

Characterizing ICU-like profiles of very old patients in medical intermediate care units in France: A clustering analysis of a nationwide population-based hospitalized study

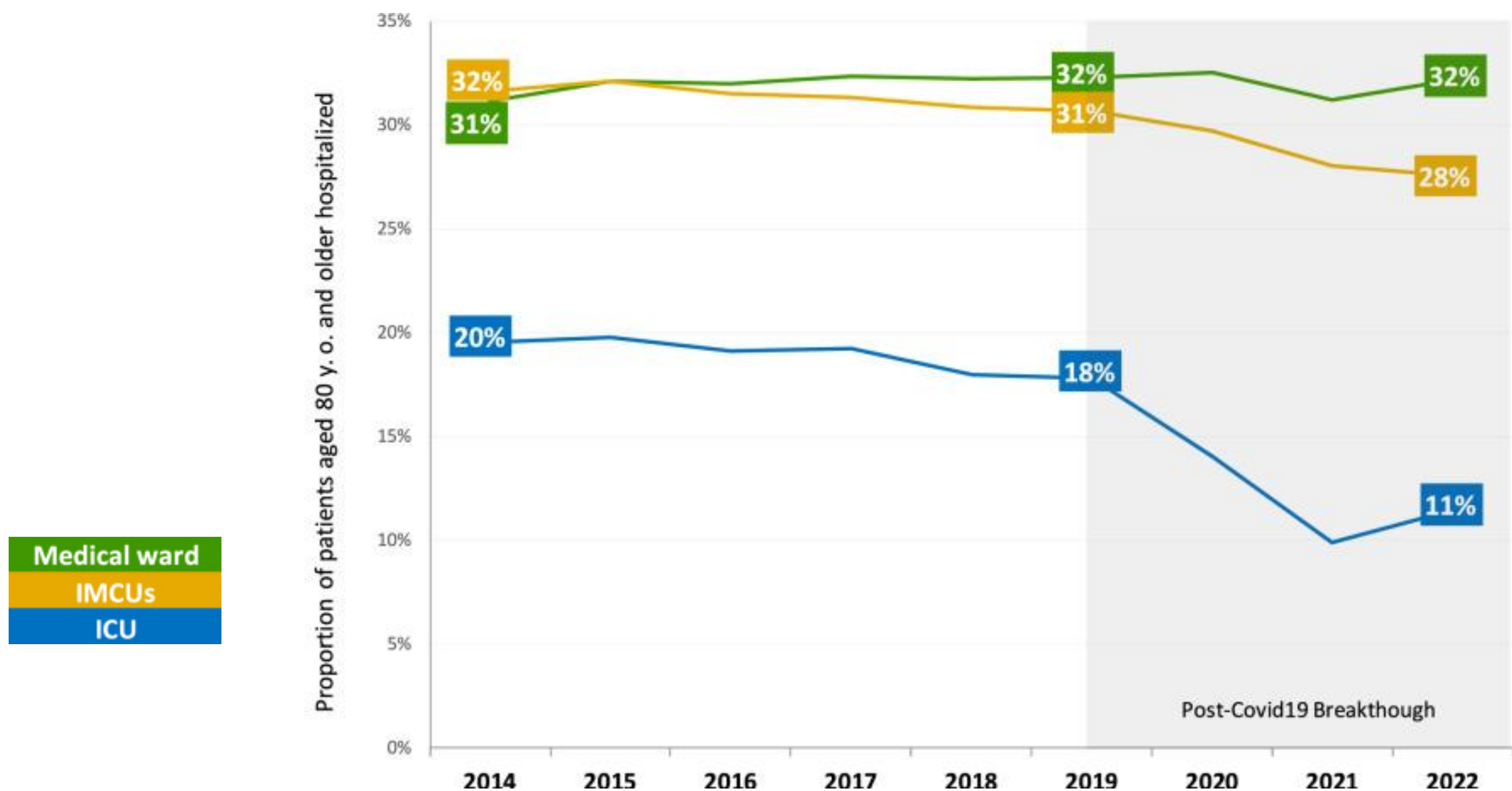
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INTRODUCTION

The aging population is having an increasing impact on critical care. Beyond illness severity, admission policies for critically ill older patients appear to differ between intermediate care units (IMCUs) and intensive care units (ICUs).



