

## ***Supplementary Material***

Incidence and burden of herpes zoster in Sweden: a regional population-based register study

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**Table S1.** Definitions of HZ cases based on ICD-10 codes.

<i>ICD-10 code</i>	<i>Corresponding description</i>
B02	Zoster [herpes zoster]
B020	Zoster encephalitis
B021	Zoster meningitis
B023	Zoster ocular disease
B0230	Zoster ocular disease, unspecified
B0231	Zoster conjunctivitis
B0232	Zoster iridocyclitis
B0233	Zoster keratitis
B0234	Zoster scleritis
B0239	Other herpes zoster eye disease
B027	Disseminated zoster
B028	Zoster with other complications
B029	Zoster without complications

HZ, herpes zoster; ICD-10, International Classification of Diseases 10<sup>th</sup> revision

**Table S2.** Definitions of complications due to HZ based on ICD-10 codes.

<b>Herpes Zoster</b>	
<i>ICD-10 code</i>	<i>Corresponding description</i>
B022	Zoster with other nervous system involvement
B0221	Postherpetic geniculate ganglionitis
B0222	Postherpetic trigeminal neuralgia
B0223	Postherpetic polyneuropathy
B0224	Postherpetic myelitis
B0229	Other postherpetic nervous system involvement
G02.0*B02.1 G04.9*B02.2 G05.1*B02.0 G53.0 G53.0*B02.20 G53.0*B02.21 G63.0*B02.29 H03.1*B02.3 H13.1*B02.3 H19.0*B02.3 H19.2*B02.3 H22.0*B02.3 H62.1*B02.8 I68.1*B02.8	Other complications directly attributed to HZ

HZ, herpes zoster; ICD-10, International Classification of Diseases 10<sup>th</sup> revision

**Table S3.** Definition of herpes zoster related complications for brain and cardiovascular complications based on ICD-10 codes

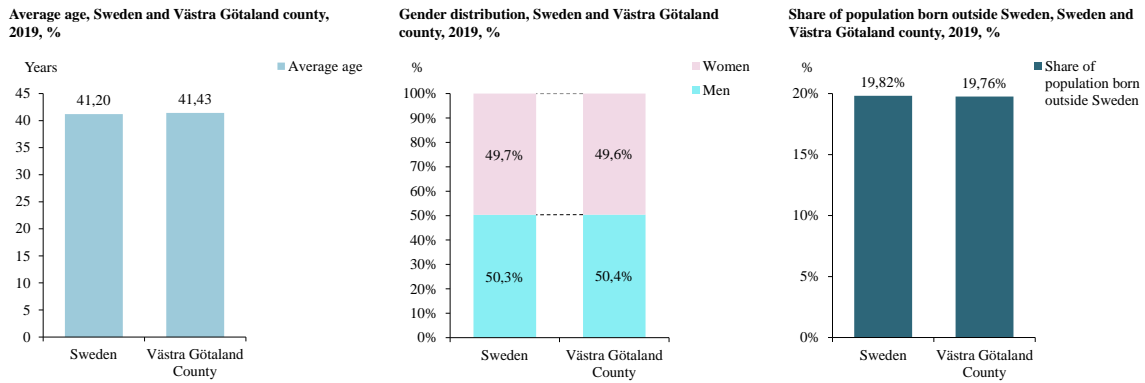
	<b>ICD-10 codes</b>
<b>Brain</b>	Stroke: I61, I62, I86 Cerebrovascular disease: I60, I65, I66, I67, I69
<b>Heart</b>	Myocardial infarction: I21 Other acute ischaemic heart diseases: I24 Acute pericarditis: I30

