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Changes in vaccine administration trends across the life-course during the COVID-19 pandemic in the United States: a claims database study

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Approach

- 1 Retrospective, cross-sectional analysis
- 2 The baseline (pre-COVID-19) period was defined as 1 January 2018 to 31 December 2019. The impact (COVID-19) period was defined as 1 January 2020 to 31 August 2022;
- 3 Study population: **commercially insured individuals** nationwide, of any age who resided in the US and were enrolled in the Merative™MarketScan database

Approach

Vaccines by age group

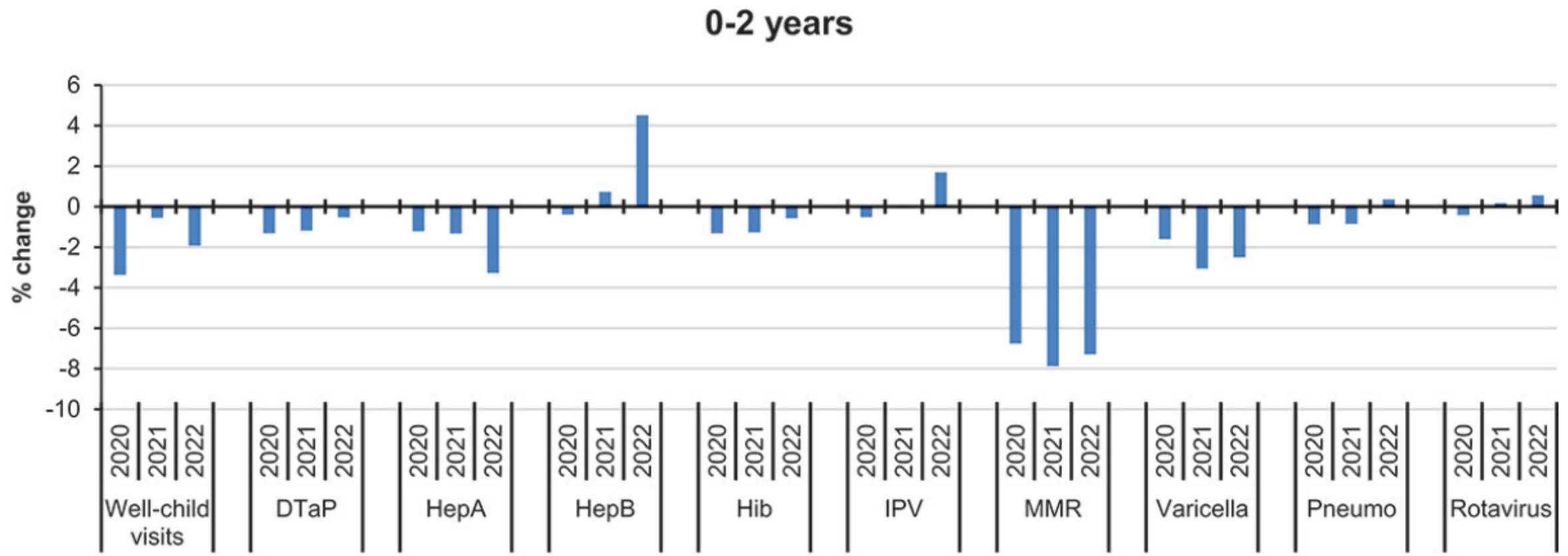
0-2 years	4-6	9-16	19-49	50-64 and >64
<ul style="list-style-type: none">• DTaP• Hepatitis A• Hepatitis B• Hib• IPV• MMR• Pneumococcal• RotavirusB• Varicella	<ul style="list-style-type: none">• DTaP• IPV• MMR• Varicella	<ul style="list-style-type: none">• DTaP• IPV• MMR• Varicella• HPV• Meningococcal• Tdap/Td	<ul style="list-style-type: none">• Hepatitis A• Hepatitis B• Meningococcal• Pneumococcal**• Tdap/T	<ul style="list-style-type: none">• Pneumococcal**• Tdap/Td

