Herpes Zoster Hospitalisation Rates in Germany: A Retrospective Database Analysis

Hospitalisation rates due to herpes zoster in Germany are increasing in adults aged 18–59 years, despite a decrease in adults aged 60 years and older.

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Objectives

- To evaluate annual herpes zoster (HZ)-related hospitalisation rates between 2000–2024 based on primary diagnoses and secondary diagnoses in three age groups (18–49 years [y], 50–59y, ≥60y) in Germany.
- To estimate the mean length of stay (LoS) and proportion of intensive care unit (ICU) admissions associated with HZ hospitalisation.

Methods

This was a descriptive, retrospective database analysis conducted with data from two publicly available databases:

	GENESIS-Online (Federal Statistical Office)[1]	Institute for the Hospital Remuneration System (InEK)[2]
Time period	2000–2023	2019–2024
Data extracted	Population data, number of hospitalisations due to primary HZ diagnosis[a]	Number of hospitalisations due to primary or secondary diagnosis, average LoS, number of ICU admissions
Outcomes reported	Annual HZ hospitalisation rates, overall and by gender	Annual HZ hospitalisation rates, mean LoS, ICU admission rates

All outcomes are reported for three age groups (18–49y, 50–59y, ≥60y).

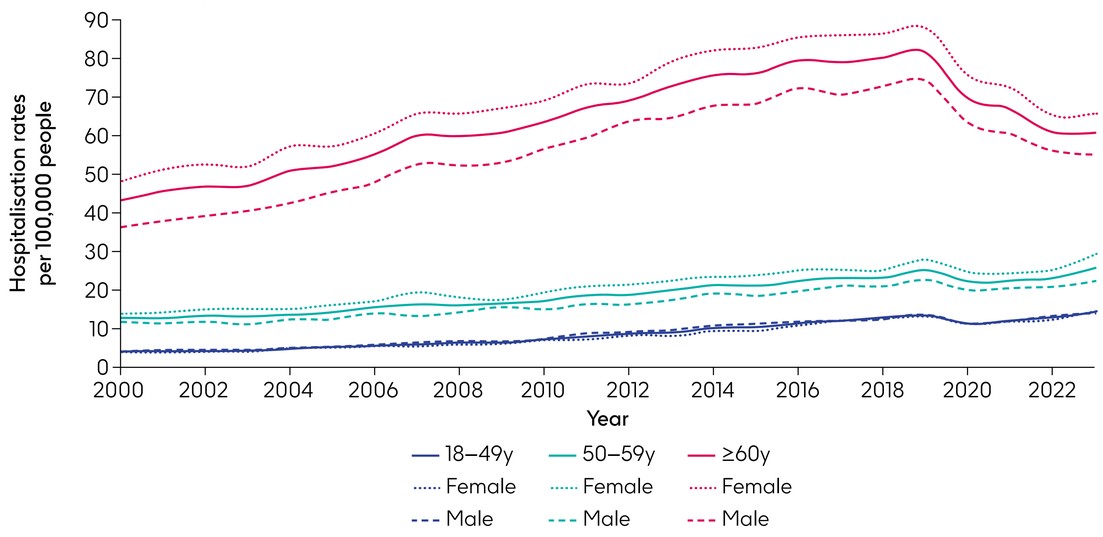
[a]Main discharge diagnosis.

Results

HZ hospitalisation rates

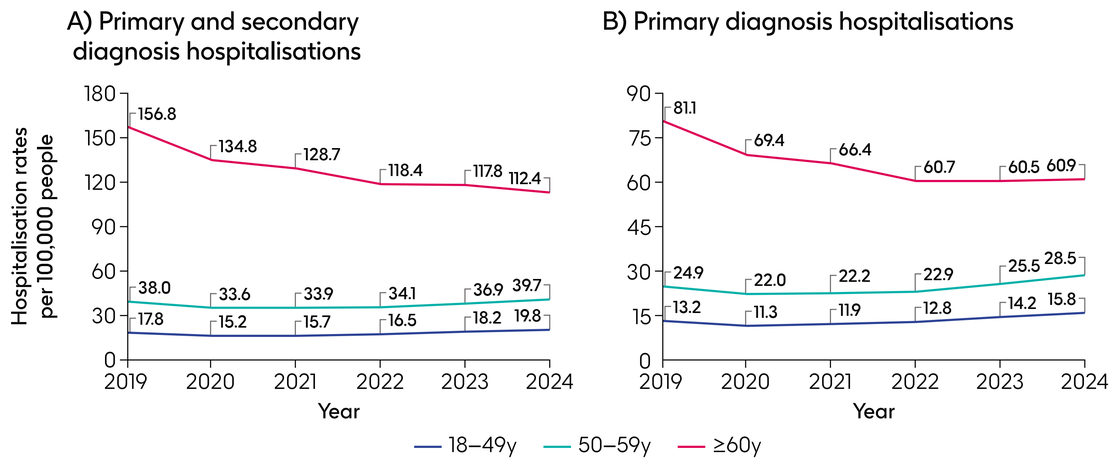
- Overall, primary HZ diagnosis hospitalisation rates increased from 2000–2019, then declined in 2020 (Figure 1).
  - The decline was most notable in the ≥60y group, with a decrease from 81.6 to 69.7 hospitalisations per 100,000 people (19,212 to 16,680 hospitalisations) from 2019 to 2020.
- In 2021, hospitalisation rates started to increase again in both the 18–49y and 50–59y groups but continued to decline in the ≥60y group.
- Although female patients consistently showed higher rates of HZ-related hospitalisations, female and male populations displayed similar overall trends.
- Both datasets (GENESIS and InEK) showed consistent trends across all three age groups analysed.
- InEK data, including primary and secondary HZ hospitalisations, confirmed this trend, with a further decline in hospitalisation rates among the ≥60y group in 2024, attributed to a decrease in secondary HZ diagnoses (Figure 2A).
  - Among the 18–49y and 50–59y groups, hospitalisation rates based on primary diagnoses declined between 2019–2020, then increased to their peak in 2024 (Figure 2B).

