

The Effect of the SARS-CoV-2 (COVID-19) Pandemic on Seasonal Influenza in the United States

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Introduction

- There was concern of concurrent influenza and COVID-19 epidemics at the start of the 2020-21 influenza season.¹
- COVID-19 cases/deaths peaked during the typical peak of influenza season (Dec-Mar), averaging between 150,000 and 225,000 cases/day and 2,000-3,000 deaths/day.²
- Over the past 10 seasons, the US has had 12,000-61,000 deaths and 140,000 – 810,000 hospitalizations annually from influenza.¹

Methods

- The purpose of this poster is a literature review comparing previous influenza seasons to the 2020-2021 influenza season and assessing the impact of the COVID-19 pandemic on influenza cases.
- Peer-reviewed journals considering both influenza and COVID-19 were used.
- The CDC reports weekly influenza cases for several previous seasons. Data from 2014-2021 was downloaded to Microsoft Excel. Using Excel, data was manipulated to create visuals to compare influenza seasons.

Background Info/Results

- A national emergency was declared near the end of the 2019-20 influenza season. Percentage of positive tests (PPT) sharply fell within a few weeks and maintained historic lows of interseasonal circulation. (Figure 1)³
- The first full influenza season during the COVID-19 pandemic was in the Southern Hemisphere (April-July 2020), before the US. Chile, South Africa, and Australia recorded 51 total positive tests for a PPT rate of 0.06% (83,307 tests).
- In these same countries, during 2017-19, a total of 24,512 positive influenza tests were recorded for a percent positive rate of 13.7% (178,690 tests).³
- During the 2020-2021 US season, there was a marked decrease in positive influenza tests compared to the previous seven seasons (shown in Figures 2 and 3).⁴
- The hospitalization rate for the 2020-2021 season was 0.8 per 100,000 residents. This is one-tenth the rate seen during the historically low 2011-2012 season.⁴