- The rotavirus vaccine is not recommended for individuals >8 months of age and was therefore only counted for the subset of the 0-2 years group who were 0-1 year of age
- Influenza and COVID-19 vaccinations were excluded for all age groups
- Herpes zoster vaccines were excluded due to atypical data distribution, likely due to supply shortages that drove aberrant administration patterns during the baseline and impact periods.
- We did not assess adult HPV vaccination because the ACIP expanded the recommendation in 2019 to include new age groups, with SCDM now recommended for all adults aged 27-45 years, which would have impacted the baseline data
- Hib, varicella, and MMR vaccinations were also excluded for enrollees ≥18 years of age

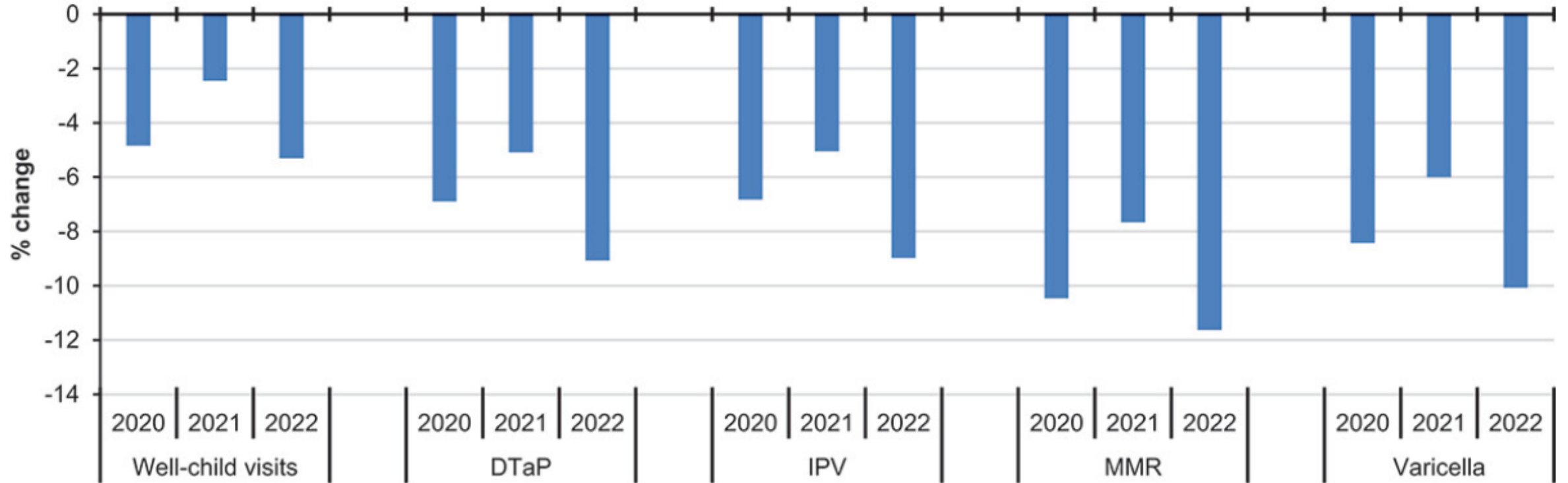
While all vaccines experienced declines, HPV experienced the greatest and longest sustained, cumulative deficit

- Wellness visits experienced some rebound but demonstrated incomplete recovery across the study period
- Large deficits were observed for HPV vaccination among adolescents 9–16 years of age, hepatitis A vaccination among those 19–49 years of age, and pneumococcal vaccination among adults ≥ 65 years of age
- The 2021 recovery in the annual accumulated vaccine administration rate was weaker for HPV (–10.0%) than for Tdap (–4.4%) and meningococcal (–2.6%) vaccines; **the HPV rate decreased further in 2022, to –18.6% below baseline**
- Pediatrics
 - The greatest overall decreases were observed for MMR vaccine administrations, which had an annual accumulated percent change compared to baseline of –6.8%, –7.9%, and –7.3%, in 2020, 2021, and 2022
- Adults.
 - The annual accumulated percent change compared to baseline was –28.3% for pneumococcal vaccines among those ≥ 65 years of age

