

Supplementary Table S1. Three-year Bell’s palsy risk: age-restricted cohort (50–59) vs overall cohort (18–89).

This table compares the three-year risk of Bell’s palsy between COVID-19 survivors with and without herpes zoster (HZ) reactivation in both the age-restricted cohort (50–59 years) and the overall cohort (18–89 years). Results are presented as unadjusted hazard ratios (HRs) with 95% confidence intervals (CIs) derived from the pre-matching cohort.

| Age strata | Outcomes | Cohorts | Patients in cohort | Patients with outcome | Odds Ratio | Survival probability at end of time window | Hazard Ratio | 95% CI | Log-Rank test P-value |
|-----------------------------|--------------|------------|--------------------|-----------------------|------------|--|--------------|----------------|-----------------------|
| 50~59 Years | Bell's palsy | COVID + HZ | 21,162 | 235 | 4.959 | 98.817% | 4.159 | (3.049, 5.673) | <0.0001 |
| | | COVID - HZ | 21,243 | 48 | | 99.706% | | | |
| 18~89 years (Entire cohort) | | COVID + HZ | 109,010 | 1,095 | 4.638 | 98.91% | 3.625 | (3.151, 4.170) | |
| | | COVID - HZ | 109,487 | 239 | | 99.70% | | | |

Abbreviations: COVID-19, coronavirus disease 2019; HZ, herpes zoster; COVID+HZ, COVID-19 survivors with subsequent herpes zoster reactivation; COVID–HZ, COVID-19 survivors without herpes zoster reactivation; HR, hazard ratio; CI, confidence interval.

Supplementary Table S2. Three-year risks and associations of peripheral nervous system outcomes in COVID-19 survivors with and without herpes zoster reactivation.

This table presents the cumulative incidence, absolute risk differences, and relative measures for Bell’s palsy, Guillain–Barré syndrome, and myasthenia gravis among COVID-19 survivors with and without herpes zoster (HZ) reactivation. Results are reported as risk ratios (RRs), odds ratios (ORs), and hazard ratios (HRs) with 95% confidence intervals (CIs) over a three-year follow-up period.

| Outcomes | Cohorts | Patients in cohort | Patients with outcome | Risk | Risk Difference | Risk Ratio | Odds Ratio | 95% CI | P value |
|-------------------------|------------|--------------------|-----------------------|-------|-----------------|------------|------------|--------------|---------|
| Bell’s palsy | COVID + HZ | 109,010 | 1,095 | 0.010 | 0.008 | 4.602 | 4.638 | 4.031, 5.336 | 0.000 |
| | COVID - HZ | 109,487 | 239 | 0.002 | | | | | |
| Guillain–Barré syndrome | COVID + HZ | 109,918 | 79 | 0.001 | 0.000 | 2.325 | 2.326 | 1.556, 3.477 | 0.000 |
| | COVID - HZ | 109,975 | 34 | 0.000 | | | | | |
| Myasthenia gravis | COVID + HZ | 109,726 | 108 | 0.001 | 0.001 | 2.080 | 2.081 | 1.494, 2.897 | 0.000 |
| | COVID - HZ | 109,871 | 52 | 0.000 | | | | | |

Abbreviations: COVID-19, coronavirus disease 2019; HZ, herpes zoster; COVID+HZ, COVID-19 survivors with subsequent herpes zoster reactivation; COVID–HZ, COVID-19 survivors without herpes zoster reactivation; HR, hazard ratio; CI, confidence interval.

Supplementary Table S3. Landmark analysis of peripheral nervous system outcomes.

This table compares the 1-, 2-, and 3-year risks of Bell’s palsy, Guillain–Barré syndrome, and myasthenia gravis between COVID-19 survivors with and without herpes zoster (HZ) reactivation. Results are reported as odds ratios (ORs) and hazard ratios (HRs) with 95% confidence intervals (CIs) at each time point, illustrating temporal patterns of risk over the follow-up period.

