The cost of coronary artery disease in the UK

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Abstract

Coronary artery disease (CAD) is the leading cause of death in the UK. The objective of this study was to readdress the economic burden of CAD in the UK, with the ultimate aim of providing a reliable and up-to-date estimate of the economic cost to society of CAD in the UK. We estimated the cost of CAD in the UK using a prevalence-based 'top down' approach. We took a societal perspective by including both direct healthcare costs and indirect costs. The total direct healthcare cost of CAD in the UK in 2001 was estimated to be approximately £1.8 billion. The largest cost components were drug treatment (70%) and hospital treatment (25%). Friction-adjusted indirect costs of CAD borne by society in the UK are estimated to be £702 million, or approximately 28% of the overall costs of CAD.

Our study illustrates the impact of recent changes in drug treatment for CAD, and has shown that CAD has a relatively small share of total NHS expenditure considering that CAD is the leading cause of death in the UK. This suggests that new medical interventions are required for CAD, with sufficient efficacy and cost-effectiveness to justify a greater share of NHS resources.

Key words: coronary artery disease, cost of illness, cost allocation.

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Introduction

Coronary artery disease (CAD), defined in this study using the International Classification of Diseases (ICD10) codes I20–I25 (ischaemic heart disease), is the leading cause of death in the UK.[1] One in four men and one in six women die from the disease: CAD caused more than 120,000 deaths in the UK in 2001.[1]

The epidemiological importance of CAD in the UK is well documented,[1] but less attention has been paid to the economic burden. A cost of illness study quantifies the economic burden of a disease, expressing it in monetary terms by estimating the resources consumed in disease prevention, detection and treatment. This type of study offers an alternative perspective on the importance of disease, and can provide a useful tool for determining research priorities.

Previous attempts have been made to estimate the economic impact of CAD in the UK.[2-5] They have tended to focus on the direct healthcare costs. More recently, the importance of the indirect costs of CAD has been identified.[6] The objective of this study was to readdress the economic burden of CAD in the UK, by building on earlier studies and taking a more conservative approach, with the ultimate aim of providing a reliable and up-to-date estimate of the economic cost of CAD to society in the UK.

Methods

We estimated the cost of CAD in the UK using a prevalence-based 'top down' approach and aggregate data on mortality, morbidity and health service utilisation. Often cost of illness studies focus solely on cost items attributable to the healthcare system (direct healthcare costs). However, there are substantial indirect non-health service costs associated with loss of production through morbidity and mortality. We took a societal perspective by including both direct healthcare costs and indirect costs. The total cost estimate was obtained for the whole UK in 2001 (the base year). Where the available data covered only England or England and Wales, estimates were weighted to the UK level using population ratios from the 2001 census. Costs incurred from future losses in productivity resulting from mortality were discounted at a rate of 6% to reflect a positive rate of time preference.[7]

Epidemiology

The number of prevalent CAD cases in the UK was estimated by combining prevalence data taken from the 1998 Health Survey for England with 2001 UK census population data (table 1).[8-11] These estimates were used for calculating the cost of CAD.

Direct healthcare utilisation and costs

Hospital in-patient treatment costs for CAD were estimated using NHS reference costs for England 2001.[12] We identified the HealthCare Resource Groups (HRGs) associated with CAD. These

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Table 1. CAD prevalence and mortality in the UK

	Age group (years)							
	16–24	**25–34**	**35–44**	**45–54**	**55–64**	**65–74**	**75+**	**Total**
Prevalence								
Men	3,636	16,382	39,010	165,752	416,309	464,708	376,844	**1,482,639**
Women	0	12,796	26,658	70,591	198,936	329,443	514,112	**1,152,536**
Total	**3,636**	**29,178**	**65,668**	**236,343**	**615,245**	**794,151**	**890,956**	**2,635,175**
Mortality								
Men	5	112	897	3,611	8,409	17,662	35,945	**66,646**
Women	4	22	197	763	2,532	8,677	42,397	**54,593**
Total	**9**	**134**	**1,094**	**4,374**	**10,941**	**26,339**	**78,342**	**121,239**

Data taken from references[8-11] and the UK Census 2001

were, specifically, acute myocardial infarction (E11 and E12), angina (E33 and E34), coronary atherosclerosis (E22 and E23), cardiac arrest (E28), coronary bypass (E04), percutaneous transluminal coronary angioplasty (PTCA) (E15), and other percutaneous cardiac procedures (E16).

