



## Vers versus oud, ATTACH versus SCANDAT; De mogelijkheden van een nationale database

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## Disclosures

- Geen (potentiële) belangenverstrengeling

# ATTACH

- ATTACH: **A**nalysis of **T**hrombocyte **Tr**Ansfusion in **C**ardiothoracic surgery and **H**ematology
- Cohort: patiënten die minimaal 1 PLT transfusie hebben gehad
- 2005-2015
- 9 ziekenhuizen



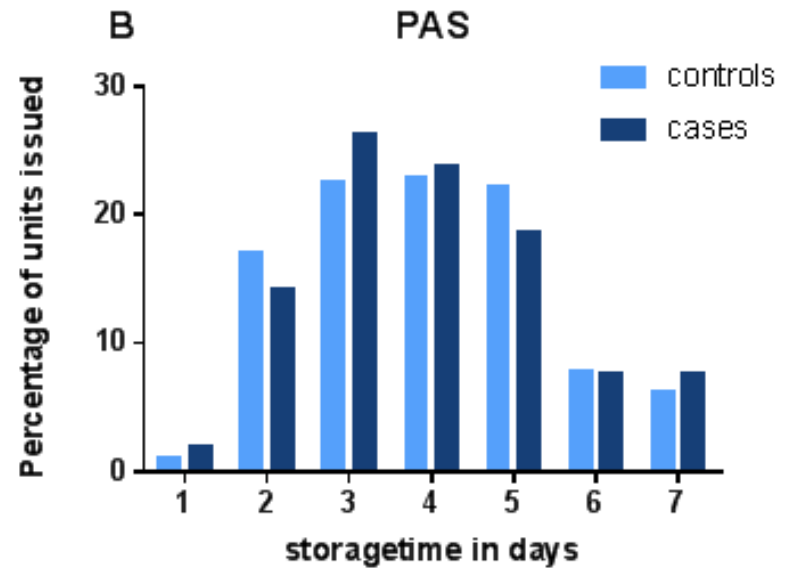
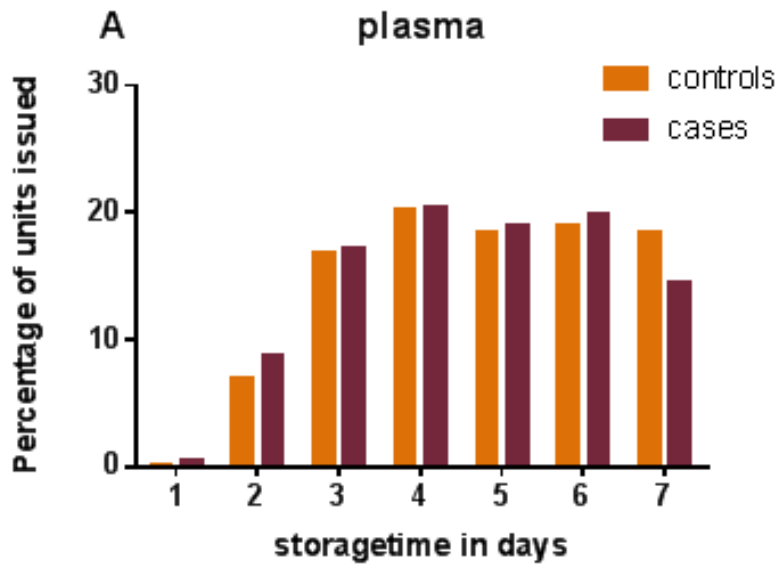
## ATTACH methode

- Nested case control
- Hematologische patiënten,  $\geq 1$  jaar oud
  
- Case: patiënt met positieve bloedkweek 1 dag na PLT transfusie
- Controle: gematched op ziekenhuis, dag van de week, aantal transfusies, ABO bloed groep, bewaarmedium
  
- Bewaarduur:
  - 1-2 dagen
  - 3-4 dagen
  - 5-7 dagen
- Conditionele logistische regressie

