national STaTiSTiCS

Experimental total UK health expenditure

UK Health Accounts are currently at an experimental stage in their development. ONS is keen to involve potential users early in this development to maximise quality assurance as well as to familiarise users with the new data.

This document presents a detailed note on the methods employed in compiling experimental total UK health expenditure figures for 1997-2001, which were disseminated on 27 February 2003. In doing so, it describes the differences between these latest and the previous estimates of total UK health expenditure, and compares the two sets of estimates. Summary details can be found on the National Statistics website, at http://www.statistics.gov.uk/healthaccounts

A System of Health Accounts[1] defines total expenditure on health as the economic resources spent on health care goods and services, including administration and health insurance, plus gross capital formation in health care industries. ONS is using this definition as the basis for its experimental estimates for the calendar years 1997-2001 of total UK expenditure on health, which appear in table 1, because of the requirement to compare the UK with other countries around the world.

Table 1: experimental total, public and private UK health expenditure, 1997 - 2001, £m

	Total UK health expenditure (£m)	As a percentage of GDP	Public UK health expenditure (£m)	Private UK health expenditure (£m)
1997	55,545	6.8%	44,502	11,043
1998	59,240	6.9%	47,482	11,758
1999	64,773	7.2%	52,128	12,645
2000	69,117	7.3%	55,947	13,170
2001	75,014	7.6%	61,642	13,372

Source: ONS

The definition in *A System of Health Accounts* has been discussed and agreed internationally and is promulgated by the OECD. It is supported by the World Health Organisation, the World Bank, and the European Commission. The figures in table 1 do not conform entirely with the internationally agreed definitions, as some of the methods for estimating components of the total require further researching and quality assurance. The estimates also do not include two components which are treated as health expenditure in the international definitions. These are (i) household production of health care services and (ii) occupational health care (therapeutic and preventive care given by employers to employees). These methods have been discussed and agreed by a Project Board, membership of which is made up of representatives from ONS, all UK health administrations, HM Treasury and an academic. ONS considers these latest

experimental estimates to be calculated on a more internationally comparable basis than previous estimates.

An overview of the methodology and limitations of the estimates

The experimental estimates of total UK health expenditure are built up from a number of components as described in seven sections, each containing a component of the total, on the following pages.

1. Health administrations' expenditure on health care

The latest estimates for government expenditure on health are published in table 11.2 of the *National Accounts Blue Book 2002* [2]. According to the Blue Book, government spent over £60 billion on health care in the UK in 2001. Expenditure on investment, or capital, is not included as health care and is dealt with in section 7 below. Health expenditure by prisons and the armed forces is dealt with in section 2 below.

This estimate covers expenditure by health administrations in England, Wales, Scotland and Northern Ireland as well as the NHS. The primary purpose of some of this expenditure is not health care but Research & Development (R&D) or Education & Training (E&T). As such, expenditure on R&D and on E&T by health administrations and the NHS needs to be excluded from total expenditure on health. *A System of Health Accounts* recognises the importance to a country's health system of R&D into new medical procedures and of E&T of health professionals, and treats them as health related functions rather than health care.

An annual government survey is carried out to quantify R&D expenditure, with aggregate results published by the Office of Science and Technology in *Science, Engineering and Technology (SET) Statistics 2001* [3]. To convert these financial year data to the calendar year basis, a method of apportionment is used. For example, 1999 figures are estimated as one quarter of those for 1998/1999 and three quarters of those for 1999/2000. Table 2 provides the detailed data on expenditure by health administrations in the UK on R&D. A number of refinements have been made to the data, as follows.

- A number of institutions were merged to form the Research & Development Office in Northern Ireland, in 1998. The expenditure of these institutions was not separately accounted for, so an estimate has been included for the years 1996/97 and 1997/98.
- The Scottish Executive has provided revised figures for its R&D expenditure in health for all years.
- The National Assembly for Wales has provided a revised figure for 1996/97

Table 2: expenditure by UK health administrations on Research & Development, 1997-2001, £m

	Expenditure (£m)
1997	528
1998	524
1999	530
2000	538
2001	546

For England, Wales and Northern Ireland, expenditure on R&D in health for the financial year 2000/01 has been used as an estimate for the calendar year 2001 in the absence of later data.

