

New Zealand 2006 and 2008 Consumers Price Index Reviews: Price Updating

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1. Introduction

The New Zealand Consumers Price Index (CPI) was reweighted in 2006 and again in 2008. The weights were based on expenditure information from the 2003/04 and 2006/07 Household Economic Surveys (HES) and other sources, price updated to the June 2006 and June 2008 quarters, respectively.

The effect of price updating was to express the underlying 2003/04 and 2006/07 quantities of the weight reference periods in the prices of the June 2006 quarter and June 2008 quarter price reference periods. However, volume adjustments were also made for some goods and services (such as audio-visual equipment), to reflect trend change in quantities subsequent to the weight reference periods but before implementation of the weights.

This paper describes the price-updating and volume-adjustment processes.

The paper also presents 10 analytical time series that have been constructed using 2003/04 and 2006/07 weights without price updating, with price updating but at different levels of the hierarchical CPI classification, and based solely on the HES. These analytical series have been compiled using Lowe, Young and geometric Young index formulas.

The time series now run for nearly three years, and this paper builds on one available as a room document at the previous Ottawa Group conference, in 2007.

2. Background

Typically, CPI expenditure weights are derived from household budget surveys, national accounts data or other sources. The weight reference period that these household consumption expenditures relate to is usually a year or longer and earlier than the CPI price reference period.

CPI compilers have the options of preserving the underlying quantities of the weight reference period by price updating the weight reference period expenditures to the price reference period, or of preserving the weight reference period expenditure shares.

The price updating (or Lowe index) approach is conceptually clear, as it measures the changing cost of the weight reference period basket. However, it holds weight reference period quantities fixed and assumes households do not substitute in response to changes in relative prices.

An approach that involved preserving the weight reference period expenditure shares and calculating a Young index would imply households substitute in response to changes in relative prices from the weight reference period to the price reference period, but that there is no substitution after the price reference period. Carsten Hansen (2006) suggested that this apparent inconsistency could be addressed by using a geometric mean upper-level index aggregation formula.

Whether preserving weight reference period quantities by price updating (and calculating a Lowe index) or preserving weight reference period expenditure shares (and compiling a Young index) is likely to be more representative overall of the consumption pattern at the price reference period is an open question. Use of a Lowe index could be justified strongly for some parts of the basket but much less so for others, and vice versa for a Young index.

The *Resolution Concerning Consumer Price Indices* (International Labour Organization, 2003) states that:

Where the weight reference period differs significantly from the price reference period, the weights should be price updated to take account of price changes between the weight reference period and the price reference period. Where it is likely that price updated weights are less representative of the consumption pattern in the price reference period this procedure may be omitted.

For the New Zealand CPI, weight reference period expenditures have historically been price updated to the price reference period. Price updating generally occurs at the lowest level of the expenditure classification, comprising about 700 goods and services in the basket. At the reweighting of the CPI in 2006, there was a longer gap between the weight reference period and the price reference period than usual. This resulted in careful consideration about whether to price update and, if so, at what level of the expenditure classification.

The longer than usual gap also meant that Statistics NZ had access to a range of information, such as retail transaction data, for periods after the weight reference period, prior to finalising and implementing the expenditure weights in the CPI. This presented an opportunity to consider whether there was a case for making volume adjustments to reflect significant trend change in quantities that had occurred after the weight reference period but before implementation of the weights.

The following section of the paper explains how the expenditure weights were calculated as part of the 2006 and 2008 CPI reviews.

3. Reweighting the basket

3.1 Background

The New Zealand CPI is reweighted approximately once every three years 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 well within the ILO recommendation of at least once every five years. The most recent reweights, in 2006 and 2008, were based on information from the 2003/04 HES, the 2006/07 HES, and a number of other sources.

The 2006 reweight was implemented one year later than usual. This is because decisions were made to delay both the 2003/04 HES and the 2003 CPI Revision Advisory Committee review by one year. The HES decision was subsequently reversed, but this decision was made too late to convene the CPI Revision Advisory Committee in 2003.

The 2006/07 HES, which ran from July 2006 to June 2007, was used to reweight the CPI in 2008 (with the publication of the September 2008 quarter CPI in October 2008). The 2006 CPI weights based on the 2003/04 HES were, therefore, used for only two years, rather than the usual three.

As noted above, the 2006 and 2008 reweights made use of information from the 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), 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.

HES data is 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 685 (2006 reweight) and 694 (2008 reweight) individual goods and services in the 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 changes. For example, oranges and mandarins are included in the basket but lemons are not. Expenditure on lemons (and other citrus fruits 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.

Table 1 shows the proportion of the 2006 expenditure weights contributed directly from the HES for the sample of goods and services included in the CPI basket (for example, oranges), the proportion that was

contributed by the HES for goods and services not directly included in the basket (for example, lemons), and the proportion of the weight estimated using sources other than the HES.

Table 1

Consumers Price Index
Source of 2006 expenditure weights
By group

Group	Household Economic Survey (HES)		Total HES	Other sources	Total
	Directly allocated ⁽¹⁾	Indirectly allocated ⁽²⁾			
Percent					
Food	48.6	32.1	80.7	19.3	100.0
Alcoholic beverages and tobacco	0.0	0.4	0.4	99.6	100.0
Clothing and footwear ⁽³⁾	59.7	40.3	100.0	0.0	100.0
Housing and household utilities	35.3	9.7	45.0	55.0	100.0
Household contents and services	60.8	38.6	99.4	0.6	100.0
Health	11.6	5.6	17.1	82.9	100.0
Transport	66.5	4.8	71.4	28.6	100.0
Communication	86.1	13.9	100.0	0.0	100.0
Recreation and culture	65.6	28.0	93.7	6.3	100.0
Education	52.2	15.1	67.3	32.7	100.0
Miscellaneous goods and services	36.3	18.1	54.4	45.6	100.0
All groups	47.3	18.3	65.5	34.5	100.0

(1) HES expenditure on goods and services directly included in the CPI basket.

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

(3) Although the HES is listed as being the source of clothing and footwear weights, HES expenditure is benchmarked to adjusted Retail Trade Survey figures. This benchmarking contributed about one-quarter of the weight for clothing and footwear.

Table 1 shows that 65.5 percent of the total 2006 expenditure weight was sourced from the HES, and the remainder was based on information from other sources. Of the HES-sourced weights, more than two-thirds 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.

Table 1 shows that HES was the main weighting source for communication (100 percent), household contents and services (99.4 percent), and recreation and culture (93.7 percent). While the table shows that HES was the only source of clothing and footwear weights, HES provided the relative shares of apparel goods and services in the basket, but use was made of adjusted Retail Trade Survey figures to benchmark clothing and footwear expenditure. Groups where other information sources were heavily relied on include alcoholic beverages and tobacco (the HES contributed just 0.4 percent), health (HES contributed 17.1 percent), and housing and household utilities (HES contributed 45.0 percent).

Table 2 shows that 52.8 percent of the total 2008 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.

Table 2

Consumers Price Index
Source of 2008 expenditure weights
 By group

Group	Household Economic Survey (HES)		Total HES	Other sources	Total
	Directly allocated ⁽¹⁾	Indirectly allocated ⁽²⁾			
Percent					
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 ⁽³⁾	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
All groups	38.2	14.5	52.8	47.2	100.0

(1) HES expenditure on goods and services directly included in the CPI basket.

