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INEQUITY IN THE FINANCING AND
DELIVERY OF HEALTH CARE
IN IRELAND

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Inequity in the Financing and Delivery of Health Care in Ireland

1. Introduction

This paper presents the first results of an analysis of inequity in the financing and delivery of health care in Ireland. It is designed as a contribution to the EC project on distributive aspects of health care financing and delivery, and follows the project guidelines on methods of analysis and areas covered. The data on which the paper is based come from two recent large-scale surveys - the Household Budget Survey, carried out by the Irish Central Statistics Office in 1987 (for the financing side), and the Survey of Income Distribution, Poverty and Usage of State Services carried out by The Economic and Social Research Institute in the same year (for the delivery side). More complete data from the Household Budget Survey, covering in particular the distribution of indirect tax payments, will be available shortly: in their absence some of the results of the present paper, based on estimates, must be regarded as preliminary.

The paper is structured as follows. Section 2 briefly outlines the key features of the Irish system of health care financing and delivery. Section 3 describes the data used in the analysis. Section 4 presents results for the financing of health care, and Section 5 looks at distributional aspects of health care delivery in Ireland. Conclusions and some

issues for further consideration are summarised in Section 6.

2. The Irish System of Health Care Financing and Delivery

The way in which health care financing and delivery are organised in Ireland is described briefly in Nolan (1989) and more fully in Tussing (1985) and Report of the Commission on Health Funding (1989). The system is a complex one, with different groups in the population having different entitlements to free or subsidised care, and with care being delivered by public and private sectors which are interwoven rather than distinct. It is necessary to first outline the structure of entitlement to free or subsidised medical care set up by the State. The population is divided into three Entitlement Categories whose entitlements are fully set out in Table 1:

- (i) Category I have full entitlement to free medical care financed by the State, covering GP care, prescribed medicines, and hospital outpatient services and inpatient maintenance and treatment.
- (ii) Category II are entitled to maintenance and treatment in public hospitals (subject to a £10 per night charge¹) and to hospital outpatient services (subject to a £10 charge for the first visit for a particular condition) but not to GP care or (most) prescription medicines².
- (iii) Category III are entitled only to maintenance in public hospitals (subject to the £10 per night

charge), they are liable for consultant services as well as for outpatient and primary care.

The Entitlement Category into which a person and his/her dependants fall is determined on the basis of income limits/means tests³. In 1987, the year to which the data used in this paper apply, about 38% of the population were in Category I, 47% were in Category II and 15% were in Category III⁴. (The £10 charges for Categories II and III were introduced only during 1987 and their full effect is not, therefore, reflected in the data analysed here).

Primarily because those in Category III have only limited entitlement to hospital care, the State also set up a monopoly health insurer, the Voluntary Health Insurance Board (VHI). This operates at arms-length from the State and currently provides health insurance, for the most part covering hospital care, to about 29% of the population. Given that only 15% of the population are in Category III, clearly many people in the other categories, with full, or close to full, entitlement to public hospital care, nonetheless are willing to pay "extra" to obtain VHI cover. The dominant factor in producing this demand appears to be the ease of access to "private" hospital care - in either private or public hospitals - enjoyed by those with insurance. (The fact that premia are fully tax-deductible is probably an important contributory factor in such demand.)

With a substantial proportion of health care either

provided free (or at a low charge) by the State or covered by health insurance, there still remains a significant element paid for out-of-pocket by households. This includes most importantly GP care and (most) prescription medicines for those not in Category I. Expenditure on non-prescription medicines is also significant, as is spending on dental care. (The latter is in theory provided free by the State to those in Category I but this is hard to obtain; those paying social insurance and obtaining private dental treatment - whether in Category I or not - are covered by social insurance "treatment benefits".)

State expenditure on health care is itself financed largely through general taxation, with a small proportion provided by social security contributions. Social security contributions are at a relatively low level in Ireland. A special Health Contribution of 1.25%, based on earnings up to a ceiling, goes to fund general health services, and the dental treatment of insured workers is covered by the Social Insurance Fund. These account for only about 10 per cent of public expenditure on health service provision, the remainder being financed out of general taxation.

How then is health care - financed by the State, health insurance or out-of-pocket - delivered? General practitioner care is provided by independent professionals, most of whom treat both patients in Category I, who are entitled to free GP care, and the remainder of the population. For Category I patients these GPs are now remunerated by the State through a

capitation system introduced in 1989. In 1987, though, they were paid by the State on a fee service basis, which is also the way in which patients outside Category I are themselves charged.

Hospital services are provided predominantly through publicly-financed rather than private hospitals, though there is a small private hospital sector. Some of these publicly-financed hospitals are fully owned and managed by the State (through local area Health Boards), while others are owned and run by religious orders or voluntary trusts. In these public hospitals, though, there is an important distinction between treatment in public wards and in private or semi-private accommodation. People in Categories I and II are entitled to treatment in public wards (free for Category I and subject to a £10 per night charge for Category II). Those either willing to pay out of pocket or with health insurance cover usually obtain care in private accommodation from a consultant of their own choice. The hospital consultant most often treats both "public" and "private" patients. Thus both "public" and "private" hospital care is often provided by the same hospital and consultant - there is no clear divide between public and private delivery in the hospital sector..

Hospital outpatient services are similarly provided for the most part by publicly-financed hospitals. Dental care is largely delivered by independent professionals with a small element provided by dentists employed by local area Health

Boards.

This brief overview of the Irish system of health care financing and delivery is intended to serve as background to the analysis of its distributional implications in Sections 4 and 5. First, though, Section 3 describes the data on which this analysis is based.