There are no similar data for quantifying government expenditure on E&T. ONS has focused initial attention on estimating E&T expenditure in England by the Department of Health and the NHS. To do this, ONS worked with the Department of Health to identify items of E&T expenditure within the Departmental and NHS budgets. This was then grossed up to a UK estimate by assuming that public expenditure per head of population on E&T in Wales, Scotland and Northern Ireland was the same as it is in England. Further work to investigate this assumption is planned, for example different levels of staffing outside England may lead to different levels of staff E&T.

ONS was due to release revised mid-year population estimates based on new population data from the 2001 Census on 27 February 2003. It has not been possible to take these new estimates on board.

Table 3: expenditure by health administrations on Education & Training, UK, 1997-2001, £m

	Dept of Health expenditure on E&T (£m)	England population	UK population	UK expenditure on E&T (£m)
1997	929	49,284,242	59,013,966	1,112
1998	982	49,494,582	59,236,522	1,175
1999	1,043	49,752,864	59,500,915	1,247
2000	1,160	49,997,089	59,755,659	1,387
2001	1,313	49,181,300	58,836,700	1,571

2. Expenditure on health by the armed forces and in prisons

Expenditure by the NHS on health care for armed forces personnel and for prison inmates is already included as government expenditure (see section 1 above) on health in the National Accounts Blue Book. Expenditure on health by the armed forces is classified as defence expenditure and expenditure on health by prisons is classified as public order and safety expenditure.

Estimates of expenditure on health by the individual armed forces are available in the Ministry of Defence's Medical Quinquennial Review for the Army of £98.9m for 1999/2000, for the Navy of £20.5m for 2000/2001, and for the Royal Air Force of £22.0m for 2001/2002. The costs across all forces of 'health policy', 'secondary care', and 'dental care' are available from the Surgeon General's Office, which has reported an estimate for 2002/03 of £184.2m. The costs across all forces of 'medical goods dispensed to outpatients', and 'preventative & public health services' are available from the Medical Supplies Agency, which has reported an estimate for 2001/02 of £52.1m.

No estimates for other years are available. Our health expenditure estimates are published on a calendar year basis so we have assumed, for example, that 1999 calendar year estimates can be approximated by 1999/2000 financial year data, and so on. Whilst total expenditure could be affected by changes in productivity, economies of scale, inflation and other influences, we have assumed that health expenditure moves in line with the number of armed forces personnel, so have calculated time series by applying the year-on-year changes in armed forces personnel to

the available expenditure figures. The sum of all these costs represents total health expenditure in the armed forces.

The relevant authorities with responsibility for prisons in the UK (the Home Office, the Scottish Prison Service and the Northern Ireland Prison Service) have each provided a single year estimate for the cost of health care in prisons that is not already included in NHS figures. In order to create a time series for 1997-2001, ONS has assumed that prison expenditure moves in line with the number of prison inmates. ONS is aware, however, that prison expenditure could also be affected by changes in productivity, economies of scale, inflation and other influences. Table 4 provides the combined estimates for expenditure on health by the armed forces and by prisons for the UK.

Table 4: Expenditure on health by the armed forces and by prisons, UK, 1997-2001, £m

	Health expenditure by armed forces and prisons (£m)
1997	501
1998	495
1999	488
2000	487
2001	483

3. Household expenditure on health care

The estimate for household expenditure on health is published in table 6.4 of the *National Accounts Blue Book 2002* [2]. It covers private expenditure by UK-resident households, for example individuals' purchases of medicines or payments for treatment in private hospitals, and is estimated at just over £10 billion in 2001. The definition currently used is based on an internationally recognised classification by purpose, which is consistent with the functional classification used in the international framework of Health Accounts.

