

Transfusion safety and risks in the UK

Transfusion is a vital, often life-saving intervention, but it is not without risk. A clear understanding of these risks is essential for informed decision-making, effective risk mitigation strategies and maintaining trust in the safety of transfusions. The key risks associated with transfusion based on the UK haemovigilance data from SHOT 2020-2024 are listed here.

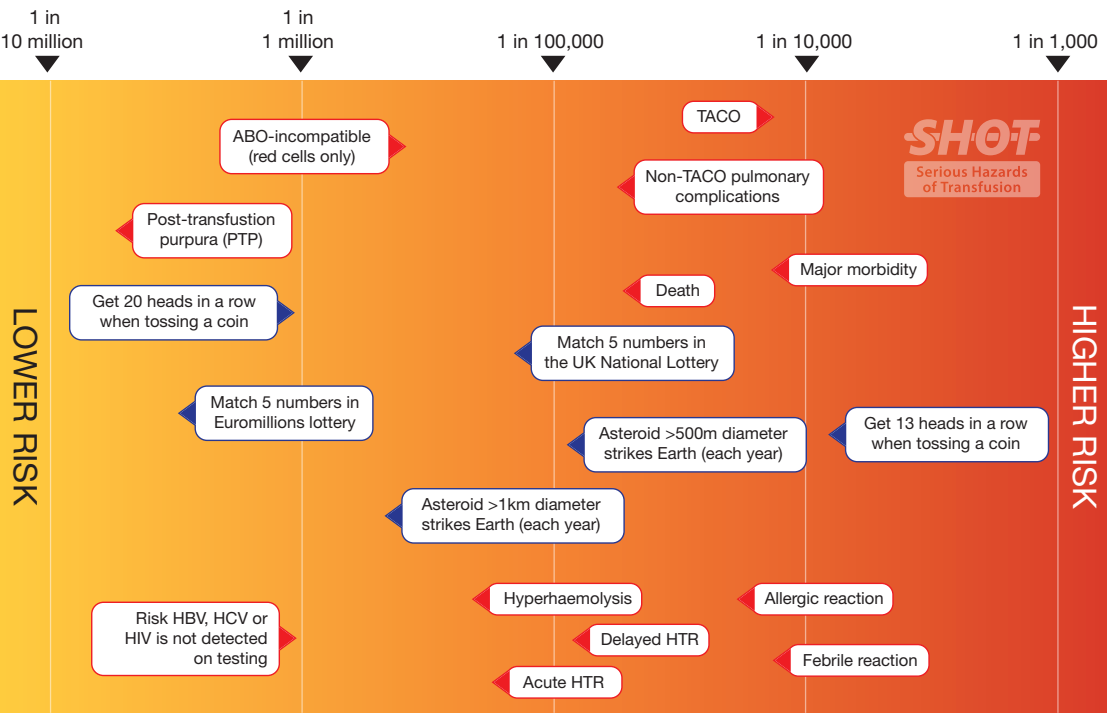
The risks shown are for all transfusion recipients, adult and paediatric.

The events shown here as comparators have been chosen to have equal probability of occurring for all individuals, so that interpretation does not depend on personal risk factors (modifiable or non modifiable) such as age, sex or lifestyle. Previously, comparators such as “smoking-related death” were displayed, using risk statistics for the population as a whole. These population averages overestimated the actual risks for some people (e.g. younger, never smoked) and underestimated them for others (e.g. older, heavy smokers), making meaningful comparison with transfusion-related risks difficult on an individual basis. The intention in replacing the comparators was to enable consistent interpretation by anyone using this data.

It is important to note some caveats when interpreting this data: SHOT is a passive haemovigilance scheme with distinct reporting categories and thresholds. There could be under-reporting, especially in some categories which could affect these risk figures.

The risks related to deaths and major morbidity include all cases reported to SHOT irrespective of imputability, cases with possible, probable or definite imputability are all included in this calculation. Apart from ABO incompatible transfusions, process-based errors are not included in this risk figures. These are often preventable and should not occur in an optimally functioning system, they may vary based on local conditions.

For further information about transfusion-transmitted infections and related risks, please see [Number of recipients with confirmed/probable Transfusion-Transmitted Infections \(TTI\) - Serious Hazards of Transfusion](#). Additional information about residual risks for transfusion transmitted infections in the UK can be found in the position statement on the Joint United Kingdom (UK) Blood Transfusion and Tissue Transplantation Services Professional Advisory Committee website at this link: [Position Statements](#).



TACO= Transfusion-associated circulatory overload, HTR= Haemolytic transfusion reaction, HBV= hepatitis B virus, HCV= hepatitis C Virus and HIV= human immunodeficiency virus
Based on the UK data 2021-2023, the estimated risk that a potentially infectious HBV, HCV or HIV donation is made in the window period and not detected on testing is up to 1 in 1million donations tested, highest for HBV and as low as 1 in 100 million for HCV

Transfusion related risks

Transfusion related risks: table

Event description	Total events, 2020-2024	Risk (1 in X components issued)	Risk (per 100,000 components issued)
Death	206	52,853	1.89
Major morbidity	793	13,730	7.28
Pulmonary complications: TACO	800	13,610	7.35
Pulmonary complications: non TACO	198	54,988	1.82
Acute HTR	62	175,607	0.57
Delayed HTR	129	84,400	1.18
Hyperhaemolysis	52	209,377	0.48
Allergic reactions	589	18,485	5.41
Febrile reactions	818	13,310	7.51
PTP	2	5,443,810	0.02
ABO-incompatible (red cells only)	20	397,631	0.25
Number of confirmed acute HBV/HCV/HIV transmissions	0*		

Total components issued 2020-2024 = 10,887,619.

PTP= Post-transfusion purpura; TACO= Transfusion-associated circulatory overload, HTR= Haemolytic transfusion reaction, HBV= hepatitis B virus, HCV= hepatitis C Virus and HIV= human immunodeficiency virus

*For further information please access: [Number of recipients with confirmed/probable Transfusion-Transmitted Infections \(TTI\) - Serious Hazards of Transfusion](#)

The definitive risk per components issued cannot be accurately determined, as transfusion-transmitted infections may remain asymptomatic or only be diagnosed several years after transmission. However, based on the UK data 2021-2023, the estimated risk that a potentially infectious HBV, HCV or HIV donation is made in the window period and not detected on testing is up to 1 in 1million donations tested, highest for HBV and as low as 1 in 100 million for HCV.

Comparative risks: table

Event description	Risk (1 in X)	Risk (per 100,000 years, tickets etc)
Getting 13 heads in a row when tossing a coin	8192	12.21
Asteroid >500m diameter striking Earth (each year)	90,563	1.10
Matching 5 numbers in the UK National Lottery (each ticket purchased)	144,415	0.69
Asteroid >1km diameter striking Earth (each year)	464,665	0.22
Getting 20 heads in a row when tossing a coin	1,048,576	0.10
Matching 5 numbers in the Euromillions lottery (each ticket purchased)	3,107,515	0.03

Sources:

Risk of asteroid strike: <https://cneos.jpl.nasa.gov/doc/neoreport030825.pdf>, Table 3.1

National Lottery: <https://www.national-lottery.co.uk/games/lotto/game-procedures>, <https://www.national-lottery.co.uk/games/euromillions/game-procedures>