

Mortality after blood transfusion from donors with a history of pregnancy

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**Disclosure belangen spreker bijeenkomst
Consortium Transfusiegeneskundig Onderzoek 17-11-2017**

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Geen (potentiële) belangenverstrengeling

Voor bijeenkomst mogelijk relevante relaties

Ik werk voor Sanquin

- **Sponsoring of onderzoeksgeld**
- **Honorarium of andere (financiële) vergoeding**
- **Aandeelhouder**
- **Andere relatie, namelijk ...**

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Should plasma from female donors be avoided?

A population-based cohort study of plasma recipients in Sweden from 1990 through 2002

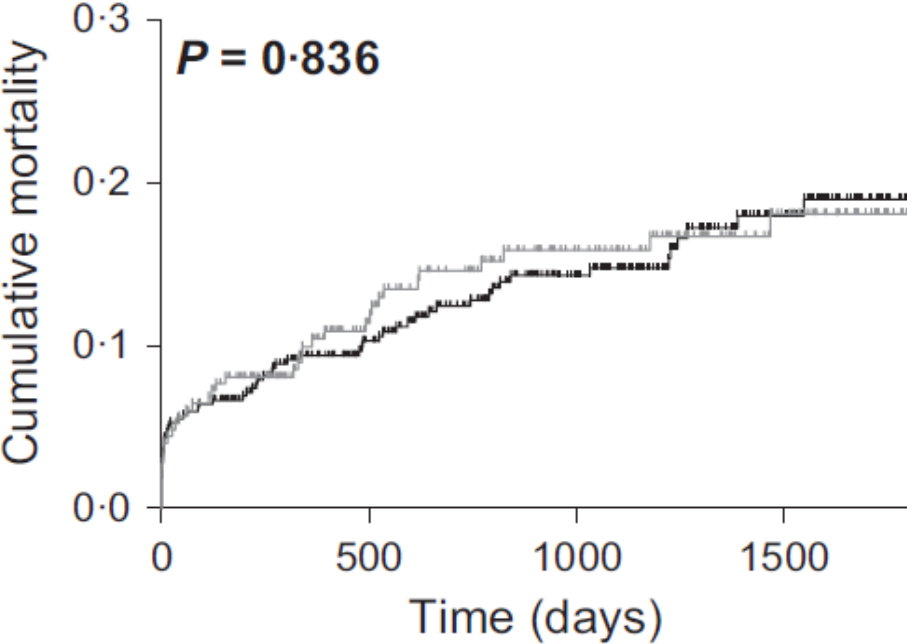
Elsa Tynell, Therese M.L. Andersson, Rut Norda, Gustaf Edgren, Olof Nyren, Agneta Shanwell, and Marie Reilly

TABLE 3. Estimates of RR of death (any cause) and the secondary outcome of death with a discharge diagnosis indicating respiratory or circulatory morbidity or adverse reaction in patients exposed to plasma from female donors compared to recipients of plasma from male donors only*

Number of units of female plasma	Death from any cause			Death after diagnosis of respiratory or circulatory morbidity or adverse reaction		
	Number of deaths	RR (95% CI)	p value	Number of deaths	RR (95% CI)	p value
0	2247	1.0		389	1.0	
1	2494	1.01 (0.96-1.07)	0.67	485	1.12 (0.98-1.24)	0.09
2	1302	1.00 (0.93-1.08)	0.99	246	1.10 (0.92-1.31)	0.28
3-4	1023	1.16 (1.06-1.27)	0.002	210	1.47 (1.19-1.82)	0.0003
5+	734	1.32 (1.17-1.49)	<0.0001	147	1.72 (1.29-2.29)	0.0002

* All estimates derived from Poisson regression analyses adjusted for age, sex, year of transfusion, hospital, and total number of plasma and RBC units.

