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Explaining Waiting Times Variations for Elective Surgery across OECD Countries

Luigi Siciliani and Jeremy Hurst

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OECD HEALTH WORKING PAPERS

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SUMMARY

2. Waiting times for elective surgery are a significant health policy concern in approximately half of all OECD countries. The main objectives of the OECD Waiting Times project were to: *i)* review policy initiatives to reduce waiting times in 12 OECD countries; and *ii)* to investigate the causes of variations in waiting times for non-emergency surgery across countries. The first objective was addressed in an earlier report (Hurst and Siciliani, 2003; OECD Health Working paper, n.6).

3. This report is devoted to the second objective. An interesting feature of OECD countries is that while some countries report significant waiting, others do not. Waiting times are a serious health policy issue in the 12 countries involved in this project (Australia, Canada, Denmark, Finland, Ireland, Italy, Netherlands, New Zealand, Norway, Spain, Sweden, and the United Kingdom). Waiting times are not recorded administratively in a second group of countries (Austria, Belgium, France, Germany, Japan, Luxembourg, Switzerland, and the United States) but are anecdotally (informally) reported to be low.

4. This paper contains a comparative analysis of these two groups of countries and addresses what factors may explain the absence of waiting times in the second group. It suggests that there is a clear negative association between waiting times and capacity, either measured in terms of number of beds or number of practising physicians. Analogously, a higher level of health spending is also systematically associated with lower waiting times, all other things equal.

5. Among the group of countries with waiting times, it is the availability of doctors that has the most significant negative association with waiting times. Econometric estimates suggest that a marginal increase of 0.1 practising physicians and specialists (per 1 000 population) is associated respectively with a marginal reduction of *mean* waiting times of 8.3 and 6.4 days (at the sample mean) and a marginal reduction of *median* waiting times of 7.6 and 8.9 days, across all procedures included in the study. Analogously, an increase in total health expenditure per capita of $100 is associated with a reduction of *mean* waiting times of 6.6 days and of *median* waiting times of 6.1 days.

6. In the comparison between countries with and without waiting times, low availability of acute care beds is significantly associated with the presence of waiting times. Also, evidence from this and other studies suggests that fee-for-service remuneration for specialists, as opposed to salaried remuneration, is negatively associated with the presence of waiting times. Fee-for-service systems may induce specialists to increase productivity and may also discourage the formation of visible queues because of competitive pressures. In addition, evidence from this and other studies suggests that activity-based funding for hospitals may also help reduce waiting times.

RESUME

7. Dans près de la moitié des pays de l'OCDE, les délais d'attente pour les interventions chirurgicales non urgentes constituent un important sujet de préoccupation pour les responsables de la politique de la santé. Le projet de l'OCDE sur ce sujet vise principalement les objectifs suivants : *i)* examiner les initiatives prises par les pouvoirs publics en vue de réduire ces délais d'attente dans douze pays Membres ; *ii)* rechercher les causes des différences observées d'un pays à l'autre quant à ces délais. Un précédent rapport a été consacré au premier de ces objectifs (Hurst et Siciliani, 2003 ; document de travail de l'OCDE sur la santé, n°6).

8. Le présent document porte sur le second objectif. Il est intéressant de noter que, si certains pays de l'OCDE font état de délais d'attente non négligeables, ce n'est pas le cas pour d'autres. Ces délais posent un épineux problème de fond en matière de santé dans les douze pays qui participent au projet (Australie, Canada, Danemark, Espagne, Finlande, Irlande, Italie, Nouvelle-Zélande, Norvège, Pays-Bas, Royaume-Uni et Suède). Or, dans huit autres pays (Allemagne, Autriche, Belgique, Etats-Unis, France, Japon, Luxembourg et Suisse), ces temps d'attente sont, semble-t-il, peu importants.

9. Cet exposé présente une analyse comparative de la situation de ces deux groupes de pays et s'intéresse aux facteurs de nature à expliquer l'absence de délais d'attente dans le second. Il montre qu'il existe une nette corrélation négative entre ces délais et la capacité, qu'elle soit mesurée en nombre de lits ou en nombre de médecins en exercice. De même, des dépenses de santé élevées vont systématiquement de pair avec de faibles délais d'attente, toutes choses étant égales par ailleurs.

10. Dans les pays où il existe des délais d'attente, c'est avec l'offre de médecins que ceux-ci ont la corrélation négative la plus forte. Selon des estimations économétriques, une augmentation marginale de 0.1 médecins et spécialistes en exercice (pour 1 000 habitants) entraîne respectivement une réduction marginale des délais d'attente *moyens* de 8.3 et 6.4 jours (moyenne de l'échantillon) et une réduction marginale des délais d'attente *médians* de 7.6 et 8.9 jours. De même, un accroissement de 100 dollars des dépenses totales de santé par habitant induit une diminution des délais d'attente *moyens* de 6.6 jours et des délais d'attente *médians* de 6.1 jours.

11. La comparaison des pays connaissant des délais d'attente avec ceux où ces délais sont absents montre qu'une offre peu importante de lits pour soins de courte durée est en forte corrélation avec l'existence de délais d'attente. De plus, il ressort des observations recueillies dans le cadre de cette étude et d'autres travaux que la rémunération des spécialistes à l'acte plutôt que par un salaire est en corrélation négative avec l'existence de délais d'attente. Il se peut que les systèmes de paiement à l'acte incitent les spécialistes à accroître leur productivité et qu'ils freinent aussi la formation de files d'attente visibles en raison de la pression exercée par la concurrence. Cette analyse et d'autres études donnent à penser que l'octroi aux hôpitaux d'un financement lié à l'activité peut aussi contribuer à faire baisser les délais d'attente.

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1. INTRODUCTION

12. Waiting times for elective surgery are a main health policy concern in approximately half of all OECD countries. The main objectives of the OECD Waiting Times project have been to: *i)* review policy initiatives to reduce waiting times in 12 OECD countries; and *ii)* to investigate the causes of variations in waiting times for non-emergency surgery across countries. The first objective was addressed in an earlier report (Hurst and Siciliani, 2003; OECD Health Working paper, No.6).

13. This report is devoted to the second objective. An interesting feature of OECD countries is that while some countries report significant waiting, others do not. For the 12 countries involved in this project, waiting times are a serious health policy issue. In most of these countries waiting times are routinely recorded through administrative databases. These 12 countries are: Australia, Canada, Denmark, Finland, Ireland, Italy, Netherlands, New Zealand, Norway, Spain, Sweden and the United Kingdom[1].

14. A second group of eight OECD countries can be identified, where waiting times are reported to be low. For these countries policy makers indicate that waiting times are not an issue. These countries are: Austria, Belgium, France, Germany, Japan, Luxembourg, Switzerland and the United States.

15. This paper contains a comparative analysis of these two groups of countries and addresses what factors may explain the absence of waiting times in the second group. The remaining ten OECD countries are not included in this study, either because it is not known to what extent waiting times represent an issue or because adequate information is not available at present. These ten countries are: Czech Republic, Greece, Hungary, Iceland, Korea, Mexico, Poland, Portugal, Slovak Republic and Turkey.

16. Waiting times are a complex phenomenon and are the results of many possible determinants and variables. However, only a subset of these variables can be measured empirically at an international level. This is a limitation of the present study. A more comprehensive approach has been used in an earlier separate report, which looks in detail at how each country with waiting times has tried to manage them (Hurst and Siciliani, 2003).

17. The study is organised in the following way. Section 2 provides evidence of waiting times across OECD countries. Section 3 explores the factors that may explain variations in waiting times. Section 4 provides a set of multivariate regression analyses which quantify the effect of various determinants on waiting times. Section 5 contains conclusions. Four annexes are also included. Annex 1 presents Tables A1-A12, which support the analysis. Annex 2 contains the information relative to the data collection, including sources and methods. Annex 3 presents some available evidence on outpatient waiting times. Annex 4 seeks to explain how three countries without waiting times (France, Germany and the United States) seem to avoid them.

1 This list of countries is not exhaustive of all OECD countries with waiting times (for example, waiting times are currently an issue in Portugal, as well).

2. EVIDENCE ON COMPARATIVE WAITING TIMES ACROSS OECD COUNTRIES

18. This section presents international evidence on waiting times for elective surgery across OECD countries. We first describe the evidence from the available literature, which is mainly based on small-sample surveys. We then present further evidence gathered through the OECD Waiting-Times project from large national administrative databases.

2.1 Existing literature

19. There is a small amount of comparative waiting-time data from international surveys. One advantage of international surveys is that they report evidence also for countries where waiting times are not a policy concern. However, they are often based on small samples of respondents.

20. Table 1 shows some data on waiting for surgery in eight European countries (Fleming *et al.*, 1992). It provides figures on the proportion of patients, who in 1990 waited longer than 12 weeks between specialist assessment and surgery, as reported by samples of GPs for samples of their patients in each country. It reports Portugal as the country with the highest percentage of patients waiting longer than 12 weeks (58.1%), followed by the United Kingdom (41.7%), Italy (36.3%), Norway (28%), Germany (19.4%), Spain (18.5%), Switzerland (16.1%) and the Netherlands (15.2%). The main limitations of this survey are that the information was reported by the GPs (and not directly by the patients). Moreover as the survey dates back to more than ten years ago, the waiting times which were reported may not reflect the current situation. Note how surprisingly Germany and Switzerland report similar percentages compared to Spain and the Netherlands.

Table 1. Waiting between specialist appointment and surgical intervention

% of patients waiting for surgery more than 12 weeks (year 1990)	
Countries where waiting times are <u>not</u> a policy concern	
Germany	19.4
Switzerland	16.1
Countries where waiting times are a policy concern	
Italy	36.3
Netherlands	15.2
Norway	28.0
Portugal	58.1
Spain	18.5
United Kingdom	41.7

Source: Fleming, *et al*., 1992.

21. Table 2 shows data of a recent study (Blendon *et al.*, 2002) for five English-speaking countries, which measures the percentage of respondents to a phone survey in 2001, who had experienced elective surgery in the last two years and who said they had waited longer than four months for elective surgery. It was found that 38% of patients had been waiting for at least 4 months in the United Kingdom, 27% in Canada, 26% in New Zealand, 23% in Australia and 5% in the U.S.

Table 2. Percentage of patients waiting for elective surgery more than 4 months		
Base: Those with elective surgery in the past 2 years		
	Year 1998	Year 2001
Countries where waiting times are <u>not</u> a policy concern		
United States	1	5
Countries where waiting times are a policy concern		
Australia	17	23
Canada	12	27
New Zealand	22	26
United Kingdom	33	38

Source: Blendon, *et al.,* 2002.

22. Table 3 summarises the information contained in three further surveys. Carroll *et al.* (1995) focused on waiting times for cardiovascular procedures in four countries. It found that the percentage of the respondents in need of elective coronary bypass who had been waiting for more than three months was 88.9% in the United Kingdom, 46.7% in Canada, 18.2% in Sweden and 0% in the U.S. For elective coronary angiography the percentage was 22.8% in the United Kingdom, 16.1% in Canada, 15.4% in Sweden and 0% in the U.S. Similarly, Coyte *et al.* (1994) found that surveyed patients in need of knee replacement had a median waiting time of eight weeks in Canada (Ontario) and three weeks in the U.S. In Germany, self-reported mean waiting times for cataract surgery was equal to 35 days in 2000 (Wenzel, Reuscher and Aral, 2001; the survey was based on 450 institutions and 926 operating ophthalmologists).

Table 3. Inpatient waiting times.				
	CABG % waiting more than 3 months (year 1993)	**PTCA** % waiting more than 3 months (year 1993)	**Knee replacement** Median waiting time (weeks) (year 1985-1989)	**Cataract surgery** Median waiting time (weeks) (year 2000)
Countries where waiting times are <u>not</u> a policy concern				
Germany				5 weeks
United States	0%	0%		
Countries where waiting times are a policy concern				
Canada	46.7%	16.1%	8 weeks (Ontario)	
Sweden	18.2%	15.4%	3 weeks	
United Kingdom	88.9%	22.8%		

23. Finally for some OECD countries, there is some anecdotal evidence that waiting times are low. Imai, Jacobzone and Lenain (2000; p.2) report that "the health system in France is regarded as delivering high quality services, with freedom of choice and generally no waiting lists for treatments". For Belgium, WHO (2000; p.33) reports that "Patients do not usually have to wait long, if at all, for access either to general practitioners or specialists".

2.2 Data collected in this study

24. In this study data on waiting times were requested by questionnaire for ten elective procedures in twelve countries. The results are shown in Tables 4 and 5. The preferred definition of waiting times was "The time elapsed for a patient on the elective surgery waiting list from the date they were added to the waiting list for the procedure, after specialist assessment, to the date they were *admitted* to an inpatient or

day-case surgical unit for the procedure". This definition is commonly referred to as "the waiting time of the patients *admitted*". The main reason for choosing this measure is that it is the one most widely available in OECD countries.

25. This measurement is available in eight countries, at least for some surgical procedures. Alternative measures such as the "waiting time of the patients *on the list*" or "total waiting" (inpatient plus outpatient) were available for few countries. Measures of the inpatient waiting time of the patients on the list were available for Spain (Insalud; mean), Ireland and Sweden (percentage of patients waiting longer than 12 months). Measures of total waiting (from GP referral to treatment) were available in Denmark and Norway (see Annexes 2 and 3 for more details).

26. Tables 4 and 5 report respectively the mean and median inpatient waiting time of the patient *admitted*. More details about the methodology and the samples considered are included in Annex 2.

Table 4. Mean inpatient waiting times of patients admitted by surgical procedure. Year 2000. Number of days.

	Hip replace-ment	Knee Repla-Cement	Cataract surgery	Varicose veins	Hyste-rectomy	Prosta-tectomy	Cholecy-stectomy	Inguinal and femoral hernia	CABG	PTCA
Australia	163	201	179	216	54	69	83	87	44	
Denmark	112	112	71	99			75	73		
Finland	206	274	233	280	100	81	159	125	42	30
Norway	133	160	63	142	64	75	103	109	46	53
Netherlands	96	85	111	107	61	60	71	75		18
Spain (Insalud)	123	148	104	117	102	62	107	102	39	81
Sweden			199							
United Kingdom (England)	244	281	206	227	159	52	156	150	213	80

Notes: More details on "Sources and methods" are contained in Annex 2.
Australia: includes Queensland, South Australia and Western Australia.
Norway: cataract waiting time refers to 2001.
Spain: includes INSALUD population only.
United Kingdom: includes English population only.

Table 5. Median inpatient waiting times of patients admitted by surgical procedure. Year 2000. Number of days.

	Hip Replace-ment	Knee Repla-Cement	Cataract surgery	Varicose veins	Hyste-rectomy	Prosta-tectomy	Cholecy-stectomy	Inguinal and femoral hernia	CABG	PTCA
Australia	98	120	120	94	38	24	48	46	22	
Canada	112(BC) 105(MN) 162(SK)	136 (BC) 105(MN) 291(SK)	80 (BC)						23(ON) 10(SK)	
Denmark	87	90	36	69			57	46		
Finland	148	202	189	155	70	39	90	74	34	20
Norway	99	132	28	110	37	47	63	74	25	18
United Kingdom (England)	211	261	182	178	110	37	97	95	191	58

Notes: More details on "Sources and methods" are contained in Annex 2.
Australia: includes Queensland, South Australia and Western Australia.
Canada: BC=British Columbia, MN=Manitoba, ON=Ontario and SK= Saskatchewan.
Norway: cataract waiting time refers to 2001.
Spain: includes INSALUD population only.
United Kingdom: includes English population only.

27. The countries with highest waiting times were the United Kingdom (England) and Finland, followed by Denmark, Norway, Australia and Spain (Insalud). The country with the shortest waiting times was the Netherlands. It is interesting to note how the waiting times for less urgent procedures (for example hip and knee replacement, cataract surgery) are systematically higher than the waiting times for more urgent procedures (for example hysterectomy, CABG, PTCA). This provides evidence that specialists do prioritise patients according to their urgency.

28. As the waiting times distributions tend to be positively skewed, the mean and median can be significantly different. The mean is consistently larger than the median. This is because there is a small proportion of patients with very long waits (Sanmartin, 2001). Comparing waiting times in Tables 4 and 5, the difference between mean and median varies between 22-43%, depending on the procedure considered.

29. Finally, although in this study we focus on *inpatient* waiting time, a significant part of the total waiting experienced by the patients includes outpatient waiting (the time from GP referral to the specialist visit). Preliminary evidence from three countries (the United Kingdom (England), Denmark and Norway) suggests that outpatient waiting accounts for at least one third of total waiting (see Annex 3 for more details).

3. EXPLORING THE DETERMINANTS OF VARIATIONS IN WAITING TIMES

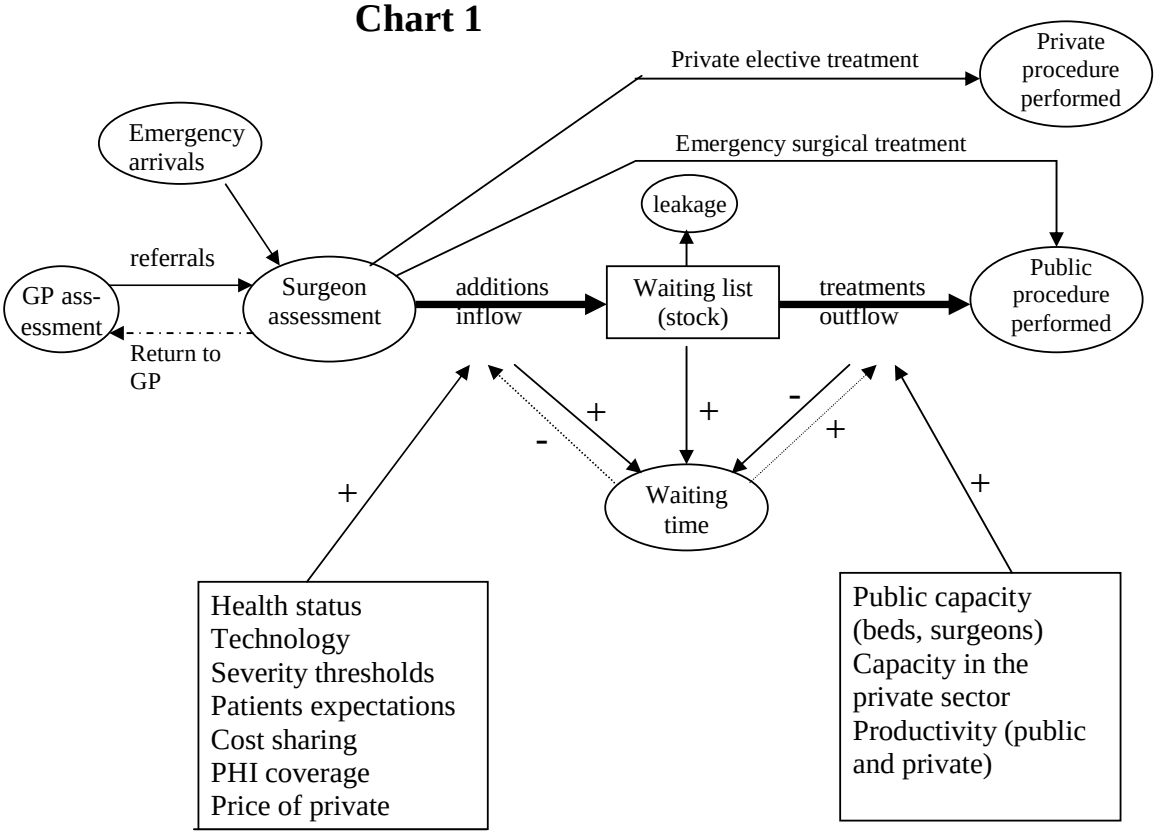
30. This section first re-examines the model of the determinants of waiting times presented in the earlier report (Hurst and Siciliani, 2003) and the available evidence on the effects of the determinants from the existing literature. We then provide further evidence collected within the OECD Waiting-Times project about factors that may potentially explain waiting-times differences across two groups of OECD countries, one composed of countries which do *not* report waiting times and one composed of countries which *do* report waiting times (Table 6). This analysis focuses on capacity, productivity, incentives and the need for surgery. The analysis is at this stage rather descriptive and makes extensive use of scatter diagrams. A multivariate regression analysis is deferred to Section 4. Finally, we draw attention to Annex 4 which explores how three countries which do not report waiting times, France, Germany and the United States, have managed to avoid the problem.

