Total UK health expenditure

This document presents a detailed note on the methods employed in compiling total UK health expenditure figures. It compares, and describes the differences between, the latest and previous estimates of total UK health expenditure. Summary details are on the National Statistics website, http://www.statistics.gov.uk/healthaccounts

ONS has reviewed the data sources and methods used in compiling total UK health expenditure figures and is satisfied that they are consistent with the principles set out in the National Statistics Code of Practice. ONS therefore published total UK health expenditure for 1997-2002 on 16 December 2003 as National Statistics. ONS previously published the figures on an experimental basis in February 2003 and in February 2002.

ONS has developed total UK health expenditure figures as part of its Health Accounts project. This project has also produced a set of UK Health Accounts, which were published as experimental statistics in February 2003.

The project involves the development of expenditure estimates according to an internationally agreed framework of concepts, definitions, classifications and accounting rules, drawn up by the Organisation for Economic Co-operation and Development (OECD), and supported by the World Health Organisation, the World Bank, and the European Commission. Using such a comprehensive, coherent and consistent statistical description of health care expenditure permits meaningful comparisons over time as well as across countries. Most countries in the European Union, as well as the OECD group of countries and more globally, are taking steps to develop Health Accounts, and publicly available estimates for other countries can be found on the OECD website.

This framework is published in *A System of Health Accounts*[1], which 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 estimates for the calendar years 1997-2002 of total UK expenditure on health, which appear in table 1, because of the requirement to compare the UK with other countries.

Table 1: Total, public and private UK health expenditure, 1997 - 2002

Year	Total UK health expenditure (£m)	As a percentage of GDP	Public UK health expenditure (£m)	Private UK health expenditure (£m)
1997	55,462	6.8	44,568	10,894
1998	59,178	6.9	47,552	11,626
1999	64,733	7.2	52,192	12,541
2000	69,242	7.3	55,996	13,246
2001	74,833	7.5	62,090	12,743
2002	80,620	7.7	67,201	13,419

Source: ONS

The figures in table 1 do not conform entirely with the international definitions, as they 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).

Other countries' deviations from the international definitions are documented in OECD Health Data 2003[2]. In particular, ONS is aware that there are questions over the international comparability of estimates for long term nursing care, as legislation in different countries provides for different activities to be carried out by nurses under the banner of nursing care. Consequently what is recorded nationally as nursing care may in many cases differ from what is deemed nursing care in the international definitions. The OECD is currently investigating how to compile further guidance for estimating this component in order to improve international comparisons.

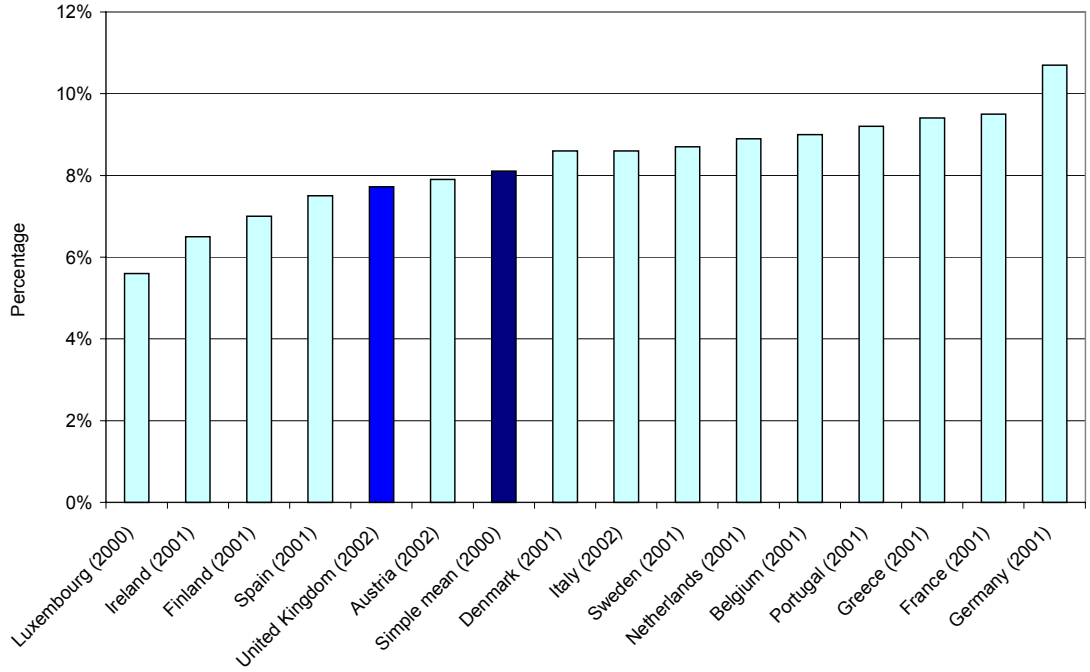
The methods described in this paper have been discussed and agreed by a Project Board, membership of which is made up of representatives from ONS, all UK health administrations, HM Treasury and an academic.

