

Aetion Measure Appendix

Administrative Information (STaRT-RWE Table 1)

Protocol Title	UK	
Primary Objective	Estimate the incidence rates and evaluate the association of nonfatal stroke (ischemic or hemorrhagic) for patients nonvalvular AFib who initiated apixaban compared to rivaroxaban	
Secondary Objective	apixaban compared to edoxaban, dabigatran, and DOAs class	
Secondary Objective	transient ischemic attack (TIA), major bleeding events, and major adverse cardiovascular events (MACE) for patients	

Registration

Registration Identifier	Date	Registration Site
45074	1/10/2022	EU PASS register

Version

Version Number	Version Date
V1	10/22/21

Protocol Contributors

Name	Role	Affiliation
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Funding

Grant Identifier	Source
-	This research was conducted as part of a Research Collaboration Agreement with NICE.

Data Use Agreement (DUA)

DUA Identifier	Data Provider	Data Provider Contact for DUA
-	Cegedim	Shelley Jessop

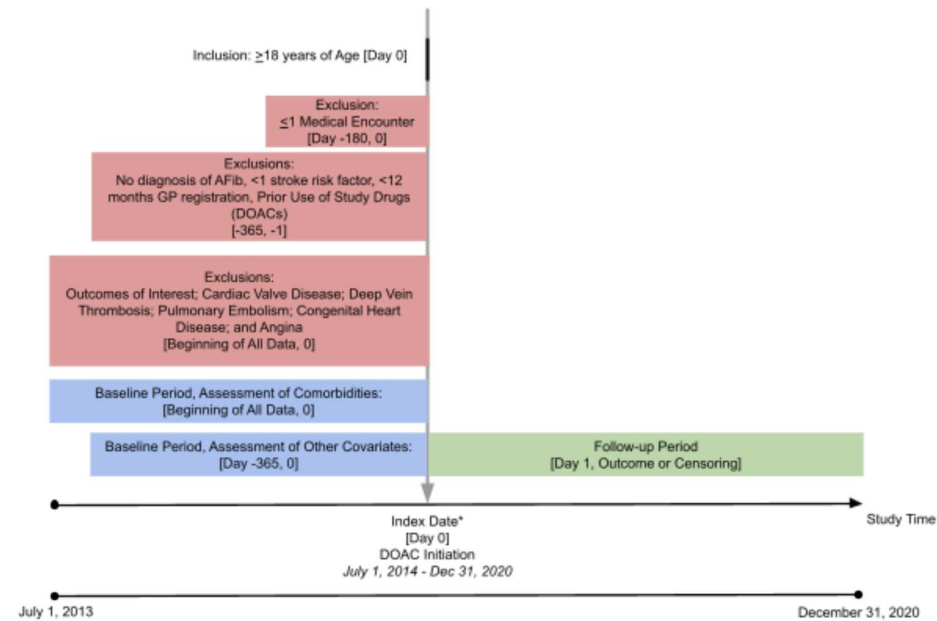
Human Subjects/Ethics Approval

observational, non-interventional study does not affect the treatment of the patients. The study is conducted in accordance with ethical principles that are

[This Measure Appendix is based largely on the STaRT-RWF templates proposed by Wang et al., 2020.](#)

Research Question Overview

fibrillation (AFib) in the UK. Individual DOAs of interest include apixaban, rivaroxaban, edoxaban, and dabigatran.

Study Design Diagram (STaRT-RWE Figure 1)

Measure Appendix Version History (STaRT-RWE Table 2)			
Version Number	Version Date	Change Log	Rationale for Changes
1	1/3/2022	N/A	N/A

Data Source Details (STaRT-RWE Table 3)	
<i>calendar time range of data available for pre-index assessment windows and post-index follow up (study period). The data source name</i>	
	Data Source 1
Data Source Name	The Health Improvement Network (THIN) Database (A priority database from Cegedim)
Study Period	July 1, 2013 - December 31, 2020
Eligible Cohort Entry Period	July 1, 2014 - December 31, 2020
Data Extraction Date / Version	July 30, 2021
Data Sampling / Extraction Criteria	As part of the study application and data access process, Cegedim applied limited inclusion/exclusion criteria to extract the data set used in the analysis. See Cohort tab for more details.
Type(s) of Data	EHR
Data Linkage	N/A
Data Conversion	N/A
Software to Create Study Population	Action Evidence Platform

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Study Population			Implementation										
Abbreviation	Name	Corresponding Study Objective	Index Date Description	Number of Entries	Type of Entry	Washout Window	Care Settings (Events)	Code Type	Code Position	Incident With Respect to...	Pre-Specified	Varied for Sensitivity	Source
Apixaban	Incident Users of apixaban	Primary	initiation of apixaban during July 1, 2014 through December 31, 2020	Single	Incident	Day -365 to Day -1	Perscriptions	Product ATC code	N/A	Incident users with respect to exposure and all other DOACs	Yes	No	ATC index; reviewed by Pharmacist
Rivaroxaban	Incident users of rivaroxaban	Primary	initiation of apixaban during July 1, 2014 through December 31, 2020	Single	Incident	Day -365 to Day -1	Perscriptions	Product ATC code	N/A	Incident users with respect to exposure and all other DOACs	Yes	No	ATC index; reviewed by Pharmacist
Dabigatran	Incident users of dabogatran	Secondary	initiation of apixaban during July 1, 2014 through December 31, 2020	Single	Incident	Day -365 to Day -1	Perscriptions	Product ATC code	N/A	Incident users with respect to exposure and all other DOACs	Yes	No	ATC index; reviewed by Pharmacist
Edoxaban	Incident users of edoxaban	Secondary	initiation of apixaban during July 1, 2014 through December 31, 2020	Single	Incident	Day -365 to Day -1	Perscriptions	Product ATC code	N/A	Incident users with respect to exposure and all other DOACs	Yes	No	ATC index; reviewed by Pharmacist
DOAC other than Apixaban	Incident users of Rivaroxaban, Edoxaban, or Dabigatran	Secondary	initiation of apixaban during July 1, 2014 through December 31, 2020	Single	Incident	Day -365 to Day -1	Perscriptions	Product ATC code	N/A	Incident users with respect to exposure and all other DOACs	Yes	No	ATC index; reviewed by Pharmacist
DOAC other than Rivaroxaban	Incident users of Apixaban, Edoxaban, or Dabigatran	Secondary	initiation of apixaban during July 1, 2014 through December 31, 2020	Single	Incident	Day -365 to Day -1	Perscriptions	Product ATC code	N/A	Incident users with respect to exposure and all other DOACs	Yes	No	ATC index; reviewed by Pharmacist
DOAC other than Edoxaban	Incident users Apixaban, Rivaroxaban, or Dabigatran	Secondary	initiation of apixaban during July 1, 2014 through December 31, 2020	Single	Incident	Day -365 to Day -1	Perscriptions	Product ATC code	N/A	Incident users with respect to exposure and all other DOACs	Yes	No	ATC index; reviewed by Pharmacist
DOAC other than Dabigatran	Incident users of Apixaban, Rivaroxaban, or Edoxaban	Secondary	initiation of apixaban during July 1, 2014 through December 31, 2020	Single	Incident	Day -365 to Day -1	Perscriptions	Product ATC code	N/A	Incident users with respect to exposure and all other DOACs	Yes	No	ATC index; reviewed by Pharmacist

The criterion that define the date of entry to the cohort(s) is specified in this section. There should be one row for each unique definition of a study population entry. If the study is descriptive, there may only be one row filled out. An active comparator study may have 2 rows, one for the exposure of interest and one for the comparator.

Check the pre-specified box if the exclusion criterion was specified before beginning data analyses, check the varied for sensitivity box if it was modified as part of sensitivity analyses. Specify the source of algorithms to define study entry criteria.

Cohort

Implementation											
Criterion (Measure)	Criterion Details (Measure Details)	Order Applied	Applied by	Assessment Window	Care Settings (Events)	Code Type	Code Position	Notes	Pre-Specified	Varied for Sensitivity	Source
Initiators of DOAC	Prescription for DOAs of interest. Washout for prior use described below.	Before selection of cohort entry	Cegedim/THIN	Day 0	Primary care/General practice	Product ATC codes	N/A	B01AF01 B01AF02 B01AF03 B01AE07	Yes	No	https://www.whooc.no/atcddd_index/ and Reviewed by pharmacist
Age	18+ on index date	Before selection of cohort entry	Cegedim/THIN	Day 0	N/A	N/A	N/A	N/A	Yes	No	N/A
								INUK.3272.00 INUK.3273.00 INUK.3274.00 INUK.7936A00 INUK.G570.00 INUK.G570000 INUK.G573.00 INUK.G573000 INUK.G573100 INUK.G573200 INUK.G573200 INUK.14AN.00 INUK.212R.00 INUK.6625.00 INUK.6A9.00 INUK.9hF.00 INUK.9hF1.00 INUK.9Os.00 INUK.9Os0.00 INUK.9Os1.00 INUK.9Os2.00 INUK.9Os3.00 INUK.9Os4.00 INUK.G573300			
Diagnosis of Afib	≥1 diagnosis code for Afib on index date or 12 months prior	Before selection of cohort entry	Cegedim/THIN	[-365, 0]	Primary care/General practice	READ Codes	N/A		Yes	No	Bujacmez_2019
≥1 risk factor for stroke other than Afib	≥1 risk factor for stroke other than Afib on index date or in 12 months prior defined by CHADS ₂ score (CHA ₂ DS ₂ -VASc) >1 for men and >2 for women	Before selection of cohort entry	Cegedim/THIN	[-365, 0]	N/A	READ Codes	N/A	Based on the CHA2DS2 score and its corresponding READ codes - INUK.38DE.00, INUK.38DE.11, INUK.38DE000	Yes	No	Cegedim/THIN
GP registration	Registered with a GP for ≥12 months prior to the index date	Before selection of cohort entry	Cegedim/THIN	[-365, 0]	N/A	READ Codes	N/A		Yes	No	Cegedim/THIN
≥1 medical encounter	≥1 medical encounter in the 180 days prior to index date	Before selection of cohort entry	Cegedim/THIN	[-180, 0]	N/A	READ Codes	N/A		Yes	No	Cegedim/THIN
Previous diagnoses	≥ diagnosis code for the following conditions on index date or any time prior: Angina Cardiac valve disease (mitral stenosis, valvular replacement) Congenital heart disease Deep vein thrombosis Pulmonary embolism	Before selection of cohort entry	Cegedim/THIN	[-∞, 0]	Primary care/General practice	READ Codes	N/A	Mitral Stenosis, Valvular Replacement, Pulmonary Embolism, DVT	Yes	No	Bujacmez_2019
Washout period	≥1 prescription record for any DOAC in the months prior to the index date (i.e., prevalent users)	Before selection of cohort entry	Aetion	[-365, 0]	Primary care/General practice	Product ATC codes	N/A	New user design	Yes	No	Reviewed by pharmacist
Prior outcomes	≥1 diagnosis code for the study outcomes of interest (stroke, MI, TIA, major bleeding events) on index date or any time prior	Before selection of cohort entry	Aetion	[-∞, 0]	Primary care/General practice	READ and ICD10 codes	Any	Prior stroke, MI, TIA, major bleeding event, angina from the Diagnosis and First Diagnosis tables	Yes	No	