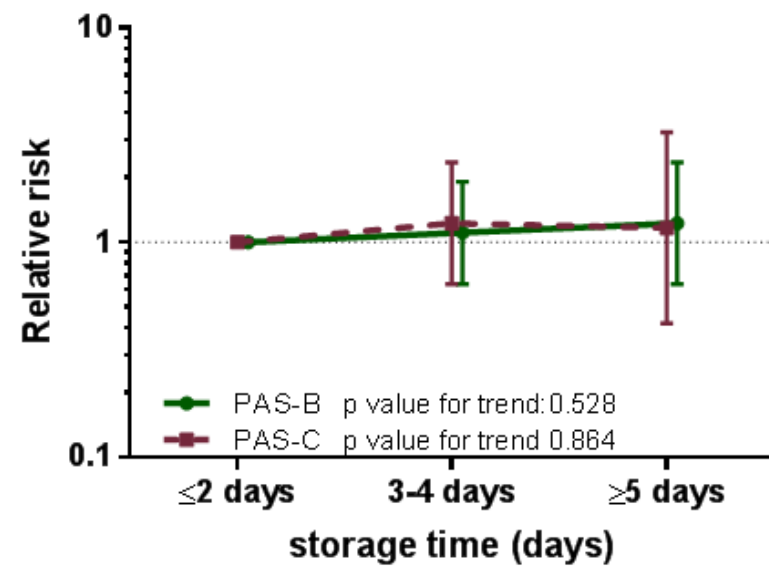
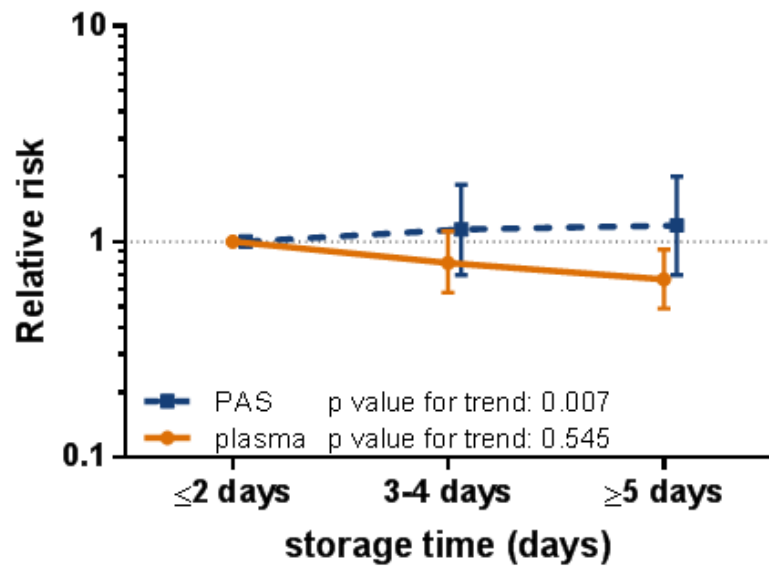
## ATTACH resultaten

<b>Plasma</b>	<b>Total</b>	<b>≤2 days</b>	<b>3-4 days</b>	<b>≥5 days</b>
Transfusion days	32,734	2,390 (7.3)	12,100 (37.0)	18,244 (55.7)
Patients	3,514	1,240	2,671	3,030
Age in years, mean (SD)	52.8 (17.6)	52.3 (17.3)	52.6 (17.5)	53.1 (18.0)
Male sex (%)	20,856 (63.7)	1,540 (64.4)	7,672 (63.4)	11,644 (63.8)
Number of transfusions per day, median (range)	1 (1-10)	1 (1-6)	1 (1-10)	1 (1-8)
Diagnosis				
-Acute leukemia	20,575 (62.9)	1,409 (58.9)	7,596 (62.8)	11,570 (63.4)
-Lymphoma	4,955 (15.1)	413 (17.3)	1,802 (14.9)	2,740 (15.0)
-Myeloma	2,275 (6.9)	160 (6.7)	871 (7.2)	1,244 (6.8)
-Chronic leukemia	2,289 (7.0)	188 (7.9)	846 (7.0)	1,255 (6.9)
-Aplastic anemia and other	2,640 (8.1)	220 (9.2)	985 (8.1)	1,435 (7.9)
<b>PAS</b>	<b>Total</b>	<b>≤2 days</b>	<b>3-4 days</b>	<b>≥5 days</b>
Transfusion days	10,716	1,994 (18.6)	4,840 (45.2)	3,882 (36.2)
Patients	1,527	798	1,180	1,051
Age in years, mean (SD)	59.4 (15.0)	58.6 (14.7)	59.5 (15.1)	59.9 (15.0)
Male sex	6,633 (61.9)	1,174 (58.9)	3,000 (62.0)	2,459 (63.3)
Number of transfusions per day, median (range)	1 (1-5)	1 (1-5)	1 (1-5)	1 (1-4)
Diagnosis				
-Acute leukemia	6,033 (56.3)	1,053 (52.8)	2,692 (55.6)	2,288 (58.9)
-Lymphoma	2,192 (20.5)	457 (22.9)	1,003 (20.7)	732 (18.9)
-Myeloma	1,258 (11.7)	271 (13.6)	579 (12.0)	408 (10.5)
-Chronic leukemia	577 (5.4)	133 (6.7)	260 (5.4)	184 (4.7)
-Aplastic anemia and other	656 (6.1)	80 (4.0)	306 (6.3)	270 (7.0)

