



## **Consumers Price Index, 2008 Review**

### **Reproduction of material**

Material in this report may be reproduced and published, provided that it does not purport to be published under government authority and that acknowledgement is made of this source.

### **Citation**

Statistics New Zealand. (2008). *Consumers Price Index, 2008 Review*.  
Wellington: Author

### **Published in October 2008 by**

Statistics New Zealand  
Tatauranga Aotearoa  
Wellington, New Zealand

---

ISBN 978-0-478-31547-9 (online)

## **Standards and further information**

### **Percentage changes**

Percentage movements are, in a number of cases, calculated using data of greater precision than published. This could result in slight variations.

### **Rounding procedures**

On occasion, figures are rounded to the nearest thousand or some other convenient unit. This may result in a total disagreeing slightly with the total of the individual items as shown in tables.

### **Source**

All data is compiled by Statistics New Zealand, except where otherwise stated. Both administrative and survey data had been used in this report.

### **Liability statement**

While all care and diligence has been used in processing, analysing and extracting data and information in this report, Statistics New Zealand gives no warranty it is error free and will not be liable for any loss or damage suffered as a result of the use, directly or indirectly, of information in this report.

### **Statistics New Zealand's Information Centre**

For further information on the statistics in this report or for help finding and using statistical information available on our website or in the INFOS database, contact the Information Centre:

Email: [info@stats.govt.nz](mailto:info@stats.govt.nz)  
Phone toll-free: 0508 525 525  
Phone international: +64 4 931 4600  
Fax: +64 4 931 4610  
Post: PO Box 2922, Wellington, 6140, New Zealand  
Website: [www.stats.govt.nz](http://www.stats.govt.nz)

## Contents

List of tables and figures .....	5
1. Introduction .....	6
2. Summary.....	7
3. Publication timetable and seminar on the review.....	9
4. Reselecting the basket.....	10
5. Reviewing product specifications.....	12
6. Expression base and additional indexes.....	13
7. Regional population weights .....	14
8. Reweighting the basket.....	15
8.1 Background .....	15
8.2 Excluding out-of-scope expenditure .....	16
8.3 Price updating expenditures.....	17
8.4 Volume adjustments.....	18
9. Methods used to derive expenditure weights.....	21
9.1 Purchase of housing.....	21
9.2 Rentals for housing .....	23
9.3 Purchase of new and second-hand motor cars.....	23
9.4 Domestic air transport .....	23
9.5 International air transport .....	24
9.6 Alcoholic beverages .....	25
9.7 Cigarettes and tobacco .....	25
9.8 Insurance services .....	26
9.9 Health services.....	28
9.10 Education .....	28
9.11 Clothing and footwear .....	28
10. Analysis of expenditure weights.....	30
10.1 Food .....	30
10.2 Alcoholic beverages and tobacco.....	31
10.3 Clothing and footwear .....	31
10.4 Housing and household utilities.....	31
10.5 Household contents and services .....	32
10.6 Health .....	32
10.7 Transport.....	33
10.8 Communication .....	33
10.9 Recreation and culture .....	33
10.10 Education .....	33
10.11 Miscellaneous goods and services.....	34
10.12 CPI all groups plus interest .....	34
10.13 Tradables/non-tradables .....	34
11. Use of retail transaction data .....	35
12. Quantifying upper-level substitution bias .....	36
Appendix tables .....	37

**List of tables and figures**

Figure 1	Consumers Price Index, base quarter expenditure weight by group, June quarters, 2006 and 2008.....	8
Table 1	Items added to the CPI basket.....	10
Table 2	Items removed from the CPI basket.....	11
Table 3	Information sources for out-of-scope adjustment factors .....	17
Table 4	Volume adjustments.....	19
 Appendix tables		
Appendix table 1	Consumers Price Index, expenditure weights, groups, subgroups and classes .....	37
Appendix table 2	Consumers Price Index, expenditure weights, group .....	40
Appendix table 3	Consumers Price Index, population weights, region, pricing centre ..	40
Appendix table 4	Consumers Price Index, source of expenditure weights, group .....	41

## **1. Introduction**

A review of the Consumers Price Index (CPI) will be implemented when the September 2008 quarter index is released on 21 October 2008. The review encompassed reselecting and reweighting the basket of representative goods and services, to ensure the basket continues to reflect household spending patterns.

This information paper includes:

- details of changes made to the basket of representative goods and services
- the new CPI expenditure weights
- details of how these weights were derived
- an analysis of the main changes in the weights.

## 2. Summary

The CPI measures the rate of price change of goods and services purchased by households. Household spending patterns change, as tastes, lifestyles and incomes change, and as the range of goods and services available for households to acquire changes. Spending patterns also change as a result of relative price change, with households tending to buy fewer goods and services showing high relative price change, and buying more of goods and services showing low relative price change. Hence, the CPI needs to be reviewed periodically to ensure that it continues to reflect contemporary household spending patterns.

The main source of information used in the current review was the 2006/07 Household Economic Survey (HES), which collected detailed information on the spending patterns of about 2,600 households. The survey ran from July 2006 to June 2007. The number of private households covered by the HES grew by 5.0 percent from 1,494,200 for 2003/04 to 1,569,200 for 2006/07.

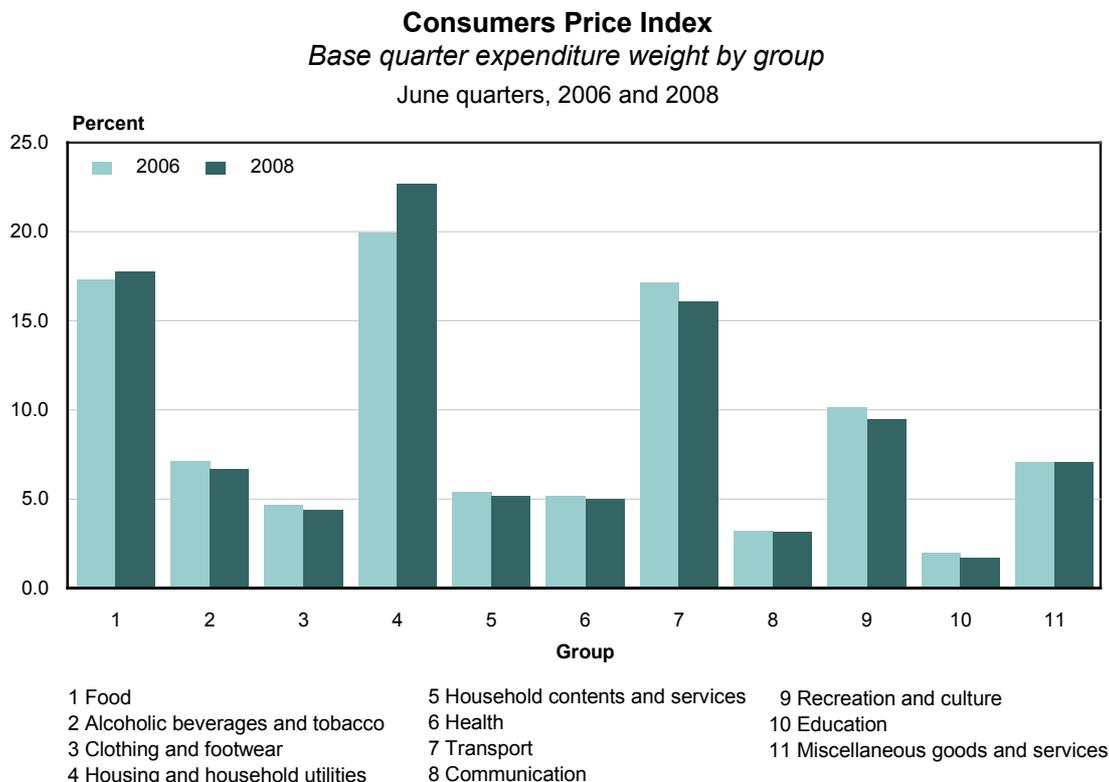
However, because the HES does not provide accurate information for some items, information from a range of other sources was also used.

The initial weights for the year to June 2007 (the weight reference period) were 'price updated' to the June 2008 quarter (the price reference period). This updating involved expressing the underlying quantities of the weight reference period in the prices of the price reference period. The initial weights indicated that households spent \$76.831 billion on goods and services covered by the CPI during the year to June 2007 (2006/07). When the goods and services acquired during 2006/07 are expressed in prices that were current at the June 2008 quarter, that spending rose to \$80.982 billion (5.4 percent higher, mainly due to increased housing, transport and food prices since 2006/07).

Figure 1 compares the new June 2008 quarter expenditure weights for the eleven CPI groups with the June 2006 quarter weights. Housing and household utilities; and food have grown in relative importance. The figure shows that \$22.75 of every \$100 spent by households on goods and services covered by the CPI is spent on housing and household utilities, compared with \$20.02 in 2006. This reflects increased spending on renting and on purchasing new housing, and higher electricity prices. Food accounts for \$17.83 of every \$100 spent, compared with \$17.38 in 2006. The increase largely reflects an increase of 11.3 percent in food prices from the June 2006 quarter to the June 2008 quarter.

Other groups have shown declines in relative importance, including transport (down from \$17.24 to \$16.18 of every \$100 spent), with lower spending on cars contributing to the fall. However, the relative importance of petrol has increased to \$5.47 of every \$100 spent.

**Figure 1**



Goods added to the basket as part of the review include heat pumps and cut flowers. High-tech products that have been added include in-car satellite navigation units, free-to-air digital television receivers, and digital music downloads. Services added to the new basket include lawn mowing, house cleaning and auction services, with the latter reflecting the growing popularity of online trading of goods.