Covariate Drugs

Characteristic(Measure)	Details(Measure Definition)	Type of Variable	Assessment Window	Care Settings		Implementation			
				(Events)	Code Type	Code Position	Notes	Pre-Specified?	Varied for Sensitivity?
Antianemic preparations	B03*, B03X*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Antiarrhythmics	C01B*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Antihyperglycemics (other than Insulins)	A10BJ*, A10BX04, A10BX10, A10BX13, A10BX14, A10AE54, A10AE56, A10BX07, A10BH*, A10BD07, A10BD08, A10BD09, A10BD10, A10BD11, A10BD12, A10BD13, A10BD18, A10BD22, A10BD25, A10BD19, A10BD21, A10BD24, A10BD15, A10BD16, A10BD19, A10BD20, A10BD21, A10BD23, A10BD24, A10BD25, A10BK*, A10BX09, A10BX11, A10BX12, A10B, A10BA*, A10BB, A10BC* A10BD*, A10BF*, A10BG*, A10BX*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Antihypertensives	C09A*, C09B*, C09C*, C09D*, C09XA*, C09AA, C07AA01, C07AA02, C07AA03, C07AA05, C07AA06, C07AA07, C07AA12, C07AA14, C07AA15, C07AA16, C07AA17, C07AA19, C07AA23, C07AA27, C07AA57, C07AB, C07AB01, C07AB02, C07AB03, C07AB04, C07AB05, C07AB06, C07AB07, C07AB08, C07AB09, C07AB10, C07AB11, C07AB12, C07AB13, C07AB14, C07AB52, C07AB57, C07AG, C07AG01, C07AG02, C07B, C07BA, C07BA02, C07BA05, C07BA07, C07BA12, C07BA68, C07BB, C07BB02, C07BB03, C07BB04, C07BB06, C07BB07, C07BB12, C07BB52, C07BG, C07BG01, C07C, C07CA, C07CA02, C07CA03, C07CA17, C07CA23, C07CB, C07CB02, C07CB03, C07CB53, C07CG, C07CG01, C07D, C07DA, C07DA06, C07DE, C07DB01, C07E, C07EA, C07EB, C07F, C07FA, C07FA05, C07FB, C07FB02, C07FB03, C07FB07, C07FB12, C07FB13, C07FX, C07FX01, C07FX02, C07FX03, C07FX04, C07FX05, C07FX06	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Antineoplastics	L01*, L02*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Antiplatelets (excluding Aspirin)	B01AC, B01AC01, B01AC02, B01AC03, B01AC04, B01AC05, B01AC07, B01AC08, B01AC09, B01AC10, B01AC11, B01AC13, B01AC15, B01AC16, B01AC17, B01AC18, B01AC19, B01AC21, B01AC22, B01AC23, B01AC24, B01AC25, B01AC26, B01AC27, B01AC30	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Antipsychotics (Excluding BZD)	N05A*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Aspirin	B01AC06, B01AC56, N02BA01	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Benzodiazepines (BZD)	N03AE01, N05BA*, N05CF*, N05CD*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Bisphosphonates and other agents affecting bone structure	M05BA*, M05BB*, M05BC*, M05BX*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No

Cardiac Stimulants	C01AA*, C01CA*, C01CE*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
GI Protective Agents	A02A*, A02BA*, A02BC*, A02BD*, A02BB01 A02BB02	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Insulin	A10A*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Lipid Lowering Agents	C10AA*, C10BA*, C10BX*, C10AB*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Nitrates Cardiac Vasodilators	C01DA*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
NSAIDs (Excluding Aspirin & APAP)	M01A*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Opioid Analgesics	N02A*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Other Antidepressants (Excluding SSRI)	N06A, N06AA*, N06AF*, N06AG*, N06AX*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Other Antiepileptics (Excluding BZD)	N03AA*, N03AB*, N03AC*, N03AD*, N03AF N03AG*, N03AX*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
SSRI	N06AB*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Systemic Antibiotics	P02*, J01*, J02*, D01B*, P01B*, J04*, P01A P01C*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Systemic Antivirals	J05*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Systemic Corticosteroids	H02A*, H02B*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Vaccines and Immunoglobulins	J06*, J07*	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No
Warfarin	B01AA03	Binary	[-365, 0]	N/A	ATC codes	N/A		Yes	No

STaRT-RWE Instructions:

Define the covariate conceptually, with accompanying details as necessary. Specify which planned analyses adjust for the covariate, and how it is specified in the analysis (e.g., continuous, categorical, binary). D assessment window relative to the index date (day 0), whether there are restrictions on care setting or diagnosis position in the algorithm, and which study populations defined in Table 3B the covariate is measured. Specify the source of algorithms to define covariates.

Check the pre-specified box if the covariate was specified before beginning data analyses, check the varied for sensitivity box if it was modified as part of sensitivity analyses. Specify the source of algorithms to define covariates.

Covariate Conditions

Characteristic(Measure)	Type of Variable	Assessment Window	Implementation				Pre-Specified?	Varied for Sensitivity?	Included in Quality Framework?	Included in PS model?
			Care Settings (Events)	Code Type	Code Position	Notes				
Acute Kidney Injury	Binary	[-∞, 0]	GP	ICD10 and READ codes	First Diagnosis or Diagnostics		Yes	No	No	Yes
Anemia	Binary	[-∞, 0]	GP	ICD10 and READ codes	First Diagnosis or Diagnostics		Yes	No	No	Yes
Asthma or COPD	Binary	[-∞, 0]	GP	ICD10 and READ codes	First Diagnosis or Diagnostics		Yes	No	Yes	Yes
Chronic Kidney Disease	Binary	[-∞, 0]	GP	ICD10 and READ codes	First Diagnosis or Diagnostics		Yes	No	No	Yes
Dementia	Binary	[-∞, 0]	GP	ICD10 and READ codes	First Diagnosis or Diagnostics		Yes	No	Yes	Yes
Diabetes Mellitus	Binary	[-∞, 0]	GP	ICD10 and READ codes	First Diagnosis or Diagnostics		Yes	No	Yes	Yes
Heart Failure	Binary	[-∞, 0]	GP	ICD10 and READ codes	First Diagnosis or Diagnostics		Yes	No	Yes	Yes
Hypertension	Binary	[-∞, 0]	GP	ICD10 and READ codes	First Diagnosis or Diagnostics		Yes	No	Yes	Yes
Malignant Neoplasms	Binary	[-∞, 0]	GP	ICD10 and READ codes	First Diagnosis or Diagnostics		Yes	No	No	Yes
Non Major Bleeding	Binary	[-∞, 0]	GP	ICD10 and READ codes	First Diagnosis or Diagnostics		Yes	No	No	Yes
Osteoporosis/Hip Fractures	Binary	[-∞, 0]	GP	ICD10 and READ codes	First Diagnosis or Diagnostics		Yes	No	Yes	Yes
CHA2DS2 VASc score	Categorical	[-∞, 0]	GP	ICD10 and READ codes for diagnoses, ATC codes for use of antihypertensives	First Diagnosis or Diagnostics	- Age: +1 if age 65-74, +2 if age ≥75 years - Gender: +1 if female - Heart failure: +1 if any history - Stroke, TIA, or thromboembolism +1 if any history - Vascular disease (MI, PAD, aortic plaque): +1 if any history - Diabetes mellitus: +1 if any history - Hypertension or use of antihypertensives: +1 if any history	Yes	No	Yes	Yes

Follow Up				
Follow Up Begins				
Begins		Day 1	Pre-Specified?	Varied for Sensitivity?
			Yes	No
Follow Up Ends				
Ends	Select All That Apply	Specify Details	Pre-Specified?	Varied for Sensitivity?
Date of Outcome	<input checked="" type="checkbox"/>	Primary analysis (ITT) and AT sensitivity analysis	Yes	No
Date of Death	<input checked="" type="checkbox"/>	Primary analysis (ITT) and AT sensitivity analysis	Yes	No
End of patient data	<input checked="" type="checkbox"/>	Primary analysis (ITT) and AT sensitivity analysis	Yes	No
End of registration with GP	<input checked="" type="checkbox"/>	Primary analysis (ITT) and AT sensitivity analysis	Yes	No
Crossover of exposure group or addition of drug from other exposure group	<input checked="" type="checkbox"/>	AT sensitivity analysis only	Yes	Yes
Termination of exposure	<input checked="" type="checkbox"/>	AT sensitivity analysis only. Defined allowing a 30-day grace period and 30-day risk window.	Yes	Yes

STaRT-RWE Instructions:

Specify when follow up begins relative to the index date (day 0) and select each criterion that is used to end follow up.

Check the pre-specified box if the outcome parameters were specified before beginning data analyses, check the varied for sensitivity box if the parameters were modified as part of sensitivity analyses.

Outcomes

Outcome Name (Measure)	Outcome Measurement Characteristics(Measure Definition)	Primary Outcome?	Type of Outcome	Washout Window	Care Settings (Events)	Implementation				Pre-Specified?	Varied for Sensitivity?	Citations
						Code Type	Code Position	Notes				
Stroke (Ischemic or hemorrhagic)	See Code List Catalog tab	Yes	Incident	[-∞, 0]	Primary care/General practice	READ & ICD-10	Any	From Diagnostics table	Yes	No	Rannikmäe K, Ngho K, Bush K, Al-Shahi Salm R, Doubal F, Flaig R, Henshall DE, Hutchison A, Nolan J, Osborne S, Samarasekera N, Schrier C, Whiteley W, Wilkinson T, Wilson K, Woodfield R, Zhang Q, Allen N, Sudlow CLM. Accuracy of identifying incident stroke cases from linked health care data in UK Biobank. <i>Neurology</i> . 2020 Aug 11;95(6):e697-e707. doi: 10.1212/WNL.00000000000009924. Epub 2020 2. PMID: 32616677; PMCID: PMC7455356.	
All-cause mortality	State Code = "D - Dead"	No	Incident	[-∞, 0]	Primary care/General practice	N/A	N/A		Yes	No		
Myocardial infarction	See Code List Catalog tab	No	Incident	[-∞, 0]	Primary care/General practice	READ & ICD-10	Any	From Diagnostics table	Yes	No	Arana A, Margulis AV, Varas-Lorenzo C, Bul C, Gilsenan A, McQuay LJ, Reynolds M, Reboredo C, Franks B, de Vogel S, Appenteng K, Perez-Guthann S. Validation of cardiovascular outcomes and risk factors in the Clinical Practice Research Datalink in the United Kingdom. <i>Pharmacoepidemiol Drug Saf</i> . 2021 Feb;30(2):237-247. doi: 10.1002/pds.5150. Epub 2020 Oct 28. PMID: 33091194; PMCID: PMC7821285. Metcalfe A, Neudam A, Forde S, et al. Case definitions for acute myocardial infarction in administrative databases and their impact on in hospital mortality rates. <i>Health Serv Res</i> . 2013;48(1):290-318. doi:10.1111/j.1475-6773.2012.01440.x	
Transient ischemic attack	See Code List Catalog tab	No	Incident	[-∞, 0]	Primary care/General practice	READ & ICD-10	Any	From Diagnostics table	Yes	No	Andrade SE, Harrold LR, Tjia J, et al. A systematic review of validated methods for identifying cerebrovascular accident or transient ischemic attack using administrative data. <i>Pharmacoepidemiol Drug Saf</i> . 2012;21 Suppl 1(Suppl 1):100-128. doi:10.1002/pds.2312	
Major bleeding events	Defined as a composite outcome of major intracranial (including hemorrhagic stroke), gastrointestinal, and urogenital bleeds; see code lists.	No	Incident	[-∞, 0]	Primary care/General practice	READ & ICD-10	Any	From Diagnostics table	Yes	No	Pasea L, Chung SC, Pujades-Rodriguez M, et al. Bleeding in cardiac patients prescribed antithrombotic drugs: electronic health record phenotyping algorithms, incidence, trends and prognosis. <i>BMC Med</i> . 2019;17(1):206. Published 2019 Nov 20. doi:10.1186/s12916-019-1438-y	
Composite angina MI / stroke (AMS)	Composite endpoint of angina, myocardial infarction, and stroke.; see code lists.	No	Incident	[-∞, 0]	Primary care/General practice	READ & ICD-10	Any	From Diagnostics table	Yes	No		