Results

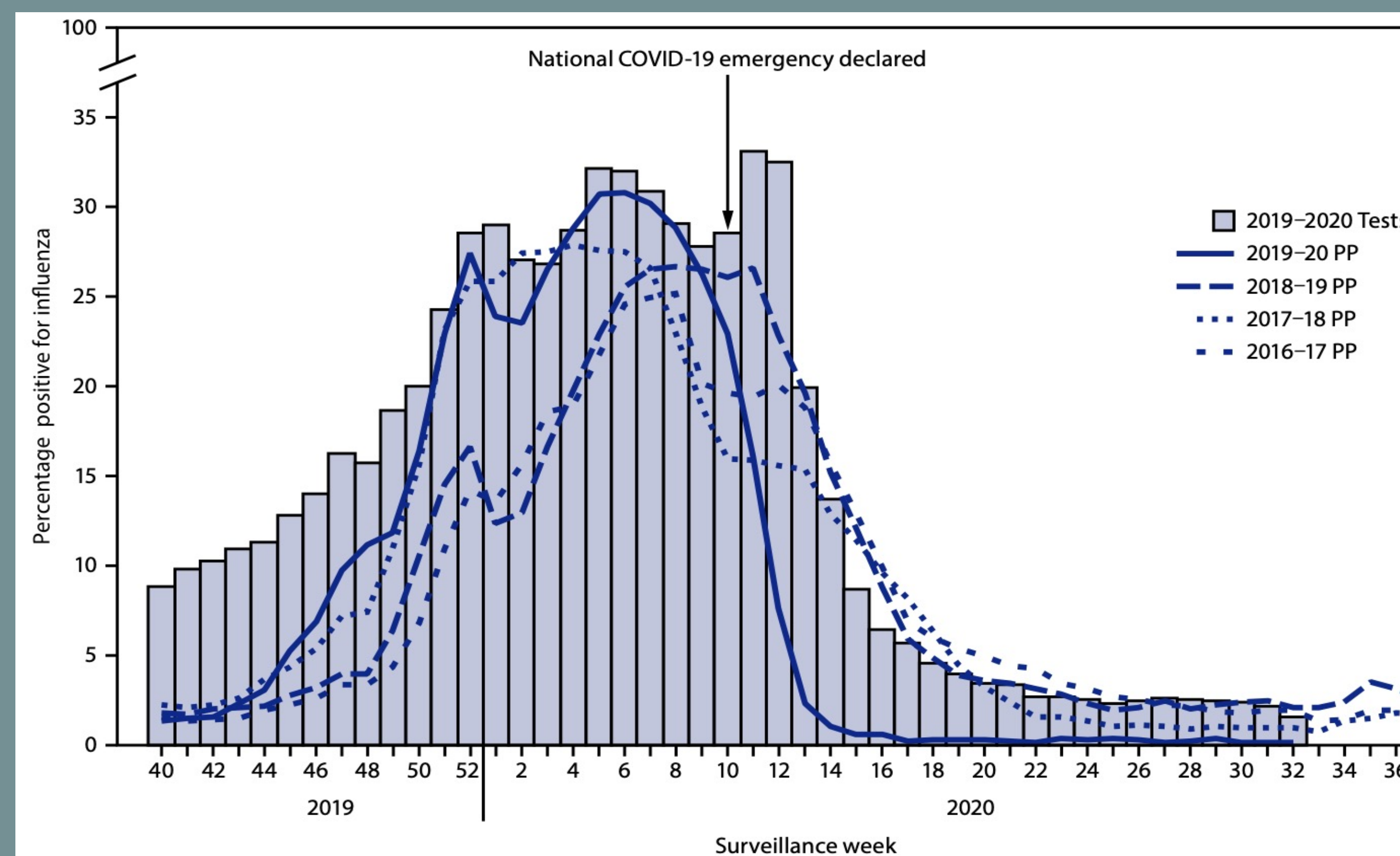


Figure 1: National Emergency declared Week 10. The percentage of positive influenza tests was >20% week 51 – week 10, and sharply declined to 2.3% by week 13 (Figure taken from Olsen, et. al.).³

