RATIONALIZING WAITING TIMES IN HEALTH CARE DELIVERY: AN INTERNATIONAL COMPARISON

1. INTRODUCTION

Waiting lists are one of the major problems in publicly funded system, engendering discomfort and dissatisfaction. In absence of price, however, waiting lists are 'necessary' because they act as a rationing tool to balance supply-side and demand-side, thus achieving allocative efficiency. Public funding, however, aims at ensuring equity also, that is at guaranteeing access based on need and not on purchasing power. If waits are too long, people who can pay will address private healthcare, while this is not possible for the poorest ones, even if their need is equally urgent. In this case, the rationing tool would be again the price, exactly what public intervention intended to avoid.

The paper tries to outline how efficiency can be achieved together with equity also in current practice, with reference to a particular high demand health care service, elective (non-urgent) surgery. Waiting times for elective surgery are a main health concern in approximately half of the OECD countries (Siciliani and Hurst, 2005).

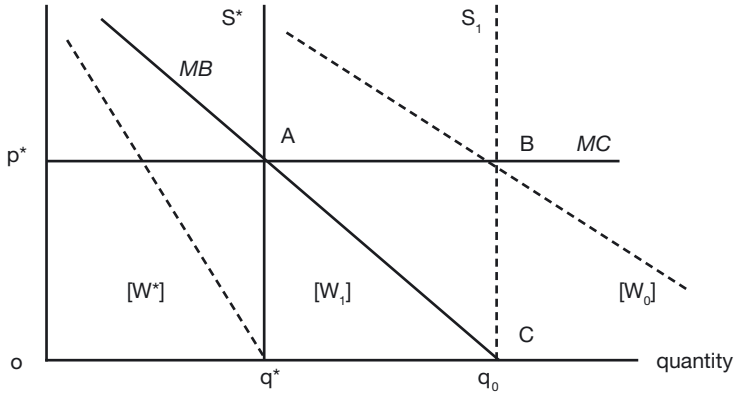
At first glance, it seems that facing waiting list problems is not too difficult as it would be sufficient only to increase the supply for health care delivery. As this may be difficult due to budget restriction, waiting lists are seen mainly as a symptom of insufficient capacity. The model presented demonstrates that paradoxically increasing capacity would not be the solution, because in brief the demand increases again more than supply does and waiting times attain levels similar to those before the capacity increased. Following the experience put forward in some countries, in particular Canada, Australia, New Zealand and recently also Italy, the most appropriate policy seems, instead, to be on the demand-side, through prioritization of needs. Priority settings, however, is not easy to implement in the practice: in section 3 two different approaches are compared (Tanfani and Testi, 2004), whereas in section 4 a successful experience in

Italy is reported (Valente *et al*., 2009). In section 5 comparisons of recent international policies are reported (Willcox *et al*., 2007), where it appears that the most effective reductions in waiting list such as obtained in England are due to a mix of different policies, both supply-side as well demand-side based, but that the winning card seems to be strong financial incentives and consistent funding. Equity is, however, still far from being an achieved goal of such policies (Siciliani and Verzulli, 2009).

2. The efficiency point of view: the optimal waiting time

In this section we demonstrate why waiting lists for elective surgery are necessary in a publicly funded system and they cannot be cut. For patients requiring surgery in a certain moment, the situation can be explained by figure 1 by means of the usual concepts of marginal cost and benefit. Marginal benefit (*MB*) is decreasing as usual. Marginal cost (*MC*) is constant for simplicity. Note that curve *MC* represents the 'societal' marginal cost, whereas the private marginal cost is null because individuals do not pay healthcare delivery. The capacity (supply) is correctly fixed at level S*, corresponding to quantity q*, where *MB=MC*. This position would coincide with market equilibrium at price p*. In publicly funded health system, however, as healthcare services are free, patients demand services q_0 until *MB*>0, equalizing their benefit to the individual zero cost instead than on the societal one *MC*. From an individual point of view there is, therefore, a capacity constraint

Figure 1 - *Marginal Benefit of Healthcare Provision depending on Waiting Time*



which means that q^*q_0 may be regarded as the list consistency, that is people who are enrolled to receive surgery in a future time.

