**Supplementary Method:**

First, we fitted a flexible parametric survival model to estimate hazards of sepsis among patients with pre-cancer psychiatric disorders and patients without pre-cancer psychiatric disorders. The baseline was modeled with 5 degrees of freedom. This model allowed for non-proportional hazards (time-dependent effect) with 3 degrees of freedom but did not adjust for any other covariates.

Then we fitted flexible parametric models to obtain the temporal trend of HRs and their 95% confidence intervals. The effects of all covariates were modeled with 5 degrees of freedom. The effects of psychiatric disorders and type of cancer were allowed to vary over time (non-proportional hazards) and were modeled with 3 degrees of freedom, and the effects of other covariates were assumed to be time-fixed (proportional hazards).

As the increased rate of sepsis in relation to pre-cancer psychiatric disorders was constant during the entire follow-up, all reported HRs were from models assuming proportional hazards for effect of pre-cancer psychiatric disorders. The effects of all covariates were modeled with 5 degrees of freedom. The effect of type of cancer was allowed to vary over time (non-proportional hazards) and was modeled with 3 degrees of freedom, and the effects of other covariates were assumed to be time-fixed (proportional hazards) in all analyses.

In separate analyses of cancer subtype, reported HRs and their 95% confidence intervals were estimated by flexible parametric models. The effects of all covariates were assumed to be time-fixed (proportional hazards) and were modeled with 5 degrees of freedom.