

Healthcare Utilization Trajectories From Life-Sustaining Treatment Documentation to Death in Korea

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BACKGROUND & OBJECTIVE

- Korea's life-sustaining treatment (LST) decision system was introduced to protect patient autonomy and to allow withholding or withdrawal of medically futile treatment at the end of life.
- Implementation is not merely stopping treatment — it should mark a shift from life-prolonging care to end-of-life care that supports comfort and dignity.
- As the Second Comprehensive Plan (2024–2028) debates extending implementation to the terminal stage, evaluating the system by document or implementation counts alone is insufficient.
- Objective: to describe pre-death healthcare utilization trajectories and the extent of hospice-related care linkage in the implementation group, using the non-implementation group as a supplementary comparison.

METHODS

- Retrospective cohort study using nationwide Health Insurance Review and Assessment Service (HIRA) claims; patients who completed an LST plan in or after 2018 (index date = documentation date), followed to death.
- Implementation group = a billed LST implementation code after the index date; all others formed the non-implementation group.
- Every patient-day was classified into one of eight care states (tertiary / general / other hospital inpatient, long-term care hospital, hospice ward, hospice dying room, home hospice, non-inpatient/non-hospice); hospice states took priority when claims overlapped.
- Indicators: care-state occupancy (% of follow-up days) and landmark state distribution at 30, 14, 7, 3 and 1 days before death, also recalculated within survival strata (≤ 7 , 8–30, >30 days).
- Wilcoxon rank-sum, chi-square and Welch's t-tests; SAS 9.4 and Python 3.13. IRB exempt (1040173-202504-HR-013-02).

RESULTS

408,721 patients with a documented LST plan

Table 1. Baseline characteristics

Characteristic	Implementation (n = 372,200)	Non-implementation (n = 36,521)
Median age, years (IQR)	75 (65–83)	70 (61–79)
Male	217,596 (58.5)	22,192 (60.8)
Medical Aid	36,997 (9.9)	4,116 (11.3)
CCI score ≥ 3	310,386 (83.4)	33,001 (90.4)
Pneumonia, primary Dx	25,813 (6.9)	843 (2.3)
Lung/bronchus cancer, primary Dx	17,205 (4.6)	3,265 (8.9)
Metastatic solid tumor, comorbidity	101,717 (27.3)	15,297 (41.9)

n (%) unless stated. All comparisons $P < 0.001$. CCI, Charlson comorbidity index.

Table 2. Follow-up and care-state occupancy

Indicator	Implementation	Non-implementation
Follow-up, days — mean (SD)	82.6 (216.4)	140.9 (289.3)
Follow-up, days — median (IQR)	20 (7–51)	44 (19–118)
Acute inpatient occupancy	3.33%	3.72%
Long-term care hospital occupancy	1.10%	1.01%
Hospice ward occupancy	0.16%	0.29%
Home hospice occupancy	0.21%	0.93%

Occupancy = proportion of follow-up days in a given state. All comparisons $P < 0.001$ (Wilcoxon rank-sum for follow-up; Welch's t-test for occupancy).

Table 3. 7 days before death, 8–30 day stratum

Care state	Implementation (n = 129,492)	Non-implementation (n = 10,130)
Non-inpatient / non-hospice	125,187 (96.7)	9,394 (92.7)
Home hospice	237 (0.2)	92 (0.9)
Hospice ward	239 (0.2)	62 (0.6)