We combined elective and non-elective finished consultant episodes (FCE) in 2001 and calculated weighted mean costs for each HRG and a weighted average cost for a CAD-related in-patient episode (table 2). An estimate of the mean total annual in-patient costs for CAD in the UK was obtained by multiplying the total number of CAD-related in-patient episodes by the weighted mean costs for a CAD-related in-patient episode.

The number of out-patient hospital attendances related to CAD was estimated by multiplying the excess referral rate among people with CAD by the prevalence of CAD in the UK. *Key health statistics from general practice* reported out-patient referral rates of 11 per 100 patients and 25 per 100 CAD patients for England and Wales in 1994.[13] Multiplying the excess referral rate (14 per 100 patients) by the estimated number of people in the UK suffering from CAD in 2001 (table 1) gave an annual estimate of CAD-related out-patient visits. We also assumed that half of all in-patient episodes relating to CAD were followed by one out-patient appointment. The unit cost of an out-patient visit for CAD was estimated by taking the weighted average cost of all cardiology out-patient visits reported in 2001.[12] The total cost of out-patient visits related to CAD was estimated by multiplying the average unit cost per visit by the total estimated number of out-patient visits related to CAD.

Primary care consultation rates related to CAD were obtained from the fourth national study on morbidity[14] and applied to CAD prevalence data to give an estimate of the number of CAD-related consultations. These were multiplied by appropriate unit costs[15] to provide an estimate of the total cost of CAD in primary care.

Data on the number and cost of prescriptions dispensed in the community used for prevention and treatment of cardiovascular disease (CVD) in England in 2001 were obtained from the Department of Health (table 3).[16] The Department of Health estimated that 48.9% of all the prescriptions for CVD were for CAD in 1994.[17] We acknowledge that this figure is likely to be somewhat out of date, particularly with the large increase in prescribing of lipid-regulating drugs during the intermittent years. Therefore, we attributed the increase in lipid-regulating drugs wholly to the treatment of CAD and estimated that 66.3% of all prescriptions for CVD were for CAD. The cost of dispensing was

Table 2. CAD-related hospital in-patient HRG costs

HRG code	**Label**	**Share FCEs**	**Weighted average unit cost**
E11	Acute myocardial infarction with complications	5%	£1,308
E12	Acute myocardial infarction without complications	25%	£910
E22	Coronary atherosclerosis > 69 years or with complications	2%	£1,274
E23	Coronary atherosclerosis < 70 years without complications	2%	£1,056
E28	Cardiac arrest	1%	£849
E33	Angina > 69 years or with complications	25%	£747
E34	Angina < 70 years without complications	23%	£602
E04	Coronary bypass	7%	£5,502
E15	PTCA	8%	£2,554
E16	Other percutaneous cardiac procedures	2%	£1,854

Key: CAD = coronary artery disease; HRG = healthcare resource group; FCE = finished consultant episode; PTCA = percutaneous transluminal coronary angioplasty
Data from Department of Health[12]

Table 3. Prescriptions for cardiovascular disease in England in 2001

British National Formulary (BNF) Section name (chapter and section)	Prescriptions (thousands)	Cost (£ thousands)
Positive inotropic drugs (2.1)	4,030.6	£3,572.0
Diuretics (2.2)	30,203.3	£61,853.1
Anti-arrhythmic drugs (2.3)	1,292.1	£15,290.9
Beta-adrenoceptor blocking drugs (2.4)	20,438.8	£81,644.2
Antihypertensive therapy (2.5)	25,046.9	£420,616.9
Nitrates, calcium blockers and potassium channel activators (2.6)	26,813.5	£366,703.6
Sympathomimetics (2.7)	1.6	£139.9
Anticoagulants and protamine (2.8)	4,609.1	£19,917.0
Antiplatelet drugs (2.9)	18,890.6	£50,954.2
Antifibrinolytic drugs and haemostatics (2.11)	282.4	£4,635.6
Lipid-regulating drugs (2.12)	13,523.0	£438,845.0
Local sclerosants (2.13)	0.5	£2.1
Total	**145,132**	**£1,464,174**

Prescription cost analysis data from the Department of Health[16]

estimated by multiplying the total number of items dispensed by the unit cost of dispensing.[18]