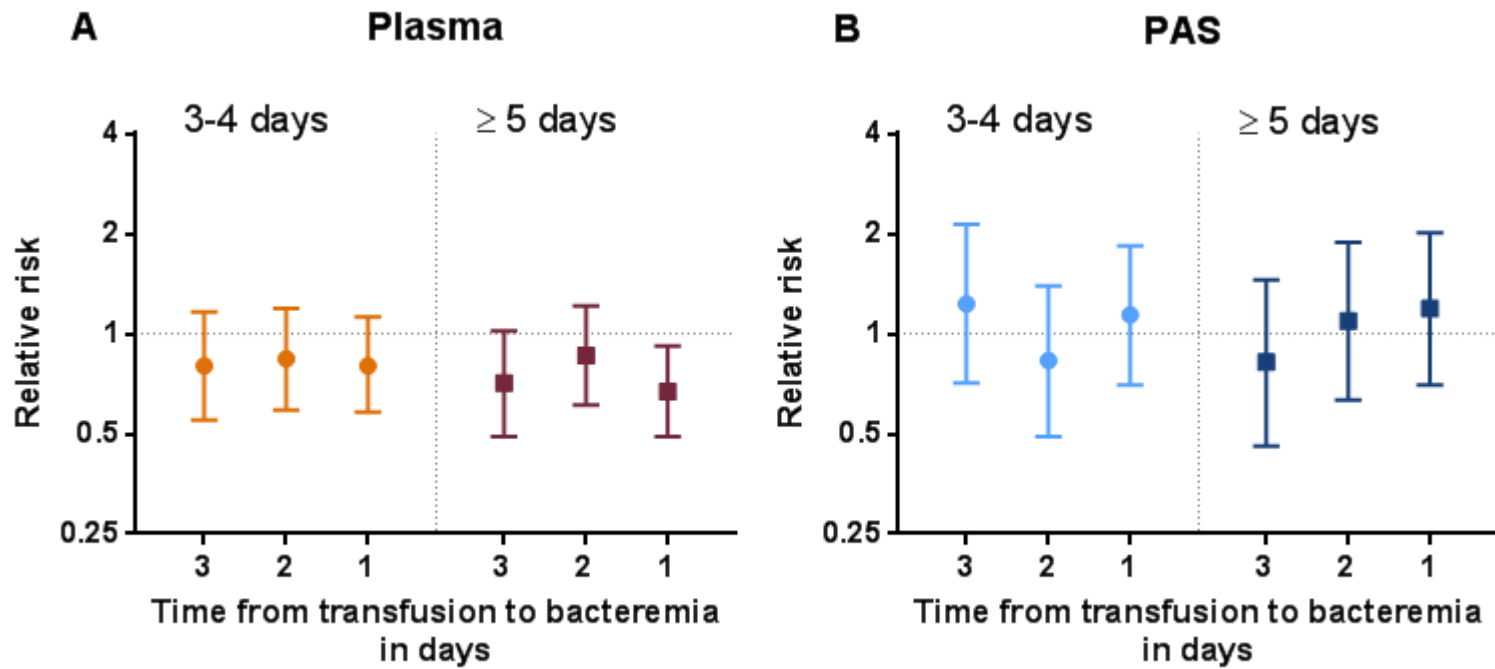
## ATTACH resultaten (2)



## ATTACH resultaten (3)



# ATTACH resultaten (4)





## ATTACH conclusie en discussie

- PLTs in plasma
  - Langer bewaren geassocieerd met lager risico bacteremie
- PLTs in PAS
  - Geen associatie bewaarduur en bacteremie
- Geen associatie bewaarduur en bacteremie na 2 of 3 dagen
- Verschillend effect PAS en plasma
  - Effect modificatie door bewaarvloeistof?
  - Power?

