

Equity in the finance of health care: some further international comparisons ¹

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Abstract

This paper presents further international comparisons of progressivity of health care financing systems. The paper builds on the work of Wagstaff et al. [Wagstaff, A., van Doorslaer E., et al., 1992. Equity in the finance of health care: some international comparisons, *Journal of Health Economics* 11, pp. 361–387] but extends it in a number of directions: we modify the methodology used there and achieve a higher degree of cross-country comparability in variable definitions; we update and extend the cross-section of countries; and we present evidence on trends in financing mixes and progressivity. © 1999 Elsevier Science B.V. All rights reserved.

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1. Introduction

There is good evidence that policy-makers in the OECD countries are concerned about the effects of health care financing arrangements on the distribution of income as well as on who receives health care (cf. e.g., OECD, 1992). A natural way to assess this redistributive impact is to compute the difference between the Gini coefficients for pre-payment income and post-payment income. The results of Aronson et al. (1994) make it clear that this difference will depend on four factors: the average proportion of income spent on health care, the progressivity of the health care financing system, the extent to which households with similar incomes are treated unequally (classical horizontal inequity) and the extent of any reranking in the move from the pre-payment income distribution to the post-payment income distribution.²

² Cf. also Aronson and Lambert (1994). See Lambert and Ramos (1995), Lambert and Ramos (1997) and Lambert (1995) for more on decomposing redistributive effect, including decompositions based on measures of income inequality other than the Gini coefficient.

This paper and a companion paper in this issue explore the redistributive effect of health care financing arrangements in 12 OECD countries. The companion paper (van Doorslaer et al., 1999) examines all four aforementioned influences on redistributive effect, showing how progressivity interacts with the average payment rate, horizontal inequity and reranking to determine the impact of each country's health care financing system on the income distribution. The present paper focuses just on progressivity and is, in effect, a sequel to an earlier paper (Wagstaff et al., 1992) (hereafter WDEA) in which we presented progressivity estimates for ten OECD countries' health care financing systems and their constituent parts. This paper extends and develops WDEA in a number of respects: (i) we improve the methodology used in WDEA and achieve a higher degree of comparability of results; (ii) we report results for three new countries (Finland, Germany and Sweden); (iii) we present evidence on trends in financing mixes and progressivity; and (iv) we report more up-to-date results than those reported in WDEA.

With regard to (i), we have modified the methodology used in WDEA in a number of ways. One is in respect of equivalisation: the adjustment to income (or whatever) that is made in order to allow welfare comparisons to be made across households of different sizes and different structures. In WDEA, we used country-specific equivalence scales and equivalised income but not health care payments. It now seems to us that it would make more sense to adopt a common equivalence scale, as this eliminates cross-country differences that arise simply from the unwarranted use of differing scales. It also seems to us sensible to equalise both income *and* payments. This is apparently becoming standard practice in the field of income redistribution (cf. e.g., Aronson et al., 1994) and makes good sense for reasons outlined below. A further improvement in the methodology has been made in respect of the computation of progressivity indices, which here have been computed using a very precise method. In addition to these methodological improvements, we have also achieved higher degree of comparability in the income and health care payment variables than in WDEA. We have also adopted a more sensible set of conventions concerning how to classify different types of health care payments and how to deal with the tax deductibility of private insurance. The overall result is, we believe, a more reliable set of results.

With regard to (ii), we report results for three new countries: Finland, Germany and Sweden. The inclusion of Finland and Sweden is interesting, because we now have three Nordic countries represented whose health care financing systems share similar features, especially those of Denmark and Sweden. The inclusion of Germany is of interest, because it provides another example, along with France and the Netherlands, of a social insurance system. The three countries have, as will be seen, similarities in their health care financing systems but also important differences.

Table 1
Health care financing in the three new countries

Country	Year	Taxation	Social insurance	Private insurance	Direct payments
Finland	1990	General central and local government taxes. Central government taxes are regressive commodity taxes (23%) and progressive income taxes (14%). Local government taxes (37%) are proportional income taxes, with rates varying by municipality.	Compulsory employer and employee national sickness insurance contributions. Employee contributions levied on taxable income as defined for purposes of local government taxation. Employer contribution based on earnings.	Virtually none—less than 2% of total revenues. Mainly taken out to provide cover against private sector medical expenses incurred in treatment of children.	User charges for certain public services, including inpatient care, dental care and medicines. Charges for private outpatient and specialist services.
Germany	1988	General taxes to fund public health care.	Income-related insurance premiums for statutory sickness funds. Contributions proportional to earnings subject to a ceiling with varying contribution rates across funds.	Alternative cover for individuals opting out of or not eligible to join the statutory sickness fund system. Supplementary cover for special hospital services (e.g., treatment by chief physician, accommodation in single bed or two-bed rooms, etc.).	Co-payments for dental care, opticians, drug prescriptions and some medical devices (e.g., spectacles, hearing aids, etc.).

Sweden	1980 and 1990	Most tax revenues used to fund health care are from county council income tax (78% and 83% of tax revenues in 1980 and 1990, respectively). This is fixed proportion of income, but rates vary across counties. The small amount of general central government revenues that finance health care are used to support county councils and the social insurance fund.	Earmarked contributions for health insurance, some of which goes towards health care.	Some private insurance, but very little.	User charges for ambulatory care, inpatient care, medicines and dental care. Extent of user charges has increased in recent years.
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Table 2
Financing mixes

	Direct taxes (%)	Indirect taxes (%)	General taxes (%)	Social insurance (%)	Total public (%)	Private insurance (%)	Direct payments (%)	Total private (%)
Denmark (1981) ^a	65.8	20.2	86.0	0.0	86.0	1.0	13.0	14.0
Denmark (1987)	72.5	12.2	84.7	0.0	84.7	1.5	13.8	15.3
Finland (1990)	51.0	24.0	75.0	11.0	86.0	0.0	14.0	14.0
France (1984) ^a			0.0	77.3	77.3	7.7	15.1	22.7
France (1989)			0.0	73.6	73.6	6.3	20.1	26.4
Germany (1989)	10.5	7.2	17.7	65.0	82.7	7.1	10.2	17.3
Ireland (1987) ^a	28.5	39.3	67.8	7.3	75.1	10.0	14.9	24.9
Italy (1987) ^{ab}	19.6	22.7	42.3	37.7	80.0	0.0	20.0	20.0
Italy (1991)	21.0	17.2	38.2	39.2	77.4	1.8	20.9	22.6
Netherlands (1987) ^a	5.2	4.9	10.1	63.3	73.4	17.2	9.4	22.6
Netherlands (1992)	6.3	5.0	11.3	64.6	75.9	16.3	7.7	24.1
Portugal (1980) ^{ac}	23.2	42.8	66.0	5.2	71.2	0.6	28.2	28.8
Portugal (1990)	20.7	34.5	55.2	6.0	61.2	1.4	37.4	38.8
Spain (1980) ^a	7.6	6.4	14.0	61.7	75.7	3.0	21.3	24.3
Spain (1990)	30.8	25.5	56.3	22.0	78.3	2.4	19.3	21.7
Sweden (1980)	61.6	10.4	72.0	19.9	91.9	0.0	8.1	8.1
Sweden (1990)	63.5	8.4	71.9	17.8	89.7	0.0	10.3	10.3
Switzerland (1982) ^a	31.6	7.4	39.0	1.5	40.5	40.9	18.6	59.5
Switzerland (1992)	23.9	4.8	28.7	6.9	35.6	40.5	23.9	64.4
UK (1985) ^{ab}	38.3	31.2	69.5	17.0	86.5	4.8	8.7	13.5
UK (1993)	29.0	35.0	64.0	20.0	84.0	7.0	9.0	16.0
US (1981) ^{ab}	23.1	6.6	29.7	14.4	44.1	26.3	29.6	55.9
US (1987)	28.1	7.4	35.5	13.3	48.7	29.2	22.1	51.3