Goods that have been removed from the basket include solid fuel burners, cathode ray tube television sets, video cassette tapes, photographic film and writing paper.

### **3. Publication timetable and seminar on the review**

The reweighted Food Price Index (FPI) for July 2008 was published on 25 August 2008.

The current review will culminate in the publication of the September 2008 quarter CPI on 21 October 2008.

The release dates for the July 2008 FPI and the September 2008 quarter CPI are later than usual to allow time to implement changes made as part of the review.

Users are invited to attend a seminar on the CPI review. The seminar will be held at 10.30am on Tuesday 14 October 2008 at Statistics NZ's Wellington office, Statistics House, The Boulevard, Harbour Quays. The seminar will start with an overview of the review and will give attendees the opportunity to discuss any aspect of this in more detail.

## 4. Reselecting the basket

The CPI basket of representative goods and services is reviewed about once every three years to ensure it continues to reflect household purchases. The aim of these reviews is to introduce goods and services that have become available since the previous review (provided that they have achieved a sufficient share of household spending) or have grown in importance, and to remove from the basket those goods and services that have declined in importance to the extent that they no longer have a significant share of household spending. In making these changes to the basket, there is a constraint, imposed by fixed compilation resources, of keeping the overall size of the basket about the same.

As the sample of goods and services in the basket represents a much wider range of those acquired by households, steps are taken to ensure adequate representation across the basket. This means that areas of the expenditure classification showing relatively high variability in price movements across goods and services (eg fresh vegetables, audio-visual appliances) may require greater representation in the basket than areas showing relatively low variability (eg cigarettes and tobacco).

The current review of the basket was informed by lower-level 2003/04 and 2006/07 HES expenditure data, feedback from CPI price collectors, supermarket scan data from the Nielsen Company and retail transaction data obtained from GfK (electrical appliances).

Table 1 shows items that have been added to the basket.

**Table 1**  
**Items Added to the CPI Basket**

Items	Details
Fresh pineapples	Replaces fresh peaches
Cooked chickens	Priced at supermarkets and joins frozen whole, fresh pieces and takeaway chicken already in the basket
Soy milk	Replaces condensed milk in the milk, cheese and eggs class
Free-range eggs	Joins standard eggs
Hummus dip	Added due to growth in popularity
Frozen desserts	Covers a broad range, including cheesecakes
Chilled fruit juice and smoothies	Joins 1-litre and 3-litre shelf-stable fruit juices
Vodka bottle (consumed off licensed premises)	Consumption is increasing and considerably higher than brandy (which is being replaced)
Men's ties	Previously, expenditure on clothing accessories was represented by clothing and footwear items
Belts	Previously, expenditure on clothing accessories was represented by clothing and footwear items
Lawn mowing	Has grown in relative importance
Refuse bin hire	Joins landfill fees
Council refuse bags	Joins landfill fees
Heat pumps	Increasingly popular; replaces solid fuel burners
Automatic dishwashing powder	Joins liquid dishwashing detergent
Fly spray	Represents pest control products
Housekeeping services	House cleaning has grown in relative importance
Electronic vehicle accessories	Covers car alarms and in-car satellite navigation units
Free-to-air digital television receivers	Added to reflect uptake of free-to-air digital television
Recordable DVD discs	Replaces video cassette tapes
Digital downloads	Covers paid digital downloads (eg music downloads)
Cut flowers	Added to reflect high expenditure

**Table 1 continued**

Items	Details
Ten-pin bowling	Popular casual sporting activity
Computer printer paper	Replaces writing paper
Printer ink	Relatively high expenditure on computer-related consumables
Adult education courses	Covers adult community education courses typically run at schools
Shower gel	Has increased in popularity and joins toilet soap cakes
Official passports, licenses and certificates	Covers expenditure on passports, marriage licences, birth certificates and other official documents
Auction services	Covers expenditure on auction services (excluding those associated with selling real estate through real estate agents), for example, those incurred through selling items online

Table 2 shows items that have been removed from the basket.

**Table 2**  
**Items Removed from the CPI Basket**

Items	Details
Fresh peaches	Replaced by pineapples, although other stone fruit, such as nectarines, remain in the basket
Saveloys	Sausages remain in the basket
Condensed milk	Replaced by soy milk
Cheesecakes	Now covered by the broader frozen desserts category
Brandy bottle (consumed off licensed premises)	Low expenditure; replaced by vodka
Solid fuel burners	Replaced by heat pumps
Casserole dishes	Adequately represented by remaining glassware, tableware and cookware in the basket
Bleach	Relatively low expenditure; made way for automatic dishwashing powder
Brooms	Relatively low expenditure
Rest-home fees	Previously had a small weight, with in-scope expenditure comprising spending by private households on behalf of rest-home residents; decline in expenditure reported in the HES
Seat covers (for vehicles)	Declining expenditure; made way for electronic vehicle accessories
DVD/VCR combination players	Transitional product that is beginning to decline in popularity; there are now two items in the basket dedicated to DVD players and to DVD recorders
Cathode ray tube (CRT) television sets	Declining popularity; there are now two items in the basket dedicated to LCD display television sets and to plasma display television sets
Calculators	Relatively low expenditure
Video cassette tapes	Declining popularity; replaced by recordable DVD discs
Photographic film	Declining popularity; superseded by digital camera memory cards (already in the basket)
Rosebushes	Relatively low expenditure
Hire of video cassette tapes	Declining availability; hire of DVD discs already in the basket
Writing paper	Declining expenditure

## 5. Reviewing product specifications

The pricing specifications of the goods and services priced at retail outlets have been reviewed to ensure that surveyed varieties and sizes are representative of household purchases. The samples of product sizes, brands and varieties have been reselected.

Summary information collated from supermarket scan data (obtained from the Nielsen Company) and retail transaction data for appliances (obtained from GfK) was used to:

- determine representative specifications for goods already in the basket and for basket additions
- provide price collectors with information about the market shares of the main brands
- provide price collectors with specific brand-share targets for selected goods, to ensure that the mix of brands in the CPI price samples reflected market shares.

The new samples of products were selected in February 2008 (for goods and services where prices are collected once each quarter from retail outlets) and in March 2008 (for goods and services where prices are collected monthly from retail outlets). Price collection for the existing and new samples ran alongside each other until June 2008, when collection for the old index ceased.

**Note:** Postal questionnaires are used to collect prices for a number of sampled goods and services, including rented dwellings and construction of new dwellings. The postal samples are reselected on a rolling basis and were not specifically reviewed as part of the current CPI review. New postal questionnaires have been implemented for two of the basket additions, lawn mowing and housekeeping services.

## **6. Expression base and additional indexes**

Although the composition and relative importance of the CPI basket have been reviewed, the index will continue to be published on a base of the June 2006 quarter (=1000).

Additions to the CPI basket have resulted in the publication of two new indexes at the class level of the New Zealand Household Expenditure Classification (NZHEC). These classes are clothing accessories and other education. Prior to the review, expenditure on goods and services within these two classes was allocated to other apparel and education items, respectively. As the two classes are new, they will be expressed on a base of the June 2008 quarter (=1000).

## **7. Regional population weights**

As part of the review of the CPI, the regional population weights have been updated. These population weights are used to allocate the national expenditure weights of goods and services derived from the HES and other sources to the CPI pricing centres. The population weights ensure that a given price change in Auckland, for example, with a new population weight of 32.98 percent, would have nearly three times the effect on the national CPI than would the same movement in Christchurch, which has a new population weight of 11.55 percent.

The new population weights, which appear in appendix table 3, have been calculated by making use of local government boundaries. The 2008 weights were derived by assigning the usually resident population as at June 2007 of each regional council area to the pricing centre(s) within the region.

For three regional council areas, Bay of Plenty, Manawatu-Wanganui and Canterbury, there are two pricing centres in each region. The proportion of the regional council area population allocated to each pricing centre was based on the population of the pricing centre's territorial authority.

The four regions without a pricing centre had their populations allocated to the nearest pricing centres. The Gisborne region's population was allocated to the Napier-Hastings pricing centre, and the Marlborough, Tasman and West Coast regions were allocated to the Nelson pricing centre.

In addition to allocating population weights to the 15 CPI pricing centres, Statistics NZ publishes the CPI for five broad regions, based on regional council area boundaries. These regions are Auckland, Wellington, Rest of North Island, Canterbury and Rest of South Island. Auckland and Canterbury have had small increases in relative importance, while the remaining three broad regions have had small declines in relative importance.

The population weights used previously were based on the usually resident population as at June 2005.

## 8. Reweighting the basket

### 8.1 Background

The CPI is reweighted once every three years, on average, to ensure that the expenditure weights allocated to the basket of representative goods and services continue to reflect the relative importance of goods and services acquired by households for consumption purposes. The time between reweights is within the International Labour Office (ILO) recommendation of at least once every five years. The 2006 reweight was based on the 2003/04 HES and a number of other sources. The 2008 reweight was based on information from the 2006/07 HES and other sources.

The previous reweight was implemented one year later than usual because of a decision to delay (by one year) both the 2003/04 HES and the CPI Revision Advisory Committee review. The HES decision was subsequently reversed, but this was made too late to convene the CPI Revision Advisory Committee in 2003, as originally planned.

The next HES will be conducted from July 2009 to June 2010. The 2009/10 HES will be used to reweight the CPI in 2011 (with the publication of the September 2011 quarter CPI in October 2011). The new CPI weights will therefore be used for the usual three years (rather than the two years from 2006 to 2008) for the weights from the 2006 review.