# Epidemiologie in Denemarken

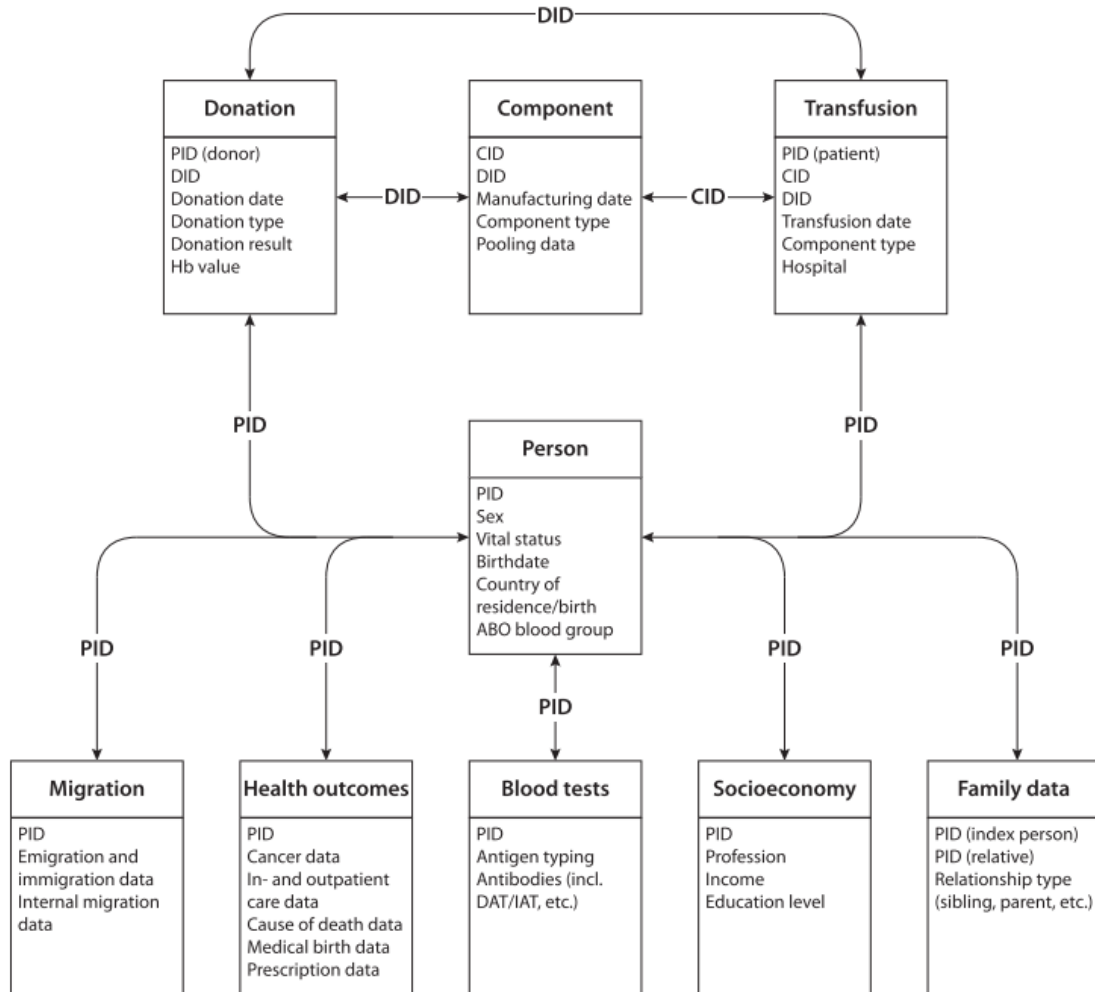


## SCANDAT

- Binationale database
- Zweden 1966, Denemarken 1981 tot 2012
- CPR number
- Donatie – transfusie – uitkomst
  - 25,523,334 donaties
  - 21,318,794 transfusies
  - 3,692,653 personen