^a Same year as WDEA.

^b Taken from WDEA.

^c Taken from Pereira (1995).

With regard to (iii), we present results on trends, both in financing mixes and in progressivity. It is well known that during the last decade or so, there has been a shift in many OECD countries away from public sources of finance to private sources. Less well documented are the changes *within* public and private sources. Has there been a shift away from taxation towards social insurance? Or vice versa? Has there been a shift from direct taxes to indirect taxes within the tax component of health care financing? Has the increase in private sources been due to an increased emphasis on out-of-pocket payments or to increased expenditure on private insurance? Relatively little is known about these issues. Even less is known about the progressivity consequences of such changes. In this paper, we attempt to shed light on both sets of issues.

With regard to (iv), for all but one of the countries in WDEA (Ireland) we present results for a more recent year than in WDEA. For the most part, the results reported in WDEA referred to the early 1980s, the exceptions to this being Ireland, Italy and the Netherlands, whose data referred to 1987. The results in this paper, by contrast, refer to the late 1980s and early 1990s.

The paper is organised along the lines of WDEA. Section 2 outlines the principal differences across the 13 countries in their health care financing systems and presents evidence on their mixes and changes in these over time. Section 3 outlines the incidence assumptions employed, the data sources and the variable definitions. Section 4 presents the empirical results. Section 5 contains a summary and draws various conclusions.

2. Health care financing systems

Table 1 describes, for each of the three new countries, the role that each of the four main financing sources plays in health care financing (see Table 1 in WDEA for comparable information for the ‘old’ countries). Considering first taxation, it is interesting that, in contrast to the countries in WDEA, in one of the new countries (Sweden) there *are* taxes that are virtually earmarked for health care spending, these being largely local income taxes whose purpose is almost entirely to raise revenues for health care. There is also a degree of earmarking involved in social insurance in two of these countries. In Germany, the social insurance takes the form of contributions to sickness funds, while in Sweden some of the health insurance contributions are used to finance health care. The role of private insurance varies across the new countries. In Finland and Sweden, it is very limited, while in Germany it provides cover to persons outside the public sickness fund scheme (e.g., because they have opted out of it). User charges play an important role in all three of the new countries, though in Germany they are not used in primary care, specialist care or inpatient care.

Table 2 shows the financing mixes in all 13 countries for selected years. In the case of the old countries, this is the year used in WDEA and the survey year for

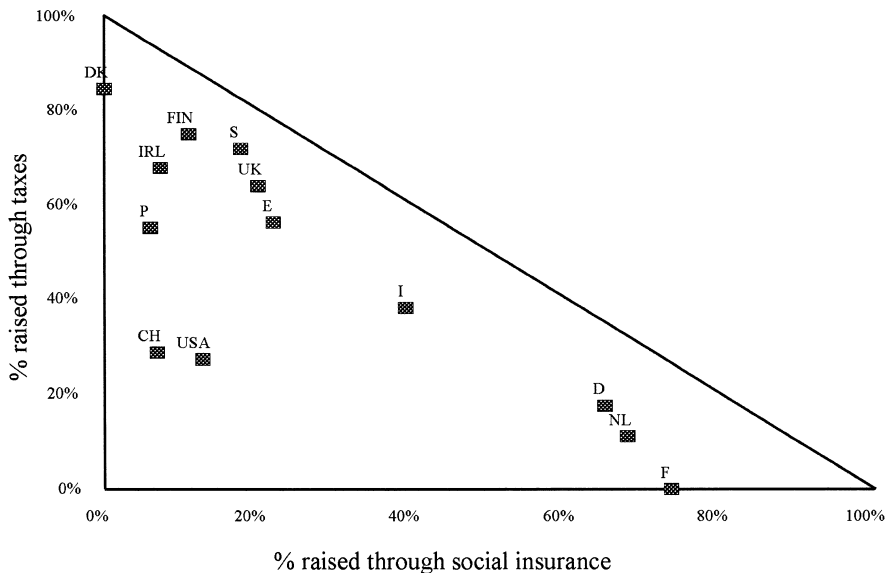


Fig. 1. Health care financing triangle. The percentage of revenues raised through taxation in France is, in reality, around 5%. In the case of countries with 2 years' worth of data, the data here are for the latest year.

the updated progressivity results. The financing mixes for the WDEA year are, in fact, mostly taken from WDEA—the exceptions are the mixes for Denmark, the Netherlands and Portugal, but the differences are minimal.³

Consider first the cross-sectional variation and focus on the latest year in the case of the countries for which 2 years' worth of mixes are available. We can best see the clustering of countries into different groups using the 'health care financing triangle' introduced in WDEA, shown here as Fig. 1. Germany joins France and the Netherlands in the social insurance group in the bottom right corner. The other two new countries, Finland and Sweden, belong firmly to the tax-financed cluster of countries in the top left corner. Fig. 1 does not, of course, show the mix between private insurance and out-of-pocket payments. In Finland and Sweden, the share of private insurance is negligible, while in Germany, it accounts for nearly half of private payments.

Turning to trends in financing mixes, several points emerge. One is that, except in the case of Spain, the clustering noted above, and discussed at greater length in

³ In the case of Denmark, the new higher share attributed to direct taxes and the new lower share attributed to indirect taxes reflects better the actual mix of local income tax, central government direct taxes and indirect taxes used to finance health care. In the case of the Netherlands, the revisions are due to the adoption of a definition of health care that is closer to the OECD definition used to derive the financing mixes in the other countries.