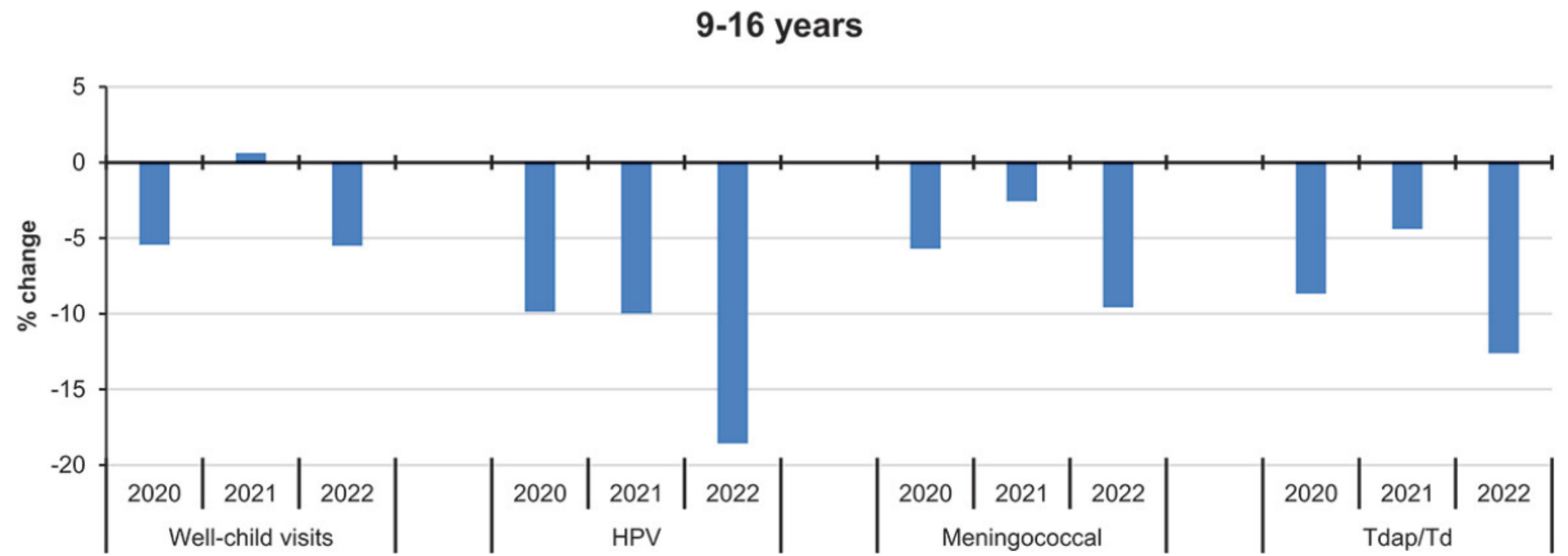
MMR experienced greatest cumulative deficit comparatively