As noted above, the current reweight used information from the 2006/07 HES and other sources. For some goods and services, the HES does not provide accurate estimates of expenditure. Respondents tend to under-report expenditure on some goods and services (such as tobacco and alcohol). Furthermore, large, infrequent purchases (such as new cars) may not be reported frequently enough by the nearly 2,600 households in the survey to provide accurate estimates of total household expenditure.

HES data has been complemented by information obtained from a range of other sources, including Statistics NZ surveys, government administration data, retail transaction data and information provided by businesses.

The goods and services in the CPI basket comprise a representative sample of the wider range of goods and services acquired by households. The expenditure weights assigned to the 694 individual goods and services in the new basket represent expenditure on those goods and services, and also expenditure on similar goods and services not directly included in the basket but expected to exhibit similar price change. For example, oranges and mandarins are included in the basket but lemons are not. Expenditure on lemons (and other citrus fruit not directly included in the basket) is allocated to oranges and to mandarins in proportion to spending directly on each of these two citrus fruits.

Appendix table 4 shows the proportion of the new expenditure weights contributed directly from the HES for the sample of goods and services included in the CPI basket (eg oranges), the proportion that was contributed by the HES for goods and services not directly included in the basket (eg lemons), and the proportion of the weight estimated using sources other than the HES.

Appendix table 4 shows that 52.8 percent of the total expenditure weight was sourced from the HES, and the remainder was based on information from other sources. Of the HES-sourced weights, more than 70 percent comprised spending directly on goods and services in the basket, with the remainder being spending on goods and services not directly included in the basket.

HES was the main weighting source for household contents and services (96.7 percent), food (75.3 percent), recreation and culture (71.8 percent), communication (71.4 percent), and transport (68.4 percent). Groups where other information sources were heavily relied on included alcoholic beverages and tobacco (the HES contributed just 0.2 percent), clothing and footwear (1.1 percent), health (14.1 percent), education (14.6 percent), and housing and household utilities (43.1 percent).

## **8.2 Excluding out-of-scope expenditure**

The target population for the HES (and the CPI) is New Zealand-resident, private households living in permanent private dwellings. This means that the population does not include overseas visitors who expect to be resident in New Zealand for fewer than 12 months; people living in non-private dwellings such as hotels, motels, boarding houses, hostels, motor camps and homes for the elderly; patients in hospitals; residents of psychiatric and penal institutions; members of the permanent armed forces; members of the non-New Zealand armed forces; and overseas diplomats. Children at boarding schools are not surveyed, but expenditure on behalf of those children is included in the record keeping of the parent or guardian.

For survey purposes, a 'household' comprises a group of people who share a private dwelling and normally spend four or more nights a week in the household. They must share consumption of food or contribute some portion of income towards the provision of essentials for living as a group.

A key step when alternative data sources are used to estimate CPI expenditure weights is to ensure that the estimates include expenditure made by only the HES and CPI reference population. Expenditure by others is out of scope of the CPI and needs to be excluded from the expenditure weights so that they will not be upwardly biased relative to weights sourced from the HES. In addition to the people listed above not covered by the HES and CPI, expenditure by businesses and government also needs to be excluded.

Alternative expenditure information is sourced from a wide range of providers. Where possible, data providers were asked to report expenditure information that closely matches the scope of the CPI. In practice, however, many providers were not able to disaggregate their data to the level required. Statistics NZ had to estimate what proportion of a particular expenditure was in scope of the CPI when making use of this information to derive expenditure weights.

Excluding out-of-scope expenditure involved deriving a set of specific adjustment ratios for various areas of the basket. Appropriate ratios were then applied to the corresponding independently sourced expenditures. For example, these ratios took into account the relative shares of expenditure made by visitors from overseas, which varied significantly across different areas of the basket.

Sources of information used to derive the out-of-scope adjustment factors included:

**Table 3**  
**Information Sources for Out-of-scope Adjustment Factors**

Information source	Breakdown	Type of out-of-scope expenditure
National Accounts Household Consumption Expenditure	Estimates of proportion of total retail spending by the business sector, by retail storetype	Business
National Population Estimates	Estimated resident population	Non-private and non-permanent households
Tourism Satellite Account	International visitor expenditure as a proportion of total supply, by product	Non-residents (overseas tourists)

### 8.3 Price updating expenditures

For the current review, the 'weight reference' period is the year to June 2007, which coincides with the 2006/07 HES (although expenditure on some goods and services is collected in the HES on a recall basis, meaning that purchases can span a two-year period). When alternative sources were used to derive expenditure weights, information for the year to June 2007 was used, where possible.

Expenditure information from the 2006/07 HES and other sources has been 'price updated' to the 'price reference' period of the June 2008 quarter. The effect of price updating, recommended for CPIs by the ILO and common international practice, is to express the underlying 2006/07 quantities in the prices of the June 2008 quarter price reference period. In general, the indicators used to price update the weights were the lower-level CPI indexes corresponding to the goods and services in the new basket.

Prior to price updating, the expenditure totalled \$76.831 billion for 2006/07. After price updating to the June 2008 quarter, the new CPI expenditure weights totalled \$80.982 billion, which is \$4.151 billion or 5.4 percent higher than the figure prior to price updating.

Prices of vehicle fuels and lubricants increased by about 31 percent from 2006/07 to the June 2008 quarter, resulting in the price updating of petrol, diesel and motor oil adding \$1.151 billion (or 28 percent) of the overall \$4.151 billion added by price updating. Food prices increased by about 9 percent from 2006/07 to the June 2008 quarter, resulting in price updating adding \$1.161 billion (or 28 percent). Within food, milk, cheese and egg prices increased by about 21 percent from 2006/07 to the June 2008 quarter, resulting in price updating adding \$0.259 billion. Electricity prices increased by about 10 percent from 2006/07 to the June 2008 quarter, resulting in price updating adding \$0.269 billion.

Goods and services for which price updating resulted in reduced expenditure included early childhood education (down 34 percent as a result of the introduction of free services for three- and four-year-olds), audio-visual equipment (down 12 percent), computing equipment (down 11 percent), and domestic air transport (down 7 percent). Some of the price updating indicators for audio-visual equipment and computing equipment were customised to include rather than exclude quality improvements, which helps to explain their relatively modest falls.

For goods and services showing price increases from 2006/07 to the June 2008 quarter, price updating added \$5.153 billion to the expenditure weight. This was partly offset by a reduction of \$1.002 billion for goods and services showing price decreases from 2006/07 to the June 2008 quarter.

#### **8.4 Volume adjustments**

CPIs are generally calculated using a base-weighted Laspeyres formula that measures the changing cost of acquiring a basket of goods and services. The underlying quantities of goods and services in the basket relate to some earlier period and are held fixed.

The underlying 2006/07 quantities will be held fixed in the Laspeyres price index formula during the life of the index (from 2008 to 2011). These quantities will be assumed to be broadly representative of household purchases during the three-year life of the index (although it is known that consumers will, to some extent, substitute towards goods and services showing lower relative price change during the period).

It is also known that there have been significant shifts in quantities for some goods and services since the weight reference period of 2006/07.

As the 2006 reweight happened a year later than usual, the price reference period was also a year further away from the weight reference period, therefore increasing the possibility and magnitude of volume shifts. Adjustments were made to the underlying quantities in selected cases where there was strong evidence of a significant trend (rather than short-term) change in volumes since 2003/04. A wide range of possible adjustments was considered, but the number of changes actually made was limited to those cases that were considered significant and where reliable information was available. Although the use of selected adjustments introduced a level of subjectivity into the process, this was considered preferable to steadfastly retaining the underlying 2003/04 quantities across the whole basket. The aim of making these adjustments was to improve the relevance of the expenditure weights during the period they were used (from 2006 to 2008).

A similar, but slightly more conservative, approach has been adopted for the 2008 review, given that the price reference period is closer to the weight reference period than was the case for the 2006 review.

These 'volume adjustments' were made in two ways: either directly to the 2006/07 expenditures prior to price updating, or incorporated into the indicator used to price update 2006/07 expenditures.

Table 4 lists the volume adjustments that were made, the reasons for making these adjustments, and the data sources used to determine whether to adjust and by how much. It should be noted that volume change is considered to encompass not only change in physical quantities, such as the number of desktop computers acquired, but also change in quality.

**Table 4**  
**Volume Adjustments**

Good or service	Reason for adjustment	Information source
Cheddar-type cheese	To reflect lower volumes, influenced by price increases	Supermarket scan data, obtained from the Nielsen Company, for the years to June 2007 and June 2008
Butter/margarine	To reflect a shift from butter towards margarine, influenced by price increases for butter	Supermarket scan data, obtained from the Nielsen Company, for the years to June 2007 and June 2008
Ready-to-drink spirits	To reflect growth in volumes	Alcohol available for consumption figures for 2006/07 and 2007/08
Purchase of housing	To reflect increases in the size of new houses and increased costs as a result of the introduction of more stringent building standards	Building consents and value of work put in place information
Purchase of new motor cars	To reflect a shift from large to medium and small cars since 2006/07	Vehicle registration information for the years to June 2007 and June 2008
Purchase of motorcycles	To reflect big increases in registrations, influenced by petrol price increases	Vehicle registration information for the years to June 2007 and June 2008
Petrol	To reflect lower usage, influenced by price increases	Petroleum retail delivery volume figures
Urban train fares	To reflect increased usage, particularly in Auckland	Passenger numbers
Domestic air transport	To reflect increased usage following the entry of an additional airline	Passenger numbers
Internet charges	To reflect a continued shift from dial-up to broadband connections	Internet connection numbers
Cellphone handset purchases	To reflect growth in connections and improvements in the quality of handsets	Information on the number of connections and the prices of handsets
Cellphone cell charges	To reflect growth in connections and changes in average revenue per user	Information on the number of connections and average revenue per user
DVD players and player/recorders	To reflect volume growth, particularly in player/recorders	Retail transaction data for 2006/07 and 2007/08 obtained from GfK
Television sets	To reflect strong volume growth in the number and size of flat-panel plasma and LCD display television sets, and a shift away from cathode ray tube television sets	Retail transaction data for 2006/07 and 2007/08 obtained from GfK
Digital still and video cameras	To reflect growth in the number and quality of cameras	Retail transaction data for 2006/07 and 2007/08 obtained from GfK
Computers	To reflect improvements in the quality of computers	A time series of CPI shelf prices (prior to quality adjustment) was used to price update 2006/07 expenditure

Price updating expenditure on petrol by households during 2006/07 to June 2008 quarter prices added \$996 million to the expenditure weight for petrol. The volume of petrol delivered to retailers declined by a little more than 1 percent from the year to June 2007 to the year to June 2008, after adjusting for population growth. Although these deliveries are for both household and non-household use, a decision was made to make a volume adjustment of the magnitude indicated by the petrol delivery figures. This decision was informed by other information and reports such as increased use of public transport, lower monthly average daily traffic counts at specific locations in the five main cities, and fewer day trips being made by households.