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

(3) As HES expenditure on most clothing and footwear is benchmarked to adjusted Retail Trade Survey figures (contributing about one-quarter of the weight for clothing and footwear), the expenditure was recorded as being from other sources for the 2008 review.

Table 2 shows that 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, with benchmarking to adjusted Retail Trade Survey figures being formally recognised as an alternative source for the 2008 review), health (14.1 percent), education (14.6 percent), and housing and household utilities (43.1 percent). For the 2008 review, more use was made of alternative sources than in 2006 for education and communication, as the quality of HES estimates for these two groups appeared to deteriorate.

3.2 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 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 the scope of the CPI and needs to be excluded from the expenditure weights so that they will not be overstated 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 are asked to report expenditure information that closely matches the scope of the CPI. In practice, however, many providers are not able to disaggregate their data to the level required. Statistics NZ has to estimate what proportion of a particular expenditure is in scope of the CPI when making use of this information to derive expenditure weights.

Excluding out-of-scope expenditure for the 2006 and 2008 reviews 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 those shown in table 3.

Table 3

Consumers Price Index
Source of 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 store type	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)

3.3 Price updating expenditures

For the 2006 review, the weight reference period was the year to June 2004, which coincides with the 2003/04 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 2004 was used, where possible.

Expenditure information from the 2003/04 HES and other sources was price updated to the price reference period of the June 2006 quarter. The effect of price updating, which is common international practice and in line with recommendations for CPIs by the ILO, was to express the underlying 2003/04 quantities in the prices of the June 2006 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 \$64.691 billion for 2003/04. After price updating to the June 2006 quarter, the new CPI expenditure weights totalled \$69.586 billion, which is \$4.895 billion or 7.6 percent higher than the figure prior to price updating.

Petrol prices increased by about 53 percent from 2003/04 to the June 2006 quarter, resulting in the price updating of petrol adding \$1.294 billion (or 26 percent) of the overall \$4.895 million added by price updating.

Other goods and services with high price updating ratios included other vehicle fuels and lubricants, including diesel (prices in the June 2006 quarter were 83 percent higher than in 2003/04), purchase of housing (up 31 percent), domestic air transport (up 29 percent), gas (up 22 percent), real estate services (up 21 percent), dental services (up 21 percent), electricity (up 19 percent), property maintenance services (up 16 percent), and local authority rates and payments (up 13 percent). The price updating indicator that was used for purchase of housing was not the CPI index for purchase and construction of new dwellings. The reasons for this are given in table 4.

Goods and services for which price updating resulted in reduced expenditure included audio-visual equipment (prices in the June 2006 quarter were 39 percent lower than in 2003/04), small electrical household appliances (down 12 percent), purchase of second-hand motor cars (down 5 percent), international air transport (down 3 percent) and purchase of new motor cars (down 3 percent).

For goods and services showing price increases from 2003/04 to the June 2006 quarter, price updating added \$6.215 billion to the expenditure weight. This was partly offset by a reduction of \$1.320 billion for goods and services showing price decreases from 2003/04 to the June 2006 quarter.

For the 2008 review, the weight reference period was 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 was price updated to the price reference period of the June 2008 quarter. The effect of price updating was 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 many 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.

3.4 Volume adjustments

CPIs are generally calculated using a Lowe formula that measures the changing cost of acquiring, using or paying for a basket of goods and services. The underlying quantities of goods and services in the basket relate to some earlier period (prior to the price reference period) and are held fixed.

The underlying 2003/04 quantities were held fixed in the price index formula during the life of the index (from 2006 to 2008). These quantities were assumed to be broadly representative of household purchases during the two-year life of the index (although it is known that consumers would to some extent substitute towards goods and services showing lower relative price change during the period).

It was also known that there have been significant shifts in quantities for some goods and services since the weight reference period of 2003/04. As the 2006 reweight happened a year later than usual, the price reference period was a year further away from the weight reference period than usual, 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 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 to be used (from 2006 to 2008).

A similar, but slightly more conservative, approach was 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 2003/04 or 2006/07 expenditures prior to price updating, or incorporated into the indicators used to price update 2003/04 or 2006/07 expenditures.

Tables 4 and 5 list 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.

Table 4

Consumers Price Index
Expenditure-weight volume adjustments – 2006 review

Good or service	Reason for adjustment	Information source
Wine	To reflect growth in volumes	Alcohol available for consumption figures for 2003/04 and 2005/06
Spirits and liqueurs	To reflect growth in volumes, particularly for ready-to-drink spirits	Alcohol available for consumption figures for 2003/04 and 2005/06
Purchase of housing	To reflect increases in the size of new houses and increased costs as a result of the introduction of a more stringent building consents and inspection process	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 2003/04	Vehicle registration information for the year to March 2006
Purchase of motorcycles	To reflect big increases in registrations, influenced by petrol price increases	Vehicle registration information for the year to March 2006
Urban train fares	To reflect increased usage, particularly in Auckland	Passenger numbers
Internet charges	To reflect a strong 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 call 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 strong volume growth, particularly in player/recorders	Retail transaction data for 2003/04, 2004/05 and 2005/06 obtained from GfK
VCR/DVD combination players	To reflect volume growth in combination players and player/recorders	Retail transaction data for 2003/04, 2004/05 and 2005/06 obtained from GfK
Television sets	To reflect strong volume growth, particularly in flat-panel plasma and LCD display television sets	Retail transaction data for 2003/04, 2004/05 and 2005/06 obtained from GfK
Digital cameras	To reflect strong growth for digital cameras, partly offset by decreased volumes for analogue cameras	Retail transaction data for 2003/04, 2004/05 and 2005/06 obtained from GfK
Subscriber television	To reflect strong growth in subscribers	Subscriber numbers
Sunday newspapers	To reflect the emergence in 2005 of a new Sunday newspaper	Circulation figures

Table 5

Consumers Price Index
Expenditure-weight volume adjustments – 2008 review

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 a big increase 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 to the quality of handsets	Information on the number of connections and the prices of handsets
Cellphone call 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 made it possible to partially smooth the impact of cyclical highs or lows (housing) or unusual claims years (insurance). For the 2006 review, information for the three years to June 2004 was used. For the 2008 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.

4. Analytical series

At the 2006 review, Statistics NZ had a number of options relating to price updating and expenditure weight information sources. To help shed light on the impact of the choices that were made, Statistics NZ compiled a range of analytical time series. These analytical time series are based on 2003/04 weight reference period expenditures and 2006/07 weight reference period expenditures:

- without price updating or volume adjustments
- with price updating but at different levels of the hierarchical CPI classification
- based solely on the HES.

The analytical series have been compiled using Lowe, Young and geometric Young index formulas. All index series except the geometric Young index have been set up in the price index computer processing system and are being calculated on an ongoing basis. To date, the time series run from the June 2006 quarter to the March 2009 quarter.

As they grow in length, the time series will be used to inform decisions regarding price updating practice for future CPI reviews. The time series will also be used to help assess how much value is added through devoting a significant amount of resources to the estimation of expenditure weights using information sources other than the HES for nearly half of the basket.

Table 6 describes the analytical series and the official CPI.