Analysis Plan Specification										
	Primary Objective	Secondary Objective I	Secondary Objective II	Secondary Objective III	Secondary Objective IV	Secondary Objective V	Secondary Objective VI	Secondary Objective VII	Secondary Objective VIII	Secondary Objective IX
Hypothesis	Null hypothesis HRR=1	Null hypothesis HRR=1	Null hypothesis HRR=1	Null hypothesis HRR=1	Null hypothesis HRR=1	Null hypothesis HRR=1	Null hypothesis HRR=1	Null hypothesis HRR=1	Null hypothesis HRR=1	Null hypothesis HRR=1
	Initiators of apixaban	Initiators of apixaban	Initiators of apixaban	Initiators of apixaban	Initiators of rivaroxaban	Initiators of rivaroxaban	Initiators of rivaroxaban	Initiators of edoxaban	Initiators of edoxaban	Initiators of dabigatran
Study Populations	Initiators of rivaroxaban	Initiators of edoxaban	Initiators of dabigatran	Initiators of rivaroxaban, edoxaban, and dabigatran	Initiators of edoxaban	Initiators of dabigatran	Initiators of apixaban, edoxaban, and dabigatran	Initiators of dabigatran	Initiators of apixaban, rivaroxaban, and dabigatran	Initiators of apixaban, rivaroxaban, and edoxaban
Outcome	Incidence of stroke									
Software										
Model(s)	comparisons as mutually exclusive cohorts.									
Confounding Adjustment Method (check all that apply and provide details where specified)										
	Bivariate									
	Multivariate	✓								
Propensity Score Matching (Specify matching algorithm, ratio, and caliper)	✓; Propensity score matching between exposure groups will be performed using 1:1 nearest neighbor matching without replacement with a maximum matching caliper of 0.01									
Propensity Score Weighting (specify formula, weighting, and truncation decisions)										
Propensity Score Stratification (specify strata definitions)										
Other (Specify details)	✓; High-dimensional propensity score analysis will be used as sensitivity analysis									
Missing Data Method (select all that apply)										
	Missing Indicators	✓								
	Complete Case									
	Last Value Carried Forward									
	Multiple Imputation (specify variables)									
	Other (Specify Details)									
Subgroup Analysis	DOACs initiators with prior warfarin use; age (<65, 65-74, and >75 years); concomitant aspirin use; CHADS ₂ score (1, 2, and >3), and selected comorbid conditions, e.g. diabetes, heart failure, and BMI status (<30 and >30 kg/m ²).									

Sensitivity Analyses (SA)				
Sensitivity Analysis	What is the parameter being varied? (Be clear what is changing from)	Why? (What do you expect to learn?)	Strengths of the Sensitivity Analysis compared to the Primary?	Weaknesses of the Sensitivity Analysis compared to the Primary?
As-treated follow-up	Primary (ITT) analysis does not censor on treatment discontinuation or crossover. This is changed to censoring on discontinuation or crossover.	ITT and AT analyses are subject to different biases (exposure misclassification versus potential for informative censoring). Running both can test influence of these effects and help bound the range of plausible effect estimates.	Avoids misclassification of time following discontinuation of crossover as exposure time.	Estimates may be biased if discontinuation and crossover are driven by symptoms or perceived lack of efficacy.
Limiting analysis up to February 28, 2020 [Note, this was not completed due to sample size issues]	End of data is truncated to Feb 28th, 2020 instead of Dec 31, 2020.	With the COVID-19 pandemic starting in March 2020, there is a possibility that patients' care pathways were interrupted. This could impact results.	Eliminates the possibility of confounding by COVID-19, e.g. if COVID results in temporal trends in outcomes, and there are temporal trends in drug choice.	Reduced follow-up time and power
high-dimensional propensity score (hdPS) analysis		A difference in estimates between the hdPS and PS analysis could indicate the presence of uncontrolled confounding in the PS analysis.	May reduce confounding by identifying confounders and proxies missed in user-specified PS model	there is a slight risk of including instrument-like variables in a hdPS model, introducing bias

This Measure Appendix is based largely on the START-RWE templates proposed by Wang et. al., 2020.

Inclusion or Exclusion for primary comparison of apixabar v. rivaroxaban		Order of Application	TOTAL	
Criterion (Measure)	Excluded Patients		Remaining Patients	
All patients initiating DOACs between 01-07-2013 through 12-31-2020	N/A	N/A	N/A	124,106
Excluded due to age ≤ 18 at index	Age	1	50	124,056
Excluded due to no diagnosis of non-valvular Afib in 12 months prior to index	Non-valvular Afib	2	77,747	46,309
Excluded due to CHA2DS2 VASc < 1 for men and < 2 for women	CHA2DS2 VASc score	3	30,613	15,696
Excluded due to < 12 months prior registration with GP and < 1 medical encounter in 6mo prior to index	GP registration	4	952	14,744
Excluded due to any prior diagnosis of cardiac valve disease (mitral stenosis, valvular replacement, deep vein thrombosis, or pulmonary embolism)	Cardiac valve disease	5	753	13,991
Excluded due to history of a DOAC prescription in the 365 days prior to a qualifying DOAC initiation	DOAC	6	7255	6,736
Excluded due to history of stroke, MI, TIA, major bleeding event, angina, or congenital heart disease at any point prior to index	Stroke, MI, TIA, major bleeding event, angina, congenital heart disease	7	1019	5,717
Excluded due to censoring prior to the start of follow-up		8	62	5,655
Not included in propensity score matching for inferential analyses		9	1977	3,678
Inclusion or Exclusion for primary comparison of apixabar v. DOACs		Order of Application	TOTAL	
Criterion (Measure)	Excluded Patients		Remaining Patients	
All patients initiating DOACs between 01-07-2013 through 12-31-2020	N/A	N/A	N/A	124,106
Excluded due to age ≤ 18 at index	Age	1	50	124,056
Excluded due to no diagnosis of non-valvular Afib in 12 months prior to index	Non-valvular Afib	2	77,747	46,309
Excluded due to CHA2DS2 VASc < 1 for men and < 2 for women	CHA2DS2 VASc score	3	30,613	15,696
Excluded due to < 12 months prior registration with GP and < 1 medical encounter in 6mo prior to index	GP registration	4	952	14,744
Excluded due to any prior diagnosis of cardiac valve disease (mitral stenosis, valvular replacement, deep vein thrombosis, or pulmonary embolism)	Cardiac valve disease	5	753	13,991
Excluded due to history of a DOAC prescription in the 365 days prior to a qualifying DOAC initiation	DOAC	6	7255	6,736
Excluded due to history of stroke, MI, TIA, major bleeding event, angina, or congenital heart disease at any point prior to index	Stroke, MI, TIA, major bleeding event, angina, congenital heart disease	7	1019	5,717
Excluded due to censoring prior to the start of follow-up		8	62	5,655

Inclusion or Exclusion for primary comparison of rivaroxiban v. DOACs		Order of Application	TOTAL	
	Criterion (Measure)		Excluded Patients	Remaining Patients
Not included in propensity score matching for inferential analyses		9	1,103	4,552
All patients initiating DOACs between 01-07-2013 through 12-31-2020		N/A	N/A	124,106
Excluded due to age ≤ 18 at index		1	50	124,056
Excluded due to no diagnosis of non-valvular Afib in 12 months prior to index		2	77,747	46,309
Excluded due to CHA2DS2 VASc < 1 for men and < 2 for women		3	30,613	15,696
Excluded due to < 12 months prior registration with GP and < 1 medical encounter in 6mo prior to index		4	952	14,744
Excluded due to any prior diagnosis of cardiac valve disease (mitral stenosis, valvular replacement, deep vein thrombosis, or pulmonary embolism)		5	753	13,991
Excluded due to history of a DOAC prescription in the 365 days prior to a qualifying DOAC initiation		6	7255	6,736
Excluded due to history of stroke, MI, TIA, major bleeding event, angina, or congenital heart disease at any point prior to index		7	1019	5,717
Excluded due to censoring prior to the start of follow-up		8	62	5,655
Not included in propensity score matching for inferential analyses		9	1,685	3,970

Software	R
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Sample Size & Power Calculations for primary comparison (apixaban vs. rivoraxiban)			
Population Assumptions	Analysis	Range	Source for Estimated Parameters
Assuming 1:1 PS matching with 1,851 patients per group and an unstratified stroke risk of 27.15/1,000 patients	Minimum detectable HR with 80% power using intent to treat follow-up	Minimum detectable HR with 80% power = 0.57	Feasibility analysis
Assuming 1:1 PS matching with 1,851 patients per group and an unstratified stroke risk of 16.17/1,000 patients	Minimum detectable HR with 80% power using as treated follow-up	Minimum detectable HR with 80% power = 0.48	Feasibility analysis

Sample Size & Power Calculations for primary comparison (apixaban vs. other DOACs)			
Population Assumptions	Analysis	Range	Source for Estimated Parameters
Assuming 1:1 PS matching with 2,305 patients per group and an unstratified stroke risk of 16.63/1,000 patients	Minimum detectable HR with 80% power using intent to treat follow-up	Minimum detectable HR with 80% power = 0.60	Feasibility analysis