International Comparisons

One of the main reasons for the UK Health Accounts project developing estimates of UK health expenditure is so that meaningful international comparisons can be made. Different countries are in different stages of development in terms of implementing *A System of Health Accounts* and so international comparisons should be approached with caution. Some comparisons with EU countries are made here as they provide insight into the different funding levels and funding arrangements for health care across the EU.

Figure 1 presents total health expenditure as a percentage of Gross Domestic Product (GDP), for the latest period for which estimates are available, for all fifteen EU member states. A simple average across these countries is also shown. Ten of the other fourteen EU countries devoted proportionately more of their resources to health than the UK in the latest year available. The latest year for which all EU member states have provided total health expenditure figures was 2000, when the simple average across these countries was 8.1 per cent of GDP. In 2002, the UK spent just below the average for 2000 at 7.7 per cent of GDP. Germany spent the greatest percentage of its resources on health within the EU, at 10.7 per cent in 2001, whilst Luxembourg spent the least, at 5.6 per cent in 2000.

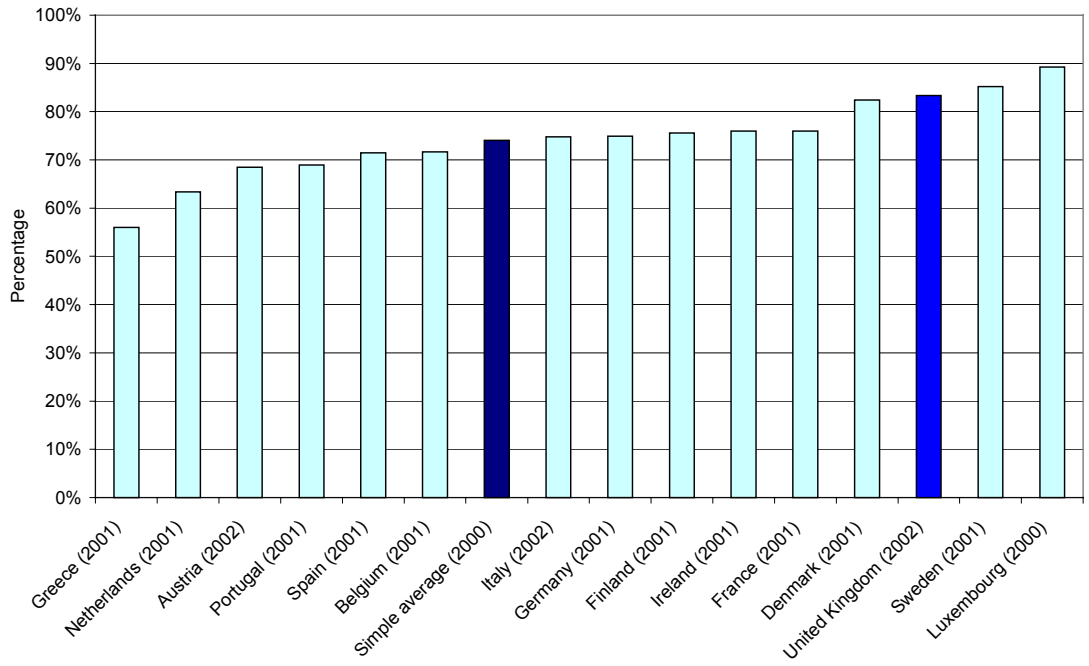
Figure 1: Total health expenditure as a percentage of Gross Domestic Product, EU