3. *The Data*

The data employed come from two large-scale household surveys. In examining distributional aspects of the financing of health care, detailed information is required on direct household expenditures on health care and health insurance and, crucially, the household's contribution to public expenditure on health care, through the taxes and social security contributions it pays, must also be estimated. Thus, data not only on income tax and social security paid, but also on expenditures over the whole range of goods covered by indirect taxes, is necessary.

The Household Budget Survey (HBS) carried out by the CSO in 1987 (and previously in 1980 and 1973) provides this level of detail on Irish households. It covered a random national sample of 7705 households, and results have recently been published (CSO, 1989). These show, *inter alia*, average direct household expenditure on different types of health care and on health insurance and average income tax and social insurance contributions paid, by households classified by gross income decile. This allows the spread of these expenditures/taxes over the gross income distribution to be

analysed. Published information does not permit equivalent income or the equivalent income distribution to be derived. However, access is also available to the data tapes held by the CSO, and for this paper special tabulations have been produced on an equivalent income basis from these tapes.

The budget survey itself presents no data on indirect taxes, but the CSO also produce an analysis of the redistributive effects of taxes and benefits, including indirect taxes and non-cash services provided, based on the HBS. (This corresponds closely to the similar exercise published by the UK CSO on the basis of the Family Expenditure Survey, see for example, *Economic Trends*, May 1990). This allocates indirect taxes to households on the basis of their expenditure patterns using the conventional incidence assumptions that such taxes are borne fully by the consumer. Such an exercise is currently being completed by the CSO on the basis of the 1987 HBS and should be available shortly, in time to be taken into account in the final version of this paper: for the present draft, though, for indirect taxes we have had to rely on the distributional pattern shown by the previous exercise which used 1980 data (CSO, 1983).

Reliance on the HBS for the finance side of the analysis dictates the use of the household as the unit of analysis. For the delivery of health care, though, an alternative data source is available in the Survey of Income Distribution, Poverty and Usage of State Services, carried out by the ESRI

in 1987. This covered 3,300 households and gathered in-depth information on household income and, *inter alia*, on utilisation of health services of various kinds during the previous year (see Callan, Nolan, Whelan, Hannan and Creighton (1989) for a full description of the sample). The utilisation data covered the number of GP visits, prescriptions filled, visits to outpatient clinics or day surgery, nights spent in hospital, and visits for dental treatment, sight or hearing tests in the previous twelve months, for each household member. Comparison of sample data with the limited national aggregates available indicate that the sample represents the population's characteristics and health service utilisation levels well, although there may be some under-representation of GP visits, possibly due to recall problems (see Nolan, 1990).

The survey also sought limited information on health status. Each adult (where possible) was asked "Do you have any major illness, physical disability or infirmity that has troubled you for at least the past year or that is likely to go on troubling you in the future?" Positive responses were probed to specify the nature of the illness/disability, and interviewers also noted whether the respondent was bedfast, a wheelchair user, or had other mobility problems. To provide information about psychological health, adults were also asked a shortened version of the widely-used General Health Questionnaire (GHQ), comprising twelve items (see Whelan *et al.*, 1990).

The ESRI survey allows the pattern of health service utilisation across income groups - including individuals classified by their household gross income or gross equivalent income - to be analysed. The information on health status also provides a measure, albeit a crude one, of chronic illness which allows some analysis of utilisation controlling for "need". To examine the distributional pattern of delivery in terms of the share of health care expenditure received, though, it is necessary to assign a monetary value to the observed utilisation of each individual. This is done using estimates of the unit cost of each type of utilisation, constructed from a variety of sources as described in detail in the Appendix. It is worth noting here, though, that these values/unit costs are assumed to be identical for those receiving care financed fully by the State and those paying privately. For example, those in Entitlement Category I, for whom the GP is reimbursed by the State, are assumed to receive the same "value" of care as the rest of the population who pay out-of-pocket for each visit, although the latter pay a higher rate. Similarly, a night spent in a private hospital or a private ward of a public hospital is assigned the same value as a public ward. This follows the approach set out in Working Paper 3 (Van Doorslaer and Wagstaff, 1989) in analysing the delivery of health care in The Netherlands, which employs unit costs calculated by dividing national expenditure on the service in question by the total number of consumption units. The

issues this raises are general ones to which we return in the final section.

4. *Inequity in the Financing of Health Care in Ireland*

First we look at the importance of the various sources of health service financing and then at their distributional pattern. As outlined in Section 2, these sources are:

- (i) general taxation
- (ii) social security contributions
- (iii) health insurance, and
- (iv) out-of-pocket household expenditure.

In arriving at total current State expenditure on health service provision, the starting point is non-capital expenditure by the Department of Health, which in 1987 was IR£1221.5 million⁵. From this we must subtract expenditure on income maintenance for certain groups (which is administered by the Department but constitutes social welfare rather than health care), and conversely some health services funded by other departments ("Treatment Benefits" administered by the Department of Social Welfare) must be included⁶. This produces a total for public expenditure of £1133 million, of which about 10% is financed by social security contributions and the remainder out of general taxation⁷.

Health insurance expenditure, almost all by the VHI, amounted to £150 million in 1987⁸. Based primarily on the Household Budget Survey the CSO have estimated that household expenditure on health care (net of insurance premia and refunds) amounted to about £225 million⁹. Thus aggregate

expenditure on health care was about £1508 million (8.4% of GNP), and was financed as follows:

(i) general taxation	67.8%
(ii) social insurance	7.3%
(iii) health insurance	10.0%
(iv) household expenditure	14.9%

Compared with the data for other countries presented in Wagstaff, Van Doorslaer and Paci (1989, Table 1), drawn from Maxwell (1981), this financing structure has a relatively high share coming from general taxation. Social insurance is much less important than in France, Germany, Italy and The Netherlands, private insurance is quite important and out-of-pocket expenditure is about the middle of the range of the countries shown.

