

# All for One and One for All? Patterns of Familial Influenza Vaccination

Brenna L. Brady<sup>1</sup>, Helen Varker<sup>1</sup>, Liisa Palmer<sup>1</sup>  
<sup>1</sup>Merative, Life Sciences and Outcomes Research, Ann Arbor, MI, USA

Study Summary

**Study Question:** How do individual rates of influenza vaccination correlate with familial vaccination status?

**Study Design**

Study Period (2 flu seasons):

- 2018-2019 Season (pre-COVID) – July 1, 2018 to June 30, 2019
- 2022-2023 Season (post-COVID) – July 1, 2022 to June 30, 2023

Study Methods:

1. Select eligible patients

2. Identify of eligible family units

3. Classify into vaccination cohorts

4. Examine family characteristics

Continuous eligibility for full flu season

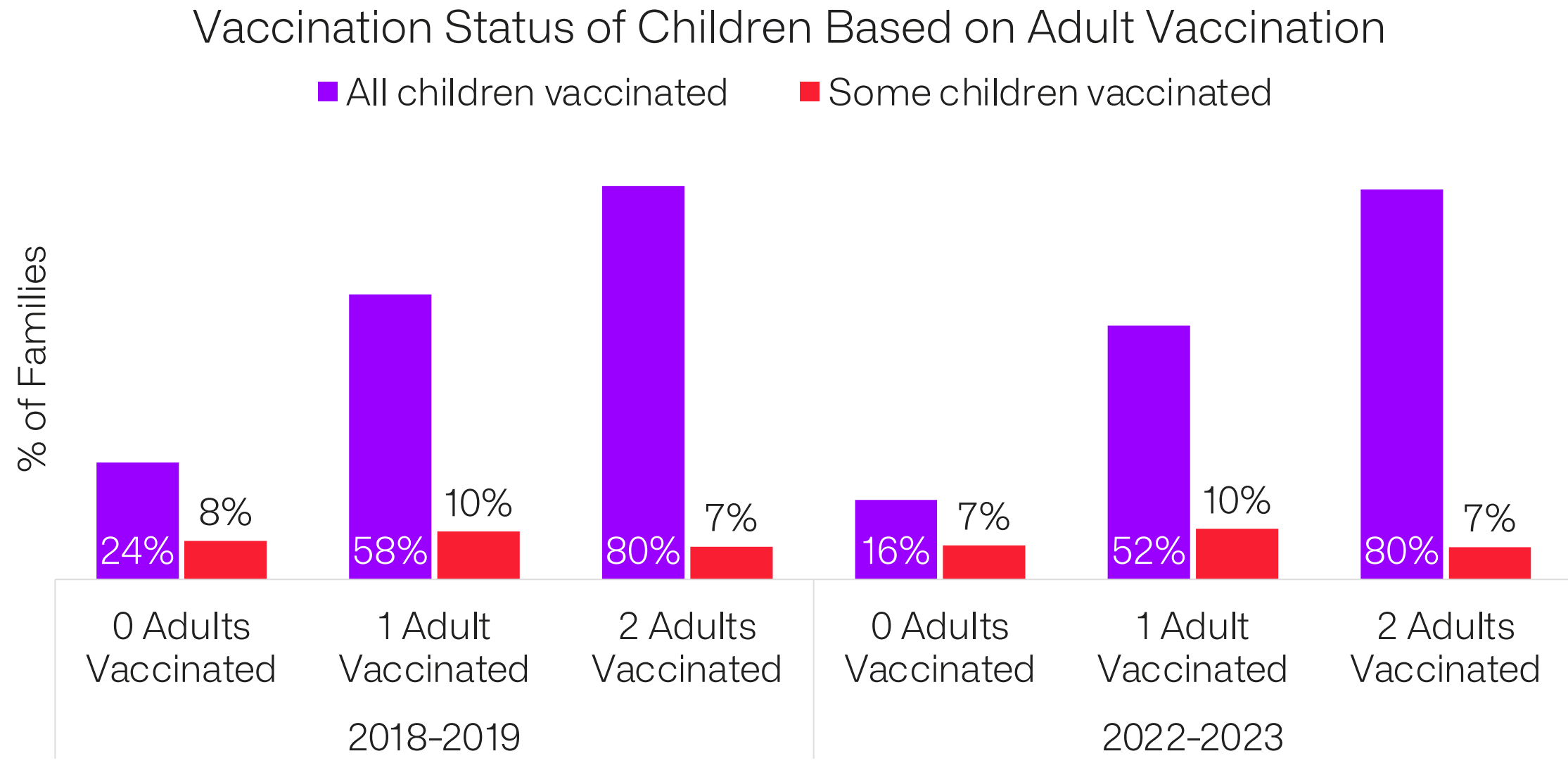
- Employee and spouse/partner ≥1 dependent aged ≤16 years on 6/30

