

Effect of admission time on provision of acute stroke treatment at Stroke Units and Stroke Centers in Switzerland – an analysis of the Swiss Stroke Registry



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Background

Rapid state-of-the-art treatment of acute ischemic stroke (AIS) depends on sufficient staffing. Certification criteria in Switzerland require a 24/7 presence of a stroke neurologist at Stroke Centers, and an on-call service at night and on weekends at Stroke Units. We studied the effect of admission time on performance measures of AIS treatment and related temporal trends over time at Stroke Centers and Stroke Units.

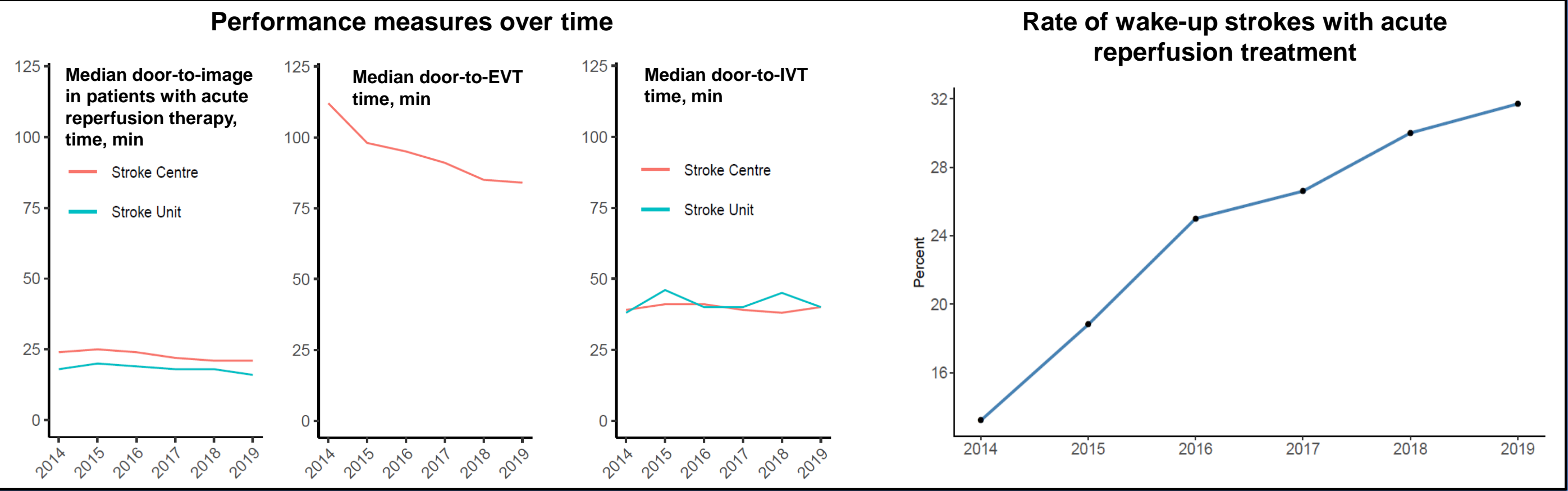
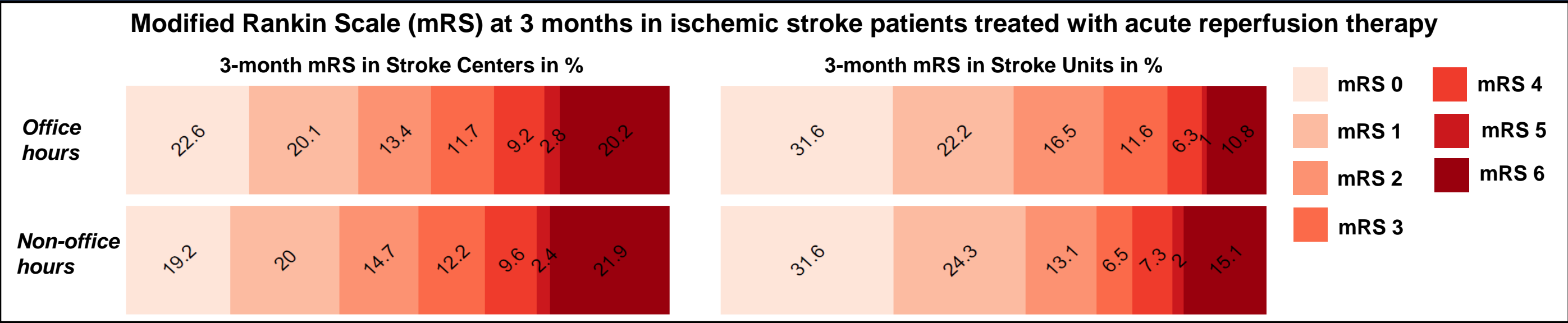
Methods

We compared treatment rates, door-to-image-time (DIT), door-to-needle-time (DNT), and door-to-groin-puncture-time (DPT) in stroke patients receiving intravenous thrombolysis (IVT) and/or endovascular treatment (EVT) admitted during office hours (OH; Monday-Friday 8:00-17:59) and non-office hours (NH) at all certified Stroke Centers and Stroke Units in Switzerland, as well as secular trends thereof between 2014 and 2019, using data from the Swiss Stroke Registry. Secondary outcomes were modified Rankin Scale and mortality at 3 months.

Results

Treatment rates for IVT/EVT were higher during NH compared with OH in Stroke Centers (40.8 vs 36.5%) and Stroke Units (21.8 vs 18.5%). DIT and DNT were increased during NH (DIT: Stroke Centers, median 23 vs 22 minutes; Stroke Units 19 vs 17; DNT: Stroke Centers 43 vs 37; Stroke Units 45 vs 39). DPT at Stroke Centers was longer during NH compared to OH (95 vs 84 minutes). Admission during NH was independently associated with worse functional outcome and increased mortality. From 2014 to 2019, median DPT improved from 112 to 84 minutes and the treatment rate for wake-up strokes increased from 13 to 32%.

		Office hours	Non-office hours	Office vs non-office hours, p-value
Acute reperfusion therapy, n (%)	Stroke Center	4'322 (36.5)	5'090 (40.8)	<0.001
	Stroke Unit	724 (18.5)	773 (21.8)	<0.001
Door-to-image time, min, median (IQR)	Stroke Center	22 (16-30)	23 (17-31)	<0.001
	Stroke Unit	17 (11-25)	19 (13-27)	<0.01
Door-to-IVT time, min, median (IQR)	Stroke Center	37 (27-54)	43 (30-61)	<0.001
	Stroke Unit	39 (29-53)	45 (32-65)	<0.001
Door-to-EVT time, min, median (IQR)	Stroke Center	84 (59-116)	95 (66-130)	<0.001



Conclusions

Despite differences in staffing, patient admission during NH delayed IVT to a similar, modest degree at Stroke Centers and Stroke Units. A larger delay of EVT was observed during NH, but Stroke Centres sped up delivery of EVT over time. Patients admitted during NH had worse functional outcomes, which was not explained by treatment delays.