Source: ONS, OECD

Figure 2 presents the public share of total health expenditure for the latest period for EU member states, along with the simple average across these countries. In all EU countries, the main source of financing for health care is the public sector. In most countries, the public share of total health expenditure is around 70-80 per cent.

Figure 2: Public share of total health expenditure, EU



Source: ONS, OECD

As noted above the UK figures do not conform entirely with the internationally agreed definitions due to the exclusion of household production of health care services and occupational health care. However, other countries' figures also deviate from the international definitions, and indeed the exclusion of the household production and occupational health care components is typical.

An overview of the methodology

Total UK health expenditure is built up from a number of components as described in the following seven sections.

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 2003*[3]. According to the *Blue Book*, government spent just under £67 billion on health care in the UK in 2002. This figure does not include expenditure on investment, or capital formation, which is dealt with in section 7 below. Health expenditure by prisons and the armed forces is also not included in this figure and so is dealt with separately 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 2002*[4]. 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 and the NHS on Research & Development, 1997-2002, £m

	Expenditure (£m)
1997	524
1998	527
1999	534
2000	541
2001	569
2002	578

For England, Wales and Northern Ireland, expenditure on R&D in health for the financial year 2001/02 has been used as an estimate for the calendar year 2002 in the absence of later data.

In previous releases, the 75%:25% ratio used to adjust from the financial to the calendar year basis was applied the wrong way round. This has been corrected: the correction was small relative to the size of the component.

Table 3: Health administrations' expenditure on Education & Training, UK, 1997-2002, £m

	Dept of Health expenditure on E&T (£m)	England population	UK population	UK expenditure on E&T (£m)
1997	956	48,523,000	58,167,217	1,146
1998	1,006	48,657,508	58,305,254	1,206
1999	1,091	48,836,466	58,481,070	1,307
2000	1,250	48,997,263	58,643,230	1,496
2001	1,351	49,369,505	59,030,616	1,616
2002	1,639	49,536,567	59,206,731	1,958

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 health administrations' expenditure per head of population on E&T in Wales, Scotland and Northern Ireland was the same as it is in England.

On 26 September 2003, ONS released new mid-year population estimates for the years 1997-2002, which have been taken on board. Table 3 shows the resulting estimates. As with R&D expenditure, the 75%:25% ratio used to adjust from the financial to the calendar year basis was applied the round way round. This has also been corrected and again the correction was small relative to the size of the component.

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*. However, 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.

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 (HM Prison Service, 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 in the UK.

Table 4: Expenditure on health by the armed forces and by prisons, UK, 1997-2002, £m

	Health expenditure by armed forces and prisons (£m)
1997	513
1998	511
1999	504
2000	502
2001	499
2002	496

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 2003*[3]. 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 £11 billion in 2002. 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. Expenditure on health by charities and religious organisations

Charities and religious organisations provide health care either as health care providers (e.g. hospices) or as contributors to the health care of specific conditions such as AIDS, and Parkinson's Disease.

In National Accounts, charities and religious organisations form part of the "Non-profit institutions serving households" or NPISH sector. Other NPISH include trade unions, some higher education institutions and friendly societies. 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.

Whilst National Accounts publishes figures for total expenditure of these types of institution (see table 6.4 of the *National Accounts Blue Book 2003)*, no functional breakdown is produced: the health expenditure component has been estimated as part of the UK Health Accounts project.

In previous years the Caritas publication of the top 3000 charities[5] in the UK, which contains a range of information including income, expenditure and purpose, has been used to identify health expenditure by charities and religious organisations. This year a new source has become available. The ONS has been given access to a new database of charity accounts compiled by the National Council of Voluntary Organisations (NCVO). This database is designed to track financial information of charities over time and is therefore a very useful resource for the ONS.

