Cite this as: Peiwen ZHANG, Dandan XU, Xinhan ZHANG, Mengyin WU, Xuecheng YAO, Dawei CUI, Jue XIE. Factors associated with red blood cell transfusion among hospitalized patients: a cross-sectional study[J]. Journal of Zhejiang University Science B, 2021, 22(12): 1060-1064.
http://doi.org/10.1631/jzus.B2100491

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**

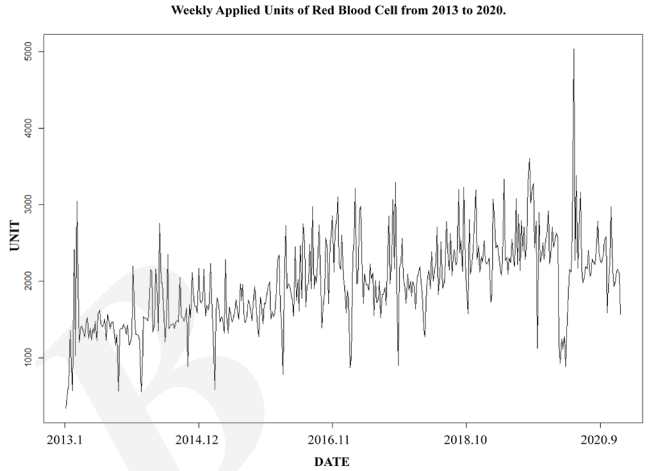
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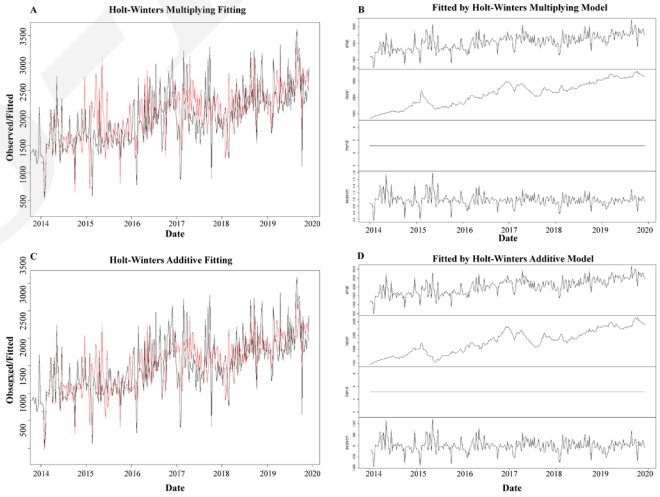
Innovation points

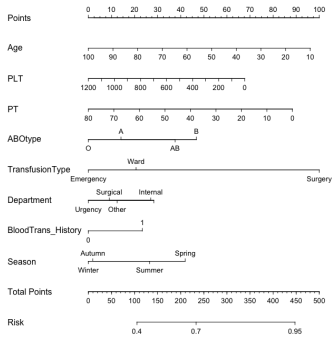
- **Understand** the relevant factors that affect the amount of red blood cell transfusion in hospitalized patients from the hospital- and patient-level.

- **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.







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.**