



## A Closer Look at the Weekend Effect



By Michael Freeman , INSEAD Assistant Professor of Technology and Operations Management

**A study of one hospital’s A&E department shows that bigger is not always better when it comes to data.**

Any visit to an accident and emergency department (ED) is fraught – it’s unplanned and unpleasant. But going at the weekend is even more trying, with bigger crowds and longer waits to be seen by a doctor. Plus, there is a phenomenon known as the “**weekend effect**” which suggests that patients admitted to hospital on Saturdays and Sundays have an increased risk of death.

The problem is thought to be persistent in the United Kingdom. Although the British National Health Service (NHS) is exemplary and provides access to primary care physicians free of charge, there are still droves of patients who arrive at EDs around the nation in various states of illness. And there is still a

higher rate of mortality if they are admitted to hospital on a Saturday, Sunday or public holiday.

## **How to diagnose the weekend effect**

In response to the weekend effect, in 2015 then-Health Secretary Jeremy Hunt tried to push through contract changes to help deliver [a seven-day NHS](#) by 2020. The goal was to ensure that patients received the same access to health services every day of the week.

Yet some have questioned whether this push was predicated on the incorrect assumption that patients were put at harm when they arrived on the weekend versus a weekday. Is the weekend effect really explained by worse service availability at the hospital on a weekend, or are there other explanations, such as differences in patient characteristics and doctor decision making?

One possible alternative explanation for the weekend effect, for example, is that people only turn up at the ED on Saturday or Sunday if they are very, very sick. Perhaps they can't afford to take time off work, so they delay their visit to the hospital to the weekend, at which point they are in a worse state of health. Also, since most hospitals offer reduced services at the weekend, perhaps fewer routine cases are admitted to the hospital than during a weekday, explaining why the likelihood of dying after a visit to the ED appears higher.

In order to clarify the problem, my co-authors\* and I decided to look deeply at the fine-grained data from one hospital to see what insights could be derived from a focused analysis of this site. In an [article](#) published in the *Emergency Medicine Journal*, we examined nearly 425,000 ED attendances from 2007 to 2013 to explore what could vary between a weekend day and a weekday that could explain these differences in mortality statistics.

Looking at these data, we found evidence that even after accounting for various alternative explanations, patients do appear to be at greater risk of death if they arrive at the weekend. However, we found that this was only the case for patients seen and admitted by a junior doctor in the ED. Junior doctors are qualified medical doctors but are still in training.

For patients admitted by junior doctors in the ED, those who arrived on a weekday had an unadjusted mortality rate of 3.3 percent. This compared to

a slightly higher rate of 4 percent at the weekend. We found that this could be partly explained by differences in admitting behaviour: Junior doctors admitted lower risk (i.e. less sick) patients at half the rate on weekends as compared to Monday through Friday. This dilutes the risk pool of weekday mortality, and thus contributes to the weekend effect. However, it does not explain the weekend effect entirely. In a risk-adjusted model that accounts for differences in patient characteristics and doctor admission behaviour, we still find that patients are 15 percent more likely to die if they arrive to the hospital at the weekend and are seen by a junior doctor. This increased mortality rate at the weekend rose even more for higher risk patients (i.e. those requiring immediate resuscitation) and patients arriving during daytime hours, who are 24 percent and 39 percent more likely to die during the weekend, respectively.

Senior doctors, on the other hand, had the same admitting patterns on weekends and weekdays. Our data did not show evidence of a weekend effect among patients admitted by senior doctors – their mortality rate was stable at 3.3 percent.

From a practitioner point of view, **Dr Katherine Henderson**, current President of the Royal College of Emergency Medicine, commented that our study had “given us a lot to think about” and described the finding that junior doctors admitted a greater number of relatively well patients on weekdays as “surprising”.

“The NHS needs to use its resources as effectively as possible,” she wrote. “We should only admit patients who need to be admitted. This paper suggests it would be a good idea to make sure we are using our senior decision makers where they can be most valuable – seeing sick patients and actively evaluating all borderline admission/discharge decisions.”

### **What can you do with the data?**

With this in mind, it’s possible for firms to look to their own data to find answers that may run against broader trends. This paper shows the weekend effect does exist in a single hospital even after accounting for various alternative explanations. We were able to locate it because we had more detailed, more granular information at the hospital level. If instead we had looked at nationwide data, with a multi-hospital study, some of the necessary detail – e.g. junior or senior doctors admitting – wouldn’t necessarily be available.

Large studies are still important, of course, to corroborate results and determine the extent to which findings are generalisable. But sometimes for more nuanced and actionable insights, rather than a one-size-fits-all approach, managers (e.g. hospital administrators) ought to look to their own data to see what is going on and ask if there are some specific factors that exacerbate a given issue.

For this problem – junior doctors’ admission rates at the weekend – one possible solution in the ED from our study could be to have more senior doctors available on the weekend or a mechanism for junior doctors to follow up with a senior doctor in case of doubt. Solutions such as telemedicine or other technology might help to enable such changes.

An organisation’s own data can thus provide more insights before drastic changes are made off the back of national or global recommendations. With access to granular data, experts can uncover particular and perhaps unpopular solutions. Rather than following the wisdom of the crowd, organisations should consider their problems through their own unique prism.

*\* The authors are Larry Han (Harvard University/University of Cambridge Judge Business School), Jason Fine (University of North Carolina at Chapel Hill Gillings School of Global Public Health), Susan M. Robinson and Adrian A. Boyle (Emergency Department, Cambridge University Hospitals NHS Foundation Trust), Michael Freeman, and Stefan Scholtes (University of Cambridge Judge Business School).*

**Michael Freeman** is an Assistant Professor of Technology and Operations Management at INSEAD.

Don’t miss our latest content. Download the free [\*\*INSEAD Knowledge app\*\*](#) today.

Follow INSEAD Knowledge on [\*\*Twitter\*\*](#) and [\*\*Facebook\*\*](#).

#### **Find article at**

<https://knowledge.insead.edu/operations/closer-look-weekend-effect>

---

#### **About the author(s)**

**Michael Freeman** is an Assistant Professor of Technology and Operations Management at INSEAD.

Download the free Knowledge App

