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Factors associated with red blood cell transfusion among hospitalized patients: a cross-sectional study

Key words: Transfusion; Red blood cell; Triple exponential smoothing method

Research Summary

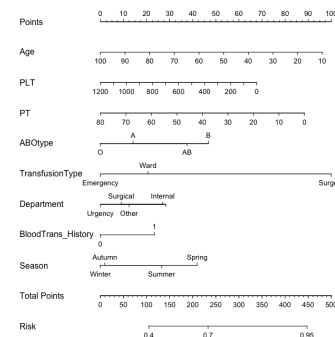
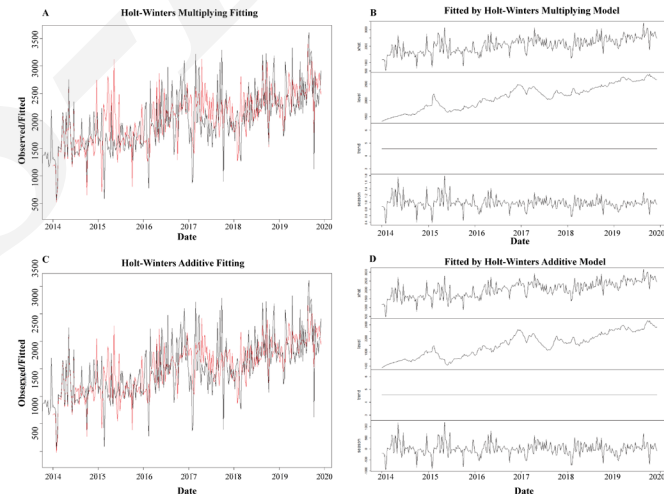
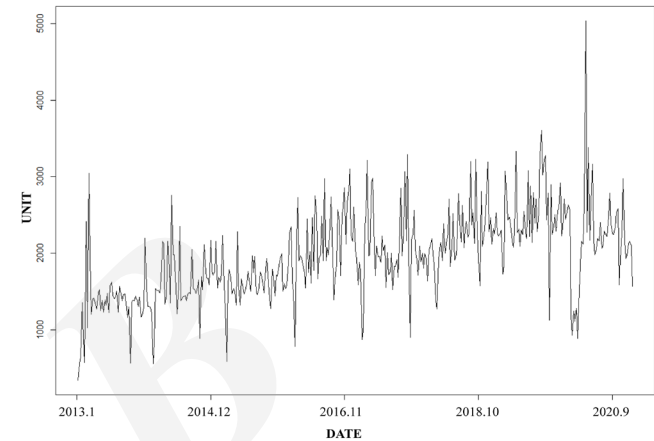
This study considered the related factors both from hospital-level and patient-level, and contained the blood inventory as well.

- **Transfusion**
- **Red blood cell**
- **Triple exponential smoothing method**

Innovation points

- **Understand** the relevant factors that affect the amount of red blood cell transfusion in hospitalized patients from the hospital- and patient-level.
- **Summary** the seasonality in RBC inventory and patients' clinic state is the indicators of RBC transfusion units in the studied hospital.
- **Emphasis** a time-series analysis based on the weekly total applied units of RBC using the triple exponential smoothing method and a binary logistic model for patients-level.

Weekly Applied Units of Red Blood Cell from 2013 to 2020.



Innovation points

Triple exponential smoothing method based on the time-series analysis were conducted on hospital-level, a binary logistic model was conducted based on the patients' selected factors and seasonal trends.

Figure 1A | Time plot of the daily & weekly demand for RBC transfusion from Jan. 2013 to Dec.

Figure 1B-E | Fitting graphs and component decomposition graphs produced with the Holt-Winters multiplicative and additive models

Figure 1F | Nomogram showing the risk of transfusing red blood cells below or beyond 2 units.