

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 1997-2000, which were disseminated on 12 February 2002. In doing so, it describes the differences between the experimental 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 1997-2000 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.

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 estimates in table 1 do not conform entirely with the internationally agreed definition, as some of the methods for estimating components of the total require further researching and quality assurance. However, ONS considers these experimental estimates to be calculated on a more internationally comparable basis than previous estimates. For these reasons, ONS is disseminating the estimates as experimental statistics.

Table 1: experimental total, public and private UK health expenditure, 1997 - 2000

	Total UK health expenditure (£m)	As a percentage of GDP	Public UK health expenditure (£m)	Private UK health expenditure (£m)
1997	55,064	6.8%	44,002	11,063
1998	58,801	6.8%	46,987	11,814
1999	64,435	7.1%	51,643	12,789
2000	68,493	7.3%	55,491	13,001

Source: ONS

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 6 sections, each containing a component of the total, below.

1. Government expenditure on health care

The latest estimates for government expenditure on health are published in table 11.2 of the *National Accounts Blue Book 2001*². According to the Blue Book, government spent over £54 billion on health care

in the UK in 2000. Note that expenditure on investments, or capital, is not included as health care and is dealt with in section 5 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 a new entity in Northern Ireland, the Research & Development Office, 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, 1997-2000, £m

	Expenditure (£m)
1997	528
1998	524
1999	530
2000	537

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.

Table 3: expenditure by health administrations on Education & Training, 1997-2000, £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

2. Household expenditure on health care

The estimate for household expenditure on health is also published in table 6.4 of the *National Accounts Blue Book 2001*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 2000. 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>

3. 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 2001*². As such, NPISH health expenditure has not previously been included in total UK expenditure on health.

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 publication of the top 3000 charities in the UK⁴ contains a range of information on these charities, including income, expenditure and purpose. To reduce the task of examining individual charities' expenditure, a systematic sample was taken from this list of 3000 charities. Although there are many more charities in the UK, these 3000 make the most significant contribution to total expenditure. The publication was 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. Instead, all expenditure by a charity whose main purpose was health was treated as health expenditure. Conversely, 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 in 1997 was 17%. 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.

As this estimate is based on the results of a sample, it is subject to sampling error. On this basis the value is likely to lie between £0.7 billion and £1.7 billion with 95% confidence. Any deviation from the assumptions made will also affect the precision of the estimate.

Estimates for other years have been produced, by assuming that the proportion of total NPISH expenditure on health care did not vary over time.

More detail on this sample survey can be found in the annex.

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

The previous estimate of total UK health expenditure only includes 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.

Payment for nursing care in nursing homes is progressively being taken over by the NHS, as follows. Nursing home residents who are self-funding will have their nursing care paid for by the NHS in England from October 2001, in Wales from December 2001, in Scotland from July 2002 and in Northern Ireland from October 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. Adjustments to the total UK health expenditure are only required for the years preceding completion of these changes in funding arrangements. There are a number of potential data sources to help identify the amount of expenditure on nursing care provided in nursing homes.

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 4: Calculation of average weekly cost of nursing care in nursing homes, UK

	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

Source: Laing & Buisson: *Care of Elderly People Market Survey 2001*

Table 4 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. The results of these calculations are summarised in Table 5.

Table 5: Expenditure on non-NHS funded nursing care in nursing homes, UK

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

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.

5. 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 2001 or A System of Health Accounts. The main difference is the treatment of investment in computer software, although there are other slight inconsistencies. However it is thought that the effect of all these deviations is small, so no attempt has been made to adjust the available estimates. In 2000, capital investment in medical facilities was estimated at £3 billion.

6. 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 has previously calculated total UK health expenditure in a different way, which has meant that the previous estimates were not as comparable with those for other countries. These previous estimates were published in *OECD Health Data 2001*⁶. The differences in method are:

- previous estimates included health administrations' expenditure on Research & Development and on Education & Training
- previous estimates excluded health expenditure by Non Profit Organisations Serving Households (charities and religious organisations) and nursing care expenditure by Local Authorities and households

Table 6 compares the 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 2000 and Blue Book 2001, and improvements made because of the Health Accounts project and the drive for better international comparability. Chart 1 compares the experimental estimates with the previous estimates at the total UK health expenditure level over the period 1997-2000. Chart 2 demonstrates graphically the relative effects of the various types of revision.