Table 6

Consumers Price Index

Analytical price updating and alternative weighting options

Weight reference periods: 2003/04 and 2006/07; price reference periods: June 2006 and June 2008 quarters

Series	Source of Weights		Volume Adjustments	Price Updated	Reweighted Annually	Index Formula
	HES	Other				
Official	Yes	Yes	Yes	Yes (subitem)	No	Low
Analytical						
Series 1	Yes	Yes	No	Yes (subitem)	No	Low
Series 2	Yes	Yes	No	Yes (class)	No	Low
Series 3	Yes	Yes	No	Yes (subgroup)	No	Low
Series 4	Yes	Yes	No	Yes (group)	No	Low
Series 5	Yes	Yes	No	No	No	Young (arithmetic)
Series 5a	Yes	Yes	No	No	Yes	Young (arithmetic)
Series 6	Yes	Yes	No	No	No	Young (geometric)
Series 7	Yes	No	No	Yes (subitem)	No	Low
Series 8	Yes	No	No	No	No	Young (arithmetic)
Series 8a	Yes	No	No	No	Yes	Young (arithmetic)

The expenditure weights of the official series are based on the 2003/04 HES, the 2006/07 HES and a range of other sources, volume adjustments (outlined in section 3.4) were made to reflect trend change in quantities after the weight reference periods but before implementation, and weight reference period (that is, 2003/04 and 2006/07) expenditures were price updated to the price reference periods of the June 2006 quarter and the June 2008 quarter.

By comparison, the expenditure weights for analytical series 1 were compiled in the same way as the official series, except that no volume adjustments were made (either directly or via price updating).

The New Zealand Household Expenditure Classification (NZHEC) is loosely based on the United Nations Classification of Individual Consumption According to Purpose (COICOP). The NZHEC classification has seven levels.

Table 7

Consumers Price Index
New Zealand Household Expenditure Classification
Number of categories by level

Level	Level Name	Number of Categories	
		2006	2008
1	Group	11	11
2	Subgroup	44	45
3	Class	105	107
4	Section	176	179
5	Subsection	215	218
6	Item	487	492
7	Subitem	685	694

Expenditure weights – and index numbers – are published down to the class level. The expenditure weights were calculated – and assigned in the calculation system – at the subitem level of the classification. Price updating of expenditure weights for the official series and for analytical series 1 was generally at the subitem level of NZHEC.

At the 2006 review, consideration was given to price updating 2003/04 expenditures at an intermediate level of the classification. This would have resulted in 2003/04 expenditure shares being preserved below the intermediate level. For example, if indexes at the class level were used to price update 2003/04 expenditures, there would be an assumption that households respond to change in relative prices by substituting within classes to keep expenditure shares constant, but do not substitute between classes.

Analytical series 2, 3 and 4 were compiled in the same way as series 1, except that the indexes used to price update 2003/04 and 2006/07 expenditures were at the class, subgroup and group levels of NZHEC, respectively.

Series 1, 2, 3 and 4 are all being calculated using a Lowe formula. Series 5 was compiled using the same weighting sources as series 1 to 4 (that is, the HES and other sources) and no direct volume adjustments were made. However, series 5 was not price updated, resulting in 2003/04 expenditure shares and then 2006/07 expenditure shares being preserved and an arithmetic Young formula being used.

As noted in section 2, an approach that involved preserving the weight reference period expenditure shares and calculating a Young index would imply households substitute in response to changes in relative prices from the weight reference period to the price reference period, but that there is no substitution after the price reference period (an apparent inconsistency noted by Carsten Hansen (2006)). He suggested that this could be addressed by using a geometric mean upper-level index aggregation formula. Another approach would be to use an arithmetic Young formula, but to re-impose the weight reference period expenditure shares at regular intervals, such as annually. Series 5a is being compiled in the same way as series 5, except that the weight reference period expenditure shares are being re-imposed annually.

The expenditure weights for series 6 are the same as those for series 5 and 5a (as at the price reference periods). However, a geometric Young formula is being used to calculate series 6.

The 2003/04 expenditures for series 7 were compiled only from the HES (after editing and cleaning, but with no use of weighting information from other sources nor any adjustments for under-reporting). No volume

adjustments were made and 2003/04 expenditures were price updated (using subitem indexes), resulting in a Lowe formula being used.

Note: Net capital outlay (purchase and sale of property and related costs) was not collected in the 2006/07 HES, so the alternative sources used for the official CPI series for purchase of new housing and related costs were also used for series 7, from the September 2008 quarter onwards.

The expenditure weights for series 8 were compiled in the same way as those for series 7, except that the price-updating step was omitted. An arithmetic Young formula is being used to calculate series 8. Series 8a is compiled in the same way as series 8, except that the weight reference period expenditure shares are being re-imposed annually.

Table 8 shows the expenditure weights for the official CPI and for the analytical series, at the group level of NZHEC.

Comparing the official series with analytical series 1 (HES and other weighting sources, after price updating but without volume adjustments), shows that volume adjustments made as part of the 2006 review resulted in higher relative weights for recreation and culture; communication; and housing and household utilities in particular. The reasons for this are explained in relation to figures presented in table 9. In general, differences between the group-level expenditure shares of the official series and analytical series 1 were less pronounced for the 2008 review.

Table 8

Consumers Price Index
Group expenditure weights – percent of total

Group	Official Series	Analytical Series									
		1	2	3	4	5	5a	6	7	8	8a
June 2006 quarter											
Food	17.38	17.64	17.59	17.55	17.51	18.20	18.20	18.20	18.03	18.62	18.62
Alcoholic beverages and tobacco	7.20	7.10	7.08	7.08	7.06	7.12	7.12	7.12	4.13	4.16	4.16
Clothing and footwear	4.75	4.82	4.81	4.80	4.79	5.17	5.17	5.17	3.84	4.13	4.13
Housing and household utilities	20.02	19.81	19.72	19.66	19.88	18.85	18.85	18.85	23.84	22.54	22.54
Household contents and services	5.49	5.57	5.58	5.58	5.56	5.97	5.97	5.97	5.85	6.29	6.29
Health	5.23	5.31	5.34	5.32	5.33	5.08	5.08	5.08	3.08	3.04	3.04
Transport	17.24	17.48	17.44	17.42	17.35	16.37	16.37	16.37	16.62	15.48	15.48
Communication	3.26	3.01	3.00	2.99	2.99	3.23	3.23	3.23	3.20	3.44	3.44
Recreation and culture	10.21	9.90	9.94	10.05	10.15	10.77	10.77	10.77	10.22	11.17	11.17
Education	2.08	2.11	2.10	2.09	2.07	1.98	1.98	1.98	2.63	2.47	2.47
Miscellaneous goods and services	7.13	7.23	7.42	7.46	7.32	7.26	7.26	7.26	8.57	8.67	8.67
All groups	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
All groups – NZ\$(billion)	69.586	68.559	68.778	68.931	69.097	64.075	64.075	64.075	64.468	60.073	60.073
June 2008 quarter											
Food	17.83	17.95	17.88	17.87	17.84	17.35	17.35	17.35	19.14	18.56	18.56
Alcoholic beverages and tobacco	6.76	6.74	6.76	6.77	6.75	6.83	6.83	6.83	3.58	3.65	3.65
Clothing and footwear	4.48	4.50	4.49	4.49	4.49	4.71	4.71	4.71	3.93	4.14	4.14
Housing and household utilities	22.75	22.78	22.83	22.85	22.83	22.40	22.40	22.40	24.73	24.34	24.34
Household contents and services	5.26	5.28	5.30	5.31	5.30	5.57	5.57	5.57	5.69	6.04	6.04
Health	5.09	5.11	5.04	5.03	5.02	5.18	5.18	5.18	2.72	2.82	2.82
Transport	16.18	16.31	16.36	16.30	16.28	15.53	15.53	15.53	15.82	14.89	14.89
Communication	3.21	3.10	3.15	3.16	3.17	3.34	3.34	3.34	3.61	3.90	3.90
Recreation and culture	9.54	9.29	9.23	9.26	9.33	9.90	9.90	9.90	9.50	10.16	10.16
Education	1.78	1.79	1.79	1.79	1.81	1.92	1.92	1.92	1.50	1.58	1.58
Miscellaneous goods and services	7.12	7.15	7.16	7.18	7.17	7.26	7.26	7.26	9.79	9.93	9.93
All groups	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
All groups – NZ\$(billion)	80.982	80.627	80.551	80.472	80.587	76.670	76.670	76.670	72.530	68.605	68.605

