

# Researchers find association between donor age, female sex and transfusion outcomes

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A large Canadian study has shown a link between blood donor characteristics and transfusion recipients' outcomes. This is the first study to suggest that red blood cell transfusions from young donors and from female donors may be associated with poorer survival in recipients. Credit: Canadian Blood Services

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characteristics and transfusion recipients' outcomes. This is the first study to suggest that red blood cell transfusions from young donors and from female donors may be associated with poorer survival in recipients.

Red blood cell transfusions are the most common medical procedure provided in hospitals, with more than 100 million units collected worldwide every year for this purpose, according to the World Health Organization.

"These results are intriguing and suggest that if you require a transfusion, your clinical outcome may be affected by the [blood donor](#)'s age and sex," said senior author Dr. Dean Fergusson, a senior scientist and Director of the Clinical Epidemiology Program at The Ottawa Hospital as well as a professor at the University of Ottawa. "However, it is important to remember that our study was observational in nature, which means it cannot be considered definitive evidence."

The study, published in *JAMA Internal Medicine*, evaluated the impact of blood donor sex and age on recipient outcomes by linking 30,503 transfusion recipients at The Ottawa Hospital between October 2006 and December 2013 with their respective blood donors (80,755 donors in total). The average age of the recipients was 66.2 years and their outcomes were followed for an average of 2.3 years with a maximum follow-up time of 7.2 years.

The researchers found that recipients of female donor red [blood cells](#) were associated with an eight percent increased risk of death (from any cause) per unit transfused compared with recipients of male donor red blood cells. For example, for a recipient that received six units of red blood cells, this would translate into an associated risk of death of 36 percent for recipients of all-female donor blood compared to 27 percent for recipients of all-male donor blood one year later.

The researchers also found similar associations with red blood cells from younger donors. Recipients of blood from donors aged 17- 20 were associated with an eight percent increased risk of death per unit transfused compared with recipients of red blood cells from donors aged 40-50. In addition, recipients of red blood cells from donors aged 20-30 were associated with a six percent increased risk of death per transfused product compared with recipients of red blood cells from donors aged 40-50.

"We need further research to confirm these findings and to look at possible biological mechanisms," said lead author Dr. Michaël Chassé, an assistant professor at Université Laval and a critical care physician at CHU de Québec-Université Laval. "One possibility is that components in the blood of younger donors or female donors may affect the immune system of the transfusion recipient."

"Though our research suggests that we should investigate what's behind the associations that we found, there is no definitive evidence yet that proves that one type of blood is better or worse for patients," says Dr. Jason Acker, co-author on the paper and Senior Development Scientist with Canadian Blood Services. "This study opens up new areas of investigation where we can really dig into the biological explanations and understand true cause and effect. In the meantime, patients continue to receive the safest transfusions possible."

Importantly, all of the patients in this study needed and received potentially life-saving transfusions. All eligible donors are encouraged to continue to donate.

The ability to link [donor](#) and product characteristics to patient outcomes is the result of a unique collaboration between a hospital and a blood operator that has the potential to radically change how clinical practice is informed by research and large data analytics.

Provided by Ottawa Hospital Research Institute

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