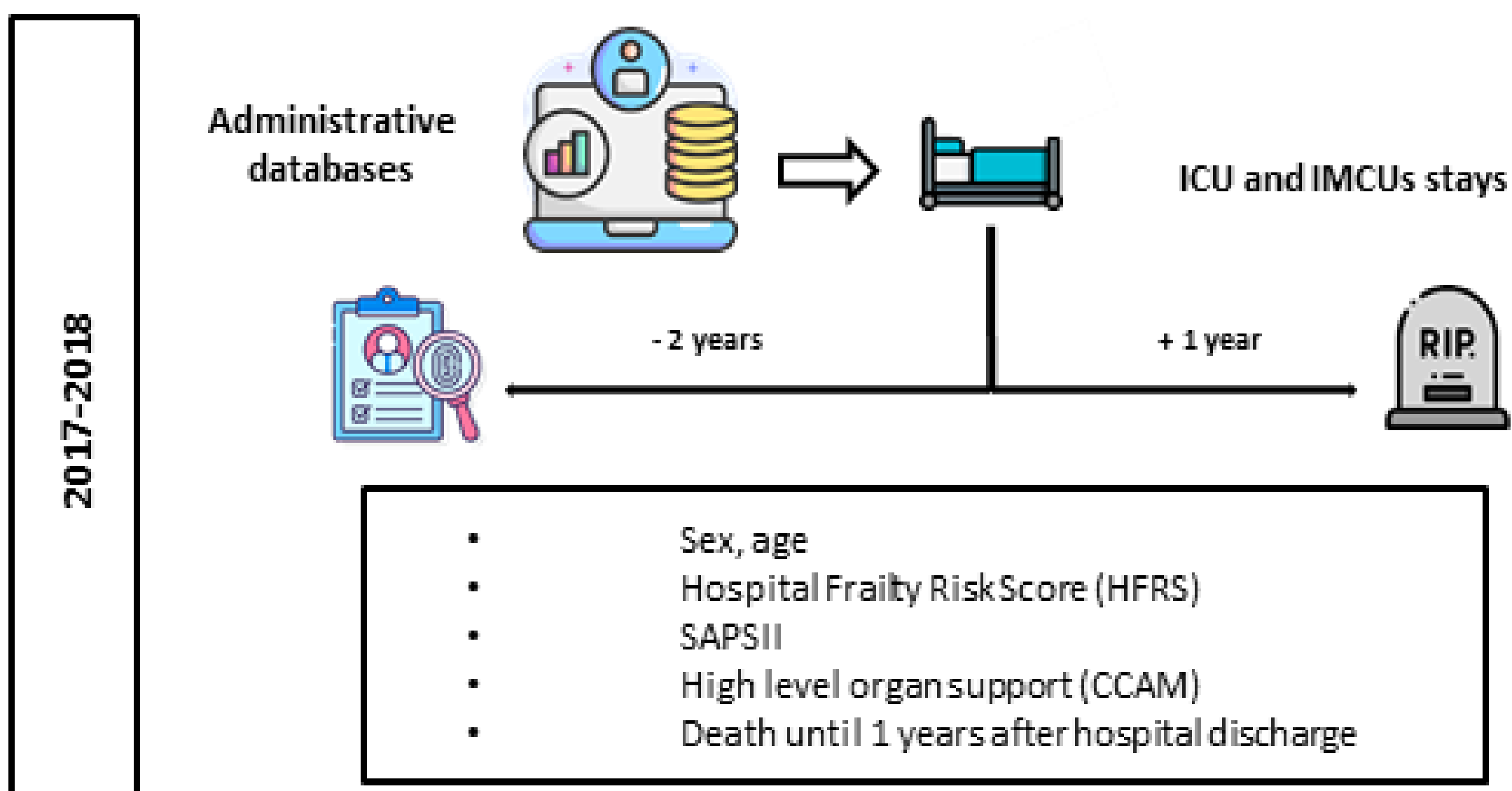
Hospitalization of very old critically ill patients in medical intermediate care units in France: a nationwide population-based study
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This study aimed to identify clusters of very old patients in IMCUs and to compare "ICU-like" profiles among them with matched very old patients admitted to the ICU.

