ALTEA OBSERVATIONAL STUDY: ANALYSIS OF A LARGE, NATIONALLY REPRESENTATIVE US DATABASE ON THE BURDEN OF DISEASE AMONG PATIENTS WITH ISCHAEMIC STROKE AND TRANSIENT ISCHAEMIC ATTACK

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Background

- Patients with a first ischaemic stroke (IS) or transient ischaemic attack (TIA) face a substantial risk of recurrent cerebrovascular events, particularly within the first year after diagnosis[1,2].
- Most prior studies have focused on cardioembolic stroke or have been limited to select cohorts, leaving less understanding about outcomes in patients with non-cardioembolic IS (NCIS) and TIA in routine US clinical practice[3].
- We aimed to assess outcomes after NCIS and TIA in a real-world context.

Methods

- This retrospective observational study used electronic health records (EHR) from the Truveta database.
- The Truveta database provides access to continuously updated, linked EHR data from a collective of 30 US health systems, covering over 120 million patients across more than 20,000 clinics and 900 hospitals.
- Adults with a first diagnosis of non-cardioembolic NCIS or TIA between 1 January 2017 and 31 December 2023 were included. Patients who died during the index hospitalisation were excluded from the analysis.
- Incidence rates of recurrent IS, TIA and all-cause mortality were measured through 365 days post-discharge (Day 0 = discharge date).
- For study endpoints of IS and TIA, patients were censored at death, end of study period (31 December 2024) or loss to follow-up if any were observed before the endpoints.
- All analyses were stratified by index event (NCIS vs TIA).

Inclusion and exclusion criteria

- Aged ≥18 years diagnosed with IS or TIA in study identification period (January 2017 – December 2023).
- Had ≥12 months of EHR activity prior to the index date.
- Received care documented in the EHR database from at least one provider in the 12 months prior to the index date.
- Had stroke that was not caused by a cardioembolic source (e.g., one or more of the following underlying conditions: recent myocardial infarction [ST-segment elevation myocardial infarction or non-ST-segment elevation myocardial infarction], atrial myxoma, cardiac surgery, atrial fibrillation, sustained atrial flutter, intracardiac thrombus, prosthetic or mechanical heart valve, mitral stenosis, or valvular vegetation/endocarditis).

Results

- Among 234,413 patients, 180,021 (76.8%) had NCIS and 54,392 (23.2%) had TIA (**Table 1**).
- Patients with NCIS experienced more recurrent IS than those with TIA, with risk peaking in the first 30–90 days and then levelling off; approximately 1 in 10 patients with NCIS had a recurrent IS within 1 year (10.30%; **Table 2** and **Figure 1**).
- The TIA cohort had a higher risk of recurrent TIAs than the NCIS cohort, with about 1 in 30 patients with TIA experiencing a recurrent TIA within 1 year (3.53%; **Table 2** and **Figure 2**).
- Mortality was consistently higher after NCIS than TIA, with most deaths in the NCIS group occurring within 90 days post-discharge compared with a more even distribution in the TIA group; approximately 1 in 9 patients with NCIS (10.78%), and 1 in 23 patients with TIA (4.43%) died within 1 year (**Table 2** and **Figure 3**).

Table 2. Incidence of IS, TIA and all-cause death by index event

	NCIS (n = 180,021)		TIA (n = 54,392)	
	No. of events	Incidence rate† (95% CI)	No. of events	Incidence rate† (95% CI)
IS				
Day 21	4436	2.89 (2.81–2.97)	680	1.37 (1.26–1.47)
Day 30	830	3.45 (3.36–3.54)	111	1.59 (1.48–1.70)
Day 90	3220	5.71 (5.59–5.83)	487	2.62 (2.48–2.76)
Day 365	5899	10.30 (10.14–10.46)	1101	5.09 (4.89–5.29)
TIA				
Day 21	329	0.22 (0.19–0.24)	477	0.96 (0.87–1.05)
Day 30	89	0.28 (0.25–0.30)	80	1.12 (1.03–1.22)
Day 90	373	0.54 (0.50–0.58)	314	1.78 (1.67–1.90)
Day 365	824	1.19 (1.13–1.25)	776	3.53 (3.37–3.70)
All-cause death				
Day 21	10,701	6.04 (5.92–6.15)	476	0.90 (0.82–0.98)
Day 30	450	6.32 (6.21–6.44)	80	1.07 (0.98–1.15)
Day 90	1994	7.63 (7.50–7.76)	430	1.96 (1.83–2.08)
Day 365	4396	10.78 (10.63–10.93)	1130	4.43 (4.25–4.62)