Defined by flu vaccination status of all family members OR the two adults

- Vaccination status
- Demographics
- Risk status
- Healthcare use

**Study Results**

Vaccination Status of Children Based on Adult Vaccination

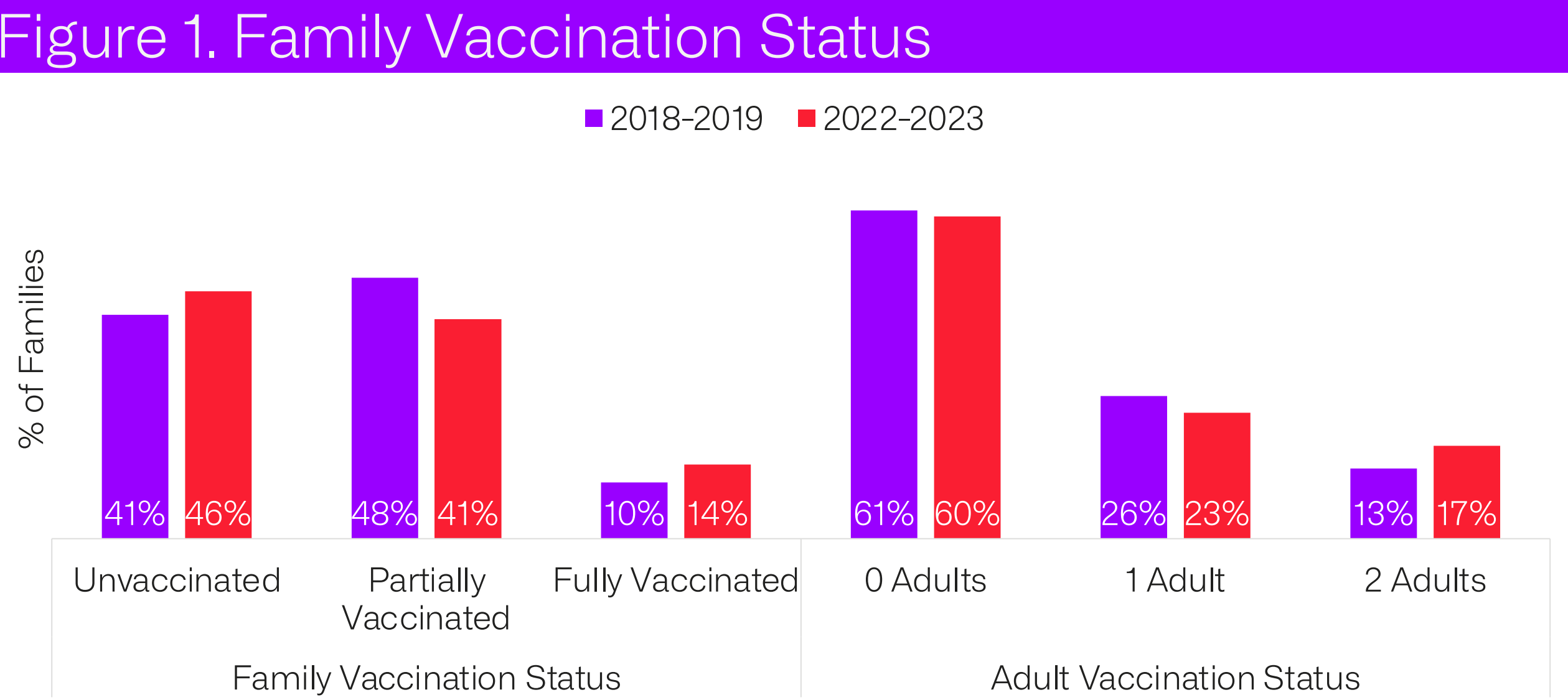


**Conclusion:** Results indicate that family characteristics including demographics, healthcare utilization patterns, and healthcare access influence vaccination rates, especially for minor dependents.