From Figure 1 it appears that waiting lists act, apparently, as a rationing device, as price p* does in a market system. Waiting lists role, in fact, is to ensure achievement of quantity q*, that is to prevent from welfare loss, measured by the area ABC. Note, however, that waiting lists role is different from the price one. Actually in a market system, with price p*, people corresponding to quantity q^*q_0 would not be operated on at all. Price as rationing device excludes people with no sufficient purchasing power. On the contrary, waiting lists do not exclude from surgery (Mullen, 2003). In a certain sense they play the opposite role: being enrolled into the waiting list means to recognize that you are allowed to receive the treatment, even if you must wait before getting it.

For efficiency attainment in Figure 1, the crucial assumption is that, as it happens for other goods, delay in receipt of healthcare services lowers their value to demanders. If we include temporal preference into the marginal benefit function, for each q in Figure 1 the expected benefit is smaller if healthcare delivery is delayed. In particular, we assume that for each service unit the marginal benefit B_0 decreases by the disutility from delaying proportionally to the time W that the patient expects to wait before treatment according to a coefficient β_i, which proxies the benefit decay for time unit, depending both on clinical reasons as well as on pure time preference (Lindsay and Feigenbaum, 1984). Expected marginal benefit for patient i to receive the q unit of service at time t can, therefore, be expressed as:

$$B_i^e = B_i^0 - \beta_i W_i \tag{1}$$

The optimal average waiting time (W^*) is obtained when expected benefit at the current time is zero, that is equal to the private marginal cost. In correspondence with optimal waiting time, the list consistency becomes optimal that is equal to q^*q_0 in the figure. It would be useless to increase productive capacity (new supply curve S_1) because marginal benefit shifts to the right to W_0 and creates a new demand excess.

In conclusion, efficiency attainment requires not removing waits completely, but defining the optimal waiting time (W^*), that is the one that determines a shift to the left of the marginal benefit curve to W^*, until it meets the x-axis in q*, so that expected benefit at the current time is zero, that is equal to the private marginal cost: $W_i^* = B_i^0/\beta_i$.

3. The equity point of view: time appropriateness and prioritization

So far we have concluded that in a publicly funded system wait is necessary, because delaying health care delivery is the only device to ensure that at societal level the cost-benefit rule is followed. It seems that the equity principle is satisfied too, because everyone who has a discounted marginal positive benefit can accede to healthcare delivery. In Figure 1, however, we refer to an average optimal waiting time, but nothing can be said about individual differences. The following step is, therefore, to state who should be treated the first, which means prioritizing needs. The criterion should be meeting both of the meanings of equity in health care provision, the horizontal as well as the vertical one. Horizontal equity requires that patients in the same need should be treated after the same time, whereas vertical equity prescribes that patients in different need should be admitted after a different wait (Culyer, 1991). In the terms of our model, taking into account equity requires to know the value of the decay coefficient of each single patient because everyone should be treated according to his particular individually-optimal time, based on his need which usually differs from the average optimal time from a societal point of view. A new principle is, therefore, necessary in a publicly funded system, the 'time appropriateness' of health care services. This means that citizens are entitled to receive free what is comprised in their guaranteed packet, even if not all services are to be delivered immediately, but according to the state of need established by the physician. To the single citizen it doesn't matter if he is the first or the tenth of the list: what he requires is to be treated within his individual 'right' time.

The interest in evaluating individual needs has a long history since the late 1960s and early 1970s, when several prioritization formulae were developed (Mullen, 2003) to suggest how to manage hospital waiting lists according to a more transparent and fair approach, for ensuring appropriate individual waits even if there is not, at the moment, an international agreement and the choice between these criteria is an ongoing point of discussion (for a review, see Mullen, 2003 and Tanfani and Testi, 2004).

In the first models, priority scores were determined using multiplicative formulae taking into account both proxies of clinical need (such as rate of progress or deterioration of disease, disability or dependence on others, pain or distress) as well the time already waited. More recent formulae take an additive form, though intended as the earlier ones to determine the order of admission. Also in this case beside the clinical criteria, time already waited was inserted and

some Authors suggested also social variables (for instance, loss of occupation). Last models propose a different point of view, that is scores aimed at assigning patients to an 'urgency class', characterized by a given recommended time for treatment. Their formulae are additive and time is not included, because they are not intended to give an order of treatment, but a proxy of the urgency.

In recent years, based partially on these models, waiting list policies have been implemented all over the world, in particular, in Australia, Canada, New Zealand, United Kingdom, following two main approaches (Testi *et al*., 2008). The first determines priority scores directly, whereas the second categorizes patients into urgency classes according to the maximum time they should wait not to deteriorate.