Table 8 also shows that price updating at the class, subgroup and group levels (series 2, 3 and 4, respectively) had relatively little effect on the 2006 and 2008 relative weights at the group level. However, there is a more pronounced effect at lower levels within classes, subgroups and groups that have shown strong variations in price change. For example, the television sets index within the audio-visual equipment class has shown lower relative price change than other goods and services within its class, subgroup and group. This resulted in the 2006 relative weights of television sets in series 1, 2, 3 and 4 being 0.23, 0.28, 0.34 and 0.43 percent, respectively. Interestingly, the figure for series 4 (with price updating at the group level) is very similar to the official series figure of 0.42 percent, which includes a volume adjustment to reflect strong volume growth after the weight reference period. This pattern also held in 2008, with the relative weights of television sets in series 1, 2, 3 and 4 being 0.23, 0.26, 0.28 and 0.35 percent, respectively. The 2008 figure for series 4 (with price updating at the group level) is similar to the official series figure of 0.37 percent, which includes a volume adjustment to reflect strong volume growth after the weight reference period.

Comparing series 5, 5a and 6 (HES and other weighting sources, before price updating and without volume adjustments) with series 1, 2, 3 and 4 (HES and other weighting sources, after price updating at various levels but without volume adjustments), shows that price updating the expenditure weights from the 2003/04 weight reference period to the June 2006 quarter price reference period had a strong impact on the relative weights of some groups. Series 1 has significantly higher relative weights than series 5, 5a and 6 for housing and household utilities (mainly the result of relatively strong growth in new house prices, local authority rates and electricity prices) and transport (mainly due to petrol prices increasing by about 53 percent from 2003/04 to the June 2006 quarter). The 2006 series 1 weight for recreation and culture (9.90 percent) was lower than those for series 5, 5a and 6 (10.77 percent), reflecting a fall of 39 percent in audio-visual equipment prices from 2003/04 to the June 2006 quarter.

For both 2006 and 2008, series 5, 5a and 6 weights for recreation and culture are higher than those of the official series (10.21 percent in 2006 and 9.54 percent in 2008), with the volume adjustments for the official series being offset by price updating.

Series 7 (HES only, with price updating) has significantly lower weights than the official series for alcoholic beverages and tobacco (4.13 percent compared with 7.20 percent in 2006, and 3.58 percent compared with 6.76 percent in 2008), reflecting under-reporting in the HES. Series 7 also has lower relative weights for health, transport, and clothing and footwear. The reasons for these differences are explained in relation to figures presented in table 9.

Table 9 presents the expenditure weights in New Zealand dollars for selected analytical series and for the official series. Comparing series 8 (HES only, without price updating) with series 5 (HES and other weighting sources, without price updating) shows that the use of other weighting sources added a net NZ\$4.002 billion of expenditure (prior to price updating) for the 2006 review. For the 2008 review, the difference doubled to (NZ\$8.065 billion), with the gap widening for many groups. For housing and household utilities, net capital outlay was collected in the 2003/04 HES and the series 8 (HES-only) estimate for the group was higher than the series 5 (HES/other sources) estimate. Net capital outlay (purchase and sale of property and related costs) was not collected in the 2006/07 HES, so the alternative sources used for series 5 were also used for series 8.

At the group level, alternative weighting sources resulted in higher expenditure values for series 5 (compared with series 8) for alcoholic beverages and tobacco, health (mainly as a result of the inclusion of spending on claims made, on behalf of households, by health insurance companies to health service providers), transport (mainly due to alternative sources being used to estimate expenditure on new cars, domestic and international air transport; and the inclusion of spending on claims made, on behalf of households, by motor vehicle insurance companies to vehicle repairers), clothing and footwear, and food (mainly due to the inclusion of independent estimates of expenditure on soft drinks and confectionery).

Alternative weighting sources resulted in lower weights for miscellaneous goods and services (mainly due to alternative sources being used to estimate the value of insurance service charges). For education, alternative weighting sources resulted in a lower weight in 2006 (as independent sources indicated expenditure on tertiary education had been significantly over-estimated in the 2003/04 HES), and a higher weight in 2008 (as independent sources indicated expenditure on most forms of education had been significantly under-estimated in the 2006/07 HES).

Table 9

Consumers Price Index
Expenditure weights – dollar values

Group	Official Series	Analytical Series			
		Series 1	Series 5	Series 7	Series 8
NZ\$(billion)					
June 2006 quarter					
Food	12.094	12.094	11.660	11.622	11.187
Alcoholic beverages and tobacco	5.013	4.871	4.563	2.661	2.497
Clothing and footwear	3.305	3.305	3.311	2.476	2.480
Housing and household utilities	13.933	13.580	12.080	15.370	13.538
Household contents and services	3.822	3.822	3.828	3.771	3.778
Health	3.642	3.642	3.253	1.988	1.826
Transport	11.996	11.987	10.490	10.712	9.300
Communication	2.269	2.064	2.071	2.063	2.069
Recreation and culture	7.104	6.786	6.902	6.589	6.710
Education	1.448	1.448	1.266	1.695	1.482
Miscellaneous goods and services	4.959	4.959	4.650	5.523	5.207
All groups	69.586	68.559	64.075	64.468	60.073
June 2008 quarter					
Food	14.442	14.476	13.300	13.885	12.731
Alcoholic beverages and tobacco	5.478	5.431	5.240	2.594	2.505
Clothing and footwear	3.624	3.624	3.612	2.849	2.837
Housing and household utilities	18.421	18.364	17.177	17.935	16.696
Household contents and services	4.258	4.258	4.273	4.127	4.142
Health	4.118	4.118	3.971	1.971	1.936
Transport	13.104	13.154	11.906	11.472	10.214
Communication	2.600	2.502	2.558	2.618	2.678
Recreation and culture	7.729	7.491	7.593	6.889	6.970
Education	1.441	1.441	1.473	1.089	1.083
Miscellaneous goods and services	5.768	5.768	5.566	7.101	6.815
All groups	80.982	80.627	76.670	72.530	68.605

Comparing series 1 (HES and other weighting sources, after price updating but without volume adjustments) with series 5 (HES and other weighting sources, before price updating and without volume adjustments) shows that price updating the expenditure weights from the 2003/04 weight reference period to the June 2006 quarter price reference period added NZ\$4.484 billion of expenditure. About two-thirds of the added expenditure came from housing and household utilities (NZ\$1.499 billion higher, mainly the result of relatively strong growth from 2003/04 to the June 2006 quarter in new house prices, local authority rates and electricity prices) and transport (NZ\$1.497 billion higher, mainly due to petrol prices increasing by about 53 percent from 2003/04 to the June 2006 quarter).