It is worth noting that the Quarterly Employment Survey (QES) measure of average weekly earnings (including overtime) increased by 5.9 percent from 2006/07 to the June 2008 quarter, roughly in line with the 5.4 percent increase caused by expressing 2006/07 expenditures in June 2008 quarter prices.

Expenditure for some goods and services is highly cyclical or highly volatile. Two important areas of expenditure where this can be the case are the purchase of newly constructed dwellings and insurance services. For purchase of housing (and related services such as conveyancing and real estate fees), rentals for housing and insurance services, a decision was made at the 2006 review to extend the weight reference period to the three years ending with the HES period. This extension makes it possible to partially smooth the impact of cyclical highs or lows (housing) or unusual claims years (insurance). For the previous review, information for the three years to June 2004 was used. For the current review, information for the three years to June 2007 was used.

In cases where volume adjustments were made, and for housing and insurance (where an average of three years was used for the weight reference period), volumes for periods after or before the weight reference period of 2006/07 were adjusted to remove the effect of growth in the usually resident population. For example, nominal growth in volumes from the weight reference period of 2006/07 to 2007/08, was deflated by population growth between 2006/07 and 2007/08, to ensure that any volume adjustments made were above those that may have arisen simply from population change.

## **9. Methods used to derive expenditure weights**

As noted above, HES expenditure information has been complemented by information obtained from a range of other sources, including Statistics NZ surveys, government administration data, retail transaction data and information provided by businesses. For some goods and services, the HES does not provide accurate estimates of expenditure. Respondents tend to under-report expenditure on some goods and services (such as tobacco and alcohol), and large, infrequent purchases (such as new cars) may not be reported frequently enough by the 2,600 households in the survey to provide accurate estimates of total household expenditure. In other cases, such as insurance services, expenditure captured in the HES might not match the concept employed in the CPI.

This chapter outlines the methods used to derive expenditure weights for key parts of the index where alternative information sources were used.

### **9.1 Purchase of housing**

Under the 'acquisitions' conceptual approach used to compile the New Zealand CPI, the expenditure weight allocated to purchase of housing represents the value of the net increase in the stock of owner-occupied housing during the weight reference period. Expenditure on newly constructed dwellings by owner-occupiers is included, as are alterations and additions to established (ie existing) owner-occupied dwellings.

Sales within the household sector of established owner-occupied dwellings do not add to the stock of owner-occupied dwellings, as netting results in each purchase (positive expenditure) being cancelled out by a corresponding sale (negative expenditure). However, any net shift of dwellings in either direction between owner-occupation and renting or small-business use should be included, as it would result in a net addition (towards owner-occupation) or net reduction (towards renting or business use) to the stock of owner-occupied housing.

The method used in 2006 and again in 2008 involved applying an average new private dwelling value to the net change in the number of owner-occupied dwellings, then adding an estimate of owner-occupiers' share of the value of residential building additions and alterations to established dwellings.

The net change in the number of owner-occupied dwellings reflects the overall effect of households:

- acquiring newly constructed dwellings for occupation
- demolishing established owner-occupied dwellings
- selling established owner-occupied dwellings to landlords, small businesses, developers or government
- acquiring established dwellings (for owner-occupation) from landlords, small businesses, developers or government.

Information from the Census of Population and Dwellings, the HES and other sources indicates that there has been a trend over a lengthy period towards lower home ownership rates.

Information from the 1991, 1996, 2001 and 2006 Census of Population and Dwellings and research by the Reserve Bank on the impact of family trusts on published home ownership rates were used to extrapolate tenure proportions (ie home ownership and renting rates) beyond the 2006 Census of Population and Dwellings. These extrapolated home ownership rates were applied to Statistics NZ's time series estimates of the total number of dwellings (included in Dwelling Estimates by Tenure statistics) to derive time series estimates of the number of owner-occupied dwellings. The Dwelling Estimates by Tenure figures currently hold tenure proportions constant beyond the 2001 Census.

As noted above, a weight reference period of the three years ending with the HES period is used to derive annual average CPI expenditure weights for the purchase of housing (and related services such as conveyancing and real estate fees) and rentals for housing, to partially smooth the impact of cyclical highs or lows in activity. For the current review, information for the three years to June 2007 was used.

The derived time series estimates of the number of owner-occupied dwellings for the years to June 2004, 2005, 2006 and 2007 were used to calculate the net annual change for each of the three years to June 2007. These net annual changes were multiplied by the average cost of constructing a new dwelling during the year to June 2007 (derived from Statistics NZ's Building Consents statistics and Value of Building Work Put in Place statistics). Figures for each of the three years to June 2007 were averaged.

The values of residential building additions/alterations to established dwellings for the years to June 2005, 2006 and 2007 (from Value of Building Work Put in Place statistics) were multiplied by the extrapolated home ownership rates referred to above, to estimate owner-occupiers' share of the value of improvements to established dwellings. Figures for each of the three years to June 2007 were expressed in 2006/07 prices, averaged, then added to the annual average value assigned to the net change in the number of owner-occupied dwellings.

The final step was to price update to the June 2008 quarter. The price updating indicator used for the part of the estimate relating to the net increase in the number of owner-occupied dwellings was the CPI index for purchase of new housing, with a further adjustment made to reflect an increase in the average size of new houses.

**Notes:**

1. For the purposes of deriving the CPI expenditure weight for purchase of housing, households holding the homes they occupy in family trusts were treated as being owner-occupiers (even though this might not be true in a strict legal sense).
2. Expenditure by landlords on, or relating to, the properties they rent out is not included in the CPI.

## 9.2 Rentals for housing

To provide consistency with purchase of housing, the expenditure weight of rentals for housing was estimated from data for the three years to June 2007.

Administrative data was used to estimate the expenditure weight allocated to Housing New Zealand dwellings.

As noted under chapter 9.1, a range of information was used to extrapolate tenure proportions beyond the 2006 Census of Population and Dwellings. These rates were applied to Statistics NZ's time series estimates of the total number of dwellings (included in Dwelling Estimates by Tenure statistics) to derive time series estimates of the number of households renting non-Housing New Zealand dwellings. These households were classified by number of bedrooms, using ratios from the 2006 Census of Population and Dwellings. To estimate expenditure, the resulting figures were multiplied by corresponding average prices from the CPI rented dwellings collection. These average prices excluded Housing New Zealand properties.

Figures for each of the three years to June 2007 were expressed in 2006/07 prices, averaged, then price updated to the June 2008 quarter. In dollar-value terms, the 2008 expenditure weight of rentals for housing is about one-third higher than the 2006 weight, reflecting both a relative shift towards renting and, to a lesser extent, rent increases.

**Note:** Educational accommodation is included in rentals for housing.

## 9.3 Purchase of new and second-hand motor cars

Information on new motor car registrations by individuals for private use (disaggregated by make and model) was used in conjunction with list prices (disaggregated by make and model) to derive the expenditure weight for new motor cars. Adjustments were made to exclude out-of-scope expenditure and to reflect discounts for cash. Registrations for the year to June 2007 were used initially to derive the expenditure weight, then volume adjustments based on registrations for the year to June 2008 were made to reflect a relative shift from large cars to medium cars, in particular, and to small cars since 2006/07. This resulted in a lower overall weight for new motor cars than would have been the case if 2006/07 registrations had been used, and higher relative weights for medium and small cars.

The sample of new car makes and models was reselected as part of the current review. The reselection was based on registrations (disaggregated by make and model) for the year to June 2007.

The expenditure weight allocated to the purchase of new cars represents gross expenditure on new cars for private use by households. The expenditure weight for purchase of second-hand cars, derived from the HES, represents net purchases of second-hand cars (ie purchases of second-hand cars minus sales and trade-ins of second-hand cars, including trade-ins on purchases of new cars).

## 9.4 Domestic air transport

Industry information was used to estimate total revenue from domestic passengers and the number of domestic passengers carried for the year ended June 2007, with an adjustment made to reflect the entry of an additional airline after 2006/07.

Since only some domestic air transport trips in New Zealand are taken by the CPI reference population of private households living in permanent dwellings, it was necessary to make an adjustment for out-of-scope trips. This involved firstly turning the summed revenue into a total number of one-way domestic air travel trips taken, using an average fare derived from industry information and the CPI monthly survey of domestic air transport.

