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Insight report

Emergency inpatient diagnostics - CT scans

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Variation in timeliness of CT scans

CHKS recently carried out research into the timeliness of CT scans for patients admitted as emergencies. Our intention was to establish whether there were differences in scanning rates or speed of scanning between weekdays and weekends. Although we did not find significant differences during the week, we were surprised by the level of variation of scanning rates between trusts. We looked at CT scans because they are more likely to be recorded in the inpatient record. Other less costly investigations (X-rays, blood tests and ultrasound scans) are not as reliably recorded. The analysis was carried out using HES data from all English acute hospital trusts for 12 months to July 2015.

Normally the speed and volume of emergency diagnostic testing are expected to be negatively correlated. In other words, as more tests are requested the speed of response is likely to diminish. However, our analysis found there is a clear positive relationship when it comes to CT scans. Scans are carried out more promptly in trusts doing more of them. Conversely, those hospitals scanning fewer patients also had longer waits.

Chart 1 shows the percentage of emergency admissions with a CT scan where the scan was undertaken on the day of admission rather than later in the stay; essentially a measure of speed. It is plotted against the percentage of admissions with inpatient CT scan at any point in the stay, a measure of how many are carried out.

The fact that there is a positive relationship, rather than the expected negative correlation, suggests levels of service (both volume and speed) adjust in response to the level of provision, and are therefore not driven purely by demand.

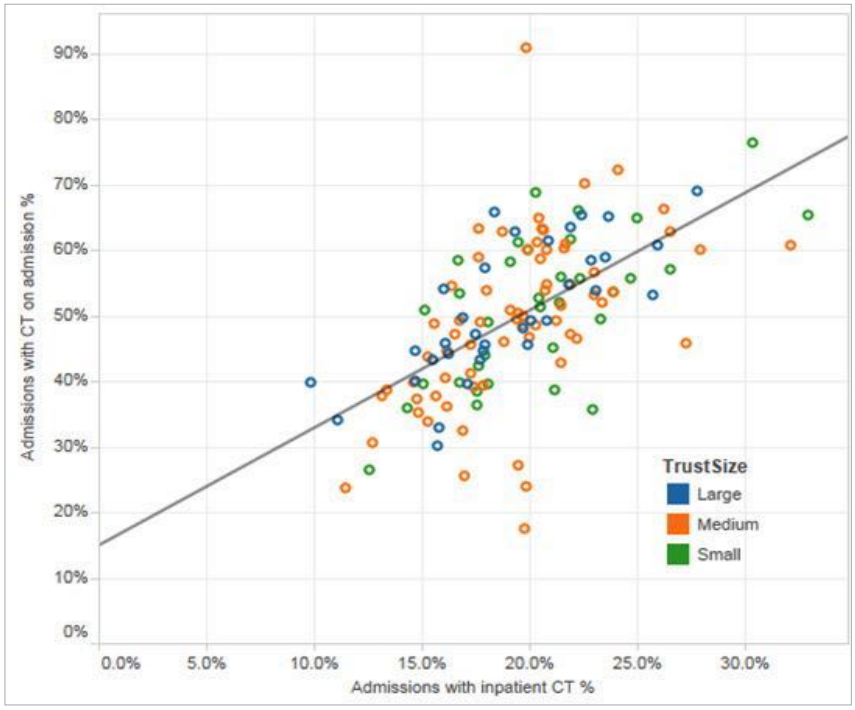

Chart 1 – Speed and volume of CT scans according to trust size

As well as revealing a clear positive relationship, Chart 1 also shows significant variation between hospitals, regardless of trust size. The same relationship exists for specific conditions and for stroke (I63) it is particularly strong. As expected, trusts with hyper acute stroke units perform notably well (Chart 2).

