Pertussis Vaccination and Test Rates in Germany by Asthma/COPD Comorbidity Status: A Healthcare Claims Data Analysis in Germany from 2014-2019

EPH178

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INTRODUCTION

A post-COVID surge of pertussis or "whooping cough“ has been observed worldwide in the last 3 years and touched Germany in 2024, with record incidence levels [1]. Many countries in Europe observed a high proportion of cases among adolescents and adults.

As data of the 2024 pertussis outbreak in Germany is still being collected, we leveraged pre-COVID data to estimate pertussis test and vaccination rates among adults in Germany, stratified by age as well as asthma and COPD history.

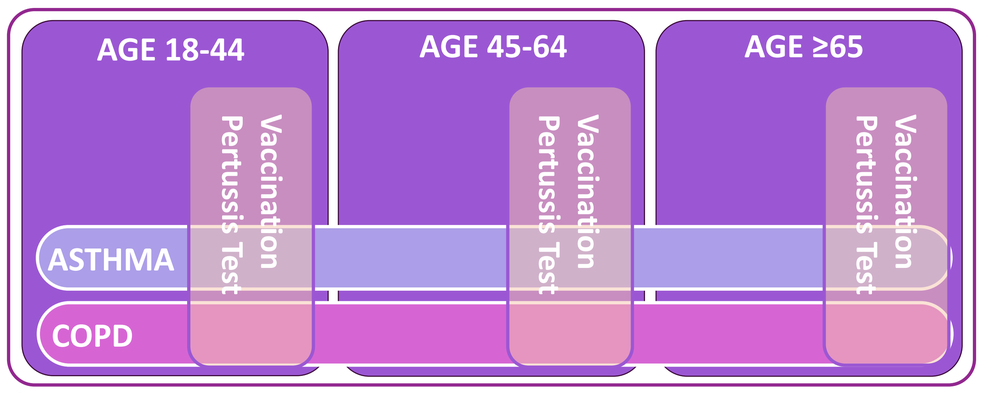
OBJECTIVES

Describe **pertussis vaccination** and **test rates** among German adults ≥18 years-old from 2014 through 2019

Describe vaccination and test rates and compare incidence rate ratios (IRRs, with 95% confidence intervals) **by age** and **respiratory subgroups** (asthma, COPD, both, or neither)

METHOD

Retrospective cohort study with a study period of 2014-2019 (with an additional one-year look-back period) using German Statutory Health Insurance (SHI) claims database (2,506,566 patients, unprojected)



EBM Vaccination Codes: Tdap (89303, 89303 R, 89303 Y) or TdapIPV (89400, 89400 R)
EBM Test Codes: Bordetella pertussis antibody (32585), Bordetella PCR test referral code (32829)

RESULTS

21,8%

vaccination rate over 6-years of study period amongst adult SHI population. Representative data from 2019 reported 41% of adults having received pertussis vaccination within the past 10 years [2].

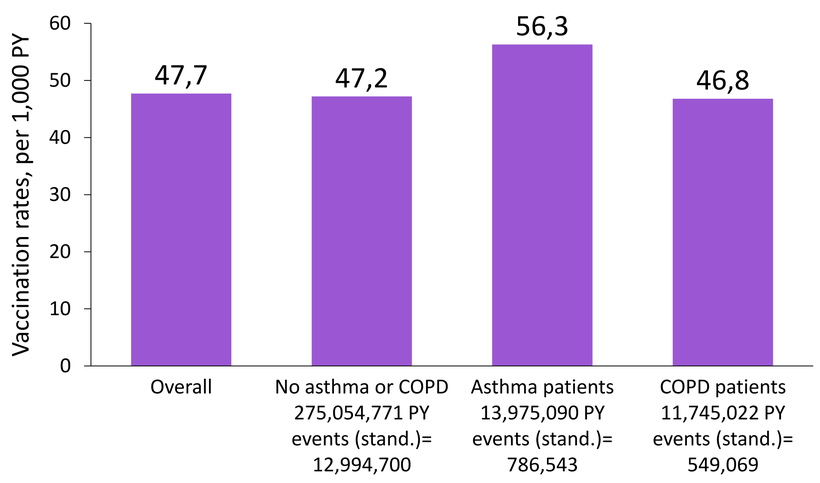


Fig. 1. Vaccination rates per 1,000 PY. 2014-2019. Standardized to German SHI population.