Trips that were taken by overseas visitors and by businesses were then removed. To estimate the proportion of all trips taken by overseas visitors, information from the Tourism Research Council New Zealand (TRCNZ) International Visitor Survey was used. This survey gives the estimated number of trips taken by international visitors by type of transport used. These trips were removed from the total, leaving only the trips taken by New Zealand residents.

The next step involved removing out-of-scope trips, such as those taken mainly for business purposes, from all trips taken by New Zealand residents. The Domestic Tourism Survey, also compiled by TRCNZ, gives information on the number of trips taken by New Zealand residents, broken down by main purpose of trip. A ratio of in-scope trips to total trips taken by New Zealand residents was derived. The final ratio used was an average of the annual ratios for the four years to June 2007.

The final step involved removing expenditure by people who are not part of private households living in permanent dwellings, using sources of information listed in chapter 8.2.

## **9.5 International air transport**

Estimating the expenditure weight for international air transport involved two key steps. First, the volume of in-scope trips, broken down by routes, taken by the CPI population was estimated. Second, these volumes were combined with average prices, which were weighted by the importance of routes.

External migration statistics provided the main data source used to derive the passenger volumes. Information on short-term overseas trips taken by New Zealand residents was used in conjunction with port of disembarkation data to derive the passenger volumes at the route level. Out-of-scope trips, such as those where the main purposes of travel were business, conventions and conferences, were removed from the totals.

Information collected as part of the CPI monthly survey of international air transport was used to derive a set of weighted average prices. These average prices took into account the relative importance of airlines for each route, and included the taxes and levies payable on each journey.

After combining the volumes with their corresponding weighted average prices, out-of-scope expenditure by people who are not part of private households living in permanent dwellings was removed (using sources of information listed in chapter 8.2).

As part of the current review, the routes for which prices are collected each month have been reweighted to reflect the changing popularity of destinations.

While international air transport is included in the transport group, overseas package holiday and accommodation costs prepaid in New Zealand are included in the package holidays class within the recreation and culture group. Because the calculation of the international air transport expenditure estimate was based on passenger volumes, the

volume data included those departing on package holidays. An adjustment was made to remove air transport expenditure that related to prepaid packages.

## **9.6 Alcoholic beverages**

HES respondents tend to under-report expenditure on alcoholic beverages, so alternative information sources are required for calculating CPI expenditure weights. Statistics NZ Alcohol Available for Consumption statistics for 2006/07 were used to base the 2008 weights on.

The quantities of alcoholic beverages available for consumption within New Zealand in the year to June 2007 were used in the calculations as proxies for purchases in the weight reference period. These were available at a disaggregated level (eg by type of spirit for full-strength spirits).

Expenditure estimates were calculated by multiplying the quantities available for consumption by average prices derived from the CPI price collections and from supermarket scan data obtained from the Nielsen Company. The quantities were split into beverages consumed on and off licensed premises, using industry information (beer) and the HES (wine, spirits and liqueurs). This is an important step, given that prices for alcoholic beverages consumed on licensed premises are much higher than for those consumed off licensed premises. The beer information was available in quantities, but the HES breakdown by storetype related to expenditure shares, so spending on wine, spirits and liqueurs had to be converted to quantity shares using corresponding average prices.

The disaggregated alcohol available for consumption figures and supermarket scan information on the relative shares of different types of wine were used to allocate quantities to a representative sample of beverages in the CPI basket.

Adjustments were made to exclude out-of-scope expenditure from international tourists, businesses and people living in non-private dwellings, using information from the sources listed in chapter 8.2.

Further adjustments were made to reflect growth from 2006/07 to 2007/08 in volumes of ready-to-drink spirits (up about 12 percent over and above population growth).

In dollar-value terms, the expenditure weight of alcoholic beverages before price updating is nearly double what it would have been if based simply on what was reported in the 2006/07 HES.

## **9.7 Cigarettes and tobacco**

HES respondents also tend to significantly under-report expenditure on cigarettes and tobacco. Statistics NZ Tobacco Available for Consumption statistics were used to base the 2008 weights on.

The quantities of cigarettes and tobacco available for consumption within New Zealand in the year to June 2007 were used in the calculations as a proxy for purchases in the weight reference period.

Expenditure estimates were calculated by multiplying the quantities available for consumption by corresponding unit prices derived from supermarket expenditure and quantity scan data. CPI price collection information indicates that cigarette and tobacco price levels vary little between different storetypes.

Adjustments were made to exclude out-of-scope expenditure from international tourists and people living in non-private dwellings, using information from the sources listed in chapter 8.2.

Supermarket scan data was used to review the brands in the sample (which represent different market segments) and to review their relative importance.

## **9.8 Insurance services**

The expenditure weights allocated to the various types of insurance service have been estimated on a 'net' basis. Under a net approach, the cost of insurance is viewed as being only the cost associated with the provision by insurance companies of administration and risk-pooling services.

The insurance industry is viewed as essentially providing an intermediation service in which the contributions made by policy holders are pooled and managed. The part of premiums that does not pay for the intermediation service goes into pools that are managed by the companies, invested to best advantage, and provide a source of funds for policy holders to use when it becomes necessary to repair or replace insured property, pay for medical services or obtain income.

Under the net approach, the weight given to insurance relates to the administrative costs of providing the service, which is collecting premiums and paying claims, and the profits of insurance companies.

The value of the insurance service can be defined as:

gross insurance premiums payable by households  
+ premium supplements (income earned on investing prepaid premiums and actuarial reserves)  
- claims  
- changes in actuarial reserves.

Under the net approach for insurance services, the weights of goods and services covered by insurance represent total expenditure on goods and services, whether funded by insurance or other means.

A similar view of insurance services is taken in the National Accounts, and the CPI expenditure weights for life insurance and health insurance were based on Household Consumption Expenditure (HCE) estimates.

Some adjustments were needed to bring the scope of the HCE insurance service charges in line with the scope of the CPI. The HCE estimate for health insurance includes a proportion that is funded by employers, which was excluded from the CPI weight calculations (as the value of fringe benefits, or income paid in kind, has not traditionally been included in the CPI weights). Information was obtained from the industry on the share of premiums funded by employers.

Some types of life insurance are excluded from the CPI because they are considered to represent savings and investment, rather than consumption. However, 'term' life insurance provides risk-only cover and has no surrender or residual value. Claims are paid out only in the event of death, disability or personal accident. With respect to the CPI, the service provided by term life insurance can be regarded as protection against

the risk of disability, personal accident or loss of life. Given that there is no investment element in this type of life insurance, it is appropriate to include it in the CPI.

The HCE estimate for life insurance includes the service charge for investment and savings products, in addition to that for risk cover. An adjustment was made to exclude the proportion of the life insurance service charge that is not attributable to term life insurance, and the proportion attributable to employers subsidising the cover of paid employees. Information giving a breakdown of premiums and claims by type of life insurance policy, and an estimate of the proportion of premium income funded by employers, were obtained from the industry and used to adjust the HCE estimate.

Adjustments were also made to exclude the estimated shares of health and life insurance service charges attributable to people who are not part of private households living in permanent dwellings, using information from the sources listed in chapter 8.2 above.

Information obtained from the industry was used to estimate the service charge for general insurance in the CPI. These calculations were based on the premiums paid by households less claims received for dwelling, contents insurance and vehicle insurance. Adjustments were made to exclude out-of-scope expenditure, using information from the sources listed in chapter 8.2 above. Because expenditure by landlords on, or relating to, the properties they rent out is excluded from the CPI, a further adjustment was made to exclude landlord spending on dwelling and contents insurance. Statistics NZ tenure estimates and information obtained from the industry were used to calculate this adjustment.

Using the net approach for insurance services, spending on goods and services that is funded by insurance claims is allocated to the expenditure weights of those goods and services. When claims are paid by insurance providers directly to households, the resulting expenditure made by households to repair or replace insured property is captured directly in the HES. However, when insurance providers pay claims directly to the goods and service providers repairing or replacing insured property, this expenditure on behalf of households would not be captured in the HES.

Information was obtained from the industry on the proportion of claims paid directly to service providers for the different types of general insurance. These proportions were applied to the claims figures used to derive the service charge weights, and the resulting amounts were added to the expenditure weights of appropriate insurable goods and services. The total estimated amount of general insurance claims paid directly to goods and service providers was \$710 million (more than half related to vehicle insurance), and \$600 million of this was allocated to the weights of appropriate insurable goods and services (as the remainder of the claims paid directly to goods and service providers was estimated to have already been included in the independently sourced estimates of insurable goods and services).

As noted in chapter 8.4, a decision was made to extend the weight reference period to the three years ending with the HES period to derive annual average CPI expenditure weights for insurance services, to smooth the impact of unusual claims years and to minimise the risk of negative weights. For the current review, information for the three years to June 2007 was used.

## **9.9 Health services**

Within the health group, most of the expenditure weights allocated to the out-patient services class and the hospital services class were derived from sources other than the HES.

GST sales data (including GST) was used to provide information on the total income of medical service providers (broken down by type of provider). Information obtained from the Ministry of Health was used to remove the part of providers' income funded directly by government (such as subsidies for general practitioner consultations). An adjustment was also made to exclude the share of health insurance claims attributable to employers that subsidise health insurance premiums of paid employees. The resulting expenditure weights allocated to the various health services represent out-of-pocket spending by private households, and spending on claims made, on behalf of private households, by health insurance companies to health service providers.

The information obtained from the Ministry of Health on government funding and health insurance was provided in a different format, due to a change in reporting methods. A greater number of assumptions and adjustments had to be made for the 2008 review than for the 2006 review to align the funding data with the CPI basket.

## **9.10 Education**

For the 2006 review, about two-thirds of the expenditure weight for education was derived from the HES. However, the 2006/07 HES appeared to provide poor estimates of expenditure on education services, so, for the 2008 review, about 85 percent of the weight for education was estimated from alternative sources.

