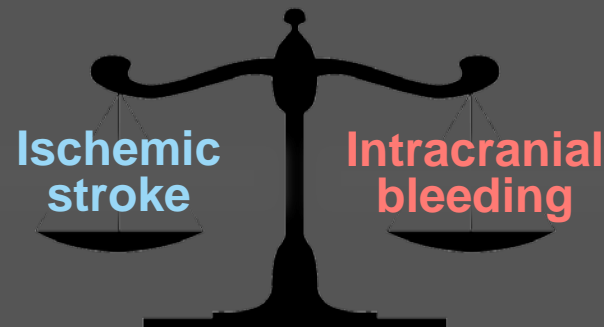




Ischemic and hemorrhagic stroke associated with NOACs and warfarin use in patients with atrial fibrillation

A nationwide cohort study

Laila Stærk, Emil L Fosbøl, Gregory Y H Lip, Morten Lamberts, Anders N Bonde, Christian Torp-Pedersen, Brice Ozenne, Thomas Gerds, Gunnar H Gislason, Jonas B Olesen.



Declaration of Interest

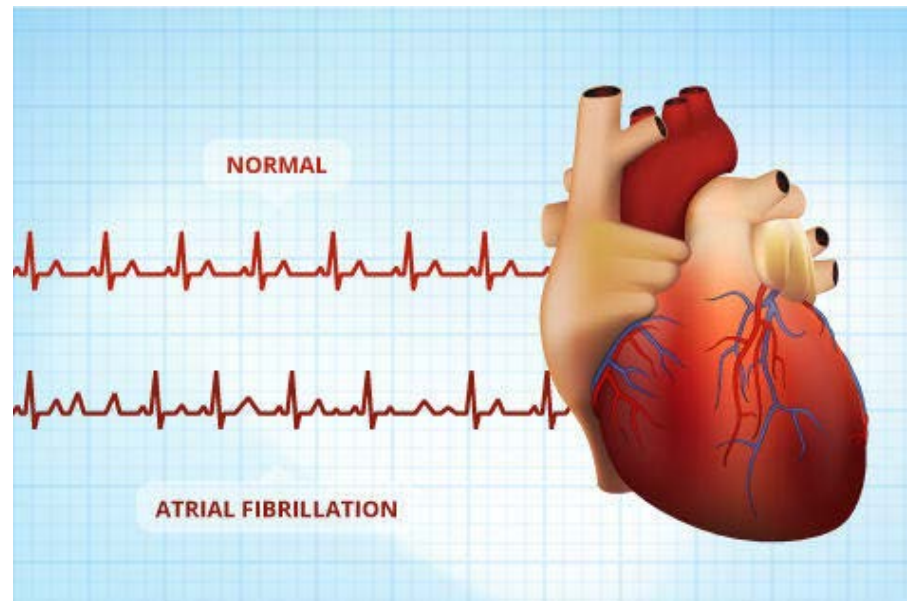
- Research contracts (Previous received a restricted research grant from Boehringer-Ingelheim)





Background

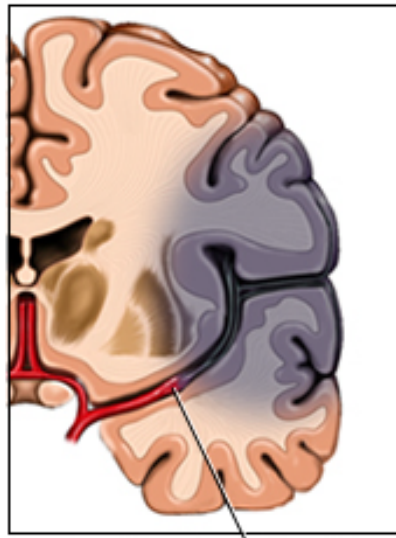
- Atrial fibrillation affects 33 million people worldwide.





Background

- Atrial fibrillation affects 33 million people worldwide.
- Atrial fibrillation increases the risk of stroke with a factor 5.