Figure 1: **HZ hospitalisation rates based on primary diagnoses from 2000–2023 by age group (GENESIS)**



Annual HZ hospitalisation rates overall and by gender are available in Supplementary Table 1.

Figure 2: **HZ hospitalisation rates from 2019–2024 by age group (InEK)**



HZ hospitalisation LoS and proportion of ICU admissions

- The LoS for HZ hospitalisations remained largely consistent across all age groups between 2019–2024, ranging from 6.6–7.0 days (18–49y), 7.0–7.3 days (50–59y), and 8.4–8.7 days (≥60y; Table 1).
- ICU admission rates generally increased across all age groups from 2019–2023, then decreased slightly in the 18–49y and ≥60y groups in 2024.

Table 1: **LoS and proportion of ICU admissions for HZ hospitalisations based on primary diagnoses from 2019–2024 by age group (InEK)**

Year	18–49y			50–59y			≥60y		
	HZ cases,[a] n	LoS, mean (SD) days	ICU admissions, n (%)[b]	HZ cases,[a] n	LoS, mean (SD) days	ICU admissions, n (%)[b]	HZ cases,[a] n	LoS, mean (SD) days	ICU admissions, n (%)[b]
2019	4,290	6.6 (3.5)	110 (2.6)	3,348	7.0 (4.4)	79 (2.4)	19,108	8.5 (5.9)	546 (2.9)
2020	3,619	6.8 (3.7)	100 (2.8)	2,937	7.1 (4.0)	76 (2.6)	16,608	8.4 (5.9)	626 (3.8)
2021	3,793	6.8 (3.6)	112 (3.0)	2,929	7.2 (4.1)	81 (2.8)	16,112	8.5 (6.1)	642 (4.0)
2022	4,035	7.0 (3.8)	124 (3.1)	2,950	7.3 (4.6)	101 (3.4)	14,828	8.7 (6.3)	623 (4.2)
2023	4,547	6.9 (3.8)	154 (3.4)	3,192	7.3 (6.1)	82 (2.6)	15,039	8.6 (6.3)	631 (4.2)
2024	5,094	7.0 (4.0)	157 (3.1)	3,444	7.2 (4.4)	117 (3.4)	15,390	8.5 (5.9)	622 (4.0)

[a]HZ hospitalisation cases; [b]percentages are calculated based on the total number of HZ hospitalisations in a given age group in the given year.

Background

- HZ is caused by the reactivation of varicella zoster virus, presenting as a painful and blistering skin rash and may lead to severe complications requiring hospitalisation.[3]
- The lifetime risk of HZ has been estimated at around 30%, drastically increasing after the age of 50y.[4]
- Since 2018, HZ vaccination has been recommended in Germany for all adults aged ≥60y and adults aged 50–59y at increased risk. Furthermore, mandatory reimbursement of the recombinant zoster vaccine was introduced in Germany in 2019.[5]
- HZ hospitalisation rates in Germany are understudied, but previous data indicate they increase with age.[6]

Conclusions

HZ hospitalisations pose a substantial burden across age groups, particularly for patients aged ≥60y; rates in this group peaked in 2019 with 156.8 hospitalisations per 100,000 people due to primary and secondary diagnosis.

The decline in hospitalisation rates after 2019 in the ≥60y age group may be due to the implementation of HZ vaccination recommendations in Germany.

Between 2000–2024, HZ hospitalisation rates among adults aged 18–59y increased, highlighting the importance of HZ vaccination in younger age groups.

Abbreviations

HZ, herpes zoster; **ICU,** intensive care unit; **InEK,** Institute for the Hospital Remuneration System; **LoS,** length of stay; **SD,** standard deviation; **y,** years.

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Disclosures

FJ, SP, CR, MW, CM, SG: Employees of GSK. **JH, PM:** Employees of, and hold financial equities in, GSK. **IP:** Employee of, and holds financial equities in, GSK; holds financial equities in Haleon.

