

An edited version of this article appeared as: Jones R (2000) Outpatient appointments – Feeling a bit peaky. Health Service Journal 110(5732), 28-31. Please use this as the citation.

Outpatient Waiting Time

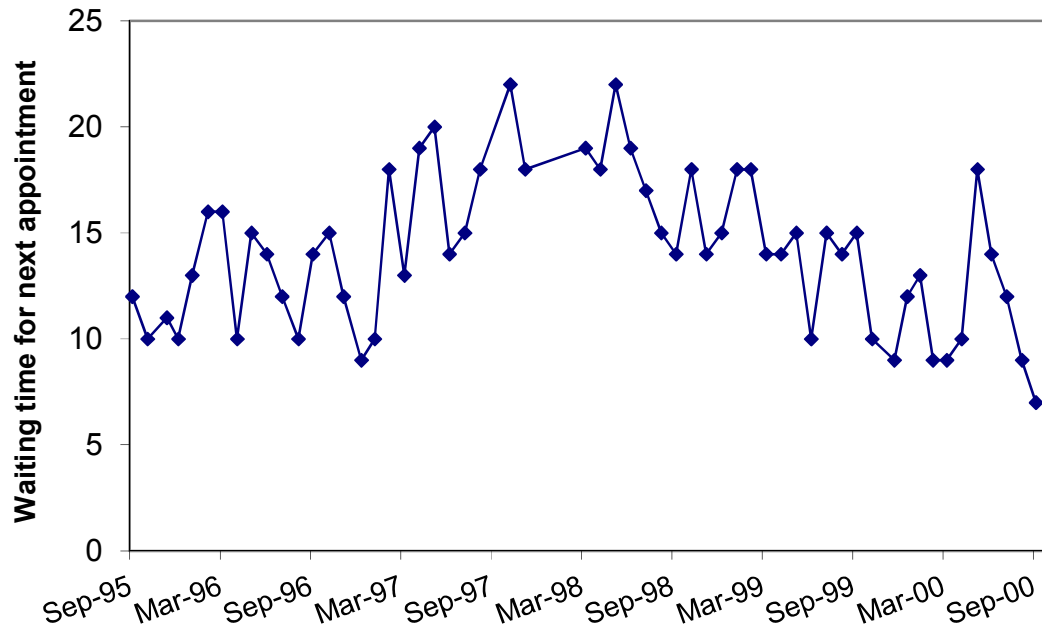
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There has been much recent alarm within the NHS at the apparent rise in the number of outpatients waiting longer than 13 weeks for their first appointment. This alarm is somewhat needless since the total number of patients waiting (and hence those waiting longer than 13 weeks) always reaches a seasonal peak in September.

Figure One gives an example from one Trust covering the past three years (note that September 2000 is an actual number while December 2000 and March 2001 are forecast from the underlying seasonal pattern plus additional work to achieve waiting time targets). This article describes why this seasonal behaviour is fundamental to the forecasting of total number waiting for an appointment and thus the outpatient waiting time.

Figure One: Waiting time for an Orthopaedic clinic



Any waiting list is simply the difference between demand (GP referrals) and supply (available Consultant first appointments). If demand and supply follow different monthly patterns then the number waiting will fluctuate accordingly. We need therefore to determine why these two processes should follow different patterns.

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Turning first to demand, namely, the number of GP referrals sent each month. All disease conditions are seasonal and hence it should be no surprise if a unique GP referral profile is required for each specialty (1). This referral profile will be the composite profile arising from the basket of disease conditions encountered in that specialty.

Figure Two shows the profile for referrals to the Varicose Veins Clinic (a sub-specialty within General Surgery). In this instance the seasonal profile appears to vary roughly with light intensity. Of interest is the fact that the seasonal profile (as referrals per workday) does not vary greatly from the pattern expected in a given year (as GP referrals per workday times the number of workdays in the month, i.e. the total number of referrals per month). This indicates that holiday periods (Summer and Christmas) have little impact on attendance at a GP surgery – a crucial point in the difference between demand and supply which will be discussed later.