WDEA, has not changed much over time—the tax-financed countries have stuck with tax-financing; the social insurance countries with social insurance; and the private systems with private financing. Spain is the exception to this pattern, having abandoned social insurance in favour of tax financing in 1989. Another point to emerge from Table 3 is that except in Spain, the Netherlands and the US, the share of health care financed privately has increased. This change is especially pronounced in Portugal and to a lesser extent in Switzerland. In most cases, the increase is attributable mostly to an increased emphasis on out-of-pocket payments, though this is not true of Italy and the UK, where the rise was mostly due to a growth in the share of private insurance. The reduction in the private share in Spain, the Netherlands and the US is due to an increase in the importance of public schemes in the period in question, with Spain introducing universal tax-financed cover in 1989 and the Netherlands making the AWBZ scheme for catastrophic medical expenses more important. The third point to emerge is that the shift from direct to indirect taxes that has occurred in the UK has not occurred elsewhere in the two Scandinavian countries, which rely heavily on local income taxes to finance health care, and the remaining countries, where the direct taxes involved in health care finance are general direct taxes, the balance has shifted from indirect to direct taxes.

3. Data and variable definitions

The rest of the paper aims to present evidence on the progressivity of the various sources of finance for the new countries, and to examine trends in progressivity of health care finance in these and the WDEA countries. In a study of this type harmonisation of variable definitions and methods is crucial. We have achieved a much higher degree of comparability in this paper than in WDEA.

3.1. Assigning the financing burden

As in WDEA, non-earmarked financing sources, such as general tax revenues and general social insurance contributions, are simply allocated pro rata according to the shares of the source in question in the overall financing mix. Irrespective of whether or not a particular source of health care financing is earmarked, the question arises as to who bears the burden of the payment. In principle, one could adopt different sets of incidence assumptions for different countries. This was rejected in this paper, as in WDEA, on the grounds that one could not then be sure whether differences in progressivity were due to differences in financing systems or to differences in incidence assumptions. As in WDEA, where possible personal income tax and property taxes have been assumed to be borne by the taxpayers concerned, corporate income taxes by shareholders, sales and excise taxes by

Table 3
Incidence assumptions

Country	Direct taxes	Indirect taxes	Social insurance
Denmark	All direct taxes assumed to be distributed as personal income tax, which is assumed to be borne by taxpayer.	Indirect taxes borne by consumers.	Not applicable.
Finland	Personal income tax borne by taxpayer. Corporate income and property taxes relatively unimportant.	Indirect taxes borne by consumers.	Employer and employee contribution borne by employee.
France	Not allocated—in any case tiny share of revenues.	Not allocated—in any case tiny share of revenues.	Employer and employee contribution borne by employee.
Germany	Personal income tax and property taxes borne by tax-payer. Corporate income tax assumed to be distributed as personal income tax and property tax.	All assumed to be distributed as VAT and to be borne by consumer.	Employer and employee contributions borne by employee.
Ireland	All direct taxes assumed to be distributed as personal income tax, which is assumed to be borne by taxpayer. Corporate income and property taxes relatively unimportant in Ireland.	Not allocated—but is an important source of revenue.	Employer and employee contribution borne by employee.
Italy	All direct taxes assumed to be distributed as personal income tax, which is assumed to be borne by taxpayer.	All indirect taxes assumed to be distributed as VAT, assumed to be borne by consumer.	Employer and employee contribution borne by employee.
Netherlands	Personal income tax borne by taxpayer. Corporate income tax borne by shareholders. Property taxes borne by taxpayer.	Indirect taxes borne by consumers.	Employer and employee contribution borne by employee.

Table 3 (continued)

Country	Direct taxes	Indirect taxes	Social insurance
Portugal	Personal income tax and property taxes borne by taxpayer. Corporate income tax borne by shareholders.	All indirect taxes assumed to be distributed as VAT, assumed to be borne by consumer.	Employee contribution borne by employee. Employer contribution included under taxes as only public sector schemes considered.
Spain	All direct taxes assumed to be distributed as personal income tax, which is assumed to be borne by taxpayer.	Indirect taxes borne by consumer.	Employer and employee contribution borne by employee.
Sweden	Local income tax and central government personal income tax borne by taxpayer. Corporate income tax assumed to be distributed as personal income tax. Property taxes borne by taxpayer.	Indirect taxes borne by consumer.	Employer contribution borne by employee. No employee contribution.
Switzerland	Personal income tax borne by taxpayer. Corporate income tax borne by shareholders. Property taxes borne by taxpayer.	Indirect taxes borne by consumer.	Employer and employee contribution borne by employee.
UK	Personal income tax borne by taxpayer. Corporate income tax and other direct taxes assumed to be distributed as personal income tax.	Indirect taxes borne by consumer.	Employer and employee contribution borne by employee.
US	Personal income tax borne by taxpayer. Corporate income tax borne by recipients of corporate dividend income. Other direct taxes borne by taxpayer. Tax expenditures associated with deductibility of private insurance assumed to be financed by higher Federal income tax.	Indirect taxes borne by consumer.	Employer and employee contribution borne by employee.

Table 4
Details of surveys and samples

Country	Year	Survey name	Institution conducting survey	Sampling unit in survey	Unit of analysis	Sample size	Sample weighted?	Comments on survey and sample
Denmark	1981	Household Expenditure Survey	Central Statistical Office (Danmarks Statistik)			2776	Yes	
	1987	Household Expenditure Survey	Central Statistical Office (Danmarks Statistik)	Household/Address	Household	2232	Yes	
Finland	1990	Household Expenditure Survey	Statistics Finland	Household	Household	8258	No	
France	1984	Family Expenditure Survey	National Institute of Statistics and Economic Studies (INSEE)	Household	Household	8679	No	
	1989	Family Expenditure Survey	National Institute of Statistics and Economic Studies (INSEE)	Household	Household	11260	No	
Germany	1988	Income and Expenditure Survey	National Statistical Office	Household	Household	42982	No	
Ireland	1987	Survey of Income Distribution, Poverty and Use of State Services	Economic and Social Research Institute	Household	Household	3924	Yes	
Italy	1991	Bank of Italy Survey of Household Income and Wealth	Bank of Italy	Household	Household	8188	Yes	
Netherlands	1990	Family Budget Survey	Netherlands Central Bureau of Statistics	Household	Household	2227	Yes	
	1992	Family Budget Survey	Netherlands Central Bureau of Statistics	Household	Household	1955	Yes	

Portugal	1980/ 1981	Family Income and Expenditure Survey	National Statistical Institute	Household	Household	8039	No	
	1989/ 1990	Family Budget Survey	National Statistical Institute	Household	Household	9640	No	
Spain	1980	Family Budget Survey	INE	Household	Household	23996	Yes	
	1990	Family Budget Survey	INE	Household	Household	21155	Yes	
Sweden	1980	Level of Living Survey	Institute for Social Research	Individual	Family	4494	No	Persons interviewed aged 15–76
	1990	Level of Living Survey	Institute for Social Research	Individual	Family	5274	No	
Switzerland	1982	Income and Wealth Survey	National Science Foundation	Individual	Household	3853	Yes	Some variables not available at household level.
	1992	Living Conditions Survey	National Science Foundation	Individual	Household	5981	Yes	
UK	1993	Family Expenditure Survey	Central Statistical Office	Household	Household	7000	No	
US	1987	National Medical Expenditure Survey	Agency for Health Care Policy and Research	Household	Household	12573	Yes	

Near-cash transfers are in-kind payments that have a cash equivalent value, such as Food Stamps in the US, scholarships, student and training allowances, rent rebates, etc.