Price updating the expenditure weights from the 2006/07 weight reference period to the June 2008 quarter price reference period added NZ\$3.957 billion of expenditure. Three groups contributed about NZ\$1.2 billion each: transport (due to higher petrol prices), housing and household utilities (mainly the result of higher new house prices and electricity prices), and food (as prices grew strongly from 2006/07 to the June 2008 quarter).

Comparing series 1 (HES and other weighting sources, after price updating but without volume adjustments) with the official series shows that volume adjustments added about NZ\$1.027 billion for the 2006 review (after price updating).¹ This came largely from housing and household utilities (NZ\$0.353 billion, to reflect increases in the size and quality of new houses), recreation and culture (NZ\$0.318 billion, to reflect strong volume growth of audio-visual equipment), and communication (NZ\$0.205 billion, to reflect growth in cellphone connections, handset quality and average revenue per user, and to reflect a strong shift from dial-up to broadband Internet connections).

For the 2008 review, volume adjustments added only about NZ\$0.355 billion (after price updating). This came largely from recreation and culture (NZ\$0.238 billion, to reflect strong volume growth of audio-visual equipment, and improvements in the quality of computers). There were partly offsetting downward contributions from transport (as a result of a downward adjustment to petrol volumes) and food (reflecting downward adjustments to cheese and butter volumes).

Table 10 shows the all groups index numbers for the June 2007, June 2008 and March 2009 quarters, on an index reference period of the June 2006 quarter (=1000), for the official series and for the 10 analytical series.

Table 10

Consumers Price Index
All groups – index numbers and differences
Base: June 2006 quarter (=1000)

Level	Official Series	Analytical Series									
		1	2	3	4	5	5a	6	7	8	8a
June 2007 quarter											
All groups	1019.60	1020.28	1020.69	1021.24	1020.43	1020.39	1020.39	1017.99	1020.49	1020.75	1020.75
Index points difference ⁽¹⁾	...	0.68	1.09	1.64	0.83	0.79	0.79	-1.61	0.89	1.15	1.15
June 2008 quarter											
All groups	1060.77	1062.59	1062.33	1060.49	1056.90	1055.98	1055.93	1048.28	1065.24	1058.32	1058.40
Index points difference ⁽¹⁾	...	1.81	1.55	-0.29	-3.88	-4.79	-4.84	-12.49	4.46	-2.45	-2.38
March 2009 quarter											
All groups	1074.75	1077.09	1077.65	1077.53	1073.90	1073.21	1073.16	1060.99	1079.25	1075.47	1075.54
Index points difference ⁽¹⁾	...	2.35	2.91	2.78	-0.85	-1.54	-1.59	-13.76	4.50	0.72	0.79

(1) Analytical series minus official series.

Symbol:

... not applicable

After a year, the June 2007 quarter index numbers for the nine analytical series calculated using Lowe or arithmetic Young formulas were higher than that for the official series, by between 0.68 and 1.64 index points. The smallest differences were for series 1 (which, compared with the official series, omits volumes adjustments) and series 5 (which omits both volumes adjustments and price updating).

Series 6 (which is calculated using the geometric Young formula and omits both volumes adjustments and price updating), was 1.61 index points lower than the official series at the June 2007 quarter (and 3.25 index points lower than series 3, which had weights price updated at the subgroup level).

After another year, the spread had widened, and in both directions. The June 2008 quarter index numbers for the nine analytical series calculated using Lowe or arithmetic Young formulas were between 4.84 index points

¹ When the 2006 expenditure weights were compiled, volume adjustments were actually made prior to price updating from 2003/04 to the June 2006 quarter.

lower and 4.46 index points higher than that for the official series. Four of the five series that were lower by at least 2 index points (5, 5a, 8 and 8a) all omit price updating and so have lower relative weights for petrol, which rose in price by 25.9 percent from the June 2007 quarter to the June 2008 quarter. By omitting price updating, these four series also have higher weights than the official series for audio-visual and computing equipment (which fell in price by 16.0 percent from the June 2007 quarter to the June 2008 quarter).

Series 6 (which is calculated using the geometric Young formula and omits both volumes adjustments and price updating – both explicitly, and implicitly beyond the price reference period), was 12.49 index points lower than the official series.

Updated expenditure weights implemented as part of the 2008 CPI review were implemented with the release of the September 2008 quarter, on a new price reference period of the June 2008 quarter. As at the March 2009 quarter (the latest available at the time of writing), index numbers for the nine analytical series calculated using Lowe or arithmetic Young formulas were between 1.59 index points lower and 4.50 index points higher than that for the official series. For each of series 4, 5, 5a, 8 and 8a, there was an upward shift in the difference of more than 3 index points (from between -4.84 and -2.38 index points at the June 2008 quarter, to between -0.85 and 0.79 index points at the March 2009 quarter). As noted above, all omit price updating and so have lower relative weights for petrol, which fell in price by 19.6 percent from the June 2008 quarter to the March 2009 quarter.

By the March 2009 quarter, the difference between series 6 and the official series had grown only slightly, with series 6 being 13.76 index points lower than the official series.

It is interesting to note that annually re-imposing the weight reference period expenditure shares in 2007 for series 5a and 8a, had very little impact at the overall level when compared with the otherwise identical series 5 and 8 (both calculated using the arithmetic Young formula), respectively. Differences are apparent at the group and subgroup level, however.

Following implementation of the 2006 CPI review, Statistics NZ published an information paper (Statistics New Zealand, 2007) that presented results of a retrospective superlative index calculated between the June 2002 quarter and the June 2006 quarter. After accounting for changes between 2002 and 2006 in the way that the housing-related expenditure weights were calculated, the analytical Fisher index rose by an average of 1.83 index points per year less than the Lowe index during the period from the June 2002 quarter to the June 2006 quarter.

This exercise was repeated following implementation of the 2008 CPI review (Statistics New Zealand, 2008), for the period from the June 2006 quarter and the June 2008 quarter. The analytical Fisher index rose by an average of 1.72 index points per year less than the Lowe index during this period.

Series 6 (which is calculated using the geometric Young formula and omits both volume adjustments and price updating), was 12.49 index points lower than the official series at the June 2008 quarter. By comparison, a retrospective analytical Fisher series calculated between the June 2006 quarter and the June 2008 quarter was 3.44 index points lower than the official series. The Paasche component of the retrospective analytical series was 6.87 index points lower than the official series. This difference is considerably smaller in magnitude than the 12.49 index points lower recorded for series 6, indicating that series 6 appeared to understate price change over the two-year period.

Tables 11, 12 and 13 give index numbers for the June 2007, June 2008 and March 2009 quarters at the group level, for the official series and for the 10 analytical series.