| Follow up, years | Outcomes | Cohorts | Patients in cohort | Patients with outcome | Odds Ratio | Survival probability at end of time window | Hazard Ratio | 95% CI | Log-Rank test P value |
|------------------|-------------------------|------------|--------------------|-----------------------|------------|--|--------------|----------------|-----------------------|
| 1 | Bell's palsy | COVID + HZ | 96,794 | 422 | 4.295 | 99.56% | 3.604 | (2.896, 4.486) | 0.000 |
| | | COVID - HZ | 97,202 | 99 | | 99.88% | | | |
| 2 | | COVID + HZ | 109,010 | 814 | 4.754 | 99.22% | 3.828 | (3.249, 4.511) | 0.000 |
| | | COVID - HZ | 109,487 | 173 | | 99.80% | | | |
| 3 | | COVID + HZ | 109,010 | 1,095 | 4.638 | 98.91% | 3.625 | (3.151, 4.170) | 0.000 |
| | | COVID - HZ | 109,487 | 239 | | 99.70% | | | |
| 1 | Guillain-Barré syndrome | COVID + HZ | 97,604 | 33 | 1.436 | 99.97% | 1.223 | (0.718, 2.084) | 0.458 |
| | | COVID - HZ | 97,643 | 23 | | 99.97% | | | |
| 2 | | COVID + HZ | 109,918 | 60 | 2.502 | 99.94% | 2.066 | (1.287, 3.318) | 0.002 |
| | | COVID - HZ | 109,975 | 24 | | 99.97% | | | |
| 3 | | COVID + HZ | 109,918 | 79 | 2.326 | 99.92% | 1.858 | (1.243, 2.779) | 0.002 |
| | | COVID - HZ | 109,975 | 34 | | 99.96% | | | |
| 1 | Myasthenia gravis | COVID + HZ | 97,424 | 40 | 1.821 | 99.96% | 1.524 | (0.906, 2.564) | 0.110 |
| | | COVID - HZ | 97,566 | 22 | | 99.97% | | | |
| 2 | | COVID + HZ | 109,726 | 80 | 2.109 | 99.92% | 1.715 | (2.139, 4.666) | 0.006 |
| | | COVID - HZ | 109,871 | 38 | | 99.96% | | | |
| 3 | | COVID + HZ | 109,726 | 108 | 2.081 | 99.89% | 1.640 | (1.178, 2.284) | 0.003 |
| | | COVID - HZ | 109,871 | 52 | | 99.94% | | | |

Abbreviations: COVID-19, coronavirus disease 2019; HZ, herpes zoster; COVID+HZ, COVID-19 survivors with subsequent herpes zoster reactivation; COVID–HZ, COVID-19 survivors without herpes zoster reactivation; HR, hazard ratio; CI, confidence interval.

Supplementary Table S4. Sensitivity analysis of peripheral nervous system outcomes excluding patients with prior immunosuppression.

This table compares the three-year risk of peripheral nervous system outcomes between COVID-19 survivors with and without herpes zoster (HZ) reactivation.

Results are presented for the overall cohort and for a sensitivity cohort excluding individuals with documented immunosuppression in the year prior to COVID-19 diagnosis. Data are reported as hazard ratios (HRs) with 95% confidence intervals (CIs).

| Exclude immunosuppression* | Outcomes | Cohorts | Patients in cohort | Patients with outcome | Odds Ratio | Survival probability at end of time window | Hazard Ratio | 95% CI | Log-Rank test P-value |
|----------------------------|-------------------------|------------|--------------------|-----------------------|------------|--|--------------|----------------|-----------------------|
| Yes | Bell's palsy | COVID + HZ | 91,892 | 916 | 4.879 | 98.92% | 3.744 | (3.202, 4.378) | 0.000 |
| | | COVID - HZ | 92,265 | 190 | | 99.71% | | | |
| No (Entire cohort) | | COVID + HZ | 109,010 | 1,095 | 4.638 | 98.91% | 3.625 | (3.151, 4.170) | 0.000 |
| | | COVID - HZ | 109,487 | 239 | | 99.70% | | | |
| Yes | Guillain-Barré syndrome | COVID + HZ | 92,603 | 60 | 3.160 | 99.93% | 2.505 | (1.495, 4.198) | 0.000 |
| | | COVID - HZ | 92,625 | 19 | | 99.97% | | | |
| No (Entire cohort) | | COVID + HZ | 109,918 | 79 | 2.326 | 99.92% | 1.858 | (1.243, 2.779) | 0.002 |
| | | COVID - HZ | 109,975 | 34 | | 99.96% | | | |
| Yes | Myasthenia gravis | COVID + HZ | 92,478 | 81 | 1.979 | 99.91% | 1.523 | (1.046, 2.217) | 0.027 |
| | | COVID - HZ | 92,591 | 41 | | 99.94% | | | |
| No (Entire cohort) | | COVID + HZ | 109,726 | 108 | 2.081 | 99.89% | 1.640 | (1.178, 2.284) | 0.003 |
| | | COVID - HZ | 109,871 | 52 | | 99.94% | | | |