Sample Size & Power Calculations for primary comparison (rivoraxiban vs. other DOACs)			
Population Assumptions	Analysis	Range	Source for Estimated Parameters
Assuming 1:1 PS matching with a total of 2,023 patients per group and an unstratified stroke risk of 27.41/1,000 patients	Minimum detectable HR with 80% power using intent to treat follow-up	Minimum detectable HR with 80% power = 0.58	Feasibility analysis

Measure	ATC Codes	Source		
DOCA exposure (ATC Codes)				
rivaroxaban	B01AF02			
dabigatran	B01AF01			
apixaban	B01AF03			
edoxaban	B01AE07			
Covariate Drugs (ATC Codes)				
Antianemic preparations	B03*, B03X*			
Antiarrhythmics	C01B*			
Antihyperglycemics (other than Insulins)	A10BJ*, A10BX04, A10BX10, A10BX13, A10BX14, A10AE54, A10AE56, A10BX07, A10BH*, A10BD07, A10BD08, A10BD09,			
Antihypertensives	C09A*, C09B*, C09C*, C09D*, C09XA*, C08*, C07AA, C07AA01, C07AA02, C07AA03, C07AA05, C07AA06, C07AA07, C07A			
Antineoplastics	L01*, L02*			
Antiplatelets (excluding Aspirin)	B01AC, B01AC01, B01AC02, B01AC03, B01AC04, B01AC05, B01AC07, B01AC08, B01AC09, B01AC10, B01AC11, B01AC1			
Antipsychotics (Excluding BZD)	N05A*			
Aspirin	B01AC06, B01AC56, N02BA01			
Benzodiazepines (BZD)	N03AE01, N05BA*, N05CF*, N05CD*			
Bisphosphonates and other agents affecting bone structure	M05BA*, M05BB*, M05BC*, M05BX*			
Cardiac Stimulants	C01AA*, C01CA*, C01CE*			
GI Protective Agents	A02A*, A02BA*, A02BC*, A02BD*, A02BB01, A02BB02			
Insulin	A10A*			
Lipid Lowering Agents	C10AA*, C10BA*, C10BX*, C10AB*			
Nitrates Cardiac Vasodilators	C01DA*			
NSAIDs (Excluding Aspirin & APAP)	M01A*			
Opioid Analgesics	N02A*			
Other Antidepressants (Excluding SSRI)	N06A, N06AA*, N06AF*, N06AG*, N06AX*			
Other Antiepileptics (Excluding BZD)	N03AA*, N03AB*, N03AC*, N03AD*, N03AF*, N03AG*, N03AX*			
SSRI	N06AB*			
Systemic Antibiotics	P02*, J01*, J02*, D01B*, P01B*, J04*, P01A*, P01C*			
Systemic Antivirals	J05*			
Systemic Corticosteroids	H02A*, H02B*			
Vaccines and Immunoglobulins	J06*, J07*			
Warfarin	B01AA03			
Measure	READ Codes	ICD10 codes	READ Code Source	ICD10 Code Source
Chart Inclusion/Exclusion Criteria				
Atrial Fibrillation	INUK.3272.00 ECG: ATRIAL FIBRILLATION INUK.3273.00	N/A	Ruigómez A, Vora P, Balabanova Y, et al. Discontinuation of non-Vitamin K antagonist oral anticoagulants in patients with non-valvular atrial fibrillation: a population-based cohort study using primary care data from The Health Improvement Network in the U [published correction appears in BMJ Open. 2020 Apr 16;10(4):e031342corr1]. BMJ Open. 2019;9(10):e031342. Published 20 Oct 18. doi:10.1136/bmjopen-2019-031342	N/A
Mitral Stenosis	INUK.G110.00 Mitral stenosis INUK.G110.11 Rheumatic r	N/A	Ruigómez A, Vora P, Balabanova Y, et al. Discontinuation of non-Vitamin K antagonist oral anticoagulants in patients with non-valvular atrial fibrillation: a population-based cohort study using primary care data from The Health Improvement Network in the U [published correction appears in BMJ Open. 2020 Apr 16;10(4):e031342corr1]. BMJ Open. 2019;9(10):e031342. Published 20 Oct 18. doi:10.1136/bmjopen-2019-031342	N/A

Valvular Replacement	INUK.7910.12 Replacement of mitral valve INUK.7910000	N/A	Ruigómez A, Vora P, Balabanova Y, et al. Discontinuation of non-Vitamin K antagonist oral anticoagulants in patients with non-valvular atrial fibrillation: a population-based cohort study using primary care data from The Health Improvement Network in the U [published correction appears in BMJ Open. 2020 Apr 16;10(4):e031342corr1]. BMJ Open. 2019;9(10):e031342. Published 20 Oct 18. doi:10.1136/bmjopen-2019-031342	N/A
Pulmonary Embolism	INUK.G401100 Recurrent pulmonary embolism INUK.G401000	N/A	Ruigómez A, Vora P, Balabanova Y, et al. Discontinuation of non-Vitamin K antagonist oral anticoagulants in patients with non-valvular atrial fibrillation: a population-based cohort study using primary care data from The Health Improvement Network in the U [published correction appears in BMJ Open. 2020 Apr 16;10(4):e031342corr1]. BMJ Open. 2019;9(10):e031342. Published 20 Oct 18. doi:10.1136/bmjopen-2019-031342	N/A
Deep Vein Thrombosis	INUK.G801.11 Deep vein thrombosis INUK.G801.12	Deep	N/A	N/A
Exclusion criteria and outcomes				
Stroke (Ischemic and Hemorrhagic)	INUK.G60..00, INUK.G600.00, INUK.G601.00, INUK.G602.00, INUK.G603.00, INUK.G604.00, INUK.G605.00, INUK.G606.00, INUK.G60X.00, INUK.G60z.00, INUK.G61..00, INUK.G61..11, INUK.G61..12, INUK.G610.00, INUK.G611.00, INUK.G612.00, INUK.G613.00, INUK.G614.00, INUK.G615.00, INUK.G616.00, INUK.G617.00, INUK.G618.00, INUK.G619.00, INUK.G61X.00, INUK.G61X000, INUK.G61X100, INUK.G61z.00, INUK.G63y000, INUK.G63y100, INUK.G64..00, INUK.G64..11, INUK.G64..12, INUK.G64..13, INUK.G640.00, INUK.G640000, INUK.G641.00, INUK.G641.11, INUK.G641000, INUK.G64z.00, INUK.G64z.11, INUK.G64z.12, INUK.G64z000, INUK.G64z100, INUK.G64z111, INUK.G64z200, INUK.G64z300, INUK.G64z400, INUK.G66..00, INUK.G66..11, INUK.G66..12, INUK.G66..13, INUK.G667.00, INUK.G668.00, INUK.G676000, INUK.G6W..00, INUK.G6X..00, INUK.Gyu6000, INUK.Gyu6100, INUK.Gyu6200, INUK.Gyu6300, INUK.Gyu6E00, INUK.Gyu6F00, INUK.Gyu6G00	I60*, I61*, I63*	Rannikmäe K, Ngho K, Bush K, Al-Shahi Salman R, Doubal F, Flaig R, Henshall DE, Hutchison A, Nolan J, Osborne S, Samarasekera N, Schnier C, Whiteley W, Wilkinson T, Wilson K, Woodfield R, Zhan Q, Allen N, Sudlow CLM. Accuracy of identifying incident stroke cases from linked health care data in UK Biobank. Neurology. 2020 Aug 11;95(6):e697-e707. doi: 10.1212/WNL.00000000000009924. Epub 2020 Jul 2. PMID: 32616677; PMCID: PMC7455356.	Rannikmäe K, Ngho K, Bush K, Al-Shahi Salman R, Doubal F, Flaig R, Henshall DE, Hutchison A, Nolan J, Osborne S, Samarasekera N, Schnier C, Whiteley W, Wilkinson T, Wilson K, Woodfield R, Zhan Q, Allen N, Sudlow CLM. Accuracy of identifying incident stroke cases from linked health care data in UK Biobank. Neurology. 2020 Aug 11;95(6):e697-e707. doi: 10.1212/WNL.00000000000009924. Epub 2020 Jul 2. PMID: 32616677; PMCID: PMC7455356.