Table 11

Consumers Price Index
Groups – June 2007 quarter index numbers and differences
 Base: June 2006 quarter (=1000)

Group	Official Series	Analytical Series									
		1	2	3	4	5	5a	6	7	8	8a
Index number											
Food	1041	1041	1044	1044	1044	1044	1044	1039	1041	1045	1045
Alcoholic beverages and tobacco	1034	1034	1034	1034	1034	1034	1034	1034	1033	1033	1033
Clothing and footwear	1001	1001	1001	1001	1000	1000	1000	1000	1002	1001	1001
Housing and household utilities	1052	1052	1051	1051	1051	1050	1050	1050	1052	1051	1051
Household contents and services	1011	1011	1011	1011	1010	1010	1010	1010	1011	1010	1010
Health	1024	1024	1022	1021	1021	1021	1021	1018	1005	1002	1002
Transport	970	969	970	975	977	977	977	975	965	973	973
Communication	1002	1008	1008	1008	1003	1003	1003	1002	1008	1003	1003
Recreation and culture	999	1005	1004	1002	996	996	996	992	1005	997	997
Education	1032	1032	1031	1031	1031	1031	1031	1030	1032	1031	1031
Miscellaneous goods and services	1033	1033	1034	1033	1031	1031	1031	1030	1029	1027	1027
Index points difference⁽¹⁾											
Food	...	0	3	3	3	3	3	-2	0	4	4
Alcoholic beverages and tobacco	...	0	0	0	0	0	0	0	-1	-1	-1
Clothing and footwear	...	0	0	0	-1	-1	-1	-1	1	0	0
Housing and household utilities	...	0	-1	-1	-1	-2	-2	-2	0	-1	-1
Household contents and services	...	0	0	0	-1	-1	-1	-1	0	-1	-1
Health	...	0	-2	-3	-3	-3	-3	-6	-19	-22	-22
Transport	...	-1	0	5	7	7	7	5	-5	3	3
Communication	...	6	6	6	1	1	1	0	6	1	1
Recreation and culture	...	6	5	3	-3	-3	-3	-7	6	-2	-2
Education	...	0	-1	-1	-1	-1	-1	-2	0	-1	-1
Miscellaneous goods and services	...	0	1	0	-2	-2	-2	-3	-4	-6	-6

(1) Analytical series minus official series. Calculated from index numbers rounded to the nearest index point.

Symbol:

... not applicable

Table 12

Consumers Price Index
Groups – June 2008 quarter index numbers and differences
 Base: June 2006 quarter (=1000)

Group	Official Series	Analytical Series									
		1	2	3	4	5	5a	6	7	8	8a
Index number											
Food	1113	1113	1116	1116	1116	1116	1121	1109	1113	1116	1120
Alcoholic beverages and tobacco	1065	1065	1064	1065	1064	1064	1064	1064	1063	1062	1062
Clothing and footwear	997	997	996	996	996	996	996	995	998	997	996
Housing and household utilities	1105	1105	1105	1104	1103	1103	1102	1102	1106	1104	1103
Household contents and services	1004	1004	1004	1002	1002	1002	1002	1001	1005	1002	1002
Health	1010	1010	1006	1005	1004	1003	993	971	958	949	936
Transport	1063	1063	1061	1056	1048	1047	1052	1043	1069	1052	1058
Communication	998	1009	1007	1007	999	999	997	994	1009	999	997
Recreation and culture	995	1008	1006	1001	989	989	982	973	1008	989	983
Education	1013	1013	1015	1015	1013	1013	1011	993	1021	1021	1019
Miscellaneous goods and services	1059	1059	1059	1058	1055	1055	1054	1053	1060	1058	1057
Index points difference⁽¹⁾											
Food	...	0	3	3	3	3	8	-4	0	3	7
Alcoholic beverages and tobacco	...	0	-1	0	-1	-1	-1	-1	-2	-3	-3
Clothing and footwear	...	0	-1	-1	-1	-1	-1	-2	1	0	-1
Housing and household utilities	...	0	0	-1	-2	-2	-3	-3	1	-1	-2
Household contents and services	...	0	0	-2	-2	-2	-2	-3	1	-2	-2
Health	...	0	-4	-5	-6	-7	-17	-39	-52	-61	-74
Transport	...	0	-2	-7	-15	-16	-11	-20	6	-11	-5
Communication	...	11	9	9	1	1	-1	-4	11	1	-1
Recreation and culture	...	13	11	6	-6	-6	-13	-22	13	-6	-12
Education	...	0	2	2	0	0	-2	-20	8	8	6
Miscellaneous goods and services	...	0	0	-1	-4	-4	-5	-6	1	-1	-2

(1) Analytical series minus official series. Calculated from index numbers rounded to the nearest index point.

Symbol:

... not applicable

Table 13

Consumers Price Index
Groups – March 2009 quarter index numbers and differences
 Base: June 2006 quarter (=1000)

Group	Official Series	Analytical Series									
		1	2	3	4	5	5a	6	7	8	8a
Index number											
Food	1185	1185	1193	1194	1195	1195	1199	1179	1184	1194	1198
Alcoholic beverages and tobacco	1103	1103	1101	1102	1101	1101	1101	1101	1098	1097	1097
Clothing and footwear	998	998	997	997	996	996	996	995	999	998	997
Housing and household utilities	1131	1131	1130	1130	1128	1128	1128	1127	1131	1129	1129
Household contents and services	1019	1019	1019	1017	1017	1017	1017	1015	1019	1017	1017
Health	1038	1038	1033	1032	1030	1029	1020	997	985	975	962
Transport	987	986	986	991	987	987	991	974	975	976	980
Communication	982	997	995	995	985	985	983	979	998	986	984
Recreation and culture	1012	1031	1029	1023	1003	1003	997	983	1036	1009	1003
Education	1058	1058	1059	1059	1056	1056	1054	1035	1065	1064	1062
Miscellaneous goods and services	1081	1081	1081	1079	1077	1077	1076	1073	1096	1092	1092
Index points difference⁽¹⁾											
Food	...	0	8	9	10	10	14	-6	-1	9	13
Alcoholic beverages and tobacco	...	0	-2	-1	-2	-2	-2	-2	-5	-6	-6
Clothing and footwear	...	0	-1	-1	-2	-2	-2	-3	1	0	-1
Housing and household utilities	...	0	-1	-1	-3	-3	-3	-4	0	-2	-2
Household contents and services	...	0	0	-2	-2	-2	-2	-4	0	-2	-2
Health	...	0	-5	-6	-8	-9	-18	-41	-53	-63	-76
Transport	...	-1	-1	4	0	0	4	-13	-12	-11	-7
Communication	...	15	13	13	3	3	1	-3	16	4	2
Recreation and culture	...	19	17	11	-9	-9	-15	-29	24	-3	-9
Education	...	0	1	1	-2	-2	-4	-23	7	6	4
Miscellaneous goods and services	...	0	0	-2	-4	-4	-5	-8	15	11	11

(1) Analytical series minus official series. Calculated from index numbers rounded to the nearest index point.

Symbol:

... not applicable

There were moderate differences at the June 2007 quarter for food. Unusually high June 2006 quarter prices for some fresh vegetable items in the basket resulted in high price updating ratios from the weight reference period to the price reference period, giving higher relative weights to subsequent falls for the official series, series 1 and series 7.

Looking at the health group, series 7, 8 and 8a were 19, 22 and 22 index points, respectively, lower than the official series at the June 2007 quarter. This is due to a combination of:

- significantly higher relative official series weights for out-patient services and for hospital services, which were independently estimated for the official series and included spending on claims made, on behalf of households, by health insurance companies directly to health service providers
- high price change for out-patient services and for hospital services, relative to the other subgroup within health (that is, medical appliances, products and equipment).

A year later, at the June 2008 quarter, series 7, 8 and 8a were 52, 61 and 74 index points, respectively, lower than the official series. This was also due to the above combination of factors, but with even higher price change for out-patient services and for hospital services, relative to medical appliances, products and equipment.