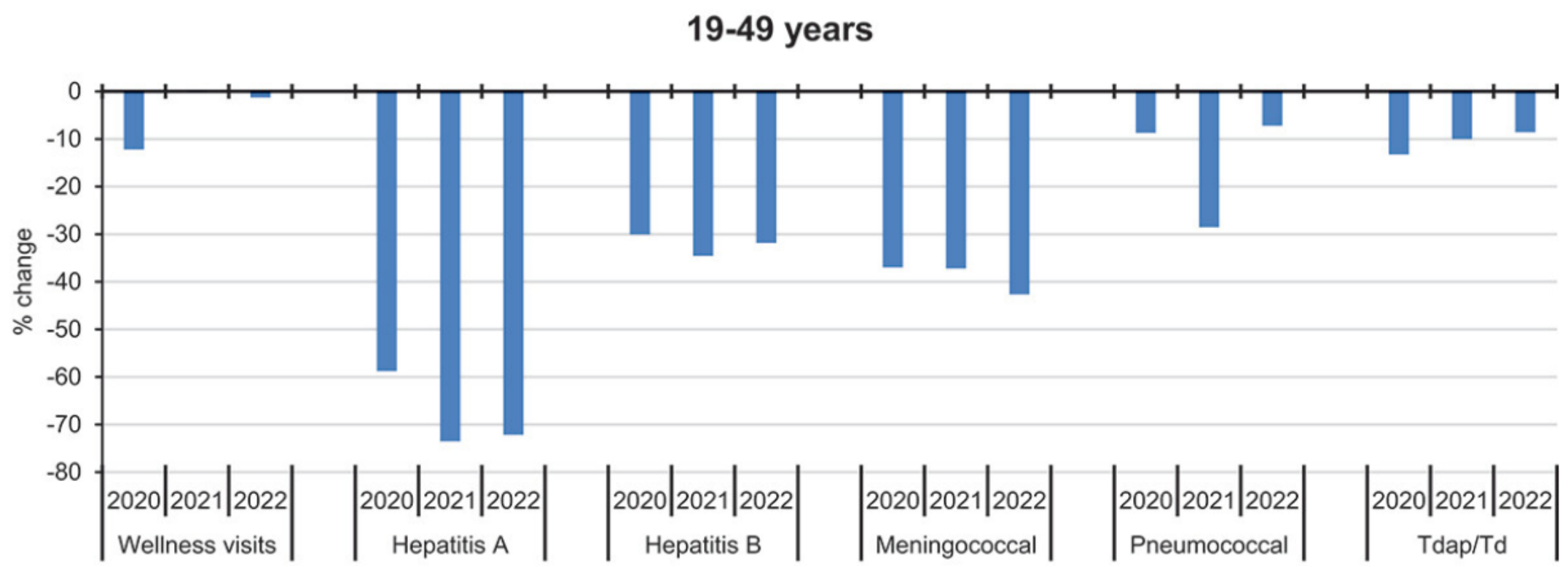
4-6 years



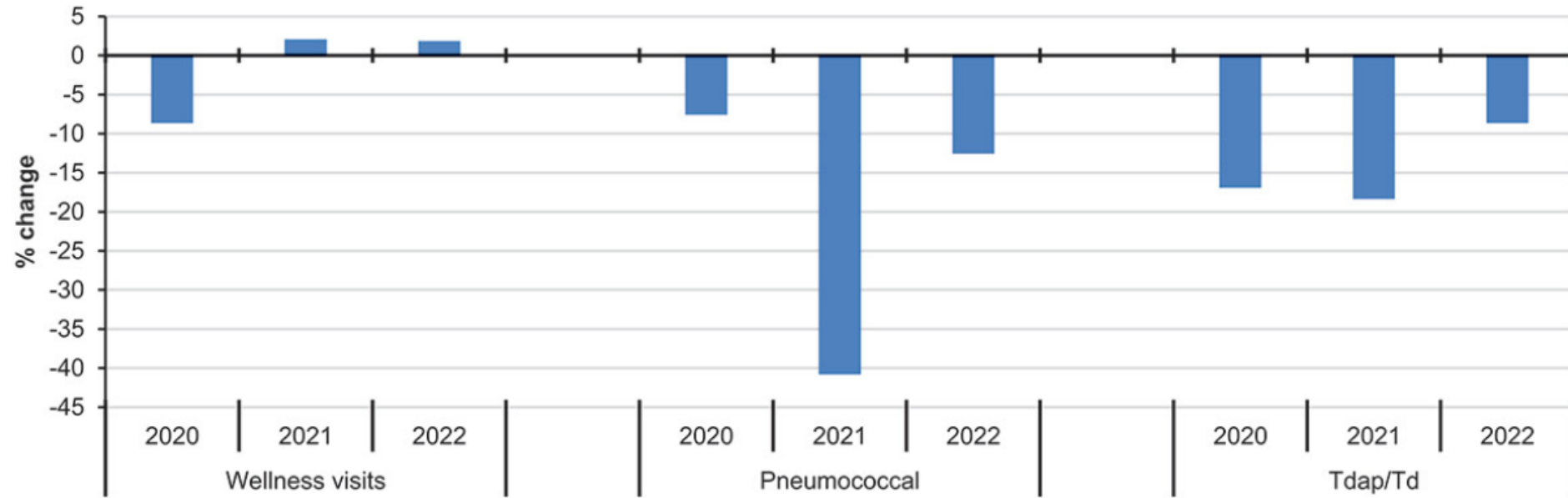
HPV vaccine administration has experienced dipropionate declines comparatively