METHODS

Hospitalizations of patients aged ≥ 80 years in IMCUs and ICUs were included over a two-year period and their characteristics recorded.

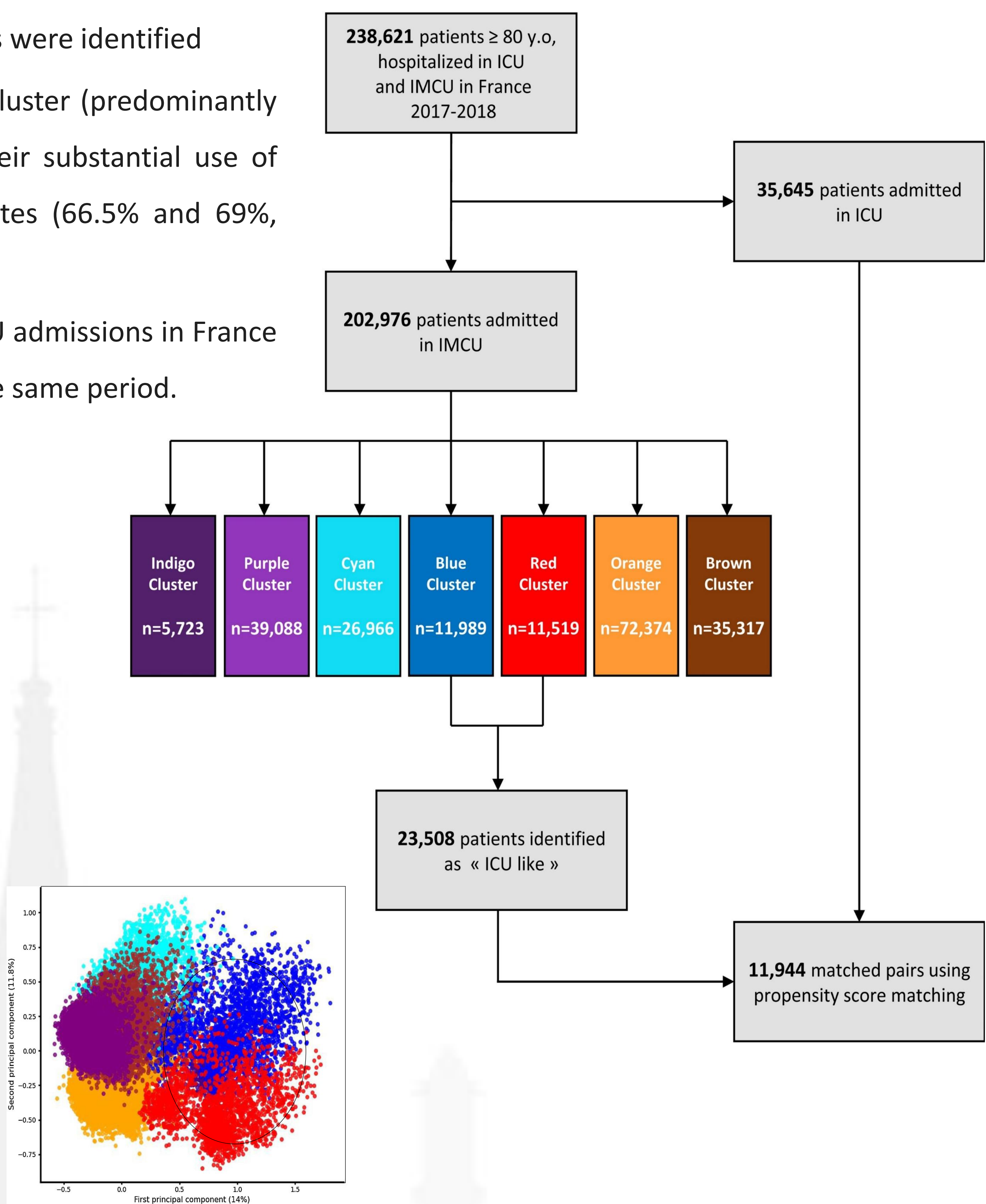


- Using latent class analysis, we identified distinct IMCU phenotypes.
- Clusters with high use of organ support ($\geq 5\%$) and high mortality ($\geq 40\%$) were classified as "ICU-like" and matched 1:1 to very old ICU patients via propensity score matching based on severity, type of clinical failure, and organ support techniques.
- We then analyzed matched pairs to identify factors associated with IMCU (rather than ICU) admission using logistic regression

RESULTS

- Among the 202,976 older patients admitted to IMCUs, seven phenotypes were identified
- The Blue cluster (predominantly respiratory dysfunction) and the Red cluster (predominantly cardiac and circulatory failure) were classified as "ICU-like" due to their substantial use of organ support (26.3% and 17.5%, respectively) and high mortality rates (66.5% and 69%, respectively).
- These "ICU-like" patients in IMCUs accounted for 11.6% of all older IMCU admissions in France (23,508 patients), compared with 35,645 older ICU admissions during the same period.
- After propensity score matching, multivariate logistic regression identified older age as the strongest determinant for IMCU (rather than ICU) admission. Comorbidity status was also an independent predictor of IMCU admission, whereas frailty status showed only a marginal effect. No association was detected for sex.

Variables	IMCU	ICU	OR	(95% CI)	p
Sex(Male)			1.00	[0.95 ; 1.05]	0.914