Table 5
Variable definitions and data sources

Country	Income	Taxes	Social insurance	Private insurance	Direct payments
Denmark	LIS gross income. Data in survey obtained via questionnaire and income tax files.	Personal income tax and indirect taxes. Personal income tax from tax files. Indirect taxes estimated from household consumption.	N/A	All private insurance premiums. Recorded in survey.	All direct payments net of reimbursement. Recorded in survey for a period of 4 weeks.
Finland	LIS gross income excluding near-cash means-tested transfers. Data in survey obtained from income tax files.	Personal income taxes from income tax files. Other taxes estimated. Employee's contributions from income tax files. Employer's contribution estimated.	Social insurance contributions.	Excluded.	Direct payments. Some recorded in survey. Some from social insurance records. Hospital copayments from discharge data. One-year recording period for medicines, 4-week period for GP copayments, 3-year average for hospital charges. Data annualised by simple scaling up or down. Tax deduction of health care expenditures subtracted from out-of-pocket payments.
France	LIS gross income excluding near-cash transfers, capital gains and fringe benefits.	Ignored because account for such a small share of revenues.	Contributions to social health insurance schemes. Contributions estimated from contributions rules.	Premiums paid to <i>mutuelles</i> and for-profit insurers. Recorded in survey at household level.	Direct payments net of reimbursement. Estimated from <i>ticket modérateur</i> and information on average insurance coverage by decile. <i>Ticket modérateur</i> estimated at individual level from gross payments recorded in survey. 14-day recording period for expenditure on medicines and ambulatory care. 6-month period for hospital expenditure. Data annualised by simple scaling up or down.
Germany	LIS gross income.	Income and property tax as recorded in survey. VAT estimated from consumption patterns.	Public sickness fund payments. Employee and employer contributions recorded in survey.	Private insurance payments excluding premiums for partial insurance covering special hospital services.	All direct payments. Recorded in survey. Recording period one year for all items, except drugs (1 month) annualised by scaling up.

Ireland	LIS gross income, excluding near-cash transfers.	Income tax. Recorded in survey. Corporate income tax and indirect taxes excluded.	Relevant portion of social insurance contributions. Recorded in survey.	Health insurance premiums net of tax relief. Estimated on assumption that everyone with cover has the most common level of cover.	Direct payments for GP care, medicines and hospital care. Estimated from data on outlays on hospital care (net of refund), and data on number of GP visits and medicines, and average cost of each. 1-year recording period for all categories of utilisation.
Italy	LIS gross income. Estimated from disposable income.	Personal income tax and value added tax. Direct taxes allocated according to personal income tax. Indirect taxes allocated according to VAT. Personal income tax estimated from disposable income. VAT estimated from household expenditures.	Contributions to social insurance. Estimated from gross income, which, in turn, is estimated from disposable income.	Private health insurance premiums, though may exclude premiums paid by employers. Recorded in survey.	All direct payments. Recorded in survey.
Netherlands	LIS gross income, excluding near-cash transfers.	All general tax revenues, personal income taxes from survey. Other taxes estimated.	AWBZ and sickness fund contributions. Recorded in survey.	Private insurance premiums. Recorded in survey.	All direct payments. Recorded in survey. 1-year recording period.
Portugal	LIS gross income. In 1990, gross income estimated from net income, personal income taxes and other contributions, all three reported in survey.	Personal income taxes and property taxes from survey. Other taxes estimated. Personal income taxes may not be 100% reliable due to a tax reform spanning the survey period making double-counting possible.	Contributions to fund social insurance schemes in public sector. Estimated from survey.	Private insurance premiums. Recorded in survey.	Direct payments net of reimbursement. Recorded in survey.

Table 5 (continued)

Country	Income	Taxes	Social insurance	Private insurance	Direct payments
Spain	LIS gross income. Estimated from disposable income.	Direct taxes allocated according to personal income tax. Indirect taxes allocated according to VAT and excise taxes. Personal income tax estimated from disposable income. VAT and excise taxes estimated from household expenditures.	Contributions to social insurance. Estimated from disposable income and distinguished by work status: salaried or self-employed.	Private insurance premiums. Recorded in survey.	All direct payments, recorded in survey. One-year recording period.
Sweden	LIS gross income, excluding near-cash means-tested transfers and alimony. Data on household income in survey obtained from income tax files.	County council (local) income tax and central government general tax revenues, i.e., personal income tax, corporate income tax, property tax and indirect County council tax payments estimated for each household member using county rates and area of residence. Personal income tax and property taxes from tax files. Corporate income tax distributed as personal income tax. Indirect taxes estimated from estimated household expenditure. Latter computed <i>only at level of decile</i> from another survey.	Relevant portion of social insurance contributions. Estimated for each household member from contributions schedule and earnings.	N/A	Direct payments for physician and hospital care. Payments for medicines excluded. In case of respondent, payments estimated from utilisation data. In case of other household members, payments estimated using predictions of a utilisation regression model. Equations, however, have very low R^2 —typically less than 1%. One-year recording period for all categories of utilisation.

Switzerland	LIS gross income. Data for all household members obtained from income tax files.	All general tax revenues. Direct taxes from tax files. Indirect taxes estimated.	Relevant portion of social insurance contributions. Estimated.	Sickness fund premiums. 1982; recorded in survey <i>but only for respondent</i> . 1992; recorded in survey for each household member.	Copayments for GP and specialist visits. In 1982 some limited information on prescription charges. No out-of-pocket payments for dental care, etc. In addition, data in both years refer <i>only to respondent</i> .
UK	LIS gross income, excluding near-cash means-tested transfers.	Personal income tax and indirect taxes. Both estimated using tax-benefit model. Corporate income tax excluded.	National Insurance Contributions. Estimated using tax-benefit model.	Private insurance premiums paid directly by individuals. Recorded in survey; calculated net of tax relief. Employer-paid premiums (50% of total) excluded.	All direct payments. Recorded in survey. Fourteen-day recording period.
US	LIS gross income, excluding near-cash means-tested transfers.	Relevant proportion of Federal, state and local taxes. Includes the portion of Federal income tax that is assumed to finance the tax relief on private insurance. All taxes estimated.	Relevant portion of social security payments. Estimated.	Private health insurance premiums. Recorded in survey. Calculated net of tax relief.	Direct payments for physician care, hospital care, dental care, eye care, and medical equipment. Recorded in survey. One-year recording period.