Petrol prices fell 8.4 percent from the June 2006 quarter to the June 2007 quarter, resulting in transport series that omitted price updating (that is, series 5, 5a, 6, 8 and 8a) or where price updating was at much higher levels in the structure (series 3 and 4), tracking several index points higher than the official series at the June 2007 quarter. The pattern reversed the following year, with petrol prices rising 25.9 percent from the June 2007 quarter to the June 2008 quarter, resulting in transport series that omitted price updating (series 5, 5a, 6, 8 and 8a) or where price updating was at much higher levels in the structure (series 3 and 4), tracking between 5 and 20 index points lower than the official series at the June 2008 quarter.

Strong price falls for telecommunication equipment during the price updating period and from the June 2006 quarter to the June 2007 quarter resulted in the analytical series that omitted price updating (series 5, 5a, 6, 8 and 8a), that were price updated at the group level (series 4) or that had volume adjustments (official series) being several index points lower at the June 2007 quarter than those series that were price updated at low levels (without volume adjustments). This pattern was also evident at the June 2008 quarter and the March 2009 quarter.

As might be expected of the group that includes audio-visual and computing equipment, there were differences for recreation and culture. Series that omitted price updating (series 5, 5a, 6, 8 and 8a) or were price updated at the group level (series 4) tracked lower than the official series (despite volume adjustments). By comparison, series 1, 2, 3 and 7 (which were price updated at lower levels of NZHEC, without volume adjustment) were higher than the official series at the June 2007, June 2008 and March 2009 quarters.

Expenditure weights and index numbers for the official CPI and for the 10 analytical series at the subgroup level of NZHEC are included in tables 14 to 18 of the appendix. Two points of interest follow.

It was noted above that unusually high June 2006 quarter prices for some fresh vegetable items in the basket resulted in high price updating ratios from the weight reference period to the price reference period, giving higher relative weights to subsequent falls for series that were price updated at the subitem level (that is, the official series, series 1 and series 7). For each of these three series, a June 2007 quarter index number of 1093 was recorded for the fruit and vegetables subgroup. This was between 20 and 22 index points lower than for the remaining series calculated using Lowe or arithmetic Young formulas. However, the figure for series 6 of 1092 (calculated using the geometric Young formula) was within an index point of the figure for the official series.

At the June 2008 quarter, the fruit and vegetables subgroup for the official series, series 1 and series 7 each recorded an index number of 1137. This was between 23 and 38 index points lower than for the remaining series calculated using Lowe or arithmetic Young formulas, but equal to the figure for series 6 (calculated using the geometric Young formula). By the March 2009 quarter, the remaining series calculated using Lowe or arithmetic Young formulas were between 53 and 79 index points higher than the official series, series 1 and series 7, but series 6 had fallen to 15 index points lower.

For the audio-visual and computing equipment subgroup, the June 2007 quarter index number for the official series (which included volume adjustments and price updating) of 875 was between 5 and 19 index points lower than the analytical series calculated using Lowe or arithmetic Young formulas. However, the figure for series 6 (calculated using a geometric Young formula) matched that of the official series. By the March 2009 quarter, series 6 was 11 index points lower than the official series, and series 5a was only one index point higher.

5. Conclusion

Statistics NZ has compiled a range of analytical time series to help shed light on the impact of the choices made concerning price updating and expenditure weight information sources.

These analytical series have been compiled using Lowe, Young and geometric Young index formulas. All indexes except the geometric Young index have been set up in the price index computer system and are being calculated on an ongoing basis.

To date, the time series run for nearly three years, and the empirical story they tell is still evolving, limiting the extent to which firm conclusions could be drawn.

As the time series grow further in length, they will be used to help inform decisions regarding price updating practice for future CPI reviews. The time series will also be used to help assess how much value is added through devoting a significant amount of resources to the estimation of expenditure weights using information sources other than the HES for nearly half of the basket.

At the June 2007 quarter, index numbers for the nine all groups analytical series calculated using Lowe or arithmetic Young formulas were higher than that for the official series, by between 0.68 and 1.64 index points. A year later, at the June 2008 quarter, differences had widened to between 4.84 index points lower and 4.46 index points higher, with much of the dispersion arising from the differing impact of a 25.9 percent increase in petrol prices from the June 2007 quarter to the June 2008 quarter. By the March 2009 quarter, differences had narrowed to between 0.85 index points lower and 4.50 index points higher, influenced by a 19.6 percent fall in petrol prices from the June 2008 quarter to the March 2009 quarter.

Series 6 (which is calculated using the geometric Young formula and omits both volume adjustments and price updating), was 1.61, 12.49 and 13.76 index points lower than the official series at the June 2007, June 2008 and March 2009 quarters, respectively. By comparison, a retrospective analytical Fisher series calculated between the June 2006 quarter and the June 2008 quarter rose by 3.44 index points less than the official series. The Paasche component of the retrospective analytical series was 6.87 index points lower than the official series. This difference is considerably smaller in magnitude than the 12.49 index points lower recorded for series 6, indicating that series 6 appeared to understate price change over the two-year period.

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Appendix

Table 14

Consumers Price Index Subgroup expenditure weights – percent of total June 2006 quarter