Estimates for other years have been constructed using the same classification. Further details on household expenditure and the classifications used are available at:
http://www.statistics.gov.uk/consumertrends

4. Non-profit institutions serving households expenditure on health care

Non-profit institutions serving households (NPISH) are charities and similar relief and aid organisations, trade unions, some higher education institutions, friendly societies and religious organisations. They are financed by donations from the public, government and business and provide goods or services to households free, or at prices that are not economically significant.

No information is available on health expenditure by the NPISH sector that is consistent with other components of the total UK health expenditure figure. There is only a figure for overall total expenditure of this sector of the economy, which is produced by ONS and is published in table 6.4 of the *National Accounts Blue Book 2002*[2].

In order to identify total health expenditure within the NPISH sector, it is first necessary to identify which parts of this sector incur health expenditure. It is thought that charities and

religious organisations are the only ones that do so, for example as health care providers (e.g. hospices) or as contributors to the health care of specific conditions such as AIDS, Parkinson's Disease and so on.

The Caritas publications of the top 3000 charities in the UK [4] contain a range of information on these charities, including income, expenditure and purpose. To reduce the task of examining individual charities' expenditure, systematic samples were taken in separate exercises (in 2000 using 1997 data for publication in February 2002 and in 2001 using 1999 data for publication in February 2003). Although there are many more charities in the UK, these 3000 make the most significant contribution to total expenditure. The publications were therefore considered to be an adequate sampling frame for estimating what proportion of charity expenditure was devoted to health care.

It was not possible to establish separate figures for health and non-health expenditure for every charity. Where it was not possible, all expenditure by a charity whose main purpose was health was treated as health expenditure, and all expenditure by charities whose main purpose was not health was treated as not being health expenditure. Examination of the expenditure of the few charities for which it was possible to separate between health and non-health suggested that the errors introduced by this treatment are of similar magnitude and should therefore have little net effect.

It was not possible to separate expenditure on health care from capital expenditure, which may lead to a bias in the results. Further work needs to be carried out to improve this method.

The sample analysis suggested that the percentage of total expenditure by charities spent on health was 17% in both 1997 and 1999. No equivalent information for religious organisations has been found, so an assumption was made that the health to total expenditure ratio is the same as for charities.

Total expenditure by the NPISH sector in 1997 was £19,602 million, of which 35% was incurred by charities and religious organisations. Therefore, health expenditure by the NPISH sector was estimated to be about £1.2 billion. Total expenditure by the NPISH sector in 1999 was £22,150 million, of which 34% was incurred by charities and religious organisations. Therefore, health expenditure by the NPISH sector was estimated to be about £1.3 billion.

As these estimates are based on the results of sample surveys, they are subject to sampling error. On this basis the 1997 and 1999 values are likely to lie between (£0.8 billion and £1.9 billion) and (£1.1 billion and £1.6) billion with 95% confidence. Any deviation from the assumptions made will also affect the precision of the estimates.

Estimates for other years have been produced, by assuming that the proportion of total NPISH expenditure on health care did not vary over time, making an adjustment for bias between the two survey results. More detail on this sample survey can be found in the annex.

5. Costs incurred by Local Authorities and private individuals on nursing care in nursing homes

The estimates of health expenditure available in the National Accounts Blue Book include only expenditure on nursing care for those residents in nursing homes who are funded by the NHS. It does not include expenditure for residents who are self-funded or Local Authority supported. *A*

System of Health Accounts includes all expenditure on nursing care in nursing homes in its definition of total health expenditure. For international comparisons, it is therefore important that non-NHS expenditure is included in the figure for total health expenditure in the UK.

Local Authority Personal Social Services financial returns identify expenditure on nursing placements in independent homes. However, this covers the total cost of the placement in the home, i.e. it also includes the residential and personal care costs, which, according to the international definition should not be included as expenditure on health. It is not possible to separate health care costs from the other care costs using this data source.

