Will COVID-19 win the Super Bowl in 2021?

Super Bowl Sunday is fast approaching, and while many families and groups of friends have traditions to watch the big game together, the Centers for Disease Control and Prevention suggests that you may not want to do that this year because of the coronavirus pandemic. It is safer to host a virtual Super Bowl watch party and rather have an outdoor viewing party on a projector screen, strictly following COVID-19 guidelines.

We show three scenarios forecasting the possibility for Super Bowl celebrations to be a super spreader event, once with a new more transmissible strain seeding in Hawaii and one without.

**Vaccines Assumptions:**
- We assume 2 doses with reduction of symptoms by 95%, and reduction in transmissibility by vaccinated people is 50%.
- We assume 60% of individuals in phase 1a and 2b of Hawaii vaccination planner vaccinated over a 3 months period with total vaccination divided in uniform weekly batches.

**Super Bowl Impact:** Assumption an increase in spread transmission rate during two weeks starting on Sunday to the same value Hawaii experienced after July 4.

**Strain assumption:** 66% more transmissible than the current rate. Seeded in the community assuming 3 individuals per day for the first week of February.

**Scenario 1:** Simulation assuming no spike to Super Bowl and no new strain

**Scenario 2:** Simulation assuming spike to Super Bowl but no new strain

**Scenario 3:** Simulation assuming spike to Super Bowl and the new strain

The primary observation is that compare to scenario 1 we have that scenario 3 shows a 147% increase in daily diagnostic on March 30, 2021 with a max in February that is 87% higher. This indicates that forecasting further than March 30 will show an increasing impact of the new strain on daily numbers (the curve scenario 3 is not decreasing contrary to the other 2).

**Conclusion:**
The Super Bowl has the potential to be a 'superspreader' event, similar to July 4th last year. The daily cases would follow a spike and then decrease back to current numbers. If in addition, we assume a more transmissible strain is already seeding in the community, the impact of the vaccines on the curve would likely be canceled out, at least in the short term.

**Table: Comparing the three scenarios**

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Daily Diagnosis (March)</th>
<th>Maximum Diagnosis</th>
<th>Cumulative Diagnosis</th>
<th>Severe Hospitalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Super Bowl and no strain</td>
<td>101</td>
<td>141 (Jan 25)</td>
<td>29949</td>
<td>2581</td>
</tr>
<tr>
<td>Super Bowl</td>
<td>165</td>
<td>223 (Feb 26)</td>
<td>33944</td>
<td>2835</td>
</tr>
<tr>
<td>Super Bowl + Strain</td>
<td>249</td>
<td>266 (Feb 25)</td>
<td>34975</td>
<td>2949</td>
</tr>
</tbody>
</table>

We used the COVID-19 Agent-based Simulator (Covasim), an open-source model that includes some demographic information; realistic transmission networks in different social layers; age-specific disease outcomes; and intrahost viral dynamics, including viral-load-based transmissibility. It also supports an extensive set of interventions, including vaccinations.


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