Table One gives further examples of referral profiles for several specialties. Figures in Table One come from a ten-year sample covering the period 1985 to 1995 (2). Ten years of data is required in order to obtain a true average in the face of considerable randomness in the actual monthly results. This randomness along with other healthcare randomness (i.e. emergency admissions, etc) can be described by Poisson statistics.

Results have been adjusted for differing work days per month in various years and re-calculated for the working-day profile applicable to 2000/01. As can be seen each specialty does indeed have a unique profile. Several of the specialties in Table One have been taken to sub-specialty level to illustrate important driving forces behind referrals. For instance, the general ENT profile is close to the profile experienced for Respiratory Allergy. In this case the peaks and troughs of the sub-specialty are diminished when mixed with the wider range of conditions encountered within ENT, many of which may also be responding to the same causative sources as respiratory allergy.

Table One: Percentage of GP referrals expected for the different months of the 2000/01 financial year.

Month	T&O	ENT	Allergy - Respiratory	Ophthalmology	Dermatology	Allergy - skin & other	Urology	General Surgery	Breast	Gynaecology	Paediatrics
Apr	7.9%	7.5%	7.1%	7.6%	7.8%	8.4%	7.0%	7.3%	6.5%	7.7%	6.9%
May	7.9%	9.1%	10.8%	8.8%	8.3%	9.5%	7.7%	9.9%	9.3%	8.9%	7.9%
Jun	8.6%	9.3%	10.4%	9.1%	9.7%	10.0%	8.9%	9.0%	9.3%	9.3%	8.9%
Jul	8.1%	8.3%	6.0%	7.8%	9.0%	8.6%	9.1%	8.8%	7.8%	8.1%	8.3%
Aug	8.4%	7.6%	7.8%	8.9%	9.1%	7.9%	7.7%	8.6%	8.4%	6.9%	7.7%
Sep	7.7%	7.6%	9.0%	8.2%	8.6%	7.9%	8.5%	7.9%	8.4%	8.0%	7.7%
Oct	7.5%	8.9%	10.7%	9.2%	8.3%	6.8%	8.2%	8.7%	9.3%	8.5%	9.4%
Nov	8.9%	8.9%	5.8%	8.6%	8.3%	6.8%	9.2%	8.4%	8.2%	9.2%	8.9%
Dec	7.5%	6.7%	6.1%	7.0%	6.8%	7.7%	7.6%	6.5%	6.2%	7.2%	6.7%
Jan	8.8%	8.6%	9.6%	7.5%	8.2%	7.7%	8.7%	8.4%	8.8%	8.1%	9.0%
Feb	9.2%	9.3%	8.6%	8.4%	7.9%	9.5%	7.9%	8.4%	8.4%	9.7%	8.4%
Mar	9.5%	8.3%	8.2%	8.8%	8.1%	9.1%	9.5%	8.0%	9.5%	8.2%	10.1%

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To determine the impact of the different profiles of GP referral upon the profile for the number of patients waiting longer than 13 weeks it is important to weight the contribution of each specialty by the total number of patients experiencing a long wait. This is illustrated in Table Two where national figures have been used (3). As can be seen 91% of patients waiting longer than 13 weeks come from just 8 specialties.

For some specialties such as Varicose Veins (hence General Surgery), Dermatology (also Allergy – Respiratory, Skin and other) and Ophthalmology there are more GP referrals in the first half of the year. Referrals for varicose veins probably represents the extreme case with 62% of referrals occurring in the first half of the financial year.

Although T&O constitutes around 25% of all NHS outpatients waiting longer than 13 weeks the referrals are fairly balanced with 49% of referrals in the first half of the year. However, the number waiting still reaches a peak in September each year. How can we explain this apparent discrepancy?

Consultant clinics are normally held on a set day each week, i.e. Mr X’s Urology clinic is held on a Monday. Table Three gives the number of workdays available in a year to clinics held on particular days of the week.

