

# Use of oral iron supplementation is not associated with risk of infection

## Results from the Danish Blood Donor Study

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1

## The Danish Blood Donor Study

### Aim:

Does oral iron supplementation  
increase the risk of infection?

2



# Overview

## 1. Introduction

- Background:
  - Side effects for oral iron supplementation
  - Iron metabolism
- Hypothesis

## 2. Methods

- The Danish Blood Donor Study
- Overview over the study population

## 3. Results

## 4. Conclusion

3



# Background

## Oral iron supplementation

### Known side effects:

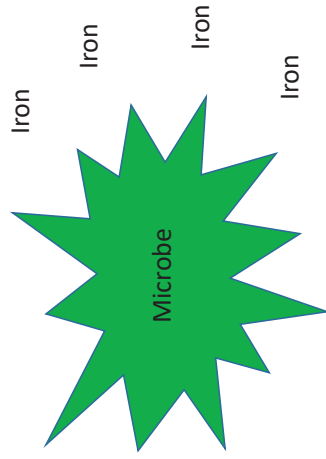
- Nausea
- Dyspepsia
- Diarrhea
- Constipation

### Increased risk of infection?

- Patients with haemochromatosis
- Intravenous iron supplements
- Changing the human gut microbiota

4

## Hypothesis



Ref: *Role of hepcidin in the pathophysiology and diagnosis of anemia*, March 2013, *Blood Research* 48(1):10-5, DOI: 10.5045/br.2013.48.1.10

5

## Methods

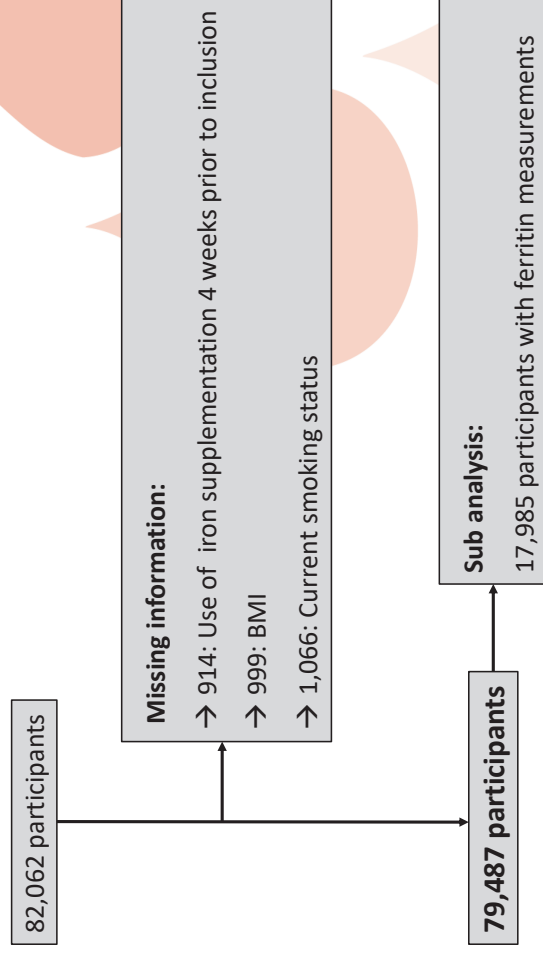
### The Danish Blood Donor Study DBDS:

- Initiated in 2010
- Donors aged 18 – 67 years old
- Questionnaires
- Plasma samples in a biobank
- Registers
- 110,000 donors are included

6

# Methods

## Overview:



7

# Methods

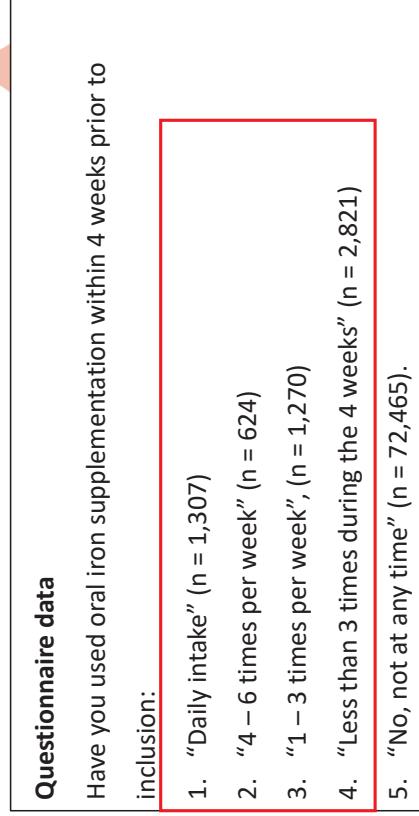
## The EXPOSURE:

Iron supplementation



## The OUTCOME

Infections



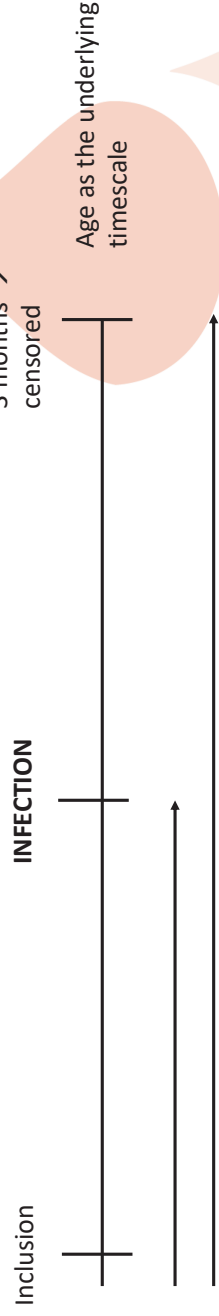
Filled prescriptions for antibiotics (ATC codes, the Danish National Prescription Register)

Diagnostic codes (ICD-10, the Danish National Patient Register)

8

# Methods

## Statistics: Multivariable Cox proportion hazard analysis



Adjustments:

- Obesity
- Current smoking status at inclusion
- Donation rate 3 years prior to inclusion

# Results

Prescriptions overall											
		Crude model (n = 82,062)			Adjusted model (n = 82,062)			Ferritin-adjusted model (n = 17,985)			
		N	IR	HR	CI	HR	CI	N	IR	HR	CI
<b>Women</b>											
Premenopausal											
Iron no		2,875	143.9	1	-	1	-	660	153.9	1	-
Iron yes		482	24.1	1.00	0.91 – 1.10	1.00	0.91 – 1.10	130	30.3	1.07	0.88 – 1.30
Postmenopausal											
Iron no		843	42.2	1	-	1	-	166	38.7	1	-
Iron yes		102	5.1	1.07	0.87 – 1.32	1.09	0.89 – 1.35	19	4.4	0.90	0.54 – 1.49
<b>Men</b>											
Iron no		2,558	128.0	1	-	1	-	614	143.2	1	-
Iron yes		123	6.2	1.01	0.84 – 1.21	1.02	0.85 – 1.23	37	8.6	1.30	0.93 – 1.83
<b>Crude and adjusted model: During 19,978 person-years of observation, 6,983 donors were treated for infection at a hospital.</b>											
<b>Ferritin-adjusted model: During 4,289 person-years of observation, 1,626 donors were treated for infection at a hospital.</b>											

## Results

Phenoxyethylpenicillin										
	Crude model (n = 82,062)			Adjusted model (n = 82,062)			Ferritin-adjusted model (n = 17,985)			
	N	IR	HR	CI	HR	CI	N	IR	HR	CI
<b>Women</b>										
Premenopausal										
Iron no	902	46.2	1	-	1	-	222	50.2	1	-
Iron yes	164	8.4	1.08	0.92 – 1.28	1.11	0.94 – 1.31	43	9.7	1.08	0.78 – 1.51
Postmenopausal										
Iron no	320	16.4	1	-	1	-	58	13.1	1	-
Iron yes	35	1.2	0.95	0.67 – 1.35	0.98	0.69 – 1.40	7	1.6	0.91	0.40 – 2.08
<b>Men</b>										
Iron no	1,184	60.6	1	-	1	-	269	60.9	1	-
Iron yes	46	2.4	0.79	0.58 – 1.06	0.80	0.60 – 1.08	9	2.0	0.68	0.35 – 1.33
Crude and adjusted model: During 19,533 person-years of observation, 2,651 donors redeemed at least one prescription of antimicrobials.										
Ferritin-adjusted model: During 4,419 person-years of observation, 608 donors redeemed at least one prescription of antimicrobials.										

11

## Results

Unstratified analysis showed no association between iron supplementation and hospital-based treatment for infection

12



## Conclusion

Oral iron supplementation is not associated with risk of infection among Danish blood donors

→ These findings are important to help understanding the safety of using iron supplements and ferritin-guided iron supplementation



Questions... 😊