What is the risk of a transfusion-transmitted infection?

What is this research about?
Canadian Blood Services is a not-for-profit organization whose mission is to manage the supply of blood and blood products in Canada, except for the Province of Québec. Canadian Blood Services tests every blood donation for known transmissible diseases, notably for HIV, hepatitis B and hepatitis C. At least two tests are done for each of these viruses to detect the genetic material (DNA or RNA) of the virus itself, as well as antibodies (the body makes these in response to a viral infection). However, if someone has been very recently infected, there is a period of time before their body will start to make antibodies, and even a few days or weeks before the amount of virus in the blood is high enough to be detected. This period between the time of infection and the time when it can be detected is called the infectious window-period. There is a risk that if someone donates blood during the window-period, the tests would not detect the virus, and the donated blood could infect a blood recipient. This risk is the residual risk of a transfusion-transmitted infection. Blood donor education and deferral of donors with risk factors for transmissible disease aims to reduce the residual risk. This research estimated the residual risk of HIV, hepatitis B and hepatitis C to inform blood donors and recipients.

What did the researchers do?
The researchers established the National Epidemiology Donor Database to analyse data from all blood donations to Canadian Blood Services for the period 2006-2009. All donations were tested for transmissible diseases following standard testing procedures to detect HIV, hepatitis C and hepatitis B DNA or RNA and antibodies. All blood donors who tested positive for HIV, hepatitis B or hepatitis C and had a previous blood donation that was negative were considered to be new infections. The researchers used a published method to estimate the incidence rates and residual risk. Incidence rates were based on data from donors who had made at least two donations within three years.

What did the researchers find?
- The window-period for HIV and hepatitis C is less than two weeks, and about a month for hepatitis B.
- The residual risk was 1 in 8 million donations for HIV, 1 in 6.7 million donations for hepatitis C and 1 in 1.7 million donations for hepatitis B.

How can you use this research?
The residual risk of infection estimates are used by physicians to counsel their patients about the risks of transfusion. It is also used by Canadian Blood Services, and other blood suppliers, for policy formulation around blood donation and testing. It can also be used to inform donors as to why answering blood donation questions is important for the safety of the blood supply.
ResearchUnit is a knowledge mobilization tool developed by Canadian Blood Services (available online at blood.ca)

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