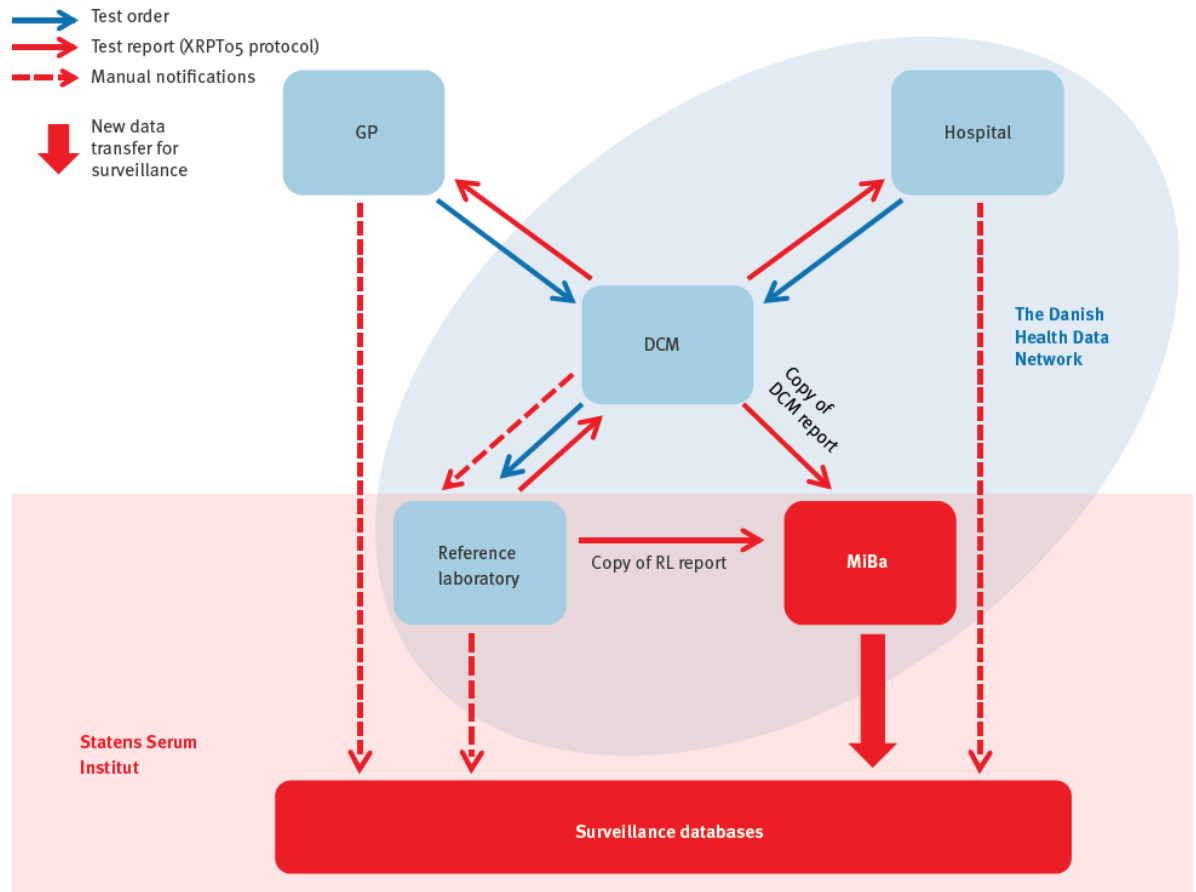


# SCANDAT (2)



# MiBa

- Microbiologie database
- 2010-2013



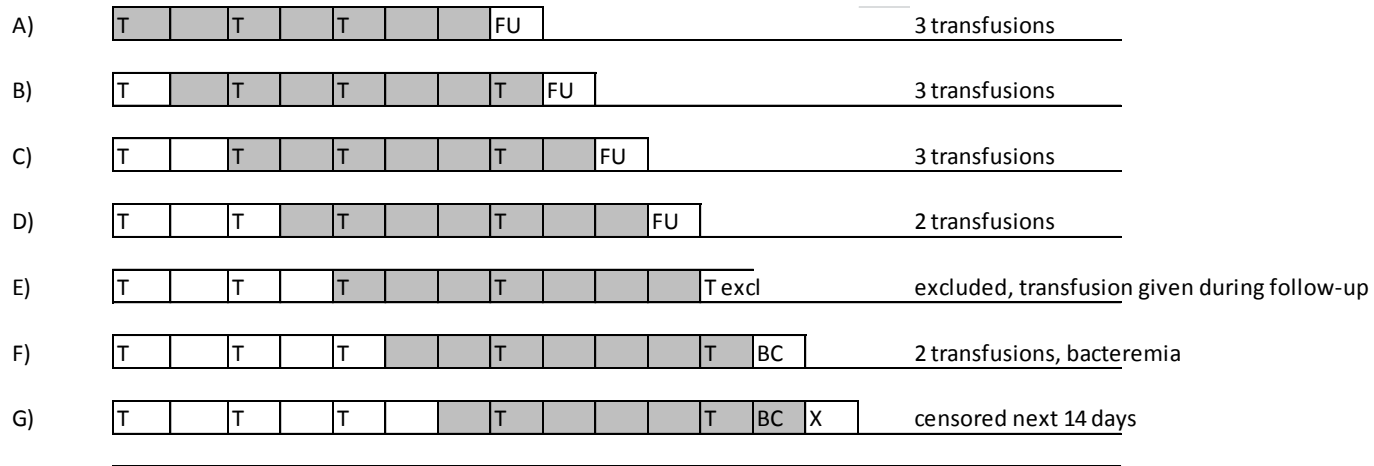
## Methode

- SCANDAT2 en MiBa
- Cohort: ontvangers PLT transfusie
- $\geq 18$  jaar oud
- 2010-2012
- PLTs
  - Buffy coats, 4 donoren
  - PAS-C/Intersol/PAS-III
  - BacT/Alert
  - Maximale bewaarduur 7 dagen
    - 1-5 dagen versus 6-7 dagen
- Uitkomst: bacteremie



# Statistische analyse

- Exposure window: 1, 3, 5, 7 dagen
- 1 dag follow-up



1	2	3	4	5	6	7	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8	9	10	11	12	13	14

weekdays  
time in days



## Statische analyse (2)

- Incidence rate ratio
- Poisson regressie
- Gecorrigeerd voor ziekenhuis, dag van de week, RhD





# Resultaten (1)

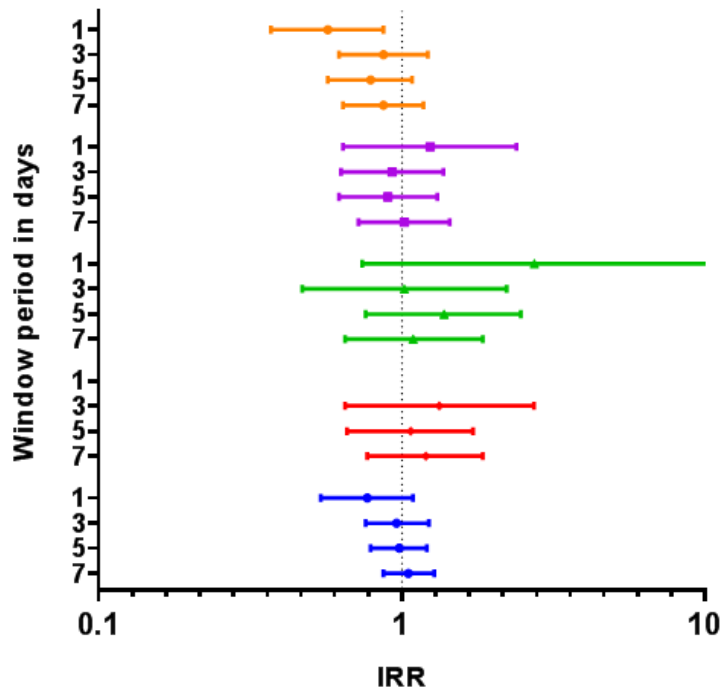
	<b>Number of patients (%)</b>
Patients, n	9,776