Age					
80-84 y-o			Reference		
85-89 y-o	*		0.61	[0.57 ; 0.64]	< 0.001 *
≥ 90 y-o	■		0.31	[0.29 ; 0.34]	< 0.001 *
Charlson Comorbidity Index (CCI)					
Low 0			Reference		
Middle [1-2]	■		0.81	[0.75 ; 0.86]	< 0.001 *
High ≥ 3	■		0.67	[0.62 ; 0.72]	< 0.001 *
Frailty score (HFRS)					
Low < 5			Reference		
Middle [5-15]	■		0.90	[0.84 ; 0.96]	0.002 *
High ≥ 15	■		0.95	[0.86 ; 1.04]	0.229



- The Orange, Cyan, Purple, and Brown clusters represented standard IMCU management, with minimal organ support use and very low mortality rates, and were characterized by distinct organ dysfunction types: cardiac failure (Orange), respiratory dysfunction (Cyan), and neurological diseases (Purple)
- In contrast, the Indigo cluster exhibited high mortality despite low organ support utilization, suggesting potential decisions to withhold life-sustaining treatments in end-of-life or poor-prognosis contexts.

DISCUSSION & CONCLUSION

Limitations and remaining questions



- Decisions to withhold or withdraw life-sustaining treatment, potentially reflecting triage choices not to escalate care, were not captured in administrative hospital discharge summaries.
- The Hospital Frailty Risk Score (HFRS), a validated surrogate measure of frailty, may not fully capture the multidimensional nature of frailty.

Conclusions. Nearly 10,000 older patients/year in France were admitted to IMCUs despite meeting ICU-level criteria, including high-level organ support.

Perspectives. Clearer admission criteria and care objectives for IMCUs in older, critically ill patients are urgently needed.