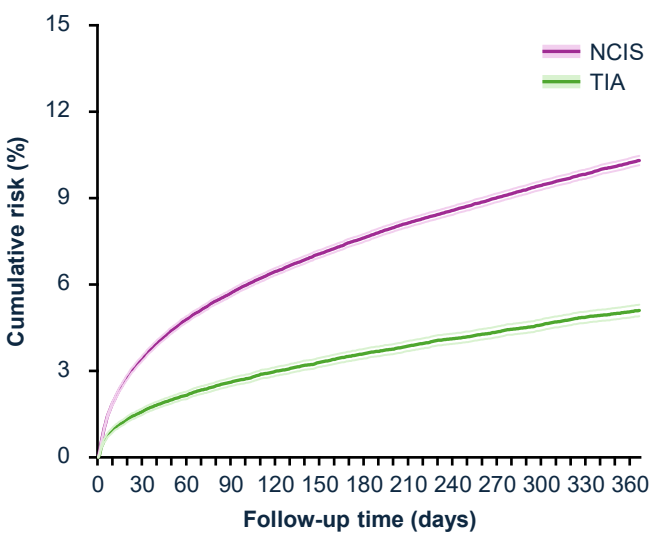
†Per 100 person-years.
CI, confidence interval; IS, ischaemic stroke; NCIS, non-cardioembolic ischaemic stroke; TIA, transient ischaemic attack.

Table 1. Patient characteristics at baseline

Characteristic	Index event: NCIS (n = 180,021)	Index event: TIA (n = 54,392)
Mean age at index, years (SD)	68 (14.5)	69 (14.6)
Sex, n (%)		
Female	88,752 (49.3)	29,234 (53.7)
Male	87,972 (48.9)	24,495 (45.0)
Other or unknown	3297 (1.8)	663 (1.2)
Race, n (%)		
White	122,933 (68.3)	40,580 (74.6)
Black or African American	24,285 (13.5)	5796 (10.7)
Asian	4446 (2.5)	1083 (2.0)
Other	8268 (4.6)	2547 (4.7)
Unknown	20,089 (11.2)	4386 (8.1)
Ethnicity, n (%)		
Hispanic or Latino	13,460 (7.5)	3976 (7.3)
Not Hispanic or Latino	149,800 (83.2)	46,708 (85.9)
Unknown	16,761 (9.3)	3708 (6.8)
Comorbidities, n (%)		
Hypertension	128,762 (71.5)	42,391 (77.9)
Hyperlipidaemia	69,140 (38.4)	24,815 (45.6)
Diabetes	47,857 (26.6)	14,314 (26.3)
Cerebrovascular disease	35,077 (19.5)	11,295 (20.8)
Coronary artery disease	31,407 (17.4)	11,206 (20.6)
Obesity	27,159 (15.1)	9103 (16.7)
Heart failure	16,521 (9.2)	5004 (9.2)
Prior stroke	25,285 (14.0)	7526 (13.8)
CKD	27,633 (15.3)	9218 (16.9)
NIHSS score		
Patients, n (%)	120,923 (67.2)	32,242 (59.3)
Median (Q1, Q3)	1 (0, 5)	0 (0, 1)

