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Survival analysis among post-pandemic in-patients in Wales: A retrospective cohort study

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The primary objective of this research was to describe and classify the sequelae associated with a previous, laboratory confirmed COVID-19 diagnosis among in-patients in the entirety of Wales. The study also sought to determine how time from acute infection and specific covariates affected these sequelae.

The SAIL Databank granted this project access to select health records from NHS Wales. Those selected for analysis had at least one PCR confirmed COVID-19 infection from at least one of three distinct SARS-CoV-2 variants (Alpha, Delta, or Omicron) and resided in Wales. Post-infection follow-up lasted up to three years in the case of Alpha and two years in the case of Delta and Omicron and specifically targeted admitted individuals. The investigator first built Cox proportional hazard regressions adjusted for age and gender for each variant and year post-acute infection, and then reconstructed these models to adjust for deprivation also.

Model outputs were hazard ratios and Kaplan-Meier survival curves. Concerning variant waves, the Alpha wave produced the greatest magnitude of risk among the widest variety of ICD-10 chapters. Risk severity and diversity decreased consistently among Delta and Omicron models. When only adjusted for age and gender, all models, irrespective of variant or duration, displayed few significant chapters except for viral and skin disease categories. In contrast, nearly all chapters across variants and durations were statistically significant after adjusting for deprivation. Two years after acute COVID-19, when controlling for age, gender, and deprivation, the greatest increased risk was for skin diseases after the Alpha wave, while after Delta it was for blood and immunological illnesses, and other viral diseases among the post-Omicron cohort.

In summary, the Alpha wave was the most virulent wave of COVID-19 and increased the risk profile the greatest for a wider cross-section of diseases than other subsequent variants. Second, multiple deprivation is a major factor to consider when accounting for post-viral sequelae risk and disease type.