We now turn to the distributional pattern associated with each financing source, based on households in the 1987 HBS. Before adjusting for differences in household size and composition, it is useful to look at the pattern when households are simply classified by gross (i.e., pre-tax but post-cash transfer) income, as in Gottschalk, *et al.* (1986) and Wagstaff, Van Doorslaer and Paci (1989). Table 2 shows the distribution of health care payments from each source among households classified by gross income decile, together with the share of total gross income going to each decile. For general taxation, income tax and indirect taxes are shown separately, and the distribution of total taxation is a weighted average of the two in accordance with their relative importance in total tax revenue, which means that indirect

taxes are weighted at 0.58 and income tax at 0.42. Taken together they account for about 85 per cent of all tax revenue.¹⁰ (Property and Corporation taxes are much less important in Ireland than in many other countries, and are not included in the CSO's redistributive exercises: no attempt is made in this paper to allocate them among households.)

The figures for all the revenue sources except indirect taxes are calculated directly from published HBS data¹¹: as noted earlier, the distributional pattern of indirect taxes in 1987 is currently being estimated by the CSO, and here 1980 data have been used.¹² Given the importance of indirect taxes - accounting for over half of tax revenue which in turn accounts for two-thirds of health care financing - the incorporation of up-to-date information on these in the next draft is essential, and the overall pattern shown here must be treated as preliminary.

Table 2 shows that, as is generally the case, income tax falls relatively heavily on high-income groups, who pay a share greater than the percentage of income they receive, whereas lower income groups pay a proportion of indirect tax greater than their share in income. The table shows the Gini coefficient for gross income and the concentration coefficient for the various revenue sources, and the Kakwani progressivity index (which may be calculated as the difference between the concentration coefficient for the

Table 2: *Distribution of Health Care Payments Among Households Classified by Gross Income, Ireland 1989*

Gross Income Decile	General Taxation				Social Security	Insurance Premia	Household Expenditure	Total Payments
	Gross Income	Income Tax	Indirect Tax	Total Tax				
	%	%	%	%	%	%	%	%
Bottom	1.9	0.0	3.7	2.2	0.0	1.8	2.0	2.0
2	3.1	0.1	4.2	2.5	0.2	1.3	3.6	2.4
3	4.2	0.3	5.5	3.3	0.4	1.4	4.1	3.0
4	5.4	1.2	7.4	4.8	2.1	3.0	7.9	4.9
5	7.0	3.3	9.1	6.7	5.8	4.2	7.7	6.5
6	8.8	6.2	10.0	8.4	10.0	6.8	10.1	8.6
7	10.9	9.4	11.1	10.4	12.9	11.5	11.1	10.8
8	13.6	14.3	13.1	13.6	16.1	15.3	15.4	14.2
9	17.6	22.5	15.9	18.7	21.9	22.0	16.0	18.9
top	27.5	42.7	20.0	29.5	30.6	32.6	22.1	28.7
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gini/ concentration index	0.40	0.64	0.29	0.43	0.54	0.52	0.34	0.43
Kakwani progressivity index	-	0.24	-0.12	0.03	0.14	0.12	-0.06	0.03

source in question, and the Gini coefficient for income).¹⁹ These indicate that income tax is progressive (the Kakwani index is positive) and indirect tax is regressive, producing a situation where total tax is slightly progressive, with shares paid in tax by the various deciles close to their shares in income. Social security contributions are progressive, though less so than income tax, and the same is true of insurance premia. Household direct expenditure is

slightly regressive. Total health care payments, then, have a distribution which is close to that of total taxes and gross income, being mildly progressive. (It is worth noting that the payment concentration curve does not, however, lie outside the Lorenz curve for gross income throughout: the curves in fact intersect at the very bottom, with the bottom decile paying a slightly higher percentage of health care payments than it receives in income.)

It is relevant to compare these results with those for the US presented in Gottschalk, *et al.* (1986) and the UK and the Netherlands in Wagstaff, Van Doorslaer and Paci (1989). The Irish pattern is in fact similar to the UK, despite the significant differences in health financing structures: both the Gini coefficient and the concentration coefficient for total payments are slightly higher in Ireland, resulting in an identical Kakwani index value for payments. Thus the Irish financing structure, on the basis of gross income, appears mildly progressive like the UK, rather than regressive like the US and the Netherlands.

In assessing equity, though, it is important to take into account differences in household size and composition, which affect 'need' and 'ability to pay'. This is conventionally done by converting income to an equivalent basis using adult equivalence scales. To facilitate comparisons across countries, we here adopt the set of scales employed by the UK Royal Commission on the Distribution of Income and Wealth, used in the analysis of Dutch data by Van

Doorslaer and Wagstaff (in Working Paper 3). This scale allows 0.61 for a single adult, 1.0 for a married couple, and 0.27 for a child, and is similar, though not identical, to the scales used in studies of income distribution and poverty in Ireland (see Callan, Nolan, *et al.*, 1989).¹⁴

Now classifying households in the HBS on the basis of equivalent gross income decile, Table 3 shows the distributional pattern of the various health-financing sources and of gross equivalent income. These figures are largely derived from special tabulations from the HBS micro-data tape, facilitated by the CSO. However, as before, indirect taxes are not yet available and represent a "best gross": since the information available on an equivalent income basis even for earlier years is incomplete, these must be treated as particularly tentative and will be replaced by actual 1987 figures as soon as the results of the CSO redistributive exercise become available.