Abbreviations: COVID-19, coronavirus disease 2019; HZ, herpes zoster; COVID+HZ, COVID-19 survivors with subsequent herpes zoster reactivation; COVID–HZ, COVID-19 survivors without herpes zoster reactivation; HR, hazard ratio; CI, confidence interval.

Supplementary Table S5A. Within-cohort effects of COVID-19 vaccination on peripheral nervous system outcomes.

This table compares the three-year risk of Bell’s palsy, Guillain–Barré syndrome, and myasthenia gravis between vaccinated and unvaccinated individuals within COVID-19 survivor cohorts stratified by herpes zoster (HZ) status. Results are reported as hazard ratios (HRs) with 95% confidence intervals (CIs).

| Outcomes | Cohort characteristics | | | | KM - survival analysis | | | |
|-------------------------|---------------------------------|------------------------|-----------------------|------------|------------------------|--------------|----------------|-----------------------|
| | Cohort (comparison) | Patients in cohort | Patients with outcome | Odds ratio | Survival probability | Hazard ratio | 95% CI | Log-Rank test P value |
| Bell's palsy | COVID-19 + HZ Vaccine (- vs. +) | 18,500 vs 18,471 | 161 vs 183 | 0.877 | 99.06% vs 99.98% | 0.923 | (0.746, 1.140) | 0.456 |
| | COVID-19 - HZ Vaccine (- vs. +) | 1,115,714 vs 1,113,882 | 2,080 vs 2,887 | 0.719 | 99.73% vs 99.71% | 0.922 | (0.871, 0.975) | 0.005 |
| Guillain-Barré syndrome | COVID-19 + HZ Vaccine (- vs. +) | 18,662 vs 18,671 | 10 vs 15 | 0.667 | 99.94% vs 99.92% | 0.695 | (0.312, 1.548) | 0.371 |
| | COVID-19 - HZ Vaccine (- vs. +) | 1,120,141 vs 1,120,081 | 355 vs 390 | 0.910 | 99.96% vs 99.96% | 1.144 | (0.991, 1.321) | 0.066 |
| Myasthenia gravis | COVID-19 + HZ Vaccine (- vs. +) | 18,642 vs 18,613 | 17 vs 19 | 0.893 | 99.90% vs 99.89% | 0.953 | (0.495, 1.834) | 0.885 |
| | COVID-19 - HZ Vaccine (- vs. +) | 1,119,571 vs 1,119,268 | 496 vs 616 | 0.805 | 99.94% vs 99.94% | 1.030 | (0.915, 1.160) | 0.622 |

Abbreviations: COVID-19, coronavirus disease 2019; HZ, herpes zoster; COVID+HZ, COVID-19 survivors with subsequent herpes zoster reactivation; COVID–HZ, COVID-19 survivors without herpes zoster reactivation; HR, hazard ratio; CI, confidence interval.

Supplementary Table S5B. Association between herpes zoster and peripheral nervous system outcomes stratified by COVID-19 vaccination status.

This table compares the three-year risk of Bell’s palsy, Guillain–Barré syndrome, and myasthenia gravis between COVID-19 survivors with and without herpes zoster (HZ) reactivation, stratified by vaccination status. Results are reported as hazard ratios (HRs) with 95% confidence intervals (CIs).

