



Study casts more doubt on weekend effect

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New research that took into account whether patients came to hospital by ambulance shows that much of the “weekend effect” identified in previous studies is likely to be explained by variation in severity of illness.¹

The study, published in the *BMJ Quality & Safety*, found that a higher proportion of patients admitted to hospital at the weekend arrived by ambulance than during weekdays and that this was a marker for illness severity.

Previous studies, including one published in *The BMJ*,² had shown higher death rates among patients admitted at weekends than among those admitted midweek.³ The UK government used the research to push for seven day services in the NHS and to increase weekend working by junior doctors.⁴⁻⁶

The researchers reanalysed the same data on emergency admission used in previous studies that had been quoted as showing a weekend effect. They examined more than three million admissions via accident and emergency departments of 140 non-specialist hospital trusts in England between April 2013 and February 2014. Admissions were linked with accident and emergency records that gave the mode of arrival and the date and time of attendance.

The proportion of admitted patients brought in by ambulance was higher on Saturdays (61%) and Sundays (60%) than on weekdays (57%). Patients coming by ambulance had much severer problems, and the death rate among these patients, at 5.5%, was rather higher than the 0.8% among patients who did not arrive by ambulance.

Without adjusting for mode of arrival the researchers found that mortality was significantly higher among patients who were admitted to hospital at the weekend and on Wednesday and Thursday nights. However, once the researchers adjusted for arrival by ambulance they found no increased risk of mortality after admission at night or for most of the weekend. When

compared with patients who arrived at hospital Wednesday daytime, raised mortality reached statistical significance only among patients who arrived Sunday daytime (odds ratio 1.06 (95% confidence interval 1.03 to 1.1)).

The study’s leader, Matthew Sutton, professor of health economics at the University of Manchester, said, “We have shown that much of the weekend effect identified in previous studies is likely to be explained by a smaller and on average sicker population of patients being admitted at weekends. Arrival by ambulance is a marker of illness severity that has been omitted from the previous studies on which the seven day services policy is based. Other measures of severity would likely explain the weekend effect away altogether.”

He added, “The seven day services policy is based on very little evidence. This major omission from the previous studies shows that much more robust evidence is needed to justify the major changes in hospital services that are under way.”

For more of *The BMJ*’s content on the “weekend effect” go to bmj.com/weekend.

- 1 Anselmi L, Meacock R, Kristensen S, et al. Arrival by ambulance explains variation in mortality by time of admission: retrospective study of admissions to hospital following emergency department attendance in England. *BMJ Qual Saf* 2016. doi:10.1136/bmjqs-2016-005680.
- 2 Freemantle N, Ray D, McNulty D, et al. Increased mortality associated with weekend hospital admission: a case for expanded seven day services? *BMJ* 2015;351:h4596. doi: 10.1136/bmj.h4596 pmid:26342923.
- 3 Aylin P. Making sense of the evidence for the “weekend effect”. *BMJ* 2015;351:h4652. doi:10.1136/bmj.h4652 pmid:26342692.
- 4 Rimmer A, Kmietowicz Z. *BMJ* editor writes to Hunt over misuse of weekend mortality data. *BMJ* 2015;351:h5624. doi:10.1136/bmj.h5624 pmid:26489427.
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- 6 Godlee F. How Jeremy Hunt derailed clinician led progress towards a seven day NHS. *BMJ* 2016;352:i187. doi:10.1136/bmj.i187 pmid:26762361.

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