Myocardial Infarction	INUK.3235.00, INUK.G30..12, INUK.G30..13, INUK.G30..14, INUK.G30..16, INUK.G301.00, INUK.G301200, INUK.G302.00, INUK.G305.00, INUK.G306.00, INUK.G307.00, INUK.G307100, INUK.G308.00, INUK.G30A.00, INUK.G30X.00, INUK.G30y100, INUK.G30y200, INUK.G30z.00, INUK.G31y100, INUK.G35..00, INUK.G351.00, INUK.G363.00, INUK.G365.00, INUK.G501.00, INUK.G5y6.00, INUK.Gyu3100, INUK.Gyu3400, INUK.3233.00, INUK.3234.00, INUK.3236.00, INUK.323Z.00, INUK.G30..00, INUK.G30..11, INUK.G30..15, INUK.G30..17, INUK.G300.00, INUK.G301000, INUK.G301100, INUK.G303.00, INUK.G304.00, INUK.G307000, INUK.G309.00, INUK.G30B.00, INUK.G30X000, INUK.G30y.00, INUK.G30y000, INUK.G30y200, INUK.G350.00, INUK.G353.00, INUK.G35X.00, INUK.G36..00, INUK.G360.00, INUK.G361.00, INUK.G362.00, INUK.G364.00, INUK.G366.00, INUK.Gyu3500, INUK.Gyu3600	I21*, I22*	Arana A, Margulis AV, Varas-Lorenzo C, Bui CL, Gilsenan A, McQuay LJ, Reynolds M, Rebordosa C, Franks B, de Vogel S, Appenteng K, Perez-Gutthann S. Validation of cardiovascular outcomes and risk factors in the Clinical Practice Research Datalink in the United Kingdom. <i>Pharmacoepidemiol Drug Saf.</i> 2021 Feb;30(2):237-247. doi: 10.1002/pds.5150. Epub 2020 Oct 28. PMID: 33091194; PMCID: PMC7821285.	Metcalfe A, Neudam A, Forde S, et al. Ca definitions for acute myocardial infarction: administrative databases and their impact on in-hospital mortality rates. <i>Health Serv Res.</i> 2013;48(1):290-318. doi:10.1111/hj.126773.2012.01440.x
TIA	Fyu5500 [X]Other transient cerebral ischaemic attacks + related syndromes G65..00 Transient cerebral ischaemia G65..11 Drop attack G65..12 Transient ischaemic attack G65..13 Vertebro-basilar insufficiency G650.00 Basilar artery syndrome G650.11 Insufficiency - basilar artery G651.00 Vertebral artery syndrome G651000 Vertebro-basilar artery syndrome G652.00 Subclavian steal syndrome G653.00 Carotid artery syndrome hemispheric G654.00 Multiple and bilateral precerebral artery syndromes G656.00 Vertebrobasilar insufficiency G657.00 Carotid territory transient ischaemic attack G65y.00 Other transient cerebral ischaemia G65z.00 Transient cerebral ischaemia NOS G65z000 Impending cerebral ischaemia G65z100 Intermittent cerebral ischaemia G65z200 Transient cerebral ischaemia NOS	G45.x*	Moran GM, Calvert M, Feltham MG, Ryan R, Marshall T. A retrospective cohort study to investigate fatigue, psychological or cognitive impairment after TIA: protocol paper. <i>BMJ Open.</i> 2015;5(4):e008149. Published 2015 May 3. doi:10.1136/bmjopen-2015-008149	Andrade SE, Harrold LR, Tjia J, et al. A systematic review of validated methods for identifying cerebrovascular accident or transient ischemic attack using administrative data. <i>Pharmacoepidemiol Drug Saf.</i> 2012;21 Suppl 1(Suppl 1):100-128. doi:10.1002/pds.2312
Intracranial Hemorrhage	INUK.G60..00, INUK.G600.00, INUK.G603.00, INUK.G604.00, INUK.G605.00, INUK.G606.00, INUK.G61..00, INUK.G610.00, INUK.G613.00, INUK.G614.00, INUK.G615.00, INUK.G616.00, INUK.G617.00, INUK.G61X100, INUK.G620.00, INUK.Gyu6100, INUK.Gyu6F00, INUK.G601.00, INUK.G602.00, INUK.G60z.00, INUK.G611.00, INUK.G612.00, INUK.G618.00, INUK.G61X.00, INUK.G61X000, INUK.G621.00, INUK.G623.00, INUK.G62z.00, INUK.Gyu6200, INUK.S626.00	I60.0, I60.1, I60.11, I60.12, I60.2, I60.21, I60.30, I60.32, I60.8, I61, I61.1, I61.4, I61.5, I61.8, I62, I62.0, I62.01, I62.00, I60.01, I60.02, I60.10, I60.20, I60.22, I60.3, I60.31, I60.4, I60.5, I60.50, I60.51, I60.52, I60.6, I60.9, I61.0, I61.1, I61.3, I61.6, I61.9, I62.00, I62.02, I62.03, I62.9, S06.4	Pasea L, Chung SC, Pujades-Rodriguez M, et al. Bleeding in cardiac patients prescribed antithrombotic drugs: electronic health record phenotyping algorithms, incidence, trends and prognosis. <i>BMC Med.</i> 2019;17(1):206. Published 2019 Nov 20. doi:10.1186/s12916-019-1438-y	Pasea L, Chung SC, Pujades-Rodriguez M, et al. Bleeding in cardiac patients prescribed antithrombotic drugs: electronic health record phenotyping algorithms, incidence, trends and prognosis. <i>BMC Med.</i> 2019;17(1):206. Published 2019 Nov 20. doi:10.1186/s12916-019-1438-y
Gastrointestinal Hemorrhage	INUK.196B.00, INUK.19E6.00, INUK.4737.11, INUK.4A23.00, INUK.4A23.11, INUK.4A5..00, INUK.4A5..11, INUK.4A51.00, INUK.G850.00, INUK.J110100, INUK.J110300, INUK.J111111, INUK.J121111, INUK.J121300, INUK.J12y300, INUK.J12yy00, INUK.J130300, INUK.J140100, INUK.J150000, INUK.J573.00, INUK.J573000, INUK.J68..00, INUK.J680.00, INUK.J680.11, INUK.J681.00, INUK.J681.11, INUK.J681.12, INUK.J681.13, INUK.J68z000, INUK.J68z100, INUK.SE22300, INUK.196C.00, INUK.19E4.12, INUK.19E6.11, INUK.479..11, INUK.4A5Z.00, INUK.7619100, INUK.G852000, INUK.J10y000, INUK.J110111, INUK.J111100, INUK.J111300, INUK.J11y100, INUK.J11yy00, INUK.J120100, INUK.J120300, INUK.J121100, INUK.J12y100, INUK.J130100, INUK.J131100, INUK.J13y100, INUK.J13y300, INUK.J14y100, INUK.J510900, INUK.J573011, INUK.J573012, INUK.J573100, INUK.J573z00, INUK.J68z.00, INUK.J68z.11, INUK.J68z200, INUK.J68z200, INUK.SE23111, INUK.1994.00, INUK.1994.11, INUK.1995.00, INUK.4762.00, INUK.4762.11	I85.01, K25.0, K25.2, K25.4, K25.6, K26.0, K26.2, K26.4, K26.6, K27.0, K27.2, K27.4, K27.6, K28.0, K28.2, K28.4, K29.01, K62.5, K66.1, K92.0, K92.2, K92.1	Pasea L, Chung SC, Pujades-Rodriguez M, et al. Bleeding in cardiac patients prescribed antithrombotic drugs: electronic health record phenotyping algorithms, incidence, trends and prognosis. <i>BMC Med.</i> 2019;17(1):206. Published 2019 Nov 20. doi:10.1186/s12916-019-1438-y	Pasea L, Chung SC, Pujades-Rodriguez M, et al. Bleeding in cardiac patients prescribed antithrombotic drugs: electronic health record phenotyping algorithms, incidence, trends and prognosis. <i>BMC Med.</i> 2019;17(1):206. Published 2019 Nov 20. doi:10.1186/s12916-019-1438-y

Urogenital Hemorrhage	INUK.1A45.00, INUK.K167.00, INUK.K197.00, INUK.K197000, INUK.K197300, INUK.K19y411, INUK.K221100, INUK.K275200, INUK.K56y100, INUK.K575.00, INUK.K59y00, INUK.K5E0.00, INUK.K5Ez.00, INUK.K16y200, INUK.K197100, INUK.K197400, INUK.K19y400, INUK.K275100, INUK.K286100, INUK.K286400, INUK.K286v00, INUK.K286w00, INUK.K537.00, INUK.K55y300, INUK.K566.00, INUK.K59yx00, INUK.K5E.00, INUK.K5E1.00, INUK.K5E2.00, INUK.Kyu9D00, INUK.1584.00	N02, N02.0, N02.1, N02.2, N02.3, N02.4, N02.5, N02.6, N02.7, N02.8, N02.9, N02.A, N93, N93.0, N93.1, N93.8, N93.9, R31, R31.0, R31.1, R31.2, R31.21, R31.29, R31.9, N42.1, N83.6, N83.7, N85.7, N89.7, N92.1, N95.0	Pasea L, Chung SC, Pujades-Rodriguez M et al. Bleeding in cardiac patients prescribed antithrombotic drugs: electronic health record phenotyping algorithms, incidence, trends and prognosis. BMC Med. 2019;17(1):206. Published 2019 Nov 20. doi:10.1186/s12916-019-1438-y	Pasea L, Chung SC, Pujades-Rodriguez M et al. Bleeding in cardiac patients prescribed antithrombotic drugs: electronic health record phenotyping algorithms, incidence, trends and prognosis. BMC Med. 2019;17(1):206. Published 2019 Nov 20. doi:10.1186/s12916-019-1438-y
Major Bleeding Events	See "Intracranial Hemorrhage", "Gastrointestinal Hemorrhage", and "Major Bleeding Events" above	See "Intracranial Hemorrhage", "Gastrointestinal Hemorrhage", and "Major Bleeding Events" above		
Angina	INUK.G311.11, INUK.G311.13, INUK.G311.14, INUK.G311100, INUK.G311200, INUK.G311300, INUK.G311400, INUK.G33.00, INUK.G330.00, INUK.G330000, INUK.G330z00, INUK.G331.00, INUK.G331.11, INUK.G33z.00, INUK.G33z300, INUK.G33z500, INUK.G33z600, INUK.G33z700, INUK.G33z00, INUK.Gyu3000	I20.0, I20.1, I20.8, I20.9, I25.110, I25.700, I25.710, I25.750, I25.760, I25.790, I20, I23.7, I25.720, I25.730		
Covariate Conditions				
Acute Kidney Injury	INUK.K04.12, INUK.14D8.00, INUK.K04C.00, INUK.K04D.00, INUK.K04E.00, INUK.K04.00, INUK.K04.11, INUK.K043000, INUK.K043100, INUK.K043200, INUK.K043300, INUK.K043400, INUK.K044.00, INUK.K045.00, INUK.K046.00, INUK.K046000, INUK.K046100, INUK.K047.00, INUK.K048.00, INUK.K049.00, INUK.K04A.00, INUK.K04B.00, INUK.K04y.00, INUK.K04z.00, INUK.Kyu2000, INUK.SK08.00	N17*		Tominson, L.A., Riding, A.M., Payne, R.A et al. The accuracy of diagnostic coding for acute kidney injury in England – a single centre study. BMC Nephrol 14, 58 (2013). https://doi.org/10.1186/1471-2369-14-58
Anemia	INUK.1453.00, INUK.1454.00, INUK.2C2.00, INUK.B937000, INUK.B937200, INUK.B937300, INUK.B937600, INUK.B937700, INUK.B937800, INUK.BBmA.00, INUK.BBmL.00, INUK.D0.11, INUK.D0.12, INUK.D00.12, INUK.D000.00, INUK.D000.11, INUK.D00y.00, INUK.D00y200, INUK.D00z.00, INUK.D00z200, INUK.D01.00, INUK.D010.11, INUK.D011.11, INUK.D011z00, INUK.D012000, INUK.D012111, INUK.D012500, INUK.D013000, INUK.D013200, INUK.D014200, INUK.D01y.00, INUK.D01y011, INUK.D01y012, INUK.D01y00, INUK.D01z.11, INUK.D01z000, INUK.D0y.00, INUK.D102000, INUK.D102200, INUK.D102y00, INUK.D102z00, INUK.D103.00, INUK.D103000, INUK.D103100, INUK.D104.12, INUK.D106.00, INUK.D106100, INUK.D106300, INUK.D106400, INUK.D106z00, INUK.D10y200, INUK.D11.00, INUK.D110.00, INUK.D110000, INUK.D110100, INUK.D110200, INUK.D110400, INUK.D111.00, INUK.D111000, INUK.D111100, INUK.D111400, INUK.D111500, INUK.D111y00, INUK.D111z00, INUK.D112z12, INUK.D1y.00, INUK.D1z.00, INUK.D200.00, INUK.D200011, INUK.D200100, INUK.D201.11, INUK.D201000, INUK.D201100, INUK.D201111, INUK.D201200, INUK.D201300, INUK.D201311, INUK.D201700, INUK.D201z00, INUK.D204.00, INUK.D20z.00, INUK.D21.00, INUK.D210100, INUK.D210300, INUK.D210400, INUK.D211.00, INUK.D212.00, INUK.D213.00, INUK.D215.00, INUK.D21y.00, INUK.D21y000, INUK.D21y011, INUK.D21z.00, INUK.D21z.12, INUK.D21z.13, INUK.D2z.00, INUK.D41yz11, INUK.Dyu0.00, INUK.Dyu0000, INUK.Dyu0100, INUK.Dyu0200, INUK.Dyu0300, INUK.Dyu0400, INUK.Dyu1.00, INUK.Dyu1000, INUK.Dyu1400, INUK.Dyu1700, INUK.Dyu2100, INUK.Dyu2200, INUK.Dyu2400, INUK.F381500, INUK.145.11, INUK.1451.00, INUK.1452.00, INUK.1458.00, INUK.2C2Z.00, INUK.B937100, INUK.B937X00, INUK.BBMA.00, INUK.ByuHCO0, INUK.D0.00, INUK.D00.00, INUK.D00.11, INUK.D000.12, INUK.D001.00, INUK.D00y100, INUK.D00z000, INUK.D00z100, INUK.D00z200, INUK.D01.11, INUK.D010.00, INUK.D010.12, INUK.D011.00, INUK.D011000, INUK.D011013, INUK.D011100, INUK.D011X00, INUK.D012.00, INUK.D012.11, INUK.D012100, INUK.D012112, INUK.D012200, INUK.D012300, INUK.D012400, INUK.D012z00, INUK.D013.00, INUK.D014.00, INUK.D014000,	D50.0, D50.1, D50.8, D50.9, D51.0, D51.1, D51.2, D51.3, D51.8, D51.9, D52.0, D52.1, D52.8, D52.9, D53.0, D53.1, D53.2, D53.8, D53.9, D55.0, D55.1, D55.2, D55.3, D55.8, D55.9, D56.0, D56.1, D56.2, D56.3, D56.4, D56.5, D56.8, D56.9, D58.0, D58.1, D58.2, D58.8, D58.9, D59.0, D59.1, D59.2, D59.3, D59.4, D59.5, D59.6, D59.8, D59.9, D60.0, D60.1, D60.8, D60.9, D61.01, D61.09, D61.1, D61.2, D61.810, D61.811, D61.818, D61.82, D61.89, D61.9, D63, D63.1, D63.8, D64.0, D64.1, D64.2, D64.3, D64.4, D64.89, D64.9, D67.00, D67.01, D67.02, D67.1, D67.20, D67.211, D67.212, D67.219, D67.3, D67.40, D67.411, D67.412, D67.419, D67.80, D67.811, D67.812, D67.819		CCS 0059, Deficiency and other anemia CCS 0061, Sickle cell anemia Elixhauser A, Steiner C, Palmer L. Clinical Classifications Software (CCS), 2018. U.S. Agency for Healthcare Research and Quality. Available https://www.hcup-us.ahrq.gov/tools_software.jsp