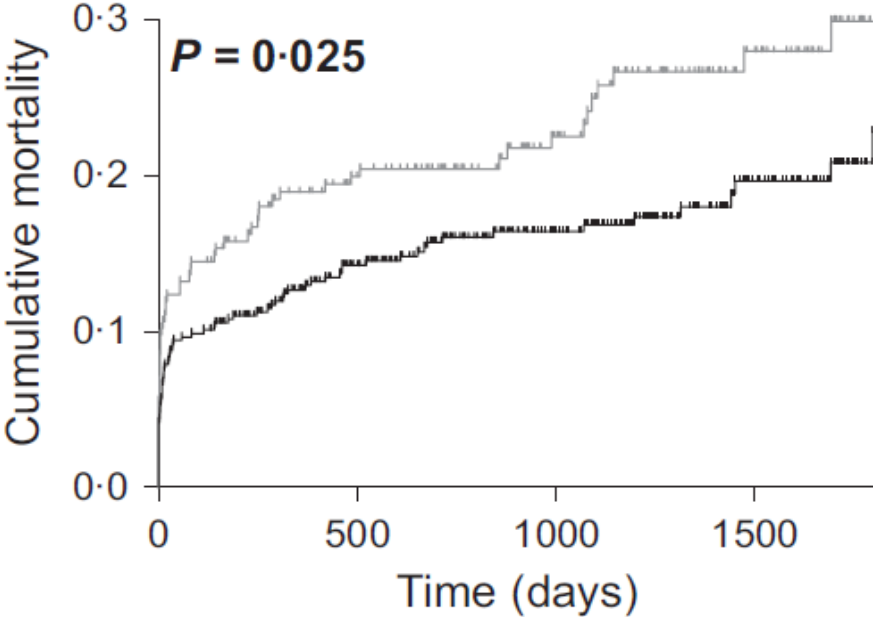
Female recipients



Mortality among female recipients
(95% CI)^a

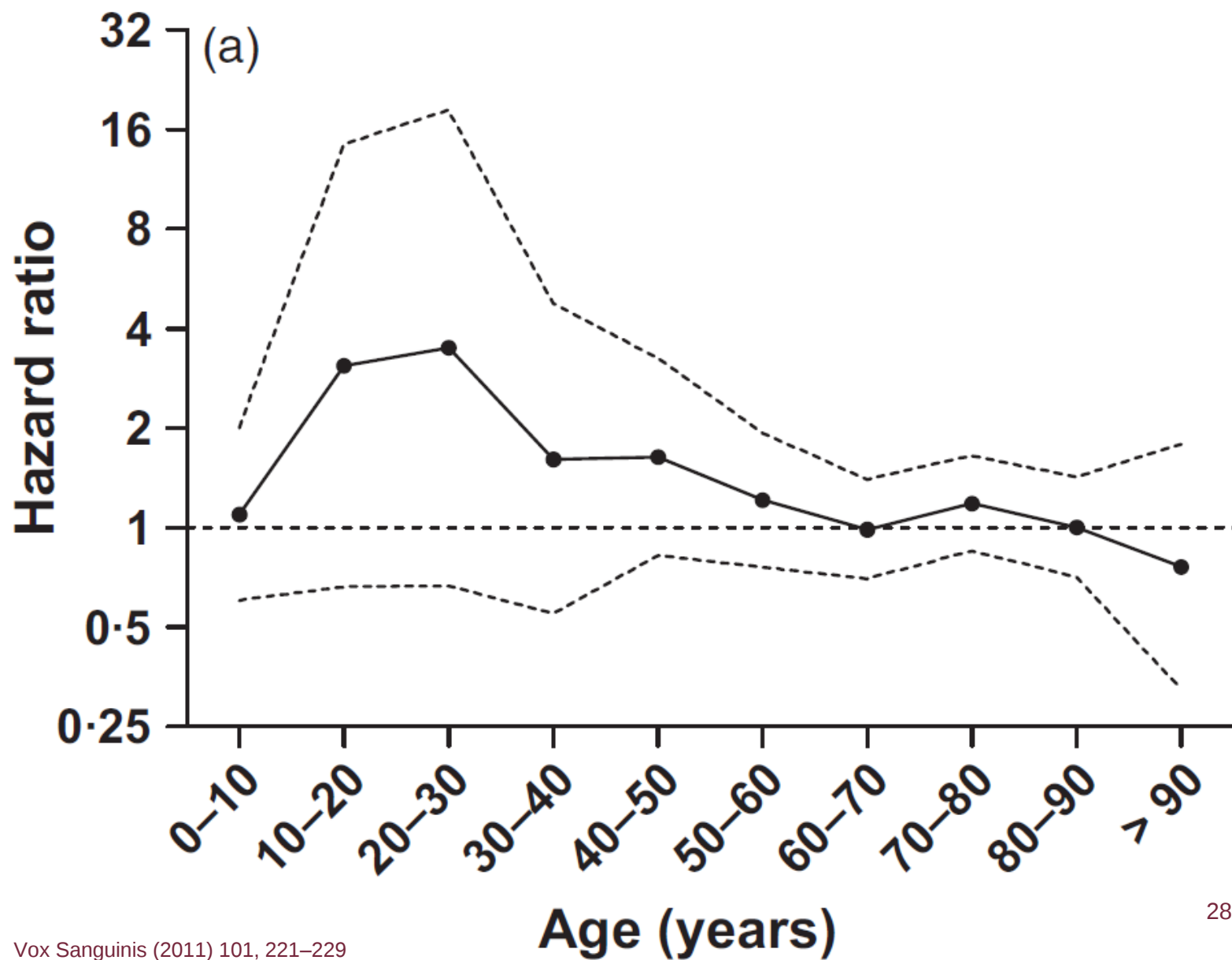
Donor sex	90 days follow-up	5 years follow-up
Female	6.9 (3.5–10)	14 (9.6–19)
Male	6.6 (4.1–9.1)	14 (10–17)
Difference ^b	0.26 (–3.9 to 4.5)	0.44 (–5.3 to 6.1)