^aSame year as WDEA.

Near-cash transfers are in-kind payments that have a cash equivalent value, such as Food Stamps in the US, scholarships, student and training allowances, rent rebates, etc.

consumers, and employee and employer social insurance contributions by employees.⁴ The assumptions made concerning the incidence of taxes and social insurance contributions for each country are listed in Table 3.

3.2. Data and variable definitions

Table 4 shows the details of the surveys and samples used. Most are household surveys (the Swedish and Swiss surveys are exceptions) and the unit of analysis is except in one case the household (the family in Sweden's case).

The benchmark income concept is gross household income, defined as close as possible to the definition employed in the Luxembourg Income Study (LIS) (cf. e.g., Smeeding et al., 1985). Table 5 gives details of the definition of the income variable in each country and the source of information. In all cases, income is defined almost entirely along the lines of the LIS definition. Households with zero or negative incomes have been excluded from the analysis. For most countries, the data on income has been obtained by means of a survey questionnaire; in others from tax files. We would expect a greater degree of accuracy in the case of the latter. Household income has then been equivalised. In this paper, in contrast to WDEA, we have used the same equivalence scale in each country, namely that proposed by Aronson et al. (1994):

$$e_h = (A_h + \Phi K_h)^\theta, \quad (1)$$

where e_h is the equivalence factor for household h , A_h is the number of adults in household h and K_h is the number of children. We have set the two parameters Φ and θ equal to 0.5. It might be argued that one ought to use different equivalence scales for different countries on the grounds that there may be differences between countries in economies of scale in household production and in the expenditure needs of persons of different ages (e.g., due to differences between countries in the VAT rating of children's clothes). There is, however, no consensus on how best to estimate equivalence scales and no consensus on what the appropriate scale is for each country. Whatever one does, therefore, one is sure to displease someone: using different scales for each country will inevitably result in some claiming that the differences between countries that emerge reflect, in part at least, unwarranted

⁴ Undoubtedly, some of these assumptions may be more applicable in some countries than in others, depending on the degree of competitiveness of product and labour markets, the elasticities of the relevant schedules, the openness of the economy of the country in question, and so on. The assumptions concerning corporate income tax, property taxes and employee social insurance contributions are of a progressive nature. The alternatives—that corporate income tax, commercial property taxes and employee social insurance contributions are borne by consumers—would make the relevant components of health care financing less progressive or more regressive. There is clearly scope for future work to explore the validity of these assumptions for the countries involved and the implications of adopting alternative—but common—assumptions.

differences across countries in equivalence scales; on the other hand, using the same scale will inevitably result in some claiming that the differences that emerge reflect, at least in part, the failure to use country-specific equivalence scales. We feel that probably the least objectionable strategy is to use the same equivalence scale.

Health care payments relate to all household members. In contrast to the treatment of payments in WDEA, health care payments in this paper have been equivalised, using the aforementioned AJL scale. Equivalising income but not payments seems, on reflection, an odd thing to do. The motives for equivalising income are clear enough. One is the number-of-mouths-to-feed motive. Each member of a large household with a total income of, say, US\$30,000 has less command over resources (i.e., a lower ability to pay) than does each member of a small household with the same total income. The second motive is the economies-of-scale or two-can-live-nearly-as-cheaply-as-one motive. The effect of this is that as the number of household members increases, holding household money income constant at US\$30,000, the typical household member's command over resources declines less than proportionately. But why equivalise payments? This is just the other side of the coin. There is the mouths-to-feed story. Each member of a large household making a combined payment of, say, US\$5000 suffers a smaller decrease in command over resources than does each member of a small household making the same combined money payment. Then there is the economies-of-scale motive too. As the number of household members increases, holding household aggregate money payments constant at US\$5000, the typical household member's command over resources rises more than proportionately. Equivalising income but not payments has little to commend it. Forgetting for the moment the economies-of-scale story, one would be taking into account that, from an income viewpoint, more household members means that a given total income gets spread across more people and hence each gets less (which is bad news for each member), but not that, from a payment viewpoint, more household members means that a given total household payment bill gets spread across more people and hence each has to make a smaller sacrifice in their standard of living (which is good news for each member). The economies of scale aspect makes the bad news slightly less bad but the good news slightly better.

Table 5 gives details of the sources of information on health care payments. These need to be read in conjunction with the incidence assumptions listed in Table 3. There is some variation in the source of data on personal income tax and social insurance payments. In some countries, the payments used are those recorded in the survey; these are likely to suffer from recall error, but reflect *actual* payments. In others, they have been obtained from tax files; these are likely to be more accurate and also reflect *actual* payments. In other countries still, they have been estimated by means of a tax-benefit model; these do not suffer from recall error, but indicate what households *ought* to have paid in the absence of cheating and errors in assessment.

Some variation between countries is likely to be present too in the accuracy of insurance private premiums and out-of-pocket payments. With regard to premiums, employer-paid premiums have had to be excluded in some countries—in the UK's case, this amounts to 50% of total expenditures on private insurance. The variation in the accuracy of out-of-pocket payments arises in part from the fact that some countries, such as Ireland and Sweden, have estimated out-of-pocket payments from utilisation data. In Sweden's case, this is in fact true only of the respondent in the survey; in the case of other household members, out-of-pocket payments have been estimated from *estimated* utilisation, the latter being derived from a utilisation regression equation estimated on data for respondents. Another source of variation in accuracy lies in the fact that the period varies for different categories of expenditure in some countries (being longer in the case of hospital out-of-pocket payments, say, than in the case of out-of-pocket payments for GP care) but not in others; furthermore, there is variation within the two approaches from country to country. A problem with the variable recall period approach is that it is hazardous trying to convert expenditures in the various categories to, say, an annual basis. An advantage of it is that the 'window' is wide enough to pick up variation but not too wide to suffer from recall error.

4. Progressivity results

We measure progressivity using Kakwani (1977) index, equal to the difference between the concentration index for payments and the Gini coefficient for gross (i.e., pre-payment) income. A positive (negative) value of the index indicates a progressive (regressive) structure, while a zero value indicates proportionality.⁵ In contrast to the empirical results in WDEA, where the Gini coefficient for gross income and the payment concentration indices for the four sources of finance were computed by means of linear approximation on deciles data, in this paper they have all been calculated on microdata using accurate methods such as the convenient covariance method (cf. e.g., Jenkins, 1988).⁶ The Kakwani indices for 'total taxes', 'total public', 'total private' and 'total' were then computed as

⁵ The reader is referred to WDEA for details.

