

Evaluation of the Impact of Herpes Zoster Vaccination in 18 to 49 Years Old German Patients with Immunosuppression on Public Health Measures

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Background



Herpes zoster (HZ) is characterized by neuropathic pain and dermatomal vesicular rash that often appears on the trunk along a thoracic dermatome or on the face. The most common complication is **post-herpetic neuralgia (PHN)**, long-lasting nerve pain).¹



The **risk of HZ** increases with **ageing** and in people with **weakened immune system** due to illness and/or therapy (immunocompromised (IC) status).²



The adjuvanted **recombinant zoster vaccine (RZV)** was approved in the European Union in 2018 for the prevention of HZ and PHN in people aged 50 and older and since 2021 for people aged 18 and older who are at increased risk of HZ.³



Current **STIKO recommendations**:⁴ Standard vaccination: ≥ 60 years of age (yoa); Indication vaccination: 50 to 59 yoa with underlying conditions. In contrast, **ACIP recommends the vaccination** with RZV for IC individuals aged 19 years or older.⁵

Inputs

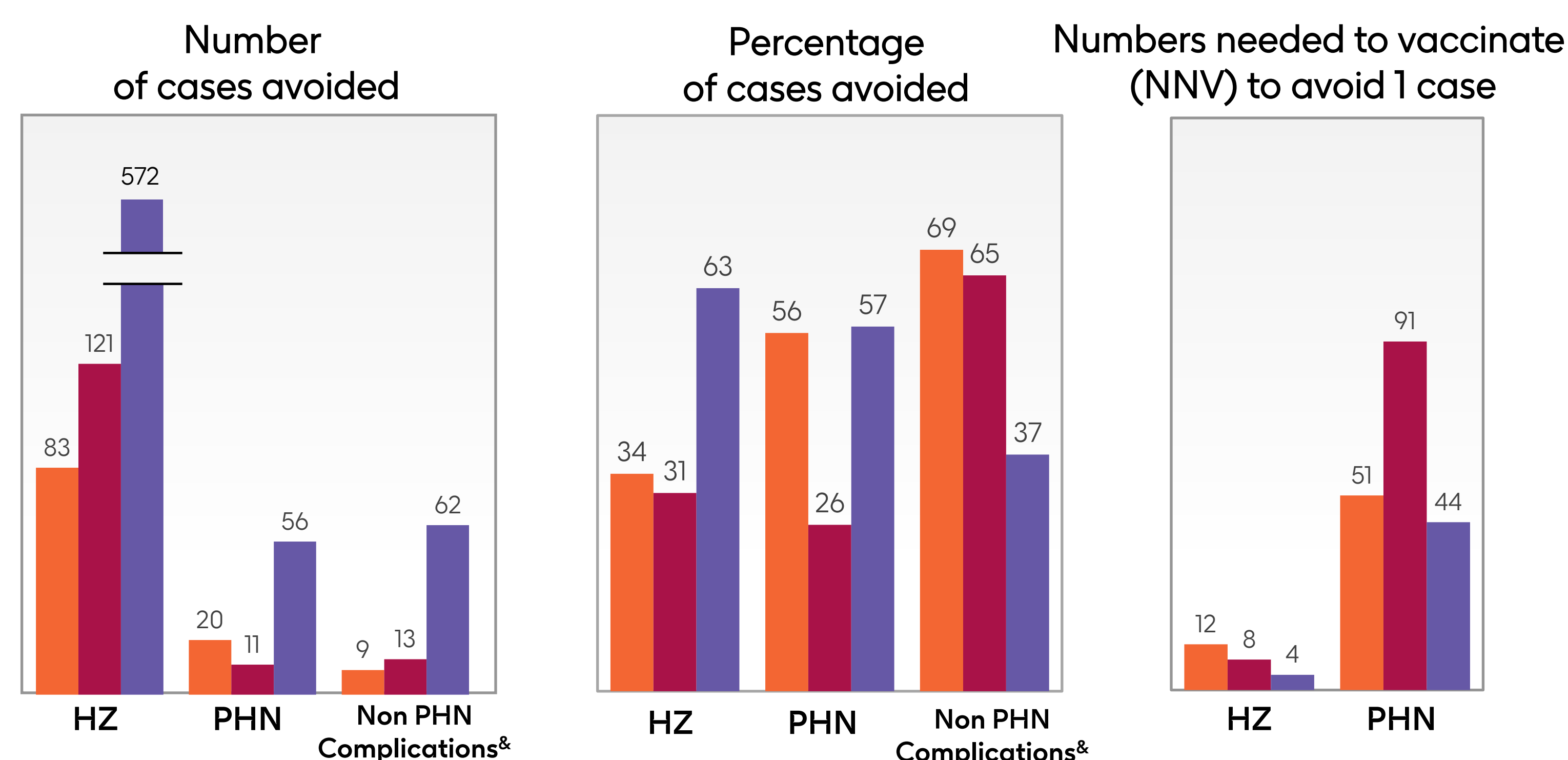
| | Healthy | HSCT | Renal transplant | HIV |
|--|--|--|---------------------|---------------------|
| Time horizon (years) | 30 | | | |
| Cohort size | Analog IC-cohort | 1,000 | 1,000 | 2,500 |
| Population starting age (years) | After the end of the IC condition [#] | 35 | | |
| IC status duration (years) | / | 5 | lifetime | |
| Coverage | / | 1 st dose: 100%, 2 nd dose: 100% | | |
| Primary 2-dose RZV efficacy against HZ | 98.9% | 72.5% | 94.5% | 98.6% |
| Primary 2-dose RZV efficacy against PHN | / | 94.8% | 97.0% | 97.5% |
| Annual waning | 1.5% | 9.1% | 5.2% | 2.3% |
| Annual incidence of primary and recurrent HZ (per person-year, 18-49 yoa)* | 0.0047 ⁷ | 0.0372 ⁸ | 0.0145 ⁹ | 0.0130 ⁸ |
| Percentage of primary and recurrent HZ cases with PHN | 9.37% ⁷ | 15.61% ¹⁰ | 8.39% ¹⁰ | 8.33% ¹⁰ |