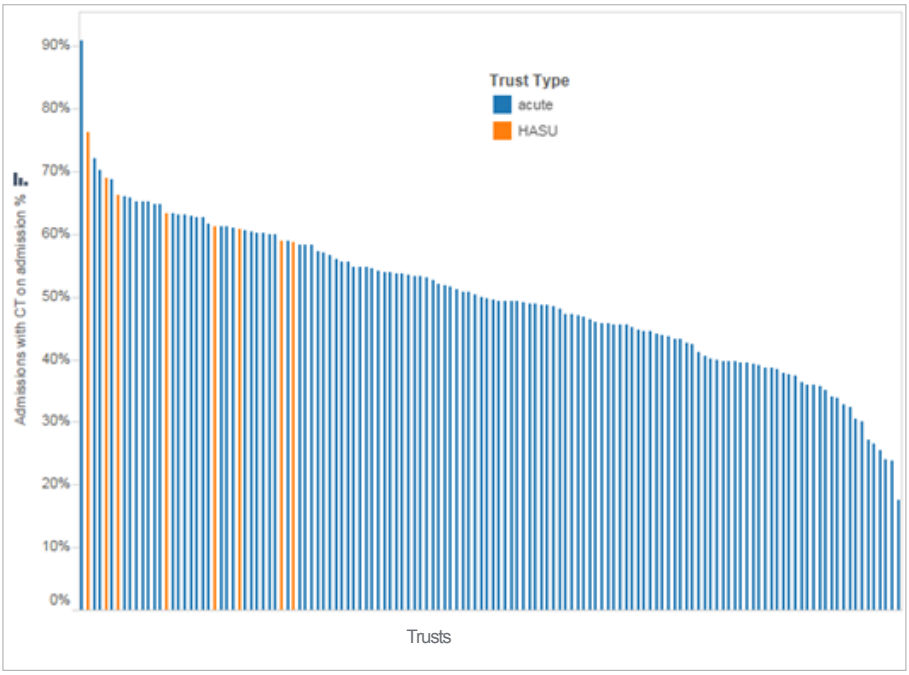

Chart 2 – Comparison between trusts with hyper acute stroke units

Impact of CT scanning variation on finances

We also found that in hospitals carrying out CT scans more quickly, the average length of stay for these patients was 9.0 days. Patients at hospitals where CT scans took longer had an average length of stay of 13.0 days (Chart 3).

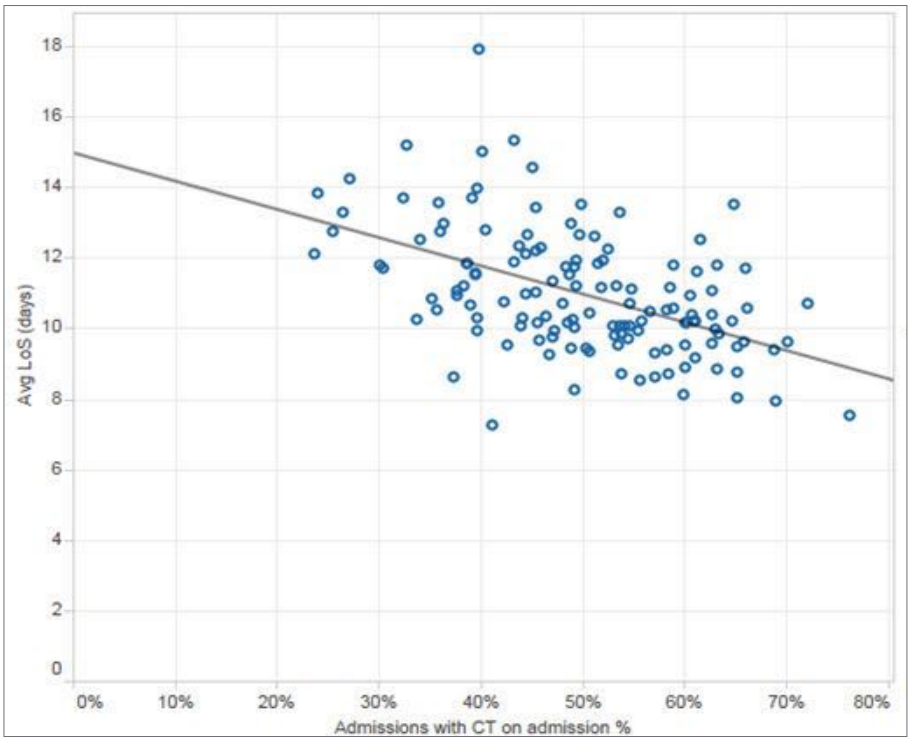

Chart 3 – CT scans and average length of stay

The extra cost of up to four extra inpatient days per patient amounts to around £1,200. The average cost of a CT scan is around £180, including capital, maintenance, and staffing costs. There is therefore a strong financial case for increasing CT scanning capacity in the trusts where capacity appears to be limited and is leading to longer waits, so that scans are done sooner after admission. In some cases, investment in further CT scanning staffing, equipment, or both might save more than it costs and result in faster diagnosis and better treatment for patients.

Trusts where fewer than half of scans are carried out on admission day (those on the left half of Chart 3) have an overall length of stay 1.5 days longer than those with speedier diagnostics (on the right). Even if the slower trusts were to achieve a more modest one day reduction, by increasing the speed of scanning, we estimate the gross savings across all trusts would be £145m per year. For each of the 69 trusts involved, the saving would be over £2m per year.

The above analysis includes all diagnoses. However, the impact on length of stay was particularly clear for patients exhibiting symptoms and signs involving cognition, perception, sensation (diagnoses R40 through to R44) - being able to rule out the possibility of stroke earlier may be a factor here.

Conclusion

The considerable variation between hospitals in both the number of emergency inpatient scans and the speed with which they were carried out suggests supply (rather than clinical need alone) determines the number and speed of procedures in NHS trusts. With a clear link between faster scans and shorter length of stay there is also a strong financial case for increasing CT capacity in the trusts with lower capacity, so that scans are done sooner after admission resulting in better treatment and shorter stays.

Find out more

To find out more about how we can support you address these challenges, please contact us:

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