Compared with the pattern by gross income shown in Table 2, Table 3 reveals a very similar picture. As usual, the distribution of equivalent income is more equal than that of unadjusted income, the Gini coefficient being reduced from 0.40 to 0.36. The concentration ratios for the various financing sources also fall slightly, but income tax, social security contributions, and health insurance premia remain progressive, and indirect taxes and household direct expenditure on health care remain regressive. There is little change in the Kakwani progressivity index values, and total

Table 3: *Distribution of Health Care Payments Among Households Classified by Gross Equivalent Income, Ireland 1989.*

<i>Equivalent Gross Income Decile</i>	<i>Equivalent Gross Income</i>	<i>General Taxation</i>			<i>Social Security</i>	<i>Insurance Premia</i>	<i>Household Expenditure</i>	<i>Total Payments</i>
		<i>Income Tax</i>	<i>Indirect Tax</i>	<i>Total Tax</i>				
	%	%	%	%	%	%	%	%
Bottom	2.8	0.1	5.1	3.0	0.3	2.4	4.1	2.9
2	4.2	0.2	4.9	3.0	0.9	1.1	2.8	2.6
3	4.8	0.5	5.1	3.2	1.4	1.2	3.2	2.9
4	5.6	1.5	6.7	4.5	3.4	2.5	5.0	4.3
5	6.9	3.6	9.1	6.8	7.0	4.5	7.8	6.7
6	8.5	7.1	11.1	9.4	11.0	8.8	10.7	9.6
7	10.5	10.8	12.4	11.7	13.8	13.7	15.5	12.6
8	13.0	14.8	13.1	13.8	16.6	16.7	15.0	14.5
9	16.8	21.8	15.4	18.1	20.2	22.5	18.6	18.8
top	27.0	39.5	17.1	26.5	25.4	26.5	17.4	25.1
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gini/ concentration	0.36	0.61	0.24	0.39	0.47	0.48	0.32	0.40
Kakwani index	-	0.25	-0.12	0.03	0.11	0.12	-0.04	0.04

health care payments remain slightly progressive. The move to equivalent rather than unadjusted income thus makes little difference to the measured progressivity of health care financing sources. This is in contrast to the Dutch results in Van Doorslaer and Wagstaff (1989, WP4) where there were some differences between the equivalent income-based results they report and those in Wagstaff, Van Doorslaer and Paci (1989) on an unadjusted income basis. However, there health

care payments were converted to an equivalent basis (and equivalent/unadjusted results were for different years). For that reason it is also not possible at this stage to make a comparison between the Irish results and their equivalent income-based results for the Netherlands, and no corresponding estimates for other countries appear to have been published.

5. Inequity in the Delivery of Health Care in Ireland

We now turn to the delivery of health care, with the ESRI survey as database and the individual as the unit of analysis. Following the procedure set out in Van Doorslaer and Wagstaff (1989, WP3), health care expenditure/benefit to be attributed to each person is estimated on the basis of their reported utilisation of care of different types, multiplied by the estimated unit cost of each type of care. (The way in which these unit costs are calculated is described in the Appendix.) The types of care covered and their estimated unit costs are:

- (i) GP visits - IR £5 per visit;
- (ii) prescriptions - IR£10 per prescription;
- (iii) outpatient consultations - £25 per visit;
- (iv) day surgery visits - IR£80 per visit;
- (v) hospital inpatient stays - IR£140 per night;
- (vi) dental, hearing or sight test visits - IR£35 per visit.

In addition to the areas covered in the Dutch results in WP3, then, prescriptions and dental visits are also included here.

It is worth drawing attention to the fact that, even so, a significant proportion of the health expenditures included in the analysis of financing are not now being allocated to individuals in looking at delivery. In the case of public expenditure, the omitted areas include, most importantly, psychiatric care, care of the handicapped, community care (e.g., community nurses), and long-term hospital care for the elderly, etc., as well as administration costs. Since much of this expenditure is on the long-term institutional population, it is difficult to see how it could usefully be allocated among households. Less importantly, some household expenditure - on non-prescription drugs and therapeutic equipment - is also omitted. Overall, under 60 per cent of the health care spending included in the analysis of financing is now being allocated among households. Since the composition of health spending varies across countries and over time, this financing/delivery divergence may have implications for both cross-country comparisons and assessing changes over time in a particular country.

It may again be useful to look briefly at the distribution by gross unadjusted income, before concentrating on equivalent income. Table 4 shows the distribution of health care expenditure among individuals classified by quintiles of gross household income (i.e., each individual is attributed the gross income of the household to which they belong and persons - rather than households - are then ranked by quintile). The bottom two quintiles receive a higher share

of expenditure than their share of the population, particularly the bottom 20 per cent who receive 29 per cent of expenditure. Using the measure of chronic illness

Table 4: *Distribution of Health Care Expenditure and Chronic Illness by Gross Income, Ireland 1987*

<i>Gross Income Quintile</i>	<i>% of Expenditure</i>	<i>% of all Chronically Ill</i>
bottom	28.7	38.0
2	22.2	19.5
3	19.1	16.1
4	14.6	13.6
top	15.4	12.8
all	100.0	100.0
concentration index	-0.137	-0.225
HI		0.088

described in Section 3, the table also shows the distribution of persons reporting such illness over the quintiles. This measure is available only for adults, 17 per cent of whom reported such an illness. Children in the sample are assumed not to have such an illness, so that 9 per cent of all persons in the sample are counted as ill. The chronically ill are considerably more concentrated towards the bottom of the distribution than health care expenditure - 38 per cent are in the bottom quintile. The concentration indices C^{*P} and C^{ill} are both negative, with lower quintiles having greater proportions of both expenditure and of the ill than their share in the population, but that for illness is greater.

Thus the HI index, which is twice the area between the expenditure and illness concentration curves and measured by $C^{*P} - C^{*I}$, is positive, indicating horizontal inequity favouring the rich.