## Methods

### Data Source and Study Design

- The Merative™ MarketScan® Commercial and Medicare Databases
  - The MarketScan administrative claims databases contain data on the full healthcare experience (inpatient, outpatient, and outpatient pharmacy) and associated costs for employees and their dependents with employer sponsored commercial or Medicare insurance in the United States.
- Analyses were conducted over the 2018-2019 and 2022-2023 flu seasons; seasons ran from July 1 through June 30.
- Family units, defined as a primary beneficiary, spouse, and ≥1 child aged ≤16 with continuous eligibility for the full season were identified.
  - Analyses were limited to families with two adult members to provide the opportunity for multiple adult decision makers/influencers.
  - Dependents >16 years were excluded as they may not be living at home.
- Vaccination rates were assessed at the individual and family level to examine how individual vaccination correlated with the family unit.
  - Family units were classified as being fully vaccinated, partially vaccinated, or unvaccinated, as well as by the number of vaccinated adults (0, 1, or 2).
- Demographics and healthcare resource utilization were examined over the flu season.
- Analyses were descriptive in nature; differences between family cohorts were assessed with students t-tests or chi-squared tests.

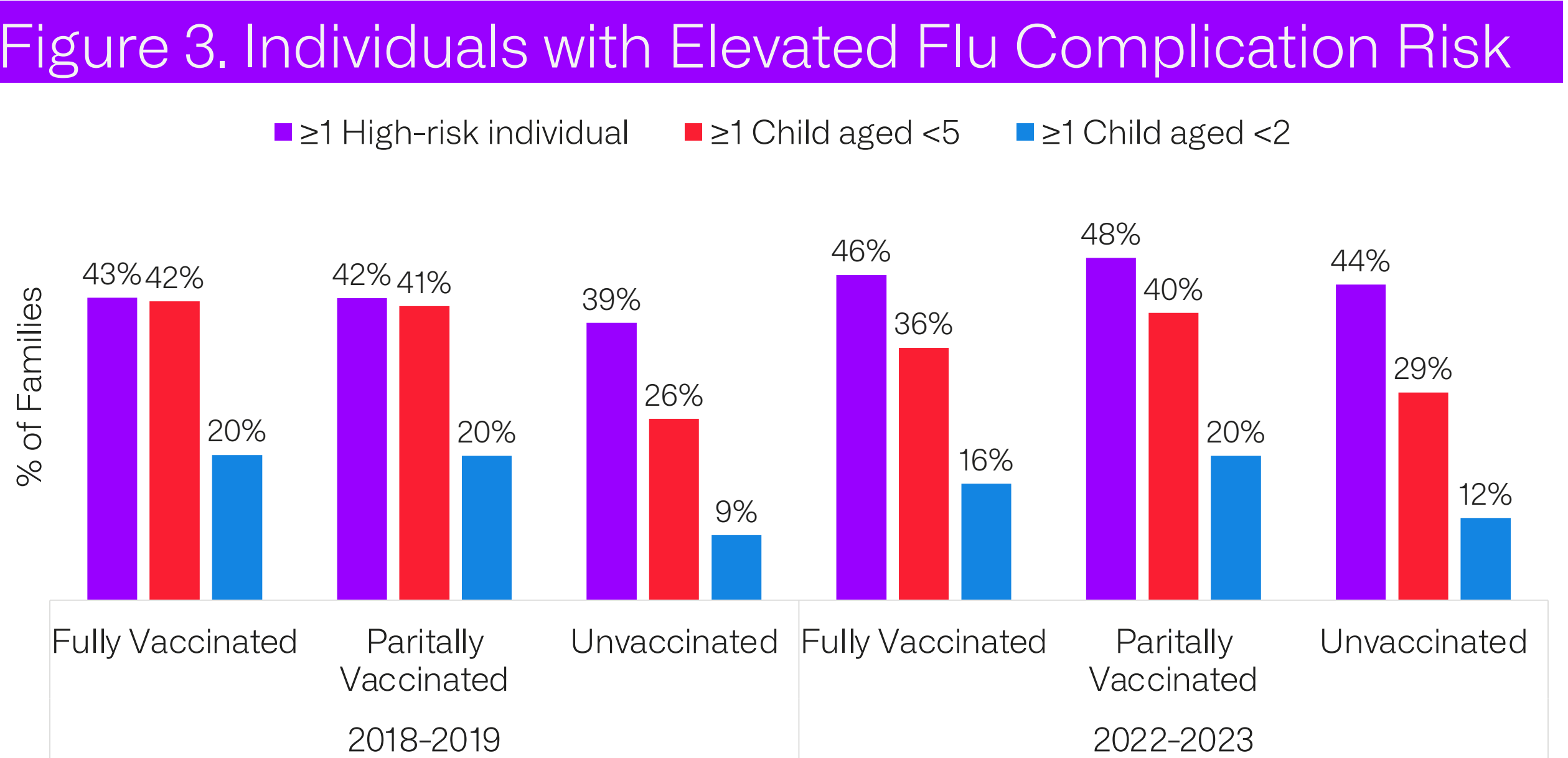


## Results

- A total of 1,128,556 and 931,537 families qualified in the 2018-2019 and 2022-2023 flu seasons, respectively.
- There were slight shifts in familial vaccination patterns from the 2018-2019 to 2022-2023 season (Figure 1).
  - Increases in unvaccinated and fully vaccinated families were observed from 2018-2019 to 2022-2023.
  - From the perspective of adult vaccination, the proportion of families with two vaccinated adults increased from 2018-2019 to 2022-2023.
- There was a notable correlation between rates of adult and minor dependent vaccination (Summary Figure).
- Fully vaccinated families had significantly fewer children than partially vaccinated or fully vaccinated families; thus, fewer vaccinations were required to reach fully vaccinated status, p<0.001 (Figure 2A).
- Unvaccinated families were significantly more likely to reside in the South and less likely to reside in the Northeast compared to fully or partially vaccinated families, p<0.001 (Figure 2B)
- Fully vaccinated families were significantly more likely to have a high deductible insurance plan (CDHP/HDHP) compared to other cohorts; while unvaccinated families were significantly more likely to have a comprehensive/indemnity or EPO/PPO plan, p<0.001 (Figure 2C).

