

00118 Are Primary Care Utilizers the Same? – Application of Latent Class Analysis for Population Segmentation in Primary Care Setting

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Aims: We aimed to segment SingHealth primary care utilizers into classes with unique disease patterns, and to characterize the variation in disease patterns, healthcare utilizations and all-cause mortality across the classes.

Methodology: Using de-identified administrative data from SingHealth population health data-mart, we included all adult (above 21 years old) Singapore citizens/permanent residents who utilized SingHealth primary care services in 2012 (n=100,747). Latent class analysis, a data-driven, model-based technique, was utilized to segment the patient population into kclasses (k=2 to 6) based on disease data. The derived models were assessed based on Bayesian Information Criterion and clinical interpretability. Healthcare utilizations (primary and specialist outpatient visits, hospital admissions, emergency department visits) and mortality in 2013 were compared across classes. Regression analysis was run to assess predictive ability of class membership on healthcare utilizations and mortality.

Result: For k=2, the classes derived were “Relatively Healthy” and “Stable metabolic disease”. Additional classes derived for k=3 to 6 were “Metabolic disease with vascular complications”, “High respiratory disease burden”, “High metabolic disease without complication” and “Metabolic disease with multiple organ complications”. Disease patterns in 2012 and healthcare utilizations in 2013 differed significantly across the classes (p<0.001). The “Metabolic disease with multiple organ complications” class accounted for the highest healthcare utilization (Incidence rate ratio (IRR) = 6.60, (95% Confidence Interval (CI) = 5.75 – 7.56) for outpatient specialist clinic visits, IRR = 19.68 (95% CI= 16.41 – 23.61) for hospital admissions and IRR = 13.86 (95% CI = 11.74 – 16.37) for emergency department visits, p<0.001) and highest one-year all-cause mortality (Hazard ratio = 27.97 (95% CI = 25.01 – 31.29), p<0.001).

Conclusion: Primary care utilizers are heterogeneous and can be divided into classes with unique health characteristics and utilization patterns by latent class analysis. The selection of the most optimal model is dependent on statistical indexes and clinical interpretation.