A clot blocks blood flow
to an area of the brain



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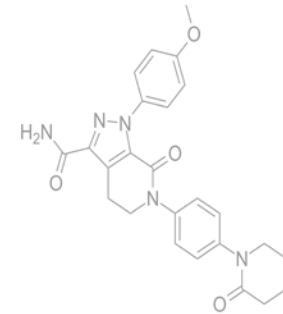
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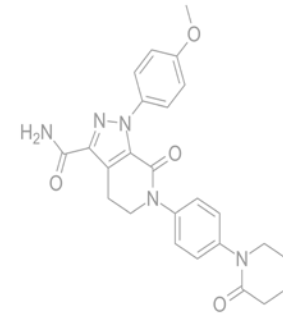
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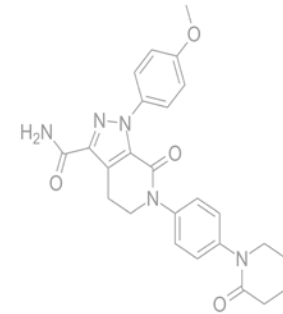
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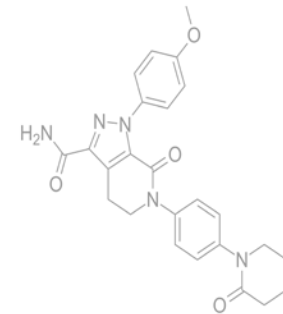
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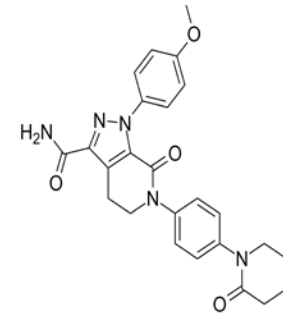
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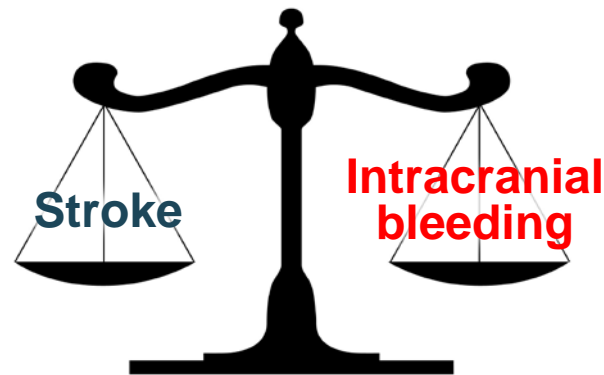
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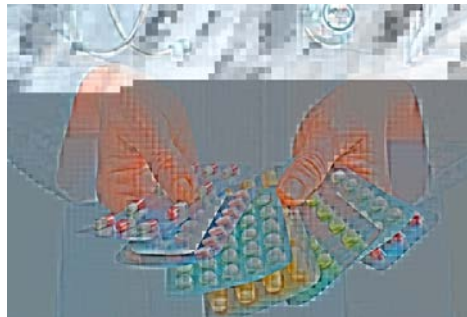


The lesser of two evils principle



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- Atrial fibrillation increases the risk of stroke with a factor 5.
- Oral anticoagulation reduces the stroke risk.
- Four treatment options in Denmark until 2016.
- Oral anticoagulation increases the bleeding risk – in particular is intracranial bleeding feared.
- The clinical question: *“Which oral anticoagulant should we choose?”*



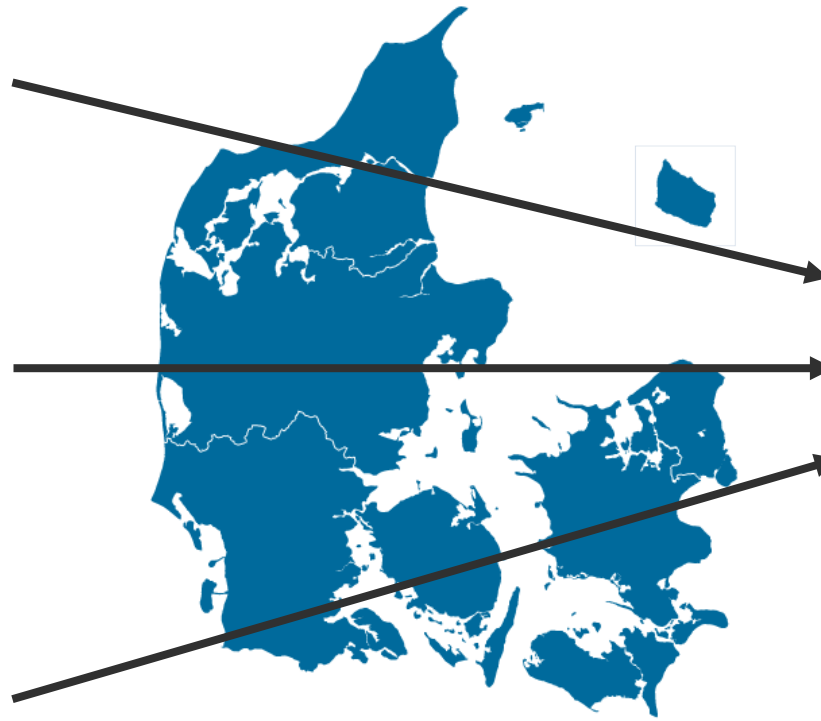
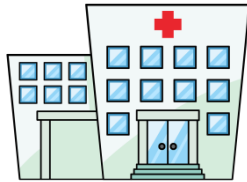


Purpose

- To compare the associated risk of ***ischemic stroke*** and ***intracranial bleeding*** with NOACs compared with warfarin among all Danish patients with atrial fibrillation.