Male, n (%)	6,088 (62.3)
Mean (SD) age in years	64.1 (14.6)
Transfused PLTs, median (IQR)	2 (1-6)
Transfused RBCs, median (IQR)	12 (5-24)
Transfused plasma, median (IQR)	2 (0-8)

	<b>Storage time 1-5 days</b>	<b>Storage time 6-7 days</b>	<b>Total*</b>
Platelet concentrates (%)	34,722 (52.5)	22,240 (33.6)	66,101 (100)
Main indication			
Hematology	17,029 (49.0)	10,681 (48.0)	32,547 (49.2)
Cardiothoracic surgery	3,017 (8.7)	1,914 (8.6)	5,657 (8.6)
Trauma and burns	5,407 (15.6)	3,429 (15.4)	10,319 (15.6)
Bleeding	1,177 (3.4)	675 (3.0)	2,106 (3.2)
ABO blood group, n (%)			
A	13,958 (40.2)	8,019 (36.1)	22,377 (33.9)
B	1,551 (4.5)	510 (2.3)	2,084 (3.2)
AB	9 (0.03)	1 (0.0)	15 (0.0)
O	16,736 (48.2)	12,216 (54.9)	30,469 (46.1)
Rhesus antigen positivity, n (%)	26,949 (77.6)	14,094 (63.4)	42,065 (63.6)
Missing blood group, n (%)	2,468 (7.1)	1,494 (6.7)	11,156 (16.9)