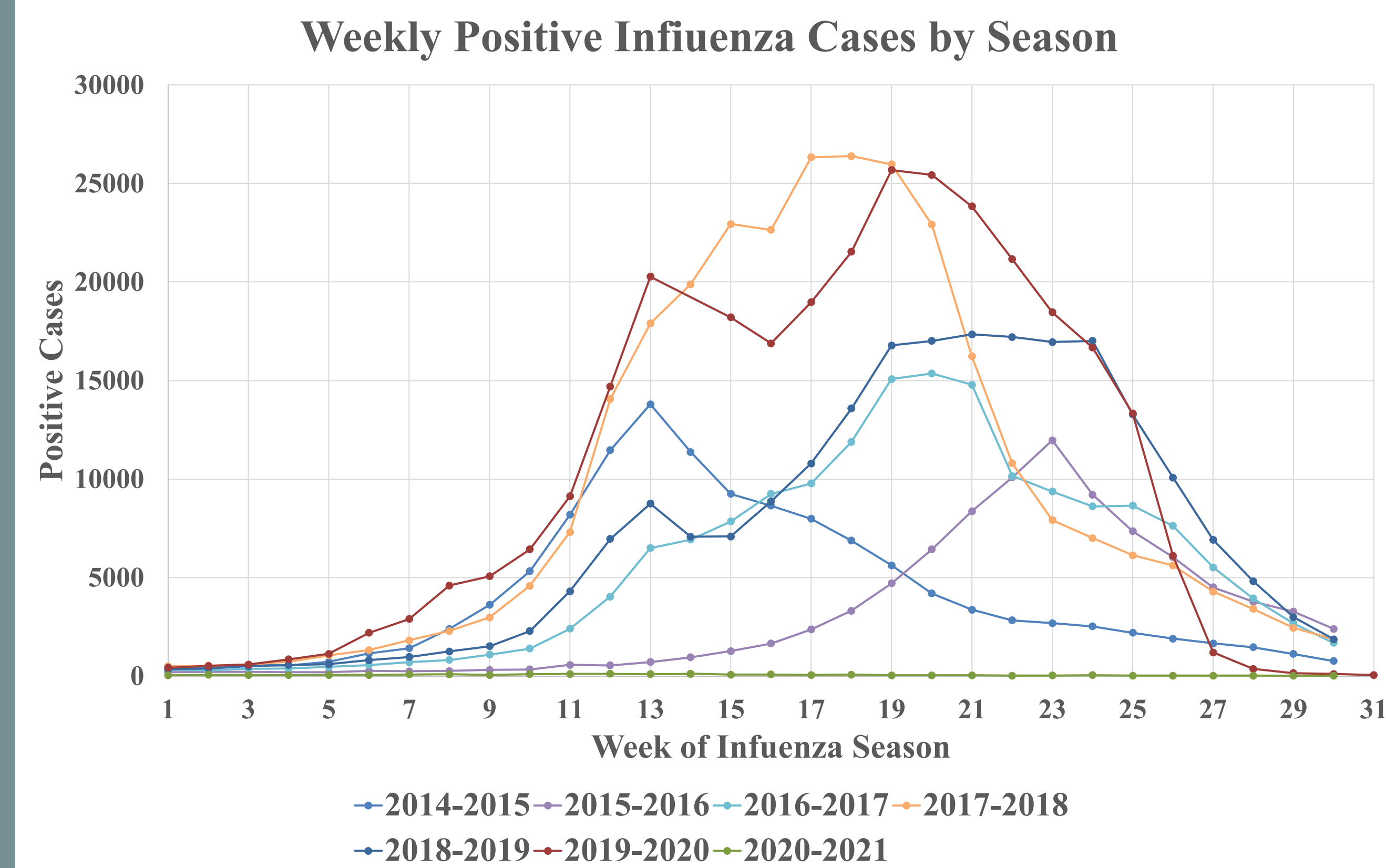


Figure 3: Weekly case count by season: 2014-2015 to 2020-2021. X-axis corresponds to typical influenza season (Week 1 is end of September/beginning of October, Week 30 is end of April/beginning of May). (Graph created in Microsoft Excel using CDC's FluView Interactive Data).⁴

Table 1: Influenza vaccine distribution in the US during the past 11 seasons. 2020-2021 set a record by nearly 20 million. (Table generated in Microsoft Excel using CDC's FluVaxView Interactive Data).⁷

Season	Vaccination Distribution (millions)
2010-2011	155.1
2011-2012	132
2012-2013	134.9
2013-2014	134.5
2014-2015	149.8
2015-2016	146.4
2016-2017	145.9
2017-2018	155.3
2018-2019	169.1
2019-2020	174.5
2020-2021	193.8