| Outcomes | Cohort characteristics | | | | KM - survival analysis | | | |
|-------------------------|-------------------------------|---|-----------------------|------------|------------------------|--------------|----------------|-----------------------|
| | Cohort (comparison) | Patients in cohort | Patients with outcome | Odds ratio | Survival probability | Hazard ratio | 95% CI | Log-Rank test P value |
| Bell's palsy | Vaccination C+H vs. C-H | 18,471 vs 18,557 | 183 vs 47 | 3.941 | 98.976% vs 99.721% | 3.685 | (2.674, 5.077) | <0.0001 |
| | No Vaccination C+H vs. C-H | 90,535 vs 90,896 | 912 vs 171 | 5.399 | 98.90% vs 99.73% | 4.138 | (3.514, 4.873) | 0.000 |
| Guillain-Barré syndrome | Vaccination C+H vs. C-H | <i>Based on the outcome terms, the patient count is too small, so detailed results cannot be displayed.</i> | | | | | | |
| | No Vaccination C+H vs. C-H | 91,243 vs 91,283 | 64 vs 29 | 2.209 | 99.92% vs 99.96% | 1.736 | (1.119, 2.693) | 0.013 |
| Myasthenia gravis | Vaccination C+H vs. C-H | 18,613 vs 18,657 | 19 vs 14 | 1.361 | 99.893% vs 99.919% | 1.282 | (0.643, 2.557) | 0.4797 |
| | No Vaccination C+H vs. C-H | 91,109 vs 91,225 | 89 vs 49 | 1.819 | 99.89% vs 99.92% | 1.396 | (0.985, 1.979) | 0.060 |

Abbreviations: COVID-19, coronavirus disease 2019; HZ, herpes zoster; COVID+HZ, COVID-19 survivors with subsequent herpes zoster reactivation; COVID–HZ, COVID-19 survivors without herpes zoster reactivation; HR, hazard ratio; CI, confidence interval.

Supplementary Table S6. Sensitivity analysis excluding individuals with influenza and HIV infection.

This table compares the three-year risk of peripheral nervous system outcomes between COVID-19 survivors with and without herpes zoster (HZ) reactivation after excluding individuals with influenza or HIV infection within the defined time window. Results are reported as hazard ratios (HRs) with 95% confidence intervals (CIs).

| Exclude HIV & Influenza | Outcomes | Cohorts | Patients in cohort | Patients with outcome | Survival probability at end of time window | Hazard Ratio | 95% CI | Log-Rank test P-value |
|-------------------------|-------------------------|------------|--------------------|-----------------------|--|--------------|---------------|-----------------------|
| Yes | Bell's palsy | COVID + HZ | 9,390 | 814 | 98.914% | 4.173 | (3.515,4.952) | <0.0001 |
| | | COVID - HZ | 79,711 | 156 | 99.738% | | | |
| No (Entire cohort) | | COVID + HZ | 94,613 | 996 | 98.878% | 3.607 | (3.118,4.172) | |
| | | COVID - HZ | 95,030 | 222 | 99.686% | | | |
| Yes | Guillain-Barré syndrome | COVID + HZ | 80,024 | 55 | 99.928% | 2.318 | (1.375,3.906) | 0.001 |
| | | COVID - HZ | 80,058 | 19 | 99.969% | | | |
| No (Entire cohort) | | COVID + HZ | 95,393 | 74 | 99.918% | 1.617 | (1.089,2.4) | |
| | | COVID - HZ | 95,437 | 37 | 99.950% | | | |
| Yes | Myasthenia gravis | COVID + HZ | 79,904 | 75 | 99.901% | 1.533 | (1.041,2.258) | 0.029 |
| | | COVID - HZ | 80,030 | 39 | 99.935% | | | |
| No (Entire cohort) | | COVID + HZ | 95,234 | 98 | 99.891% | 1.542 | (1.099,2.164) | |
| | | COVID - HZ | 95,392 | 51 | 99.929% | | | |

Abbreviations: HZ, herpes zoster; COVID-19, coronavirus disease 2019; COVID+ HZ, COVID-19 survivors with HZ reactivation; COVID- HZ, COVID-19 survivors without HZ reactivation; HR, hazard ratio; CI, confidence interval.

Supplementary Table S7. Comparison of Incident Cases and Diagnostic Frequency for Peripheral Nervous System Disorders in COVID-19 Survivors With and Without Herpes Zoster

This table compares incident cases and total diagnostic counts of peripheral nervous system outcomes between COVID-19 survivors with and without herpes zoster (HZ) reactivation. Results are presented to evaluate potential differences in diagnostic intensity between cohorts.