ICD-10, International Classification of Diseases 10<sup>th</sup> edition

**Table S4.** High-risk group conditions were defined based on ICD-10 codes.

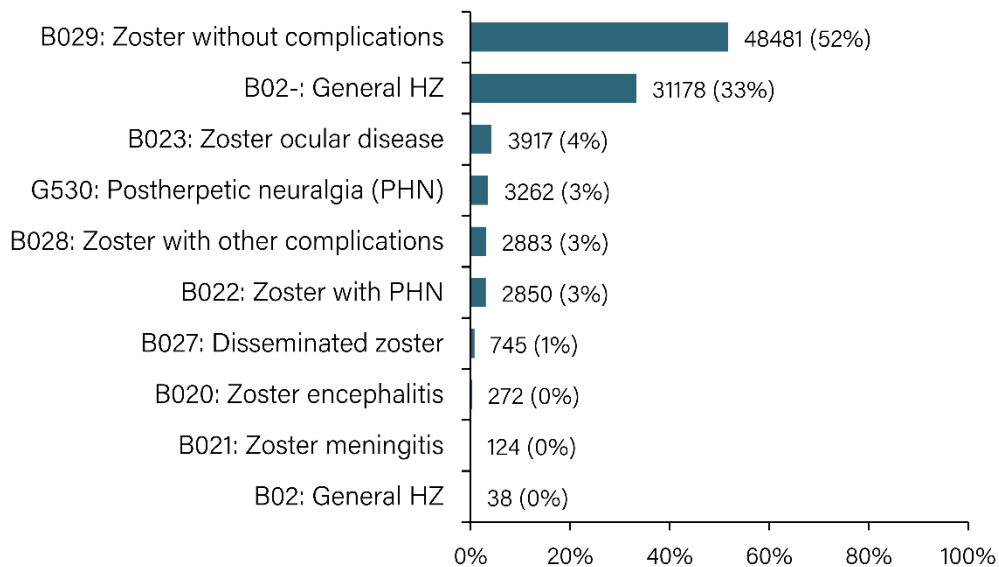
Category	Condition	Definition
IC conditions	Solid organ tumours [50]	C00-C26, C30-C34, C37-C41, C45, C47-C49, C4A, C50-C58, C60-C79, C7A, C7B
	Haematological malignancies [50]	C81-C86, C88, C90-C96
	HIV [50]	B21-B24
	Solid organ transplant [51]	T86.1-4, T86.81, T86.85, Z94.0-Z94.4, Z94.82, Z94.83, Z94.89, Z94.9
	Haematological stem cell transplant [52]	Z48.290, Z94.81, Z94.84
Comorbid conditions	COPD [50, 53]	(J41), J42-J44
	Asthma [50, 53]	J45, J46, (J82.83)
	Diabetes [50]	E10, E11, E13
Autoimmune conditions	Rheumatoid arthritis [50]	M05, M06, M45
	Multiple sclerosis [50]	G35
	Systemic lupus erythematosus [50]	M32
	Other inflammatory systemic diseases [50]	M33-M35
	Inflammatory bowel disease [50]	K50, K51, (K52)
	Psoriasis [54]	L40.0, L40.1, L40.2 L40.4, L40.5, L40.8, L40.9, M07.0, M07.1, M07.2, M07.3

COPD, chronic obstructive pulmonary disease; HIV, human immunodeficiency virus; IC, immunocompromised; ICD-10, International Classification of Diseases 10<sup>th</sup> edition



VGR, Västra Götaland Region

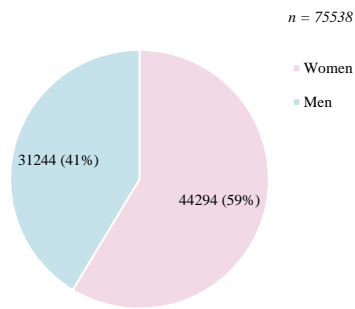
**Figure S1.** Comparison of population characteristics between VGR and Sweden.



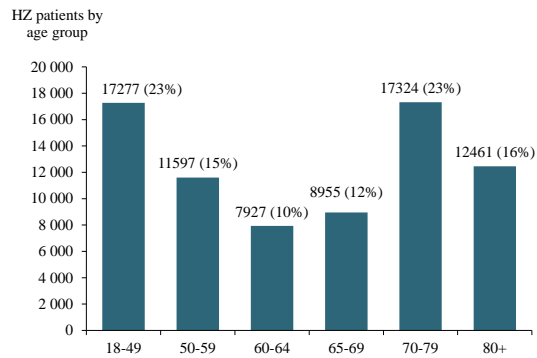
HZ, herpes zoster; ICD-10, International Classification of Diseases 10th Revision; PHN, postherpetic neuralgia

**Figure S2.** Number and proportion of patients with HZ and its complications by diagnosis (ICD-10 codes), Sweden, 2005–2021.