*The incidence is assumed to increase by age in the healthy population: Range: 0.0047 - 0.0141 (per 100,000 person-years).

[#] The model population starts in the IC cohort and switches to the healthy cohort after 5 years in HSCT. As RT and HIV are assumed to be lifelong, there is no change to the healthy cohort.

Results

HSCT (n=1,000) Renal transplant (n=1,000) HIV (n=2,500)



^aE.g. ocular, neurological, cutaneous and other non-pain complications

Conclusion



Vaccination with **RZV** can significantly reduce the **HZ-related disease** burden in individuals with HCST, renal transplant and HIV aged 18 to 49 years in Germany.

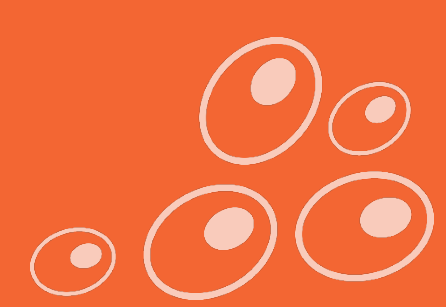


Future studies may include more **conditions and therapies**, more **recent epidemiological data** and account for **costs** averted.

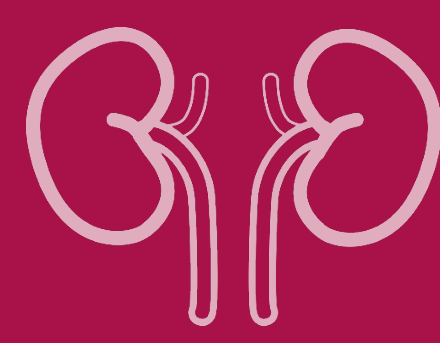
Objective

Evaluate the public health impact of RZV in German IC populations aged 18 to 49 years for the prevention of HZ and its complications considering three selected IC conditions:

Hematopoietic stem-cell transplant (HSCT)