Table 6. Countries included in the study
Group 1. Countries which do not report waiting times
Austria
Belgium
France
Germany
Japan
Luxembourg
Switzerland
United States
Group 2. Countries which do report waiting times
Australia
Canada
Denmark
Finland
Ireland
Italy
Netherlands
New Zealand
Norway
Spain
Sweden
United Kingdom

3.1 Likely determinants of variations in waiting times

31. A model of the likely determinants of waiting times (Chart 1) and the relevant evidence from the literature was reviewed in an earlier report (Hurst and Siciliani, 2003) and is summarised in this section. Waiting times may be determined by demand factors that affect the inflow to the waiting list, and by supply factors, that affect the outflow. The demand for elective surgery is determined by the health status of the population and by the state of medical technology, which determines the range of conditions which are treatable and patient's expectations. Various financial incentives, such as the extent of cost sharing by public patients, the proportion of the population with private health insurance and the price of private surgery, are also likely to be factors influencing demand. Meanwhile, given the key role that doctors play in managing demand, the thresholds for referrals and for additions to the list, set by GPs and surgeons, respectively will be important. Competitive fee-for-service payment of surgeons, unlike salaried payment, may encourage many to offer fast access – that is, to maintain short queues (Iversen and Luras, 2002) – especially where there are no gatekeepers and such surgeons can assume primary care responsibilities for patients. In contrast, allowing dual practice by salaried surgeons (in both public and private sectors) may encourage some surgeons to lengthen the public queues to boost the demand for their private practices (DeCoster *et al.*, 2000; Morga and Xavier, 2001).

Chart 1



32. The supply of elective surgery depends on both public and private surgical capacity and the productivity with which capacity is used. Evidence on the impact of capacity is provided by Martin and Smith (1999) who showed that the waiting time is negatively associated with the number of available beds (elasticity equal to -0.242), using an English database from the Hospital Episode Statistics in fiscal year 1991-92. Similarly, Lindsay and Feigenbaum (1984) found waiting times to be negatively associated with both the number of available doctors and beds.

33. Productivity is likely to depend, among other things, on the way in which surgeons and hospitals are paid. Physicians paid by fee for service may deliver more tests and more procedures per patient than physicians paid by salary. A number of national studies have investigated the relationship between methods of paying physicians and productivity. One recent review of methods of paying primary care physicians (Gosden *et al.*, 2001) which adopted high standards for inclusion of studies in the review, including their being based on randomised trials, suggested that fee-for-service payment resulted in a higher quantity of primary care services provided compared with capitation. In the field of surgery, in a randomised trial in the U.S., Siu *et al.* (1988) found lower rates of elective surgery in a staff- model HMO plan compared with a fee-for-service plan. The rate of emergency surgery was similar in the two plans. Two American studies of surgery, which were not randomised trials, came to similar conclusions. One study of 6 hospitals which adopted different methods of payment of surgeons (Wilson and Longmire, 1978), found that the number of operations per month in the two hospitals that paid by salary was 10.0 and 9.6, respectively. The corresponding figures were 15.4 and 15.8 in two hospitals which paid by fee for service and 17.0 and 24.0 in two hospitals which paid by a mix of salary and a percentage. Meanwhile a 'before and after' study (Ransom *et al.*, 1996) of a change in the payment of surgeons in one clinic from fee for service to salary (involving an experimental and a control group) found a 15% decrease in the number of surgical procedures performed after the change. There was a statistically significant change in the number of elective sterilisations. There was no significant change for more severe conditions. Productivity may also depend on the percentage of the patients treated by day-surgery. Martin and Smith (1995) show that the waiting time is negatively associated with the 'proportions of all elective episodes that are day case' (elasticity equal to –0.252).

34. Turning to hospital remuneration, activity-based funding (for example of the DRG type) is likely to encourage higher productivity compared to funding based on fixed budgets. For example, in *Norway* the government introduced partial activity-based remuneration in 1997, covering 30% of the average DRG-based costs per inpatient treated (50% since 1999 and 55% since 2002). A study of 48 acute hospitals between 1992 and 2000 suggested that the policy led to a rise in the annual growth rate of hospital activity from 2% between 1992-1996 to 3.2% between 1997-1999 (Biorn *et al.*, 2002). In *Denmark* at the beginning of 2002 an activity-related payment based on DRGs was implemented initially for elective treatments only, but then it was further extended to all hospital activity. In 2000 the volume of activity for 18 common surgical procedures increased by 13% and average waiting times declined from 26 weeks to 21.5 weeks (17% reduction; Clemmesen and Hansen, 2003). Undesired effects of the policy were DRG-creep (increase in the case-mix of the patients due to up-coding) and some difficulty in distinguishing between elective care and other hospital activity, which led to the decision of extending activity-related payment to all activity. Meanwhile, Mot (2002) found that in the *Netherlands* the replacement of specialists' fee-for-service payments with fixed budget payments, reduced on average the admission rate and increased the waiting times for surgery (the study was conducted in six hospitals).

35. Just as there are feedback effects from prices to quantities demanded and supplied in private markets, so there are likely to be feedback effects from waiting times to quantities demanded and supplied in the public provision of elective surgery. Other things being equal, higher waiting time may reduce demand by encouraging patients to take out private health insurance (Besley *et al.*, 1998) or to purchase private surgery out-of-pocket. It may reduce demand by discouraging GPs from making referrals and by deterring surgeons from adding patients to lists (Iversen, 1997). At the same time, higher waiting times may raise supply by encouraging public authorities to allocate more money to public hospitals with longer queues – money may 'follow the queue' (Gravelle, Smith and Xavier, 2003; Iversen, 1993). Moreover, higher waiting times may help to reduce unused capacity, reducing the probability that the number of treatments offered is higher than the number of treatments demanded (Cooper, 1981). Likewise, higher waiting times may be an indirect signal to private hospitals to expand activity. The presence of such feedback effects may help to bring about equilibrium waiting times.

3.2 Graphical analysis of the evidence collected in this study

36. In this section we provide a graphical analysis of the cross-country evidence on waiting times and determinants collected within the OECD Waiting-Times project, informed by the model described above. Ideally, the investigation of waiting times for elective surgery would require data on surgeons, number of surgical beds, surgical expenditure and surgical need. However, these data are not yet available mainly due to cross-country comparability problems. In particular, our attempt to collect data on the number of surgeons and the number of surgical beds was not successful. Number of surgeons was reported by three countries and the number of surgical beds by only two countries. Hence, the analysis below falls back on *total* numbers of specialists and doctors, as a proxy for the number of surgeons, the *total* number of acute care beds, as a proxy for the number of surgical beds, and the *total* public and private health expenditure as a proxy for surgical expenditure. The implicit assumption is that the surgical share of these aggregate variables is reasonably similar across countries. Finally, it is difficult to find good measures of need for elective surgery. For example, for cataract surgery a good indicator of need would be the incidence of the population affected by cataract. Such data are not available at an international level. Consequently, in this study we have used as a proxy for need the percentage of the population over 65.

Do countries which do not report waiting times spend more?

37. In the light of the model outlined above and the evidence from the literature, we may advance the hypothesis that, higher health expenditure per capita is associated with higher rates of surgery and, for a given demand, a lower waiting time for surgery across countries. Table A1 in Annex 1 shows that *total* and *public* health expenditure per capita (US$PPP), were respectively 31% (19%, excluding the U.S.) and 16% higher in the countries not reporting waiting times in year 2000. *Total* health expenditure (per capita) was on average 2 750$ in countries not reporting waiting times and 2 092$ in countries with waiting times. *Public* health expenditure (per capita) was 1 842$ in countries not reporting waiting times and 1 585$ in countries with waiting times. *Private* health expenditure was 44% higher in countries not reporting waiting times. However this percentage reduces to 9% when U.S. and Switzerland are excluded from the comparison[2]. A t-test suggests that the difference in the health expenditure means for the two groups is different from zero at a significance level below 5% in the case of total health expenditure and 10% in the case of public health expenditure.

38. In Charts 2-7, we plot the *mean* waiting time for three common surgical procedures (hip replacement, cataract surgery and cholecystectomy) against health expenditure per capita in 2000. Correlations suggest in general a negative association. This implies that among the countries who report waiting times, countries with higher expenditure have lower waiting times. Charts 2-4 refer to total health expenditure, while Charts 5-7 to public health expenditure. We focus on these three procedures as they are representative of the waiting times within a country and tend to be correlated with the waiting times for other procedures.

39. The countries considered in Charts 2-4 may be classified into three categories: countries with low expenditure (less than 1900$), average expenditure (between 1900-2500$) and high expenditure (more than 2500$). Countries with low expenditure are the U.K., Finland and Spain; countries with average expenditure are Austria, Belgium, France, Australia, Denmark, Norway and the Netherlands; countries with high expenditure are Germany, Luxembourg, Switzerland and the U.S.

40. The charts suggest that countries like Finland and the U.K. have low expenditure and report generally the highest waiting times. On the other hand, countries like Germany, Luxembourg, Switzerland

2 For the US and Switzerland private health expenditure counts respectively for 56% and 44% of total health expenditure (OECD Health Data, 2003).

and the U.S., have highest expenditure and do not report waiting times. However, Spain is a low-expenditure country but reports relatively low waiting times (similar to Denmark and Norway). Norway is a high-expenditure country (similar to Germany and Luxembourg) but reports relatively high waiting times (with the exception of cataract surgery).

41. More equivocal is the middle-expenditure category. It is interesting to note that, despite these countries being characterised by a similar level of expenditure, waiting times are reported in Australia, Denmark, the Netherlands and Sweden, but are not reported in Austria, Belgium and France.

42. A similar picture may be obtained from Charts 5-7 by plotting waiting times against *public* health expenditure per capita. Finland and the U.K. have highest waiting times and lowest public expenditure (below 1500$). Germany and Luxembourg do not report waiting times and have highest public expenditure (above 2000$). As in the previous case, Spain is a low public-expenditure country (below 1500$) but reports relatively low waiting times. Norway is a high-expenditure country (above 2000$) but reports relatively high waiting times (with the exception of cataract surgery). Among the countries with average level of public expenditure (between 1500-2000), Australia, Denmark and Sweden report waiting times while Austria, Belgium, France and Japan do not[3].

43. Similar results may be obtained by using *median* waiting times as opposed to *mean* waiting times in the above charts for both total and public health expenditure.

44. The above evidence suggests that variations in expenditure may be an important determinant of waiting times but certainly not the only one. Moreover, it raises the following further questions. For similar level of total expenditure why do countries like Austria, Belgium and France not report waiting times while countries like Australia, Norway and Denmark do? How can Spain have such low waiting times with such low expenditure? Why does Norway not report low waiting times given its higher expenditure?

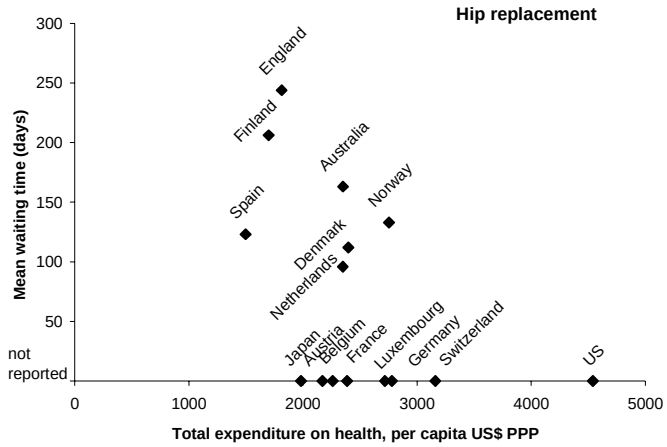
45. One possibility is that differences in expenditure do not necessarily reflect differences in surgical capacity and activity. Indeed, one limitation of the above charts is that health expenditure figures include not only hospital expenditure but also other expenditure (including pharmaceutical, public health and other…). An alternative is to proxy the amount of resources involved in the hospital sector by measuring the amount of acute care beds and personnel within each country. This is developed in the next section.

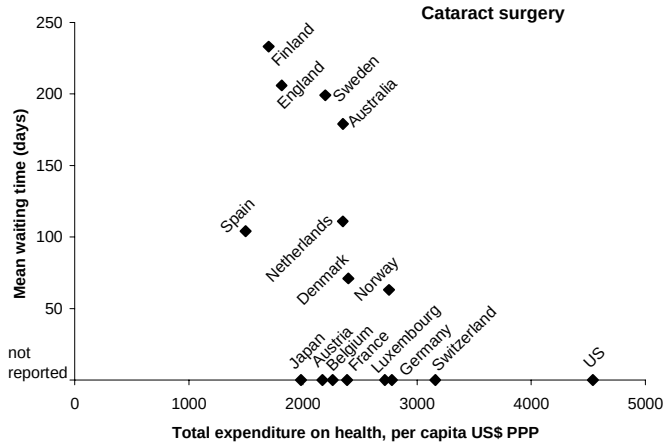
46. Another possible explanation is that countries with similar levels of expenditure, if exposed to different types of incentive and institutional settings may end up with very different level of waiting times. Certain financial incentives may for example induce increases in productivity, while certain institutional settings may induce a higher propensity to add patients on the list (for example in the presence of dual practice).

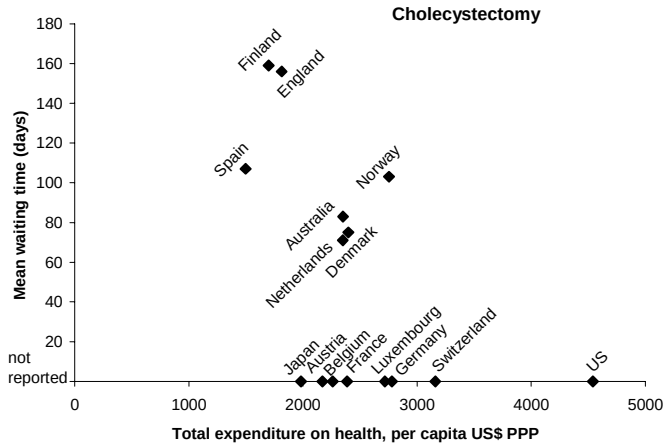
47. Finally, some countries may implement policies aimed at managing and reducing demand (as in New Zealand and Spain), independently of higher health expenditure. For example in Spain financial incentives for reductions in waiting times may have induced specialists to contain demand. In New Zealand the introduction of a booking system was aimed at raising clinical thresholds for adding patients to waiting lists (for more details see Hurst and Siciliani, 2003).

3 US and Switzerland are excluded from this comparison as a high share of health expenditure is private (56% for the US and 44% for Switzerland).

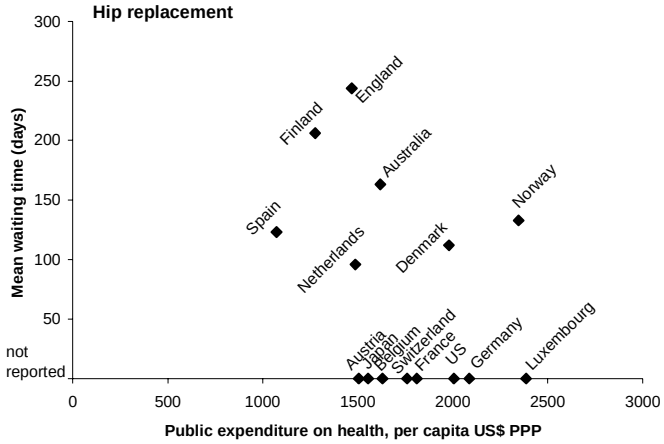
Charts 2-4. Mean waiting times and total health expenditure per capita. Year 2000

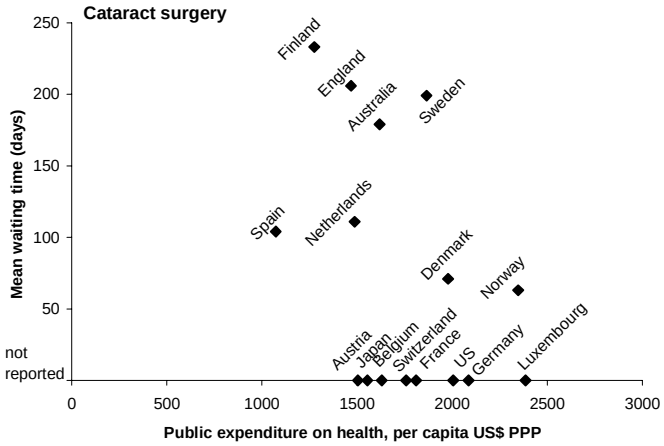


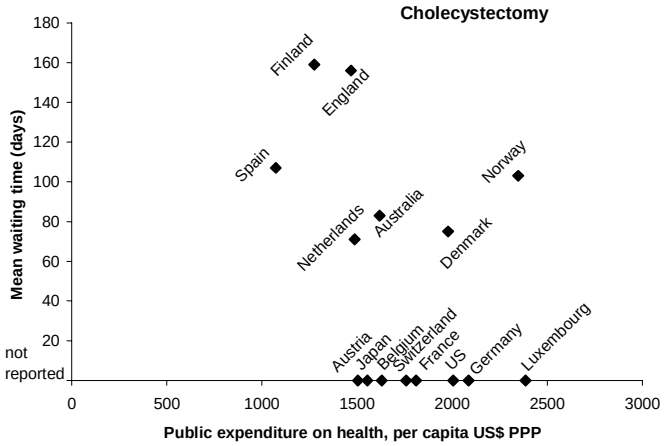




Charts 5-7. Mean waiting times and public health expenditure per capita. Year 2000







Do countries which do not report waiting times have higher capacity (beds, doctors)?