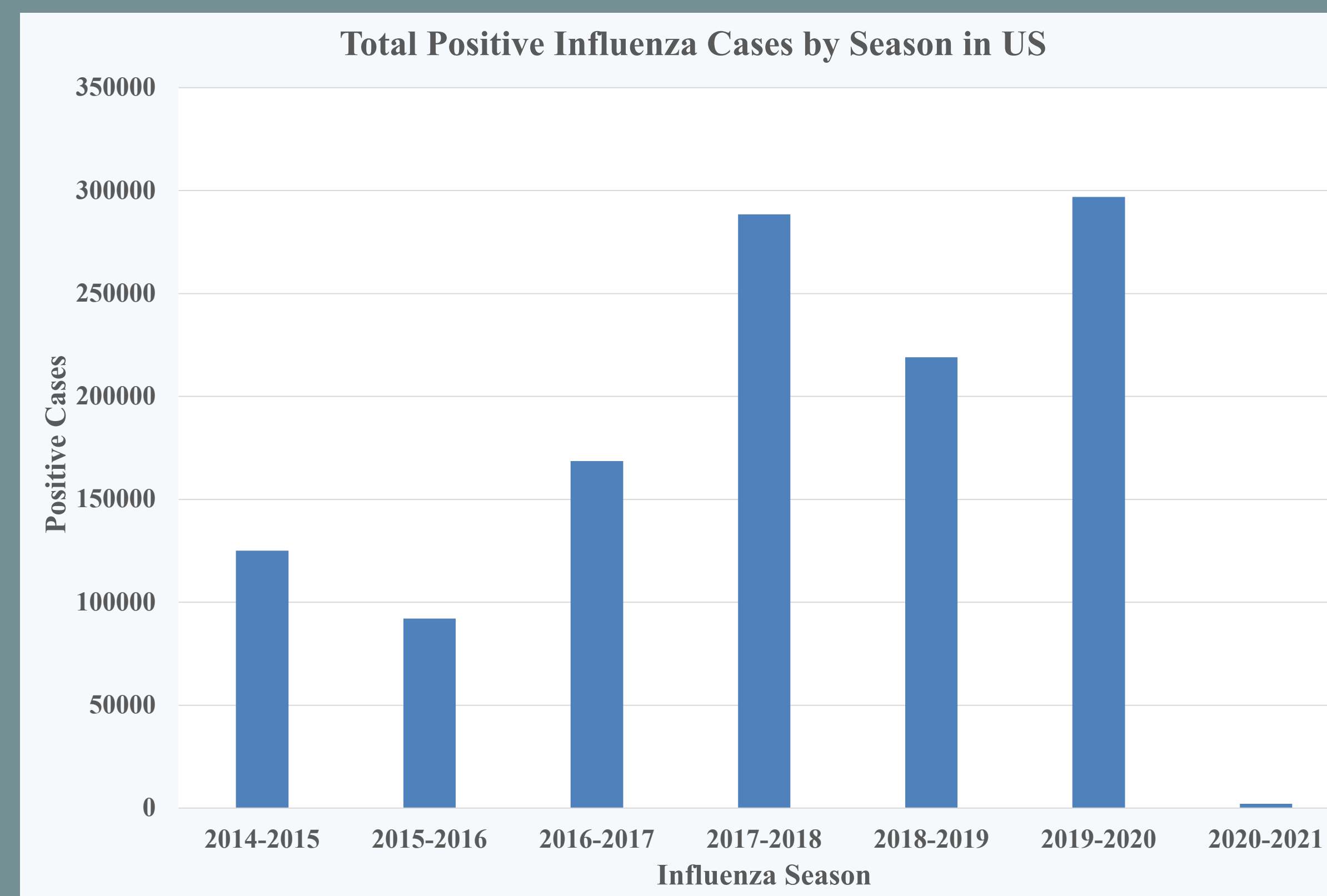


Figure 2: Total seasonal case count from 2014-2015 to 2020-2021. Value for 2020-2021 is 2,074. (Figure generated in Microsoft Excel using CDC's FluView Interactive Data).⁴