In calculating the cost of nursing care, the Royal Commission on Long Term Care for the Elderly and the devolved administrations estimated this figure from the difference between the fees for a nursing home placement and a residential care home placement.

Laing & Buisson, in their annual *Care of Elderly People Market Survey* [5], provide estimates of the numbers of residents and the average weekly fees in private care homes in the UK. These data are derived from their annual survey of all care homes, to which they receive a 30% response rate.

Table 5: Calculation of average weekly cost of nursing care in nursing homes, UK, 1997-2001, £

	Average weekly nursing home fee (£)	Average weekly residential care home fee (£)	Average weekly cost of nursing care (£) (= difference between weekly fees)
1997	338	247	91
1998	352	252	100
1999	360	258	102
2000	370	268	102
2001	393	280	113

Source: Laing & Buisson: *Care of Elderly People Market Survey 2002*

Table 5 shows an average weekly cost of nursing care in the UK calculated from the difference between average weekly nursing and residential care home fees published in Laing & Buisson.

For England, these data have been combined with an estimate of the number of residents who are not NHS funded in nursing homes to produce an estimate of the annual amount of expenditure on nursing care in nursing homes. It is necessary to exclude those residents who are NHS funded, as expenditure relating to these people is already included in the NHS accounts, thus an estimate including them would result in some double-counting. To produce a UK figure the estimates for England are grossed up on the basis of the number of residents in nursing homes in the different administrations.

Payment for nursing care in nursing homes has been taken over by the NHS for self funders in England from 1 October 2001. As the NHS takes responsibility for this expenditure, it will be included in the NHS accounts and therefore automatically be counted in the compilation of UK expenditure on health. It is therefore necessary to adjust the UK estimate to take this into account. This has been done by estimating expenditure in England on nursing care from 1 October 2001 to 31 December 2001 as a quarter of the calendar year 2001 annual total. The results of these calculations are summarised in Table 6.

Table 6: Expenditure on non-NHS funded nursing care in nursing homes, UK, 1997-2001, £m

	Expenditure (£m)
1997	789
1998	872
1999	956
2000	909
2001	801

The timetable for further changes in funding arrangements for nursing care provision is that the NHS will bear these costs for all in Scotland from 1 July 2002, for all in Northern Ireland from 7 October 2002, for self funders in Wales from 1 December 2002, and for those receiving Local Authority support in England and Wales from April 2003.

The public/private split of this component has been estimated on the basis of the funding arrangements for nursing home residents in England. Those funded by the Department for Work and Pensions under preserved rights arrangements and those supported by Local Authorities are included under public, whilst the remainder - self funded residents – are included as private.

ONS recognises that the methodology used to produce the UK figure is crude. However, it is felt that this makes best use of the available data. ONS is aware that there are questions over the international comparability of the estimates produced - what is deemed nursing care in the international definitions is not seen as nursing care in the UK. These are questions that all countries are facing, as each different nationality's legislation provides for different activities to be carried out by nurses under the banner of nursing care. OECD is working on a long term care project which will examine the comparability of long term nursing care figures across the OECD group of countries, and is due to report in May 2003. This may include a clearer interpretation of the international definitions. ONS is also working closely with EU countries to establish a European interpretation of the international definitions on long term nursing care. Until this further guidance is available, ONS does not intend to change its methods for compiling estimates of long term nursing care out side the NHS.

6. Capital expenditure by healthcare providers

The available estimates for capital expenditure on health are not entirely consistent with either the other economic aggregates in the National Accounts Blue Book 2002 or *A System of Health Accounts*. The main difference is the treatment of investment in computer software, although there are other slight inconsistencies. In 2001, total investment in medical facilities was estimated at £3.3 billion.

7. Provision of healthcare services in the home and of healthcare goods and services by employers

The provision of healthcare services in the home takes the form of, for example, nursing of elderly relatives or sick members of the household. There is no payment involved and as such this type of service has been ignored in compiling the total UK health expenditure figure.