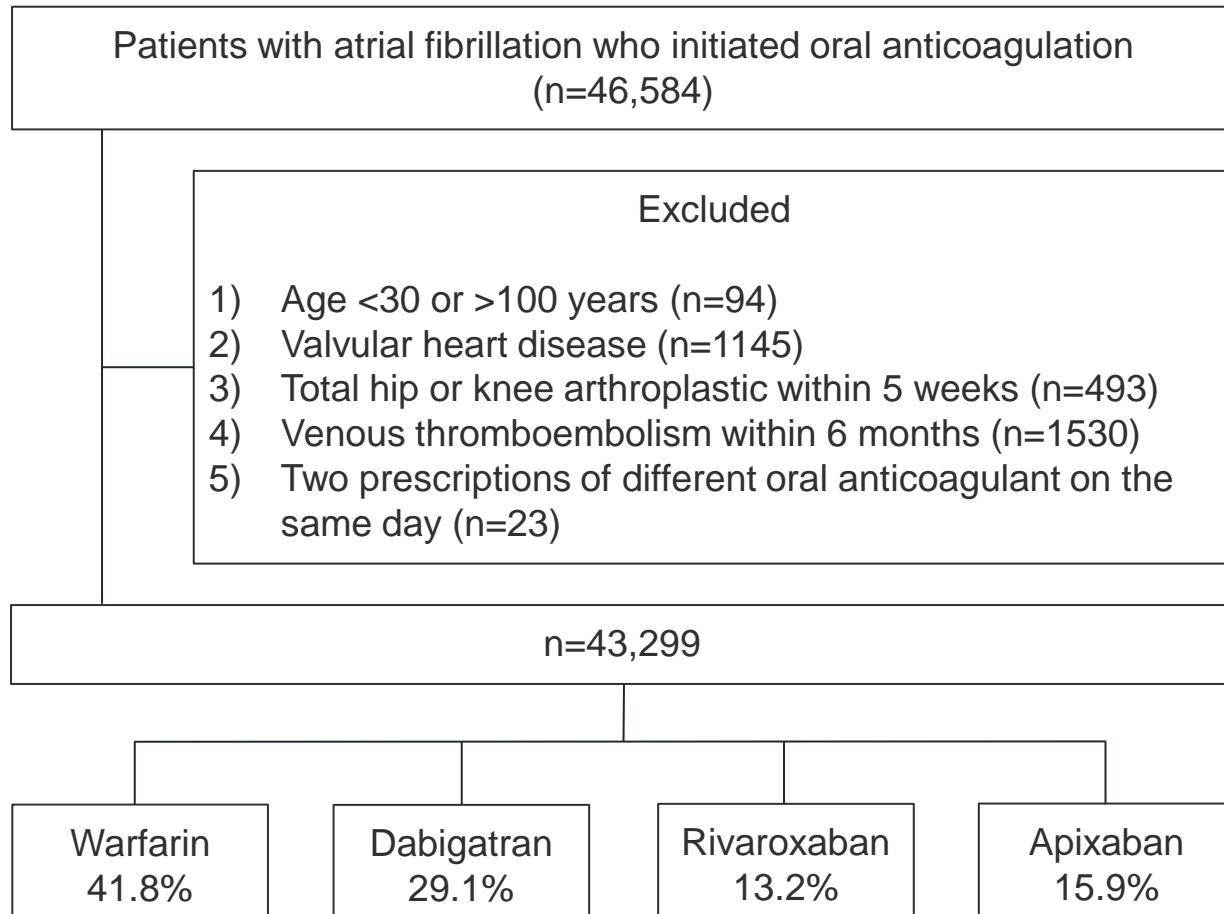


Methods



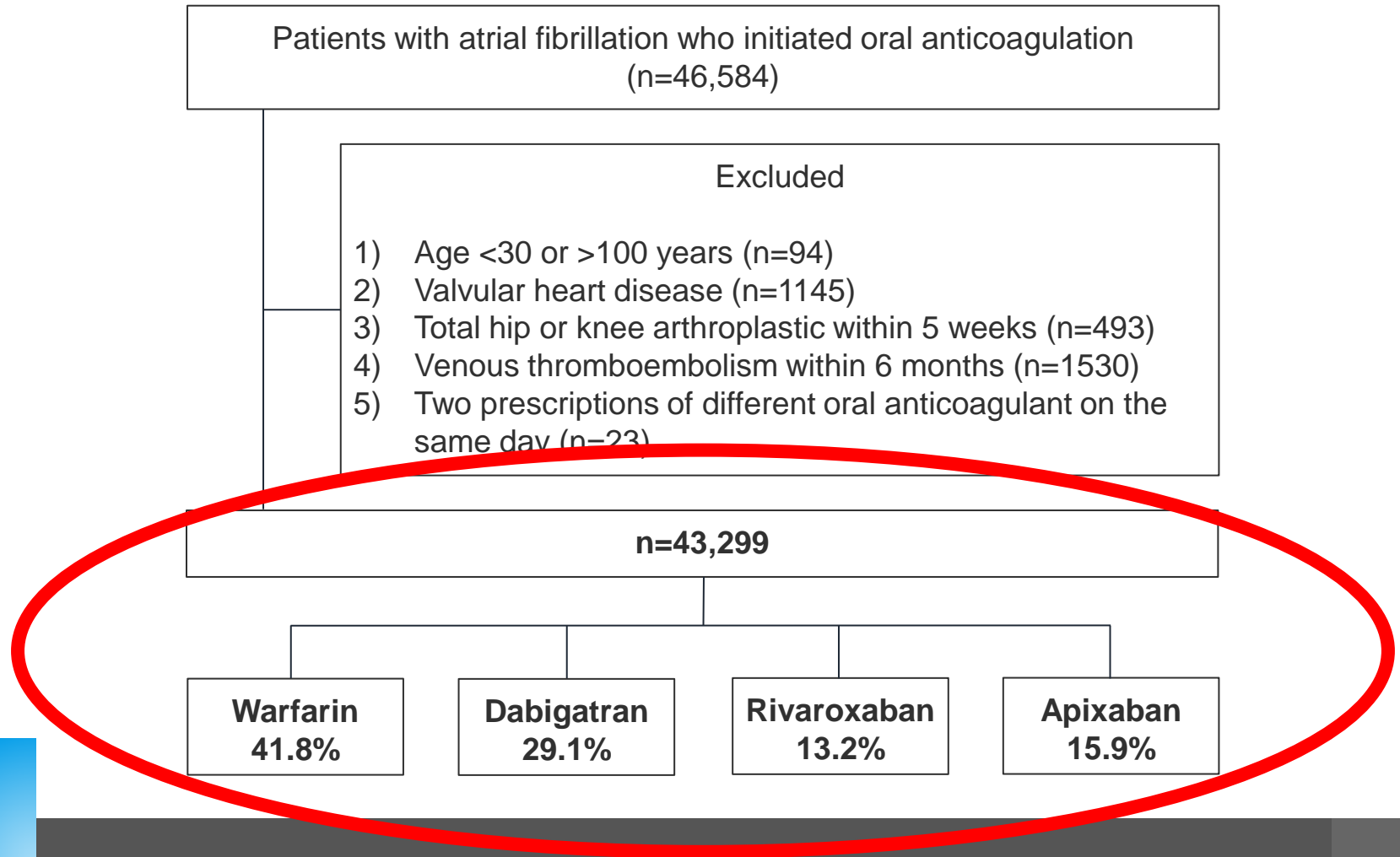


Selection of the study population



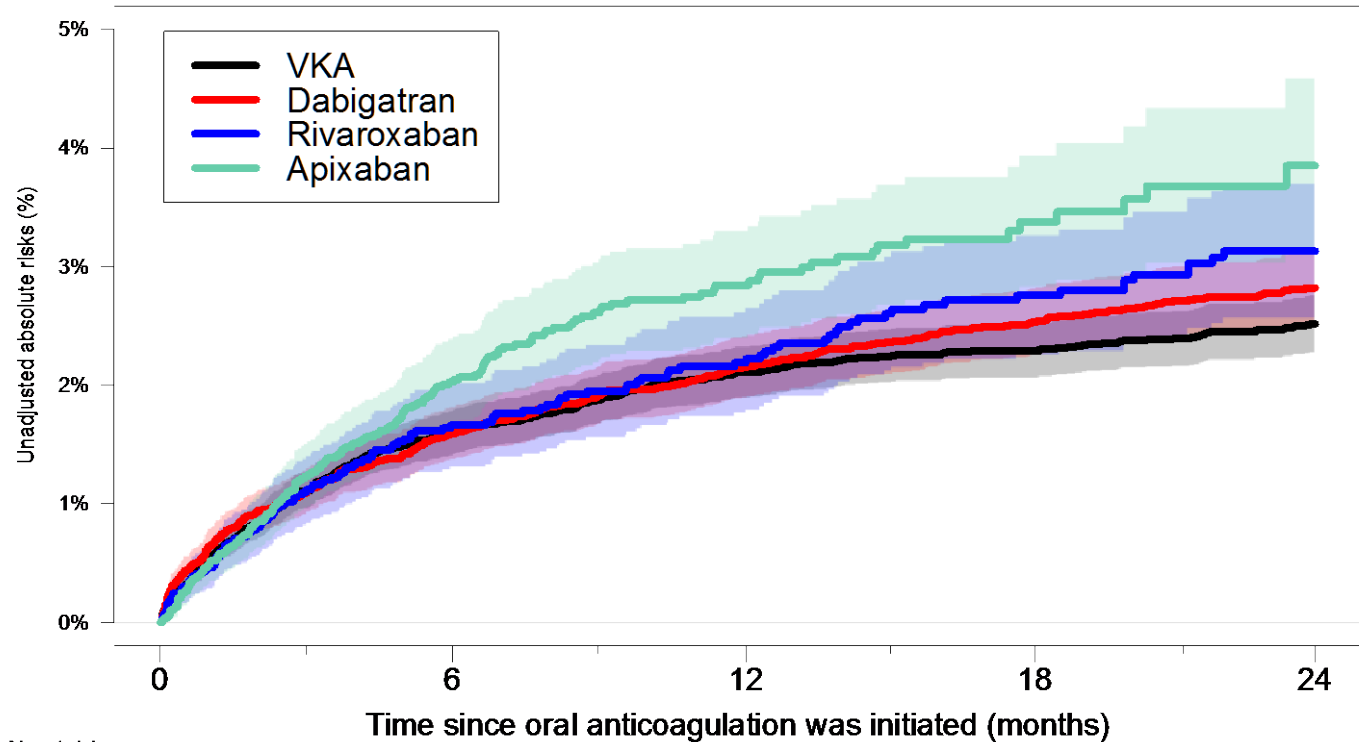


Selection of the study population





Stroke – unadjusted absolute risk



No. at risk	0	6	12	18	24
VKA	18094	11196	6870	4815	3446
Dabigatran	12613	8398	6484	5109	3760