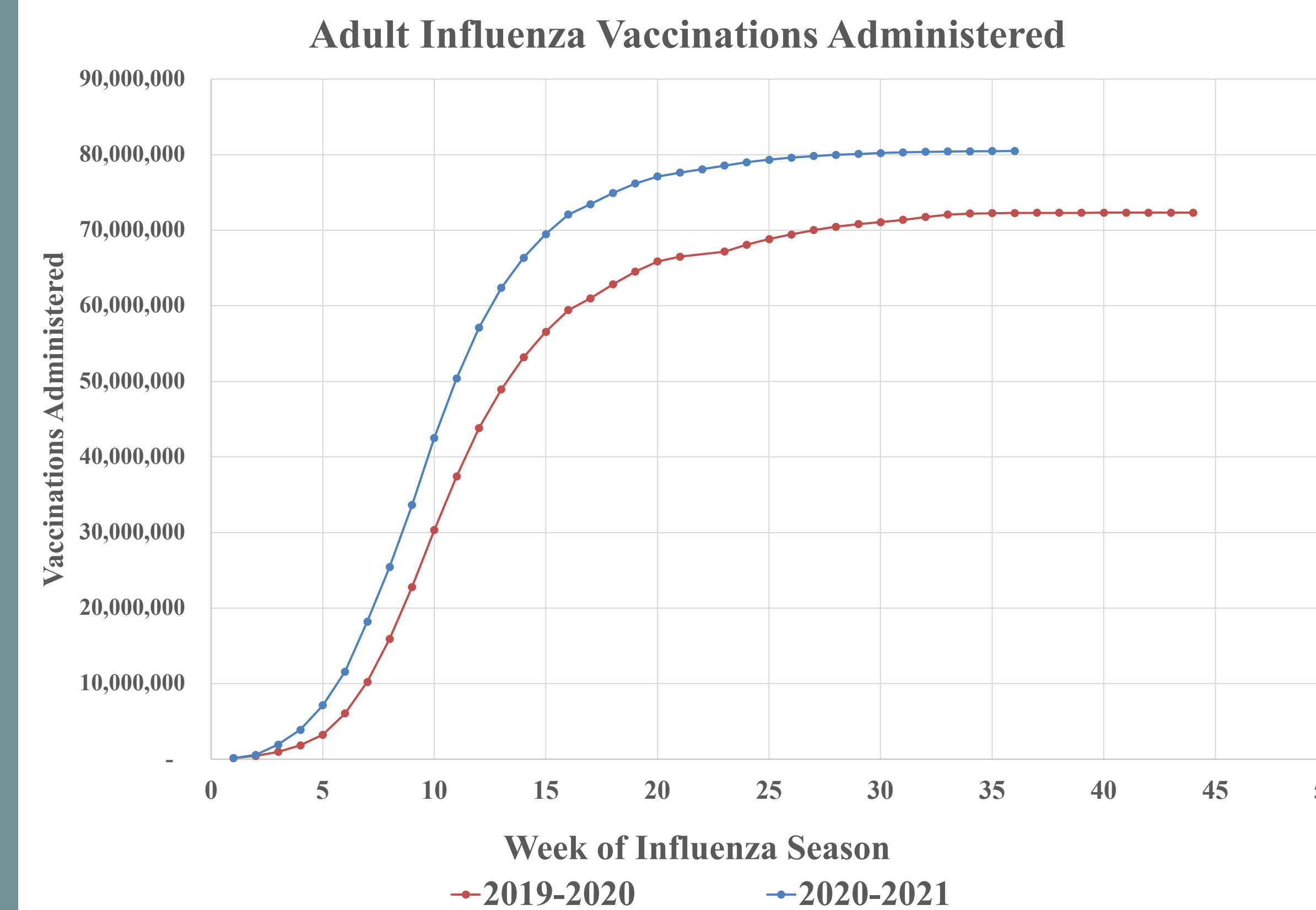


Figure 4: Vaccinations administered to US adults (over age 18) during the past two influenza seasons. (Graph generated in Microsoft Excel using CDC's FluVaxView Interactive Data).⁷

Table 2: Total seasonal influenza case count in Minnesota over past 6 seasons. (Table generated in Microsoft Excel using CDC's FluView Interactive Data).⁴ This is provided to focus on a smaller region to see the effects.

Minnesota	
Season	Positive Tests
2015-16	6,988
2016-17	8,981
2017-18	12,092
2018-19	4,555
2019-20	5,344
2020-21	78

Discussion

- An R_0 value represents the average number of people that contract a disease from a person with the disease. Higher R_0 = more contagious.
- Seasonal influenza has an R_0 of approximately 1.3 compared to SARS-CoV-2 at 2-3.5.
- Though nonpharmacologic interventions (NPIs) such as school closures, face coverings, and social distancing are thought to reduce the spread of each virus, the lower transmissibility of influenza could have allowed NPIs to mitigate cases much more effectively.^{1&3}
- An early season survey found 59% of adults had/intended to receive an influenza vaccine (52.2% reported receiving the prior season).⁵
- 35% of respondents were more likely to receive an influenza vaccine due to the COVID-19 pandemic.⁵
- The 2020-2021 season had records for both vaccine distribution (Table 1) and adult vaccines administered (Figure 4).⁶
- Disruptions to seasonal patterns of transmission could impact future seasons.⁷
- A study uses a variety of models to suggest a buildup of susceptible individuals could lead to large influenza outbreaks in coming seasons.⁷

Conclusion

- NPIs due to COVID-19 and increases in influenza vaccine compliance likely combined for large decrease in influenza cases.
- Some level of NPIs could be utilized during future influenza epidemics, especially among vulnerable populations, to reduce transmission.³
- An increase in susceptibility could result in large influenza outbreaks in future seasons.
- More investigation into the possibility of these large outbreaks is necessary.
- Data is limited to one COVID-19/influenza season with no similar instance to compare to.

References

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