of the disease is no longer exponential, was reached on day 20 since February 23, 2020 for Crested Butte, on day 25 for Gunnison and between day 21 and 22 for Gunnison County.

The second threshold of a larger than 20 day time range for case doubling, meaning that the spread of the disease is largely contained, was reached between day 24 and 25 for Crested Butte, between day 31 and 32 for Gunnison and between day 26 and 27 for Gunnison County.

### 1.1.3 Spread rate

Assuming an infectious time frame of 14 days, it is now possible to calculate the spread rate per day and infectious person over time – see figure 1.3.

A spread rate of 1.3 per day and infectious person means, that in 14 days this person will cause another approximately 40 infections. A value of 1.15 means that one infectious person causes approximately 7 new infections over a period of 14 days.

A steady state is reached when the number of infections per day is 1.05 – red line in figure 1.3 – then every infected person only creates 1 new infected person over its entire infectious time range of 14 days.

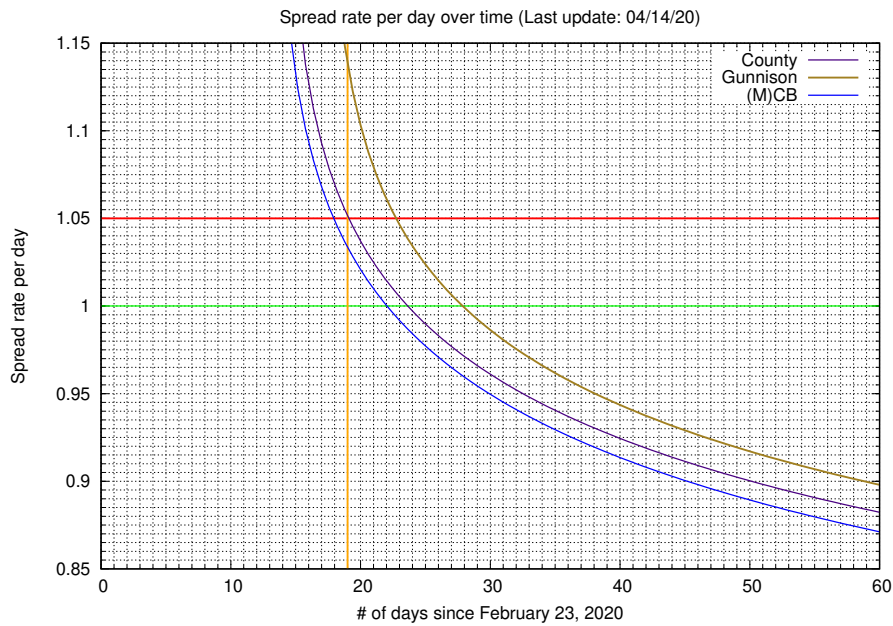


Figure 1.3: Spread rate per day and infectious person over time (Source: Own research)

For any value smaller than 1.05 the total number of active cases diminishes over time. A relatively safe value in this context is a spread rate of 1.0 per day – green line in figure 1.3.

The yellow vertical line in figure 1.3 marks the day of the 1<sup>st</sup> Public Health Order.

Current spread rates per day and infectious person are in the range of 0.875 for Crested Butte, 0.905 for Gunnison and 0.89 for Gunnison County.

## 1.2 Outlook

With the current mitigation/suppression measures the situation is stable.

No surge is expected in the upcoming weeks, as long as status quo is maintained.

These models allow to predict the effects of lifting any mitigation/suppression measures before they are put in place, allowing for a science- and data-based informed decision making. This way the available “wobble room” can be efficiently used without risking the stability of the system and the results achieved.

## 2 Update: April 18, 2020

Today is day 55 relative to day 0 on February 23, 2020.

The main epidemiological database for this event is set-up and in a testing phase. Automatic data input is still in the works.