Patients by gender



Patients by age group



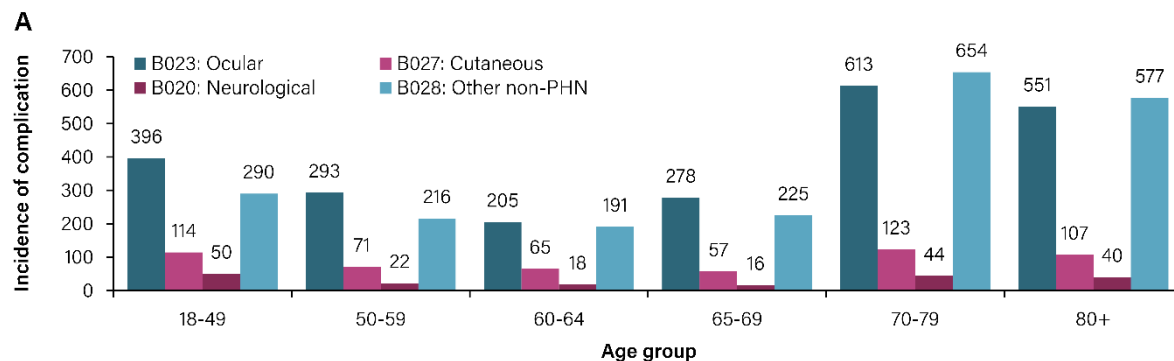
HZ, herpes zoster; VGR, Västra Götaland Region

**Figure S3.** Individuals with an HZ diagnosis in Västra Götaland Region, 2005–2021.

**Table S5.** The incidence rate of HZ and PHN stratified by age group (per 1,000 PY) in Västra Götaland Region, Sweden 2005–2021.

Age group (years)	HZ			PHN		
	n	%	IR (95% CI)	n	%	IR (95% CI)
<b>18–49</b>	18,105	21.89	1.55 (1.53–1.57)	393	7.60	0.03 (0.03–0.04)
<b>50–59</b>	12,439	15.04	3.59 (3.52–3.65)	479	9.26	0.14 (0.13–0.15)
<b>60–64</b>	8,603	10.40	5.25 (5.14–5.36)	385	7.45	0.24 (0.21–0.26)
<b>65–69</b>	9,763	11.80	6.58 (6.45–6.71)	542	10.8	0.37 (0.33–0.40)
<b>70–79</b>	19,433	23.49	8.71 (8.58–8.83)	1,638	31.68	0.73 (0.70–0.77)
<b>80+</b>	14,369	17.37	9.94 (9.77–10.10)	1,733	33.52	1.20 (1.14–1.25)
<b>Total</b>	82,712	100.00	3.77 (3.74–3.79)	5,170	100.00	0.24 (0.23–0.24)

HZ, herpes zoster; IR, incidence rate; PHN, postherpetic neuralgia; PY, person-years



HZ, herpes zoster; PHN, post-herpetic neuralgia

\*A disease episode is defined as an episode of healthcare visits starting with an index event with an HZ diagnosis (ICD-10 code starting with B02) and has a washout period of 365 days. A complication episode is defined as a disease episode where at least one healthcare visit during the disease episode has a diagnosis of the complication (ICD-10 code of B028 for other non-PHN, B027 for cutaneous and B020 for neurological complications).

**Figure S4.** Incidence of HZ episodes with non-PHN complications stratified by age, 2012–2020.\*

**Table S6.** Incidence of cerebral and cardiovascular by age group.\* A comparison between patients with HZ and the general population between 2012 and 2020.

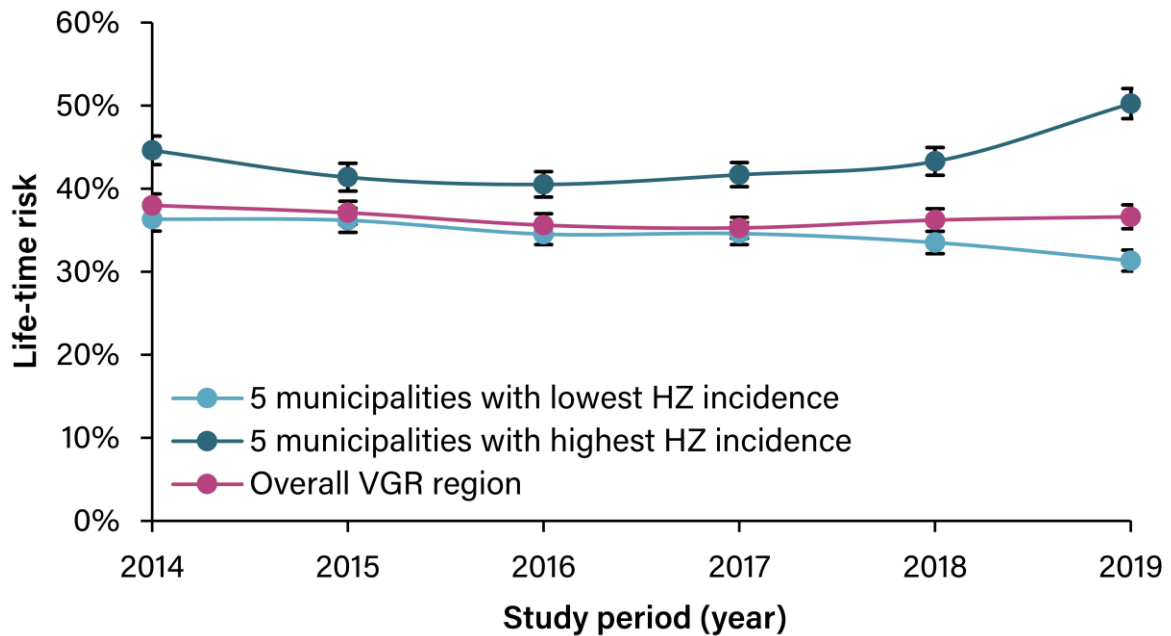
Age group (years)	Stroke (I61, I62, I64)		Cerebrovascular disease (I60, I65-67, I69)		Myocardial infarction (I21)		Other ischaemic disease (I24)		Myocarditis (I40)		Pericarditis (I30)	
	HZ	Baseline	HZ	Baseline	HZ	Baseline	HZ	Baseline	HZ	Baseline	HZ	Baseline
18–49	0.01%	0.01%	0.10%	0.01%	0.03%	0.02%	0.00%	0.00%	0.01%	0.01%	0.01%	0.01%
50–59	0.04%	0.03%	0.19%	0.04%	0.05%	0.17%	0.00%	0.00%	0.01%	0.00%	0.00%	0.01%