Rivaroxaban	5693	3090	1864	1282	826
Apixaban	6899	3731	1818	754	283



Stroke – standardized absolute risk

	1 year since treatment was initiated	
	Absolute risk (%)	Absolute risk difference (%)
Warfarin	2.01 (1.80 to 2.21)	reference
Dabigatran	2.12 (1.90 to 2.39)	0.11 (-0.16 to 0.42)
Rivaroxaban	2.06 (1.73 to 2.47)	0.05 (-0.33 to 0.48)
Apixaban	2.46 (2.07 to 2.85)	0.45 (-0.001 to 0.93)

* Significant difference (P value < 0.05)



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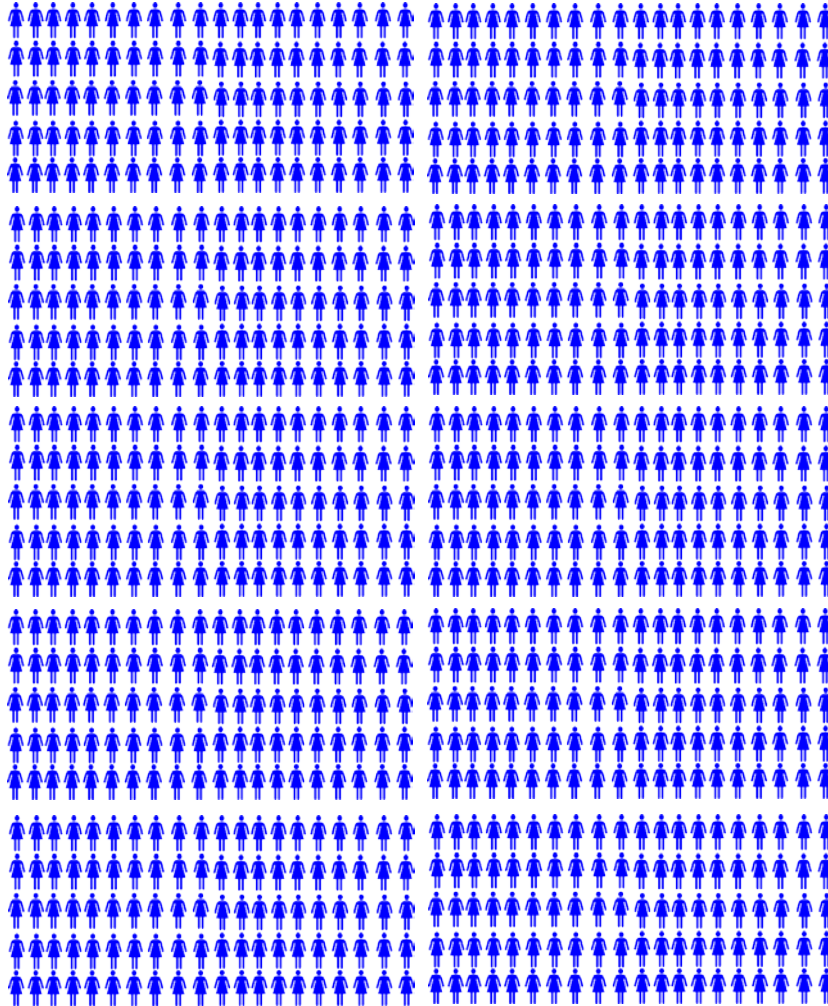
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1000 patients with atrial fibrillation treated with oral anticoagulation