For early childhood education, information was obtained from the Ministry of Education on the number of children enrolled in early childhood education by age and type of provider, and on the distribution of hours children are enrolled for. This was combined with CPI average fees for each age group and type of provider to calculate total expenditure on early childhood education fees, after removing the childcare subsidy administered by Work and Income.

For state and integrated schools, parents' contributions were estimated from information supplied by the Ministry of Education. The weight for private school fees was based on pupil enrolment numbers supplied by the Ministry of Education, and on average prices from the CPI survey of private school fees.

Within tertiary education, the weights for university education and polytechnic education were estimated from tuition fee revenue information supplied by the Tertiary Education Commission. Spending by students considered out of scope (eg students living in university halls of residence and overseas students who are not usually resident) was removed.

## **9.11 Clothing and footwear**

HES estimates of expenditure on clothing and footwear appear to be significantly understated. This may reflect under-reporting by respondents and/or issues with how information is collected.

The approach used to derive the CPI clothing and footwear expenditure weights involved the following steps:

1. using the HES to determine the ratio of apparel sales to all sales at clothing stores, department stores, footwear stores and sports stores
2. applying these ratios to Retail Trade Survey (RTS) disaggregated sales figures for the equivalent storetypes
3. adding GST
4. removing out-of-scope spending (such as that by international visitors and businesses)
5. adjusting HES expenditure for apparel items by the ratio of HES expenditure to adjusted RTS expenditure at the storetype level.

A similar approach was used for the 2002 and 2006 reviews. Benchmarking HES expenditure to the RTS contributed about one-quarter of the 2008 CPI expenditure weight for clothing and footwear.

## 10. Analysis of expenditure weights

Appendix table 1 gives the new expenditure weights, as at the June 2008 quarter, for the reweighted CPI. This table also includes the expenditure weights for the June 2002 and 2006 quarters. For 2002, basket items were reclassified using the NZHEC classification system adopted at the 2006 review, rather than the previously used classification system.

The expenditure weights and corresponding indexes are published at the group, subgroup and class levels of the NZHEC classification. Weights will be held fixed down to the class level until the subsequent reweight in 2011. Relative weights below the class level of the NZHEC classification will be monitored on an ongoing basis and adjusted where necessary to reflect volume-related shifts in relative importance.

As noted above, the initial weights for the year to June 2007 (the weight reference period) were 'price updated' to the June 2008 quarter (the price reference period). This updating involved expressing the underlying quantities of the weight reference period in the prices of the price reference period. The initial weights indicated that households spent \$76.831 billion on goods and services covered by the CPI during the year to June 2007 (2006/07). When the goods and services acquired during 2006/07 are expressed in prices that were current at the June 2008 quarter, that spending rises to \$80.982 billion (5.4 percent higher, mainly due to increased housing, transport and food prices since 2006/07).

When the goods and services acquired during 2003/04 were expressed in prices that were current at the June 2006 quarter, spending amounted to \$69.586 billion at the last CPI review in 2006. This means that the total expenditure on which the 2006 and 2008 CPI weights are based increased 16.4 percent from the June 2006 quarter to the June 2008 quarter. Prices increased 6.1 percent from the June 2006 quarter to the June 2008 quarter, which implies an increase of 9.7 percent from 2003/04 to 2006/07 in the quantity and quality of goods and services acquired by private households. The number of households increased 5.0 percent between the two HES periods.

QES average weekly earnings (including overtime) increased 12.5 percent from 2003/04 to 2006/07, while CPI prices increased 9.1 percent over the same period.

### 10.1 Food

The food group has a June 2008 quarter expenditure weight of 17.83 percent, compared with 17.38 percent in 2006.

When the food consumed during 2003/04 and 2006/07 is expressed in June 2006 and June 2008 quarter prices, respectively, spending rose 19.4 percent from \$12.094 billion to \$14.442 billion. Much of the increase in spending was the result of an increase of 11.3 percent in food prices from the June 2006 quarter to the June 2008 quarter.

The main source of information used to reweight the food group was the 2006/07 HES. However, because the HES does not provide accurate information for some food items, such as confectionery and soft drinks, information was also sourced from food manufacturers and distributors, and from supermarket scan data (from the Nielsen Company).

The relative importance of grocery food has increased slightly, from 6.70 percent in 2006 to 6.88 percent in 2008. Within this subgroup, the weight of milk, cheese and eggs increased from 1.57 percent to 1.84 percent, which partly reflects recent increases in cheese prices. The relative shares of fruit and vegetables, of meat, poultry and fish, and of non-alcoholic beverages, all grew. The increase in the relative importance of non-alcoholic beverages, from 1.62 percent in 2006 to 1.82 percent in 2008, in part reflects real growth in spending on beverages such as soft drinks, energy drinks and bottled water, and partly reflects the availability of better information sources for the 2008 CPI review.

Based on spending reported in the 2003/04 and 2006/07 Household Economic Surveys, the relative importance of restaurant meals and ready-to-eat food has declined. This decline is not regarded as a real fall in spending between the two surveys. Rather, results from the two surveys suggest that the level of spending on restaurant meals reported in the 2003/04 survey may have been overstated. Spending on ready-to-eat food actually increased 15.8 percent, but when expressed as a percentage of total spending, its relative importance was steady, at 2.23 percent in 2008 compared with 2.24 percent in 2006.

Faced with increases in food prices during 2007/08, consumers reacted to some extent by changing their spending patterns. Supermarket scan data from the Nielsen Company for the years to June 2007 and June 2008 was used to examine whether any significant shifts were evident. The data, combined with average prices, showed that consumers have been buying less cheddar-type cheese, and buying less butter but more margarine. The 2008 CPI expenditure weights for cheddar cheese, butter and margarine were adjusted to reflect these changes, which occurred after the 2006/07 survey period. Adjustments were also considered for milk and bread, but for these items there was no indication of declines in volumes.

## **10.2 Alcoholic beverages and tobacco**

The alcoholic beverages and tobacco group has a June 2008 expenditure weight of 6.76 percent, compared with 7.20 percent in 2006. In dollar-value terms, spending rose 9.3 percent from an estimated \$5.013 billion at June 2006 quarter prices to \$5.478 billion at June 2008 quarter prices.

The weight for alcoholic beverages fell from 4.97 percent to 4.62 percent. This was largely the result of a shift for beer from consumption on licensed premises to off licensed premises.

The weight for cigarettes and tobacco fell slightly, from 2.23 percent to 2.15 percent.

## **10.3 Clothing and footwear**

The new weight for clothing and footwear (4.48 percent) compares with 4.75 percent in 2006. In dollar terms, spending rose 9.7 percent from the old weights expressed at June 2006 quarter prices to the new weights expressed in June 2008 quarter prices. Prices were flat between the June 2006 quarter and June 2008 quarter, falling 0.3 percent.

## **10.4 Housing and household utilities**

Housing and household utilities continues to be the highest-weighted group. Its share of the CPI weight has increased from 20.02 percent to 22.75 percent.

The group's increase reflects higher contributions from each of the five subgroups. The weight for housing rentals increased from 6.87 percent to 7.85 percent, reflecting an increase in the proportion of households that rent.

The weight for purchase of housing rose from 4.66 percent in 2006 to 5.51 percent in 2008. This reflects stronger growth in net additions to the owner-occupied housing stock during the three years to June 2007, compared with the three years to June 2004, and to a strong increase in the average cost of constructing a new dwelling. The net increase in the number of owner-occupied dwellings used to calculate the 2008 weight was about 25 percent higher than the number used for the 2006 weight, and the average cost of constructing a new dwelling during the year to June 2007 was about 40 percent higher than in the year to June 2004.

The average annual net increase in the number of owner-occupied houses used to calculate the 2006 weight for purchase of new housing turned out to be broadly in line with the net addition for each of the June 2007 and June 2008 years (that is, for the period the weight was used in the CPI). The average annual net increase in the number of owner-occupied houses during the three years to June 2007 will be used to calculate the CPI from the September 2008 quarter to the June 2011 quarter. It will represent the average annual net increase in the number of owner-occupied dwellings during the life of the new weights of the three years to the June 2011 quarter.

As the net increase for the year to June 2005 was relatively high, there is a possibility that the annual average net increase for the three years to June 2007 will turn out to be higher than the annual average increase for the three years to June 2011. While alternative weight reference period options were considered, a decision was made to retain the practice of using the three years ending with the HES period for calculating the weight for purchase of new housing.

The weight for electricity has increased from 3.29 percent to 3.54 percent, reflecting an increase of 14.0 percent in electricity prices from the June 2006 quarter to the June 2008 quarter. The relative weight for local authority rates and payments increased from 2.16 percent to 2.32 percent, while the CPI local authority rates index increased by 14.6 percent from the June 2006 quarter to the June 2008 quarter.

### **10.5 Household contents and services**

The relative weight for household contents and services declined to 5.26 percent, compared with 5.49 percent in 2006. In dollar-value terms, spending on household contents and services rose 11.4 percent.

### **10.6 Health**

The health group has a June 2008 quarter expenditure weight of 5.09 percent, compared with 5.23 percent in the June 2006 quarter.

The weight for medical products, appliances and equipment fell from 1.13 percent in 2006 to 0.98 percent in 2008, reflecting lower prescription charges as a result of increased government subsidies.

The weight for medical services fell from 2.09 percent in 2006 to 1.97 percent in 2008, reflecting lower general practitioner fees as a result of increased government subsidies.

## **10.7 Transport**

The transport group has a June 2008 quarter expenditure weight of 16.18 percent, compared with 17.24 percent in the June 2006 quarter.