Compared with the results based on gross income for England and Wales presented in Hurst (1985), the distribution of expenditure in Ireland is less concentrated at the bottom, and the chronically ill are rather more concentrated in the bottom (rather than the second) quintile. The result is that the HI index is positive in both cases but considerably higher in Ireland. The Irish figure is also well above that for Italy presented in Wagstaff, Van Doorslaer and Paci (1989) based on gross income (and using the chronic illness rather than the "health not good" measure). In the same paper the results for the Netherlands (based on net income and the chronically ill measure) show a negative HI index - inequity favouring the poor.

We now adjust incomes for differences in household size and composition, using the equivalence scales described earlier, and rank individuals in quintiles by equivalent gross income. Table 5 shows the overall pattern of expenditure and illness distributed over equivalent income quintiles. Compared with unadjusted income in Table 4, there is in fact little change in the distribution of health care expenditure, as reflected in the very similar level of the concentration index C^{*P} . The chronically ill are now even more concentrated towards the bottom, though, with 63 per

cent in the bottom two quintiles (compared with 57¹/₂ per cent by unadjusted income). As a result the concentration index C^{111} has a higher negative value, and the HI index has a higher positive one, indicating even more horizontal inequity in favour of the rich.

Table 5: *Distribution of Health Care Expenditure and Chronic Illness by Gross Equivalent Income, Ireland 1987*

<i>Gross Equivalent Income Quintile</i>	<i>% of Expenditure</i>	<i>% of Chronically Ill</i>
bottom	30.6	41.7
2	19.7	21.6
3	17.3	14.6
4	16.6	12.4
top	15.8	9.7
all	100.0	100.0
concentration index	-0.131	-0.293
HI		0.162

This pattern is analysed in greater detail in Table 6, which adopts the same format as Table 1 of Van Doorslaer and Wagstaff (1989, WP3). This shows that the level of health expenditure per person falls consistently as income rises, with a relatively very high figure for the bottom quintile. However, the sickness rate also falls steadily as income rises, with the chronically ill even more concentrated in the bottom quintile. Averaging expenditure only over the chronically ill, we see that the level of expenditure per

Table 6: Distribution of Health Care Expenditure, Chronic Illness, Expenditure Per Person Ill, Ireland 1987

Quintile	Number in Quintile	Cumulative % of Pop.	Sickness Rate (per 1000)	Numbers Chronically Ill	% of Chronically Ill	Cumulative % of Ill	Expend. per Person	Expend. per Person Ill	Total Expend.	% of Expend.	Cumulative % of Expend.
bottom	2630	20.0	182	480	41.7	41.7	368.1	2016.8	968.1	30.6	30.6
2	2629	40.0	94	248	21.6	63.3	238.6	2529.1	627.2	19.7	50.3
3	2629	60.0	64	168	14.6	77.9	209.7	3281.2	551.2	17.3	67.6
4	2629	80.0	54	142	12.4	90.3	282.2	3744.0	531.6	16.6	84.2
top	2630	100.0	42	112	9.7	100.0	190.3	4469.1	500.5	15.8	100.0
	13147		87	1150	100.0		241.8	2764.3	3178.8	100.0	

person now increases consistently as income rises, and is over twice as high in the top quintile as in the bottom one.

These results may be contrasted with those for the Netherlands, presented in Van Doorslaer and Wagstaff (1989, WP3). There, the bottom quintile contained 18 per cent of the chronically ill and received 17 per cent of the expenditure - the corresponding figures for Ireland being 42 per cent and 31 per cent respectively. It is worth noting, though, that while 9 per cent of the Irish sample (17 per cent of adults) reported chronic illness, this was the case for fully 29 per cent of the Dutch sample (which seems remarkably high even if only adults are included?). Without knowing more about the Dutch sample and illness measure, it is difficult to explore the implications of this difference. It does suggest, though, that the assumption implicit in calculating health expenditure per person ill - that only the chronically ill benefit from such expenditure - is likely to be even less realistic in the Irish case.

Having looked at the pattern of expenditure using the whole sample, we now look at sub-groups - those aged under 65, those aged 18-64, and those aged 18 and over. In each case individuals are classified by quintile and the expenditure going to each quintile and number reporting chronic illness in each derived (i.e., the decile rankings are re-calculated for each sub-group). Table 7 shows the percentage of health care expenditure going to each quintile, the percentage of the ill in each, and the mean expenditure

per person and per person ill for each quintile for the three sub-groups and, for comparison, the entire sample. The overall pattern found for the sample as a whole is also seen for each sub-group - average expenditure per person falls as we move up the quintiles, so that the bottom quintiles have a relatively high share of expenditure, but they also have a disproportionate share of the ill. Thus in each case expenditure per person ill rises as we move up the quintile distribution. This increase is a little less steep for the three sub-groups than it is for the entire sample - the top quintile receives 2.2 times the expenditure per person ill going to the bottom one for the sample, but the corresponding figure for the 18-64 and all over 18 sub-groups is 1.7/1.8, while for the under 65s it is 2.1. Overall, though, focusing on particular sub-groups makes little difference to the general pattern revealed.

Standardising Expenditure

The importance of standardising for the differences in age and sex composition between the quintiles, as well as the proportion ill, has been emphasised in previous project papers. The approach suggested by Wagstaff (1989, WP2), as specified in Van Doorslaer and Wagstaff (1989), is now implemented. This involves splitting the sample into 16 groups, on the basis of cross-classification by 4 age categories, male/female, and chronically ill/healthy. For each quintile, mean health care expenditure for each of these 16 groups is derived. Weighted by the proportion of

Table 7: *Distribution of Health Care Expenditure, Chronic Illness, Expenditure per Person and per Person Ill, Sample and Sub-Groups, Ireland 1987*