NOAC or warfarin

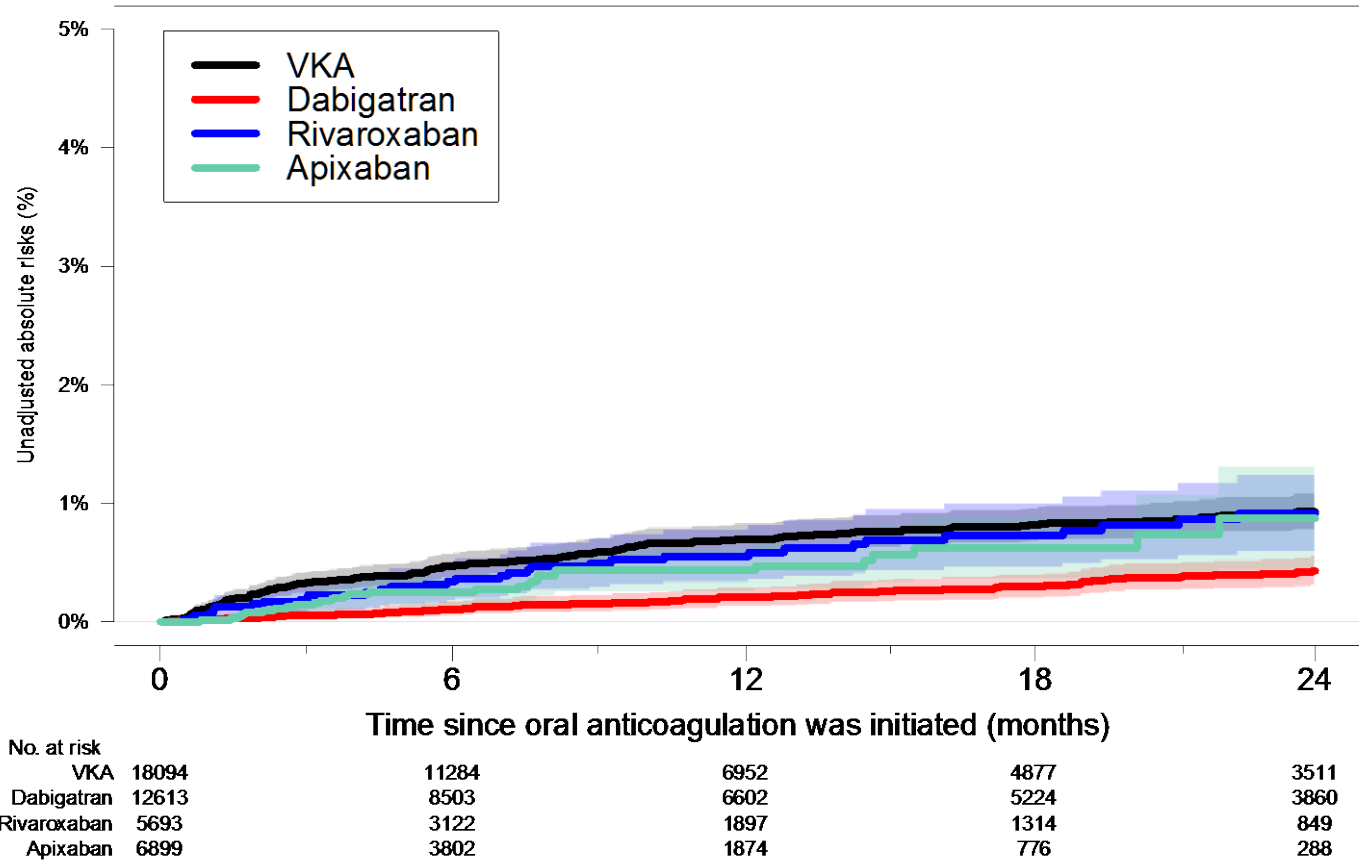


Stroke

~ 20-25 patients



Intracranial bleeding – unadjusted absolute risk





Intracranial bleeding – standardized absolute risk

	1 year since treatment was initiated	
	Absolute risk (%)	Absolute risk difference (%)
Warfarin	0.60 (0.49 to 0.72)	reference
Dabigatran	0.26 (0.19 to 0.34)*	-0.34 (-0.47 to -0.21)*
Rivaroxaban	0.47 (0.32 to 0.65)	-0.13 (-0.33 to 0.08)
Apixaban	0.40 (0.25 to 0.57)*	-0.20 (-0.38 to -0.01)*