The first is embodied in Canadian practice (WCWL, 2001), where priority scoring has been defined distinctly for each of the higher demand areas: cataract surgery, general surgery procedure, hip and knee replacement, magnetic resonance imaging and children's mental health. The second approach is followed in Australia (NHHRC, 2009). Italy's guidelines follow the Australian experience (CSR, 2002).

As we will see in the next sections, both approaches should be integrated to correctly manage waiting lists as an Italian project has demonstrated (Valente *et al*., 2009).

4. Urgency vs priority: the Italian SWALIS project

If the equity principle is interpreted as time appropriateness, managing waiting lists requires distinguishing between 'urgency' and 'priority', following Davis and Johnson (1999). They develop a prioritization model which combines three criteria (pain, social or career effects and disease progression) in order to obtain a patient's initial quotient (PIQ) which, multiplied by the time already waited, produces a patient's eligibility quotient (PEQ) giving the relative position of each patient on the waiting list. PIQ and PEQ can be regarded as urgency and priority, respectively. Urgency is, therefore, a characteristic attached to the single patient depending only on his individual condition at the time of referring to the waiting list, whereas priority represents the relative position of each patient on a surgical waiting list in each moment (Testi *et al.,* 2008). Urgency should be held distinct from priority and both should be taken into account when managing waiting lists (Kee *et al*., 1998). Priority

indicates who should be treated the first, but urgency should be checked to verify if each patient is operated on within the maximum prescribed time.

Current practice applications, however, don't consider priority and urgency contemporarily: Canada experience is based on priority scoring, whereas Australia's one is based solely on urgency.

Italian national guidelines following the Australian reform, prescribe that elective patients are assigned to urgency categories by surgeons that assess clinical conditions at the time of the outpatient visit. Each class is associated to a Maximum Time Before Treatment (MTBT). No explicit rule, however, is given to sort patients among the categories, that is to assess priority. To fill the gap, in Italy the project 'Surgical Waiting List Info System' (SWALIS), funded by the Italian Health Ministry, developed a prioritizing algorithm aimed at filling the gap between urgency and priority, thus providing a complete tool to manage waiting lists. The algorithm is based on the 'urgency coefficient', that is the speed at which the clinical need of the patient increases along with time passing. For instance, if a patient must be treated within 30 days and another within 60 days, for the first one day spent in the list equals two days of the second patient, because they both must obtain the treatment at their individual *MTBT* (see Table 1). The urgency coefficient of the second patient is, therefore, double than the first one. Patients proceed in the list according to their urgency and gain different relative priorities, given the same time spent in the list. For each individual i priority P_i is measured by the product of the waited time (t-d_i), where t is the current day when allocation is made, d_i is the referral day and an urgency coefficient. We can, therefore, define the dynamic priority function (2) for each patient which can be considered as a proxy for the second term of marginal benefit equation (1), that is the disutility coming from waiting, where the urgency coefficient is equal to β, the benefit decay coefficient, and t-d_i is the waiting time W:

$$P_i = \beta_i W_i = \beta(t - d_i) \tag{2}$$

Priority considers contemporarily both urgency coefficient and waited time: more urgent patients are not always admitted the first, but they can be postponed to some less urgent patients who have been waiting for a long time. Priority is measured in days (the already waited days), adjusted for the urgency coefficient, which, in its turn, proxies the speed of proceeding along the waiting list. We can call this priority measure Need-Adjusted-Life-Days (NAWDs) (Testi *et al.*, 2008). The variable P (priority) in our model is, therefore, crucial not only because it provides a scheduling tool to

order patients' admission, but also because it constitutes a rough but effective measure of need, increasing with time at different speed according to urgency class. This means that it is possible to quantify both vertical and horizontal equity achievement. To assess vertical equity we must check that each patient is treated within the *MTBT* of his urgency class, whereas horizontal equity is guaranteed if patients have the same priority expressed in NAWDs at the moment they are admitted to surgery, whatever their urgency class is (Testi *et al.*, 2008).

The model proved to be effective in improving the performance of waiting list management, even if, as expected, waiting list length did not change, because patient arrival rate and resources were the same, but equity improved and also patient and surgeon satisfaction (Valente *et al.*, 2009).