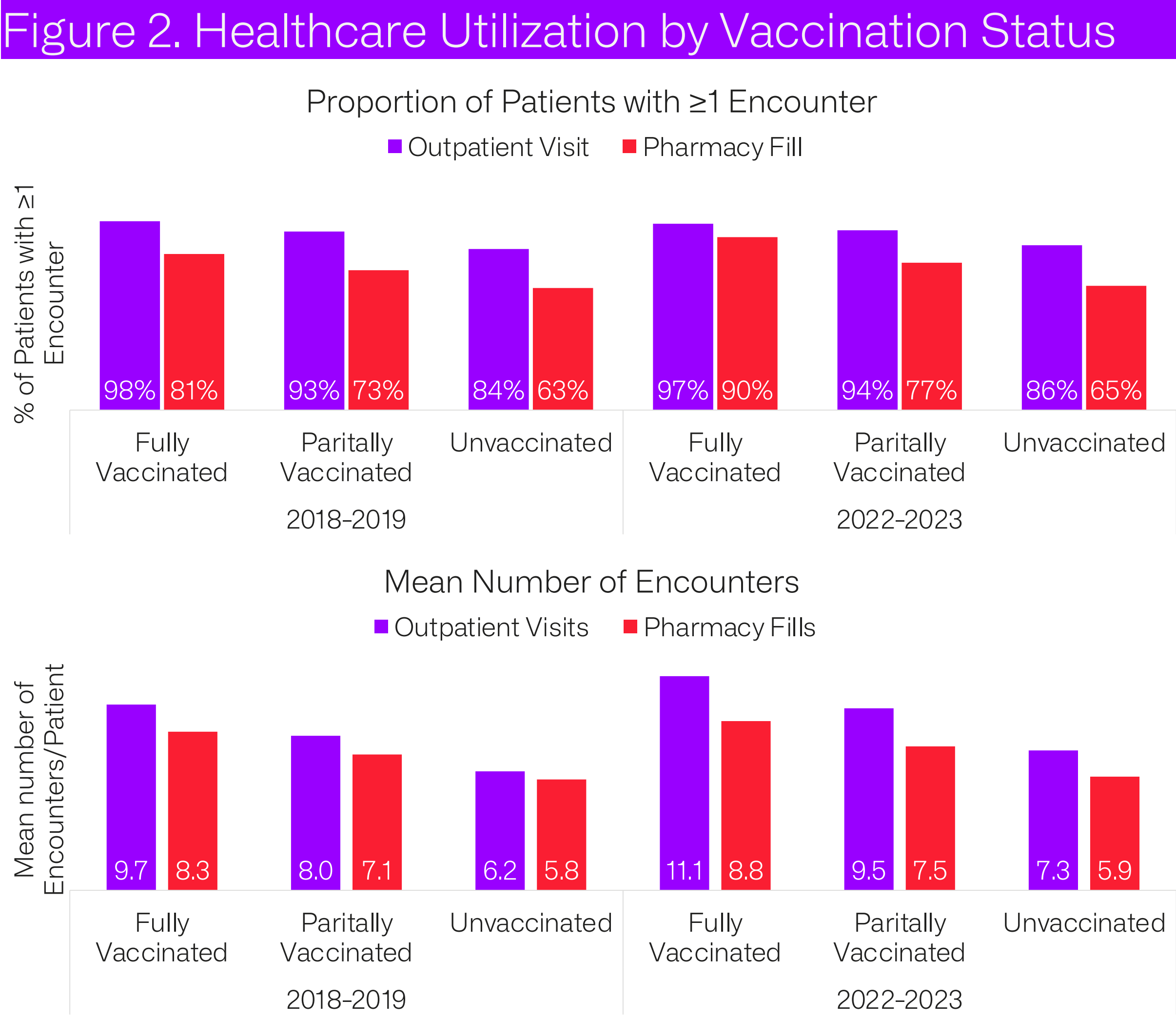


- The CDC associates certain chronic conditions, as well as age <5 years (notably age <2 years) as being at elevated risk for flu complications.
- Fully and partially vaccinated families were significantly more likely to have ≥1 member with an elevated risk of flu complications, p<0.001 (Figure 3).
  - The proportion of families with ≥1 high-risk individual increased from 2018-2019 to 2022-2023 in all cohorts.



## Results

- There were also differential patterns of outpatient healthcare utilization across vaccination cohorts, potentially pointing to variation in healthcare engagement or differences in health status.
  - The proportion of individuals with ≥1 outpatient office visit or ≥1 outpatient pharmacy fill significantly decreased from the fully vaccinated to the unvaccinated cohort, p<0.001 (Figure 4A).
  - The mean number of visits during the flu season also significantly decreased across the vaccination cohorts from fully vaccinated to unvaccinated, p<0.001 (Figure 4B).



## Limitations

- Analyses were descriptive in nature based on administrative claims data; therefore, causal associations can not be made and underlying decision making around vaccination remains unknown.
- Results may not generalize to populations with non-employer sponsored insurance.