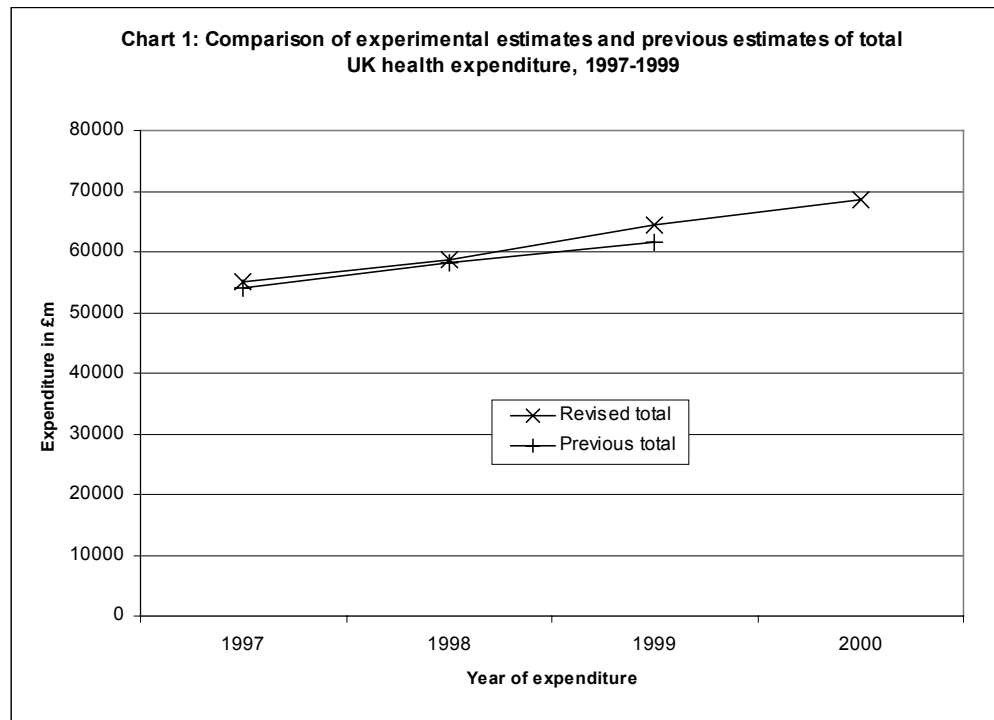
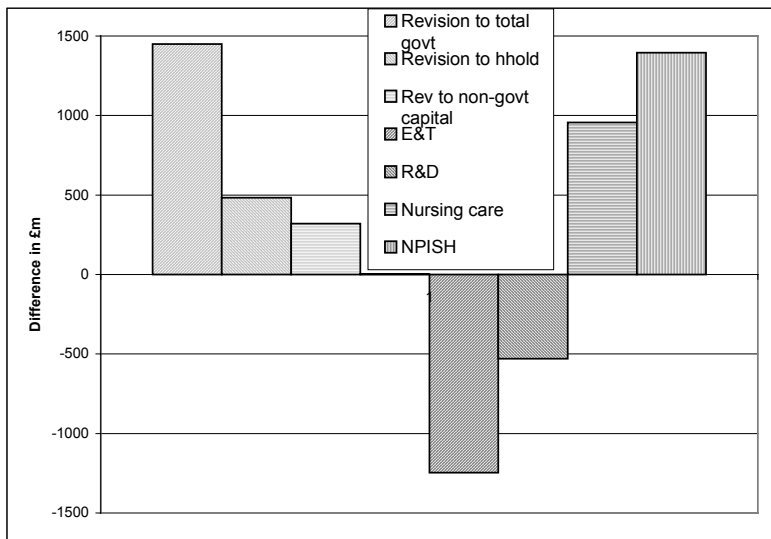