Asthma or COPD	<p>INUK.173d.00, INUK.1780.00, INUK.1781.00, INUK.1782.00, INUK.1783.00, INUK.1785.00, INUK.1786.00, INUK.1787.00, INUK.178A.00, INUK.178B.00, INUK.663N000, INUK.663N100, INUK.663O000, INUK.663P.00, INUK.663P100, INUK.663U.00, INUK.663V000, INUK.663V200, INUK.663V300, INUK.663e100, INUK.663j.00, INUK.663n.00, INUK.663r.00, INUK.663s.00, INUK.663t.00, INUK.663w.00, INUK.663x.00, INUK.66Ys.00, INUK.H312000, INUK.H33.00, INUK.H330.00, INUK.H330.11, INUK.H330.14, INUK.H330011, INUK.H331.00, INUK.H331.11, INUK.H331111, INUK.H335.00, INUK.H33z011, INUK.H33z200, INUK.H33zz00, INUK.H33zz12, INUK.H35y600, INUK.H35y700, INUK.14B4.00, INUK.1784.00, INUK.1788.00, INUK.1789.00, INUK.1O2.00, INUK.663J.00, INUK.663N.00, INUK.663N200, INUK.663P000, INUK.663P200, INUK.663R.00, INUK.663S.00, INUK.663T.00, INUK.663V100, INUK.663W.00, INUK.663X.00, INUK.663e000, INUK.663f.00, INUK.663p.00, INUK.663u.00, INUK.66Ys.00, INUK.8H2P.00, INUK.H33.11, INUK.H330.12, INUK.H330.13, INUK.H330111, INUK.H330z00, INUK.H331z00, INUK.H332.00, INUK.H333.00, INUK.H334.00, INUK.H33z.00, INUK.H33z100, INUK.H33z111, INUK.H33z11, INUK.H47y000, INUK.173c.00, INUK.66YQ.00, INUK.66Yq.00, INUK.173A.00, INUK.663H.00, INUK.663Q.00, INUK.663Q.00, INUK.663V.00, INUK.663h.00, INUK.663a.00, INUK.663q.00, INUK.663v.00, INUK.66YP.00, INUK.66Yr.00, INUK.66Yp.00, INUK.66Yr.00, INUK.H330000, INUK.H330100, INUK.H331000, INUK.H331100, INUK.H33z000, INUK.66YG.00, INUK.66YH.00, INUK.H3...00, INUK.H310.00, INUK.H310z00, INUK.H311100, INUK.H311z00, INUK.H312.00, INUK.H312100, INUK.H313.00, INUK.H31y.00, INUK.H31yz00, INUK.H32.00, INUK.H320300, INUK.H320z00, INUK.H32y111, INUK.H32y200, INUK.H32yz00, INUK.H32z.00, INUK.H37.00, INUK.H39.00, INUK.H3B.00, INUK.H3y.11, INUK.H581.00, INUK.Hyu3000, INUK.J650200, INUK.K101400, INUK.14B3.12, INUK.66Yg.00, INUK.66Yh.00, INUK.H31.00, INUK.H311.00, INUK.H311000, INUK.H312z00, INUK.H31z.00, INUK.H320.00, INUK.H320000, INUK.H320100, INUK.H320200, INUK.H321.00, INUK.H322.00, INUK.H32y.00, INUK.H32y000, INUK.H32y100, INUK.H36.00, INUK.H38.00, INUK.H3z.11,</p>	J45*, J46*, J82.83, J41*, J42*, J43*, J44*		<p>Khakban A, FitzGerald JM, Tavakoli H, Lynd L, Ehteshami-Afshar S, Sadatsafavi. Extent, trends, and determinants of controller/reliever balance in mild asthma: 14-year population-based study. <i>Respir Res.</i> 2019;20(1):44. Published 2019 Feb 2. doi:10.1186/s12931-019-1007-0</p>
Chronic Kidney Disease	<p>INUK.K05..13, INUK.K05.00, INUK.D215000, INUK.K0E.00, INUK.Kyu2100, INUK.1Z1.00, INUK.1Z10.00, INUK.1Z11.00, INUK.1Z12.00, INUK.1Z13.00, INUK.1Z14.00, INUK.1Z15.00, INUK.1Z16.00, INUK.1Z17.00, INUK.1Z18.00, INUK.1Z19.00, INUK.1Z1A.00, INUK.1Z1B.00, INUK.1Z1C.00, INUK.1Z1D.00, INUK.1Z1E.00, INUK.1Z1F.00, INUK.1Z1G.00, INUK.1Z1H.00, INUK.1Z1J.00, INUK.1Z1K.00, INUK.1Z1L.00, INUK.K051.00, INUK.K052.00, INUK.K053.00, INUK.K054.00, INUK.K055.00, INUK.1Z17.11, INUK.1Z18.11, INUK.1Z19.11, INUK.1Z1A.11, INUK.1Z1B.11, INUK.1Z1C.11, INUK.1Z1D.11, INUK.1Z1E.11, INUK.1Z1F.11, INUK.1Z1G.11, INUK.1Z1H.11, INUK.1Z1J.11, INUK.1Z1K.11, INUK.1Z1L.11, INUK.1Z1M.00, INUK.1Z1N.00, INUK.1Z1P.00, INUK.1Z1Q.00, INUK.1Z1R.00, INUK.1Z1S.00, INUK.1Z1T.00, INUK.1Z1V.00, INUK.1Z1W.00, INUK.1Z1X.00, INUK.1Z1Y.00, INUK.1Z1Z.00, INUK.1Z1a.00, INUK.1Z1b.00, INUK.1Z1c.00, INUK.1Z1d.00, INUK.1Z1e.00, INUK.1Z1f.00, INUK.66i.00, INUK.6AA.00, INUK.8L50.00, INUK.D215.00, INUK.G22.11, INUK.K05.11, INUK.K06.00, INUK.K06.11, INUK.K060.00, INUK.K08.00, INUK.K08z.00, INUK.K0D.00, INUK.SP08300</p>	N18, N18.1, N18.2, N18.3, N18.30, N18.31, N18.32, N18.5, N18.9	Denburg MR, Haynes K, Shults J, Lewis JD, Leonard MB. Validation of The Health Improvement Network (THIN) database for epidemiologic studies of chronic kidney disease. <i>Pharmacoepidemiol Drug Saf.</i> 2011;20(11):1138-1149. doi:10.1002/pds.2203	

Heart Failure	<p>INUK.G58..00, INUK.1O1..00, INUK.G580.00, INUK.G580.12, INUK.G580000, INUK.G580100, INUK.G580400, INUK.G582.00, INUK.G583.00, INUK.G583.11, INUK.G583.12, INUK.G585.00, INUK.G58z.00, INUK.G5y4z00, INUK.SP11111, INUK.G58..11, INUK.G580.11, INUK.G580200, INUK.G580300, INUK.G58z.12, INUK.L09y200, INUK.Q48y100, INUK.G232.00, INUK.G1yz100, INUK.G580.13, INUK.G580.14, INUK.G581.00, INUK.G581000, INUK.G584.00</p>	I50*		<p>Frolova N, Bakal JA, McAlister FA, Rowe BH, Quan H, Kaul P, Ezekowitz JA. Assessing the use of international classification of diseases-10th revision codes from the emergency department for the identification of acute heart failure. <i>JACC Heart Fail.</i> 2015 May;3(5):386-391. doi: 10.1016/j.jchf.2014.11.010. PMID: 25951759.</p> <p>Delekta J, Hansen SM, AlZuhairi KS, Bork CS, Joensen AM. The validity of the diagnosis of heart failure (I50.0-I50.9) in the Danish National Patient Register. <i>Dan Med J.</i> 2018 Apr;65(4):A5470. PMID: 29619924</p>
Hypertension	<p>INUK.G2...11, INUK.G2...00, INUK.G2...11, INUK.G20..00, INUK.G20..12, INUK.G200.00, INUK.G203.00, INUK.G20z.00, INUK.G21..00, INUK.G211.00, INUK.G211000, INUK.G211100, INUK.G211z00, INUK.G21z000, INUK.G21z011, INUK.G21z100, INUK.G22..00, INUK.G220.00, INUK.G222.00, INUK.G232.00, INUK.G240z00, INUK.G241.00, INUK.G24z.00, INUK.G26..11, INUK.G27..00, INUK.G28..00, INUK.G2y..00, INUK.G41y000, INUK.G41y100, INUK.Gyu2.00, INUK.Gyu2000, INUK.Gyu2100, INUK.J17B.00, INUK.G201.00, INUK.G202.00, INUK.G20z.11, INUK.G210.00, INUK.G210000, INUK.G210100, INUK.G210z00, INUK.G21z.00, INUK.G21zz00, INUK.G221.00, INUK.G22z.00, INUK.G22z.11, INUK.G23..00, INUK.G230.00, INUK.G231.00, INUK.G233.00, INUK.G23z.00, INUK.G24..00, INUK.G240.00, INUK.G240000, INUK.G241000, INUK.G241z00, INUK.G244.00, INUK.G24z000, INUK.G24z100, INUK.G24zz00, INUK.G25..00, INUK.G25..11, INUK.G26..00, INUK.G2z..00, INUK.G410.00, INUK.G672.11, INUK.G8y3.00, INUK.J623.00</p>	I10*, I11*, I12*, I13*, I15*	<p>Peng M, Chen G, Kaplan GG, Lix LM, Drummond N, Lucyk K, Garies S, Lowerison M, Weibe S, Quan H. Methods defining hypertension in electronic medical records: validation against national survey data. <i>J Public Health (Oxf).</i> 2016 Sep;38(3):e392-e399. doi: 10.1093/pubmed/fdv155. Epub 2015 Nov. PMID: 26547088; PMCID: PMC5072168.</p>	<p>Tu K, Campbell NR, Chen ZL, Cauch-Dudek KJ, McAlister FA. Accuracy of administrative databases in identifying patients with hypertension. <i>Open Med.</i> 2007;1(1):e18-e26. Published 2007 Apr 14</p>