	<i>Age Sub-Groups</i>			
	<i>All</i>	<i>Under 65</i>	<i>18-65</i>	<i>18+</i>
<i>% of Expenditure</i>				
Quintile 1	30.6	27.2	28.6	29.1
2	19.7	21.9	20.2	23.3
3	17.3	15.8	15.6	16.2
4	16.6	17.6	16.7	14.5
5	<u>15.8</u>	<u>17.5</u>	<u>18.9</u>	<u>16.8</u>
All	100.0	100.0	100.0	100.0
<i>% of Chronically Ill Persons</i>				
Quintile 1	41.7	38.9	34.0	33.8
2	21.6	20.3	23.3	25.3
3	14.6	14.4	15.3	16.7
4	12.4	14.6	14.9	12.9
5	<u>9.7</u>	<u>11.9</u>	<u>12.5</u>	<u>11.3</u>
All	100.0	100.0	100.0	100.0
<i>Expenditure per Person (IR£)</i>				
Quintile 1	368.1	287.5	357.5	424.5
2	238.6	231.6	252.9	341.1
3	209.7	168.1	196.1	236.6
4	202.2	186.3	210.5	213.8
5	<u>190.3</u>	<u>184.2</u>	<u>236.2</u>	<u>245.7</u>
All	241.9	211.6	250.7	292.4
<i>Exp. per Person Ill (IR£)</i>				
Quintile 1	2,017	2,230	1,889	1,882
2	2,529	3,434	1,945	1,951
3	3,281	3,505	2,289	2,073
4	3,744	3,847	2,520	2,394
5	<u>4,469</u>	<u>4,693</u>	<u>3,422</u>	<u>3,152</u>
All	2,764	3,186	2,249	2,121

individuals in the quintile in each group, this of course produces the mean expenditure for the quintile. To standardise, though, the weights applied are, instead, the proportion of all individuals falling into each group. The standardised mean expenditure for the quintiles can then be compared.

Table 8 shows the standardised expenditure figures derived in this way for the Irish sample, concentrating on those aged 18 or over to facilitate comparison with the Dutch results in Van Doorslaer and Wagstaff (1989). The picture revealed is quite different to that produced by simply examining expenditure per person ill, i.e., in effect attempting to standardise only for the incidence of illness. Standardised expenditure per person is now higher for the bottom two quintiles than for quintiles 3 and 4, and while the top quintile still receives an above-average share, it is now only the same as that going to the bottom one.

Table 8: *Application of Wagstaff's Standardisation Method to Irish Sample 1987 (over 18s only)*

<i>Quintile</i>	<i>Standardised Expenditure per Person (IR£)</i>	<i>Standardised Expenditure per Person Ill (IR£)</i>	<i>Share of Standardised Expenditure %</i>
1	327.1	2,366	22.4
2	309.6	2,240	21.2
3	250.9	1,815	17.2
4	247.2	1,789	16.9
5	325.9	2,358	22.3

(There seems little point in now looking at expenditure per person ill, since we have already standardised for illness and it tells us nothing extra?) The bottom 20 per cent, 40 per cent and 60 per cent of the distribution receive a higher share of standardised expenditure than their share in the population, but this is not true of the bottom 80 per cent - the standardised concentration curve crosses the diagonal. None the less, the concentration index, at -0.018 , suggests that on balance there is inequity favouring the poor. This corresponds to the finding for the Netherlands produced by the standardised results in Van Doorslaer and Wagstaff (1989).

Where the Dutch and Irish results differ, though, is that the standardisation made little difference in the Dutch case but a great deal of difference in the Irish one. It is therefore worth exploring why standardisation affects the Irish pattern in this way. It is instructive in doing so to focus on the bottom quintile. Mean expenditure in that quintile is sharply reduced by standardisation, so that its share of total expenditure falls from 29 per cent before standardisation to 22 per cent after it. This occurs because the elderly, including the ill elderly, are concentrated relatively heavily in that quintile and have relatively high expenditure levels. Thus 25 per cent of those in the bottom quintile are "healthy" and aged 65 or over, compared with 11 per cent in the sample, while 11 per cent are ill and aged 65 or over, compared with 4 per cent in the sample. Substituting

the sample age/sex/illness group weights for those of the quintile itself thus produces a lower mean expenditure figure (£327 compared with £425, see Tables 7 and 8).

However, this standardised mean expenditure per person is now above average (as, of course, is the mean per person ill). To see why, the mean expenditure figures for each of the 16 age/sex/illness groups for the bottom quintile must be compared with the averages for the corresponding group for the whole sample. While the pattern is not uniform, the bottom quintile has an above-average level of expenditure for ten out of the 16 groups. This is particularly pronounced for ill women, and there are also smaller but significant differences for non-elderly healthy women (who have a higher weight).

The apparent inequity favouring the rich shown by the unstandardised results, based simply on expenditure per person ill, arises because of the biases in that procedure analysed clearly in Wagstaff (1989), and the Irish results are in fact a perfect illustration of the points made there. In essence, (i) the bottom quintiles have a much higher proportion of the ill than higher quintiles, (ii) mean expenditure on the ill per person is well above expenditure on the non-ill, and (iii) nevertheless, expenditure on the healthy is a substantial proportion of all expenditure because most people are healthy. When all expenditure is averaged over the ill, the ill in the bottom quintiles appear to do less well, even though they are actually receiving more

expenditure per head than those in higher quintiles. This arises because (a) total expenditure on the healthy is higher in the higher quintiles because there are more healthy people, and (b) this expenditure on the healthy is being spread over a much smaller number of ill persons in the higher quintiles.

The importance of expenditure on the healthy must be emphasised: only 38 per cent of all health care expenditure in the Irish sample goes on the ill, 62 per cent goes on the healthy (over 18s only). For the top quintile, about 70 per cent of all expenditure is on the healthy. When total expenditure for this quintile is averaged over the small number of ill in the quintile (only 11 per cent of all ill persons) a quite misleading picture of the actual expenditure on the ill is given. For the bottom quintile, by contrast, only about 46 per cent of expenditure is on the healthy, and total expenditure is averaged over a much larger number of ill (34 per cent of all ill persons in the sample). The biases introduced by simply looking at expenditure per person ill are therefore very substantial, and the need for the more elaborate standardisation procedure illustrated.