48. The two main inputs in the hospital production function are the personnel and the beds (often considered a rough proxy for capital). In this section we explore to what extent countries with higher beds and doctors report lower levels of waiting times. Table A2 in Annex 1 shows how countries not reporting waiting times had in 1998 on average 66% more acute care beds (per 1 000 population) compared to countries reporting waiting times. For example in year 1998 the average number of acute care beds was 5.8 (per 1 000 pop.) for the countries not reporting waiting as opposed to 3.5 for countries reporting waiting times[4]. A t-test suggests that the difference in the acute beds means for the two groups is different from zero at a significance level below 1%.

49. Charts 8-10 provide the relationship between waiting times (for three surgical procedures) and the number of acute care beds (per 1 000 population) in year 2000. Note that the countries, which do not report waiting times, with the exception of the U.S., have systematically higher number of acute care beds compared to countries with waiting times. The countries with the highest number of beds are France, Luxembourg, Germany and Austria (6.2-6.7 per 1 000 population), followed by Switzerland (4.1 per 1 000 population). A notable exception among the countries without waiting times is the U.S., with a very low number of acute care beds (2.9 per 1 000 population). This may be explained by the large share of activity that is carried out within the ambulatory care as opposed to the acute care sector (Docteur, Suppanz and Woo, 2003). It may also be explained by the remuneration system, usually based on payment per case by Diagnosis Related Groups (DRGs), which encourages reductions in length of stay.

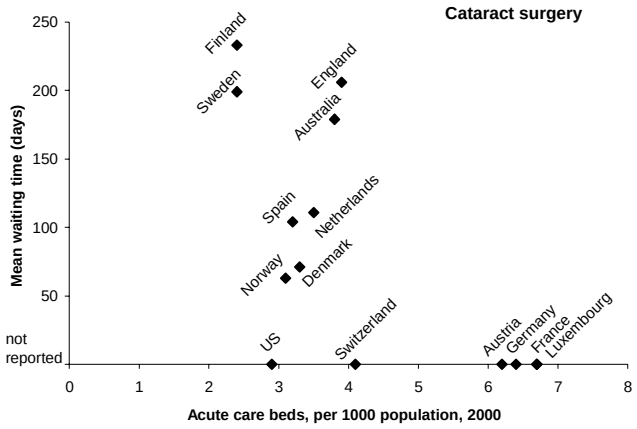
50. Among the countries with waiting times, only a weak negative pattern is found between waiting times and acute care beds. Most of the countries with waiting times have a number of beds ranging in the interval 3.1-3.9 per 1 000 population (Norway, Spain, Denmark, Netherlands, Australia and the U.K.). The two countries with the lowest number of beds are Sweden and Finland (2.4 beds per 1 000 population). They report relatively high waiting times. Similar patterns may be identified for other surgical procedures.

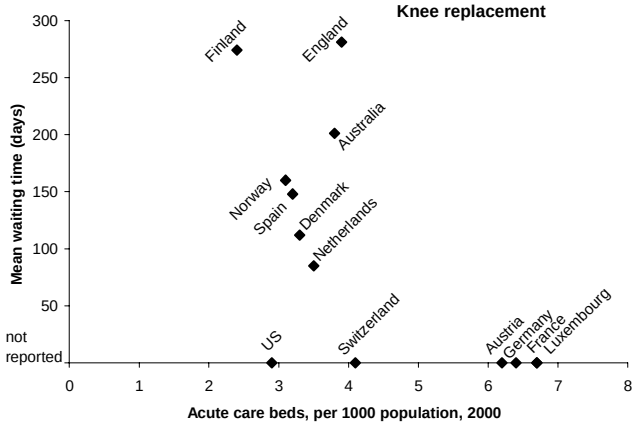
51. One limitation of the above comparisons is that the figures on acute care beds include all hospitals (publicly and privately owned, publicly and privately funded). It is the number of publicly-funded beds (either publicly or privately owned) which is likely to affect most the waiting times for public patients. The number of privately-funded beds may also help to reduce waiting times, as long as patients are induced to opt for the private treatment. Another limitation of the above data is that the number of beds refers to all acute care (medical, surgical, elective and emergency) while the waiting times relate to selected elective procedures.

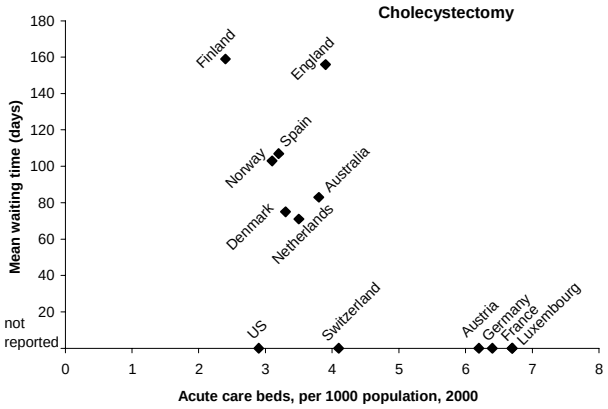
52. Overall, we may conclude that availability of acute beds differs markedly between the two groups of countries but not significantly within each group. A low endowment of acute care beds may constitute a binding constraint for countries with waiting times, limiting, in the short run, the opportunity to increase output to a great extent.

4 In comparing the numbers of acute care beds, some cautionary notes should be considered. Irish data do not include beds in private hospitals. Finnish data are based on the number of occupied beddays. Both these figures are then downward biased. On the other hand, data for Luxembourg and the Netherlands include day care beds, which bias upwards their figures.

Charts 8-10. Mean waiting times and acute care beds. Year 2000







53. Another important set of inputs to the hospital production function is provided by personnel (doctors, nurses and administrative staff). For elective surgery, the more appropriate measure (among the available ones) of the labour input is the number of "practising specialists". However, in this section we also consider the total number of "practising physicians" on the ground that the data may be more comparable across countries and are available for a higher number of countries[5].

5 The underlying assumption is that the proportion of GPs and other doctors as opposed to specialists does not vary greatly across countries.

54. Table A3 in Annex 1 compares the number of practising physicians and specialists in the two groups of countries over the period 1998-2000. It shows that countries not reporting waiting times had on average in 1998 respectively 13.4% and 23.4% more practising physicians and practising specialists. For example in 1998, countries not reporting waiting had a number of practising physicians (per 1 000 population) equal to 2.9 as opposed to 2.6 for countries with waiting times. In the same year the number of practising specialists was 1.7 per 1 000 population in countries not reporting waiting times as opposed to 1.4 for countries with waiting times[6]. A t-test suggests that the difference in the doctor's means for the two groups is different from zero at a significance level below 5% in the case of the practising physicians and 10% in the case of practising specialists. Charts 11-13 show the relationship of waiting times with the number of practising *physicians* (per 1 000 population) while Charts 14-16 show the relationship with practising *specialists*.

55. Among the countries with waiting times, both the availability of physicians and specialists show a negative correlation with variations in waiting times. From Chart 11 which refers to cataract surgery, we can also see how Sweden and Finland have considerable higher waiting times given the amount of doctors, compared to the other countries with waiting times. A possible explanation is that these countries are also characterised by a low level of acute care beds.

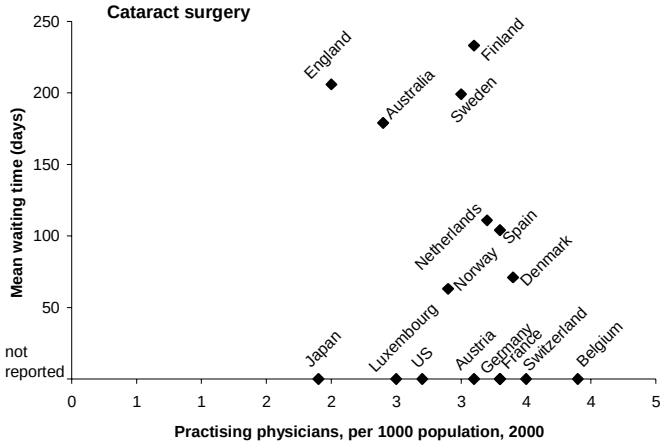
56. On the other hand, countries without waiting times often have similar levels of doctors compared to countries with waiting times. For example, Austria, France, Germany and Switzerland have a number of physicians which vary in the interval 3.1-3.3 per 1 000 population. That is very similar to the level reported by the Netherlands and Spain, 3.2 and 3.3 per 1 000 population respectively. However, the first group of countries has a considerably higher number of acute care beds. Countries with the highest availability of physicians (Belgium and Switzerland) also report no waiting times, 3.9 and 3.5 per 1 000 population respectively.

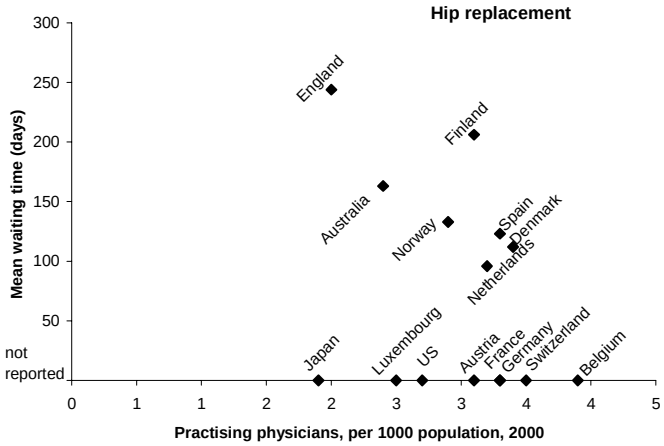
57. This evidence suggests that the number of available doctors (and human resources) may play only a partial role in explaining variations in waiting times (analogously to what was found for total and public health expenditure). It also suggests that higher numbers of personnel may be associated with lower waiting times if combined with other inputs (such as the number of acute care beds). Another possibility is that other institutional differences may also play a role. For example, incentives and remuneration systems may encourage higher productivity in countries without waiting times or, on the contrary, induce a high propensity to add patients on the list.

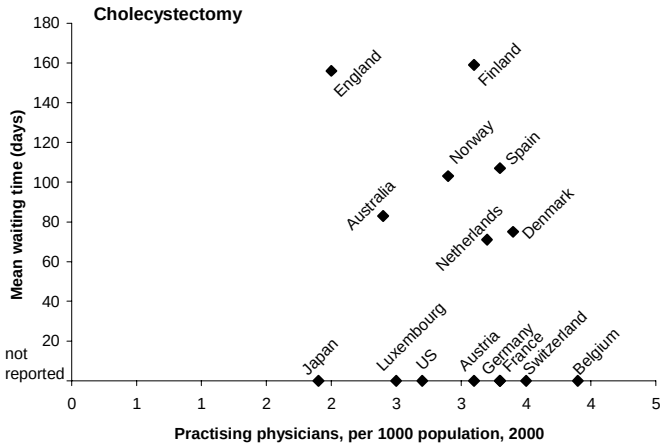
58. Similar patterns may be obtained between *mean* waiting times and doctors for other surgical procedures, and between *median* waiting times and doctors. Finally, analogously to the above section, it is important to point out the limitations of the data used. Figures on doctors include all physicians and specialists working either for the public or private sector. They refer to the whole health care sector, while waiting times refer to selected surgical procedures. Moreover the number of doctors may not be the only relevant measure of hospital personnel, as for example the availability of nurses may also play a crucial role.

6 In comparing the numbers of practising physicians and specialists across countries, a cautionary note should be introduced. Despite the OECD definition referring to "practising" physicians and specialists only, most of the countries include also the physicians and specialists working in industry, administration and research. This is the case for Belgium, France, Germany, Switzerland and US, among the group of countries without waiting times, and Canada, Denmark, Finland, Ireland, Netherlands, New Zealand, Spain, Sweden. For more information see Sources and methods of OECD Health data (2003).

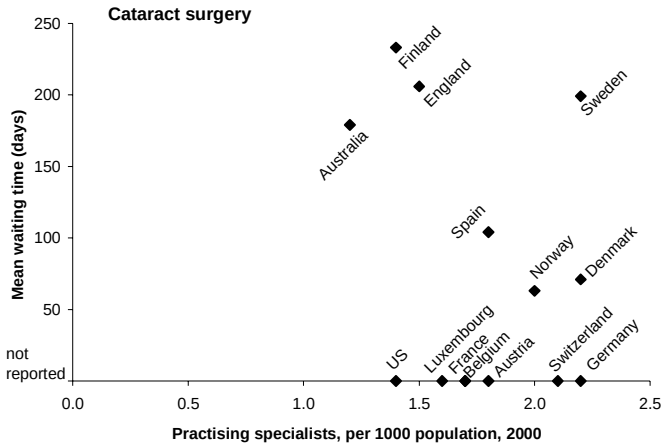
Charts 11-13. Waiting times and practising physicians. Year 2000

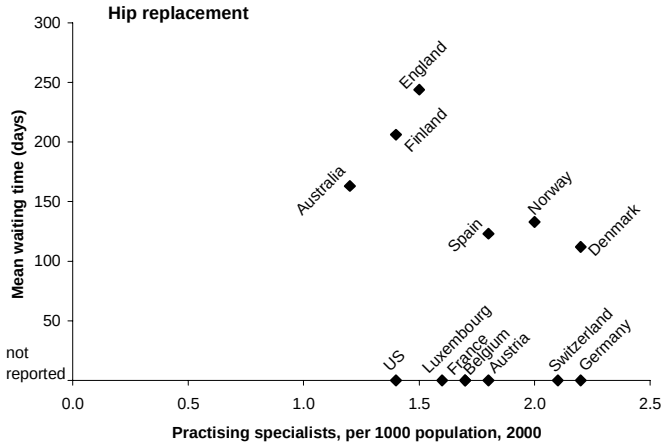


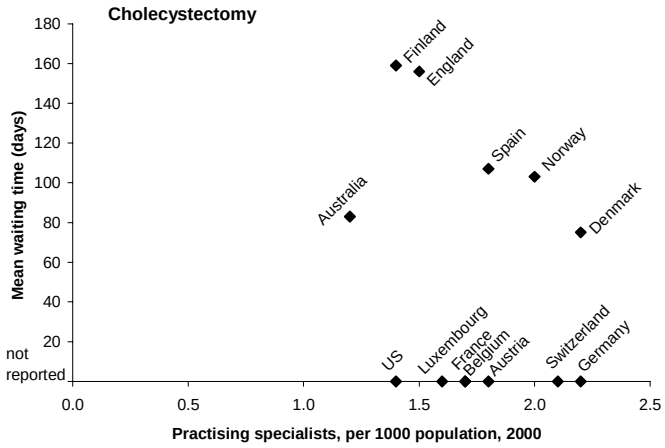




Charts 14-16. Waiting times and practising specialists. Year 2000







Do countries which do not report waiting times produce more activity (surgical inpatients, discharges)?

59. We may advance the hypothesis that, higher spending and capacity generates more output, which translates into a higher supply and, for a given demand, a lower waiting time for surgery. In this section we investigate the relationship between capacity and activity and in the next section the relationship between activity and waiting times.

60. One straightforward way to measure activity, is to look at the total volume of surgical inpatients, which is presented in Table A4 in Annex 1. This table is broken down by inpatient and day-surgery. Note that information on day-surgery is generally not available for the countries that do not report waiting times. A comparison based on total surgical activity is therefore not possible. The information on inpatient surgery includes only four countries in the group without waiting times and eight in the group with waiting times. Nevertheless, this table suggests that in 1998 inpatient surgical activity (per 1 000 population) was on average 68% higher in the countries without waiting times[7]. A t-test suggests that the difference in the inpatient activity for the two groups is significantly different from zero.

61. Charts 17-18 show the relationship between surgical inpatients and, respectively, the number of practising specialists and the number of acute care beds. Chart 17 suggests that countries with more specialists are associated with a higher volume of inpatient surgical activity. Austria and Luxembourg have the highest level of productivity in terms of the highest number of surgical inpatients per practising specialist. For Luxembourg, this may be explained by the fee-for-service system to remunerate specialists. In Austria a mixed remuneration system is used for specialists (salary plus extra charges for each patient treated). In addition, at hospital level an activity-based funding based on DRGs is used in Austria, which may well help to explain the higher productivity. Chart 18 shows how the higher productivity of the specialists in Austria and Luxembourg is also made possible thanks to higher beds capacity available in the system (in other words, the number of beds is not a binding constraint).

62. A similar picture may be obtained by using the more aggregate indicator of activity measured by the "total number of discharges" (Charts 19-20). Table A5 in Annex 1 suggests that in 1998 total discharges (per 1 000 population) was on average 29% higher in the countries without waiting times. The countries with highest discharges are Austria, France, Luxembourg and Finland. Chart 20 suggests once more how the availability of a higher number of beds seems to play a crucial role for generating higher levels of activity for Austria, France, Germany and Luxembourg. A t-test suggests that the difference in the mean discharges for the two groups is significantly different from zero.

63. Finally, Table A6 in Annex 1 provides procedure rates for nine surgical procedures in year 2000. For all procedures, countries with no reported waiting times have on average higher levels of activity. For hip and knee replacement countries with no reported waiting times have on average 57% and 84% higher rates. This percentage is respectively 43%, 53% for prostatectomy and hysterectomy, 44% for CABG, 56% for 'Inguinal and femoral hernia', 17% for cataract surgery, 72% for cholecystectomy and 91% for varicose veins. A t-test suggests that the difference in the surgical procedure means for the two groups is different from zero at a significance level below 5% for hip replacement, knee replacement, prostatectomy, inguinal and femoral hernia, cholecystectomy and varicose veins. This is not the case for hysterectomy, CABG and cataract surgery.

7 For Ireland, the data refer to procedures, as opposed to patients. More than one procedure may be recorded for each patient.