60–64	0.05%	0.06%	0.24%	0.05%	0.06%	0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
65–69	0.10%	0.08%	0.37%	0.07%	0.05%	0.41%	0.01%	0.00%	0.01%	0.01%	0.00%	0.01%
70–79	0.30%	0.15%	1.30%	0.11%	0.26%	0.60%	0.01%	0.00%	0.00%	0.00%	0.02%	0.01%
80+	0.30%	0.37%	1.40%	0.18%	0.24%	1.25%	0.01%	0.01%	0.01%	0.00%	0.01%	0.01%

HZ, herpes zoster

\* A disease episode is defined as an episode of healthcare visits starting with an index event with an HZ diagnosis (ICD-10 code starting with B02 in any diagnosis field) and has a washout period of 365 days. A complication is recorded for a patient with HZ if it is diagnosed within 365 days after the HZ index event. The baselines for all complications above were calculated using only inpatient and specialised care data from the Swedish National Board of Health and Welfare statistics database, while the HZ numbers also include primary care all care.



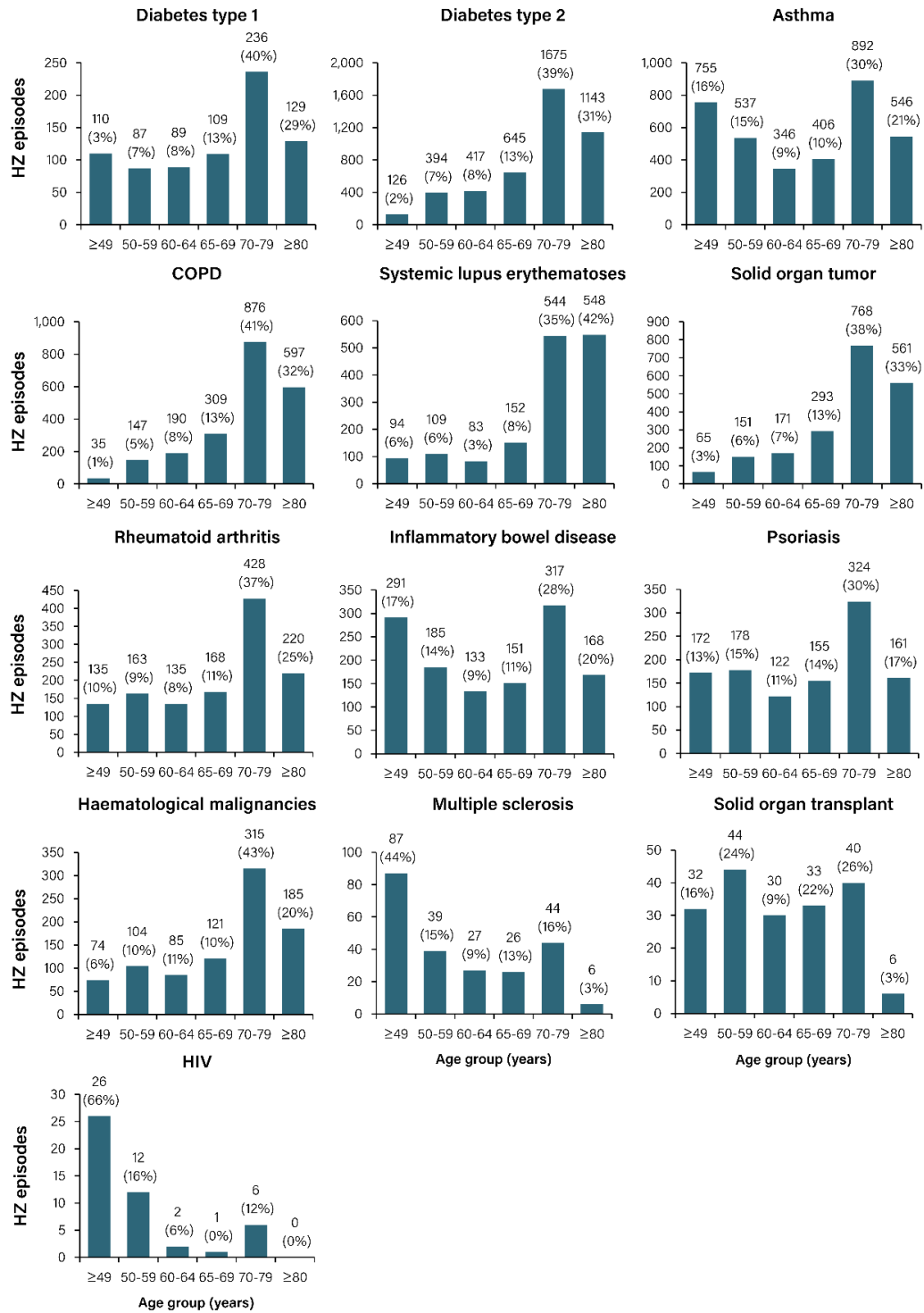


**Figure S5.** Average standardized cumulative risk (lifetime risk) across all age groups and five municipalities each with the lowest and highest incidence of HZ per year (excluding recurrences), in Västra Götaland Region, 2014–2019. HZ, herpes