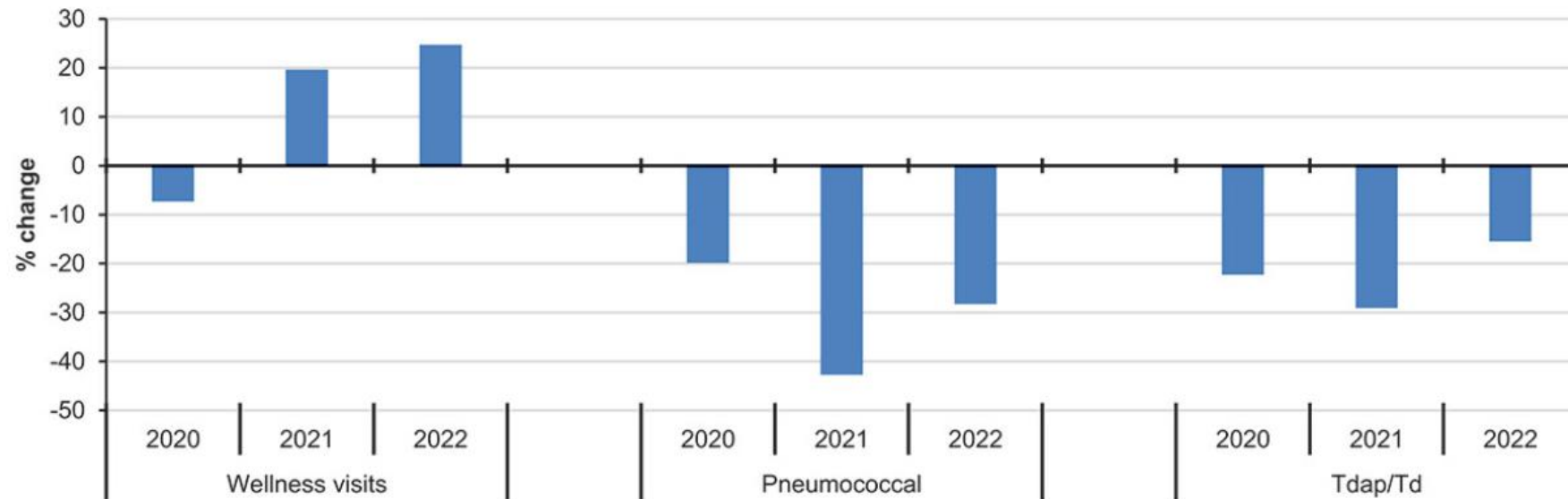
Hepatitis A experienced greatest deficit among young and mid-adults