Chart 17. Surgical inpatients and specialists. Year 2000

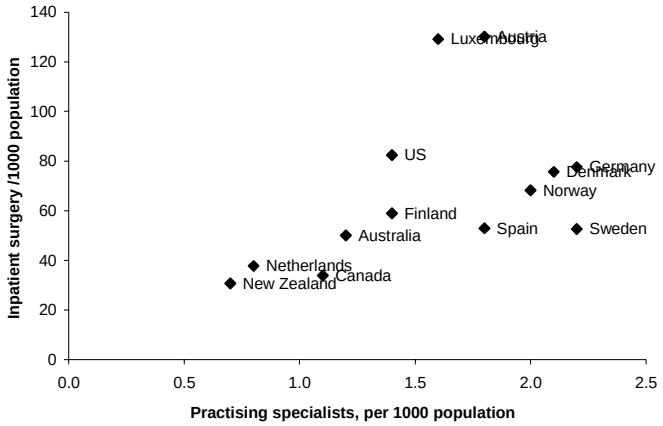


Chart 18. Surgical inpatients and acute care beds. Year 2000

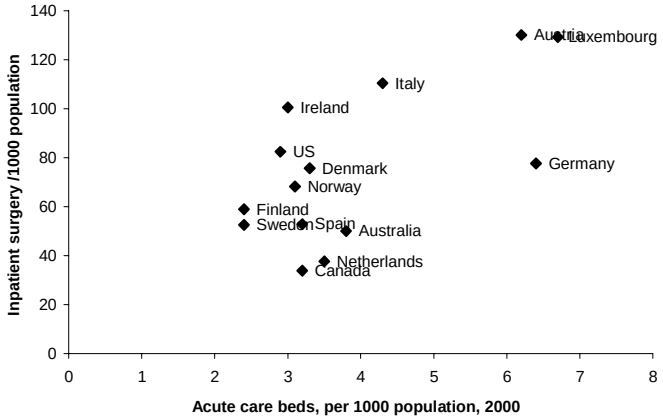


Chart 19. Total discharges and specialists. Year 2000

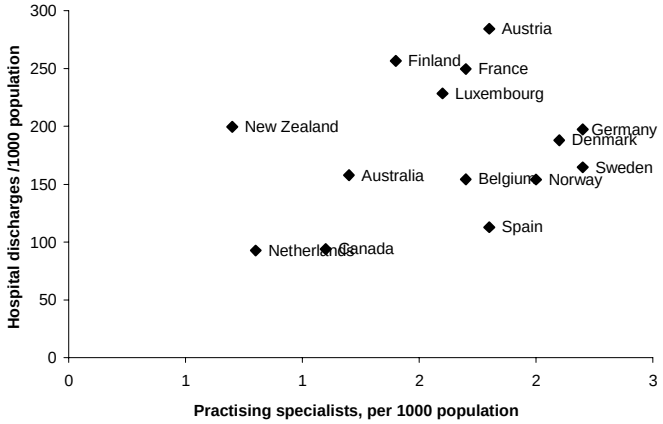
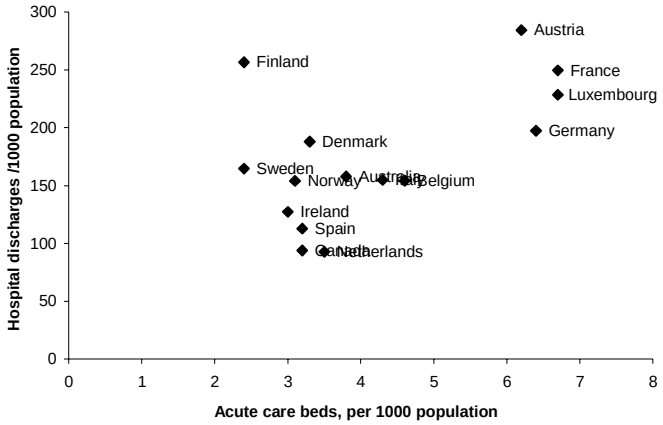


Chart 20. Total discharges and acute care beds. Year 2000



Do countries which do not report waiting times have higher productivity?

64. It seems clear from the above evidence, that countries which do not report waiting times are characterised by a higher level of capacity (doctors, beds),and a higher level of spending, which translates into higher production. But are these countries also characterised by higher productivity, driven for example by financial incentives such as fee for service and soft budgets?

65. Table A7 in Annex 1 shows some productivity indicators based on the number of 'surgical inpatients'. Unfortunately the data are available for only four of the eight countries with no reported waiting times for years 1998 and 1999. This table suggests that the number of surgical inpatients per acute care bed look similar across the two groups of countries, as confirmed by a t-test. However, the number of surgical inpatients per practising specialist and practising physician are respectively 64% and 88% higher on average in the countries with no reported waiting times. The countries with the highest productivity are Austria, Luxembourg followed by the U.S. However, a t-test suggests that the difference in the productivity means for the two groups is not significantly different from zero for the first measure (inpatients per specialist) and it is different at a significance level below 5% for the second measure (inpatients per physician). One limitation of this comparison is that it does not consider day-surgery activity, as data are not available for the countries with no reported waiting times.

66. An alternative measure of output is provided by the number of 'total discharges'. Table A8 in Annex 1 shows that the number of discharges per acute care bed is lower in countries with no reported waiting times. This is also the case for the number of discharges per practising specialist in 1998. The number of discharges per practising physician is higher in countries with no reported waiting times but is not significantly different from the value of the countries with waiting times in 1998 (the year with the most complete database), as confirmed by a t-test. Once more it has to be noted that for this table the numbers of countries with no reported waiting times are available only for five out of the eight. In summary, the evidence on surgical productivity is, at this stage, both limited and mixed.

And does the higher surgical activity lead to lower waiting times?

67. Overall, countries with higher capacity do provide a higher volume of activity, especially if accompanied by fee-for-service reimbursement system. In this section we investigate to what extent higher activity is associated with lower waiting times. This is shown in Charts 21-28 that refer to eight surgical

procedures (hip replacement, hysterectomy, prostatectomy, inguinal and femoral hernia, cholecystectomy, varicose veins, cataract surgery and knee replacement).

68. Before proceeding, it is important to point out how the relationship between waiting time and activity at individual surgical procedure is a complex one. The level of activity is determined by supply factors (like beds and doctors) but also by demand factors (such as the level of need). If the higher activity reflects higher supply, then it will be associated with lower waiting times. If higher activity reflects a higher level of demand, then it may be associated also with higher waiting times. If the level of need is constant across countries, the association between activity and waiting times should reflect variations in supply and then be negative. If capacity is constant across countries, then it should reflect variations in demand and it should be positive. In other terms, some countries may have high supply and high waiting times, compared to other countries simply because they have higher need.

69. Moreover, for a given level of activity provided and for a given level of need, countries may have different propensities to add patients on the list. In other words, severity thresholds for adding patients to the list may differ across countries. If so, a country with high severity thresholds may have a lower waiting time compared to a country with low severity thresholds.

70. At the aggregate level, proxies for the level of need might be the percentage of elderly people in the population or mortality rates. With respect to these two variables, countries with no reported waiting times do not differ significantly from countries with waiting times (see below). However, countries may differ in the level of need at surgical procedure level. For example, numbers of people in need of cataract or affected by arthritis may differ across OECD countries. At this stage, there is not enough evidence at international level to measure and control for the level of need (or disease incidence) at surgical procedure level for a significant number of OECD countries.

71. These cautionary notes need to be taken into account when interpreting the relationship between activity and waiting times. Chart 21 refers to hip replacement and shows among the countries with waiting times a weak negative association. On the other hand, countries who do not report waiting times always report higher activity, with the exception of the U.S. (as already mentioned, it is likely that in the U.S. a much larger share of surgical activity is conducted not as inpatient but in day surgery). A very similar picture can be obtained for ‘inguinal and femoral hernia’ and varicose veins (Charts 22-23). From these charts we may then be tempted to conclude that a negative relation exists between activity and waiting times.

72. However, a different picture may be obtained for cholecystectomy, prostatectomy and hysterectomy (Charts 24-26). In these cases, although on average, countries which do not report waiting times have higher activity, several countries without waiting times can be identified that report similar levels of activity to countries with waiting times. Moreover, for this last group an even weaker association is detected between the two variables.

73. Chart 27 shows that for cataract surgery, a positive association between activity and waiting times can be found for countries with waiting times. Chart 28 shows an analogous figure for knee replacement. As already mentioned, these associations may be explained by different levels of need or by different propensities to add patients to the list.

74. Finally, it is worth stressing how difficult it is at this stage to obtain fully comparable figures on surgical procedure rates. A variety of methodological problems may bias our measurements (hospital activity classification system, principal or secondary diagnosis, double counting, measures of treatments as opposed to patients).

Chart 21. Waiting times and surgical activity: hip replacement. Year 2000

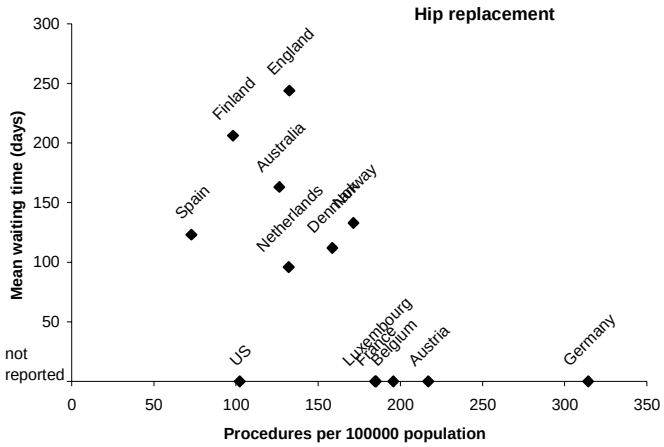


Chart 22. Waiting times and surgical activity: inguinal and femoral hernia. Year 2000

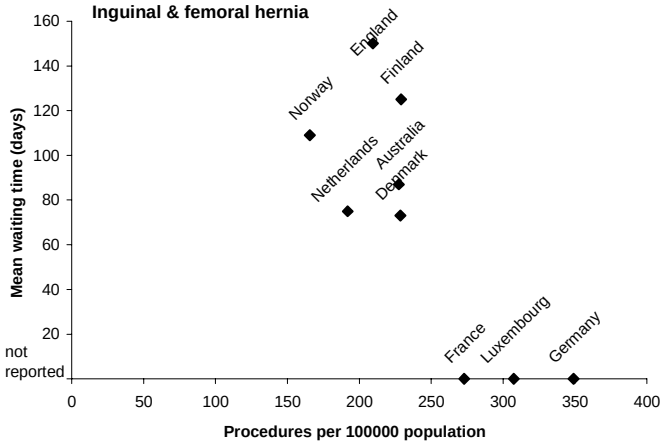


Chart 23. Waiting times and surgical activity: varicose veins. Year 2000

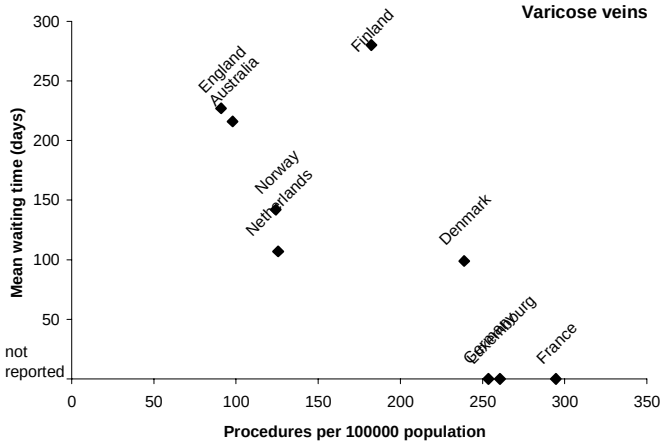


Chart 24. Waiting times and surgical activity: cholecystectomy. Year 2000

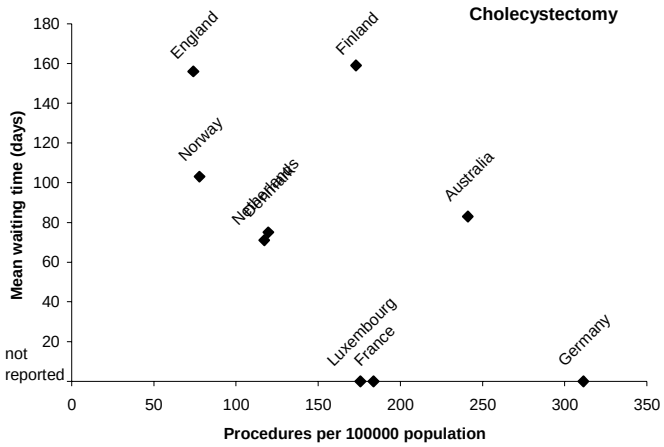


Chart 25. Waiting times and surgical activity: prostatectomy. Year 2000

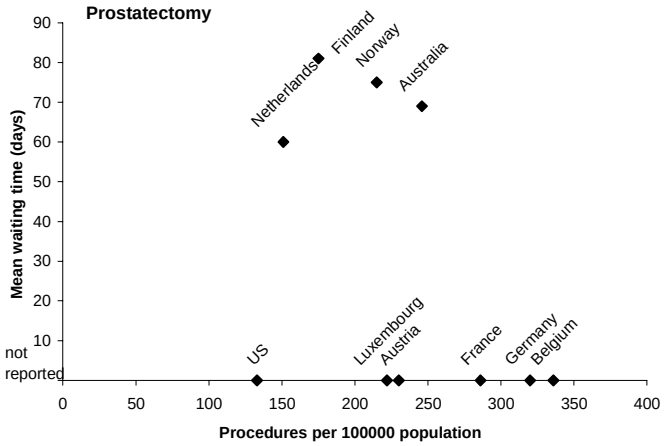


Chart 26. Waiting times and surgical activity: hysterectomy. Year 2000

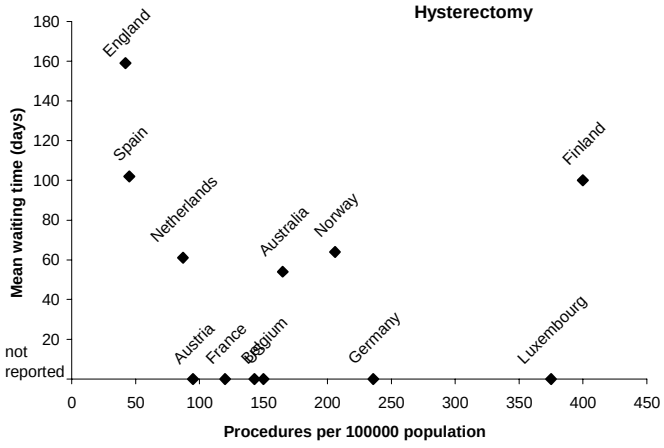


Chart 27. Waiting times and surgical activity: cataract surgery. Year 2000

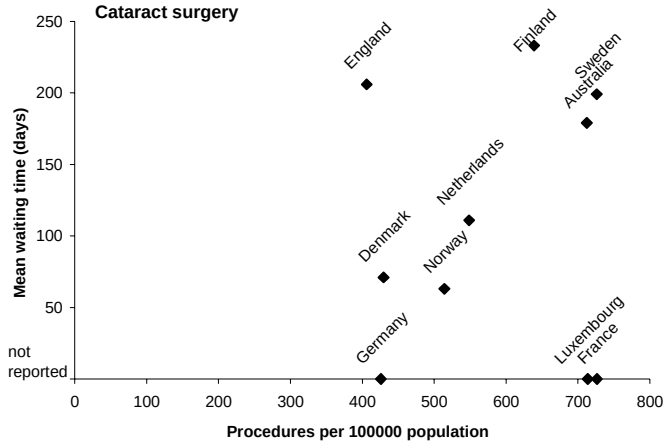
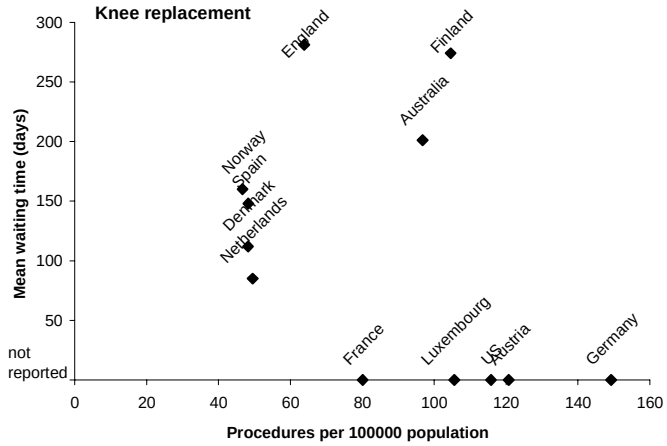


Chart 28. Waiting times and surgical activity: knee replacement. Year 2000



Are countries which do not report waiting times characterised by different remuneration systems for doctors and hospitals?

75. As the productivity indicators have at this stage some limitations, it is interesting to investigate also the structural constraints and incentives provided by different remuneration and budgeting systems for specialists and hospitals respectively. These are summarised in Table 7.

Table 7. Potential constraints on the supply of surgical treatments (until year 2002)

Constraints on activity	**Strong**	**Medium**	**Low**
Specialists working for publicly-funded hospitals	***Salary***	***Mixed payment or FFS with restrictions on volumes***	***Mainly FFS*** ***(with no restrictions on volumes)***
Countries not reporting waiting times	Japan, Germany, France (public hospitals)	Austria (salary + extra charges), Switzerland (salary + additional payments), The U.S. (Managed Care)	Belgium, France (publicly-funded private clinics) Germany (ambulatory care) Luxembourg, the U.S.
Countries reporting waiting times	Denmark, Finland, Ireland, Italy, New Zealand, Netherlands, Norway, Sweden, U.K.	Australia (either salary or FFS), Spain (Insalud, salary + bonuses)	Canada
Payments for publicly funded hospitals	***Mainly fixed budgets*** ***(including case-mix adjusted budgets through DRG, HRG)***	***Mixed financing*** ***(part of the budget is directly related to activity)***	***Mainly Activity-based funding*** ***(ABF)*** ***(with no restrictions on volumes)***
Countries not reporting waiting times	France (public hospitals)	Belgium (mixture of fixed budgets and ABF), Germany (ABF with penalties for high volumes of activity) Luxembourg, Switzerland (per diem) The U.S. (HMOs)	Austria (ABF based on modified DRGs) Japan (ABF based on cases and bed-days); France (private hospitals) The U.S. Medicare (ABF based on DRG prospective tariff)
Countries reporting waiting times	Denmark, Finland, New Zealand, U.K.	Australia (varies among States and Territories), Canada (varies among Provinces), Ireland, Italy (varies among regions), Norway (50% of budget is activity-based), Netherlands, Spain, Sweden	

Notes: ABF = Activity-based funding; FFS = Fee for service; HMO =Health maintenance organisation; DRG=Diagnosis Related Group.

Specialists

76. It is commonly thought that one of the reasons underlying the presence of waiting times is the lack of incentives for hospitals doctors to deliver higher productivity. If hospital doctors are paid by salary, there may be little incentive for them to increase activity. On the contrary, doctors paid by fee for service may exert a higher effort. In this section we intend to analyse to what extent variations in waiting times across OECD countries may be partially explained by differences in the remuneration system of the doctors.

77. In ten of the twelve countries with waiting times considered in this study, hospital specialists are remunerated according to salary. This is the case in Denmark, Finland, Ireland, Italy, New Zealand, Netherlands, Norway, Sweden and the U.K. Increasingly, bonus systems have been also introduced to encourage increases in productivity, especially in Spain. In Australia, the remuneration system differs across States and Territories and may be either based on salary or on fee for service. In Canada specialists tend to be remunerated by fee for service but ceilings may be placed on the volume of activity.

78. Among the countries without waiting times, different remuneration systems are also used. In three of the eight countries considered, specialists are salaried, as in Japan, Germany (but not in ambulatory care) and in France within public hospitals.

79. At the other extreme, specialists are remunerated purely by fee for service in Belgium, Luxembourg, the U.S. (not necessarily for Medicare) and France within publicly-funded private hospitals (which account for 30% of the beds).

80. Two intermediate situations are represented by Austria and Switzerland, where the salary is combined with the possibility of obtaining additional payments related to the activity performed. More precisely, in Austria, hospital specialists are salaried but receive in addition to their salary a share of the extra charges paid by the patients in special-class accommodation and a share of outpatient-department charges. In Switzerland, most hospital doctors are salaried but can also receive additional payments for services provided to people with supplementary health insurance but have to pay part of this income to the hospitals.