The slight inequity favouring the poor revealed by the standardised results will require a good deal of analysis. The sensitivity of the results to the categories chosen for grouping will bear examination - for example, mean expenditure on the elderly (whether ill or healthy) in the bottom quintile may be higher than average because a higher

proportion are aged 75 or over than in other quintiles. None the less, that pattern is consistent with the results of the analysis of utilisation behaviour in Nolan (1989), where it was found that those in Entitlement Category I - the bottom 40 per cent of the distribution - had relatively high levels of GP visits and prescriptions, even after controlling for age, sex, ill/not ill, etc. This may be influenced by the fact that GP visits and prescription medicines are available free of charge to persons in this category but not the rest of the population. (A similar analysis of hospital inpatient stays, which dominate the overall expenditure pattern, is under way.) However, the key question both with respect to the distributional pattern and the utilisation results is whether we have adequately controlled for the incidence of illness. The crude chronically ill/not ill dichotomy is a useful control, and represents an advance on what has previously been available in Irish studies, but may fail to reflect the higher levels of ill-health known to be experienced by lower socio-economic groups. This is obviously a central issue for the EC project as a whole, and one on which results for other countries, with a wider range of indicators of ill-health, should be helpful.

Finally, we look at the results of regression-based tests for inequality, as set out in Van Doorslaer and Wagstaff (1989). Table 9, col. (1), presents the results of regressing health care expenditure on dummy variables for the income quintiles, age categories, sex and illness variables

Table 9: *Results of Regressions Explaining Health Care Expenditure, Ireland 1987 (over 18s only)*

<i>Variable</i>	<i>Regression Equation</i>		
	<i>1</i>	<i>2</i>	<i>3</i>
Constant	95.16 (1.45)	131.29 (5.51)	
Quintile 2	131.97 (1.59)		
Quintile 3	13.93 (0.17)		
Quintile 4	37.45 (0.46)		
Quintile 5	3.22 (0.04)		
Chronic illness	703.64 (10.16)	554.56 (14.43)	710.42 (10.28)
Quintile 2* chronic	-208.16 (2.00)		-175.58 (1.70)
Quintile 3* chronic	-399.93 (3.47)		-392.42 (3.41)
Quintile 4* chronic	-212.39 (1.71)		-207.97 (1.68)
Quintile 5* chronic	-70.07 (0.54)		-67.28 (0.52)
Age 35-44	66.75 (0.71)	-19.52 (0.52)	154.57 (1.91)
Age 45-64	72.13 (0.94)	37.26 (1.15)	150.88 (2.66)
Age 65+	155.17 (1.98)	177.01 (4.52)	230.45 (3.82)
Female	155.05 (2.69)	99.66 (3.89)	185.75 (3.52)
Quintile 2* Age 35-44	-138.08 (1.19)		-77.32 (0.74)

Table 9 (Continued)

<i>Variable</i>	<i>Regression Equation</i>		
	<i>1</i>	<i>2</i>	<i>3</i>
Quintile 3* Age 35-44	54.78 (0.47)		46.23 (0.40)
Quintile 4* Age 35-44	-23.32 (0.20)		-32.94 (0.28)
Quintile 5* Age 35-44	-141.32 (1.26)		-149.46 (1.33)
Quintile 2* Age 45-64	40.75 (0.40)		28.93 (0.34)
Quintile 3* Age 45-64	-62.88 (0.60)		-68.56 (0.81)
Quintile 4* Age 45-64	-102.37 (0.98)		-92.14 (1.09)
Quintile 5* Age 45-64	48.87 (0.45)		35.77 (0.40)
Quintile 2* Age 65+	-54.46 (0.49)		22.96 (0.25)
Quintile 3* Age 65+	85.23 (0.69)		75.86 (0.70)
Quintile 4* Age 65+	-2.69 (0.02)		3.45 (0.03)
Quintile 5* Age 65+	231.83 (1.15)		217.86 (1.13)
Quintile 2* Female	-130.06 (1.61)		-34.28 (0.48)
Quintile 3* Female	-54.26 (0.67)		-15.42 (0.22)
Quintile 4* Female	-62.49 (0.77)		-8.37 (0.12)
Quintile 5* Female	-16.66 (0.20)		17.64 (0.25)

Table 9 (continued)

	<i>Regression Equation</i>		
	<i>1</i>	<i>2</i>	<i>3</i>
R ²	0.0384	0.0348	0.0894
adj. R ²	0.0351	0.0342	0.0867
F statistic	11.4434	59.9918	32.6302
res. sum of squares	11,326,960,	11,370,097,	11,375,468,
	919	754	449
number of observations	8303	8303	8303
number of parameters	30	6	25

already described in the context of standardisation, together with interaction terms - age category 18-34 and quintile 1 being included in the intercept. As found by Van Doorslaer and Wagstaff, the illness, age 65 and over, and female variables are all significant, with the expected positive sign. (To facilitate comparison with their results, the Irish regression results are for those aged 18 and over.) The only other significant variables are the quintile 2 and quintile 3 interactions with illness - both with negative signs. Any tendency, such as this suggests, for the chronically ill in the second and third quintiles to receive less than those in the bottom quintile does not lead to strong conclusions about inequity.