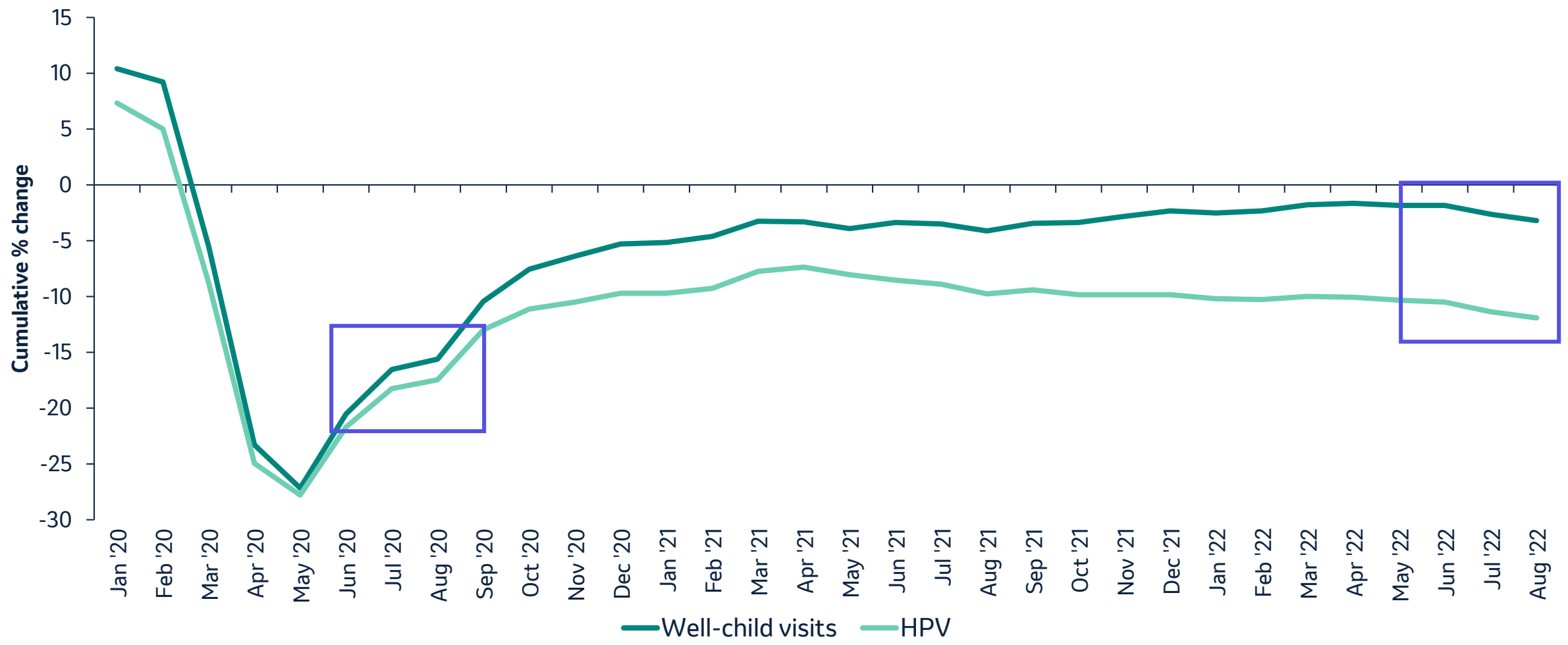
50-64 years



≥65 years

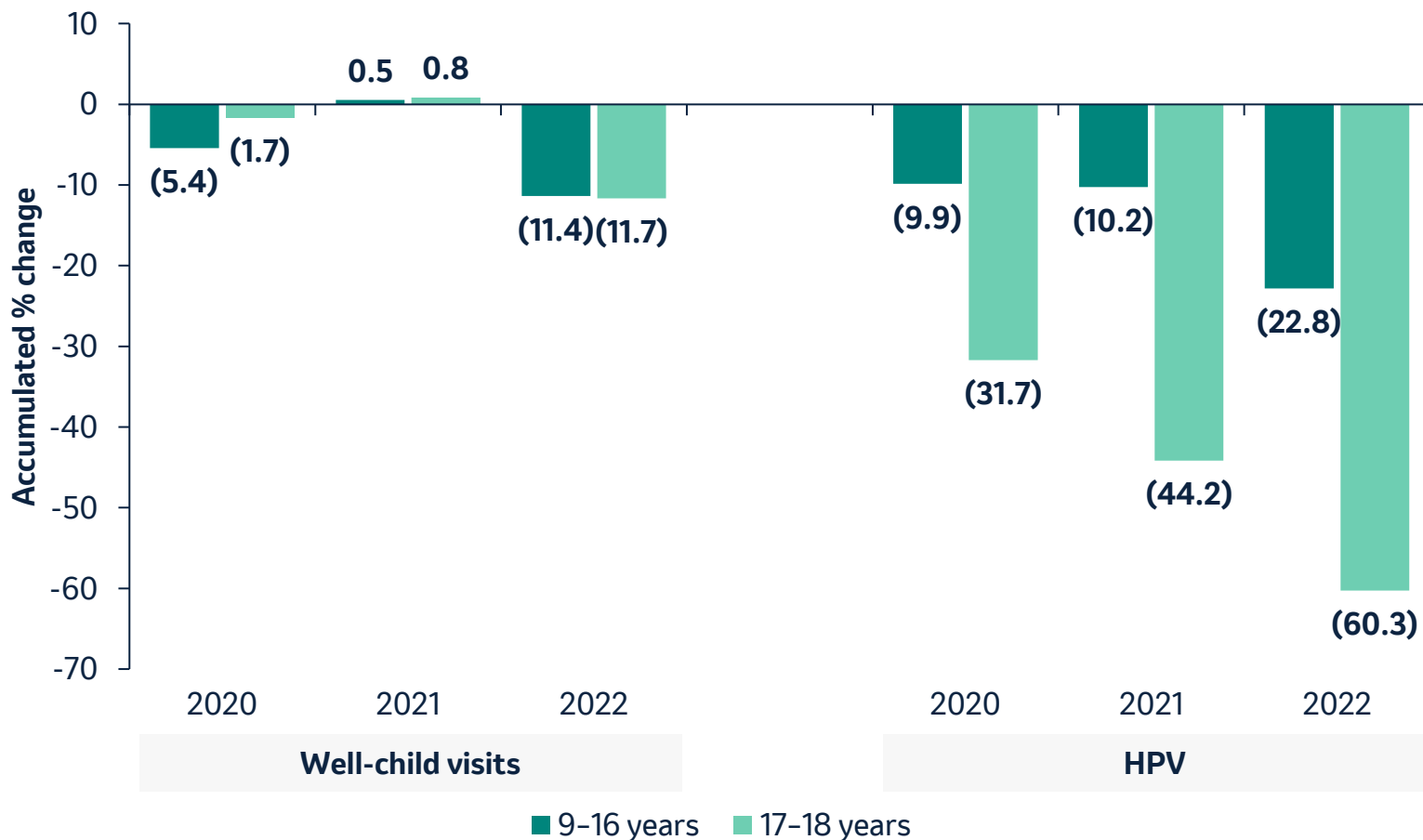


While well-visits are rebounding, but HPV vaccine administration is not rebounding proportionally



Annual accumulated percent change between the baseline and each year of the impact period

Annually accumulated percent change



- The annual well child visits reduced for both 9-16, and 17-18 years old in 2020. It recovered slightly in 2021, however went down again in 2022, with the accumulated deficit in August 2022 showing to be around 11% for both age categories
- The vaccine administration rates deficit consistently grew each year, with the latest data showing the deficit to be around 23% for 9-16 years old, and 60% for 17-18 years old

Conclusion

- **Our analysis showed that HPV vaccines saw the greatest decline among all adolescent vaccine administration during the pandemic.** We also observed that rates of in-person well child visits recovered faster than the rate of vaccine administrations in adolescent and young adult age groups, indicating that opportunities for individuals to receive scheduled and overdue HPV vaccination during these visits were potentially being missed
- **Decline in HPV vaccination uptake observed during the pandemic represents a major setback for public health efforts.** Sustained lower vaccination rates can not only cause lowering of individual level immunity but can also have a detrimental effect on herd immunity
- **Provider and parent education around the urgency of catch-up vaccination is important,** and emphasis on alternative sites to administer HPV vaccine such as mobile clinics, schools, and pharmacies is needed

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2. Daniels V, Saxena K, Roberts C, et al. Impact of reduced human papillomavirus vaccination coverage rates due to COVID-19 in the United States: A model based analysis. *Vaccine.* May 12 2021;39(20):2731-2735.



Thank you