Male recipients



Mortality among male recipients
(95% CI)^a

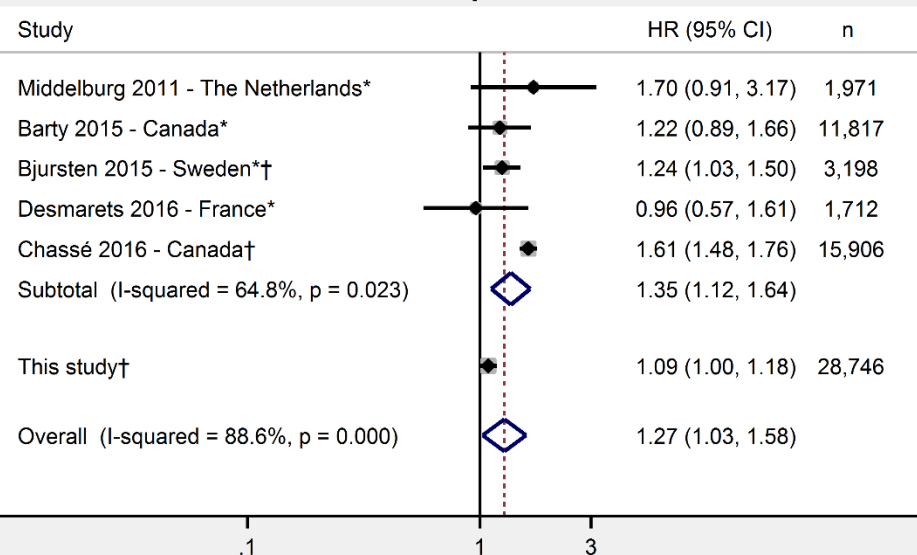
90 days follow-up	5 years follow-up
17 (11–22)	24 (18–30)
11 (7.7–14)	16 (13–20)
5.8 (–0.70 to 12)	7.6 (0.38–15)



Questions

- Is it true?
 - Randomised due to “first-in-first-out”
 - Chance association
- What’s the reason?
 - Why at all?
 - Why only in males?
 - Why only under 50 years?

Male patients

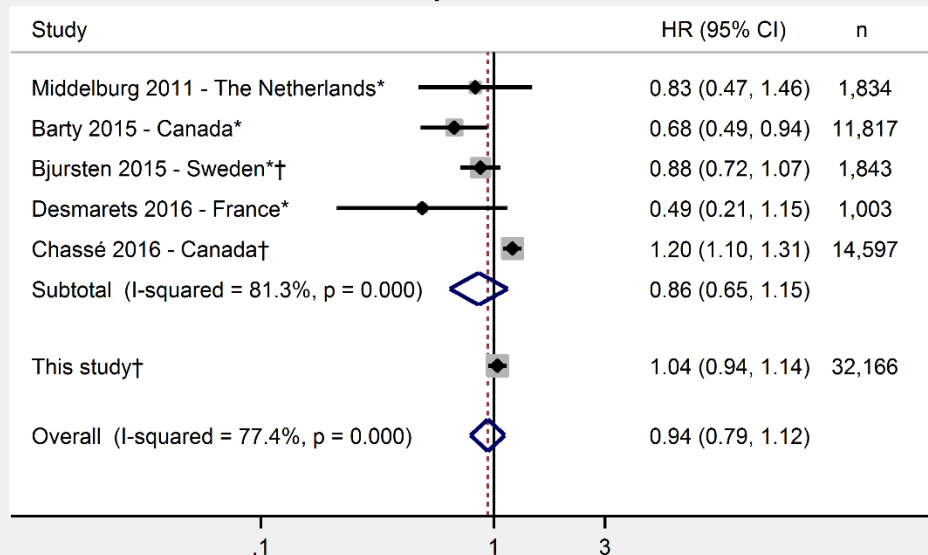


Weights are from random effects analysis;