The weight for petrol increased from 5.38 percent in 2006 to 5.47 percent in 2008, reflecting a 15.3 percent increase in price from the June 2006 quarter to the June 2008 quarter, tempered by implied volume growth of a little less than growth in the number of households between 2003/04 and 2006/07. The weight for other vehicle fuels and lubricants rose from 0.44 percent in 2006 to 0.58 percent in 2008, reflecting strong growth in diesel prices and volumes.

The weight for purchase of vehicles decreased from 5.24 percent in 2006 to 4.02 percent in 2008. Within this subgroup, the weight for purchase of second-hand motor cars fell from 3.30 percent to 2.37 percent, based on purchases, sales and trade-ins reported in the HES. Registration figures show that the number of imported used cars fell 27 percent from 2003/04 to 2006/07. The weight for purchase of new motor cars also fell, but to a lesser extent, reflecting both a fall in volumes and a relative shift from large cars towards medium and small cars, and towards motorcycles.

The weight for international air transport increased from 1.36 percent in 2006 to 1.68 percent in 2008, reflecting strong growth between 2003/04 and 2006/07 in the number of people holidaying abroad.

## **10.8 Communication**

The relative weight for communication declined slightly from 3.26 percent to 3.21 percent, although actual spending in dollars increased 14.6 percent.

## **10.9 Recreation and culture**

The relative weight for recreation and culture declined from 10.21 percent to 9.54 percent, although actual spending in dollars increased 8.8 percent.

The weight for audio-visual and computing equipment remained steady. The weight for newspapers, books and stationery fell from 1.58 percent to 1.35 percent, reflecting a fall in the weight of newspapers and magazines. In nominal dollar terms, spending on newspapers, books and stationery remained flat.

## **10.10 Education**

The education group is the lowest-weighted group in the CPI, with a weight of 1.78 percent (down from 2.08 percent).

The weight for early childhood education fell from 0.35 percent in 2006 to 0.25 percent in 2008, reflecting the introduction in 2007 of 20 hours of free early childhood education for three- and four-year-old children who attend participating early childhood education services. This fall was partly offset by improved data sources being used to estimate the 2008 expenditure weight. These sources indicate that early childhood education expenditure may have been moderately underestimated in 2003/04.

The introduction of the 'other education' class, which covers the basket addition of adult education courses, has had a small downward impact on the 2008 weight for tertiary

education, as expenditure on adult education courses was previously represented by tertiary education.

### **10.11 Miscellaneous goods and services**

The 2008 weight for the miscellaneous goods and services group is 7.12 percent, compared with 7.13 percent in 2006. Within the other miscellaneous services subgroup, the weight of other miscellaneous services not elsewhere classified has increased from 0.19 percent in 2006 to 0.30 percent in 2008. This is a result of growth in spending on auction services (now in the basket) and to administrative sources being used to estimate expenditure on official passports, licences and certificates (also added to the basket).

The relative weight of real estate fees has remained steady. The weight relates to house sales over the three years to June 2007.

### **10.12 CPI all groups plus interest**

Interest payments have been excluded from the all groups CPI since 1999. However, an analytical CPI all groups plus interest series continues to be made available. The interest component of this index has a June 2008 quarter expenditure weight of 10.57 percent, compared with 9.27 percent for the June 2006 quarter. Mortgage interest has a June 2008 quarter expenditure weight of 8.52 percent.

The increase in the relative weight of interest reflects higher mortgage rates in the June 2008 quarter than in the June 2006 quarter, and the impact of strong growth in house prices on the size of the average mortgage.

The money, credit and financial statistics published by the Reserve Bank was the main source of information used to derive the expenditure weights for interest. The CPI does not include expenditure by landlords relating to the properties they rent out. An adjustment was made to exclude an estimate of the proportion of mortgage payments that relate to rental properties and for small business purposes.

### **10.13 Tradables/non-tradables**

Tradables are goods and services that are imported or that are in competition with foreign goods and services either in domestic or foreign markets. Non-tradables are goods and services that do not face foreign competition. The June 2008 quarter expenditure weights of the tradables and non-tradables components will be calculated once the basket additions have been classified as tradable or non-tradable. The expenditure weights of the tradables and non-tradables components will be published with the September 2008 quarter CPI information release.

## **11. Use of retail transaction data**

Substantial use was made of retail transaction data, obtained from the Nielsen Company in New Zealand and from Australian company, GfK.

The Nielsen Company collects details of sales of barcoded products that are scanned at checkout counters in supermarkets around the country. Aggregate sales information was obtained for about 400 categories, broken down by quarter, leading manufacturer, leading brand and, in some cases, variety.

GfK collects similar information for a range of small and large consumer electronic appliances and computer equipment sold through most of New Zealand's main appliance retailers and department stores. Information was obtained on the volume and value of sales of about 30 different categories, broken down by feature. For example, the information quantifies the relative importance of colour TVs with standard, LCD and plasma displays.

The Nielsen Company and GfK information has been used to help:

- determine the expenditure weights of some goods in the CPI basket
- determine whether expenditure-weight adjustments were required to reflect volume changes or quality improvements since 2006/07 and, if so, by how much
- select representative products to survey when price collectors visit retail outlets each month or quarter
- ensure that the mix of brands in the CPI price samples reflects market shares.

The Nielsen Company and GfK data will also be monitored on an ongoing basis between the three-yearly reweights to assist with keeping product samples, brand shares and weights (below the class level of the NZHEC classification) up to date.

## 12. Quantifying upper-level substitution bias

Under normal economic conditions, price and quantity relatives are negatively correlated. Households tend to react to changes in relative prices by choosing to reduce purchase of goods and services showing higher relative price change and instead buying more of those showing lower relative price change. Under such circumstances, a base-weighted Laspeyres index will be larger than a current-weighted Paasche index, for example.

For practical reasons, CPIs are generally calculated using a Laspeyres formula (or a Lowe or Young variant). CPIs are therefore subject to upper-level (or item) substitution bias, unlike indexes calculated using a superlative index formula such as the Fisher ideal formula (which is the geometric mean of the Laspeyres and Paasche indexes).

The New Zealand CPI is calculated using a Laspeyres-type formula. The index is reweighted once every three years, which is within the ILO recommendation of at least once every five years.

Frequent reweighting of the basket can minimise the problem of upper-level substitution, but will not eliminate it.

Once each new set of CPI expenditure weights has been calculated, it is possible to make use of the existing and new weights to calculate a superlative index on a retrospective basis.

The 2004 CPI Revision Advisory Committee recommended that at each reweighting of the CPI basket, Statistics NZ should calculate a superlative index on a retrospective basis to provide information on the effect of upper-level (or item) substitution on the fixed-weight CPI (recommendation 10).

A retrospective superlative index calculated between the June 2002 quarter and the June 2006 quarter was published in February 2007. The exercise will be repeated for the period from the June 2006 quarter to the June 2008 quarter. An information paper that presents and analyses results will be published on 25 November 2008. The index will provide an indication of the effect of commodity substitution on the fixed-weight CPI. It will, however, also reflect changes and improvements in the methods and data sources used to derive the 2008 expenditure weights.

## Appendix table 1

**Consumers Price Index**  
*Expenditure weights*  
Groups, subgroups and classes

Group, subgroup or class	Base quarter expenditure weight		
	June 2002	June 2006	June 2008
	Percent <sup>(1)</sup>		
<b>Food group</b>	17.21	17.38	17.83
Fruit and vegetables	2.03	2.20	2.41
Fruit	0.90	0.87	0.91
Vegetables	1.13	1.33	1.49
Meat, poultry and fish	3.28	2.82	2.98
Meat and poultry	2.93	2.48	2.55
Fish and other seafood	0.36	0.34	0.42
Grocery food	6.54	6.70	6.88
Bread and cereals	1.90	2.01	1.97
Milk, cheese and eggs	1.55	1.57	1.84
Oils and fats	0.33	0.31	0.32
Food additives and condiments	0.55	0.46	0.44
Confectionery, nuts and snacks	1.60	1.65	1.63
Other grocery food	0.59	0.70	0.68
Non-alcoholic beverages	1.76	1.62	1.82
Coffee, tea and other hot drinks	0.28	0.32	0.34
Soft drinks, waters and juices	1.48	1.30	1.48
Restaurant meals and ready-to-eat food	3.60	4.03	3.75
Restaurant meals	1.64	1.79	1.52
Ready-to-eat food	1.96	2.24	2.23
<b>Alcoholic beverages and tobacco group</b>	8.72	7.20	6.76
Alcoholic beverages	6.43	4.97	4.62
Beer	2.81	2.18	1.83
Wine	1.54	1.51	1.57
Spirits and liqueurs	2.08	1.28	1.21
Cigarettes and tobacco	2.29	2.23	2.15
<b>Clothing and footwear group</b>	4.77	4.75	4.48
Clothing	3.89	3.95	3.67
Men's clothing	1.19	1.08	0.94
Women's clothing	1.86	2.00	1.88
Children's and infants' clothing	0.63	0.73	0.56
Clothing accessories	...	...	0.13
Knitting and sewing supplies	0.13	0.07	0.07
Clothing services	0.08	0.07	0.09
Footwear	0.88	0.80	0.81
Men's footwear	0.32	0.24	0.21
Women's footwear	0.41	0.43	0.51
Children's and infants' footwear	0.15	0.12	0.09
<b>Housing and household utilities group</b>	21.52	20.02	22.75
Actual rentals for housing	5.54	6.87	7.85
Home ownership	8.47	4.66	5.51
Purchase of new housing	8.47	4.66	5.51
Property maintenance	2.12	2.24	2.64
Property maintenance materials	1.08	0.63	0.67
Property maintenance services	1.04	1.61	1.98
Property rates and related services	2.34	2.44	2.68
Water supply	0.16	0.16	0.23
Refuse disposal and recycling	0.14	0.12	0.13
Local authority rates and payments	2.04	2.16	2.32
Household energy	3.04	3.82	4.06
Electricity	2.73	3.29	3.54
Gas	0.20	0.40	0.41
Solid fuels	0.11	0.13	0.11