Malignant Neoplasms	<p>INUK.142E.00, INUK.142F.00, INUK.142G.00, INUK.B0...11, INUK.B00...00, INUK.B00...11, INUK.B000100, INUK.B000z00, INUK.B0002.00, INUK.B0002000, INUK.B0003100, INUK.B0003300, INUK.B0004100, INUK.B0006.00, INUK.B0007.00, INUK.B000z00, INUK.B010.00, INUK.B010000, INUK.B010z00, INUK.B011000, INUK.B011100, INUK.B012.00, INUK.B015.00, INUK.B01y.00, INUK.B02...00, INUK.B022.00, INUK.B03...00, INUK.B030.00, INUK.B031.00, INUK.B03y.00, INUK.B04y.00, INUK.B04z.00, INUK.B05...00, INUK.B050.11, INUK.B051z00, INUK.B053.00, INUK.B054.00, INUK.B055.00, INUK.B055100, INUK.B055z00, INUK.B05y.00, INUK.B05z000, INUK.B06...00, INUK.B060.00, INUK.B060100, INUK.B060z00, INUK.B062.00, INUK.B062000, INUK.B062300, INUK.B064000, INUK.B065.00, INUK.B066.00, INUK.B06y.00, INUK.B06yz00, INUK.B06z.00, INUK.B071100, INUK.B071z00, INUK.B072000, INUK.B072100, INUK.B074.00, INUK.B07y.00, INUK.B07z.00, INUK.B08...00, INUK.B0z1.00, INUK.B1...00, INUK.B10...00, INUK.B100.00, INUK.B101.00, INUK.B102.00, INUK.B104.00, INUK.B105.00, INUK.B106.00, INUK.B10y.00, INUK.B10z.00, INUK.B110.00, INUK.B110000, INUK.B110z00, INUK.B111000, INUK.B111100, INUK.B111z00, INUK.B112.00, INUK.B113.00, INUK.B11y.00, INUK.B11y100, INUK.B11yz00, INUK.B124.00, INUK.B12y.00, INUK.B13...00, INUK.B130.00, INUK.B131.00, INUK.B132.00, INUK.B136.00, INUK.B13y.00, INUK.B13z.00, INUK.B140.00, INUK.B142.00, INUK.B142000, INUK.B143.00, INUK.B14z.00, INUK.B15...00, INUK.B150.00, INUK.B150z00, INUK.B151000, INUK.B151z00, INUK.B160.00, INUK.B161100, INUK.B161300, INUK.B161z00, INUK.B16y.00, INUK.B17...00, INUK.B170.00, INUK.B171.00, INUK.B173.00, INUK.B175.00, INUK.B180.00, INUK.B180100, INUK.B180200, INUK.B180z00, INUK.B18y.00, INUK.B18y300, INUK.B18y600, INUK.B18yz00, INUK.B18z.00, INUK.B1z0.00, INUK.B1z1.00, INUK.B1z2.00, INUK.B200000, INUK.B200200, INUK.B200300, INUK.B200z00, INUK.B201000, INUK.B201100, INUK.B201200, INUK.B203.00, INUK.B206.00, INUK.B210.00, INUK.B213.00, INUK.B213000, INUK.B213100, INUK.B213300, INUK.B215.00, INUK.B21y.00, INUK.B22...00, INUK.B220.00, INUK.B220000, INUK.B220100, INUK.B221.00, INUK.B221000,</p>	<p>C00, C00.0, C00.1, C00.2, C00.3, C00.4, C00.5, C00.6, C00.8, C00.9, C01, C02, C02.0, C02.1, C02.2, C02.3, C02.8, C02.9, C03, C03.0, C03.1, C03.9, C04, C04.0, C04.8, C04.9, C05, C05.0, C05.1, C05.2, C05.8, C05.9, C06.0, C06.1, C06.2, C06.8, C06.80, C06.89, C06.9, C07, C08, C08.0, C08.1, C08.9, C09, C09.0, C09.1, C09.8, C09.9, C10, C10.0, C10.1, C10.2, C10.3, C10.4, C10.8, C10.9, C11.0, C11.1, C11.2, C11.3, C11.8, C11.9, I82.C11, C12, I82.C12, C13, C13.0, C13.1, C13.2, C13.8, C13.9, I82.C13, C14, C14.0, C14.2, C14.8, C15, C15.3, C15.4, C15.5, C15.9, C16, C16.0, C16.1, C16.2, C16.3, C16.4, C16.5, C16.6, C16.8, C16.9, C17, C17.0, C17.1, C17.2, C17.3, C17.8, C17.9, C18, C18.0, C18.1, C18.2, C18.3, C18.4, C18.5, C18.6, C18.7, C18.8, C18.9, C19, I82.C19, C20, C21.0, C21.1, C21.2, C21.8, I82.C21, C22, C22.0, C22.1, C22.2, C22.3, C22.4, C22.7, C22.8, C22.9, I82.C22, C23, I82.C23, C24, C24.0, C24.1, C24.8, C24.9, C25, C25.0, C25.1, C25.2, C25.3, C25.4, C25.7, C25.8, C25.9, C26, C26.0, C26.1, C26.9, C30, C30.0, C30.1, C31, C31.0, C31.2, C31.3, C31.8, C31.9, C32, C32.0, C32.1, C32.2, C32.3, C32.8, C32.9, C33, C34, C34.0, C34.01, C34.02, C34.1, C34.10, C34.11, C34.12, C34.2, C34.3, C34.30, C34.31, C34.32, C34.8, C34.80, C34.81, C34.82, C34.9, C34.90, C34.91, C34.92, C37, C38, C38.0, C38.1, C38.2, C38.3, C38.4, C38.8, C39, C39.0, C39.9, C40, C40.0, C40.01, C40.02, C40.1, C40.10, C40.11, C40.12, C40.2, C40.20, C40.21, C40.22, C40.3, C40.30, C40.31, C40.32, C40.8, C40.80, C40.81, C40.82, C40.9, C40.90, C40.91, C40.92, C41, C41.0, C41.1, C41.2, C41.3, C41.4, C41.9, C43, C43.0, C43.1, C43.10, C43.11, C43.111, C43.112, C43.12, C43.121, C43.122, C43.2, C43.20, C43.22, C43.3, C43.30, C43.31, C43.39, C43.4, C43.5, C43.51, C43.52, C43.59, C43.6, C43.60, C43.61, C43.62, C43.7, C43.70, C43.71, C43.72, C43.8, C43.9, C44, C44.0, C44.01, C44.02, C44.09, C44.1, C44.10, C44.101, C44.102, C44.1021, C44.1022, C44.109, C44.1091, C44.1092, C44.11, C44.111, C44.112, C44.1121, C44.1122,</p>		
Non Major Bleeding	<p>INUK.14c...00, INUK.14c...11, INUK.16R...00, INUK.1928.00, INUK.1C6...00, INUK.1C6...11, INUK.2BB5.00, INUK.2BB8.00, INUK.2D25.00, INUK.F42y.11, INUK.F42y100, INUK.F42y500, INUK.F436000, INUK.F436100, INUK.F4C7200, INUK.F4K7.00, INUK.FyuH400, INUK.N091.00, INUK.N091000, INUK.N091100, INUK.N091200, INUK.N091500, INUK.N091600, INUK.N091611, INUK.N091711, INUK.N091800, INUK.N091900, INUK.N091B00, INUK.N091C00, INUK.N091K00, INUK.N091L00, INUK.N091M00, INUK.N091N00, INUK.N091Q00, INUK.N091R00, INUK.N091S00, INUK.N091T00, INUK.N091z00, INUK.R048.00, INUK.R063000, INUK.R063100, INUK.Ryu0200, INUK.14C...00, INUK.14C...11, INUK.1C62.00, INUK.1C6Z.00, INUK.2556.00, INUK.2DE7.00, INUK.F42y300, INUK.F42y400, INUK.F436.00, INUK.F436z00, INUK.F4C7100, INUK.F4Ey000, INUK.F4G3200, INUK.F4H4100, INUK.F4K2800, INUK.J017200, INUK.N091211, INUK.N091300, INUK.N091311, INUK.N091400, INUK.N091511, INUK.N091700, INUK.N091A00, INUK.N091D00, INUK.N091E00, INUK.N091F00, INUK.N091G00, INUK.N091H00, INUK.N091J00, INUK.N091P00, INUK.N091U00, INUK.N091V00, INUK.R047.00, INUK.Ryu0700</p>	<p>R04, R04.1, R04.2, R04.8, R04.81, R04.89, R04.9, H35.6, H35.60, H35.61, H35.62, H35.63, H43.1, H43.10, H43.11, H43.12, H43.13, M25.0, M25.00, M25.01, M25.011, M25.019, M25.02, M25.021, M25.022, M25.029, M25.03, M25.031, M25.032, M25.039, M25.04, M25.041, M25.042, M25.049, M25.05, M25.051, M25.052, M25.059, M25.06, M25.061, M25.062, M25.069, M25.07, M25.071, M25.072, M25.073, M25.074, M25.075, M25.076, M25.08, R04.0</p>		

