

Commentary

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# Covid 19 Pandemic Notes from Tri-counties: Palm Beach, Broward and Miami Dade of Florida

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## Commentary

While Florida deals with hurricane season this time around, we are dealing with the RNA genome, protein enveloped, monster SARS-CoV-2.

SARS-CoV-2 is a beta corona virus that contains positive strand RNA genome. It has various structural proteins and nonstructural nuclear proteins (NSP) (Figures 1&2) [1]. The virus binds to ACE2 receptors that are located on lung cell membrane and enters the cells for example of lung alveolus by endocytosis. In lung cells the virus un coats itself, undergoes translation to generate RNA dependent RNA polymerase (RdRp) and the viral genome gets multiplied by RdRp to produce several copies of RNA genome. The NSP's are involved in RNA 5' cap formation. For example, NSP16 along with NSP 10 forms Cap-1 structure from Cap-0. Cap1 of the viral RNA confers stability as well as evasion from host immune response by stopping the interferon (IFN) production by innate immune system [2]. Each RNA genome is packaged into viral particles through a complicated process that involves ER and Golgi bodies [2]. Finally, each viral particle exits by exocytosis (Figure 2) [1] and could enter another body through air borne close

contacts, touch etc. The Covid-19 situation in Palm Beach, Broward and Miami-Dade Counties accounts ~50% of total cases from the state of Florida, USA [3]. The monster that originated across the continent from Asia has spread all way to Florida, USA, a spanning distance that is way too higher than the seasonal forceful wind the hurricane. Here are some data on Covid-19 of South Florida. On May 26, 2020, the state of Florida reported an estimate of 51,746 positive cases, out of which more than 50% of the cases were found in the most populated tri counties [3]. Table 1 describes the details of this CoVid-19 situation. Data from the month of May-July shows an increase in both numbers of positive cases and deaths (Table 1) [3,4]. However, in July the number cases increased tremendously (Figure 3) but then the infection fatality rate in July was significantly lot less (Table 1). A slight decrease in the infection fatality rate in Broward and Palm Beach could perhaps be attributed to multiple reasons. The median ages of the population was Miami-Dade 48, Broward 47, and Palm Beach was 45 [4]. Table 2 describes the number of hospitals and average number of patients/hospitals in the three counties of study [4].

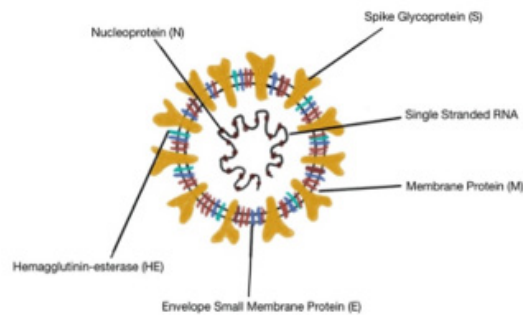
**Table 1:** Infection Fatality Rates in the Tri-County Areas: Miami Dade, Broward, and Palm Beach.

Date	County	Cases	Deaths	Infection Fatality Rate
26-May-20	Miami Dade	17041	633	3.71
	Broward	6760	298	4.41
	Palm Beach	5355	315	5.88

10-Jun-20	Miami Dade	20277	784	3.87
	Broward	8193	349	4.26
	Palm Beach	7678	397	5.17
15-Jul-20	Miami Dade	72317	1202	1.66
	Broward	34153	464	1.36
	Palm Beach	22788	634	2.78
30-Jul-20	Miami Dade	115017	1515	1.32
	Broward	53818	676	1.25
	Palm Beach	32398	806	2.49