81. Countries not reporting waiting times are more likely to reward specialists according to the activity performed, but this is not always the case.

Hospitals

82. Another claimed reason underlying the presence of waiting times is the lack of incentives towards higher productivity at *hospital* level. If hospitals are paid according to fixed budgets, there may be little incentives to increase activity. On the contrary, hospitals paid in proportion to the activity performed will be rewarded for the higher volumes provided. In this section we intend to analyse to what extent variations in waiting times across OECD countries may be partially explained by differences in the payment systems for the hospitals.

83. In practice, hospital payment arrangements can be often quite complex to describe and may differ remarkably across OECD countries. Table 7 attempts to identify the main features and classify countries according to three categories (mainly fixed budgets, mixed financing, mainly activity-based funding). In four of the twelve countries with waiting times considered in this study, hospitals are remunerated according to mainly fixed budgets. This is the case for Denmark, Finland, New Zealand and the U.K. Mixed financing is present in several countries either because of differences in regions or because only a share of the budget is based on activity-based funding. For example in Australia, Canada, Italy and Sweden

remuneration systems vary remarkably according to Provinces, Territories, Regions and Counties. In Norway, more than 50% of the funding is at present related to activity through the use of DRGs schedules. In the Netherlands, hospital budgets consist of a fixed component (based on location, infrastructure, buildings, beds and specialists) and a variable component (derived from the production-agreements with the health insurers and includes four factors: nursing days, number of admissions, number of first outpatient visits and volume of day care). In Spain additions to regular budgets were made for hospitals which increased the volume of elective activity. In Ireland public hospitals are remunerated according to fixed budgets for publicly-funded patients, but fee for service for privately-funded ones.

84. Among the countries not reporting waiting times, hospitals budgets have been in general more often related to the activity performed. Countries that have mainly implemented activity-based funding are: Austria, Japan, France (for private hospitals) and the U.S. (for Medicare). The exact financial arrangements may differ across countries. The U.S. and Austria have been using mainly DRG-based prospective tariffs to remunerate activity. In Japan, funding is related to both cases performed and number of bed-days. Countries with mixed financing are Belgium, Germany, Luxembourg and Switzerland. In Belgium and Luxembourg the budget for hospitals is partly fixed and partly based on activity. In Germany, for example, despite the link between revenues and activity, activity-based funding was accompanied by financial penalties when actual volumes were higher than the pre-negotiated ones. In Switzerland a method based mainly on per diem is used (which does not necessarily induce the treatment of a higher number of patients). An interesting case is provided by France, where public purchasers remunerate public hospitals through fixed budgets and private hospitals through a per diem.

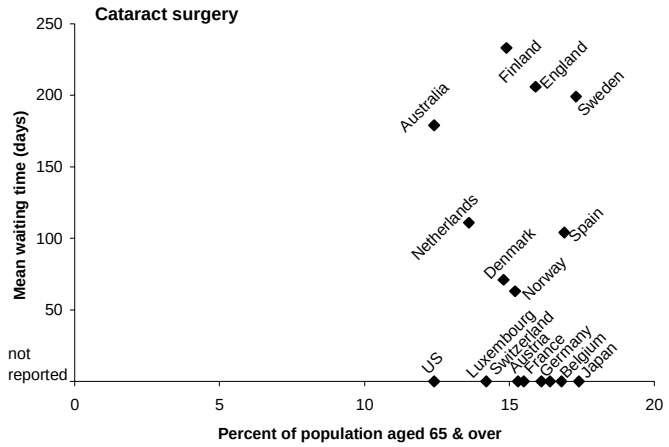
85. To summarise, it is more likely for countries which do not report waiting times to be characterised by a lower degree of restriction on the volume of activity performed.

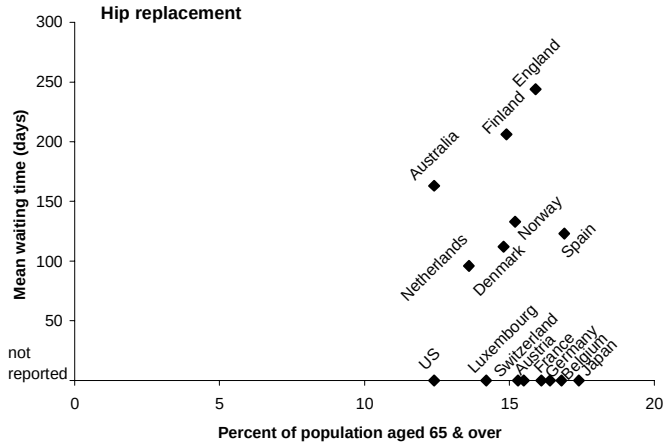
Do countries which do not report waiting times have younger populations?

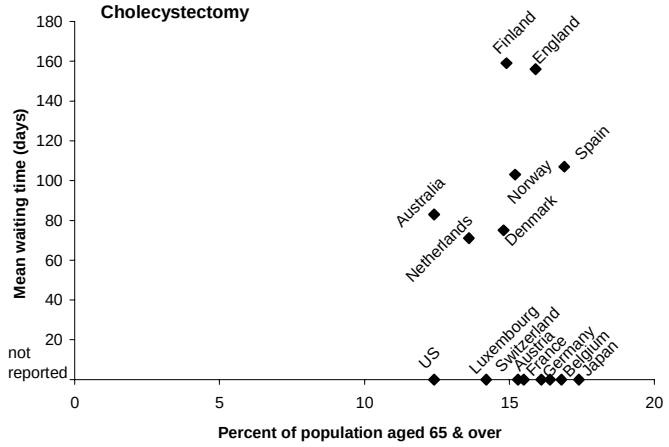
86. It may be argued that countries which do not report waiting times do not because they have a lower demand for treatments. One driver of need and demand is the share of the population which is elderly. Table A9 in Annex 1 shows that the percentage of the population older than 65 in 2000 was on average equal to 15.6% for the countries with waiting times as opposed to 14.6% in the countries without. A t-test suggests that this difference is not significantly different from zero. The percentage of the population older than 80 years old is 3.6% in both groups of countries. The age structure of the population seems to be similar across the two groups of countries.

87. Charts 29-31 provide the relationship between the waiting time of selected surgical procedures and the percentage of population older than 65 years.

Charts 29-31. Mean waiting time and percent population older than 65







Do countries which do not report waiting times have sicker populations?

88. Another aggregate indicator of need is the mortality rate. Table A10 in Annex 1 suggests a lower rate for the countries reported to be without waiting times, but, excluding Japan from the sample, the rates look very similar (in year 1998, there were 659 deaths per 100 000 population for the group without waiting times as opposed to 658). Moreover, mortality rates may not be an appropriate indicator for measuring the need for elective surgery, as for most procedures patients not receiving the treatment are unlikely to die but are likely to have a lower health status and lower quality of life.

Are countries with no reported waiting times characterised by higher levels of co-payment?

89. One factor that influences the demand for treatments is the presence of cost-sharing. In table A11 in Annex 1 we describe the degree of cost-sharing for the two groups of countries for inpatient care.

90. No significant differences can be found among the two groups. For countries with waiting times, inpatient care is usually free of charge or characterised by very low co-payments (Sweden, Ireland for Category II patients). Countries without waiting times have also very low co-payments or no co-payments at all (Germany, Austria).

What is the role of gate-keepers?

91. Table A12 in Annex 1 indicates that in countries with waiting times, general practitioners often act as gatekeepers, while in countries reported to be without waiting times they do not. This striking association does not have an easy explanation.

92. The term ‘gatekeeper’ suggests that general practitioners (GPs) should control the demand for access to specialists, avoiding unnecessary referrals, thereby lowering waiting times.

93. However, it may be that where there is a clear division of labour between generalists and specialists, GPs feel that they have a responsibility to pass on to surgeons any patients they consider could benefit from surgery, as opposed to medical treatment, creating an upward pressure on demand. By contrast, where specialists (surgeons) can be approached directly by patients and have offices outside the hospitals, they may become skilled at handling excess demand by adopting ‘watchful’ waiting without adding patients to formal hospital lists. Moreover, GPs who are salaried or capitated may reduce their workload by referring to specialists all patients, without reducing their income.

94. These arguments will not apply to the same extent to GPs who are paid on a fee-for-service basis or GP fundholders (or, more generally, GPs holding a hospital budget), who have to pay a price for referrals and admissions for their patients, as in the U.K. There is evidence that such GPs reduce admissions among their patients compared with non-fundholding GPs (Gravelle *et al.*, 2002).

3.3 What explains low waiting times in France, Germany and the United States

95. Annex 4 is devoted to three country studies on France, Germany and the United States. The aim is to examine how these three countries have avoided the problem of waiting times. In all three countries all or most of the population is covered by public or private health insurance, there is high capacity in hospitals and day-surgery units and some or all providers are financially highly motivated to meet demand.

4. A MULTIVARIATE REGRESSION ANALYSIS

96. In this section we use regression analysis to try to separate out the partial statistical associations between waiting times and several potential determinants. We test to what extent variations in determinants such as capacity, expenditure, payment methods and need are negatively or positively associated with variations in waiting times across OECD countries, holding other factors constant.

97. The analysis is divided into two parts. Section 4.1 investigates variations in mean and median waiting times for several surgical procedures. The analysis includes only eight OECD countries for which waiting times are reported and for which comparable data are available (Australia, Denmark, the United Kingdom (England), Finland, Norway, Netherlands, Spain (Insalud) and Sweden, see Tables 4 and 5). We test the following hypotheses: *i*) to what extent a higher availability of capacity (proxied by the number of acute care beds and doctors) and resources (proxied by total and public health expenditure) are negatively associated with waiting times; *ii*) to what extent a higher level of need (roughly proxied by the percentage of older population) is positively associated with waiting times; *iii)* to what extent a higher percentage of activity performed in day surgery is negatively associated with waiting times;

98. Section 4.2 has a wider scope and includes a sample of twenty OECD countries, twelve reporting waiting times (Australia, Canada, Denmark, Finland, Ireland, Italy, New Zealand, Norway, Netherlands, Spain, Sweden and the United Kingdom) and eight not reporting them (Austria, Belgium, France, Germany, Japan, Luxembourg, Switzerland and the United States). The object of the analysis is *not* to investigate variations in waiting times, as they are not easily observable for the second group of countries. It is to investigate the factors associated with the probability of reporting waiting times, measured through a binary/dummy variable (d=1, if the country reports waiting times, d=0 if not). Analogously to Section 4.1, the following hypotheses are tested: *i*) to what extent a higher availability of capacity (proxied by the number of acute care beds and doctors) and resources (proxied by total and public health expenditure) reduces the probability of reporting waiting times; *ii*) to what extent a higher level of need (roughly proxied by the percentage of older population) increases the probability of reporting waiting times; *iii)* to what extent fee-for-service remuneration systems for specialists and activity-based funding for hospitals reduces the probability of reporting waiting times.

99. The approach followed is broadly consistent with the one adopted by Martin and Smith (1999) and Lindsay and Feigenbaum (1984). Other related empirical studies are Goddard and Tavakoli (1998), Blundell and Windmeijer (2000), Propper, Croxson and Shearer (2002) and Gravelle, Dusheiko and Sutton (2002).

4.1 Explaining variations in waiting times among the countries which report waiting times.

Multivariate regression analysis

100. In this section we use multivariate regression analysis to quantify more explicitly the impact of different factors on variations in waiting times (for example the impact of an increase of doctors on reductions in waiting times).

101. This analysis focuses on a limited number of eight countries for which comparable waiting times have been reported (see Section 2).

The model

102. The empirical equation to be estimated is the following.

$$w_{ijt} = \text{const.} + \sum_j d_j \alpha_j + \sum_t d_t \alpha_t + \mathbf{x_{1(it)}}\,\boldsymbol{\beta_1} + \mathbf{x_{2(ijt)}}\,\boldsymbol{\beta_2} + \text{error term} \qquad [1]$$

where w_{ijt} denotes the mean or median waiting time, the subscript "i" indicates the country (i=1,…,I), "j" the type of surgical procedure (j=1,…,J). d_j and d_t correspond to the dummies associated to surgical procedure "j" and year "t". $\mathbf{x_{1(it)}}$ is a vector of explanatory variables that vary across time and country but not at the "surgical procedure" level (for example number of acute care beds per 1 000 population, practicing physicians per 1 000 population, percentage of the population older than 65 years old). $\mathbf{x_{2(ijt)}}$ is a vector of explanatory and control variables which vary across time, country *and* type of surgical procedure (for example, the percentage of surgical procedures performed as day-surgery, age and sex of the patients treated). This approach is similar to the one adopted by Lindsay and Feigenbaum (1984) and Propper, Croxson and Shearer (2002).

Data

103. Comparable data on *mean* waiting times were collected for 11 procedures, 8 countries and several years. The database is unbalanced, as the number of observations differs among countries with respect to both the number of procedures and the number of years available. To allow comparability, surgical procedures have been defined according to the ICD-9-CM international classification system.

104. The eight countries included are Australia, Denmark, Finland, the Netherlands, Norway, Spain (Insalud), Sweden and the United Kingdom (England). The 11 procedures considered are cataract surgery, cholecystectomy, hip replacement, knee replacement, knee arthroscopy, prostatectomy, vaginal hysterectomy, varicose veins, inguinal and femoral hernia, CABG and PTCA. Countries generally reported the data for most or all the procedures. However, for Sweden only data on cataract surgery was available. Data were available in general for 1-6 years (Australia: 2 years; Denmark: 5 years; Finland: 6 years; Norway: 2 years; Netherlands: 2 years; Spain (Insalud): 1 year; Sweden: 5 years) with the exception of the United Kingdom (England) where data were available for 10 years. In this study mean waiting times refer to the period 1996-2001.

105. Several explanatory variables are considered: health expenditure per capita (total and public); the number of practising specialists and physicians; the number of acute care beds; the percentage of elderly people in the population; and the percentage of procedures carried out as day-surgery. As control variables, which measure the characteristics of the patients in the different populations or the different case-mix, we also include the age of the patients and the percentage of the patients who are female (as in Propper, Croxson and Shearer, 2002).

106. Among the different variables, we have also considered the inclusions of two dummy variables, one for countries whose hospitals are partly paid through activity-based funding (as in Norway) and one for countries whose doctors are partly paid on a fee-for-service basis (as in Australia). However, sensitivity analysis suggests that the coefficients associated with the two dummies are not robust and for this reason they were finally dropped from the final model specifications.

107. The analysis has also been replicated using as dependent variable the *median* waiting time. In this case the number of countries is lower. The sample includes Australia, Denmark, Finland, Norway and the United Kingdom (England).

Results (mean waiting time)

108. The results of the regression analysis are provided in Table 8 and are based on a sample size of 224 observations. The dependent variable is, in this case, the *mean* waiting time. We consider four different models[8].

109. In Model 1 we include among the explanatory variables the acute care beds and physicians, but not health expenditure (to avoid multicollinearity). As expected, countries with more physicians and beds are associated with lower levels of waiting times. The results suggest that, at the sample mean, a marginal increase of 0.1 acute care beds (per 1 000 population) is associated with a marginal reduction of mean waiting times of 5.6 days. A marginal increase of 0.1 practicing physicians (per 1 000 population) is associated with a marginal reduction of mean waiting time of 8.3 days.

110. In Model 2 we include as an explanatory variable the number of specialists as opposed to the number of physicians. In this case a marginal increase of 0.1 acute care beds (per 1 000 population) is associated with a marginal reduction of mean waiting times of only 0.95 day, which is significant at 10% level. A marginal increase of 0.1 practicing specialists (per 1 000 population) is associated with a marginal reduction of mean waiting time of 6.4 days.

111. Both Models 1 and 2 report that countries with a higher percentage of procedures carried out in day-surgery are also associated with lower waiting times. An increase of 1% in the percentage of day-surgery is associated with a reduction in mean waiting times of 0.7 days.

112. Models 3 and 4 include among the explanatory variables respectively the total and public health expenditure, but not the acute care beds and physicians (to avoid multicollinearity). The results suggest that, at the sample mean, an increase in total and public health expenditure per capita of $100 reduces the mean waiting times respectively by 6.6 and 5.6 days. Unlike Models 1 and 2, the coefficient of the percentage of day-surgery is not significant.

113. In all models, the coefficient on the percentage of older population is always positive but significant only for Models 2 and 3, suggesting a weak positive association between waiting times and old populations.

114. The two control variables (age and sex of the patients) emerge as significant in Models 1, 2 and 3. The parameters associated with the year dummies (dummy = 1, if year = 1997, 1998, 1999, 2000, 2001) are positive and are generally increasing over time suggesting an upward trend in waiting times. However, the dummies were significant for years 1998, 1999, 2000 for Models 2 and 3 and for years 1999, 2000 and 2001 for Model 4.

8 A more sophisticated approach, based on panel data techniques was attempted but proved to be unsuccessful. One reason is that, despite the database being a panel, there is not enough variation over time in the explanatory variables. The number of beds and the number of practicing physicians vary little over time.

Table 8. Multivariate regression analysis				
Dependent variable - mean waiting time				
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Coefficient	Coefficient	Coefficient	Coefficient
Acute care beds	**-55.8*** **	**-9.5***		
Physicians	**-82.5*** **			
Specialists		**-63.5*** **		
Total health exp.			**-0.066*** **	
Public health exp.				**-0.056*** **
% day-surgery	**-69.8****	**-72.0****	**-6.5**	**-15.6**
% pop. over 65 years	**0.3**	**26.5*** **	**2.2**	**11.3*** **
Mean age of the patients	**2.4****	**-1.4**	**-0.5**	**-1.1**
% female	**-63.7**	**-149.0****	**-145.8****	**-145.1****
Dummy variables				
Cataract	183.0***	259.5***	204.7***	211.5***
Cholecystectomy	152.6***	145.7**	153.3***	141.9**
Coronary bypass	23.5	24.4	25.0	22.6
Hip replacement	153.8***	197.4***	192.4***	191.0***
Hernia	141.0***	77.2**	66.4**	57.4**
Knee arthroscopy	201.1***	124.2**	104.6**	91.4
Knee replacement	180.2***	234.0***	227.7***	227.0***
PTCA	24.5	16.3	21.5	16.7
Hysterectomy	141.4**	159.4**	172.2**	160.7**
Varicose veins	252.0***	234.2	215.3***	206.5***
Year 1997	5.0	16.9	13.1	13.2
Year 1998	6.2	26.7**	24.8**	24.1
Year 1999	16.7	34.7***	36.0***	33.2*
Year 2000	7.2	17.7**	30.1**	20.4*
Year 2001	16.9	31.5	59.1***	45.3***
Constant	292.9***	-132.4	165.6**	33.0
Sample size	224	224	224	224
R-squared	0.75	0.64	0.65	0.63
Adj R-squared	0.73	0.61	0.62	0.59
Notes: ***1% significance level; **5% significance level; *10% significance level				

Results (median waiting time)

115. Table 9 replicates the above analysis by using the *median* waiting time as dependent variable instead of the *mean*. The sample is in this case smaller (188 observations) and includes Australia, Denmark, Finland, Norway and the United Kingdom (England). We consider four different models. The results are broadly consistent with the previous section.