**Note:** For footnotes, see end of table.

**Appendix table 1***continued*

**Consumers Price Index**  
*Expenditure weights*  
 Groups, subgroups and classes

Group, subgroup or class	Base quarter expenditure weight		
	June 2002	June 2006	June 2008
	Percent <sup>(1)</sup>		
<b>Household contents and services group</b>	5.13	5.49	5.26
Furniture, furnishings and floor coverings	1.91	2.07	1.94
Furniture and furnishings	1.50	1.59	1.42
Carpets and other floor coverings	0.41	0.49	0.51
Household textiles	0.51	0.53	0.44
Household appliances	1.26	1.16	1.17
Major household appliances	1.08	0.89	0.95
Small electrical household appliances	0.05	0.15	0.12
Repair and hire of household appliances	0.12	0.13	0.10
Glassware, tableware and household utensils	0.32	0.35	0.30
Tools and equipment for house and garden	0.48	0.45	0.53
Major tools and equipment for the house and garden	0.21	0.18	0.25
Small tools and accessories for the house and garden	0.27	0.27	0.28
Other household supplies and services	0.66	0.93	0.89
Cleaning products and other household supplies	0.59	0.77	0.67
Other household services	0.06	0.16	0.22
<b>Health group</b>	4.83	5.23	5.09
Medical products, appliances and equipment	0.62	1.13	0.98
Pharmaceutical products	0.54	0.77	0.61
Other medical products	0.04	0.04	0.03
Therapeutic appliances and equipment	0.04	0.33	0.34
Out-patient services	3.54	3.42	3.32
Medical services	2.62	2.09	1.97
Dental services	0.70	0.86	0.94
Paramedical services	0.21	0.47	0.41
Hospital services	0.67	0.68	0.78
<b>Transport group</b>	15.51	17.24	16.18
Purchase of vehicles	4.48	5.24	4.02
Purchase of new motor cars	1.25	1.69	1.39
Purchase of second-hand motor cars	3.12	3.30	2.37
Purchase of motorcycles	0.07	0.19	0.20
Purchase of bicycles	0.04	0.05	0.06
Private transport supplies and services	6.22	9.27	9.24
Vehicle parts and accessories	0.47	0.72	0.76
Petrol	3.12	5.38	5.47
Other vehicle fuels and lubricants	0.26	0.44	0.58
Vehicle servicing and repairs	1.14	1.48	1.36
Other private transport services	1.22	1.27	1.07
Passenger transport services	4.82	2.73	2.92
Rail passenger transport	0.25	0.08	0.07
Road passenger transport	0.49	0.46	0.43
Domestic air transport	0.84	0.73	0.64
International air transport	3.11	1.36	1.68
Sea passenger transport	0.13	0.10	0.10
<b>Communication group</b>	2.92	3.26	3.21
Postal services	0.12	0.16	0.17
Telecommunication equipment	0.15	0.15	0.20
Telecommunication services	2.65	2.96	2.84

**Note:** For footnotes, see end of table.

**Appendix table 1***continued*

**Consumers Price Index**  
**Expenditure weights**  
 Groups, subgroups and classes

Group, subgroup or class	Base quarter expenditure weight		
	June 2002	June 2006	June 2008
	Percent <sup>(1)</sup>		
<b>Recreation and culture group</b>	9.73	10.21	9.54
Audio-visual and computing equipment	1.78	1.83	1.82
Audio-visual equipment	0.74	0.94	1.01
Computing equipment	0.52	0.49	0.45
Recording media	0.47	0.40	0.36
Major recreational and cultural equipment	0.87	0.42	0.37
Other recreational equipment and supplies	2.00	2.01	2.04
Games, toys and hobbies	0.28	0.37	0.52
Equipment for sport, camping and outdoor recreation	0.32	0.47	0.45
Plants, flowers and gardening supplies	0.89	0.57	0.51
Pet-related products	0.52	0.59	0.56
Recreational and cultural services	2.55	2.88	2.38
Recreational and sporting services	1.01	1.01	0.95
Cultural services	1.31	1.63	1.20
Veterinary services	0.23	0.24	0.22
Newspapers, books and stationery	1.89	1.58	1.35
Books	0.23	0.45	0.40
Newspapers and magazines	1.33	0.87	0.66
Stationery and drawing materials	0.11	0.26	0.29
Accommodation services	0.57	0.66	0.65
Package holidays	0.06	0.84	0.92
<b>Education group</b>	1.65	2.08	1.78
Early childhood education	0.48	0.35	0.25
Primary and secondary education	0.21	0.70	0.66
Tertiary and other post-school education	0.96	1.03	0.83
Other education	...	...	0.04
<b>Miscellaneous goods and services group</b>	8.01	7.13	7.12
Personal care	2.02	2.14	2.32
Hairdressing and personal grooming services	0.52	0.67	0.75
Electrical appliances for personal care	0.02	0.02	0.06
Other appliances, articles and products for personal care	1.49	1.44	1.51
Personal effects	0.45	0.58	0.47
Jewellery and watches	0.28	0.37	0.35
Other personal effects	0.18	0.22	0.12
Insurance	3.71	1.70	1.82
Life insurance	0.70	0.69	0.83
Dwelling insurance	0.51	0.19	0.12
Contents insurance	1.04	0.25	0.24
Health insurance	0.15	0.18	0.23
Vehicle insurance	1.30	0.38	0.40
Credit services	0.58	0.76	0.62
Other miscellaneous services	1.25	1.95	1.89
Vocational services	0.18	0.30	0.25
Professional services	0.31	0.35	0.24
Real estate services	0.69	1.11	1.11
Other miscellaneous services not elsewhere classified	0.07	0.19	0.30
<b>All groups</b>	100.00	100.00	100.00

(1) Figures may not add to totals due to rounding.

**Symbol:**

... not applicable

## Appendix table 2

**Consumers Price Index**  
*Expenditure weights*  
Group

Group	Base expenditure weight	
	June 2006 quarter	June 2008 quarter
	Percent <sup>(1)</sup>	
Food	17.38	17.83
Alcoholic beverages and tobacco	7.20	6.76
Clothing and footwear	4.75	4.48
Housing and household utilities	20.02	22.75
Household contents and services	5.49	5.26
Health	5.23	5.09
Transport	17.24	16.18
Communication	3.26	3.21
Recreation and culture	10.21	9.54
Education	2.08	1.78
Miscellaneous goods and services	7.13	7.12
<b>All groups</b>	100.00	100.00

(1) Percentages may not sum to totals due to rounding.

## Appendix table 3

**Consumers Price Index**  
*Population weights<sup>(1)</sup>*  
Region / pricing centre

Region / pricing centre	Base population weight	
	June 2006 quarter	June 2008 quarter
	Percent <sup>(2)</sup>	
<b>Auckland</b>	32.63	32.98
<b>Wellington</b>	11.23	11.13
<b>Rest of North Island</b>	32.19	32.04
Whangarei	3.63	3.64
Hamilton	9.39	9.43
Tauranga	4.42	4.45
Rotorua	1.94	1.88
Napier-Hastings	4.74	4.69
New Plymouth	2.56	2.54
Wanganui	1.59	1.56
Palmerston North	3.93	3.86
<b>Canterbury</b>	12.84	12.94
Christchurch	11.46	11.55
Timaru	1.38	1.39
<b>Rest of South Island</b>	11.11	10.92
Nelson	4.04	3.95
Dunedin	4.80	4.77
Invercargill	2.27	2.20
<b>Total</b>	100.00	100.00

(1) Based on the estimated usually resident population of the pricing centre's regional council area. Where there is more than one pricing centre within a region, the proportion of the regional council area allocated to each pricing centre was based on the population of the pricing centre's territorial authority. Regional council areas not containing a pricing centre were allocated to a neighbouring region.

(2) Percentages may not sum to totals due to rounding.

## Appendix table 4

**Consumers Price Index**  
*Source of expenditure weights*  
 Group

Group	Household Economic Survey (HES)		Total HES	Other Sources	Total
	Directly allocated <sup>(1)</sup>	Indirectly allocated <sup>(2)</sup>			
Percent <sup>(3)</sup>					
Food	46.4	28.9	75.3	24.7	100.0
Alcoholic beverages and tobacco	0.0	0.2	0.2	99.8	100.0
Clothing and footwear	0.7	0.4	1.1	98.9	100.0
Housing and household utilities	35.0	8.1	43.1	56.9	100.0
Household contents and services	58.5	38.2	96.7	3.3	100.0
Health	9.4	4.7	14.1	85.9	100.0
Transport	60.5	7.9	68.4	31.6	100.0
Communication	67.6	3.8	71.4	28.6	100.0
Recreation and culture	45.3	26.5	71.8	28.2	100.0
Education	6.9	7.7	14.6	85.4	100.0
Miscellaneous goods and services	31.5	16.0	47.5	52.5	100.0
<b>All groups</b>	38.2	14.5	52.8	47.2	100.0

(1) Household Economic Survey expenditure on goods and services directly included in the CPI basket.

(2) Household Economic Survey expenditure on goods and services not directly included in the CPI basket.

(3) Figures may not add to totals due to rounding.