Indirect costs

The human capital approach values costs to society as the value of lost production.[19] To calculate the cost of lost production due to premature death and inactivity during hospitalisation and associated recuperation, we included the value of lost employment and household production. This approach may overstate the costs because some nominally 'lost' work, or workers, can be replaced.[20] Time may be required to find and train suitable replacement workers. Therefore, the true production lost is the time taken to obtain suitable replacements. This is known as the friction cost approach.[19]

Levels of production were taken from the time use survey for Great Britain,[21] separated by labour force and household activity (defined using the household satellite account).[22] We assumed that both hours of employed production were constant and household production hours were constant up to retirement age (65 for men, 60 for women). From retirement age, household activity was taken to decay linearly to one hour per week at age 90. These time-use data were combined with age and gender-specific income data to estimate the value of production.[21,23]

The average hourly rate of pay was used as a 'shadow price' to value household production. Multiplying household hours worked by the shadow price and adding this to the gross weekly wage estimated the value of production for an employed person. The value of production for an unemployed person was calculated by multiplying household hours worked by the shadow price. An expected value of production for each age/gender combination was then calculated by applying a weighting for the probability of being employed.[24] This process identified the productive weekly value of a person of a given age and gender. These values were used to calculate lifetime productive values, weighted by the chance of natural death using crude mortality rates.[25,26] A 6% discount rate was used to convert expected future earnings into present values.[7]

The value of lost lifetime production from premature death caused by CAD was calculated by multiplying the respective values of production by the number of CAD fatalities of a given age and gender (table 1). We also allowed for friction costs and the ultimate replacement of deceased workers by only counting the first 90 days of lost production resulting from mortality.[20]

Lost production results from time off work due to hospitalisation and associated recuperation. The value of lost production is the average weekly value of production (employed plus household, stratified by age and gender) multiplied by the number of weeks spent in hospital and in recuperation. We assumed that two thirds of all CAD-related hospital in-patient episodes were followed by four weeks of time off work for recuperation, in addition to any time spent in hospital.[27]

To estimate costs to families, we assumed that one family member visits each CAD patient every day during their hospitalisation. That family member would incur travel and time costs. Travel costs were estimated by assuming that, on average, each visit involves a six-mile round trip. The cost per mile (£0.45) was taken from the authorised mileage rates published by the Inland Revenue.[28] The average travel cost per hospital visit was estimated to be £2.70. We assumed that the total time used per visit was two hours. We used average hourly earnings weighted by age and gender to estimate a 'shadow price' of £10.78 per hour as the value of family members' time.[23] The average length of stay for CAD was 4.51 days in 2001.[29] Thus, the average total cost to the family for visiting relatives was £97.33 per CAD-related in-patient episode.

Sensitivity analyses

Since we drew upon a wide range of sources and assumptions, there will be uncertainty in the estimated cost of CAD. Therefore, sensitivity analyses were performed to test the various input parameters to identify those where a change in value brings about the greatest change in the results. Each input parameter was varied by 20%.

Results

Direct healthcare costs

We estimated the total direct healthcare cost of CAD in the UK in 2001 at £1.8 billion (table 4). The largest costs were those used for drug treatment (70%) and in-patient hospital treatment (25%).

In 2001 there were a total of 285,172 CAD-related in-patient episodes in England. Assuming a constant incidence across the UK and applying census population data, we estimated that there was a total of 341,177 CAD-related in-patient episodes in

Table 4. Costs of coronary artery disease in the UK in 2001

Type of resource		Units	Average cost (£)	Total cost (£ million)	Source (reference no.)
Direct healthcare costs					
In-patient	Hospital episode	341,177	£1,312	£447.7	12
Out-patient	Attendances	539,513	£84.42	£45.5	12,13
Drug treatment	Prescriptions	95,117,127	–	£1,161.9	16
	Dispensing	95,117,127	£0.975	£92.7	16
Primary care	Doctor at clinic	2,154,007	£13	£28.0	15,14
	Doctor at home	497,110	£42	£20.9	
	Nurse at clinic	50,070	£7	£0.35	
	Nurse at home	30,083	£10	£0.30	
Subtotal				£1,797.4	
Indirect costs					7,21-6
Mortality	Deaths	121,239	–	£6,317	1
(friction-adjusted)		–	–	(£298)	20
Morbidity	Sickness leave (weeks)	1,120,611	–	£370.6	27
Family		341,177	£97.33	£33.2	23,28,29
Subtotal				£6,72.1	
(friction adjusted)				£701.8	
Total cost of illness				£8,518.7	
(friction-adjusted)				£2,499.3	

the UK in 2001. We estimated that the average unit cost for a CAD-related in-patient episode in the UK was £1,312.10. Multiplying this figure by the total number of in-patient episodes, we estimate that in-patient care for CAD cost £447.7 million in the UK in 2001 (table 4).