Table Two: Percentage of all patients waiting longer than 13 weeks in England

Specialty	% of total patients waiting longer than 13 weeks
T & O	25
Ophthalmology	13
ENT	11
Dermatology	9
General Surgery	7
Plastic Surgery	5
Urology	4
Neurology	4
Total	91

Table Three: Range in workdays available to clinics based on particular days of the week

Day of Week	Range in workdays for different years	Workdays available in 2000/01
Monday	46-49	46

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Tuesday	50-53	51
Wednesday	50-53	52
Thursday	50-53	52
Friday	49-52	51

From Table Three we can see that Monday and Friday clinics suffer from lost productivity due to public holidays and that 2000/01 has the minimum possible number of Mondays available. The number of workdays in a year ranges from 251 to 255 with 2000/01 having only 252 workdays. This difference in the number of workdays available in different years partly explains why NHS productivity is higher and lower in particular years.

Returning to the case of T&O. This specialty runs both general orthopaedic and fracture clinics. Given the more immediate demands of a fracture clinic (equivalent to all urgent appointments) they are not usually run on a Monday or Friday (for obvious reasons) leaving the mainly GP referred orthopaedic patients to be seen on the days where potential annual capacity is lowest.

Access to a GP is not however subject to these constraints. For example, each GP practice usually has a range of GP's available at any time. If a condition is acute the patient can then visit any member of the team of GP's in order to obtain a referral. The only limitation in this case is the number of working days in the week or month.

For these reasons GP referrals follow a pattern relating to the total number of workdays available in a week and month (4, 5) while consultant first appointments follow the profile particular to the day on which the clinic is held. For example, in 2000/01 some 47.8% of working Mondays occur in the first half of the year while 49.6% of available working days occur in the first half of the year.

The number of patients waiting longer than 13 weeks is the equivalent to water running over the causeway of a dam, hence, any additional water added to the dam runs over the causeway. The difference between demand and supply therefore shows up in the number of patients waiting longer than 13 weeks. In the example above it is 1.8% (49.6 – 47.8) of the total demand which then inflates the number waiting longer than 13 weeks. This magnifying effect therefore leads to the appearance of an 'alarming' increase in number waiting over 13 weeks up to September followed by an equally rapid reduction over the next six months.

This difference is further increased by the effect of the summer holidays. In this instance, consultant appointments are greatly reduced during August and September while the opportunity to visit a GP is not. Adjusting for the effect of holiday periods gives only 45% of available working Mondays in the first half of the year compared to 49.6% of available working days. Corresponding figures in 2000/01 for the other days are Tuesday (48.9%), Wednesday & Thursday (47.9%) and Friday (46.8%). Thus for all consultant clinics (irrespective of the day of the week on which the clinic may be held) there are

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always more opportunities for GP referral in the first half of the year that there are available outpatient appointments.

The supply side of our equation, namely, consultant first appointments therefore lags considerably behind the opportunity for GP referral during the first half of the year. Hence the number of patients waiting for a first appointment (and hence waiting time) climbs to a September peak in each and every year.

In the second half of the year this pattern is reversed and so by the end of March the total number of patients waiting for their first consultant appointment returns almost back to the previous year-end total. Any change is accounted for in the difference between total demand and supply across the whole year.

In conclusion, the total number waiting for first appointment always rises to a seasonal peak in September due to the higher relative opportunity to obtain a GP appointment during the first half of the year as opposed to a consultant appointment. This seasonal peak due to the mismatch between supply and demand is further magnified in particular specialties (e.g. General Surgery, Dermatology, Ophthalmology) where the seasonal profile of the disease(s) in that specialty leads to more than 50% of referrals occurring in the first half of the year.

References

1. Fleming, D.M. et al, 1995, Annual and seasonal variation in the incidence of common diseases. Occasional Paper No 53, Royal College of General Practitioners. ISBN 085041615.
2. The Central Bureau of the Royal Berkshire Hospital manually collected raw data covering referral to individual Consultants and sub-specialties between 1985 and 1995.
3. Data is for March 2000, NHS website
4. Jones, R.P., 1996, Estimation of annual activity and the use of activity multipliers. Health Informatics, 2, 71-77.
5. Jones, R. 1996, How many patients next year? Healthcare Analysis and Forecasting, Reading, UK.