The provision of healthcare goods and services by employers to employees is entitled "occupational healthcare" in the international framework. It includes surveillance of employee health and therapeutic care on or off business premises, and has also been ignored in the compilation of total UK health expenditure.

It is recognised by many countries compiling Health Accounts, including the UK, that identifying and/or valuing these expenditures is difficult. In this early stage of development of Health Accounts, most countries are ignoring these expenditures. ONS is not planning to examine either of these components in the current phase of development, unless specific user demand for their inclusion is identified.

Comparison with previous estimates

ONS' previous estimates of total UK health expenditure were published in *OECD Health Data 2001*[6], and these excluded expenditure on health by the armed forces and in prisons. These previous estimates were also compiled using the best estimates at that time of the various components as detailed in the paragraphs above, which have since been revised in the light, for example, of better data.

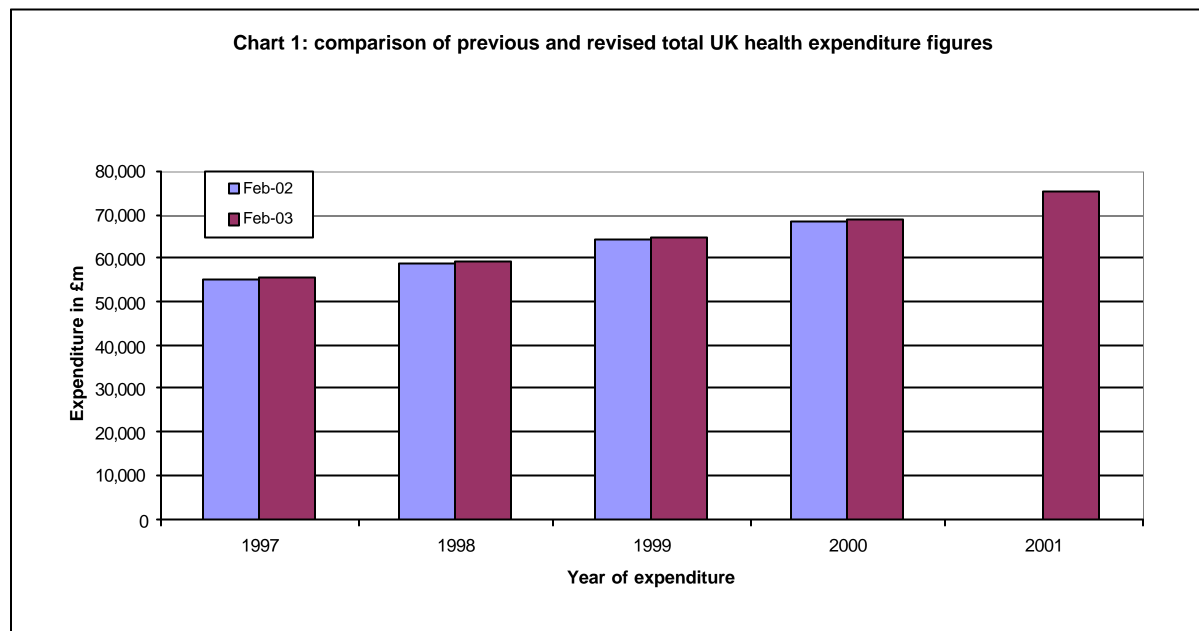
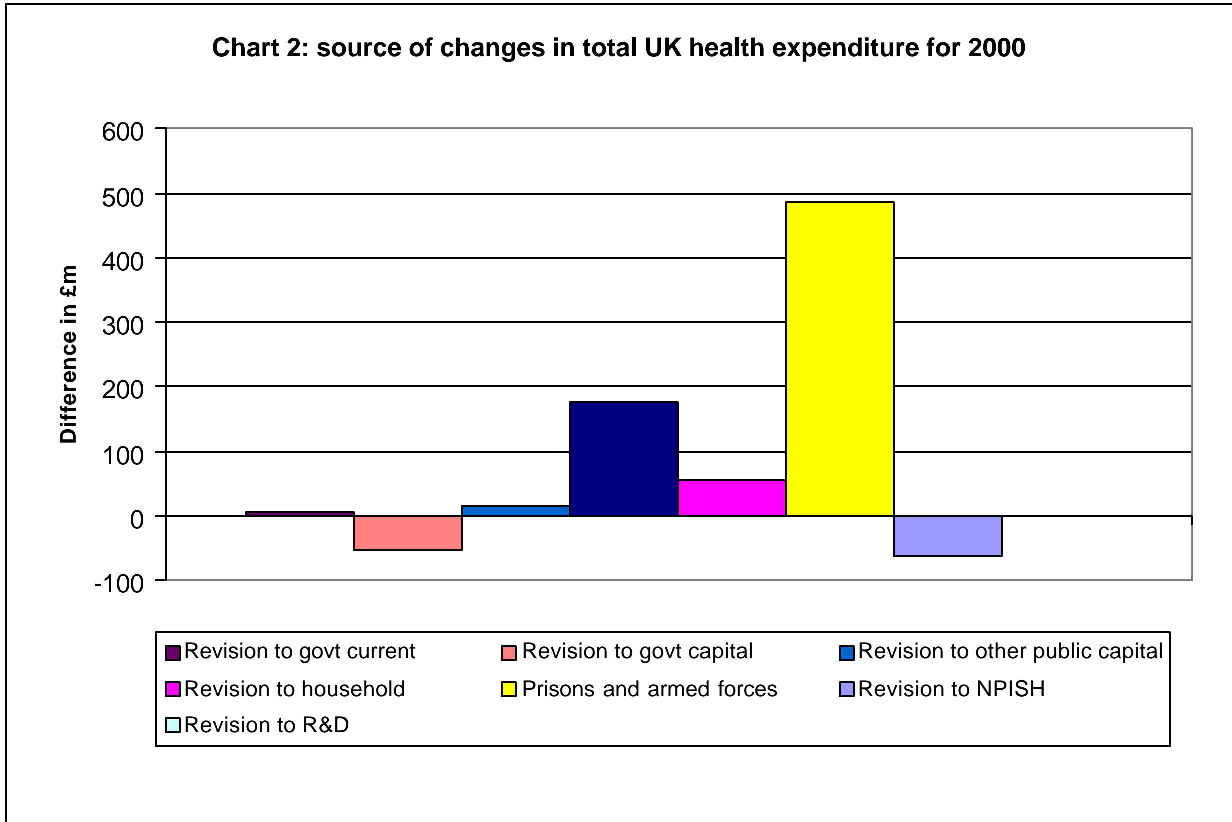


