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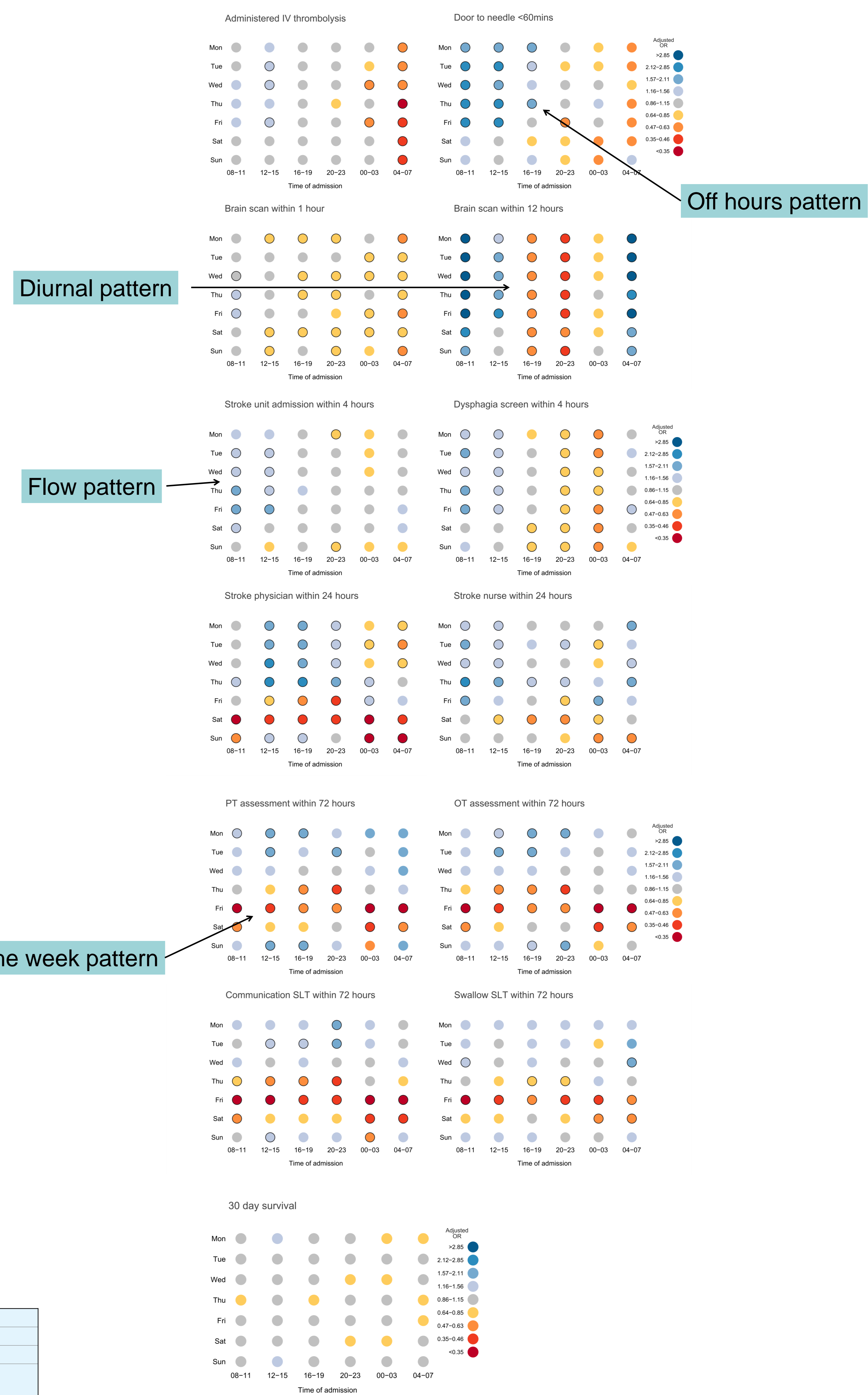
Contact: ssnap@rcplondon.ac.uk Further details at: www.strokeaudit.org

BACKGROUND

Studies in many health systems have found evidence of a "weekend effect" (poorer quality of care on weekends) in stroke care. The weekend effect is however controversial: why it occurs is not clear and it has been observed in some, but not all settings and countries. The limitation of previous studies of the weekend effect is that they have typically compared weekends with weekdays and have not considered how stroke care might change over day AND time. We aimed to describe the 24/7 variation in acute stroke care in stroke services in England and Wales

METHODS

- Nationwide registry based prospective cohort study
- Data were from the Sentinel Stroke National Audit Programme of 74307 patients admitted with acute stroke in England and Wales
- Temporal variation in thirteen measures of acute care quality was modelled with multilevel multivariable regression models. Models were adjusted for age, sex, stroke type, place of stroke onset, pre stroke level of functioning, stroke severity (NIHSS or level of consciousness), vascular co-morbidity, elapsed time from stroke onset to admission and included hospital level random intercepts
- Time was stratified into 42, four hour blocks per week
- Patients were classified according to time of admission or, if stroke whilst an inpatient, time of onset
- "Heatmap" visualisations show the adjusted odds ratio of each quality indicator compared to the average performance across the week: **blue indicates higher quality care** and **red indicates poorer quality care**. Black circles indicates 95% confidence intervals that do not include unity.



RESULTS

- Measures of quality differed in both the magnitude and pattern of 24/7 variation, affecting patients across the whole week and not just those admitted at weekend
- Four patterns of variation were identified: a diurnal pattern (e.g. dysphagia screening), a day of the week pattern (e.g. occupational therapy assessment), an off hours pattern with worse quality both overnight and at the weekend (e.g. door to needle time) and a flow pattern where quality changed sequentially across weekdays (e.g. stroke unit admission)
- There was no significant difference in adjusted 30 day survival between weekends and weekdays (aOR 1.03, 0.95-1.13) but patients admitted overnight had lower odds of survival (aOR 0.90, 0.82-0.99).

	Weekday 0800-1959	Weekend 0800-1959	Weekday 2000-0759	Weekend 2000-0759
30 day survival	Ref	1.03 (0.95-1.13)	0.90 (0.82-0.99)	0.89 (0.78-1.01)

Adjusted odds and 95% CI of 30 day survival by day-time of admission

n	74307
Female (n, %)	37434 (50)
Age (Median, IQR)	77 years (67-85)
Stroke Type (n,%)	
Ischaemic	65193 (88)
ICH	8038 (11)
Undetermined	1076 (2)

Summary characteristics of the cohort

IMPLICATIONS

The "weekend effect" is a simplification of more complex patterns of temporal variation in stroke care quality that extend across the whole week. Acute stroke care quality varies 24/7, and different aspects of care show different patterns of variation. Recognising these patterns might aid in identifying the cause of temporal variation in stroke quality (such as staffing levels, bed capacity, access to diagnostics) and could be a useful new tool for quality improvement in stroke care. More broadly, these data suggest that a more sophisticated understanding of time based variation in health care quality is required than previous studies of the weekend effect have suggested.