Renal transplant



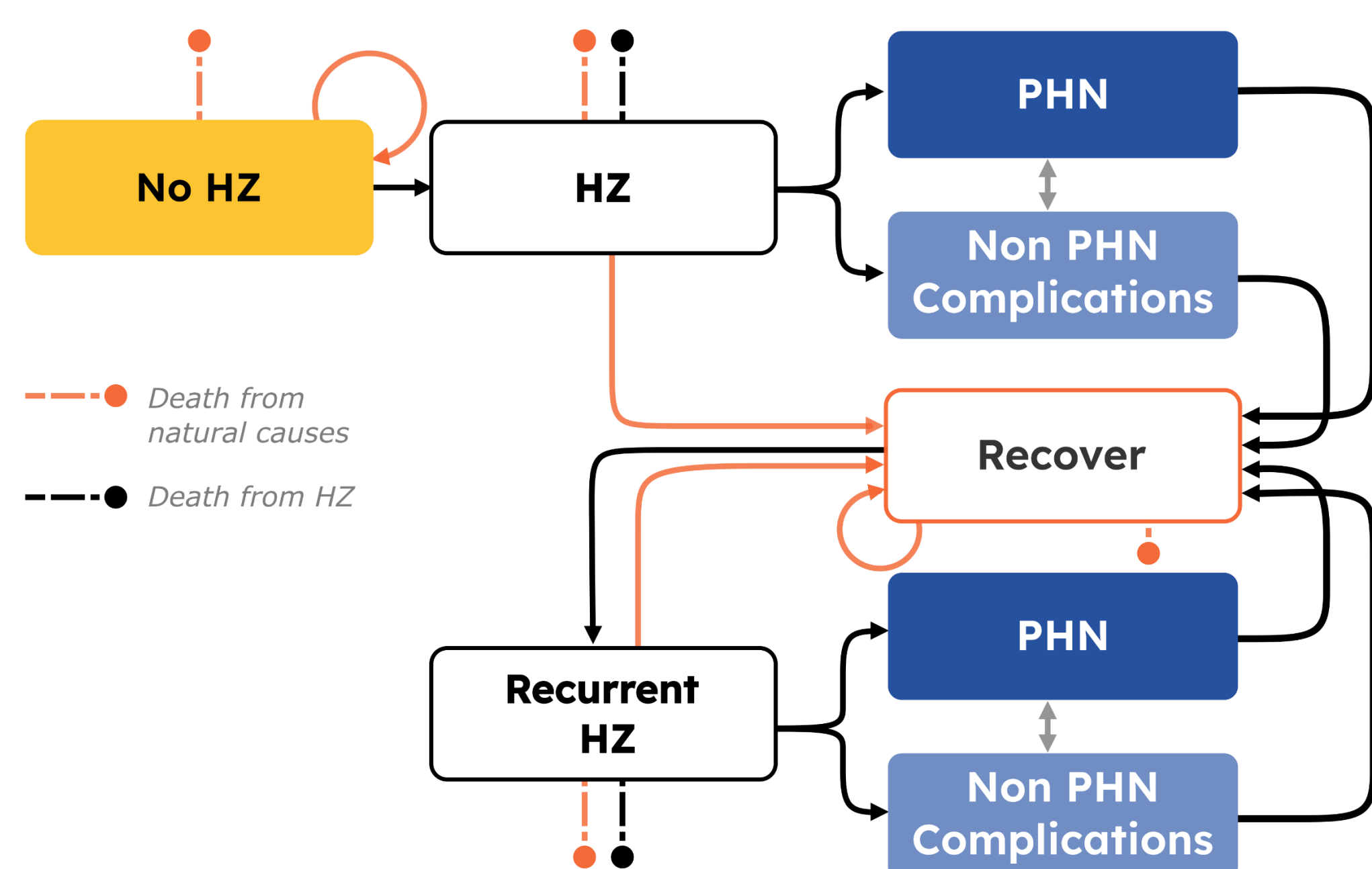
Human immunodeficiency virus (HIV)



Methods

- The existing Markov model "ZOster ecoNomic Analysis" was adapted for German IC populations (ZONA IC).⁶
- Uncertainty of parameters was assessed through Deterministic sensitivity analysis (DSA) (see supplementary data via QR code).
- For each population, in a base case scenario, a hypothetical non-vaccinated cohort was compared to a fully vaccinated cohort and the number of HZ and PHN cases were computed over a 30-year time horizon.

Markov structure of the ZONA IC model



Abbreviations

ACIP, Advisory Committee on Immunization Practices; DSA, Deterministic sensitivity analysis; HIV, Human immunodeficiency virus; HSCT, Hematopoietic stem cell transplant; HZ, Herpes zoster; IC, immunocompromised; NNV, Number needed to vaccinate; PHN, postherpetic neuralgia; RZV, adjuvanted recombinant zoster vaccine; STIKO, Ständige Impfkommission; yoa, years of age; ZONA, ZOster ecoNomic Analysis

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Conflicts of interest

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