| Outcomes | Characteristic | Cohort | Patients in cohort | Patients with outcome | Average (B/A) | Outcome P value (C+H vs. C-H) |
|-------------------------|-------------------------|------------|--------------------|-----------------------|-------------------|-------------------------------|
| Bell's palsy | (A) Incident case | COVID + HZ | 95,784 | 1,009 | 1303/1009 = 1.291 | p < 0.0001 |
| | | COVID - HZ | 96,202 | 190 | 289/190 = 1.521 | |
| | (B) Number of diagnoses | COVID + HZ | 96,695 | 1,303 | | p < 0.0001 |
| | | COVID - HZ | 96,695 | 289 | | |
| Guillain-Barré syndrome | (A) Incident case | COVID + HZ | 96,570 | 76 | 136/76 = 1.789 | p < 0.0001 |
| | | COVID - HZ | 96,617 | 30 | 64/30 = 2.133 | |
| | (B) Number of diagnoses | COVID + HZ | 96,695 | 136 | | 0.0015 |
| | | COVID - HZ | 96,695 | 64 | | |
| Myasthenia gravis | (A) Incident case | COVID + HZ | 96,410 | 101 | 323/104 = 3.106 | p < 0.0001 |
| | | COVID - HZ | 96,564 | 45 | 130/45 = 2.889 | |
| | (B) Number of diagnoses | COVID + HZ | 96,695 | 323 | | p < 0.0001 |
| | | COVID - HZ | 96,695 | 130 | | |

Abbreviations: HZ, herpes zoster; COVID-19, coronavirus disease 2019; COVID+ HZ, COVID-19 survivors with subsequent HZ reactivation; COVID- HZ, COVID-19 survivors without HZ reactivation.

Supplementary Table S8. Comparison of nerve conduction velocity (NCV) examination utilization.

This table compares the utilization of nerve conduction velocity (NCV) examinations between COVID-19 survivors with and without herpes zoster (HZ) reactivation.

Results are presented to evaluate whether increased diagnostic activity may reflect greater clinical evaluation rather than coding-related overdiagnosis.

| Outcome | Cohort | Patients in cohort | Patients with outcome | Mean | Standard Deviation | P value |
|---------------------------|------------|--------------------|-----------------------|-------|--------------------|------------|
| Number of NCV examination | COVID + HZ | 96,695 | 3,845 | 0.054 | 0.386 | p < 0.0001 |
| | COVID - HZ | 96,695 | 1,801 | 0.022 | 0.186 | |

Abbreviations: HZ, herpes zoster; COVID-19, coronavirus disease 2019; COVID+ HZ, COVID-19 survivors with subsequent HZ reactivation; COVID- HZ, COVID-19 survivors without HZ reactivation; NCV, nerve conduction velocity.

Supplementary Table S9. Time-window–based sensitivity analysis by timing of herpes zoster onset.

This sensitivity analysis assesses potential immortal time bias by categorizing the timing of HZ onset after the COVID-19 index date into specific windows (6, 12, 24, and 36 months). For each time window, a separate 1:1 propensity score-matched cohort was constructed.

| Incident HZ after COVID-19 | Outcomes | Cohorts | Patients in cohort | Patients with outcome | Survival probability at end of time window | Hazard Ratio | 95% CI | Log-Rank test P value |
|----------------------------|-------------------------|------------|--|-----------------------|--|--------------|----------------|-----------------------|
| 6 months | Bell's palsy | COVID + HZ | 20,978 | 243 | 98.765% | 5.02 | (3.629,6.942) | <0.0001 |
| | | COVID - HZ | 21,100 | 43 | 99.723% | | | |
| 12 months | | COVID + HZ | 37,608 | 408 | 98.84% | 4.332 | (3.413, 5.499) | <0.0001 |
| | | COVID - HZ | 37,803 | 81 | 99.70% | | | |
| 24 months | | COVID + HZ | 67,563 | 729 | 98.85% | 4.279 | (3.573, 5.125) | <0.0001 |
| | | COVID - HZ | 67,866 | 141 | 99.72% | | | |
| 36 months | | COVID + HZ | 94,613 | 996 | 98.878% | 3.607 | (3.118,4.172) | <0.0001 |
| | | COVID - HZ | 95,030 | 222 | 99.686% | | | |
| 6 months | Guillain-Barré syndrome | COVID + HZ | Based on the outcome terms, the patient count is too small, so detailed results cannot be displayed. | | | | | Nil |
| | | COVID - HZ | | | | | | |
| 12 months | | COVID + HZ | 37,945 | 27 | 99.92% | 2.302 | (1.114, 4.756) | 0.020 |
| | | COVID - HZ | 37,967 | 10 | 99.97% | | | |
| 24 months | | COVID + HZ | 68,130 | 49 | 99.92% | 2.027 | (1.205, 3.409) | 0.007 |
| | | COVID - HZ | 68,162 | 20 | 99.96% | | | |
| 36 months | | COVID + HZ | 95,393 | 74 | 99.918% | 1.617 | (1.089,2.4) | 0.016 |
| | | COVID - HZ | 95,437 | 37 | 99.950% | | | |
| 6 months | Myasthenia gravis | COVID + HZ | 21,144 | 14 | 99.923% | 0.637 | (0.32,1.271) | 0.197 |
| | | COVID - HZ | 21,173 | 19 | 99.878% | | | |
| 12 months | | COVID + HZ | 37,890 | 33 | 99.90% | 1.069 | (0.639, 1.787) | 0.800 |
| | | COVID - HZ | 37,938 | 26 | 99.91% | | | |
| 24 months | | COVID + HZ | 68,022 | 66 | 99.90% | 1.311 | (0.888, 1.936) | 0.172 |
| | | COVID - HZ | 68,120 | 41 | 99.92% | | | |
| 36 months | | COVID + HZ | 95,234 | 98 | 99.891% | 1.542 | (1.099,2.164) | 0.012 |
| | | COVID - HZ | 95,392 | 51 | 99.929% | | | |