* Female exposure was recalculated from sex-mismatched transfusions;

† HR per transfusion powered to the mean number of transfusions in that study

Female patients

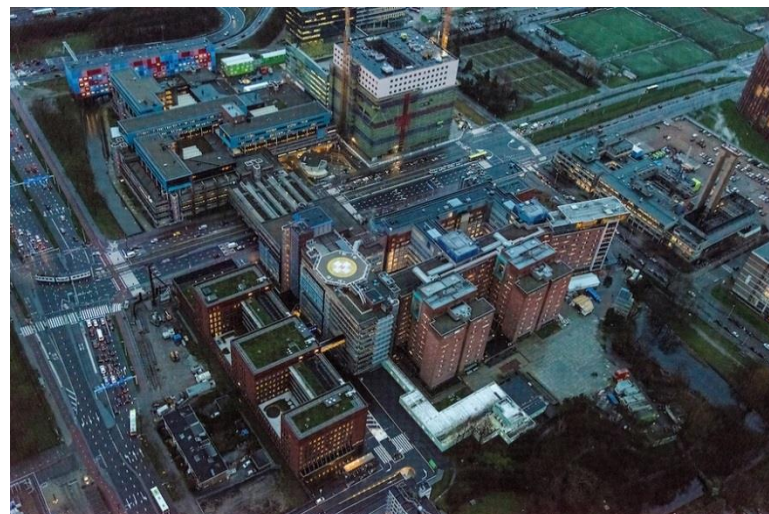


Aim

- To quantify the association between patient survival and red blood cell transfusion from female donors with and without a history of pregnancy



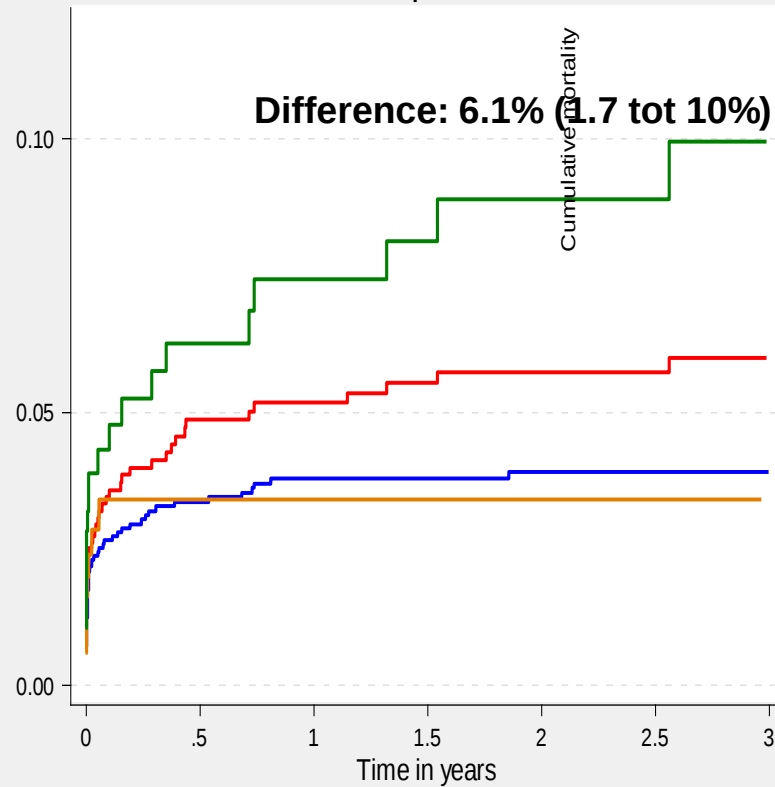
**6 centra
10 jaar
65 000 patiënten
285 000 transfusies**