## Conclusions

- Analyses identified a series of family characteristics that correlated with vaccination status including family size, demographics, health factors (e.g., risk status, insurance type).
  - There also seemed to be a correlation between overall healthcare engagement and vaccination.
- Further research into the impact of the family unit on vaccination, both from the perspectives of healthcare access and health belief models are needed to better support US vaccination programs.

### References

1. Gidengil C, et al. *Vaccine*. 2019;37(45):6793-6802; 2. Kempe A, et al. *Pediatrics*. 2020;146(1); 3. Enyinnaya JC, et al. *Vaccine*. 2024;42(3):455-463; 4. Hill HA et al. *MMWR Morb Mortl Wkly Rp*. 2024;73:844-853; 5. Eiden AL, et al. *Expert Rev Vaccines*. 2023;22(1):481-494; 6. Cuniff L, et al. *Hum Vaccin Immunother*. 2023;19(2); 7. Hotez PJ. *Nat Rev Immunol*. 2022;22:525-256; 8. Maltezou HC, et al. *Vaccine*. 2022;40:2525-2527; 9. Smith PJ, et al. *Public Health Reports*. 2011;126(2):135-146.

### Disclosure

All authors are employees of Merative. This study was funded by Merative.

## Objective

- To evaluate individual versus family-level vaccination rates for US families prior and following the COVID-19 pandemic.