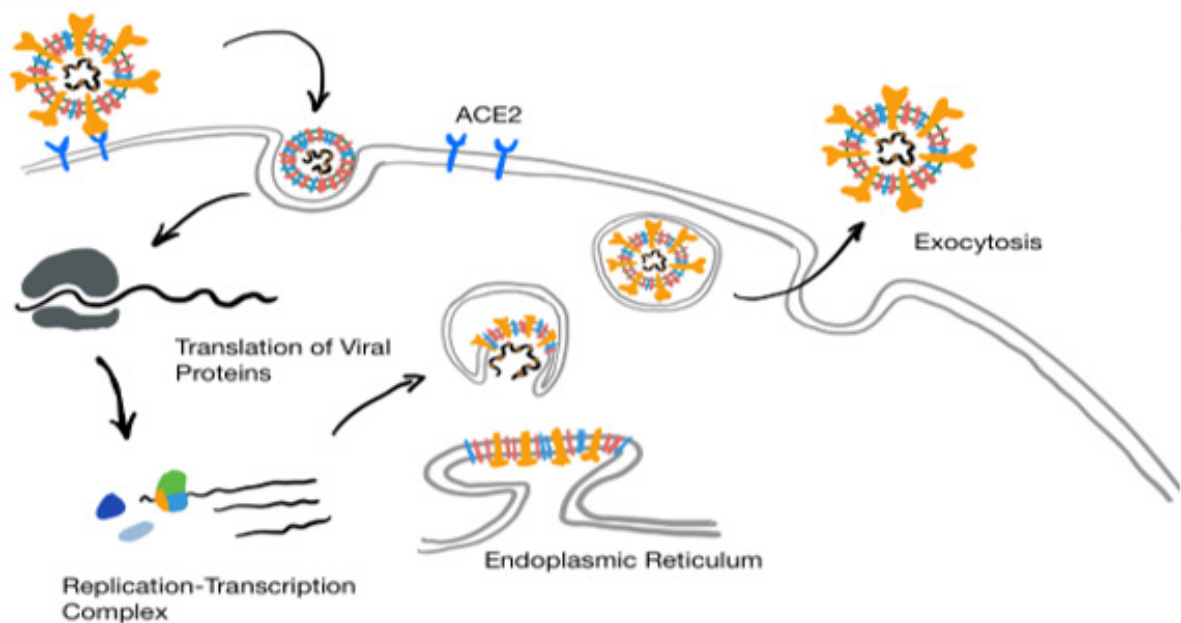
**Table 2:** Describes the number of hospitals and average number of patients/hospitals in the three counties of study.

Number of Hospitals	Number of people per hospital
Miami Dade: 46	59,064
Broward: 36	54,244
Palm Beach: 23	65,077

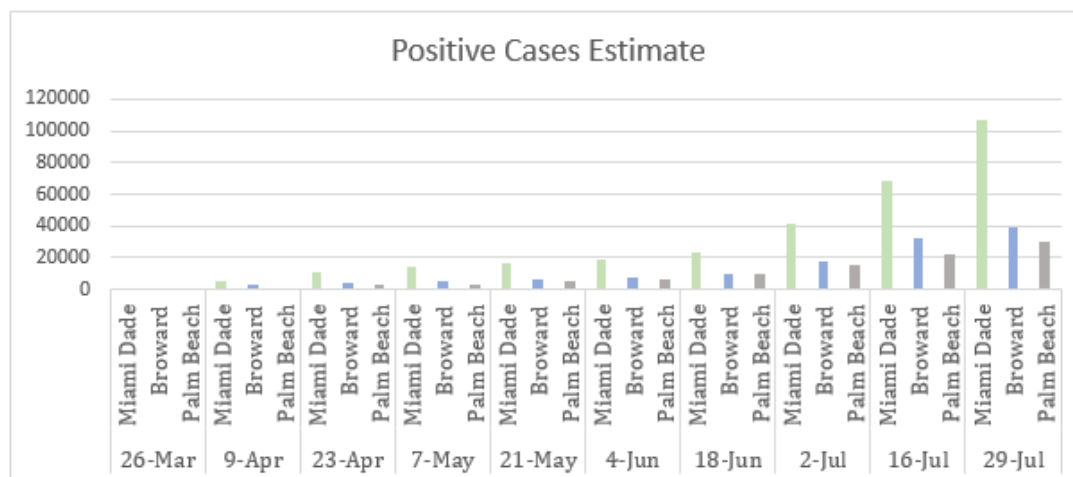


**Figure 1:** Structural proteins and nonstructural nuclear proteins.

### SARS-COV-2



**Figure 2:** Viral particle exits by exocytosis.



**Figure 3:** Growing Number of Positive Cases in the Tri-County Areas: Miami Dade, Broward, and Palm Beach.

In New York since May, the spread and the infection fatality did not increase very much [5]. It is possible the pandemic strain that entered USA is less severe compared to the endemic strain of Wuhan, China. Interestingly, transcriptomic profiling study of SARS-CoV-2 strains associated with the New York City outbreak found high occurrence of a mutation (20755: A>C) which changes serine 33 to an arginine in gate loop 1 of SARSCoV-2 nsp16 [6,7]. Viral mutation rates roughly range between 10<sup>-8</sup> and 10<sup>-4</sup> substitutions per nucleotide per cell infection (with DNA viruses occupying the 10<sup>-8</sup>–10<sup>-6</sup> range and RNA viruses the 10<sup>-6</sup>–10<sup>-4</sup> range. Mutation of nsp16 makes the virus RNA genome less stable [1].

## Conclusion

The number of infection fatality rate did not increase steeply in all three counties. We speculate that it could be due to the morphing of the original SarsCoV2 into a less severe/mutated strain before it infected the new host. In addition, it is possible that the population in South Florida is more immune compared to china or worldwide populations. It is also possible that the hospital health care system and the general hygiene is far too better compared to other countries.

## Acknowledgement

None.

## Conflicts of Interest

No Conflicts of Interest.

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