The restricted models set out in Van Doorslaer and Wagstaff were also estimated and the implied restrictions tested. Column (2) in Table 9 shows the simple model with only age categories, sex and illness as explanatory variables. The value of the F-statistic on the additional

variables included in equation (1), based on the residual sum of squares, is 1.31. This is below the critical value (at the 1 per cent level), so the hypothesis of no income effects is not rejected. Column (3) in Table 9 shows the third model from Van Doorslaer and Wagstaff, where the quintile variables and the intercept are omitted so the quintile operates only through the interaction terms. The F-statistic comparing this with the full model is 7.082, above the relevant critical value, so the null hypothesis of zero intercepts is rejected. These results correspond to those for the Netherlands in Van Doorslaer and Wagstaff.

6. Conclusions

This paper has examined the distribution of health care financing and expenditure in Ireland. The analysis of financing was based on the 1987 Household Budget Survey. Health care financing in Ireland is dominated by State expenditure financed from general taxation, which accounts for over two-thirds of all health care expenditure. Social insurance contributions finance only about 7 per cent, health insurance accounts for 10 per cent, and household direct expenditure for 15 per cent. Overall, the distributional pattern of financing among households classified by equivalent gross income appears to be mildly progressive. This reflects the balance between indirect tax and household expenditure, which are regressive, and income tax, social security contributions, and health insurance premia which are progressive. The figures used for indirect tax had to be

estimated on the basis of 1980 data, but will be replaced by 1987 results available shortly.

The analysis of health care delivery was based on the ESRI's Survey of Income Distribution, Poverty and Usage of State Services, also carried out in 1987. Unit costs per GP visit, prescription, hospital outpatient consultation, day surgery, inpatient day, and dental visit were estimated using data in the survey and available national aggregates for expenditure and utilisation. Health care expenditure was attributed to each individual in the sample on the basis of reported utilisation in the previous 12 months, using these unit costs. The distribution of expenditure among individuals ranked by the gross equivalent income of their household was examined. A measure of chronic illness in the survey allowed the distribution of expenditure and illness to be compared.

The results showed a relatively high share of expenditure going to the lower income quintiles. This was, however, not as high as the proportion of those reporting chronic illness falling into these quintiles. Averaging expenditure over the number chronically ill in each quintile, there was a marked increase in expenditure per person ill as income rose. The biases which this procedure can introduce were revealed by the full standardisation for age, sex and illness, following Wagstaff's procedure. This produced standardised expenditure per person which was above average for the bottom, second and top quintile. On balance, mild inequity in favour of those on lower incomes was

indicated by the concentration index for standardised expenditure.

A number of issues raised in the course of the Irish analysis are of general relevance. It was noted that a significant proportion of the health care spending included in the analysis of financing is not allocated among individuals/households in looking at delivery. Much of this - particularly spending on long-term institutional care - may be difficult to attribute meaningfully to the household population, but biases could perhaps be introduced in comparing health care systems where the composition of spending and the proportion allocated among households varies.

The Irish results illustrated starkly the importance of health care spending on those who are not chronically ill, and how misleading simply looking at expenditure per person chronically ill may be. The sensitivity of the results to the precise categories chosen for the standardisation procedure and the way it is carried out require detailed examination. More fundamentally, the extent to which such a measure of chronic illness provides an adequate control for the incidence of ill-health must be called into question. The observed differences between income groups in mean health care spending on both the chronically ill and the "non-ill" need to be disaggregated, by type of utilisation and by the individual's characteristics, so that the source of the differences can be identified. Much more information about

variation in health status and "needs" both among the healthy and the ill would be required before any firm conclusions about the distribution of expenditure relative to needs could be reached.

Finally, the use of uniform unit costs for a particular utilisation type in allocating expenditure raises some interesting issues. Averaging all spending on GP care over the total number of consultations implicitly assumes, in the Irish context, that a "free" visit, financed by the State, is "worth" the same as a visit paid for out-of-pocket at a higher rate by the individual. In the case of GP consultations this may be reasonable, but what about hospital inpatient treatment - is a night spent in a public ward of a public hospital "worth" the same as one spent in a private bed or a private hospital? Clearly the answer depends on what one is attempting to measure, and in focusing on equity in health care delivery it would not appear appropriate to value the private bed more highly simply because of the "hotel" aspects of the facilities available. However, there may also be differences in the health care *per se*, though valuation of these would clearly pose major difficulties.

FOOTNOTES

- 1 A maximum of £100 in any year is payable under this charge.
- 2 Expenditure on prescribed medicines above a certain ceiling is reimbursed by the State.
- 3 Membership of Category I is determined on the basis of a family means test. For Category II versus III, though, an individual earnings ceiling is applied.
- 4 Health Statistics 1987, p. 90.
- 5 Health Statistics, 1988, Table J1, p. 101.
- 6 For "treatment benefits" see Report of the Commission on Health Funding, Table 4.1, p. 43.
- 7 Health Statistics, 1988, Table J2 gives the sources of funding for the £1,221.5m spent by the Department of Health. Adding in treatment benefits and ignoring EC receipts, we arrive at a total of £127m from social security contributions, the remainder being Exchequer-financed.
- 8 Report of the Commission on Health Funding, Table 4.1, p. 43.
- 9 Report of the Commission on Health Funding, Table 4.1, p. 43.
- 10 It is worth noting that they account for a significantly smaller share of total government expenditure because of the size of the Exchequer current budget deficit in that year, as through much of the 1980s, in Ireland.
- 11 Household Budget Survey 1987, Vol. 1, Table 2.
- 12 The distribution of indirect taxes, by *original* (i.e., pre-transfer) household income decile in 1980, from the CSO's redistributive exercise, is given in Murphy (1984). UK data suggest the distribution by gross or disposable income is slightly more even over the deciles.
- 13 For the present draft these indices have been calculated from the decile shares using linear approximation, since some of the results are preliminary in any case.
- 14 While a variety of scales have been applied, the one adopted as a benchmark in our own recent work has allowed 0.60 for a single adult and 0.33 for a child.

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