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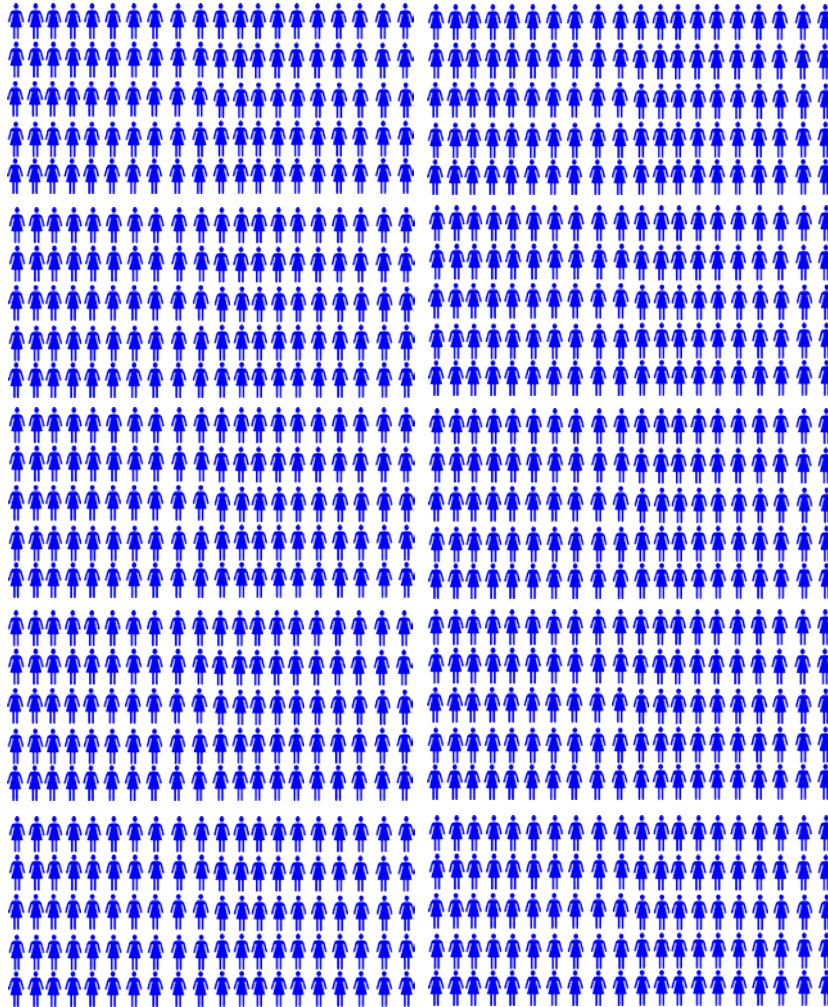
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1000 patients with atrial fibrillation treated with oral anticoagulation



