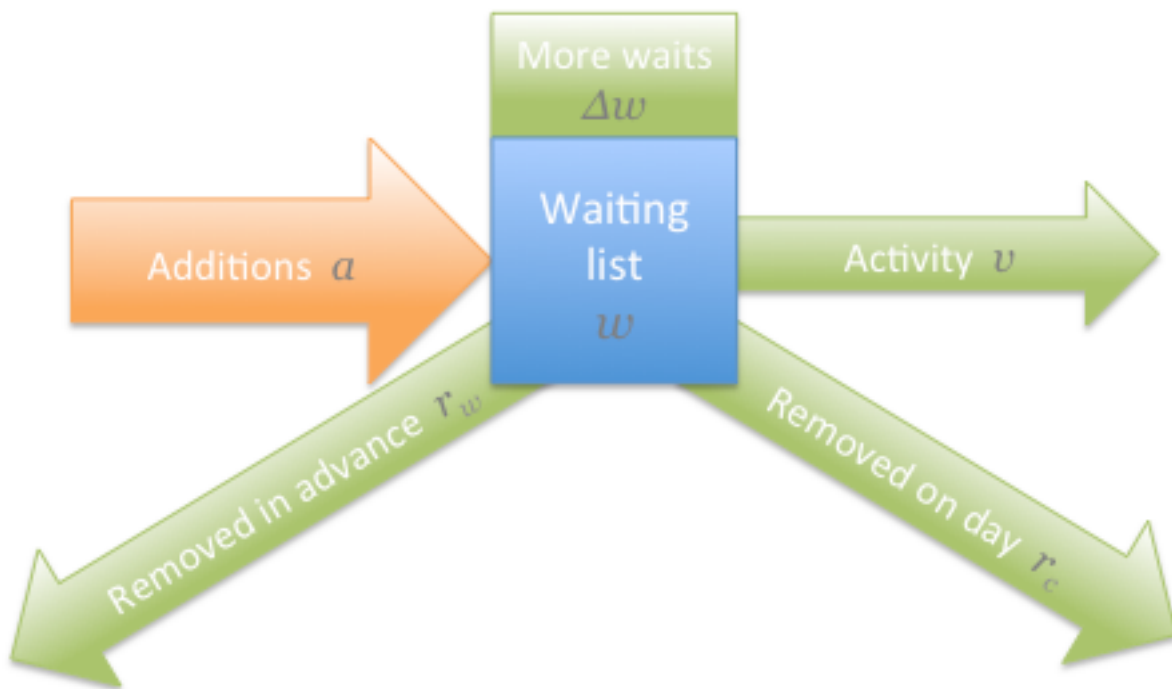


Alternative methods for measuring demand



Removals

We shall assume that there are two principal ways in which patients are removed from waiting lists for reasons other than treatment:

- > r_w patients are removed from the waiting list, e.g. through validation; and
- > r_c are removed following cancellation on the day of their appointment, e.g. some DNAs.

$$\text{total removals } r = r_w + r_c$$

Removals from the waiting list r_w are assumed proportional to the number of additions a such that

$$r_w = a \cdot \rho_w$$

where ρ_w is the waiting list removal rate relative to additions.

Removals as a result of cancellation r_c are assumed proportional to waiting list activity v such that

$$r_c = v \cdot \rho_c$$

where ρ_c is the cancelled removal rate relative to waiting list activity.

Additions

Additions are balanced by activity, removals, and the growth in waiting list (which includes suspended patients) as illustrated in the diagram above:

$$\begin{aligned}a &= v + r_w + r_c + \Delta w \\ \Rightarrow a &= v + a.\rho_w + v.\rho_c + \Delta w \\ \Rightarrow a(1 - \rho_w) &= v(1 + \rho_c) + \Delta w\end{aligned}$$

Demand

Let us define waiting list demand d as the number of additions who will end up as waiting list activity (as opposed to ending up being removed without treatment). This way of defining demand allows direct comparison between demand and activity, and leads to the useful concepts that recurring activity is equal to demand, and non-recurring activity is any additional activity.

Having defined demand in this way, it follows that $d = v$ when $\Delta w = 0$ and we can substitute these values into the additions formula above as follows:

$$\begin{aligned}a(1 - \rho_w) &= d(1 + \rho_c) \\ \therefore d &= a(1 - \rho_w) / (1 + \rho_c)\end{aligned}$$

which is a formula for calculating demand, based on additions.

Using the additions formula to substitute for $a(1 - \rho_w)$ in the demand formula above gives

$$\begin{aligned}d &= (v(1 + \rho_c) + \Delta w) / (1 + \rho_c) \\ \therefore d &= v + \Delta w / (1 + \rho_c)\end{aligned}$$

which is a formula for calculating demand, based on activity and the change in list size.

Conclusion

If waiting list demand is defined as the number of additions to the waiting list that will end up as waiting list activity, then demand may be calculated using a choice of two formulae.

If historical waiting list size data is considered more reliable than additions data, then:

$$d = v + \Delta w / (1 + \rho_c)$$

If additions data is considered more reliable (or easier to obtain) than historical waiting list size data, then:

$$d = a(1 - \rho_w) / (1 + \rho_c)$$

where

$$\rho_c = r_c / v$$

$$\rho_w = r_w / a$$