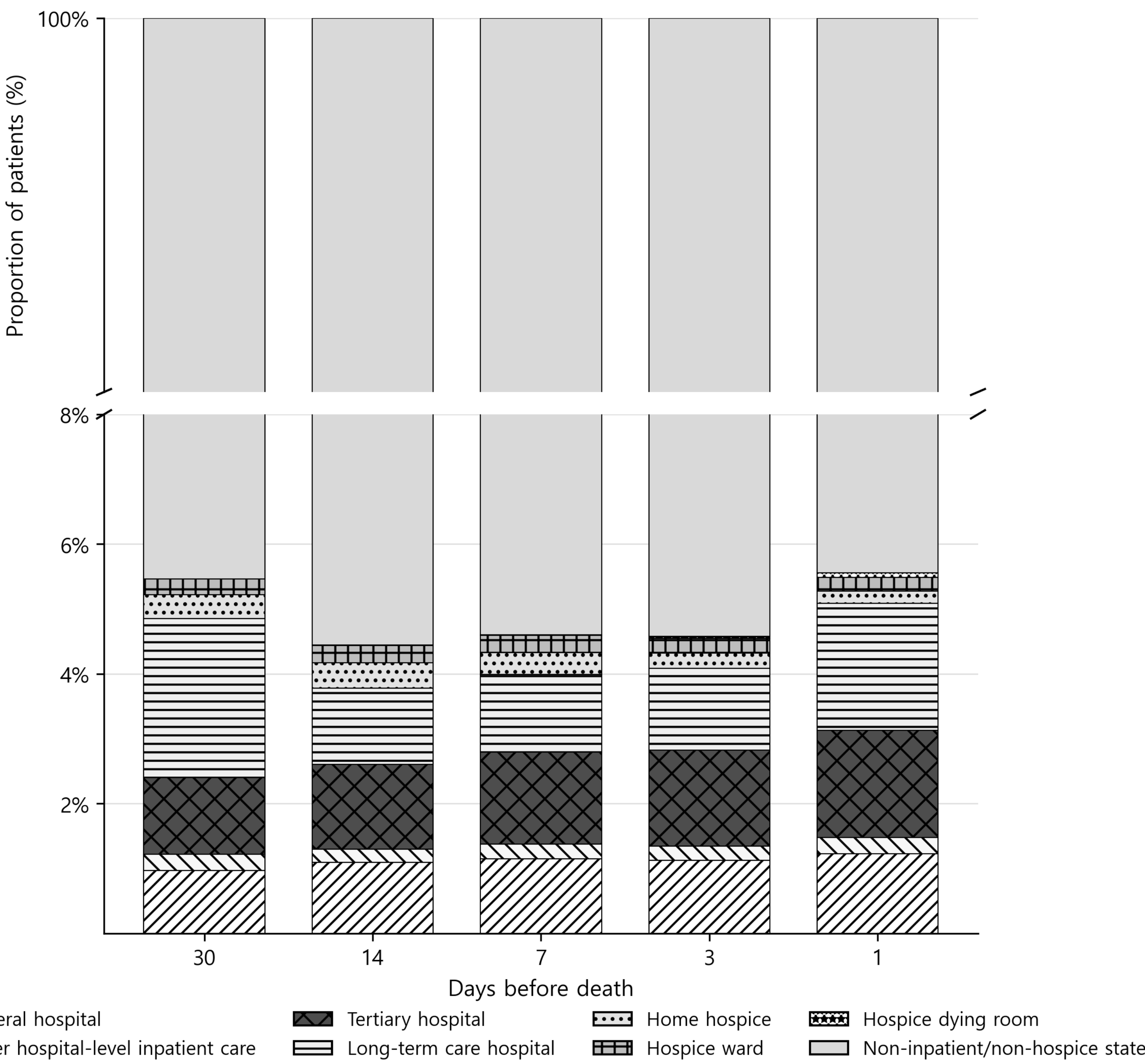


Figure 1. Landmark state distribution at 30, 14, 7, 3 and 1 days before death, implementation group. The y-axis is broken to make the small hospice-related segments visible. Non-inpatient/non-hospice states were the most common state at every landmark (94.5% at 30 days and 94.4% at 1 day before death); hospice dying room accounted for 0.001%, 0.004%, 0.009%, 0.026% and 0.069%, respectively.

Key observation

The gap in hospice-related occupancy persisted after restricting the comparison to a common survival stratum (Table 3), so it is not fully explained by the implementation group's shorter follow-up.

CONCLUSIONS & IMPLICATIONS

- Pre-death trajectories in the implementation group were dominated by non-inpatient/non-hospice states, while hospice-related utilization stayed limited after implementation.
- Implementation appears to occur late, when illness is already advanced — narrowing the window for transfer into hospice or other dedicated end-of-life settings.
- Evaluation of the system should move beyond document and implementation counts to whether patients are actually linked to appropriate care — supporting the need for care planning and service linkage after implementation.

LIMITATIONS

- Claims data cannot capture clinical severity, patient or family preference, or quality of care.
- The non-inpatient/non-hospice state is a broad residual category (outpatient visits, home-based care, or no recorded contact).
- Descriptive comparison only; group differences should not be read causally.