Osteoporosis/Hip Fractures	<p>INUK.14G6.00, INUK.14G9.00, INUK.N330100, INUK.N330200, INUK.N330300, INUK.N330400, INUK.N330500, INUK.N330600, INUK.N330900, INUK.N330A00, INUK.N330B00, INUK.N331400, INUK.N331500, INUK.N331A00, INUK.N331B00, INUK.N331K00, INUK.N331M00, INUK.N331M11, INUK.NyuB000, INUK.NyuB100, INUK.NyuB800, INUK.S30y.11, INUK.14G7.00, INUK.14G8.00, INUK.14GA.00, INUK.14GB.00, INUK.N330.00, INUK.N330000, INUK.N330700, INUK.N330800, INUK.N330C00, INUK.N330D00, INUK.N330z00, INUK.N331.14, INUK.N331200, INUK.N331300, INUK.N331600, INUK.N331800, INUK.N331900, INUK.N331H00, INUK.N331J00, INUK.N331L00, INUK.N374600, INUK.NyuB200, INUK.S30.11</p>	<p>M80, M80.0, M80.00, M80.00XA, M80.00XD, M80.00XG, M80.00XK, M80.00XP, M80.00XS, M80.01, M80.011, M80.011A, M80.011D, M80.011G, M80.011K, M80.011P, M80.011S, M80.012, M80.012A, M80.012D, M80.012G, M80.012K, M80.012P, M80.012S, M80.019, M80.019A, M80.019D, M80.019G, M80.019K, M80.019P, M80.019S, M80.02, M80.021, M80.021A, M80.021D, M80.021G, M80.021K, M80.021P, M80.021S, M80.022, M80.022A, M80.022D, M80.022G, M80.022K, M80.022P, M80.022S, M80.029, M80.029A, M80.029D, M80.029G, M80.029K, M80.029P, M80.029S, M80.03, M80.031, M80.031A, M80.031D, M80.031G, M80.031K, M80.031P, M80.031S, M80.032, M80.032A, M80.032D, M80.032G, M80.032K, M80.032P, M80.032S, M80.039, M80.039A, M80.039D, M80.039G, M80.039K, M80.039P, M80.039S, M80.04, M80.041, M80.041A, M80.041D, M80.041G, M80.041K, M80.041P, M80.041S, M80.042, M80.042A, M80.042D, M80.042G, M80.042K, M80.042P, M80.042S, M80.049, M80.049A, M80.049D, M80.049G, M80.049K, M80.049P, M80.049S, M80.05, M80.051, M80.051A, M80.051D, M80.051G, M80.051K, M80.051P, M80.051S, M80.052, M80.052A, M80.052D, M80.052G, M80.052K, M80.052P, M80.052S, M80.059, M80.059A, M80.059D, M80.059G, M80.059K, M80.059P, M80.059S, M80.06, M80.061, M80.061A, M80.061D, M80.061G, M80.061K, M80.061P, M80.061S, M80.062, M80.062A, M80.062D, M80.062G, M80.062K, M80.062P, M80.062S, M80.069, M80.069A, M80.069D, M80.069G, M80.069K, M80.069P, M80.069S, M80.07, M80.071, M80.071A, M80.071D, M80.071G, M80.071K, M80.071P, M80.071S, M80.072, M80.072A, M80.072D, M80.072G, M80.072K, M80.072P, M80.072S, M80.079, M80.079A, M80.079D, M80.079G, M80.079K, M80.079P, M80.079S, M80.08, M80.08XA, M80.08XD, M80.08XG, M80.08XK, M80.08XP, M80.08XS, M80.0A, M80.0AXA, M80.0AXD, M80.0AXG, M80.0AXK, M80.0AXM, M80.0AXS, M80.8, M80.80, M80.80XA, M80.80XD, M80.80XG, M80.80XK, M80.80XP, M80.80XS, M80.81,</p>		
CHA2DS2 VASc score component: heart failure	See "Heart Failure" above	See "Heart Failure" above		
CHA2DS2 VASc score component: thromboembolism	<p>INUK.G401.00, INUK.G401.12, INUK.G401000, INUK.G401100, INUK.G402.00, INUK.G80.00, INUK.G800.12, INUK.G800300, INUK.G800400, INUK.G801.00, INUK.G801.11, INUK.G801.12, INUK.G801.13, INUK.G801500, INUK.G801600, INUK.G801700, INUK.G801800, INUK.G801900, INUK.G801A00, INUK.G801B00, INUK.G801C00, INUK.G801D00, INUK.G801E00, INUK.G801F00, INUK.G801G00, INUK.G801H00, INUK.G801J00, INUK.G801z00, INUK.G802.00, INUK.G802000, INUK.G80y.00, INUK.G80y.11, INUK.G80y400, INUK.G80y500, INUK.G80y600, INUK.G80y700, INUK.G80y800, INUK.G80y200, INUK.G80z.00, INUK.G80z100, INUK.G80zz00, INUK.G8z.00, INUK.L096400, INUK.L414.00, INUK.L414.11, INUK.L414.12, INUK.14A8.12, INUK.14A8100, INUK.SP12200, INUK.ZV12800, INUK.ZV12811, INUK.ZV12900, INUK.L413.00, INUK.L413.11, INUK.L413000, INUK.L413100, INUK.L413200, INUK.L413z00</p>	<p>126.01, 126.92, 126.99, 182.402, 182.403, 182.409, 182.492, 182.499, 182.4Y1, 182.4Y2, 182.4Y3, 182.4Z9, 182.502, 182.503, 182.5Y2, 182.5Y9, 182.5Z1, 182.5Z2, 182.621, 182.721, 182.729, 126.02, 126.09, 126.90, 182.491, 182.493, 182.4Y9, 182.4Z1, 182.4Z2, 182.4Z3, 182.501, 182.503, 182.509, 182.509, 182.593, 182.599, 182.5Y1, 182.5Y3, 182.5Z3, 182.5Z9, 182.623, 182.629, 182.723</p>	<p>Ruigómez A, Brobert G, Vora P, García Rodríguez LA. Validation of venous thromboembolism diagnoses in patients receiving rivaroxaban or warfarin in The Health Improvement Network. <i>Pharmacoepidemiol Drug Saf.</i> 2021;30(2):229-236. doi:10.1002/pds.5144</p>	
CHA2DS2 VASc score component: stroke, TIA, or thromboembolism	See "Stroke (Ischemic and Hemorrhagic)", "TIA", and "CHA2DS2 VASc score component: thromboembolism" above	See "Stroke (Ischemic and Hemorrhagic)", "TIA", and "CHA2DS2 VASc score component: thromboembolism" above		

CHA2DS2 VASc score component: PAD	INUK.G73..00, INUK.G73..11, INUK.G73..12, INUK.G73..13, INUK.G734.00, INUK.G73y.00, INUK.G73z.00, INUK.G73z000, INUK.G73z011, INUK.G73z012, INUK.G73zz00, INUK.Gyu7400	170.208, 170.209, 170.212, 170.22, 170.222, 170.223, 170.224, 170.229, 170.231, 170.234, 170.238, 170.239, 170.24, 170.242, 170.249, 170.25, 170.262, 170.268, 170.269, 170.29, 170.293, 170.298, 170.299, 170.3, 170.301, 170.302, 170.308, 170.311, 170.312, 170.313, 170.319, 170.321, 170.322, 170.323, 170.33, 170.332, 170.333, 170.334, 170.338, 170.339, 170.34, 170.349, 170.36, 170.362, 170.368, 170.391, 170.398, 170.399, 170.40, 170.401, 170.402, 170.413, 170.419, 170.42, 170.422, 170.428, 170.43, 170.432, 170.433, 170.434, 170.44, 170.442, 170.443, 170.445, 170.449, 170.461, 170.462, 170.463, 170.464, 170.491, 170.498, 170.499, 170.5, 170.50, 170.501, 170.509, 170.51, 170.518, 170.519, 170.52, 170.521, 170.523, 170.53, 170.531, 170.532, 170.533, 170.535, 170.538, 170.539, 170.54, 170.55, 170.56, 170.561, 170.562, 170.568, 170.59, 170.591, 170.593, 170.6, 170.601, 170.608, 170.609, 170.61, 170.611, 170.613, 170.62, 170.623, 170.628, 170.629, 170.633, 170.634, 170.641, 170.642, 170.643, 170.645, 170.649, 170.66, 170.662, 170.692, 170.693, 170.699, 170.7, 170.701, 170.702, 170.703, 170.711, 170.713, 170.718, 170.72, 170.721, 170.733, 170.734, 170.735, 170.741, 170.743, 170.745, 170.749, 170.761, 170.762, 170.763, 170.768, 170.769, 170.792, 170.793, 173.9, 170.2, 170.201, 170.202, 170.203, 170.21, 170.211, 170.213, 170.214, 170.219, 170.221, 170.23, 170.232, 170.233, 170.235, 170.24, 170.244, 170.245, 170.248, 170.26, 170.261, 170.263, 170.29, 170.291, 170.30, 170.303, 170.309, 170.31, 170.318, 170.32, 170.323, 170.329, 170.331, 170.335, 170.341, 170.342, 170.343, 170.344, 170.345, 170.348, 170.35, 170.361, 170.363, 170.364, 170.39, 170.392, 170.393, 170.4, 170.403, 170.408, 170.409, 170.41, 170.411, 170.412, 170.418, 170.421, 170.423, 170.424, 170.431, 170.435, 170.438, 170.439, 170.441, 170.444, 170.445, 170.45, 170.46, 170.468, 170.49, 170.492, 170.493, 170.502, 170.503, 170.508, 170.511, 170.512, 170.513, 170.522, 170.523, 170.529, 170.534, 170.54, 170.541, 170.542, 170.543, 170.544, 170.548, 170.549, 170.563, 170.569, 170.592, 170.598, 170.599, 170.60, 170.602, 170.603, 170.612, 170.618, 170.619, 170.62, 170.622, 170.63, 170.631, 170.632, 170.634, 170.635, 170.636, 170.64, 170.644, 170.648, 170.65, 170.661, 170.663, 170.668	Quality Outcomes Framework V38	Colantonio LD, Shannon ED, Orroth KK, Zaha R, Jackson EA, Rosenson RS, Exter J, Mues KE, Muntner P. Ischemic Event Rates in Very-High-Risk Adults. J Am Coll Cardiol. 2019 Nov 19;74(20):2496-2507. doi:10.1016/j.jacc.2019.09.025. PMID: 31727288.
CHA2DS2 VASc score component: aortic plaque	INUK.G700.00	170.0		Tischer Ts, Schneider R, Lauschke J, et al. Prevalence of atrial fibrillation in patients with high CHADS2- and CHA2DS2VASc-scores: anticoagulate or monitor high-risk patients?. Pacing Clin Electrophysiol. 2014;37(12):1651-1657. doi:10.1111/pace.12470
CHA2DS2 VASc score component: vascular disease (MI, PAD, or aortic plaque)	See "Myocardial infarction", "CHA2DS2 VASc score component: PAD", and "CHA2DS2 VASc score component: aortic plaque" above	See "Myocardial infarction", "CHA2DS2 VASc score component: PAD", and "CHA2DS2 VASc score component: aortic plaque" above		
CHA2DS2 VASc score component: diabetes mellitus	See "Diabetes Mellitus" above	See "Diabetes Mellitus" above		
CHA2DS2 VASc score component: hypertension, including use of antihypertensives	See "Hypertension" and "Antihypertensives" above	See "Hypertension" and "Antihypertensives" above		