TABLE 1 - *Urgency Classes (URG) and Maximum Time before Treatment (MTBT), SWALIS Project*

URG	Clinical Assessment at the Referral Date	*MTBT*	Urgency Coefficient
A1	Evident fast disease progression, affecting outcome by delay (SWALIS Project modification to national guidelines)	8 days	45
A2	Potential fast progression of disease, affecting outcome by delay	30 days	12
B	Severe pain and/or dysfunction and/or disability, but no fast progression of disease affecting outcome by delay	60 days	6
C	Mild pain and/or dysfunction and/or disability, but no fast progression of disease affecting outcome by delay	180 days	2
D	No pain, dysfunction and disability and no fast progression of disease affecting outcome by delay	360 days	1

5. KEY POINTS FOR THE POLICY MAKERS

In previous sections it was demonstrated that in a publicly funded health system what is important is not how many people are in the waiting list or how long they have to wait before being admitted, but what is the percentage of patients admitted within their *MTBT*

in each urgency class. This can be achieved only by recurring to explicit prioritization criteria and urgency assessment. Given the absence of great agreement on the subject, however, urgency assessment may represent one of the main points of weakness of the demand-side policy, requiring more research mainly in clinical field and much attention when outlining a prioritization policy. Surgeons are principally responsible for referring patients to waiting lists, deciding on the appropriate urgency categories and selecting patients from the waiting list to receive surgery. There are, consequently, few agreed-upon criteria to help surgeons make these decisions, leading to striking differences between institutions in proportions of patients allocated to urgency categories (Courtis, 2010). There is also evidence that other criteria should be taken into consideration, for instance socioeconomic, or the patient point of view, to make them also responsible of a correct waiting appropriateness (Oudhoff *et al*., 2007).

The second aspect to consider is that demand-side policies cannot be effective by themselves, but in most cases they must be completed by supply-side ones. Both policies can be necessary as it results in the example of Table 2, drawn from a simulation during the SWALIS Project, where different 'what-if' scenarios are reported starting from a real situation of a surgical department with a waiting list of 140 patients. In the first three columns of each scenario the number of patients for each urgency class is indicated together with the *MTBT* for each class as in Table 1. Prioritization, in fact, does not shorten the waiting list, which is not desirable because of efficiency issues (see section 1). It simply changes the patient admission order. But after that, it is necessary to check if the individual *MTBT* is reached (equity issue).

Scenario 1 describes a situation where demand-side prioritization is already applied: the last column reports the simulated average waiting time following the urgency coefficient β, i.e. the relative speed of patients within the waiting list proposed by the SWALIS model (Table 1). It appears, however, that for two classes *MTBT* are not met (15 and 34 days instead of the prescribed 8 and 30). Decision-makers should, therefore, intervene. There are two possibilities: i) scenario 2 (demand-side), changing urgency coefficients; ii) scenario 3 (supply-side), increasing resources (in the example more operating theatre availability). In both cases, however, *MTBT* were not achieved. So a mix of supply-side and demand-side policies (scenario 4) is recommended.

TABLE 2 - *'What-if' Scenarios to Compare Demand-side and Supply-side Policies*

DEMAND-SIDE POLICIES

SUPPLY-SIDE POLICIES

SCENARIO 1

URG	Waiting Patients	*MTBT*	β	Waiting time
A1	5	8	45	15
A2	15	30	12	34
B	70	60	6	58
C	40	180	2	140
D	10	360	1	247
	140			*92*

SCENARIO 2

URG	Waiting Patients	*MTBT*	β	Waiting Time
A1	5	8	90	12
A2	15	30	18	28
B	70	60	6	60
C	40	180	2	142
D	10	360	1	251
	140			*92*

SCENARIO 3

URG	Waiting Patients	*MTBT*	β	Waiting Time
A1	5	8	45	10
A2	15	30	12	23
B	70	60	6	39
C	40	180	2	98
D	10	360	1	165
	140			*62*

SCENARIO 4

URG	Waiting Patients	*MTBT*	β	Waiting Time
A1	5	8	90	8
A2	15	30	18	18
B	70	60	6	40
C	40	180	2	95
D	10	360	1	168
	140			*62*

Source: SWALIS project.