Table 5: Expenditure on health by charities and religious organisations, UK, 1997-2002, £m

	Health expenditure by charities and religious organisations (£m)
1997	973
1998	1,018
1999	1,080
2000	1,138
2001	1,221
2002	1,244

The change in source has lead to improvements in methodology. One of the main improvements has been the exclusion of expenditure by nursing homes that are also registered as charities. This expenditure will be included as part of non-NHS nursing care discussed in section 5. This improvement has lead to a downward revision to the previously published time series. The other main improvement was the use of a stratified sample that takes into account the better understanding of the distribution of total expenditure by all charities.

A full discussion of the changes in data source and methods can be found in the annex to this paper. Table 5 presents the expenditure on health by charities and religious organisations.

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

The estimates of health expenditure available in the *National Accounts Blue Book* include only expenditure on nursing care for those residents in care homes who are funded by the NHS. They do not include expenditure for residents who are self-funded or Local Authority supported. *A System of Health Accounts* includes all expenditure on nursing in care homes in its definition of total health expenditure. Non-NHS expenditure should therefore be 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*[6], 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 6: Average weekly cost of nursing care in nursing homes, UK, 1997-2002, £

	Average nursing home fee (£ / week)	Average residential care home fee (£ / week)	Difference = average cost of nursing care (£ / week)
1997	338	247	91
1998	352	252	100
1999	360	258	102
2000	370	268	102
2001	393	280	113
2002	422	302	120

Source: Laing & Buisson: *Care of Elderly People Market Survey 2003*

Table 6 shows the 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 (excluding those who are 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. To produce a UK figure the estimates for England are grossed up on the basis of the number of residents in nursing homes in England and the UK.

Payment for nursing care in care homes has been taken over by the NHS for self funders in England from 1 October 2001, 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. 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. For example, 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. Table 7 presents the resulting series.

The adjustment made to the February 2003 figures assumed that all nursing care expenditure in England was taken over by the NHS on 1 October 2001, whereas this was restricted to expenditure by self funders. The figures in table 7 reflect the correct treatment.

Table 7: Expenditure on non-NHS funded nursing care in nursing homes, UK, 1997-2002, £m

	Expenditure (£m)
1997	789
1998	872
1999	956
2000	909
2001	942
2002	686

The timetable for further changes in funding arrangements for nursing care provision is that the NHS will bear these costs 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 supported by Local Authorities are included under public, whilst 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. The OECD is currently investigating how to compile further guidance for estimating this component in order to improve international comparisons.

6. Capital formation by health care providers

The available estimates for capital formation by health care providers are compiled as part of National Accounts, but are not published in *Blue Book*. The estimates are consistent with the other economic aggregates in the *National Accounts Blue Book 2003*, but exclude some capital formation - chiefly by care homes providing nursing care - that ought to be included for consistency with *A System of Health Accounts*.

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

As noted above total UK health expenditure excludes two components that are treated as health expenditure in the international definitions. These are household production of health care services and occupational health care.

The provision of health care 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 health care goods and services by employers to employees is entitled "occupational health care" 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.

Comparisons with previous estimates

Table 8 compares the latest estimates with the previous, experimental, estimates of total UK health expenditure. The table also separates between revisions made due to better data being made available from National Accounts, that is changes in the National Accounts between *Blue Book* 2002 and 2003, improvements made because of the Health Accounts project and the drive for better international comparability, and the effect of corrections (see R&D, E&T and nursing care sections).

Table 8: Latest and previous estimates of total UK health expenditure, 1997-2001; £m

	Latest estimates	Previous estimates	Difference	Percentage difference	National Accounts revisions	Health Accounts revisions	Corrections
1997	55,462	55,545	-83	-0.1%	151	-206	-28
1998	59,178	59,240	-62	-0.1%	182	-212	-32
1999	64,733	64,773	-40	-0.1%	247	-225	-62
2000	69,242	69,117	125	0.2%	472	-236	-111
2001	74,833	75,014	-181	-0.2%	-4	-255	78

Figure 3 compares the latest estimates with the previous, experimental, estimates of total UK health expenditure over the period 1997-2001.