Abbreviations: HZ, herpes zoster; COVID-19, coronavirus disease 2019; COVID+ HZ, COVID-19 survivors with subsequent HZ reactivation; COVID- HZ, COVID-19 survivors without HZ reactivation; HR, hazard ratio; CI, confidence interval.

Supplementary Table S10. Sensitivity Analysis Excluding Individuals With Peripheral Nervous System Outcomes Occurring Prior to or Concurrent With the First Recorded Herpes Zoster Episode.

This table compares the three-year risk of peripheral nervous system outcomes between COVID-19 survivors with and without herpes zoster (HZ) reactivation after excluding individuals whose outcomes occurred prior to or on the same date as the first recorded HZ episode. Results are presented alongside the entire cohort to assess the temporal relationship between HZ exposure and outcome occurrence. Hazard ratios (HRs) with 95% confidence intervals (CIs) are reported.

| Exclude PNS before first HZ | Outcomes | Cohorts | Patients in cohort | Patients with outcome | Survival probability at end of time window | Hazard Ratio | 95% CI | Log-Rank test P-value |
|-----------------------------|-------------------------|------------|--------------------|-----------------------|--|--------------|---------------|-----------------------|
| Yes | Bell's palsy | COVID + HZ | 94,560 | 367 | 99.579% | 1.428 | (1.203,1.696) | <0.0001 |
| | | COVID - HZ | 94,494 | 202 | 99.713% | | | |
| No (Entire cohort) | | COVID + HZ | 94,613 | 996 | 98.878% | 3.607 | (3.118,4.172) | |
| | | COVID - HZ | 95,030 | 222 | 99.686% | | | |
| Yes | Guillain-Barré syndrome | COVID + HZ | 94,948 | 30 | 99.966% | 0.701 | (0.429,1.146) | 0.155 |
| | | COVID - HZ | 94,924 | 34 | 99.953% | | | |
| No (Entire cohort) | | COVID + HZ | 95,393 | 74 | 99.918% | 1.617 | (1.089,2.4) | |
| | | COVID - HZ | 95,437 | 37 | 99.950% | | | |
| Yes | Myasthenia gravis | COVID + HZ | 94,946 | 35 | 99.96% | 0.460 | (0.303,0.698) | 0.0002 |
| | | COVID - HZ | 94,863 | 60 | 99.916% | | | |
| No (Entire cohort) | | COVID + HZ | 95,234 | 98 | 99.891% | 1.542 | (1.099,2.164) | |
| | | COVID - HZ | 95,392 | 51 | 99.929% | | | |

Abbreviations: COVID-19, coronavirus disease 2019; HZ, herpes zoster; PNS, peripheral nervous system; HR, hazard ratio; CI, confidence interval.