We estimated that in 2001 there were approximately 539,513 out-patient visits related to CAD in the UK. The weighted average unit cost of a cardiology out-patient visit was estimated to be £84.42. Multiplying these figures, we estimate that out-patient care for CAD cost £45.5 million in the UK in 2001 (table 4).

We estimated that there was a total of 2.7 million primary care consultations for CAD in the UK in 2001. This cost the NHS approximately £49.5 million (table 4). The majority of consultations took place at GP surgeries.

There was a total of 145 million prescriptions for cardiovascular disease in England in 2001 (table 3). We estimated that there were approximately 95 million prescriptions for CAD in the UK in 2001, costing approximately £1.16 billion. We estimated that an additional £92.7 million was spent on dispensing. The largest contributor to drug costs was lipid-regulating drugs, accounting for approximately 38%, followed by antihypertensive therapy (23%), and nitrates, calcium blockers and potassium channel activators (20%).

The estimate of the direct healthcare costs of CAD was not very sensitive to changes in the input parameters. Changes in the volume of prescriptions and in-patient episodes produced the largest variations (14.0% and 5.1%, respectively), and changes in the other input parameters had a small effect only (figure 1). The parameters are ranked in order from greatest to smallest effect on direct healthcare costs.

Indirect costs

Using the human capital approach, we estimated that mortality from CAD in the UK cost £6.3 billion in 2001 (of which £4.7 billion can be attributed to males and £1.6 billion to females). Alternatively, costing the loss of productivity until a replacement worker is found (friction cost approach), an estimate of £298 million was obtained (£212.4 million for men and £85.6 million for women).

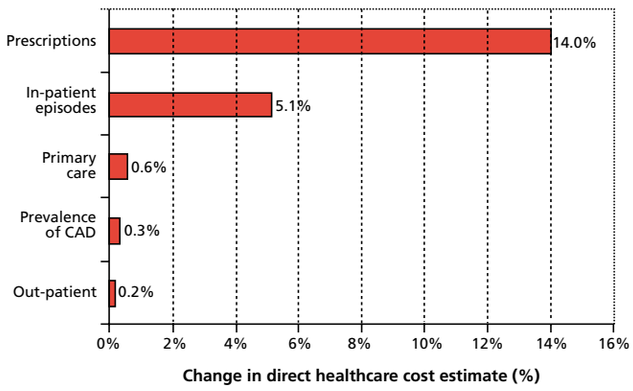
We estimated that approximately 1.5 million working days, or £72.8 million, were lost due to hospitalisation for CAD in the UK in 2001. A further 6.3 million working days, or £297.8 million, were lost in time off work for recuperation following discharge from hospital. Costs to families incurred through visiting patients in hospital amounted to approximately £33.2 million in the UK in 2001.

The largest driver of friction-adjusted indirect costs is the value of lost production due to hospitalisation and recuperation: a 20% change results in a 10.6% change in total friction-adjusted indirect costs. The second largest driver of indirect costs is the value of lost production due to premature death: a 20% change results in an 8.49% change in total friction-adjusted indirect costs. Family resources have the smallest impact on indirect costs: a 20% change results in a 0.95% change in total indirect costs.

Discussion

We estimated that the annual cost of CAD in the UK in 2001 was approximately £2.5 billion. The vast majority of these costs, £1.8 billion (72%), were direct healthcare costs. The main contributors to direct healthcare costs were drug treatment (70%) and in-

Figure 1. Sensitivity of direct healthcare costs to 20% changes in key factors



patient hospitalisation (25%). Over the last four years the total cost of prescriptions for CVD in England has grown at an average annual rate of 18.6%. This has been driven by a large increase in the prescribing of lipid-regulating drugs for prevention of CAD.