Figure 3: Comparison of previous and revised total UK health expenditure figures

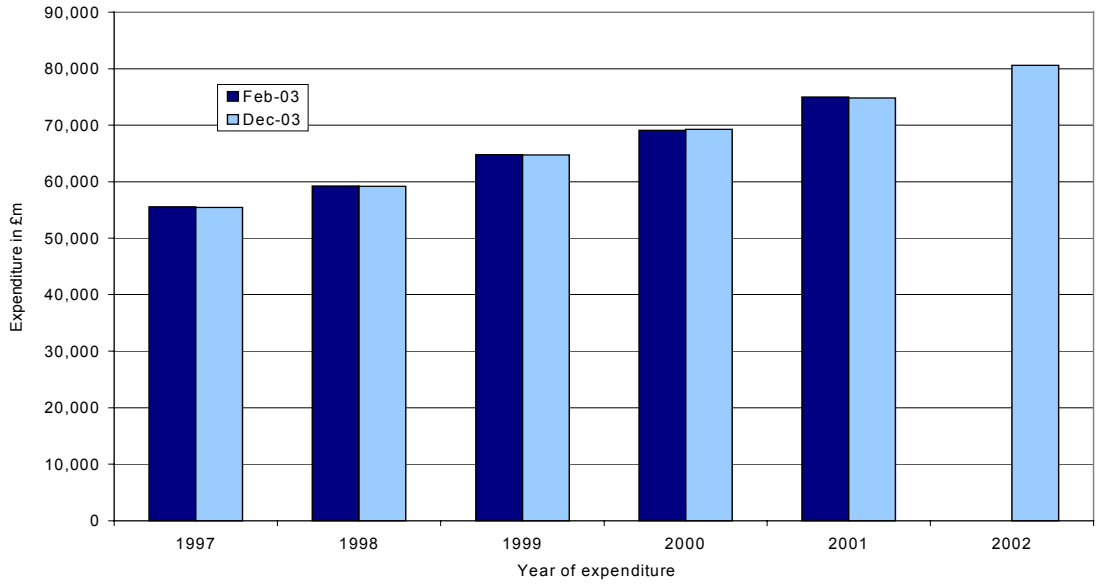
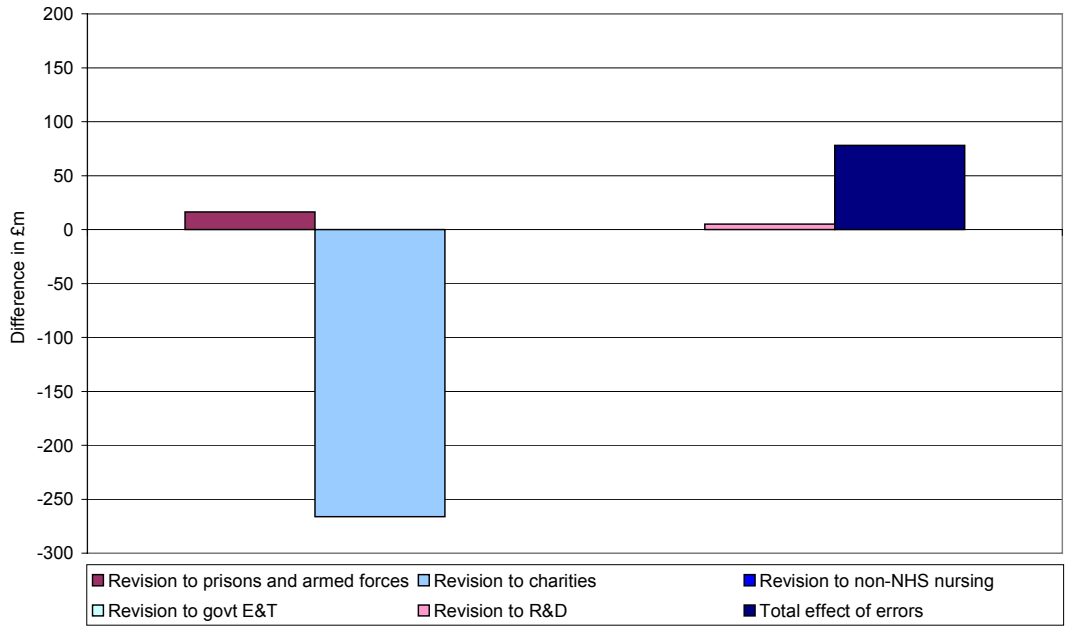