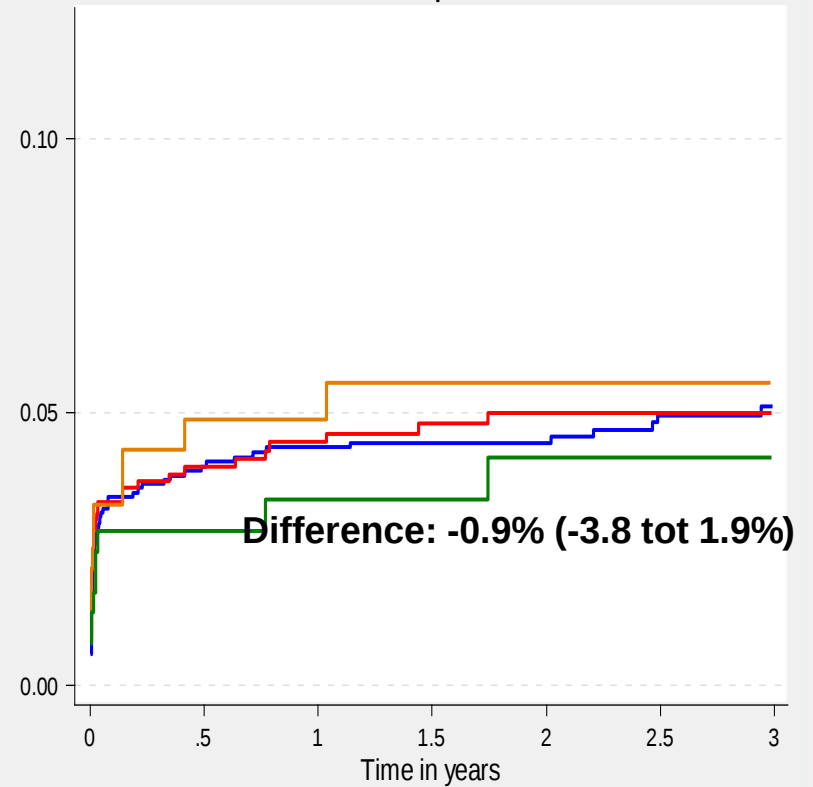
	Red blood cells transfused donated by	
	Ever-pregnant female	Never-pregnant female
Male patients		
Single transfusion cohort	1.225 (0.977 to 1.537)	0.959 (0.738 to 1.246)
No-mixture cohort	1.128 (1.009 to 1.260)	0.928 (0.809 to 1.064)
Full cohort	1.082 (1.015 to 1.152)	1.063 (0.993 to 1.136)
Female patients		
Single transfusion cohort	1.115 (0.878 to 1.417)	1.002 (0.771 to 1.302)
No-mixture cohort	0.993 (0.870 to 1.133)	1.007 (0.882 to 1.149)
Full cohort	0.994 (0.928 to 1.065)	0.957 (0.889 to 1.029)

	Red blood cells transfused donated by ever-pregnant female donors		
	Single transfusion cohort	No-mixture cohort	Full cohort
Male patients			
0 to 17 years	2.839 (1.576 to 5.117)	1.634 (1.023 to 2.610)	1.178 (0.824 to 1.685)
18 to 50 years	2.291 (0.885 to 5.928)	1.501 (0.979 to 2.303)	1.432 (1.126 to 1.823)
51 to 70 years	0.794 (0.504 to 1.252)	1.103 (0.913 to 1.332)	1.010 (0.911 to 1.120)
>70 years	1.063 (0.775 to 1.457)	1.064 (0.900 to 1.257)	1.023 (0.932 to 1.123)
Female patients			
0 to 17 years	0.690 (0.291 to 1.638)	0.650 (0.287 to 1.474)	1.075 (0.714 to 1.618)
18 to 50 years	1.077 (0.428 to 2.710)	0.834 (0.456 to 1.524)	1.087 (0.840 to 1.407)
51 to 70 years	1.349 (0.834 to 2.181)	1.050 (0.826 to 1.334)	0.911 (0.804 to 1.033)
>70 years	1.012 (0.741 to 1.381)	1.006 (0.850 to 1.192)	0.980 (0.893 to 1.074)

Male patients



Female patients



Donors:



Male



Female



Never-pregnant female



Ever-pregnant female

Discussion

- Confirmation of increased mortality of male patients after transfusion from female donors
- Association seems limited to:
 - Patients <50 years (i.e. certain diagnoses)
 - Female donors with a history of pregnancy
- Limitations:
 - Mechanism and mediator still unknown
 - Only investigated red cells

Future studies

- Observational follow-up (funding applied for):
 - Complete pregnancy histories of donors
 - Collect diagnoses
 - Investigate causes of death
 - Test blood products for potential mediator
 - **DTD en R-fact + any center willing and able to provide data**
- Cluster randomised cross-over trial (funding ZonMw doelmatigheid 2018):
 - 8000 male patients <50 years
 - 150,000 patients
 - 2020-2023
 - **Half of the 15 largest transfusion users**