| Table/Figure | Description                                                                 | Page |
|-------------|-----------------------------------------------------------------------------|------|
| Supplementary Table 1 | Characteristics of mortality trajectories from logistic regression | 2    |
| Supplementary Figure 1 | Trajectories and clustering of patients up to one year prior to death. | 4    |
| Supplementary Figure 2 | Observed end-of-life outcomes by trajectory. | 5    |
| Supplementary Figure 3 | Trajectory modelling among non-decedents, split by distinct trajectories (A and B). | 6    |
### Supplementary Table 1. Characteristics of mortality trajectories from logistic regression*

| Characteristics                      | OR†  | 95% CI       | P value |
|--------------------------------------|------|--------------|---------|
| (Intercept)                          | 0.14 | [0.08-0.23]  | <0.001  |
| **Age**                              |      |              |         |
| < 75 (Ref)                           |      |              |         |
| ≥ 75                                 | 0.73 | [0.60-0.89]  | 0.002   |
| **# of encounters**                  | 1.22 | [1.19-1.24]  | <0.001  |
| **Year of death**                    |      |              |         |
| 2018 (Ref)                           |      |              |         |
| 2019                                 | 0.87 | [0.73-1.04]  | 0.133   |
| 2020                                 | 1.04 | [0.77-1.39]  | 0.800   |
| **Gender**                           |      |              |         |
| Male (Ref)                           |      |              |         |
| Female                               | 0.97 | [0.86-1.11]  | 0.689   |
| **Race**                             |      |              |         |
| Black (Ref)                          |      |              |         |
| White                                | 1.20 | [0.95-1.53]  | 0.132   |
| Other                                | 1.19 | [0.80-1.76]  | 0.397   |
| Missing                              | 1.17 | [0.68-2.01]  | 0.560   |
| **Marital status**                   |      |              |         |
| Married (Ref)                        |      |              |         |
| Unmarried                            | 0.83 | [0.69-1.00]  | 0.048   |
| **Insurance**                        |      |              |         |
| Commercial insurance (Ref)           |      |              |         |
| Managed Care                         | 1.00 | [0.70-1.43]  | 0.992   |
| Medicaid                             | 1.16 | [0.70-1.91]  | 0.563   |
| Medicare                             | 0.93 | [0.66-1.30]  | 0.654   |
| Missing                              | 0.58 | [0.30-1.09]  | 0.089   |
| **Elixhauser comorbidity score**     |      |              |         |
| 0-1 (Ref)                            |      |              |         |
| 2                                    | 1.50 | [1.16-1.95]  | 0.002   |
| 3+                                   | 3.69 | [2.92-4.66]  | <0.001  |
| **ECOG performance status**          |      |              |         |
| 0-1 (Ref)                            |      |              |         |
| 2+                                   | 1.31 | [1.04-1.64]  | 0.020   |
| **Cancer stage**                     |      |              |         |
| Not IV (Ref)                         |      |              |         |
| IV                                   | 2.02 | [1.66-2.47]  | <0.001  |
| **Hospital type**                    |      |              |         |
| Cancer type                                      | OR (95% CI)  | p-value |
|-------------------------------------------------|--------------|---------|
| General oncology (Ref)                          |              |         |
| Tertiary academic                               | 1.16 [0.94-1.43] | 0.169   |
| Cancer type                                     |              |         |
| Thoracic (Ref)                                  |              |         |
| Breast                                          | 1.15 [0.77-1.70] | 0.494   |
| **Gastrointestinal tract**                      | 1.79 [1.37-2.33] | < 0.001 |
| Genitourinary                                   | 1.35 [0.93-1.96] | 0.118   |
| Gynecology                                      | 1.57 [0.75-3.29] | 0.235   |
| Leukemia/Other Hematologic Malignancy           | 1.26 [0.82-1.96] | 0.293   |
| Lymphoma                                        | 0.72 [0.50-1.06] | 0.094   |
| Melanoma                                        | 0.84 [0.55-1.30] | 0.435   |
| **Myeloma**                                     | 0.62 [0.41-0.92] | 0.019   |
| **Neuro-oncology**                              | 0.32 [0.21-0.49] | < 0.001 |
| Other                                           | 0.58 [0.25-1.33] | 0.197   |
| Missing                                         | 0.90 [0.66-1.23] | 0.504   |

* Bolded variables have statistically significant ORs.
†OR: “Predictable” trajectory vs. “Unpredictable” trajectory
A

Mortality Risk

Time to death (days)

B

Mortality Risk

Time to death (days)
Inpatient Death Admitted to ICU in last 30 days
Enrolled to hospice Chemotherapy in last 14 days

% of Decedents

Unpredictable cluster Predictable cluster
A

B

Mortality Risk

Time to last appointment (days)

Mortality Risk

Time to last appointment (days)
Supplementary Figure 1. Trajectories and clustering of patients up to one year prior to death. A, First (“Unpredictable”) trajectory derived from EM algorithm using the elements from FPCA. Smooth Estimate of the Mean Function from Local weighted regression (loess) method (blue smoothed line); individual trajectory for all patients in this FPC (blue spaghetti plot). B, Second (“Predictable”) trajectory derived from EM algorithm using the elements from FPCA. Smooth Estimate of the Mean Function from Local weighted regression (loess) method (red smoothed line); individual trajectory for all patients in this FPC (red spaghetti plot).

Supplementary Figure 2. Observed end-of-life outcomes by trajectory. Observed rates of end-of-life outcomes, split by mortality trajectory (predictable [red] vs. unpredictable [blue]).

Supplementary Figure 3. Trajectory modelling among non-decedents, split by distinct trajectories (A and B).