Warfarin

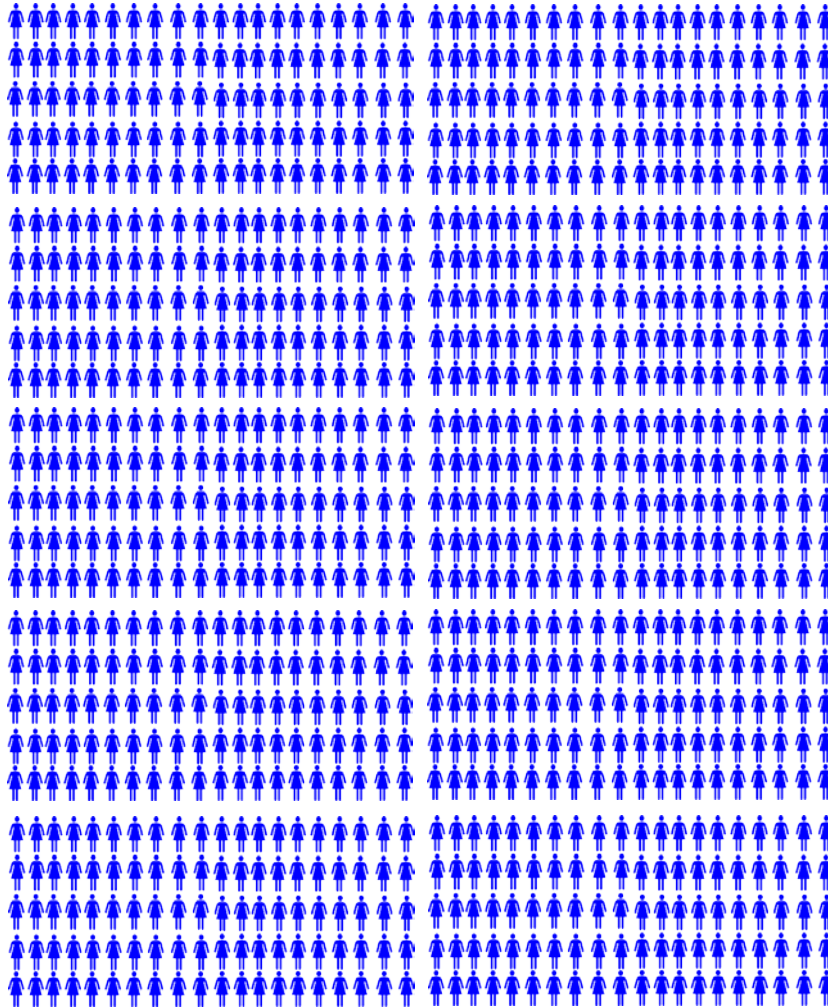


Intracranial bleeding

~ 6 patients



1000 patients with atrial fibrillation treated with oral anticoagulation



Apixaban

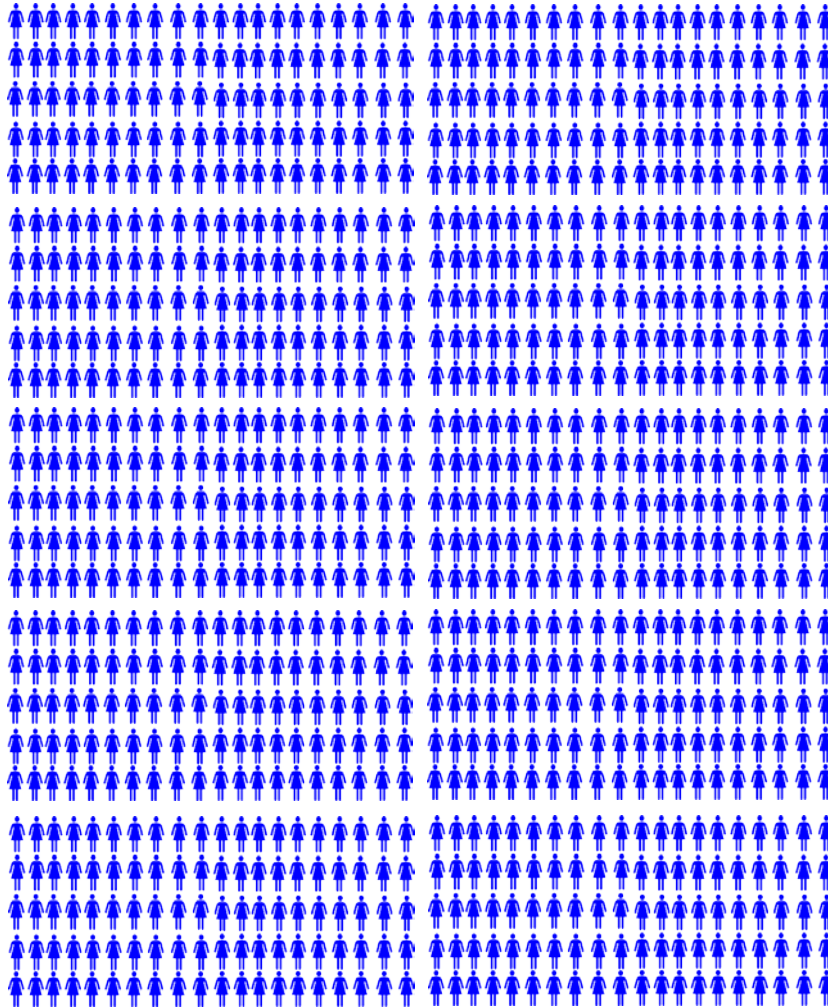


Intracranial bleeding

~ 4 patients



1000 patients with atrial fibrillation treated with oral anticoagulation



Dabigatran



Intracranial bleeding

~ 3 patients



Conclusions

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- Only treatment with dabigatran and apixaban was associated with a significantly lower risk of intracranial bleeding, compared with warfarin.



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Thank you for your attention