Using a prevalence-based approach, Stewart *et al.* estimated that in 2000 angina pectoris cost £669 million to the UK National Health Service.[30] This estimate for angina fits well with our direct healthcare cost estimate for CAD in the UK. Our estimate of both in-patient and out-patient hospitalisation costs for CAD is significantly lower than that presented by Liu *et al.*[6] Our approach made better use of the available data to calculate the weighted average cost per CAD-related episode/attendance, as opposed to simply using a less specific specialty unit cost. Similarly, our estimate of the cost of drug treatment for CAD was significantly higher than that presented by Liu *et al.* This is due to the fact that we attribute the large increase in the prescribing of lipid-regulating drugs solely to the prevention of CAD.

Indirect costs borne by society account for only £702 million (30%) of our estimated cost of CAD in the UK. Indirect costs typically swamp all direct costs in disease areas with high mortality, due to the high value of earnings per week relative to many healthcare costs, and the long duration of the effect of lost output. However, we adopted the friction cost approach to the estimation of indirect costs, which only includes the value of production lost during the time taken to recruit and train suitable replacement workers. Our estimate of indirect costs without friction adjustments, £6.72 billion, highlights the significance of the debate over which is the most appropriate methodology. However, we have shown that indirect costs are an important contributor to the overall cost of CAD. The importance of indirect costs should not be understated.

Using a friction cost approach Liu *et al.* estimated that CAD cost the UK approximately £2.9 billion in productivity losses. This is significantly different to our friction-adjusted estimate, and further highlights the need to identify a universally acceptable approach to estimating indirect costs of illness. The difference appears to be the result of assumptions made about the extent of work incapacity resulting from CAD. We conservatively assumed that two thirds of all CAD-related hospital in-patient episodes were followed by four weeks of time off work for recuperation, in addition to any time spent in hospital. However, Liu *et al.* assumed that all CAD events were followed by 90 days' work incapacity. Moreover, our estimates of production losses were based on age- and gender-specific productive weekly values, whereas Liu *et al.* used crude average weekly earnings. Since CAD prevalence increases with age and income falls as individuals reach retirement, this approach is likely to overstate the true cost of lost production.

We acknowledge that there are limitations to this study, mostly relating to data quality and availability. Recent research has highlighted both the scarcity and mixed quality of data sources for coronary heart disease in the UK.[31] Data on prevalence, incidence and costs were obtained from national databases and relevant clinical literature. The accuracy of our estimates is dependent on the accuracy of these data sources. Our selection of data sources was based on reliability and representativeness. For instance, the 1998 Health Survey for England includes information on both the prevalence of CAD and healthcare resource use. However, we only used the prevalence data, since NHS reference costs,[12] key health statistics from general practice,[13] and the fourth national study on morbidity,[14] provided a more representative source for hospitalisation, out-patient and primary care resource use. In the absence of UK level data, we have used data for England and adjusted to the UK level using population ratios from the 2001 census. This implicitly assumes that data for England are representative of the whole UK, which might not be true. However, the sensitivity analyses showed that our estimates were relatively robust to variation in input values.

The National Institute for Clinical Excellence (NICE) makes recommendations on the use in the NHS of health technologies based on appraisal and assessment of 'clinical and cost effectiveness'.[32] When considering that CAD is the leading cause of death in the UK, accounting for approximately 20% of all deaths,[1] it is perhaps a little surprising that it had such a small share (3.4%) of the £44 billion spent on the NHS in 2001.[33] This raises issues surrounding the allocation of healthcare resources, and suggests that new medical interventions are required for CAD with sufficient efficacy and cost-effectiveness to justify a greater share of NHS resources. Any increases in expenditure on more efficacious interventions for CAD are likely to be offset by reductions in indirect costs through reduced mortality. Perhaps we have seen the beginning of this with the large increase in the prescribing of lipid-regulating drugs? Our study offers an up-to-date estimate of the cost of CAD in the UK, and has illustrated the impact of recent changes in drug treatment for CAD.