Figure 4 demonstrates graphically the relative effects of the various types of revision for 2001. It show the Health Accounts revisions broken down by each component and also the effect of the corrections.

Figure 4: Health Accounts sources of changes and the effect of errors on total UK health expenditure for 2001



Endnotes

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

2. OECD (2003): *OECD Health Data 2003*. OECD: Paris

3. Office for National Statistics (2003). *United Kingdom National Accounts - The Blue Book, 2003 edition*. The Stationery Office: London. Available at http://www.statistics.gov.uk/downloads/theme_economy/BB_2003.pdf

4. Office of Science and Technology (2002). *SET Statistics 2002*. Available at www.dti.gov.uk/ost/setstats/figtab.htm

5. 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.

6. Laing & Buisson (2003). *Care of Elderly People Market Survey 2003*. Laing & Buisson Publications Ltd: London.

Annex: Estimating expenditure by charities and religious organisations on health care

This annex outlines the new method for estimating health expenditure by charities and religious organisations including the use of the new data source made available to ONS by the National Council of Voluntary Organisations (NCVO). The remainder of this annex refers to only charities, rather than charities and religious organisations, to ease reading.

Existing data sources and methods

In previous years the Caritas publication of the top 3000 charities in the UK, which contains a range of information including income, expenditure and purpose, has been used to identify health expenditure by charities. The methods used in previous years are presented in detail in the previous methods paper accompanying the 27 February 2003 release. This can be found at the following link,

http://www.statistics.gov.uk/healthaccounts/downloads/Healthexpendituremethods.pdf

The move to a new data source is due to the additional information made available by the NCVO. The NCVO have collected paper copies of individual, detailed charity accounts. These charity accounts are the basis for both the Caritas publication and the NCVO database. The information in these two sources is therefore essentially the same but for ONS purposes the use of the paper copies charity accounts offers a greater depth of information for classifying the health expenditure of charities. This enables the exclusion of items of expenditure that are not included as UK health expenditure, such as research and development and any international expenditure.

The methodology described below is similar to that used previously although the greater information in the NCVO database allows a much better view of the entire distribution of charity expenditure and so allowed a more representative sample to be taken. The previous method used a systematic sample after ordering charities by name whilst this year a random sample was taken from each identified stratum after ordering charities by their level of expenditure. This is explained in more detail below.

Both this year and in previous years the data sources described are used to provide an estimate of the ratio of health to non-health expenditure by charities. The differences in methodology only affect the estimation of this ratio. This ratio is applied to total expenditure by Non-Profit Institutions Serving Households (or NPISH, of which charities form part) from the *National Accounts Blue Book*, after taking into account the ratio of charitiesto toehr NPISH organisations (eg educational establishments, trades unions, friendly societies). Again this is explained in more detail below or in the previous methods paper.

The NCVO database

The main NCVO data source is an electronic database constructed from charity accounts and annual reports that are retained as paper copies at the NCVO. The database provides total expenditure by these charities but not health expenditure. The retained paper copies provide a further resource and allow ONS to go right back to source data and classify expenditure according to purpose.

The NCVO database consists of 2,810 charities. This is a stratified sample from a population of around 180,000 registered with the Charity Commission and Companies House. This stratified sample consists of 100 per cent of charities with expenditure over £1 million, 5 per cent of charities with expenditure between £100,000 and £1 million, 1 per cent of charities with expenditure between £10,000 and £99,999, and 0.5 per cent of charities with

expenditure between £1,000 and £9,999.[1] This is a representative sample given the distribution of expenditure over the 180,000 registered charities with the database covering around 60 per cent of all expenditure by charities.