⁶ In fact, the Kakwani index is computed as the difference between the pre-tax Gini coefficient and the concentration index for payments, where the former is computed on individual-level data and the latter is computed on grouped observations, households being grouped into gross income intervals of £5 per week in 1990 prices. This method of computation was used because it gives the counterfactual Kakwani index in the AJL decomposition (Aronson et al., 1994) showing the progressivity that would have been observed if all households at a given income level had been treated alike. This is the method used in the companion paper van Doorslaer et al. (1999). As it happens, this method probably gives a more reliable estimate of Kakwani's index anyway, since it averages out the variations in payments at each income level. Especially in the case of out-of-pocket payments, this is desirable, since for many countries the data refer to a very short period of time and are hence subject to a potentially large degree of measurement error.

Table 6
Progressivity indices

	Direct taxes	Indirect taxes	General taxes	Social insurance	Total public	Private insurance	Direct payments	Total private	Total payments
Denmark (1981) ^a	0.0431	−0.1498	−0.0022		−0.0022	0.0477	−0.2568	−0.2350	−0.0348
Denmark (1987)	0.0624	−0.1126	0.0372		0.0372	0.0313	−0.2654	−0.2363	−0.0047
Finland (1990)	0.1272	−0.0969	0.0555	0.0937	0.0604	0.0000	−0.2419	−0.2419	0.0181
France (1984) ^a				0.0960	0.0960	−0.1788	−0.2453	−0.2228	0.0236
France (1989)				0.1112	0.1112	−0.1956	−0.3396	−0.3054	0.0012
Germany (1989)	0.2488	−0.0922	0.1100	−0.0977	−0.0533	0.1219	−0.0963	−0.0067	−0.0452
Ireland (1987) ^a	0.2666	N/A	N/A	0.1263	N/A	−0.0210	−0.1472	−0.0965	N/A
Italy (1991)	0.1554	−0.1135	0.0343	0.1072	0.0712	0.1705	−0.0807	−0.0612	0.0413
Netherlands (1987) ^a	0.2428	−0.1109	0.0712	−0.1632	−0.1309	0.0859	−0.0235	0.0472	−0.0835
Netherlands (1992)	0.2003	−0.0885	0.0714	−0.1286	−0.1003	0.0833	−0.0377	0.0434	−0.0703
Portugal (1990)	0.2180	−0.0347	0.0601	0.1845	0.0723	0.1371	−0.2424	−0.2287	−0.0445
Spain (1980) ^a	0.1121	0.0107	0.0706	−0.1117	−0.0780	−0.0537	0.0079	0.0003	−0.0589
Spain (1990)	0.2125	−0.1533	0.0486	0.0615	0.0509	−0.0224	−0.1801	−0.1627	0.0004
Sweden (1980)	0.0619	−0.0888	0.0402	0.0046	0.0325		−0.4033	−0.4033	−0.0028
Sweden (1990)	0.0529	−0.0827	0.0371	0.0100	0.0100		−0.2402	−0.2402	−0.0158
Switzerland (1982) ^a	0.1958	−0.0652	0.1463	0.0145	0.1414	−0.2443	−0.3185	−0.2675	−0.1019
Switzerland (1992)	0.2055	−0.0722	0.1590	0.0551	0.1389	−0.2548	−0.3619	−0.2945	−0.1402
UK (1993)	0.2843	−0.1522	0.0456	0.1867	0.0792	0.0766	−0.2229	−0.0919	0.051
US (1987)	0.2104	−0.0674	0.1487	0.0181	0.1060	−0.2374	−0.3874	−0.3168	−0.1303

weighted averages of the relevant Kakwani indices, using the shares in tables such as Table 2 as weights. Table 6 shows the progressivity indices for all four sources for all 13 countries for selected years.

4.1. Effects of adopting the new methods and conventions

The countries that have applied the new methods and conventions to the WDEA data are Denmark, France, Ireland, the Netherlands, Spain and Switzerland. Several differences between the WDEA results and the results reported here are worth noting. The disaggregation of taxes in the case of Denmark highlights the low degree of progressivity of direct taxes used to finance health care in that country, reflecting the emphasis in health care finance on local income tax, which is close to proportional. The French social insurance index was regressive in WDEA but is progressive here, due apparently to the switch in this paper to equivalising both payments and income, not to using the AJL equivalence scale rather than that used in WDEA. A positive Kakwani index for social insurance for France makes sense—in contrast to the Dutch scheme, the French scheme includes high earners as well as low earners; furthermore, pensioners and the unemployed, who are more likely than not to be in the bottom income groups, are virtually exempt from contributions (contribution rates are a mere 1% for these groups). In the case of Ireland, there is a change in respect of private insurance which emerged as progressive in WDEA but as regressive here. The difference is attributable for the most part to the fact that here, but not in WDEA, private insurance premiums are computed net of tax relief, which in Ireland is quite substantial and benefits the better-off households most. The final noteworthy change is the index for private insurance in the Netherlands. This source emerged as regressive in WDEA but as progressive here. The reason for that is that in the survey used in WDEA, private insurance could not be separated from sickness fund insurance and the two types combined were labelled ‘private insurance’, whereas in this paper we have been able to separate the two types of payment and have included sickness fund contributions along with AWBZ contributions under ‘social insurance’ and kept ‘private insurance’ as private insurance proper.

4.2. Results for the new countries

Noteworthy in the direct tax results is the low Kakwani index for Sweden. This reflects the emphasis, as in Denmark, on a near-proportional local income tax. The middling Kakwani index for direct taxes for Finland reflects the mixture of taxes, including the proportional local income tax (accounting in 1990 for 37% of direct taxes used to finance health care). Also noteworthy is the relatively high Kakwani index for direct taxes for Germany. Indirect taxation emerges as regressive in the new countries. Social insurance emerges as progressive in Finland and Sweden, but as regressive in Germany. The latter result stems from the fact that persons

above an earnings threshold can opt out from the scheme. The only new country for which private insurance is relevant is Germany, where it emerges as progressive. This reflects the fact that it is bought by those high-earners who have opted out of the public sickness fund scheme. Turning finally to out-of-pocket payments, these emerge as regressive. The relatively small Kakwani index (in absolute size) in Germany reflects the incomplete cover of the better-off privately insured, a similar phenomenon to that noted in WDEA in respect of the Netherlands. Overall, the Finnish system emerges as progressive, while Sweden—and, to a greater degree, Germany—emerge as regressive. The Swedish result reflects the emphasis on a proportional income tax and a not insignificant usage of regressive out-of-pocket payments, while the German regressiveness stems largely from the emphasis in that country on a fairly regressive social insurance scheme.