In current practice many different policies were followed. In a recent study comparing Australia, Canada, England, New Zealand and Wales (Willcox *et al*., 2007), it appears, however, that short run intervention with large impact on media announcement were favoured, rather than a new systematic and complete design. Moreover, in most of these countries dedicated funds were allocated mainly to set targets and shift demand from public to private health providers. In New Zealand and Canada funds were invested also to prioritize access to surgery through clinical criteria. Among demand-side policies, fixing maximum treatment time targets seem to be more effective than prioritization scores only for particular high-demand surgery (cataract surgery, hip replacement, etc). Some outcome improvement was achieved: the better results were achieved in England. Starting from the NHS Plan in 2000, England has had a sustained focus on reducing waiting times through continually setting shorter maximum

wait targets and aggressive performance management of providers. Note that neither prioritization nor urgency classes were applied at a national level: the maximum wait was the same for every situation. The focus was also on tackling the combined wait along with the care pathways to achieve a maximum wait from referral to treatment and using an information technology (IT) platform (Willcox *et al.*, 2007). In my opinion, the winning card in England policy, however, is the new financial incentives introduced through the use of hospital activity payment based on results, and therefore aggressive performance management supported by very large funding boosts and funds to buy additional private-sector capacity. Many other countries that cannot increase their funds cannot of course follow this strategy and are obliged to consider, instead, a range of demand and supply-side measures to achieve the same outcomes.

Lastly, it is interesting to verify how is the situation about equity in the countries where specific waiting list policies were undertaken. In principle, publicly funded systems should, in fact, provide equal treatment or equal access. Unfortunately, the existing empirical literature provides evidence that waiting times for most educated people are significantly shorter than for people with lower education. In particular, a study based on SHARE (Survey of Health, Ageing and Retirement in Europe) shows that for elective surgery waits are cut by consistent percentages, amounting until 66% in Denmark. Overall these results suggest that a higher socioeconomic status plays a significant role in seven European countries (Denmark, France, Greece, Italy, the Netherlands, Spain and Sweden) in providing lower waiting times (Siciliani and Verzulli, 2009).

6. Conclusions

The point of view of this paper is that waiting lists cannot be eliminated in a publicly funded system and even that they should not because they play the same role as price does in achieving allocative efficiency. As to equity attainment, that is the key characteristic of public systems, it is guaranteed by prioritizing the need, i.e. recurring to demand-side policy in combination with supply-side ones. When trying to apply this general principle to the current situation two main proposals are made at an international level: either scoring or classifying by urgency classes. In our opinion, both should be considered as the SWALIS Project simulation recently proved. It requires, however, a sustained agreement about time appropriateness, following the idea

that what is important in waiting list management is not, as usually done in current practice, checking how long citizens wait but the percentage of patients receiving treatment within the 'right' time. Further work is, however, necessary to achieve consensus about what right time means in different situations, that is to state more explicit urgency criteria both on a clinical but also on a socioeconomic point of view, because inequality of treatment still remains.

The considerations made here can be extended from elective surgery to all services with high volume of demand, such as diagnostics and outpatient services. The true novelty, not yet addressed, would be recognizing the waiting times for primary care, specialist appointments and diagnostic tests that occur before patients are placed on waiting lists for surgery, and development of standard definitions and access measures that encompass the entire patient clinical pathway. This would be the new point of view of a patient-centred publicly funded system (Curtis, 2010).

ANGELA TESTI
Università di Genova, Dipartimento di Economia e Metodi Quantitativi, Genova, Italia

REFERENCES

CSR (2002), "Modalità di accesso alle prestazioni diagnostiche e terapeutiche e indirizzi applicativi sulle liste di attesa", Conferenza Stato Regioni, Repertorio n. 1488, 11 luglio 2002, <http://www.statoregioni.it/DettaglioDocGOV.asp?IDDoc=16684>.

Culyer, A.J. (1991), "Health, Health Expenditures and Equity", Center for Health Economics, The University of York Discussion Paper No. 83.

Curtis, A.J., C.O.H. Russell, J.U. Stoelwinder and J.J. McNeil (2010), "Waiting Lists and Elective Surgery: Ordering the Queue", *Medical Journal of Australia*, 192(4), 217-220.

Davis, B. and S.R. Johnson (1998), "Real-time Priority Scoring System must be Used for Prioritisation on Waiting Lists", *British Medical Journal*, 318(7199), 1699.

Kee, F., P. McDonald, J.R. Kirwan, C.C. Patterson and A.H.G. Love (1998), "Urgency and Priority for Cardiac Surgery: A Clinical Judgment Analysis", *British Medical Journal*, 316(7135), 925-929.

Lindsay, C.M. and B. Feigenbaum (1984), "Rationing by Waiting Lists", *The American Economic Review*, 74(3), 404-417.

Mullen, P.M. (2003), "Prioritising Waiting Lists: How and Why?", *European Journal of Operations Research*, 150(1), 32-45

NHHRC (2009), "A Healthier Future for all Australians – Final Report", National Health and Hospitals Reform Commission: Canberra, <http://www.nhhrc.org.au/internet/nhhrc/iopublishing.nsf/Content/nhhrcreport>.