The number of charities in the NCVO database was reduced for our purposes by subsuming the expenditure of regional offices of a charity into the national charity. An example is Age Concern for which individual regional offices were recorded in the database. Aggregating these regional offices gives a better representation of these larger charities in the sample and a better representation of the their total expenditure. This aggregation of regional charities reduced the sample to 2,582 charities.

Total expenditure for each charity is defined to be the sum of the following components recorded in the NCVO database

- Total expenditure on charitable activities
- Total expenditure on support costs
- Total expenditure on management and administration
- Trading subsidiary costs
- Other costs or expenditure

Charities were ordered by total expenditure as defined above in order to take a stratified random sample. Figure A1 at the end of this annex provides a cumulative total expenditure graph of the charities in the NCVO database.

Sample Selection

Inspection of figure A1 led to choosing the following strata, shown in table A1 below, and also the following initial sample to be taken. Figure A1 also identifies the boundaries of each stratum.

Table A1: Chosen strata and chosen sample

Stratum	Total Expenditure (as defined above)	Number of charities in stratum	Sampling fraction	Initial sample size
1	≥ £20 million	75	All	75
2	< £20 million, ≥ £3 million	381	1 in 6	64
3	< £3 million, ≥ £0.5 million	915	1 in 30	31
4	< £0.5 million	1,211	1 in 40	30
Total		2,582		200

Within each stratum a random sample was taken with the exception of stratum 1 where all charities were included in the sample.

Classification of health expenditure

Once the sample was chosen the retained paper copies of charity accounts and annual reports at the NCVO were used in order to classify any health expenditure. This classification was conducted for all 200 charities and in the majority of cases the information in these annual

[1] These percentages are approximate for the version of the database for which our estimates are derived.

accounts was sufficient to provide an exact proportion of their expenditure that was spent on health. For those less detailed accounts and reports, a view was taken on the proportion that was health expenditure based on the available information. In most of these cases, further information was available on the organisations' websites. For one single charity, it was not possible to glean sufficient information on their activities. This charity was therefore excluded from the sample completely.

The classification of health expenditure made above was double-checked using information available on charity websites. The Charity Commission website was also used to check the results. This provides details about all charities including, area of benefit, area of operation and a classification of the charity's activities.

Although the NCVO database has two years' worth of reported accounts there are differences between charities in the beginning of the reporting year and also the period covered in the database. Corrections were made for these differences in order to get estimates relating to the calendar year 2001, which was the only year for which figures on a calendar year basis could be calculated.

Any non-UK expenditure was excluded from total expenditure. The NCVO database does not separately identify this non-UK expenditure so this was separately identified from charity accounts. Where possible health related expenditure on education and training and Research and Development was also excluded from health expenditure.

This lead to identifying total UK expenditure by each charity. Multiplying this with the charity's proportion of health expenditure gives total UK health expenditure by each charity. This information allows us to estimate the proportion across all charities of total UK expenditure that is health expenditure.

This figure can then be applied to the *Blue Book* total NPISH expenditure figure, taking into account the proportion of total NPISH expenditure that is by charities.

The NCVO database allowed us to identify a small item of double counting that resulted from the previous methodology. The sample contained charities that were providing care in nursing homes. This expenditure will be accounted for in the non-NHS nursing care component and so has been excluded from charities' expenditure on health.

The calculation of the ratio to be applied to the total NPISH figure has to take into account the stratification used in sampling. Box A1 below outlines the method for calculating this ratio.

Box A1: Ratio Calculation Method for 2001 expenditure excluding nursing homes

Let N be the total population of charities, in this case all charities in the NCVO database. N_i is the size of each stratum with $i = 1,...,k$. In this case $k = 4$.

Define $\overline{x}_i$ as the sample mean of total expenditure from the *i*th stratum and $\overline{y}_i$ as the sample mean of total health expenditure from the *i*th stratum.