Supplementary Table S11. Comparison of Hospitalization Burden between COVID-19 Survivors with and Without Herpes Zoster

This table compares the number of hospitalizations between COVID-19 survivors with and without HZ reactivation. Results are presented as mean and standard deviation (SD) to assess differences in healthcare utilization between cohorts.

| Outcome | Cohort | Patients in cohort | Patients with outcome | Mean | Standard Deviation | P value |
|---------------------------|------------|--------------------|-----------------------|-------|--------------------|------------|
| Number of Hospitalization | COVID + HZ | 96,695 | 40,295 | 2.532 | 6.98 | p < 0.0001 |
| | COVID - HZ | 96,695 | 30,546 | 1.446 | 4.717 | |

Abbreviations: HZ, herpes zoster; COVID-19, coronavirus disease 2019; COVID+ HZ, COVID-19 survivors with subsequent HZ reactivation; COVID- HZ, COVID-19 survivors without HZ reactivation.

Supplementary Table S12. Impact of Anti-Herpes Zoster Therapy on 3-Year Incidence of Bell's palsy in Patients with Concurrent COVID-19 and Herpes Zoster

This table compares the 3-year risk of Bell's palsy between patients with and without anti-herpes zoster therapy among COVID-19 survivors with herpes zoster (HZ). Results are presented using Kaplan–Meier analysis and hazard ratios (HRs) with 95% confidence intervals (CIs).

| Outcomes | Cohort characteristics: COVID-19 + HZ | | | | KM - survival analysis | | | |
|--------------|---------------------------------------|--------------------|-----------------------|------------|------------------------|--------------|---------------|-----------------------|
| | Cohort | Patients in cohort | Patients with outcome | Odds ratio | Survival probability | Hazard ratio | 95% CI | Log-Rank test P value |
| Bell's palsy | + Anti-HZ | 1,661 | 27 | 1.366 | 98.203% | 1.378 | (0.773,2.457) | 0.275 |
| | - Anti-HZ | 1,673 | 20 | | 98.729% | | | |

Abbreviations: HZ, herpes zoster; COVID-19, coronavirus disease 2019; + Anti-HZ, received anti-herpes zoster therapy; - Anti-HZ, did not receive anti-herpes zoster therapy; HR, hazard ratio; CI, confidence interval.

Supplementary Table S13. Sensitivity analysis of herpes zoster vaccination and Bell's palsy risk.

This table evaluates the impact of herpes zoster (HZ) vaccination on the 3-year risk of Bell's palsy. Results for Guillain–Barré syndrome and myasthenia gravis were not estimable due to insufficient event counts.

| Exclude HZ vaccination | Outcomes | Cohorts | Patients in cohort | Patients with outcome | Survival probability at end of time window | Hazard Ratio | 95% CI | Log-Rank test P-value |
|------------------------|--------------|------------|--------------------|-----------------------|--|--------------|---------------|-----------------------|
| Yes | Bell's palsy | COVID + HZ | 2,710 | 33 | 98.724% | 0.951 | (0.593,1.525) | 0.8338 |
| No | | COVID + HZ | 2,707 | 36 | 98.653% | | | |

Abbreviations: HZ, herpes zoster; COVID-19, coronavirus disease 2019; COVID+ HZ, COVID-19 survivors with subsequent HZ reactivation; HR, hazard ratio; CI, confidence interval.

Supplementary Table S14. E-value analysis for unmeasured confounding in peripheral nervous system outcomes.

This table presents E-values for the observed associations to assess the robustness of the results to potential unmeasured confounding.

| Outcomes | Cohorts | Hazard Ratio | 95% CI | Hazard Ratio E-value | CI E-value |
|-------------------------|------------|--------------|---------------|----------------------|------------|
| Bell's palsy | COVID + HZ | 3.607 | (3.118,4.172) | 6.674 | 5.688 |
| | COVID - HZ | | | | |
| Guillain-Barré syndrome | COVID + HZ | 1.617 | (1.089,2.4) | 2.616 | 1.400 |
| | COVID - HZ | | | | |
| Myasthenia gravis | COVID + HZ | 1.542 | (1.099,2.164) | 2.456 | 1.429 |
| | COVID - HZ | | | | |

Abbreviations: HZ, herpes zoster; COVID-19, coronavirus disease 2019; COVID+ HZ, COVID-19 survivors with subsequent HZ reactivation; COVID- HZ, COVID-19 survivors without HZ reactivation; CI, confidence interval.