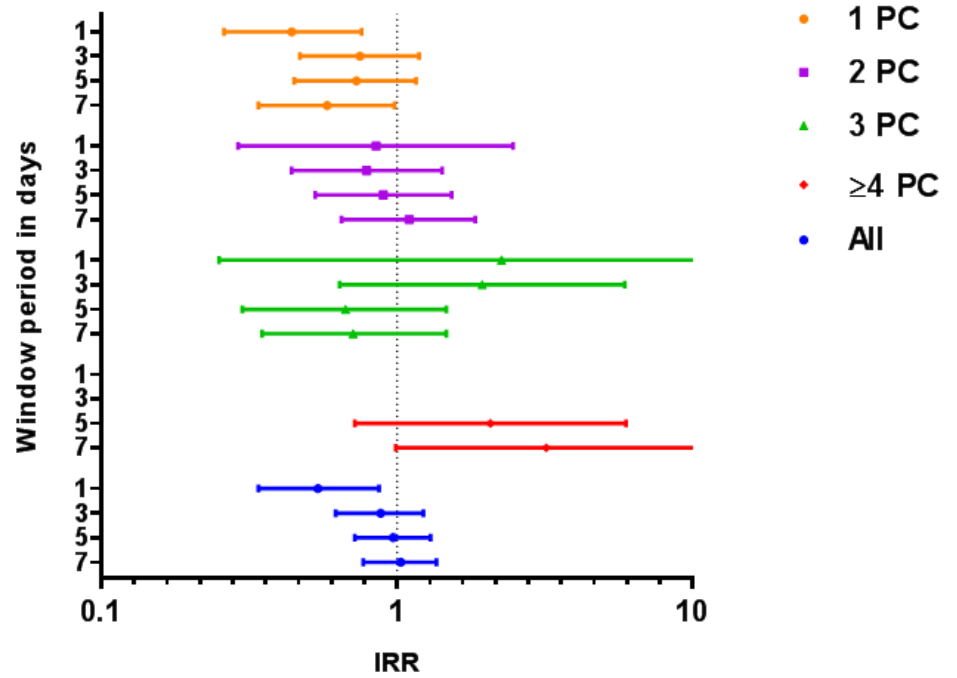


# Resultaten (2)

A) Entire cohort



B) Hematological patients



- 1 PC
- 2 PC
- ▲ 3 PC
- ◆ ≥4 PC
- All



## Conclusie en discussie

- SCANDAT: 6-7 dagen bewaren is veilig mbt risico bacteremie
  - 1 oude transfusie → lager risico bacteremie de volgende dag
- ATTACH: langer bewaren verlaagd risico
  - Oud 5-7 dagen
  - Selectie: “single storage time” → vaak 1 transfusie
- Stabiele, niet bloedende patienten?
- 2 methodes, 2 cohorten, zelfde resultaten
  - Auto-sterilisatie?
  - TRIM?



## Nationale database

### SCANDAT

- Data van bloedbanken en transfusiedatabases
- Externe link
  - Kankerregistratie
  - “CBS” gegevens
  - SES gegevens
- Persoonlijk identificatie nummer
- Update op indicatie



### ATTACH/DTD

- Data van ziekenhuizen en Sanquin
- Interne link
  - Laboratorium uitslagen
  - Zorgadministratie
- Geanonimiseerd, sleutel in ziekenhuis
- Jaarlijkse update