Acknowledgements/conflict of interest

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Key messages

- The total direct healthcare cost of CAD in the UK in 2001 is estimated to be approximately £1.8 billion. The largest cost component was expenditure on drug treatments (70%), which have grown significantly in recent years with rapid increases in prescribing of lipid-regulating drugs
- Indirect costs borne by society contribute significantly to the total cost of CAD in the UK. However, agreement on a universally acceptable approach to estimating indirect costs remains an important goal for health economics
- CAD accounts for a small share of total NHS expenditure considering that CAD is the leading cause of death in the UK. This highlights the need for new medical interventions for CAD with sufficient efficacy and cost-effectiveness to justify a greater share of NHS resources

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References

1. British Heart Foundation. *Coronary heart disease statistics.* London: British Heart Foundation, 2003.
2. Currie CJ, Morgan CL, Peters JR. Patterns and costs of hospital care for coronary heart disease related and not related diabetes. *Heart* 1997;**78**:544-9.
3. Audit Commission. *Dear to our hearts? Commissioning services for the treatment or prevention of coronary heart disease.* London: HMSO, 1995.
4. Wells N. *Coronary heart disease: the need for action.* London: Office of Health Economics, 1987.
5. Office of Health Economics. *Compendium of health statistics.* 9th ed. London: Office of Health Economics, 1995.
6. Liu JLY, Maniadakis N, Gray A, Rayner M. The economic burden of coronary heart disease in the UK. *Heart* 2002;**88**:597-603.
7. National Institute for Clinical Excellence. Technical Guidance for Manufacturers and Sponsors on Making a Submission to a Technology Appraisal. 2001.
8. Joint Health Surveys Unit. *Health Survey for England 1998, vol 1. Findings.* London: HMSO, 1999.
9. Office for National Statistics. Deaths 2001 Registrations: Deaths by age, sex and underlying cause: England and Wales. 2002.
10. General Register Office Scotland. Vital Events Reference Tables. Edinburgh, 2001.
11. General Registrars Office Northern Ireland. *The Annual Report of the Registrar General 2001.* London: The Stationery Office, 2002.
12. Department of Health. *Reference Costs 2001*. London: Department of Health, 2002.
13. Government Statistical Service. *Key Health statistics from general practice.* London: The Stationery Office, 1996.
14. McCormick A, Fleming D, Charlton J. *Morbidity statistics from general practice: 4th national study 1991-92.* London: HMSO, 1995.
15. Netten A, Curtis L. *Unit costs of health and social care 2001*. Canterbury: Personal Social Services Research Unit, University of Kent, 2001.
16. Department of Health. *Prescription cost analysis.* London: Office for National Statistics, 2001.
17. NHS Executive. *Burdens of Disease, A Discussion Document.* Wetherby: Department of Health, 1996.
18. National Health Service England and Wales. *Drug Tariff: October 2001*. London: The Stationery Office, 2001.
19. Koopmanschap MA, Rutten FF. A practical guide for calculating indirect costs of disease. *Pharmacoeconomics* 1996;**10**:460-6.
20. Koopmanschap MA, Van Ineveld BM. Towards a new approach for estimating indirect costs of disease. *Soc Sci Med* 1992;**34**:1005-10.
21. Short S. *Time use data in the household satellite account.* London: Office for National Statistics, 2000.
22. Eurostat. Proposal for a Satellite Account of Household Production. Eurostat Working Papers 9/1999/A4/11 ed. 1999.
23. *Labour Market: New Earnings Survey.* London: Office for National Statistics, 2001.
24. *Labour Force Survey.* London: Office for National Statistics, 2002.
25. Government Actuary's Department. *Interim Life Tables - United Kingdom, Males. Based on data for the years 1998-2000.* London, 2002.
26. Government Actuary's Department. *Interim Life Tables - United Kingdom, Females: Based on data for the years 1998-2000.* London, 2002.
27. British Heart Foundation. *Return to Work after Cardiac Illness: Factfile 09/98*. London, 1998.
28. Inland Revenue. Authorised Mileage Rates. 2002.
29. Department of Health. *Hospital In-patient Episode Statistics,* 2001. London: Department of Health.
30. Stewart S, Murphy N, Walker A, McGuire A, McMurray JJV. The current cost of angina pectoris to the National Health Service in the UK. *Heart* 2003;**89**:848-53.
31. Unal B, Critchley J A, Capewell S. Missing, mediocre, or merely obsolete? An evaluation of UK data sources for coronary heart disease. *J Epidemiol Community Health* 2003;**57**:530-5.
32. Raftery J. NICE: Faster access to modern medicine? Analysis of guidance on health technologies. *BMJ* 2001;**323**:1300-03.
33. Department of Health. *Department of Health Expenditure Plans 2002-2003 to 2003-2004.* Norwich: The Stationery Office, 2002.