zoster. The standardized cumulative risk was estimated using 5-year age groups (with the exception of the youngest age-group consisting of 7 years, 18-24 years of age) according to the formula:

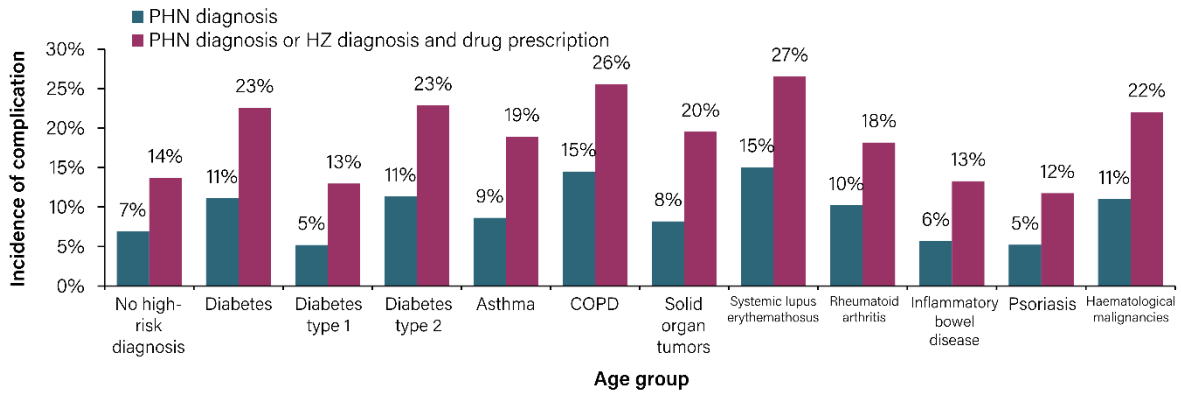
$\sum_{j=1}^{16} 5 \times S_j \times R_j$ , where  $j$  represents each age group,  $S_j$  the survival rate of age group  $j$  and

$R_j$  the disease rate (incidence) within age group  $j$ . Note that the survival rate,  $S_j$ , is taken from the survival rate of the age group for the whole region, not just for the chosen municipalities.

Further note that the 7-year age group is multiplied by 7 instead of 5.



**Figure S6.** Distribution of HZ by age-group and high-risk group in Västra Götaland Region, Sweden, 2012–2020. COPD, chronic obstructive pulmonary disease; HIV, human immunodeficiency virus; HZ, herpes zoster.



**Figure S7.** Cumulative incidence of HZ episodes with PHN complications in 2019 as a proportion of total HZ cases in the population, based on diagnosis and drug prescriptions, in Västra Götaland Region, Sweden. COPD, chronic obstructive pulmonary disease; HZ, herpes zoster; PHN, postherpetic neuralgia