4.3. Changes in progressivity

In Denmark and Spain, the direct taxes used to finance health care appear to have become more progressive (see Table 6).⁷ The change in Denmark is attributable to a tax reform in 1987 which reduced the amount of tax relief available on interest payments, while the change in Spain is due to the introduction of a more progressive tax schedule during the 1980s. In the Netherlands, Sweden and Switzerland, by contrast, the direct taxes used to finance health care became less progressive. In Denmark, the Netherlands and Sweden, the indirect taxes used to finance health care have become less regressive, while in Switzerland they have become more regressive. In Spain they have become regressive after being progressive. This is attributable to the introduction of VAT in 1986 and the abandonment of the old system in which luxury goods attracted higher rates of tax. The changes in the progressivity of taxes overall are mixed: in Spain and Sweden, taxes overall have become less progressive; in the Netherlands, the Kakwani index has not changed; in Denmark, taxes overall switched from being mildly regressive to being slightly progressive; while in Switzerland, tax progressivity increased slightly.

In all the countries for which results are available, the Kakwani index for social insurance has increased in size. This source became less regressive in the Netherlands, switched from being regressive to progressive in Spain and Sweden, and became more progressive in France and Switzerland. In all but one country (Spain), the Kakwani index for private insurance has fallen in size.⁸ Private

⁷ Neither this change in progressivity index nor any of the others mentioned below have been subjected to tests of statistical significance. It is possible that some of the changes may simply be due to sampling variation.

⁸ The change in the Kakwani index for private insurance for Switzerland ought to be interpreted with caution, since, as indicated in Table 2, the data on private insurance premiums are available for the respondent only for 1982 but for all household members in 1992.

insurance became less progressive in Denmark and the Netherlands, and more regressive in France. The reduction in progressivity of private insurance in Denmark is attributable to the large rise in persons taking out private insurance (a doubling between 1981 and 1987), with the largest increase occurring among households in the bottom half of the income distribution. In all countries except Sweden, the Kakwani index for out-of-pocket payments has also fallen in size. This source has become more regressive in Denmark, France, the Netherlands and Switzerland,⁹ and switched from being progressive to being regressive in Spain. The Kakwani index for private payments has become smaller except in Sweden, with private payments becoming more regressive in Denmark, France and Sweden, less progressive in the Netherlands, and switching from being progressive to being regressive in Spain.

The changes in the health care financing systems overall will reflect the changes in the progressivity of each source as well as the changes in the relative shares of the sources. Since private sources have for the most part become more important and these sources have for the most part seen a reduction in their Kakwani index, it might be expected that the Kakwani index for the system as a whole would have fallen. In fact, the picture is less clear-cut, reflecting, in part no doubt, the rise in the Kakwani index of social insurance in many countries. The results show that in France, Sweden and Switzerland,¹⁰ the Kakwani index for the overall health care financing system has become smaller, while in Denmark, the Netherlands and Spain, the overall index has become larger.¹¹

4.4. Lessons from the latest cross-section

As in WDEA, the direct taxes used to finance health care are progressive in all countries. They are especially progressive in the UK, Ireland and Germany, but far less progressive in the two Scandinavian countries, reflecting the aforementioned reliance in health care financing there on the local income tax. Indirect taxes are regressive in all thirteen countries, including the southern European countries where they emerged as progressive in WDEA (in Portugal, for example, the change reflects in part the introduction of VAT in 1986). Indirect taxes emerge as being especially regressive in Spain and the UK, but, in contrast to the results

⁹ Although out-of-pocket payments are available for the respondent only in both Swiss surveys, the comparison between the 2 years ought to be meaningful, since the Kakwani indices are computed on the same basis.

¹⁰ The change in the Kakwani index for total payments ought to be interpreted with caution for the reason given in ⁷.

¹¹ Using slightly different conventions, Pereira (1995) showed that during the 1980s the Portuguese health care financing system changed from mildly progressive to mildly regressive, due in part to reduced progression in the tax system and in part to the increased share of revenues raised directly from consumers.

reported in WDEA, not especially so in the US. The Kakwani indices for general taxation, calculated as a weighted average of the two Kakwani indices for direct and indirect taxes, are positive in all countries. Interestingly, the general taxes used to finance health care appear to be especially progressive in the two private financing countries, Switzerland and the US, and also, albeit to a lesser extent, in Germany.

Social insurance is regressive in the Netherlands, as it is in Germany, but with the change of methods is no longer regressive in France. The differences between France, on the one hand, and Germany and the Netherlands, on the other, is attributable to the full participation of all workers—but virtual exemption from contributions of pensioners and the unemployed—in the French social insurance system and the non-involvement of the better-off in all or part of the Dutch and German social insurance systems. In countries such as Ireland, Italy, Spain, and the UK, where it raises a not insignificant proportion of revenues, social insurance emerges as a progressive source of revenue, as in WDEA. This is probably due to exemptions (e.g., pensioners, who are often among the lower income groups) and the fact that contributions are assessed on the individual's own earnings rather than on his or her household's equivalent income.

When interpreting the progressivity indices for private health insurance it is important to bear in mind the cover that private insurance buys in each country. Broadly-speaking, countries belong to one of three groups, the exception being Ireland, and to a lesser extent Switzerland and the US. The first comprises countries where private insurance buys cover against public sector copayments and includes Denmark and France. As in WDEA, private insurance against public sector copayments emerges as being progressive in Denmark but regressive in France. This reflects the fact that private insurance against public sector copayments is more widespread among the lower income groups in France than it is in Denmark, which, in turn, probably reflects in part the higher copayments in France. The second group of countries comprises countries where private insurance is mostly taken out as supplementary cover (mostly 'double' cover) to that provided by the state and includes Italy, Portugal, Spain and the UK. Private insurance of this type emerges as progressive here, except in Spain, suggesting that such insurance is a 'luxury' good. The third group comprises countries where, for the individuals concerned, private insurance—albeit often subsidised—is (or is nearly) the sole source of cover. This group includes Germany, the Netherlands, Switzerland and the US. Switzerland is unusual in this group in that private insurance is bought by almost everyone. In the other countries, only persons with restricted or non-existent public cover generally take out private insurance.¹² In the US persons purchasing private insurance as their sole source of cover make up

¹² In the US a small proportion of expenditures on private insurance is accounted for by persons with public cover purchasing supplementary insurance.

the bulk of the population, while in the Netherlands they comprised (in 1992) 36% of the population. As is apparent from Table 6, where it is relied upon by the majority of the population for cover, as in Switzerland and the US, private insurance is highly regressive. The positive Dutch and German indices stem from the fact that private insurance in these countries is almost exclusively bought by the higher income groups. Ireland, and to some degree Switzerland and the US, span two or more of these groupings. In these three countries, private insurance emerges as regressive. The surprisingly small value, in absolute terms, of the Kakwani index for private insurance for the US is attributable to coverage gaps and under-insurance among the lower income groups (cf. Rasell and Tang, 1994).