Table 7 compares the latest experimental estimates with the previous estimates of total UK health expenditure. The table also separates between revisions made due to better data being made available to National Accounts, that is changes in the National Accounts between Blue Book 2001 and 2002, and improvements made because of the Health Accounts project and the drive for better international comparability. Chart 1 compares the latest experimental estimates with the previous estimates of total UK health expenditure over the period 1997-2000. Chart 2 demonstrates graphically the relative effects of the various types of revision.

Table 7: Comparison of latest and previous experimental estimates of total UK health expenditure, 1997-2000; £m

	Latest experimental estimates of total UK health exp	Previous estimates of total UK health exp	Difference	%age difference	Revision to govt current exp	Revision to govt capital exp	Revision to other public capital exp	Revision to private capital exp	Revision to household exp	Total National Accounts revisions	Prisons and armed forces	Revision to NPISH	Revision to non-NHS exp on nursing care	Revision to govt E&T	Revision to govt R&D	Total revision due to improved comparability
1997	55,545	55,064	481	0.9%	0	0	0	0	-20	-20	501	0	0	0	0	501
1998	59,240	58,801	439	0.7%	0	0	0	0	-34	-34	495	-22	0	0	0	473
1999	64,773	64,435	338	0.5%	11	-16	0	16	-83	-72	488	-78	0	0	0	410
2000	69,117	68,493	624	0.9%	5	-51	15	175	56	200	487	-62	0	0	1	424