## Acknowledgements

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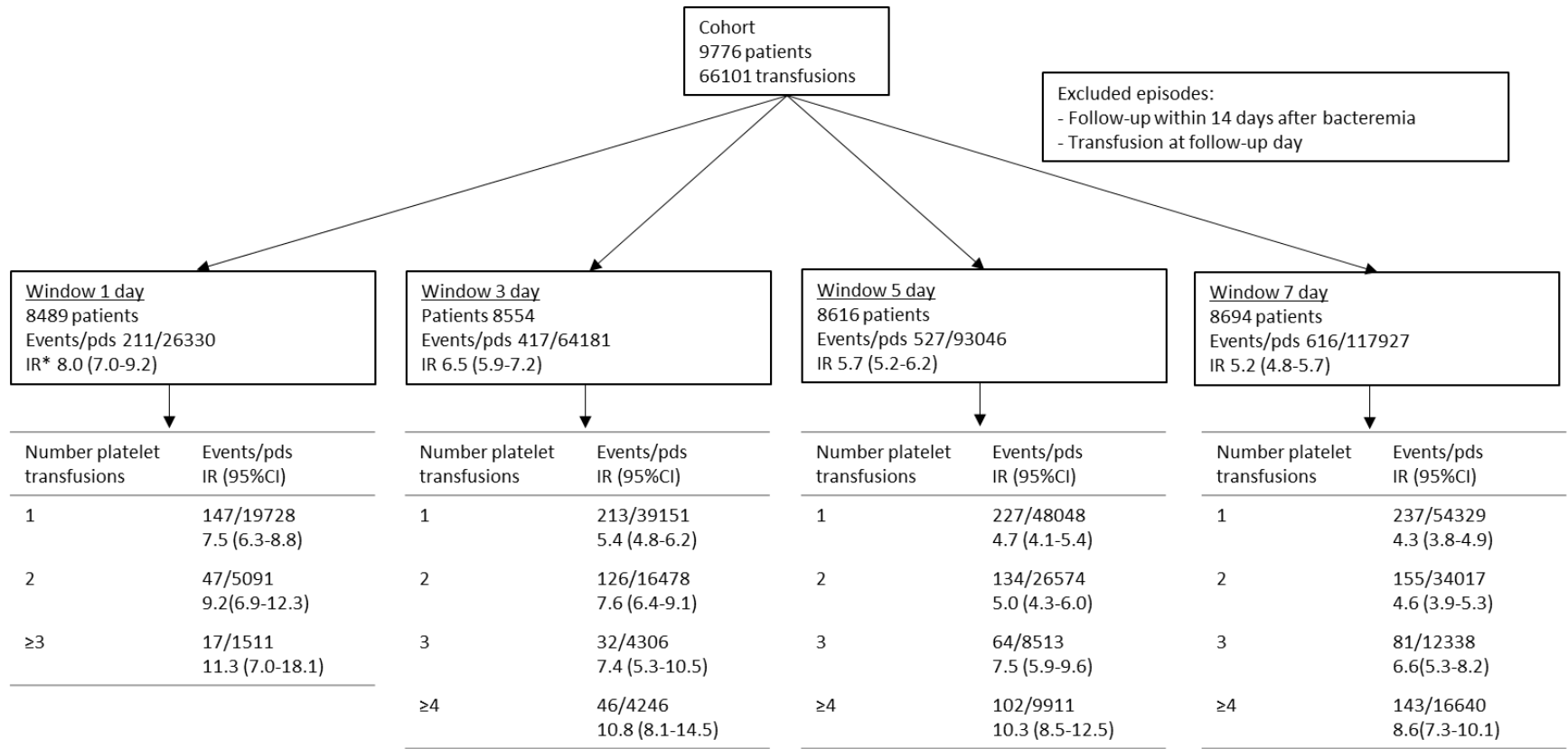
### Denemarken

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- Henrik Hjalgrim, SSI





# Incidence rates



\*incidence rate expressed per 1000 patient days of follow-up

# Dose-response

Number of transfusions		Window period			
Total	Old	1 day	3 days	5 days	7 days
1	1	0.57 (0.37-0.87)	0.87 (0.62-1.22)	0.79 (0.57-1.08)	0.87 (0.64-1.18)
2	1	1.54 (0.64-3.71)	0.87 (0.53-1.44)	0.92 (0.58-1.43)	1.08 (0.72-1.63)
2	2	1.11 (0.53-2.31)	0.98 (0.62-1.54)	0.88 (0.55-1.42)	0.95 (0.62-1.47)
3	1	2.39 (0.40-14.31)*	1.05 (0.39-2.81)	1.30 (0.65-2.61)	1.09 (0.59-2.02)
3	2	5.10 (1.13-23.00)*	1.87 (0.75-4.63)	1.88 (0.97-3.65)	1.24 (0.65-2.36)
3	3	1.94 (0.43-8.71)*	0.21 (0.03-1.63)	0.79 (0.29-2.18)	0.87 (0.36-2.09)
≥4	1		1.10 (0.35-3.41)	1.18 (0.62-2.23)	1.07 (0.59-1.91)
≥4	2		1.40 (0.52-3.78)	0.84 (0.42-1.68)	1.08 (0.61-1.91)
≥4	3		0.76 (0.17-3.42)	1.03 (0.49-2.14)	1.26 (0.68-2.33)
≥4	≥4		1.64(0.70-3.80)	1.20 (0.66-2.17)	1.37 (0.81-2.33)

\* ≥3 transfusions