The sample means in the *i*th stratum is given by the following

$$\overline{x}_i = \frac{1}{n_i}\sum_{j=1}^{n_i} x_{ij} \quad \text{and} \quad \overline{y}_i = \frac{1}{n_i}\sum_{j=1}^{n_i} y_{ij}$$

Where $j = 1,...,N_i$, $i = 1,...,k$ and n_i denotes the stratum sample sizes.

We can summarise this information in the following table with data for 2001 excluding nursing homes.

i (stratum)	N_i	n_i	$\overline{x}_i$	$\overline{y}_i$
1	75	63	54243111.86	10044214.71
2	381	57	6732358.88	511228.71
3	915	25	1668278.41	270697.60
4	1211	23	124061.52	10550.69
Total	2582 = N	168		

The stratified sample means are now given by the following

$$\overline{x}_{st} = \sum_{i=1}^{k} w_i \overline{x}_i \quad \text{and} \quad \overline{y}_{st} = \sum_{i=1}^{k} w_i \overline{y}_i$$

Where $w_i = N_i / N$.

Therefore $\overline{x}_{st} = 3218425.78$ and $\overline{y}_{st} = 468071.04$

The ratio is now given by $\overline{y}_{st} / \overline{x}_{st} = 0.14543$

The proportion of charities' expenditure on nursing care from the latest survey amounted to 3.2 per cent. This has been calculated by comparing the survey results including and excluding the nursing home expenditure. It was not possible to exclude the nursing care funded by charities in previous surveys, so it has been assumed that the 3.2 per cent is constant over time. Therefore the results from the previous surveys have been reduced by this amount.

The proportion (including nursing homes) is very similar to previous year estimates using a different data source. Previous estimates for 1997 and 1999 estimated that the percentage of total expenditure by charities on health was 17.5 per cent. The 2001 estimate including nursing homes was 17.7%. Excluding nursing homes this becomes 14.5%.

The similar results from using the NCVO data source have reduced any reconciliation issues with the figures reported in the Caritas publication and also add to our confidence in the figure estimated here and the previously released figures. Comparisons between the two data

sources in the early stages of this work also suggested that the two data sources were comparable.

The new estimate for 2001 from the NCVO sample and the correction for nursing care expenditure provides three point estimates (1997 and 1999 estimates using Caritas and 2001 using NCVO) for the percentage of total expenditure by charities that is health. Using the *Blue Book* total NPISH expenditure figures we can then estimate a time series for health expenditure by charities after filling in the missing years for the percentage using a simple average of the previous and subsequent years and by assuming the same percentage for 2002 as for 2001. This gives the following time series.

Table A2: Health expenditure by charities

	1997	1998	1999	2000	2001	2002
Total Expenditure by NPISH (£m)	19509	21053	22069	23188	24676	26009
Percentage of NPISH expenditure by Charities	34.8	33.8	34.2	34.0	34.0	32.9
Percentage (including nursing homes)	**17.5**	17.5	**17.5**	17.6	**17.7**	17.7
Percentage (excluding nursing homes)	14.3	14.3	14.3	14.4	**14.5**	14.5
Estimated time series (£m)	973	1018	1080	1138	1221	1244
Estimated time series (including nursing homes, £m)	1189	1244	1319	1388	1487	1515
Existing series	1206	1277	1317	1345	1392	
Revisions due to Blue Book changes	-17	-33	2	43	95	
Revisions due to exclusion of nursing homes	-216	-226	-239	-250	-266	
Total Revision	-233	-259	-237	-207	-171	

The figures in bold are the estimated percentages from the two Caritas samples and the recent NCVO sample.

The revisions to the existing series arise mainly from the exclusion of nursing home expenditure although there are some small revisions to the *Blue Book* total NPISH figure used to calculate the series.

An example for the 2001 calculation is as follows, £24676m*34%*14.6%=£1222m (differences due to rounding). Therefore health expenditure by charities and religious organisations in 2001 was estimated as about £1.2 billion. The remaining time series is produced in the same way.

Figure A1: Cumulative total charity expenditure and identified strata