Turning finally to out-of-pocket payments, the principal conclusion reached in WDEA—that out-of-pocket payments are a regressive means of raising revenue—is borne out by the results in Table 6. There are, however, some interesting differences across countries. The low degree of regressiveness of out-of-pocket payments in Germany and the Netherlands reflects the absence of public cover or incomplete public cover of the better-off in these countries and the fact that the privately insured in these countries often choose low-premium policies with deductibles. The relatively low degree of regressiveness of out-of-pocket payments in Ireland reflects the link in that country between income, on the one hand, and comprehensiveness of public cover and liability for public sector copayments, on the other, the top income group being liable for a full range of copayments but the bottom income group being virtually exempt (cf. Table 1 in WDEA). The very high regressiveness of out-of-pocket payments in Switzerland and the US that emerged in WDEA also emerges here.¹³ This presumably reflects the fact that persons on low incomes in these countries are liable in full for out-of-pocket payments, whereas their counterparts in many European countries would be exempt from charges, either because of their low income or because of other factors (e.g., chronic ill-health, pensioner status, etc.) that are often correlated with income.

The broad conclusions concerning the progressivity of health care financing systems overall that emerged in WDEA also emerge here. Health care finance in two of the three social insurance countries (Germany and the Netherlands) is regressive, while it is progressive in the third (France). The likely source of the difference between Germany and the Netherlands, on the one hand, and France, on the other, has already been made clear and need not be reiterated. In the tax-financed systems, by contrast, health care finance typically emerges as proportional or mildly progressive. The exception to this is Portugal, where the system

¹³ The Swiss results ought to be treated with caution, as data on out-of-pocket payments were available for the respondent only. Since other variables are at the household level, only non-equivalised out-of-pocket payments of the respondent are considered. A priori, it seems impossible to say whether this will bias upwards or downwards the Kakwani index.

overall emerges as regressive—this reflects the high share of out-of-pocket payments in that country in 1990. Finally, in the two predominantly privately financed systems, health care finance emerges as regressive.

5. Summary and conclusions

Our aims in this paper were: (i) to improve the methodology used in WDEA and achieve a higher degree of comparability of results, (ii) to extend the cross-section of countries, (iii) to present evidence on trends in financing mixes and progressivity, and (iv) to report more up-to-date results.

Our adoption of the new methodology does not much affect the financing mixes of most of the countries included in WDEA and does not alter the broad conclusion reached there concerning the clustering of countries into the three principal groups, namely tax-financed systems, social insurance systems and privately financed systems. We also find that, for the most part, the adoption of the new methods does not affect the broad conclusions reached in WDEA concerning whether sources or systems are progressive or regressive. Exceptions include: social insurance becoming progressive in France (attributable to the equalisation of both income and payments); private insurance turning from progressive to regressive in Ireland (attributable to the computation here of premiums net of tax relief); and private insurance turning from regressive to progressive in the Netherlands (due not to any change in structure but simply due to a reclassification in this paper of sickness fund insurance as social insurance rather than as private insurance).

As regards extending the cross-section, in terms of financing mixes, Germany joins France and the Netherlands in the social insurance group, while the other two new countries (Finland and Sweden) join countries like Denmark and the UK in the tax-financed group. As far as the progressivity results for the new countries are concerned, noteworthy are the low level of progressivity for the direct taxes used to finance health care in Sweden (reflecting the emphasis in that country on a proportional local income tax for financing health care), the regressive social insurance structure and progressive private insurance structure in Germany (reflecting the opting out of social insurance into private insurance by the better-off Germans), and the relatively regressive out-of-pocket payments structures in Finland and Sweden.

The evidence presented on trends in financing mixes reveals that only one country has moved from one cluster to another (Spain shifted from social insurance to tax finance in 1989). Our results also reveal that except in Spain, the Netherlands and the US, the share of health care financed privately has increased during the 1980s. As regards trends in progressivity, no clear messages emerge from our results. One pattern is that in all but one country, out-of-pocket payments are apparently becoming more regressive (or less progressive). However, the effect

of this is sometimes offset by progressive changes elsewhere—indeed, in half of the countries, the overall progressivity of the system appears to have increased (or the degree of regressiveness seems to have been reduced).

As far as updating the cross-section is concerned, we find that, for the most part, the conclusions reached in WDEA concerning the progressivity of sources and of systems are true of the latest cross-section. Taxes are a progressive means of raising revenue, though the new results on local income tax in the Scandinavian countries are worth noting. Social insurance is regressive in two of the three social insurance countries (Germany and the Netherlands)—attributable to the non-involvement of the high earners in part, or all, of the scheme—but is progressive in all other countries, including France where it raises over 70% of revenues. In several of these countries, it even emerges as a more progressive financing source than general taxation. Private insurance is regressive in countries where it is relied upon by the bulk of the population but otherwise typically progressive, reflecting the higher demand for insurance cover by the better-off. Finally, out-of-pocket payments are a highly regressive means of revenue, though their regressiveness varies across countries, reflecting the differences across countries in exemptions from out-of-pocket payments.

References

- Aronson, J.R., Lambert, P.J., 1994. Decomposing the Gini coefficient to reveal the vertical, horizontal and reranking effects of income taxation. *National Tax Journal* 47 (2), 273–294.
- Aronson, J.R., Johnson, P., Lambert, P.J., 1994. Redistributive effect and unequal tax treatment. *Economic Journal* 104, 262–270.
- Jenkins, S., 1988. Calculating income distribution indices from microdata. *National Tax Journal* 61, 139–142.
- Kakwani, N.C., 1977. Measurement of tax progressivity: an international comparison. *Economic Journal* 87, 71–80.
- Lambert, P.J., 1995. On the measurement of horizontal inequity. Working Paper WP/95/135. IMF Fiscal Affairs Department, Washington, DC.
- Lambert, P.J., X. Ramos, 1995. Vertical redistribution and horizontal inequity. Working Paper #W95/1). Institute for Fiscal Studies, London.
- Lambert, P.J., Ramos, X., 1997. Horizontal equity and vertical redistribution. *International Tax and Public Finance* 4, 25–37.
- OECD, 1992. The reform of health care: a comparative analysis of seven OECD countries. OECD, Paris.
- Pereira, J., 1995. Equity, health and health care: an economic study with reference to Portugal. Unpublished DPhil, University of York, York.
- Rasell, E., Tang, K., 1994. Paying for health care: affordability and equity in proposals of health care reform. Working Paper 111. Economic Policy Institute, Washington, DC.
- Smeeding, T.M., G. Schmauss, S. Allegra, 1985. An introduction to the LIS—the Luxembourg Income Study. LIS-CEPS Working Paper #1. Luxembourg Income Study, Walferdange.
- van Doorslaer, E., Wagstaff, A. et al., 1999. The redistributive effect of health care finance in twelve OECD countries. *Journal of Health Economics* 18, 293–315.
- Wagstaff, A., van Doorslaer, E. et al., 1992. Equity in the finance of health care: some international comparisons. *Journal of Health Economics* 11, 361–387.