Table 6: Comparison of experimental estimates and previous estimates of total UK health expenditure with previously published estimates, 1997-1999

	Experimental estimates of total UK health expenditure	Previous estimates of total UK health expenditure	Difference	Percentage change	Revision to total Government expenditure	Revision to total household expenditure	Revision to private capital expenditure	Total National Accounts revisions	Non-Profit Organisations Serving Households expenditure	Government expenditure on Education & Training	Government expenditure on Research & Development	Local Authority and household expenditure on nursing care in nursing homes	Total revision due to improved comparability
1997	55,064	53,965	1,099	2.0%	-58	699	103	744	1206	-1,112	-528	789	355
1998	58,801	58,131	670	1.2%	-338	620	-84	198	1299	-1,175	-524	872	472
1999	64,435	61,608	2,827	4.6%	1,450	483	320	2,253	1395	-1,247	-530	956	574

Chart 2: Relative effects of National Accounts and Health Accounts revisions, 1999



It is possible to produce a set of estimates, shown in table 7, which do not incorporate the improvements made because of the Health Accounts work programme, but which do incorporate the National Accounts revisions. Such estimates may be useful, for example, to those who are interested in longer time series. ONS advises users to take particular care when analysing these estimates, as they do not conform with the internationally comparable definitions, and will bias any comparisons with other countries' estimates.

Table 7: previous estimates of total UK health expenditure updated with the latest National Accounts information, 1987-2000, £m

	Previous estimates of total UK health expenditure updated with latest National Accounts information (£m)
1987	25,128
1988	27,689
1989	30,574
1990	33,558
1991	37,821
1992	42,258
1993	44,582
1994	47,748
1995	50,086
1996	53,518
1997	54,709
1998	58,329
1999	63,861
2000	68,101

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 (2001). *United Kingdom National Accounts - The Blue Book, 2001 edition*. The Stationery Office: London. Available at www.statistics.gov.uk/downloads/theme_economy/BB_2001.pdf
3. Office of Science and Technology (2001). *SET Statistics 2001*. Available at www.dti.gov.uk/ost/setstats/figtab.htm

4. Baring Asset Management (1999). *Top 3000 Charities 1999 -the guide to UK charities*. CaritasData Limited: London.
5. Laing & Buisson (2000). *Care of Elderly People Market Survey 2000*. Laing & Buisson Publications Ltd: London.
6. OECD (2001): *OECD Health Data 2001*. OECD: Paris.
7. Department of Health (2000). *Reference Costs 2000*. Available at www.doh.gov.uk/nhsexec/refcosts.htm
8. National Health Service in Scotland (2000). *Scottish Health Service Costs*. Common Services Agency: Edinburgh.

Annex: methods for charities survey

Purpose of survey

To identify the proportion of health to total final consumption expenditure of charities in 1997.

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 1997 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 financial year 1996-97. This was taken as a proxy for the calendar year 1997. 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

Two strata were identified for sampling:

- a) Top health charities (with health expenditure greater than £5 million)
- b) Other charities

a) Top health charities

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' (totalling 880 charities). 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 (totalling 117), the total number of remaining health charities was 763. Of these, 38 were found to have a total expenditure of £5 million or more.

b. Other charities

A systematic sample of charities with a random start point was then taken from the total population of 3000 charities listed. Six additional health charities with expenditure over £5 million were identified which were added to the top health charities (total number now 44). 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 charity sampled turned out to have expenditure over £5 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 (12%, 28%).

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 £831m. As all of the biggest health charities have been identified, this is an exact figure.

Average expenditure of other health charities is £1.7m, with a 95% confidence interval of (£1.2m, £2.1m)

Average expenditure of other charities is £4.5m, with a 95% confidence interval of (£3.2m, £5.8m)

These averages were multiplied by the number of charities in the publication (763 other health charities and 2193 other charities) to give estimates of the population totals. These totals could, in turn, be used for calculating the point estimate of the ratio:

$$\frac{831m + 1.7m * 763}{831m + 1.7m * 763 + 4.5m * 2193}$$

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 (0.12, 0.28).

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 is 35% 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).

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 (£800 million, £1.9 billion).