Footnotes

1. OECD (2000). *A System of Health Accounts.* OECD: Paris. Available at: http://www1.oecd.org/publications/e-book/8100061e.pdf

2. Office for National Statistics (2002). *United Kingdom National Accounts - The Blue Book, 2002 edition*. The Stationery Office: London. Available at http://www.statistics.gov.uk/downloads/theme_economy/BB_2002.pdf

3. Office of Science and Technology (2001). *SET Statistics 2001*. Available at www.dti.gov.uk/ost/setstats/figtab.htm

4. CaritasData Limited (1999). *Baring Asset Management Top 3000 Charities 1997 -the guide to UK charities*. London; and CaritasData Limited (2002), *Dresdner RCM Global Investors Top 3000 Charities 2000 – the guide to UK charities* London.

5. Laing & Buisson (2001). *Care of Elderly People Market Survey 2002*. Laing & Buisson Publications Ltd: London.

6. OECD (2001): *OECD Health Data 2001*. OECD: Paris.

Annex: methods for charities survey

Purpose of survey

To identify the proportion of health to total final consumption expenditure of charities in 1999.

Sampling frame

Each year, CaritasData Limited publishes accounts for the 'top' 3000 charities in the UK. Caritas reports that a charity is included if it satisfies one or more of the following criteria:

- income exceeding £1.2 million;
- expenditure exceeding £1.15 million; or
- funds exceeding £3 million.

The 2002 publication appears to be an adequate sampling frame for the estimation of the proportion of charities' expenditure on health on the grounds that the Charities Commission reports that 77.14% of total annual income is accounted for by the top 2.1% of charities (3399 charities). It is assumed that (i) the income distribution of the 25,155 registered charities in Scotland and Northern Ireland is broadly similar and (ii) expenditure by UK charities is distributed similarly to their income.

Identifying final consumption expenditure on health

The Caritas publication provides the following information on expenditure

1. Grants/awards made.

2. Other direct charitable.

3. Support.

4. Management,.

5. Publicity, fundraising.

6. Capital, unusual expenditure

'Grants/awards made' are treated in the survey as transfer payments where the charity is an award maker (ie provides money for others to spend, and therefore not final consumption expenditure), and as consumption where the charity is not an award maker. All other items are current expenditure, except for 'Capital, unusual expenditure'. For most charities, there was no separate identification of 'Grants/awards made' and 'Other direct charitable' expenditure. By including grant/awards made for the purposes of this analysis, the expenditure figures are inflated. It is thought that there may be some bias introduced, the extent of which may be limited by the fact that expenditure for both health and other charities is inflated. This will be revisited at a later stage to identify possible bias and to research a method for excluding the value of grants.

The expenditure information in the Caritas publication relates to the year 1999/2000. This was taken as a proxy for the calendar year 1999. It also includes expenditure on residents of other countries, for example the provision of medical goods to the developing world. Further work will be done to investigate possible bias and to exclude expenditure on non-UK residents' health care.

Identifying health charities

The Caritas publication includes an analysis of purpose, appearing as the 'Index of Expenditure Classifications'. This was not used as the basis for estimating the ratio of health expenditure as the authors warn of the quality limitations to this particular analysis. However, it does allow identification of the largest health charities.

For the remaining charities, the entry in the publication contains a description of the aims of the charity. Where this indicated that the majority of expenditure was spent on health, the charity was identified as a 'health charity'. Where the majority of expenditure was not spent on health, the charity was labelled as 'other charity'. If there was a lack of clarity over the nature of a charity's main expenditure, a cross-check was conducted by accessing further information on the Internet, for example, the charity's financial report.

To establish whether these assumptions would introduce bias to the results, we looked at the non-health expenditure of 'health charities' and the health expenditure of 'other charities'. This showed that these expenditures are broadly similar and hence introduce no net bias.