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Supplementary Results

Supplementary Table 1: **Annual HZ hospitalisation rates per 100,000 people based on primary diagnoses from 2000–2023 by age group (GENESIS)**[1]

Year	18–49y			50–59y			≥60y		
	Overall	Female	Male	Overall	Female	Male	Overall	Female	Male
2000	3.9	3.8	4.1	12.8	13.8	11.8	43.2	48.2	36.2
2001	4.2	3.7	4.6	12.8	14.1	11.4	45.6	51.3	37.8
2002	4.3	3.8	4.6	13.4	15.0	11.9	46.9	52.6	39.1
2003	4.3	4.0	4.7	13.1	15.1	11.1	47.1	52.0	40.4
2004	4.8	4.6	5.0	13.7	15.0	12.5	50.9	57.2	42.4
2005	5.2	4.9	5.4	14.3	16.1	12.5	52.1	57.3	45.3
2006	5.6	5.3	5.9	15.6	17.1	14.0	55.1	60.6	47.8
2007	5.9	5.3	6.4	16.3	19.4	13.2	60.0	65.7	52.5
2008	6.4	5.8	6.9	16.1	17.9	14.2	59.8	65.6	52.3
2009	6.3	5.9	6.7	16.6	17.5	15.7	60.8	67.0	52.9
2010	7.2	6.8	7.5	17.2	19.4	14.9	63.5	69.0	56.5
2011	7.9	7.1	8.8	18.6	21.0	16.3	67.3	73.3	59.6
2012	8.7	8.2	9.2	18.8	21.3	16.2	69.1	73.4	63.7
2013	9.0	8.1	9.8	19.9	22.5	17.3	72.8	79.2	64.7
2014	10.1	9.4	10.8	21.3	23.5	19.2	75.6	82.0	67.7
2015	10.3	9.4	11.2	21.1	23.7	18.5	76.2	82.6	68.2
2016	11.4	10.8	11.9	22.3	25.1	19.6	79.4	85.4	72.1
2017	11.9	11.9	12.0	23.2	25.3	21.0	79.0	85.9	70.5
2018	12.6	12.4	12.9	23.1	25.3	21.0	80.2	86.3	72.8
2019	13.3	13.0	13.7	25.1	27.8	22.6	81.6	87.7	74.0
2020	11.3	11.2	11.3	22.2	24.5	19.8	69.8	75.2	63.1
2021	12.0	11.9	12.0	22.4	24.4	20.4	66.7	72.2	60.1
2022	12.9	12.3	13.5	23.1	25.3	20.9	60.9	65.0	55.9
2023	14.3	14.7	14.0	25.8	29.3	22.3	60.8	65.7	54.9

Supplementary Table 2: **Annual number of HZ hospitalisation cases based on primary and secondary diagnoses from 2019–2024 by age group (InEK)**[2]

Year	Type of diagnosis	18–49y, n (%)[a]	50–59y, n (%)[a]	≥60y, n (%)[a]	Overall ≥18y, n
2019	Primary	4,290 (16.0)	3,348 (12.5)	19,108 (71.4)	26,746
	Secondary	1,483 (7.0)	1,770 (8.4)	17,838 (84.6)	21,091
	Any	5,773 (12.1)	5,118 (10.7)	36,946 (77.2)	47,837
2020	Primary	3,619 (15.6)	2,937 (12.7)	16,608 (71.7)	23,164
	Secondary	1,275 (6.9)	1,551 (8.4)	15,621 (84.7)	18,447
	Any	4,894 (11.8)	4,488 (10.8)	32,229 (77.5)	41,611
2021	Primary	3,793 (16.6)	2,929 (12.8)	16,112 (70.6)	22,834
	Secondary	1,234 (6.9)	1,539 (8.6)	15,112 (84.5)	17,885
	Any	5,027 (12.3)	4,468 (11.0)	31,224 (76.7)	40,719
2022	Primary	4,035 (18.5)	2,950 (13.5)	14,828 (68.0)	21,813
	Secondary	1,162 (7.0)	1,428 (8.6)	14,111 (84.5)	16,701
	Any	5,197 (13.5)	4,378 (11.4)	28,939 (75.1)	38,514
2023	Primary	4,547 (20.0)	3,192 (14.0)	15,039 (66.0)	22,778
	Secondary	1,266 (7.5)	1,422 (8.4)	14,247 (84.1)	16,935
	Any	5,813 (14.6)	4,614 (11.6)	29,286 (73.7)	39,713
2024	Primary	5,094 (21.3)	3,444 (14.4)	15,390 (64.3)	23,928
	Secondary	1,299 (8.3)	1,341 (8.6)	13,016 (83.1)	15,656
	Any	6,393 (16.2)	4,785 (12.1)	28,406 (71.8)	39,584

[a]Percentages are calculated based on the overall number of HZ hospitalisations for a given type of diagnosis across all three age groups.

Abbreviations

HZ, herpes zoster; **InEK,** Institute for the Hospital Remuneration System; **y,** years.

References

1. GENESIS-Online. Statistisches Bundesamt (Destatis), 2025. Available at: https://www-genesis.destatis.de/datenbank/online [Accessed 25 August 2025].
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