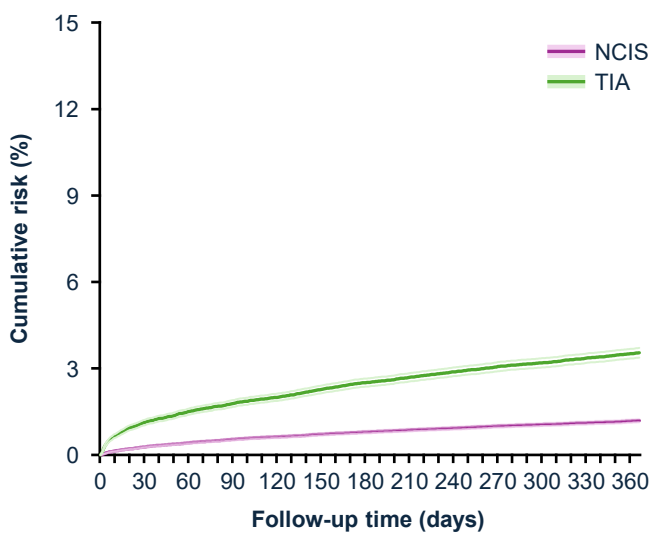
CKD, chronic kidney disease; NCIS, non-cardioembolic ischaemic stroke; NIHSS, National Institutes of Health Stroke Scale; Q, quartile; SD, standard deviation; TIA, transient ischaemic attack.

Figure 1. Kaplan–Meier cumulative risk of IS



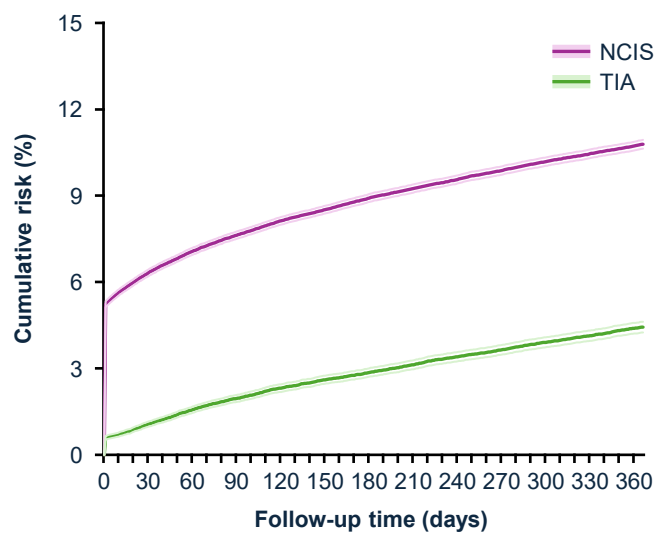
IS, ischaemic stroke; NCIS, non-cardioembolic ischaemic stroke; TIA, transient ischaemic attack.

Figure 2. Kaplan–Meier cumulative risk of TIA



NCIS, non-cardioembolic ischaemic stroke; TIA, transient ischaemic attack.

Figure 3. Kaplan–Meier cumulative risk mortality



The spike observed between Day 0 and Day 1 likely reflects the accumulation of deaths during the in-hospital stay.
NCIS, non-cardioembolic ischaemic stroke; TIA, transient ischaemic attack.

Conclusions

- Patients with NCIS experienced higher rates of recurrent IS and death compared to patients with TIA, while patients with TIA were more likely to experience repeat TIA.
- Risk of IS recurrence at 1 year remained substantial (10.3%), despite incidence peaking in the first 90 days after NCIS.
- Most recurrent events and deaths occurred within the first 90 days.
- These findings highlight the need for improved secondary prevention strategies.

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Conflicts of interest / disclosures
SEK has received grant funding and consulting fees from Bayer. **SS**'s institution received compensation from Bayer. **MD, NT, SG,** and **EK** are employees of Truveta. **JX** is an employee of Bayer, Inc. and may own shares or share options in the company. **DRM, KV,** and **KYA** are employees of Bayer, AG. and may own shares or share options in the company. **KK** is an employee of Bayer Hispania and may own shares or share options in the company. **MR** declares no conflict of interest.

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