116. Model 1 suggests that, at the sample mean, a marginal increase of 0.1 acute care beds (per 1 000 population) is associated with a marginal reduction of median waiting times of 4.7 days. A marginal increase of 0.1 practicing physicians (per 1 000 population) is associated with a marginal reduction of median waiting time of 7.6 days. Analogously, Model 2 suggests that a marginal increase of 0.1 practicing specialists (per 1 000 population) is associated with a marginal reduction of median waiting time of 8.9 days. However, unlike all the previous specifications the number of acute care beds does not seem to be significantly associated with waiting times.

117. Models 3 and 4 suggest that, at the sample mean, an increase in total and public health expenditure per capita of 100$ is associated with a reduction in median waiting times of 6.1 days for both specifications.

118. Model 1 reports that countries with a higher percentage of procedures carried out in day-surgery are also associated with lower waiting times. However, the variable is not significant for the remaining three models. In all models, the coefficient on the percentage of older population is always positive and significant. The control variables '% female' emerges as significant only in Models 3 and 4. The parameters associated with the year dummies are positive and are generally increasing over time suggesting an upward trend in waiting times.

Table 9. Multivariate regression analysis				
Dependent variable - median waiting time				
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Coefficient	Coefficient	Coefficient	Coefficient
Acute care beds	**-46.9*** **	**6.4**		
Physicians	**-75.6*** **			
Specialists		**-88.5*** **		
Total health exp.			**-0.061*** **	
Public health exp.				**-0.061*** **
% day-surgery	**-83.0** **	**-34.9**	**3.21**	**4.7**
% pop. over 65 years	**11.4*** **	**27.3*** **	**16.35*** **	**22.3*** **
Mean age of the patients	**-1.5**	**-0.4**	**0.05**	**0.1**
% female	**-20.5**	**-9.5**	**-117.1***	**-106.2***
Dummy variables				
Cataract	191.6***	138.9***	174.41***	165.7***
Cholecystectomy	48.7	54.0	135.19**	128.2**
Coronary bypass	10.3	15.2	38.60*	36.9*
Hip replacement	129.6***	119.8***	178.26***	171.9***
Hernia	62.5**	60.3**	64.54	63.7*
Knee arthroscopy	72.5	65.9	96.64**	92.9*
Knee replacement	163.4***	151.4***	215.66***	208.5***
PTCA	-11.2	-5.5	23.94	21.8
Hysterectomy	32.7	41.9	157.19**	147.6**
Varicose veins	131.2***	119.0***	180.11***	173.1***
Year 1997	10.5	19.8**	14.89	13.6
Year 1998	11.5	29.4***	23.83**	22.0**
Year 1999	22.5**	38.5***	34.66***	31.4***
Year 2000	14.2	39.7***	48.32***	43.2***
Year 2001	22.0**	52.2***	57.39***	51.8***
Constant	297.2***	-273.1***	-135.24	-249.8***
Sample size	188	188	188	188
R-squared	0.79	0.78	0.73	0.73
Adj R-squared	0.76	0.75	0.7	0.7
Notes: ***1% significance level; **5% significance level; *10% significance level				

4.2 Explaining the probability of observing waiting times across OECD countries.

A Probit analysis.

119. The analysis conducted in Section 3 suggests that countries not reporting waiting times have higher resources and capacity. But is each relationship statistically significant, keeping other factors constant?

120. This section analyses a sample of twenty OECD countries to investigate the factors associated with the probability of reporting waiting times, measured through a binary/dummy variable.

The model

121. Define Y as a *dummy* variable to indicate that "a country reports significant waiting times". Then Y = 1 for the countries involved in the Waiting times project. Y = 0 for the countries where waiting times are not reported. Note that the "0" value does not imply that the country has zero waiting times, but simply that it does not report any. The waiting time may be positive but low.

122. We estimate the following Probit model:

$$Prob(Y_{it} = 1) = \Phi(\boldsymbol{\beta}'\mathbf{x}_{it}) + \varepsilon_{it} \quad i=1,\ldots,n \; t=1,\ldots,T \qquad [2]$$

where $\Phi(.)$ is the standard normal distribution (Greene, 1997; Maddala, 1989). $\mathbf{x}_{it}$ is a vector of independent variables which may explain the probability of observing waiting times. $\boldsymbol{\beta}$ reflects the impact of changes in $\mathbf{x}$ on the probability of observing waiting times. "i" indicates the country, while "t" the year.

Data

123. The database includes 197 observations. The data refer to 20 countries over the period 1992-2000. The sample includes 12 countries with waiting times (for which Y=1; Australia, Canada, Denmark, Finland, Ireland, Italy, Netherlands, New Zealand, Norway, Spain, Sweden and the United Kingdom) and 8 countries which do not report waiting times (for which Y=0; Austria, Belgium, France, Japan, Germany, Luxembourg, Switzerland and the U.S.).

124. Among the variables which may potentially explain the probability of observing waiting times, we include health expenditure per capita (total and public), the number of practising specialists and physicians, and the number of acute care beds. We include the percentage of the population older than 65 years, as a more aged population may increase demand for surgery, and a time trend in an attempt to control for technological change.

125. We also specify a categorical variable related to the remuneration system of hospitals and specialists. For hospitals, a value equal to "0" is assigned to countries with strong constraints on hospital activity (mainly fixed budgets); a value equal to "1" for countries with medium constraints; and a value equal to "2" for countries with low constraints (mainly activity-based funding) (see Table 7 for more details)[9]. In this way a negative coefficient from the analysis would suggest that countries with lower constraints on the activity have a lower probability of reporting waiting times.

9 A value equal to "1" has been assigned to France as, among publicly funded hospitals, public hospitals are remunerated mainly through fixed budgets while private hospitals are paid fee-for-service.

126. For specialists, a value equal to "0" is assigned to countries that remunerate doctors mainly on the basis of salary; a value equal to "1" is assigned to countries with mixed systems; and a value equal to "2" is assigned to countries that remunerate doctors mainly fee for service (see Table 7 for more details). In this way a negative coefficient from the analysis would suggest that countries which remunerate specialists through a fee-for-service system have a lower probability of reporting waiting times.

Results

127. The results of the four Probit models are presented in Table 10. All four models include as explanatory variables the percentage of population older than 65 years and a time trend. Model 1 includes the number of practising physicians and the number of acute care beds, Model 2 the number of practising specialists and the number of acute care beds, Model 3 includes total health expenditure per capita and Model 4 public health expenditure per capita. It is not possible to include all these variables at the same time in one unique model as doctors, beds and expenditure are collinear variables. Sample size for the different specifications varies according to data availability.

128. Models 1 and 2 suggest that the availability of acute care beds decreases significantly the probability of observing waiting times. This is also true for the availability of practising specialists, as shown by Model 2. This is not the case for availability of practising physicians in Model 1. Despite the coefficient being negative (as expected), it is not significantly different from zero. Similarly, Models 3 and 4 indicate that higher health expenditure (public and total, respectively) reduces the probability of observing waiting times. The coefficient associated with the percentage of older populations is not robust across the different specifications.

129. The categorical variables associated with the remuneration system of the hospital are significantly different from zero in Models 3 and 4, suggesting that countries with lower constraints on activity have a lower probability of reporting waiting times. However, the significance of this variable is not confirmed by Models 1 and 2. The categorical variables associated with the remuneration system for specialists are always significantly different from zero in all the four models considered. This suggests that countries that implement a fee-for-service remuneration system for doctors have a lower probability of reporting waiting times compared to countries remunerating doctors by salary.

Table 10. Probit estimates

Dependent variable is the dummy variable Y, with Y=1 if there is presence of significant waiting times.

	Model 1 Coefficient	Model 2 Coefficient	Model 3 Coefficient	Model 4 Coefficient
acute care beds	**-0.88*** **	**-1.25*** **		
physicians	**-0.87**			
specialists		**-4.56** **		
total health exp. per capita			**- 0.0028*** **	
public health exp. per capita				**-0.0019*** **
% pop. older than 65	**0.20** **	**0.60** **	**-0.73*** **	**-0.26*** **
Hospital remuneration	**- 0.83**	**- 0.39**	**- 2.52*** **	**- 1.59*** **
Specialist remuneration	**- 1.03*** **	**- 1.14*** **	**- 1.45*** **	**- 1.01*** **
time trend	-0.05	-0.03	0.26***	0.14***
Constant	92.6	6.9	-509***	-279***
Sample size	148	135	197	193
Pseudo R2	0.62	0.72	0.63	0.43
Log likelihood	-38	-26	-49	-73
LR chi2	125	133	166	110
Prob > chi2	0	0	0	0

Notes: ***1% significance level; **5% significance level; *10% significance level

5. CONCLUSIONS

130. This study has added to the limited evidence on the causes of variations in waiting times across OECD countries for publicly-funded elective surgical procedures. It is based on a questionnaire submitted to twelve countries which provided data on waiting times from administrative databases together with more limited survey data for eight countries for which significant waiting times are not reported. Countries with the highest waiting times were the United Kingdom (England) and Finland, followed by Denmark, Norway, Australia and Spain (Insalud). The country with the shortest waiting times was the Netherlands.

131. These data have been used to investigate associations between waiting times and several potential determinants such as capacity, expenditure, need and financial incentives for hospitals and specialists. The results include evidence of a clear negative association between waiting times and capacity, measured either in terms of number of beds or number of practising physicians. Analogously, a higher level of health spending is systematically associated with lower waiting times. On the other hand, a higher proportion of elderly in the total population is not a major predictor of waiting times across different countries. The evidence also suggests that financial incentives for hospitals and doctors may influence waiting times. Fee-for-service systems induce specialists to increase productivity, a finding in line with other studies, and may also discourage the formation of visible queues because of competitive pressures and the incentive to disguise demand, especially if there are no gatekeepers and surgeons assume primary care responsibilities for patients. Meanwhile, activity-based funding appears to encourage hospitals to increase activity compared with fixed budgets.

132. It is found that among the countries reporting waiting times, it is the availability of doctors, rather than beds that explains most variations in waiting times. The econometric estimates suggest that a marginal increase of 0.1 practising physicians and specialists per 1 000 population is associated respectively with a marginal reduction of *mean* waiting times of 8.3 and 6.4 days (at the sample mean) and a marginal reduction of *median* waiting times of 7.6 and 8.9 days. Analogously, an increase in total health expenditure per capita of $100 is associated with a reduction of *mean* waiting times of 6.6 days and of *median* waiting times of 6.1 days.

133. In the comparison between countries that do and do not report waiting times, the evidence suggests that it is the higher availability of acute care beds that plays a key role in explaining lower waiting times. This should not be taken as implying that countries which have cut over time the number of acute care beds due to technological development should necessarily restore them. Nevertheless, it is interesting to recall from the first report of the Waiting Times Project, that a couple of countries, Ireland and the United Kingdom (England), which have closed many acute care beds in recent decades, are now opening a limited number of new acute beds in the face of rising demand, as well as expanding day-surgery capacity.

134. In addition, it was found that countries that remunerate specialists through fee-for-service mechanisms have a lower probability of reporting waiting times than countries which remunerate specialists by salary, controlling for other factors. There is also preliminary evidence that activity-based funding for hospitals may also help reducing waiting times. These results are broadly consistent with the existing literature.

135. Although this study has shed some additional light on the causes of international variations in waiting times for publicly-funded elective surgery, many questions remain. In particular, because data on day surgery rates and on resources used specifically for surgery are unavailable for many countries, and because of lack of comparability at an international level, relatively little has been revealed about variations in the productivity of surgery across countries. This would seem to be an important area for future data collection and research, not only to shed further light on the causes of variations in waiting times but also to provide lessons about the most efficient way to provide care in this costly and growing sector of health care.

REFERENCES

Besley, T., *et al.*, 1998, "Private and public health insurance in the U.K.", *European Economic Review*, 42, 491-497.

Biorn, E., T. Hagen, T. Iversen and J. Magnussen, 2002, "The effect of activity-based financing on hospital efficiency", Working paper 8, Health Economics Research Programme, University of Oslo.

Blendon, R.J., *et al.*, 2002, "Inequities in health care: a five-country survey", *Health Affairs*, 21,3, 182-191.

Blundell, R. and F. Windmeijer, 2000, "Identifying demand for health resources using waiting times information", *Health Economics*, 9, 465-474.

Carroll, R.J., *et al.*, 1995, "International Comparison of Waiting Times for Selected Cardiovascular Procedures", *Journal of the American College of Cardiology*, 1, 557-63.

Clemmesen, F. and M. Hansen, 2003, "Erfaringerne med meraktivitetsfinansiering af sygehuse", *Samfundsøkonomen*, 3, 11-16.

Cromwell, D.A., *et al.*, 2002, "Surgery dot.com: the quality of information disseminated by web-based waiting time information services", *Medical Journal of Australia*, 177.

Coyte, P.C., *et al.*, 1994, "Waiting Times for Knee Replacement Surgery in the United States and Ontario", *The New England Journal of Medicine*, 20.

Cooper, R.B., 1981, "Basic Queuing Theory", North Holland, New York.

DeCoster, C., *et al.*, 2000, "Waiting times for surgical procedures", *Medical Care*, 37, 6, 187-205.

Docteur, E., H. Suppanz and J. Woo, 2003, "The U.S. Health system: an assessment and prospective directions for reform", OECD, Economics Department Working papers, n. 350.

Fleming, D.M., *et al.*, 1992, "*The European study of referrals from primary to secondary care"*, Royal College of General Practitioners, London, Occasional Paper No. 56.

Goddard, J. and M. Tavakoli, 1998, "Referral rates and waiting lists: some empirical evidence", *Health Economics*, 7, 545-549.

Gosden, T. *et al.*, 2001, "Impact of payment method on behaviour of primary care physicians: a systematic review", *Journal of Health Services Policy*; 6; 44-55.

Gravelle, H., P.C. Smith, and A. Xavier, 2003, "Waiting lists and waiting times: a model of the market for elective surgery", *Oxford Economic Papers*, 55, 1, 81-103.

Gravelle, H., M. Dusheiko, M. Sutton, 2002, "The demand for elective surgery in a public system: time and money prices in the U.K. National Health Service", *Journal of Health Economics*, 21, 423-429.

Greene, W., 1997, *Econometric Analysis*, Third Edition, Prentice-Hall International, London.

Hurst, J. and L. Siciliani, 2003, "Tackling excessive waiting times for elective surgery: a comparison of policies in twelve OECD countries", OECD Health Working Paper, n.6.

Imai, Y., S. Jacobzone and P. Lenain, 2000, "The changing health system in France", Economics Department Working papers, n. 269.

Iversen, T., 1993, "A theory of hospital waiting lists", *Journal of Health Economics*, 12, 55-71.

Iversen, T., 1997, "The effect of a private sector on the waiting time in a National Health Service", *Journal of Health Economics*; 16, 381-396.

Iversen, T., and H. Luras, 2002, "Waiting times as a competitive device: an example from general medical practice", *International Journal of Health Care Finance and Economics*, 2, 189-204.

Lindsay, C.M. and Feigenbaum, B., 1984, "Rationing by waiting lists", *American Economic Review*, 74, 3, 404-417.

Maddala, G.S., 1989, *Limited-dependent and qualitative variables in econometrics*, Econometric Society Monographs n.3, Cambridge University Press.

Martin, S., and P.C. Smith, 1999, "Rationing by waiting lists: an empirical investigation", *Journal of Public Economics*, 71, 141-64.

Martin, S., and P.C. Smith, 1995, "Modelling waiting times for elective surgery", Occasional Paper, Centre of Health Economics, University of York, n.24.

Mot, E.S., 2002, "*Paying the medical specialist: the eternal puzzle: experiments in the Netherlands*", PhD Thesis, Amsterdam.

Morga, A., and A. Xavier, 2001, "Hospital specialists' private practice and its impact on the number of NHS patients treated and on the delay for elective treatment", Discussion papers in Economics, The University of York, n.2001/01.

OECD, 2003, *OECD Health Data 2003*, CD-ROM, Paris.

Propper, C., B. Croxson, A. Shearer, 2002, "Waiting times for hospital admissions: the impact of GP fundholding", *Journal of Health Economics*, 21, 227-252.

Ransom, S.B. *et al.*, 1996, "The effect of capitated and fee-for-service remuneration on physician decision making in gynaecology", *Obstetrics and Gynaecology*, 5, 707-710.

Sanmartin, C., 2001, "Toward standard definitions of waiting times", Western Canada Waiting List Project, Final Report.

Siu, A.L. *et al.*, 1988, "Use of the hospital in a randomised trial of prepaid care", *Journal of American Medical Association*, 259, 1343-1346.

Wenzel, M., A. Reuscher, H. Aral, 2001, "Zum Stand der Katarakt- und refraktiven Chirurgie Umfrage von DGII und BVA 2000 im internationalen Vergleich", *Ophtalmo-Chirurgie*, 13, 137-143.

WHO, 2000, *Health care systems in transitions. Belgium*, European Observatory on health care systems.

WHO, 2000, *Health care systems in transitions. Germany*, European Observatory on health care systems.

Wilson, S.E. and W.P. Longmire, 1978, "Does method of surgeon payment affect surgical care?", *Journal of Surgical Research*, 24, 457-468.

ANNEX 1. TABLES

Table A1. Total and public health expenditure

	Total expenditure on health per capita, U.S.$ PPP			Public expenditure on health per capita, U.S.$ PPP		
	1998	1999	2000	1998	1999	2000
Countries without waiting times						
Austria	1888	2006	2170	1316	1390	1505
Belgium	1971	2114	2260	1418	1526	1630
France	2096	2211	2387	1593	1681	1810
Germany	2520	2615	2780	1886	1957	2086
Japan	1730	1852	1984	1339	1445	1554
Luxembourg	2361	2685	2719	2182	2361	2386
Switzerland	2952	3080	3160	1619	1704	1758
United States	4095	4287	4540	1824	1895	2005
Average[1]	2452	2606	2750	1647	1745	1842
Countries with waiting times						
Australia	2079	2224	2350	1412	1545	1618
Canada	2288	2433	2580	1617	1713	1828
Denmark	2238	2344	2398	1835	1927	1979
Finland	1528	1608	1699	1166	1211	1276
Ireland	1438	1623	1793	1100	1182	1314
Italy	1778	1883	2060	1277	1356	1511
Netherlands	2176	2310	2348	1401	1461	1488
New Zealand	1431	1527	1611	1102	1183	1257
Norway	2439	2550	2755	2066	2172	2347
Spain	1353	1426	1497	976	1028	1073
Sweden	1903	2053	2195	1633	1760	1866
United Kingdom	1563	1704	1813	1253	1371	1468
Average[1]	1851	1974	2092	1403	1492	1585

[1]Unweighted point average. Not valid for comparisons over time.

Source: OECD Health Data, 2003.