Oudhoff, J.P, D.R.M. Timmermans, M. Rietberg, D.L. Knol and G. van der Wal (2007), "The Acceptability of Waiting Times for Elective General Surgery and the Appropriateness of Prioritising Patients", *BMC Health Service Research*, 7(32), doi:10.1186/1472-6963-7-32.

Siciliani, L. and J. Hurst (2005), "Tackling Excessive Waiting Times for Elective Surgery: A Comparative Analysis of Policies in 12 OECD Countries", *Health Policy,* 4(72), 201-215.

Siciliani, L. and R. Verzulli (2009), "Waiting Times and Socioeconomic Status among Elderly Europeans: Evidence from SHARE", *Health Economics*, published online in Wiley InterScience, <www.interscience.com>, doi:10.1002/hec.1429.

Tanfani, E. and A. Testi (2004), *Prioritisation Scoring Systems for Surgical Waiting Lists*, in: J. Yfantopoulos (Ed.), "The Economics of Health Reforms", Athens Institute for Education and Research: Athens.

Testi A, E. Tanfani, R. Valente, G. Ansaldo and G.C. Torre (2008), "Prioritising Surgical Waiting Lists", *Journal in Evaluation in Clinical Practice*, 14(1), 59-64.

Valente R., A. Testi, E. Tanfani, M. Fato, I. Porro, G. Santori, M. Santo, G.L. Ansaldo and G.C. Torre (2009), "A Model to Prioritize Access to Elective Surgery on the Base of Clinical Urgency and Waiting Time", *BMC, Health Services Research*, 9(1), doi: 10.1186/1472-6963-9-1.

WCWL (2001), "From Chaos to Order: Making Sense of Waiting Lists in Canada. Final report", Western Canada Waiting List Project, <http://www.wcwl.org/media/pdf/library/final_reports.2.pdf>.

Willcox, S., M. Seddon, S. Dunn, R. Tudor, E.J. Pearse and J.V. Tu (2007), "Measuring and Reducing Waiting Times: A Cross-National Comparison of Strategies", *Health Affairs*, 26(4), 1078-1087.

ABSTRACT

In health care delivery, waiting lists are perceived to reflect the inadequacy of health care funding. They are portrayed as one of the major problems of publicly funded health systems and are a perpetual source of community and political discomfort. It appears that a trade-off between efficiency (waits as a rationing tool in absence of price) and equity (free access to everyone is in need) arises.

Recent international experiences referred to elective surgery suggest to implement demand-side policies instead of supply-side ones. This means recognizing that the free package the citizens are entitled to should comprehend services to be delivered not immediately, but according to individual urgency (horizontal equity) and respecting priority as well, that is ordering access (vertical equity). It is essential, in fact, that those who have the greatest need for surgery and will benefit most from it receive it in a timely manner and before those with lesser need. Results are still under debate and future research is required.

Keywords: Waiting List, Efficiency and Equity Evaluation, Elective Surgery, Prioritization

JEL Classification: I11, I12, I18

RIASSUNTO

Governare i tempi di attesa in sanità: un confronto internazionale

Le liste di attesa continuano a essere uno dei punti dolenti dei sistemi sanitari pubblici. In assenza di prezzo, tuttavia, esse non sono eliminabili per questioni di efficienza allocativa. Si apre, pertanto, il consueto dilemma fra considerazioni di efficienza e di equità. Si mette in evidenza come le soluzioni più avanzate che si stanno prospettando in alcuni Paesi, tra cui l'Italia, per una delle prestazioni più critiche in termini di attesa, gli interventi chirurgici di elezione, si possano ricondurre a modelli decisionali che prendono in considerazione politiche dal lato della domanda piuttosto che dell'offerta. In questa ottica, si prevede che il tempo di attesa debba essere una dimensione esplicitamente dichiarata al momento della definizione dei livelli essenziali delle prestazioni. Il problema diventa, di conseguenza, non tanto predisporre una capacità produttiva in grado di fornire il più precocemente possibile ogni servizio, quanto piuttosto assicurare un tempo di attesa coerente con l'urgenza per il singolo individuo (equità orizzontale) e un ordine di accesso ai trattamenti tale da garantire una corretta prioritizzazione rispetto all'urgenza (equità verticale). I risultati finora ottenuti, sebbene promettenti mettono in luce come sia necessario ancora molta ricerca in questo campo.