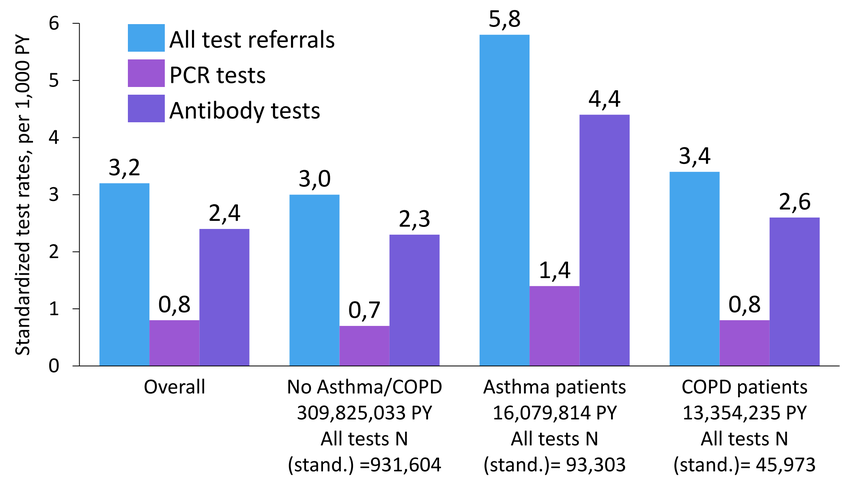


Fig. 2. Pertussis test rates by asthma and COPD history.

Asthma patients are more likely to be vaccinated against pertussis, as compared to patients without asthma, across all age-groups.

Older adults with asthma or COPD are less likely to be vaccinated against pertussis.

*Table. 1. Vaccination rate ratios with 95% confidence intervals (CIs). **Bold** indicates p<0.05.*

Vaccination rate	None	Asthma	COPD
Overall	Ref. →	**1.19 (1.18-1.21)**	0.99 (0.98-1.00)
18-44	Ref. ↓	Ref. ↓	Ref. ↓
45-64	1.09 (1.08-1.09)	0.97 (0.95-0.99)	1.02 (0.96-1.07)
65+	0.98 (0.98-0.99)	**0.88 (0.85-0.91)**	**0.83 (0.79-0.88)**
Vaccination rate			
18-44	Ref. →	**1.27 (1.25-1.29)**	**1.13 (1.07-1.19)**
45-64	Ref. →	**1.13 (1.11-1.15)**	**1.05 (1.03-1.08)**
65+	Ref. →	**1.14 (1.10-1.18)**	0.95 (0.93-0.98)

67%

of test referrals were initiated by the GP, independent of the respiratory comorbidity history.

In general, patients with asthma are more likely to be tested. Older adults tend to be less likely to be tested and receive a pertussis diagnosis post-testing (i.e., test “confirmation”)

*Table. 2. Pertussis testing and confirmation rate ratios with 95% confidence intervals (CIs). **Bold** indicates p<0.05.*

Test rate	None	Asthma	COPD
Overall	Ref. →	**1.93 (1.85-2.01)**	**1.14 (1.09-1.20)**
18-44	Ref. ↓	Ref. ↓	Ref. ↓
45-64	**0.97 (0.96-0.99)**	**0.92 (0.87-0.98)**	**0.73 (0.63-0.84)**
45-65+	**0.58 (0.56-0.59)**	**0.66 (0.60-0.72)**	**0.36 (0.30-0.44)**
Confirmation rate			
Overall	Ref. →	**1.76 (1.52-2.04)**	**1.22 (1.02-1.46)**
18-44	Ref. ↓	Ref. ↓	Ref. ↓
45-64	**1.19 (1.11-1.28)**	0.91 (0.72-1.15)	0.81 (0.47-1.38)
65+	**0.69 (0.63-0.76)**	0.85 (0.61-1.19)	**0.37 (0.18-0.77)**

CONCLUSIONS

Despite the higher risk of pertussis complications [3], older adults with asthma or COPD are less likely to receive pertussis vaccination. Adult vaccination rates are low, especially with regards to the recent 2024 pertussis outbreak in Germany.

Overall test referral rates are 3.2 per 1,000 PY, with a total of 1,092,438 test referrals from 2014-2019 (about 1% are PCR tests). About 8.5% of pertussis tests were confirmed, with asthma and COPD patients more likely to be receive a confirmed diagnosis post-testing.

To address preventive gaps in high-risk populations for pertussis complications (such as older patients, or patients with asthma or COPD), further public health initiatives beyond pediatric target populations and their care takers are needed.

REFERENCES

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