Table A2. Acute care beds - /1 000 population

	1998	1999	2000
Countries without waiting times			
Austria	6.4	6.3	6.2
Belgium			
France	7	6.9	6.7
Germany	6.5	6.4	6.4
Japan			
Luxembourg	7.1	7	6.7
Switzerland	4.4	4.4	4.1
United States	3.1	3	2.9
Average[1]	5.8	5.7	5.5
Countries with waiting times			
Australia	3.9	3.8	3.8
Canada	3.5	3.2	3.2
Denmark	3.4	3.3	
Finland	2.6	2.5	2.4
Ireland	3.1	3	3
Italy	5	4.5	4.3
Netherlands	3.7	3.6	3.5
New Zealand			
Norway	3.2	3.2	3.1
Spain	3.2		
Sweden	2.6	2.5	2.4
United Kingdom	3.9	3.9	3.9
Average[1]	3.5	3.4	3.2

[1]Unweighted point average. Not valid for comparisons over time.

Source: OECD Health Data, 2003.

Table A3. Physicians (Density /1 000 population)

	Practicing physicians			Practicing specialists		
Year	1998	1999	2000	1998	1999	2000
Countries without waiting times						
Austria	3	3	3.1	1.7	1.7	1.8
Belgium	3.7	3.8	3.9	1.7		
France	3.3	3.3	3.3	1.7	1.7	1.7
Germany	3.2	3.2	3.3	2.1	2.1	2.2
Japan	1.9		1.9			
Luxembourg	2.4	2.5	2.5	1.6	1.7	1.6
Switzerland	3.3	3.4	3.5	1.7	1.8	2.1
United States	2.7	2.7		1.4	1.4	
Average[1]	2.9	3.1	3.1	1.7	1.7	1.9
Countries with waiting times						
Australia	2.5	2.5	2.4	1.1	1.1	1.2
Canada	2.1	2.1	2.1	1.1	1.1	1.1
Denmark	3.3	3.4	3.4	2.1	2.1	2.2
Finland	3	3.1	3.1	1.4	1.4	1.4
Ireland	2.2	2.3	2.2			
Italy						
Netherlands	2.9	3.1	3.2			
New Zealand	2.2	2.2	2.2	0.7	0.7	0.7
Norway	2.7	2.8	2.9	1.9	2	2
Spain	2.9	3.0	3.3	1.8		
Sweden	2.8	2.9	3			2.2
United Kingdom	1.9	2	2	1.4	1.5	1.5
Average[1]	2.6	2.7	2.8	1.4	1.3	1.5

[1]Unweighted point average. Not valid for comparisons over time.

Source: OECD Health Data, 2003.

Table A4. Surgical inpatients

	Total surgical in-patients /1 000 population			Day-surgery /1 000 population		
	1998	1999	2000	1998	1999	2000
Countries without waiting times						
Austria	128.4	129.8	130.1			
Belgium						
France						
Germany	72	77.6				
Japan						
Luxembourg	128.6	129.4	129.2	88.1	87.8	85.9
Switzerland						
United States	86.2	85.4	82.4			
Average[1]	103.8	97.6	105.8			
Countries with waiting times						
Australia	51	51.2	50	36.7	40.5	38.4
Canada	35.2	34.6	33.9			
Denmark	76.9	76.4	75.7	109.7	117.2	133.9
Finland	61.9	60.1	58.9	27.2	29.8	31.2
Ireland[2]	78.7	90.5	100.5	58.1	63.5	69.6
Italy	108.9	109.1	110.4	27	29.5	34.3
Netherlands	40.2	39.1	37.7	31.6	32.1	32.6
New Zealand	29.4	29.5	30.7	16.5	17.6	18.4
Norway		67	68.2		27.8	28.3
Spain	52.9			10.6		
Sweden	50.7	51.5	52.6			
United Kingdom						
Average[1]	61.8	64.1	65.1	48.4	52.1	66.8

Notes:
[1] Unweighted point average. Not valid for comparisons over time.
[2] Procedures, not patients.

Source: OECD Health Data, 2003.

Table A5. Total discharges /1 000 population

	1998	1999	2000
Countries without waiting times			
Austria	272.2	280.6	284.4
Belgium	155.7		154.3
France	246.5	249.1	249.6
Germany	194.3	197.3	
Japan		100.5	
Luxembourg	207.1	220.0	228.5
Switzerland			
United States	115.4	115.2	112.4
Average[1]	198.5	193.8	205.8
Countries with waiting times			
Australia	159.7	158.2	157.7
Canada	98.8	96.6	93.9
Denmark	182.2	185.9	188.1
Finland	258.8	257.8	256.6
Ireland	116.4	124.2	127.3
Italy	163.1	161.0	154.8
Netherlands	98.3	95.9	92.7
New Zealand	182.1	189.4	199.8
Norway	154.0	156.2	154.1
Spain	112.5	113.6	112.8
Sweden	166.4	167.6	164.6
United Kingdom			
Average	153.8	155.1	154.8

[1]Unweighted point average. Not valid for comparisons over time.

Source: OECD Health Data, 2003.

Table A6. Surgical procedures rates (per 100 000 population)

	Hip Replace-ment (inpatient)	Knee replace-ment (inpatient)	Prostate-ctomy (inpatient)	Hystere-ctomy (inpatient)	CABG (inpatient)	Inguinal and femoral hernia (total, inpatient and day surgery)
Countries without waiting times						
Austria	217	120.7	230	95	56.7	
Belgium	195.6		336	150	98[2]	
France	184.6	80.1	286	120	40.1	273
Germany	314.3	149.2	320	236	122.7	349
Japan						
Luxembourg	185.1	105.6	222	375	40.7	307.4
Switzerland						
United States	102.3	115.8	133	143	204.8	
Average[1]	199.8	114.3	254.5	186.5	93.8	309.8
Countries with waiting times						
Australia	126.3	96.8	246	165	89.4	227.4
Canada	93.1	88.5	167	108	68.6	
Denmark	158.6	48.2	195	45	66.2	228.6
Finland	98.2	104.6	175	400	80.3	229.1
Ireland	(136)	29.4	120	53	26.8	125.6
Italy	117.6	40.9	197	74	48	300.1
Netherlands	132	49.5	151	87	92.9	191.9
New Zealand	120.9	65.3	119	63	103.3	111.7
Norway	171.4	46.7	215	206	76.1	165.5
Spain	72.8	48.3		45	17	
Sweden	166.3		194	174	72.8	
United Kingdom	132.5	63.8		42	40.8	209.5
Average[1]	127.1	62.0	177.9	121.8	65.2	198.8

Notes:
[1]Unweighted average.
[2] year = 1997.

Source: OECD Health Data, 2003.

Table A6. Surgical procedures rates (continued)

	Cataract surgery (total, inpatient and day surgery)	Cholecystectomy (total, inpatient and day surgery)	Ligation and stripping of varicose veins (total, inpatient and day surgery)
Countries without waiting times			
Austria			
Belgium			
France	726.2	183.7	294.6
Germany	425.9	311.4	253.6
Japan			
Luxembourg	713.7	175.6	260.5
Switzerland			
United States			
Average[1]	621.9	223.6	269.6
Countries with waiting times			
Australia	712.3	241	97.9
Canada			
Denmark	429.6	119.6	238.8
Finland	638.9	173	182.4
Ireland	446.7	105	103.4
Italy	659.9	166.8	164.6
Netherlands	548.6	117.1	125.6
New Zealand	242.8	99.6	
Norway	514.2	77.7	124.2
Spain			
Sweden	*726*	127.8	
United Kingdom	406.1	73.9	90.9
Average[1]	532.5	130.2	141.0

[1]Unweighted average.

Source: OECD Health Data, 2003.

Table A7. Productivity indicators based on surgical inpatients

	Surgical inpatient per acute care bed			Surgical inpatient per practicing specialist			Surgical inpatient per practicing physician		
	1998	1999	2000	1998	1999	2000	1998	1999	2000
Countries without waiting times									
Austria	20.1	20.6	21.0	75.5	76.4	72.3	42.8	43.3	42.0
Belgium									
France									
Germany	11.1	12.1		34.3	37.0		22.5	24.3	
Japan									
Luxembourg	18.1	18.5	19.3	80.4	76.1	80.8	53.6	51.8	51.7
Switzerland									
United States	27.8	28.5	28.4	61.6	61.0		31.9	31.6	
Average[1]	19.3	19.9	22.9	62.9	62.6	76.5	37.7	37.7	46.8
Countries with waiting times									
Australia	13.1	13.5	13.2	46.4	46.5	41.7	20.4	20.5	20.8
Canada	10.1	10.8	10.6	32.0	31.5	30.8	16.8	16.5	16.1
Denmark	22.6	23.2		36.6	36.4	34.4	23.3	22.5	22.3
Finland	23.8	24.0	24.5	44.2	42.9	42.1	20.6	19.4	19.0
Ireland	25.4	30.2	33.5				35.8	39.3	45.7
Italy	21.8	24.2	25.7						
Netherlands	10.9	10.9	10.8				13.9	12.6	11.8
New Zealand				42.0	42.1	43.9	13.4	13.4	14.0
Norway		20.9	22.0		33.5	34.1		23.9	23.5
Spain	16.5			29.4			18.2		
Sweden	19.5	20.6	21.9			23.9	18.1	17.8	17.5
United Kingdom									
Average[1]	18.2	19.8	20.3	38.4	38.8	35.8	20.0	20.7	21.2

[1]Unweighted point average. Not valid for comparisons over time.

Source: OECD Health Data, 2003.

Table A8. Productivity indicators based on total discharges

	Discharges per acute care bed			Discharges per practicing specialist			Discharges per practicing physicians		
	1998	1999	2000	1998	1999	2000	1998	1999	2000
Countries without waiting times									
Austria	42.5	44.5	45.9	160.1	165.1	158.0	90.7	93.5	91.7
Belgium				91.6			42.1		39.6
France	35.2	36.1	37.3	145.0	146.5	146.8	74.7	75.5	75.6
Germany	29.9	30.8		92.5	94.0		60.7	61.7	
Japan									
Luxembourg	29.2	31.4	34.1	129.4	129.4	142.8	86.3	88.0	91.4
Switzerland									
United States	37.2	38.4	38.8	82.4	82.3		42.7	42.7	
Average[1]	34.8	36.3	39.0	116.8	123.4	149.2	66.2	72.3	74.6
Countries with waiting times									
Australia	40.9	41.6	41.5	145.2	143.8	131.4	63.9	63.3	65.7
Canada	28.2	30.2	29.3	89.8	87.8	85.4	47.0	46.0	44.7
Denmark	53.6	56.3		86.8	88.5	85.5	55.2	54.7	55.3
Finland	99.5	103.1	106.9	184.9	184.1	183.3	86.3	83.2	82.8
Ireland	37.5	41.4	42.4				52.9	54.0	57.9
Italy	32.6	35.8	36.0						
Netherlands	26.6	26.6	26.5				33.9	30.9	29.0
New Zealand				260.1	270.6	285.4	82.8	86.1	90.8
Norway	48.1	48.8	49.7	81.1	78.1	77.1	57.0	55.8	53.1
Spain	35.2			62.5			38.8	37.9	34.2
Sweden	64.0	67.0	68.6			74.8	59.4	57.8	54.9
United Kingdom									
Average[1]	46.6	50.1	50.1	130.0	142.2	131.8	57.7	57.0	56.8

[1]Unweighted point average. Not valid for comparisons over time.

Source: OECD Health Data, 2003.

Table A9. Elderly percentage of the population

	Population: 65 and over - % total population			Population: 80 and over - % total population		
	1998	1999	2000	1998	1999	2000
Countries without waiting times						
Austria	15.3	15.4	15.5	3.6	3.5	3.5
Belgium	16.6	16.8	17	3.7	3.6	3.7
France	15.7	15.8	16	3.8	3.7	3.7
Germany	15.9	16.1	16.4	3.8	3.7	3.6
Japan	16.2	16.7	17.2	3.5	3.6	3.8
Luxembourg	14.3	14.3	14.4	3.2	3.1	3.1
Switzerland	15.5	15.8	16	3.9	4	4
United States	12.4	12.3	12.3	3.1	3.2	3.2
Average[1]	15.2	15.4	15.6	3.6	3.6	3.6
Countries with waiting times						
Australia	12.1	12.2	12.3	2.7	2.8	2.9
Canada	12.4	12.5	12.6	2.8	2.9	3
Italy	17.5	17.8	18.1	3.9	3.9	3.9
Finland	14.6	14.8	14.9	3.3	3.3	3.4
Denmark	15.1	15	15	4	4	4
Ireland	11.4	11.3	11.3	2.6	2.6	2.6
Netherlands	13.5	13.6	13.7	3.2	3.2	3.2
New Zealand	11.6	11.7	11.7	2.7	2.7	2.8
Norway	15.6	15.5	15.4	4.3	4.4	4.5
Spain	16.3	16.7	17	3.6	3.7	3.8
Sweden	17.4	17.4	17.4	4.9	5	5.1
United Kingdom	15.7	15.7	15.8	4	4	4.1
Average[1]	14.4	14.5	14.6	3.5	3.5	3.6

[1]Unweighted point average.

Source: OECD Health Data, 2003.

Table A10. Deaths (all causes) – per 100 000 population

	1998	1999	2000
Countries without waiting times			
Austria	653.6	643	621
Belgium			
France	598.5		
Germany	672.9	657.8	
Japan	496.9	502.6	
Luxembourg	671.4	632.8	628.4
Switzerland			
United States	696.1		
Average	632	609	625
Countries with waiting times			
Australia	580.5	566.4	
Canada			
Italy	604.4		
Finland	690.2	679.6	
Denmark	743		
Ireland	787.6		
Netherlands	666	669.5	
New Zealand	627.2		
Norway	639.3		
Spain	617.3		
Sweden	589.2		
United Kingdom	698.6	695	
Average	658	653	

[1]Unweighted point average. Not valid for comparisons over time.

Source: OECD Health Data, 2003.

Table A11. Level of co-payment	
Countries without waiting times	
Austria	No co-payments
Belgium	250 BF (1999)
France	11 Euro per day (1999)
Germany	No co-payments (for shared room); otherwise 7.16 Euro per day (1999)
Japan	Approximately 14%
Luxembourg	5.43 Euro per day (1999)
Switzerland	10 Swiss francs per day (2000)
United States	Varies on type of insurance
Countries with waiting times	
Australia	No co-payments
Canada	No co-payments
Denmark	No co-payments
Finland	25 Euro per day (inpatient) (2001)
Ireland	Category I: no co-payments Category II: 40 Euro per day (2003)
Italy	No co-payments
Netherlands	No co-payments
New Zealand	No co-payments
Norway	No co-payments
Spain	No co-payments
Sweden	Max 8.45 per day; varies by county council (1999)
United Kingdom	No co-payments

Table A12. Presence of gate-keeping	
Can public patients access elective surgery without GP referral?	
Countries without waiting times	
Austria	GPs act as gatekeepers to some extent
Belgium	Direct access
France	Direct access
Germany	Direct access
Japan	Direct access
Luxembourg	Direct access
Switzerland	Direct access
United States	Varies on type of insurance
Countries with waiting times	
Australia	Gate-keeping is incentivised. Medicare reimburses a higher rate if patient is referred by the GP
Canada	GPs are usually the initial contact and control access to most specialists
Denmark	GPs act as gatekeepers (Group 1 patients). Group 2 (2.5% of pop.) can consult directly the specialist at the risk of extra billing
Finland	Patients need a referral from health centre physician. However a considerable part of referrals originate from the private sector
Ireland	GPs act as gatekeepers
Italy	GPs act as gatekeepers
Netherlands	GPs act as gatekeepers
New Zealand	GPs act as gatekeepers
Norway	GPs act as gatekeepers
Spain	GPs act as gatekeepers
Sweden	Most of the access to hospitals follows a referral, but this is not compulsory and many patients access specialists directly
United Kingdom	GPs act as gatekeepers

ANNEX 2. SOURCES AND METHODS

136. Waiting times data and other variables were collected through a questionnaire submitted to 12 countries involved in the OECD Waiting Time Project. They are based on administrative databases regularly collected by participating countries. The main advantage of using administrative databases in an international context is that the sample used covers a large share or the entirety of the patient population of interest. The main challenge is to identify a common definition which allows comparisons of waiting times across countries.

137. The variables collected successfully included the following:

- the mean and median waiting time of the patients *admitted* for selected surgical procedures
- the age of patients waiting for selected surgical procedures
- the percentage of the patients waiting who were female for selected surgical procedures
- the percentage of elective treatments carried out in day surgery
- the number of surgical procedure rates (per 1 000 population)

138. Other variables, including the number of surgeons, were also included in the questionnaire but there were few responses and such variables were finally excluded from the analysis.

Definitions of waiting times and data availability

139. The data questionnaire requested the "inpatient waiting time for patients *admitted* for treatment". The main reason for choosing this measure was that it is the most widely available in OECD countries. Alternative measures are discussed below (see also Hurst and Siciliani, 2003). The waiting time of the patients *admitted* is defined as *"The time elapsed for a patient on the non-emergency (elective) surgery waiting list from the date they were added to the waiting list for the procedure (after specialist assessment) to the date they were admitted to an inpatient or day-case surgical unit for the procedure"*. This definition does not include "the time elapsed from the date of referral of the general practitioner to the date of specialist assessment", also known as the 'outpatient waiting time'.

140. The "inpatient waiting time of patients admitted for treatment" also includes all surgery performed either with 'at least an overnight stay' or as 'same-day surgery'. This distinction is relevant only for the procedures that can be performed on both bases (for example, cataract surgery). The inpatient waiting times was collected for 11 main surgical procedures classified according to the international classification system ICD-9-CM:

PROCEDURES	**ICD-9-CM CODES**	
- Cataract surgery	13.1-13.7	
- Percutaneous transluminal coronary angioplasty (PTCA)	36.0	
- Coronary bypass	36.1	
- Cholecystectomy	51.2	(includes laparascopic cholecystectomy)
- Inguinal and femorial hernia	53.0-53.3	(includes both unilateral and bilateral)

- Prostatectomy	60.2-60.6
- Vaginal hysterectomy	68.5
- Knee arthroscopy	80.26,80.6
- Total and partial hip replacement	81.51-81.53
- Knee replacement	81.54-81.55
- Ligation and stripping of varicose veins	38.5

141. Finally, the inpatient waiting times should include all "publicly-funded patients" who received the treatment either by publicly or privately (non-profit and for-profit) owned surgical providers.

142. Data availability varies widely across countries. Eight countries were able to provide the *mean* waiting time according to the proposed definitions for one or more surgical procedures (Australia, Denmark, the United Kingdom (England), Finland, Norway, the Netherlands, Spain (Insalud) and Sweden). The *median* waiting time was available for six countries (Australia, Canada, Denmark, the United Kingdom (England), Finland and Norway). While most of the countries report both the mean and the median, Canada reports the *median*, while the Netherlands, Spain and Sweden report only the *mean*.

143. Countries differed in the number of years for which data were available: Australia (2 years), Denmark (5 years), the United Kingdom (England; 10 years), Finland (6 years), Norway (2 years), Netherlands (2 years), Spain (Insalud; 1 year) and Sweden (5 years, but only for cataract surgery).