Sample selection

Three strata were identified for sampling:

a) Top health charities (with expenditure greater than £5m)

b) Top non-health charities (with expenditure greater than £20m)

c) Other charities

a) <u>Top health charities</u>

All health charities with greater than £5 million expenditure were taken from the Caritas publication's 'Index of Expenditure Classifications', in particular from the section entitled 'Health and Medicine'. Some of the sub-sections were excluded on the basis that their expenditure was not specifically health according to the international definition, for example, Medical Associations and Education and Training for People with Disabilities. This would be classified as expenditure on education and training in health, within Health Accounts. Having excluded these charities, the total number of remaining health charities was 770. Of these, 34 were found to have a total expenditure of £5 million or more.

b) <u>Top non-health charities</u>

10 non-health charities with greater than £20 million expenditure were taken from the Caritas publication's 'Index of Expenditure Classifications'.

c) Other charities

A systematic sample of charities with a random start point was then taken from the total population of 3000 charities listed. Three additional health charities with expenditure over £5 million were identified which were added to the top health charities (total number now 37). This reveals the quality of the 'Index of Expenditure Classifications' and justifies not using it as the basic tool for calculating the health expenditure ratio.

A systematic sampling method was appropriate, as the individual charities are listed alphabetically with no ordering as to size, income, expenditure etc. If the health charity sampled turned out to have expenditure over £5 million, or the non-health charity sampled turned out to have expenditure over £20 million, the adjacent charity was sampled instead.

Results

The percentage of final consumption expenditure that is health is estimated as 17%, with a 95% confidence interval of (14%, 21%).

QUALITY OF SURVEY ESTIMATES

The estimate has been calculated as expected health expenditure divided by expected total expenditure, multiplied by 100.

Expenditure of the biggest health charities (those with expenditure greater than £5m) is £1,057m. As all of the biggest health charities have been identified, this is an exact figure.

Expenditure of the biggest non-health charities (those with expenditure greater than £20m) is £5,885m. As all of the biggest non-health charities have been identified, this is an exact figure.

Average expenditure of other health charities is £1.9m, with a 95% confidence interval of (£1.5m, £2.3m)

Average expenditure of other charities is £2.6m, with a 95% confidence interval of (£2.2m, £3.0m)

These averages were multiplied by the number of charities in the publication (733 other health charities and 2123 other non-health charities) to give estimates of the population totals. These totals could, in turn, be used for calculating the point estimate of the ratio:

$$\frac{1{,}057\text{m} + 1.9\text{m} * 733}{1{,}057\text{m} + 1.9\text{m} * 733 + 5{,}885 + 2.6\text{m} * 2123}$$

or

0.17

Assuming that the proportion of health to other charities is identified as in the survey, a rough 95% confidence interval for the point estimate of the ratio can be given by:

- summing the confidence intervals for the components of the equation above
- dividing the lower health expenditure figure by the upper total expenditure figure
- dividing the upper health expenditure figure by the lower total expenditure figure

This gives a rough 95% confidence interval for the point estimate of the ratio of (0.14, 0.21).

Application to NPISH total expenditure

In the absence of information on religious organisations' health expenditure, we have assumed that it is distributed in the same way as for charities. Charities and religious organisations' expenditure was 35% in 1997 and 34% in 1999 of total NPISH expenditure. Total NPISH expenditure in 1997 was £19,602 million. Therefore, health expenditure of charities and religious organisations is estimated to be 0.17 * 0.35 * £19,602 million, or £1.2 billion (differences due to rounding). Total NPISH expenditure in 1999 was £22,150 million. Therefore, health expenditure of charities and religious organisations is estimated to be 0.17 * 0.34 * £22,150 million, or £1.3 billion (differences due to rounding).

An indication of the confidence in the ratio was calculated by dividing the lower confidence limit of health expenditure by the upper confidence limit of total expenditure and vice versa giving a 95% confidence interval of (£1.1 billion, £1.6 billion).