144. The mean and median waiting times data for patients admitted are reported in Tables 4 and 5 of the main text.

Country notes

Australia

145. Comparable data are available for years 1999-00 and 2000-01 and include only three jurisdictions (Queensland, South Australia and Western Australia), which count for approximately 36% (1999-00) and 35% (2000-01) of all admissions from waiting lists reported to the National Elective Surgery Waiting Times Data Collection (NESWTDC). The NESWTDC covers public acute hospitals only. Private hospitals are not generally included. Some public patients treated under contract in private hospitals are included. Only publicly-funded patients are included in the data provided. "Inguinal and femoral hernia" includes only inguinal hernia. "Hysterectomy" includes all hysterectomies. Sources: National Elective Surgery Waiting Times Data Collection linked to the National Hospital Morbidity Database.

Canada

146. Manitoba (MN): *Joint replacement*: the database includes only Winnipeg and captures 60-65% of the total surgical volume performed. Data include partial knee replacement. Saskatchewan (SK): *cardiac* wait list data reported has the following limitations: 1. patients who have made a personal choice to delay surgery are included; 2. data do not include all "emergent" cases; 3. difficulty in distinguishing isolated, uncomplicated cases; 4. difficulty with ascertaining the date of cardiac catheterization. *Hip and knee replacement*: the median waiting times represent only non-emergent surgery for total hip or total knee replacement. British Columbia (BC): median waiting times can be obtained from the following website: http://www.healthservices.gov.bc.ca/waitlist .

Denmark

147. The national statistics record the waiting time from the GP referral to the date of admission for the operation. The inpatient waiting time according to the OECD definition was estimated from the national statistics by pairing patients in the stationary register and the ambulatory register through the Personal ID-number and diagnosis. The waiting time is computed as the time between the day of the specialist visit (obtained through the ambulatory register) and the day on which the patient is operated upon (stationary register). The data covers the years 1996-2001, since the ambulatory register only contains data from 1996. Source: Danish National Register of Patients.

England

148. The data covers the years 1990-91 to 2000-01. Source: Hospital Episode Statistics.

Finland

149. The data covers the years 1997-2001. Sources: The National Hospital Discharge Register, Stakes.

The Netherlands

150. The data covers the years 2000 and 2001. Source: Prismant.

Norway

151. The national statistics record the waiting time from the GP referral to the date of admission for the operation. The inpatient waiting time according to the OECD definition was estimated from the national statistics using as the starting date the "date of the first specialist visit". Data were available for years 2000 and 2001. Source: Norwegian Patient Register.

Spain

152. Data include only INSALUD (*Instituto Nacional de la Salud*), which provided health services to more than 15 million people. Data are available for year 2001. Source: Waiting List Central Register in INSALUD.

Sweden

153. Comparable data are available only for cataract surgery for the years 1997-2001. Source: The Swedish National Cataract Register.

Alternative definitions of waiting times

154. There are alternative measures to the waiting times of the patients *admitted*, which include the "waiting time of the patients *on the list*" and "total waiting" (inpatient plus outpatient waiting).

155. Measures of the inpatient waiting time of the patients on the list were available for Spain (mean), Ireland and Sweden (percentage of patients waiting longer than 12 months; see Table 13). Measures of total waiting (from GP referral to treatment) were available in Denmark and Norway (Table 14).

156. There is no consensus on the best way to measure waiting times. Every measure is likely to have advantages and disadvantages, and to capture different aspects of waiting (for a more detailed discussion

see Hurst and Siciliani, 2003; Annex 2). For example, it may be argued that the waiting time of the patient *on the list* is desirable as it includes all the patients waiting, both the patients that will receive the treatments and the ones which will not (because of alternative treatment, decision to opt for the private sector or to give up the treatment). However this measure may include also patients with very low need whom doctors add to the list to exert pressure for more resources. These patients may never be included in the waiting time of the patients *admitted*. The waiting time of the patients *admitted* has the advantage of providing a measure of the *completed* waiting (as opposed to the *uncompleted* waiting of the patients on the list).

157. Depending on their level of need, patients can experience very different waiting times for given procedures. Waiting times statistics have become increasingly available on Internet websites. However, it is important for policy makers to provide explanatory notes pointing out how mean and median waiting times should be interpreted as reference numbers only. They may also want to consider the introduction of some dispersion indicators (for example the standard deviation; Cromwell *et al.*, 2002).

Table A13. Inpatient waiting times of patients on the list by surgical procedure.

	Hip replace-ment	Knee Repla-Cement	Cataract surgery	Varicose veins	Hyste-rectomy	Prosta-tectomy	Cholecy-stectomy	Inguinal and femoral hernia	CABG	PTCA
Spain (Insalud) (mean, days) Year 2000	60	63	48	51	53	43	54	48	21	
Ireland (% of the patients waiting longer than 12 months) Year 2000	50%	40%	24%	67%						
Sweden (% of the patients waiting longer than 12 months) Year 2002	11%	17%	6%	38%	2%	24%	29%		0%	0%

Table A14. Waiting time from GP referral to treatment. Denmark (year 2000) and Norway (year 2001).

		Hip replacement	Knee replacement	Cataract surgery	Varicose veins	Hysterectomy	Prostatectomy	Cholecystectomy	Inguinal and femoral hernia	CABG	PTCA
Denmark	Mean	150	166	195	211	81	88	89	111		
Norway	Mean	211	267	192	263	112	146	129	151	71	69
Denmark	Median	123	137	177	149	56	62	70	84		
Norway	Median	160	208	145	199	65	92	88	101	38	49

Future work on data collection at international level

158. The OECD Waiting Times project has made a first step in the collection of comparable international data on waiting times for elective surgery. As waiting times differ markedly according to the type of condition (cataract rather than heart disease), data were collected at surgical procedure level.

159. An alternative possibility would be to collect data at speciality level (for example ophthalmology, orthopaedics). However, as speciality denominations differ markedly across countries and no international mapping of different specialities exists, this would be a difficult task. Nevertheless, the collection of this type of data may still be possible for a subset of countries (for example the European Union) as collection of data at speciality level has already started (for example Eurostat (2003) provides number of doctors broken down by speciality).

160. The present analysis focuses on the waiting time of the patients admitted for treatment. Future work might include collecting comparable information on the waiting time of the patients *on the list*, as the two figures may differ remarkably.

161. Finally, the present analysis has focused on the "inpatient" waiting time (from "specialist visit to treatment"). However, another significant part of 'total' waiting is the "outpatient" waiting time (from "GP referral to the specialist visit"). Some preliminary evidence for three countries is presented in Annex 3.

ANNEX 3. OUTPATIENT WAITING TIME

162. We define "outpatient waiting time" as the time elapsed from the GP referral to the specialist visit. One country (England) reports outpatient waiting times as well as inpatient waiting times separately. Two countries (Denmark and Norway) routinely report total (outpatient plus inpatient) waiting times (from GP referral to treatment). They were able to separate the two periods of waiting for this study. The outpatient waiting time data at *speciality* level available for England is reported in the following table:

Table A15. Outpatient waiting times as a proportion of total waiting time by surgical procedure. England. Year 2001.

Publicly-funded patients

	Inpatient Waiting time		Outpatient Waiting time		Outpatient waiting time as a share of the total	
SPECIALITY	Mean	Median	Mean	Median		
	A	B	C	D	C/(A+C)	D/(B+D)
General surgery	122	84	56	35	31%	29%
Vascular surgery	110	80	73	56	40%	41%
Thoracic surgery	156	129	32	15	17%	10%
Urology	110	74	75	54	41%	42%
Ophthalmology	125	97	91	66	42%	40%
Orthopedic surgery	151	122	115	76	43%	38%
Ear Nose and Throat	130	92	88	64	40%	41%
Gynecology and Obstetrics	99	70	57	41	37%	37%

Source: Hospital Episode Statistics.

163. In England the outpatient waiting time counts for a significant share of the total waiting for the patients and varies according to the speciality between 10% and 40% of total waiting. For vascular surgery, urology, ophthalmology, orthopaedic surgery and 'ear nose and throat' surgery, it accounted for between 38-43%.

164. For two countries (Denmark and Norway) it is possible to estimate the outpatient waiting time at surgical procedure level as the difference between the total waiting (from GP referral to treatment) and the inpatient waiting time (form specialist visit to treatment). The results are presented in the following tables.

Table A16. Outpatient waiting times as a proportion of total waiting time by surgical procedure. Norway. Year 2001.

	Total	Total	Inpatient	Inpatient	Outpatient waiting time as a share of the total	
	Mean	Median	Mean	Median		
	A	B	C	D	(A-C)/A	(B-D)/B
Total and partial hip replacement	211	160	126	93	40%	42%
Knee replacement	267	208	152	126	43%	39%
Ligation/stripping of varicose veins	263	199	141	108	46%	46%
Vaginal hysterectomy	112	65	62	36	45%	45%
Prostatectomy	146	92	76	46	48%	50%
Cholecystectomy	129	88	76	54	41%	39%
Coronary bypass	71	38	46	27	35%	29%

Table A17. Outpatient waiting times as a proportion of total waiting time by surgical procedure. Denmark. Year 2000.

	Total	Total	Inpatient	Inpatient	Estimate of the share of outpatient waiting time	
	A	B	C	D	(A-C)/A	(B-D)/B
	Mean	Median	Mean	Median		
Total and partial hip replacement	150	123	112	87	25%	29%
Knee replacement	166	137	112	90	33%	34%
Ligation/stripping of varicose veins	211	149	99	69	53%	54%
Cholecystectomy	89	70	75	57	15%	19%
Inguinal and femoral hernia	111	84	73	46	34%	45%

165. For Norway the outpatient waiting time counts for a significant share of the total waiting for the patients and varies according to the surgical procedure between 29% and 50% of total waiting. For Denmark it varies between 15% and 54% of the total waiting.

ANNEX 4. WHAT EXPLAINS LOW WAITING TIMES IN FRANCE, GERMANY AND THE UNITED STATES?

France

166. The French health care system is based on a health insurance system composed by a basic compulsory public insurance and a supplementary insurance provided by private insurers and *mutuelles*. It is also characterised by almost total freedom for people to choose and use private and public health care services without a referral system.

167. Evidence. Imai, Jacobzone and Lenain (2000; p.2) report that "the health system in France is regarded as delivering high quality services, with freedom of choice and generally no *waiting lists* for treatments".

168. Institutions. About 70% of beds are in public hospitals, which account for two-thirds of hospital spending. Public hospital employees have the status of civil servants and are salaried. Public hospitals deal with most of the emergency treatments, the bulk of major operations, including the life-threatening conditions. Private clinics are often smaller and handle the bulk of minor surgery, for which their market share can be very high, especially in the area of elective surgery.

169. Public hospitals are funded through global budgets which are set annually by the authorities and allocated every month by the health insurance funds. Modest payments by patients top up these budgets. Until recently, hospital budgets have been determined on the basis of the historic operating costs, with a modest allowance made for their actual level of activity, the average case-mix specific costs of treating certain diseases or expensive drugs. Private clinics are paid on a fee-for-service basis (both for doctors and hospitals). Similarly, ambulatory care is provided primarily by doctors in private practice on a fee-for-service basis. The authorities set official schedules of reimbursement which in a number of cases correspond to the actual prices imposed on service providers. The system of ambulatory care provides easy access to a specialist, in contrast to many other OECD countries, where a patient can consult a specialist only through an out-patient consultation in a hospital, often with long waiting lists (Imai, Jacobzone and Lenain, 2000).

170. Capacity. Table A2 shows how hospital acute care beds availability is among the highest in OECD countries with 6.7 beds (per 1 000 population) in 2000, as opposed to 3.2 beds for the countries with waiting times. Similarly, the number of practising physicians (per 1 000 population) is 3.3, as opposed to 2.8 for countries with waiting times. The number of practising specialists is also higher than in countries with waiting times but the difference is small (1.7 as opposed to 1.5; Table A3). Total and public health expenditure per capita in year 2000 were respectively $2387 and $1810, as opposed to $2092 and $1585 in countries with waiting times (Table A1).

171. Activity. Activity is also correspondingly higher. Table A5 shows how the number of total discharges was equal to 250 (per 1 000 population) as opposed to 155 in countries with waiting times. Table A6 also shows how the number of surgical procedure rates (per 100 000 population) in year 2000 was significantly higher for most of the procedures considered (with the exception of hysterectomy and CABG).

172. *Conclusion*. The high capacity available in the hospital sector, combined with free access to private hospitals (30% of beds) under public health insurance, together with fee-for-service remuneration of the specialists and activity-related funding in private hospitals, explain the absence of significant waiting

times in the French health care system. Private hospitals provide high volumes of minor elective surgery and act as safety valve if queues build up for public hospitals.

Germany

173. The German health care system is characterised by a mixture of compulsory and voluntary health insurance. In 1997 75% of the population had mandatory health insurance (for people whose income was below a fixed level or unemployed). 13% had voluntary insurance through statutory sickness funds while 10%, in general civil servants, were covered by their employers. Most of the remaining population (mainly high-income earners) had private health insurance. Less than 0.5% of the population were uninsured (WHO, 2000).

174. Evidence. In Germany "Waiting lists and explicit rationing decisions are virtually unknown" (WHO, 2000). A survey for cataract surgery based on self-reported mean waiting times suggested a value equal to 35 days in 2000 (Wenzel, Reuscher, Aral, 2001; survey based on 450 institutions and 926 operating ophthalmologists).

175. Institutions. The health care delivery system is characterised by a clear institutional separation between hospital care (inpatient), and primary and secondary ambulatory care administered through office-based physicians. This separation has been recently lessened by allowing day-surgery in hospitals and a limited amount of ambulatory pre- and post-inpatient care. Germany has no gate-keeping system, and patients are free to select a sickness-fund-affiliated doctor of their choice. Of the 2030 general hospitals, around 790 hospitals are in public ownership, 820 have private non-profit status and 420 are private for-profit hospitals, with bed shares of 55%, 38% and 7% respectively.

176. Hospital budgets are established during negotiations between the sickness funds and the hospitals. The budget specifies targets in terms of activity as well as per diems to be reached by the end of the financial year. Activity above the target is only reimbursed at 25% for the fees and 10–15% for the activity. If actual activity is lower than the target then it receives 40% of the difference (WHO, 2000). Since 1993, hospitals have been allowed to offer surgery on an ambulatory or day-case basis.

177. However, minor surgery has been provided in the ambulatory sector under fee-for-service arrangements in private practice for a long time (especially by ophthalmologists, orthopaedic surgeons and other specialists). In 1991, day surgery accounted for almost 2% of sickness funds expenditure in the ambulatory care sector. All ambulatory care, primary and outpatient secondary care, is provided by office-based physicians (most of them working in solo practice).

178. Capacity. Table A2 shows how hospital acute care beds availability is among the highest in OECD countries with 6.4 beds (per 1 000 population) in 2000, as opposed to 3.2 beds for the countries with waiting times. Similarly, the number of practising physicians (per 1 000 population) is 3.3, as opposed to 2.8 for countries with waiting times. The number of practising specialists is 2.2, as opposed to 1.5. (Table A3). Total and public health expenditure per capita in year 2000 were respectively $2780 and $2086, as opposed to $2092 and $1585 in countries with waiting times (Table A1).

179. Activity. Activity is also correspondingly higher. Table A5 shows how the number of total discharges was equal to 197 (per 1 000 population) in 1999 as opposed to 155 in countries with waiting times. Table A6 also shows how the number of surgical procedure rates (per 100 000 population) in 2000 was significantly higher for most of the procedures considered (with the exception of cataract).

180. *Conclusion.* Virtually universal health insurance combined with high hospital capacity and extensive ambulatory day surgery (the latter remunerated with a fee-for-service mechanism), are likely explanations for the lack of significant waiting times in the German health care system.

The United States

181. About 86% of the U.S. population is covered by health insurance. About 14% of the population has no insurance coverage, although subsidised programmes facilitate access for the 40 million uninsured (Docteur *et al.*, 2003). Most of the working-age population and their family are covered by employer-provided insurance plans. *Medicare*, a publicly-funded program, covers the older population and some of the disabled. *Medicaid* covers the poorest part of the population.

182. *Evidence.* Survey data suggest that there are very low waiting times for elective surgery in the U.S. Blendon *et al*. (2002) reported the percentage of respondents to a phone survey in 2001, who had experienced elective surgery in the last two years and who said they had waited longer than four months for elective surgery. It was found that 5% of patients had been waiting for at least 4 months in the United States, as opposed to 23% in Australia, 26% in New Zealand, 27% in Canada and 38% in the United Kingdom. Carroll *et al.* (1995) found that the percentage of the respondents in need of elective coronary bypass who had been waiting for more than three months was 0% in U.S., 18.2% in Sweden, 46.7% in Canada, and 88.9% in the United Kingdom. Similarly, Coyte *et al.* (1994) found that surveyed patients in need of knee replacement had a median waiting time of three weeks in the United States and eight weeks in Canada (Ontario).

183. Institutions. Most health care facilities are privately owned. Hospitals are run either on a not-for-profit or a for-profit basis. Under the Medicare programme, payments to hospitals, physicians and other providers are determined by complex prospective payment systems. These systems provide the programme with a high level of control over the price component of total spending, but not much leverage over the volume of services.

184. The number of hospitals has fallen by 14% in the last decade (Docteur *et al.*, 2003). Table A2 shows that the number of acute care beds was only 2.9 (per 1 000 population) as opposed to 5.5 for other countries which do not report waiting times. This may be explained by the spread of managed care in the private sector and by the use *(note – Medicare PPS was introduced more than a decade ago)* of prospective payment systems by Medicare and some other payers, which furnish incentives to reduce the length of stay and to increase the use of ambulatory care. Physician payment methods vary widely by payer and type of practice from fee for service to capitation.

185. *Capacity.* Table A2 shows that hospital acute care bed availability is among the lowest in OECD countries with 2.9 beds (per 1 000 population) in 2000, as opposed to 3.2 beds for the countries with waiting times. The number of practising physicians (per 1 000 population) was 2.7 in 1999, the same as for countries with waiting times. The number of practising specialists was 1.4, also very similar to the average country with waiting times (Table A3). On the contrary, total and public health expenditure per capita in 2000 were much higher than in countries with waiting times. Total and public health expenditure were respectively $4540 and $2005, as opposed to $2092 and $1585 in countries with waiting times (Table A1).

186. Activity. Table A5 shows that the number of total discharges was equal to 115 (per 1 000 population) in 1999 as opposed to 155 in countries with waiting times. However, this figure does not include day cases. A 1996 survey suggested that about half of surgical procedures in the U.S. were carried out as day cases. Table A4 suggests that such a share was only reached in waiting times countries in 2000 and that the share may have been considerably lower in 1996. Table A6 also shows that the number of surgical procedure rates (per 100 000 population) in 2000 was significantly higher for knee replacement, hysterectomy and CABG, but not for prostatectomy and hip replacement.

187. Conclusion. The United States spends much more on health care compared to all other OECD countries. Although bed capacity is lower compared with countries without waiting times, day surgery capacity is probably comparable or higher. The majority of providers of surgery is private and is highly incentivised to meet demand by activity-related payments.

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