Subgroup	Official Series	Analytical Series									
		1	2	3	4	5	5a	6	7	8	8a
Fruit and vegetables	2.20	2.24	2.27	2.26	2.28	2.37	2.37	2.37	2.31	2.45	2.45
Meat, poultry and fish	2.82	2.86	2.87	2.87	2.86	2.97	2.97	2.97	2.99	3.11	3.11
Grocery food	6.70	6.80	6.77	6.76	6.83	7.10	7.10	7.10	6.52	6.82	6.82
Non-alcoholic beverages	1.62	1.65	1.65	1.65	1.62	1.69	1.69	1.69	1.23	1.28	1.28
Restaurant meals and ready-to-eat food	4.03	4.09	4.02	4.01	3.92	4.07	4.07	4.07	4.97	4.95	4.95
Alcoholic beverages	4.97	4.84	4.82	4.83	4.84	4.89	4.89	4.89	2.78	2.82	2.82
Cigarettes and tobacco	2.23	2.27	2.26	2.25	2.21	2.24	2.24	2.24	1.35	1.34	1.34
Clothing	3.95	4.01	4.00	4.00	3.95	4.26	4.26	4.26	3.16	3.36	3.36
Footwear	0.80	0.81	0.80	0.80	0.84	0.91	0.91	0.91	0.68	0.77	0.77
Actual rentals for housing	6.87	6.97	6.95	6.93	7.38	7.02	7.02	7.02	7.67	7.75	7.75
Home ownership	4.66	4.21	4.20	4.19	4.06	3.86	3.86	3.86	7.07	6.35	6.35
Property maintenance	2.24	2.27	2.24	2.21	2.30	2.14	2.14	2.14	2.35	2.22	2.22
Property rates and related services	2.44	2.48	2.47	2.47	2.47	2.35	2.35	2.35	2.63	2.51	2.51
Household energy	3.82	3.88	3.86	3.85	3.66	3.48	3.48	3.48	4.12	3.71	3.71
Furniture, furnishings and floor coverings	2.07	2.10	2.11	2.10	2.08	2.24	2.24	2.24	2.19	2.33	2.33
Household textiles	0.53	0.54	0.53	0.53	0.55	0.59	0.59	0.59	0.57	0.63	0.63
Household appliances	1.16	1.18	1.17	1.19	1.19	1.28	1.28	1.28	1.22	1.34	1.34
Glassware, tableware and household utensils	0.35	0.36	0.36	0.35	0.36	0.39	0.39	0.39	0.38	0.42	0.42
Tools and equipment for house and garden	0.45	0.46	0.47	0.47	0.47	0.50	0.50	0.50	0.48	0.52	0.52
Other household supplies and services	0.93	0.94	0.94	0.93	0.92	0.98	0.98	0.98	1.01	1.06	1.06
Medical products, appliances and equipment	1.13	1.15	1.17	1.18	1.20	1.17	1.17	1.17	1.08	1.10	1.10
Out-patient services	3.42	3.47	3.48	3.46	3.45	3.27	3.27	3.27	1.73	1.68	1.68
Hospital services	0.68	0.69	0.69	0.68	0.68	0.64	0.64	0.64	0.27	0.26	0.26
Purchase of vehicles	5.24	5.32	5.30	5.31	6.29	5.96	5.96	5.96	5.06	5.69	5.69
Private transport supplies and services	9.27	9.41	9.35	9.36	8.11	7.64	7.64	7.64	9.44	7.59	7.59
Passenger transport services	2.73	2.76	2.79	2.74	2.95	2.78	2.78	2.78	2.12	2.20	2.20
Postal services	0.16	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.17	0.17	0.17
Telecommunication equipment	0.15	0.07	0.07	0.07	0.13	0.15	0.15	0.15	0.08	0.15	0.15
Telecommunication services	2.96	2.78	2.77	2.76	2.70	2.93	2.93	2.93	2.95	3.12	3.12
Audio-visual and computing equipment	1.83	1.52	1.52	1.60	2.00	2.12	2.12	2.12	1.57	2.20	2.20
Major recreational and cultural equipment	0.42	0.43	0.43	0.43	0.42	0.45	0.45	0.45	0.44	0.46	0.46
Other recreational equipment and supplies	2.01	2.04	2.05	2.06	2.14	2.27	2.27	2.27	2.14	2.39	2.39
Recreational and cultural services	2.88	2.81	2.79	2.79	2.62	2.79	2.79	2.79	2.98	2.96	2.96
Newspapers, books and stationery	1.58	1.59	1.59	1.63	1.52	1.61	1.61	1.61	1.48	1.51	1.51
Accommodation services	0.66	0.67	0.66	0.66	0.62	0.65	0.65	0.65	0.71	0.70	0.70
Package holidays	0.84	0.85	0.89	0.89	0.83	0.88	0.88	0.88	0.90	0.94	0.94
Early childhood education	0.35	0.35	0.35	0.35	0.35	0.33	0.33	0.33	0.37	0.35	0.35
Primary and secondary education	0.70	0.71	0.71	0.71	0.67	0.64	0.64	0.64	0.75	0.68	0.68
Tertiary and other post school education	1.03	1.05	1.04	1.04	1.05	1.00	1.00	1.00	1.51	1.44	1.44
Personal care	2.14	2.17	2.18	2.17	2.27	2.25	2.25	2.25	2.28	2.37	2.37
Personal effects	0.58	0.59	0.60	0.60	0.63	0.62	0.62	0.62	0.62	0.65	0.65
Insurance	1.70	1.72	1.73	1.77	1.82	1.81	1.81	1.81	3.22	3.28	3.28
Credit services	0.76	0.77	0.76	0.76	0.78	0.77	0.77	0.77	0.78	0.79	0.79
Other miscellaneous services	1.95	1.98	2.15	2.16	1.83	1.81	1.81	1.81	1.66	1.58	1.58
All groups	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 15

Consumers Price Index
Subgroup expenditure weights – percent of total
 June 2008 quarter

Subgroup	Official Series	Analytical Series									
		1	2	3	4	5	5a	6	7	8	8a
Fruit and vegetables	2.41	2.42	2.31	2.30	2.42	2.35	2.35	2.35	2.68	2.62	2.62
Meat, poultry and fish	2.98	2.99	2.98	2.98	3.02	2.94	2.94	2.94	3.27	3.23	3.23
Grocery food	6.88	6.96	6.98	6.97	6.73	6.54	6.54	6.54	7.23	6.79	6.79
Non-alcoholic beverages	1.82	1.83	1.83	1.84	1.86	1.81	1.81	1.81	1.19	1.18	1.18
Restaurant meals and ready-to-eat food	3.75	3.76	3.78	3.78	3.82	3.71	3.71	3.71	4.78	4.74	4.74
Alcoholic beverages	4.62	4.58	4.60	4.61	4.63	4.68	4.68	4.68	2.49	2.56	2.56
Cigarettes and tobacco	2.15	2.16	2.16	2.16	2.13	2.15	2.15	2.15	1.09	1.09	1.09
Clothing	3.67	3.68	3.68	3.68	3.66	3.85	3.85	3.85	3.28	3.44	3.44
Footwear	0.81	0.81	0.81	0.81	0.82	0.87	0.87	0.87	0.65	0.70	0.70
Actual rentals for housing	7.85	7.89	7.90	7.91	8.09	7.96	7.96	7.96	8.10	8.20	8.20
Home ownership	5.51	5.46	5.46	5.47	5.43	5.34	5.34	5.34	6.13	5.96	5.96
Property maintenance	2.64	2.66	2.66	2.66	2.65	2.59	2.59	2.59	2.88	2.82	2.82
Property rates and related services	2.68	2.69	2.71	2.72	2.69	2.63	2.63	2.63	3.08	3.01	3.01
Household energy	4.06	4.08	4.09	4.10	3.96	3.89	3.89	3.89	4.54	4.35	4.35
Furniture, furnishings and floor coverings	1.94	1.94	1.94	1.94	1.96	2.07	2.07	2.07	2.10	2.25	2.25
Household textiles	0.44	0.44	0.44	0.44	0.44	0.46	0.46	0.46	0.49	0.51	0.51
Household appliances	1.17	1.17	1.18	1.19	1.18	1.24	1.24	1.24	1.20	1.28	1.28
Glassware, tableware and household utensils	0.30	0.30	0.30	0.30	0.30	0.32	0.32	0.32	0.33	0.35	0.35
Tools and equipment for house and garden	0.53	0.53	0.53	0.53	0.52	0.55	0.55	0.55	0.58	0.61	0.61
Other household supplies and services	0.89	0.89	0.91	0.90	0.89	0.93	0.93	0.93	0.99	1.04	1.04
Medical products, appliances and equipment	0.98	0.99	0.92	0.91	1.02	1.06	1.06	1.06	0.84	0.93	0.93
Out-patient services	3.32	3.34	3.34	3.34	3.26	3.35	3.35	3.35	1.45	1.48	1.48
Hospital services	0.78	0.78	0.78	0.78	0.74	0.77	0.77	0.77	0.42	0.41	0.41
Purchase of vehicles	4.02	4.04	4.04	4.05	4.51	4.31	4.31	4.31	3.92	4.22	4.22
Private transport supplies and services	9.24	9.35	9.37	9.31	8.57	8.17	8.17	8.17	9.61	8.35	8.35
Passenger transport services	2.92	2.93	2.95	2.94	3.20	3.05	3.05	3.05	2.29	2.32	2.32
Postal services	0.17	0.17	0.17	0.17	0.15	0.16	0.16	0.16	0.19	0.18	0.18
Telecommunication equipment	0.20	0.14	0.14	0.14	0.20	0.21	0.21	0.21	0.15	0.23	0.23
Telecommunication services	2.84	2.80	2.84	2.84	2.82	2.96	2.96	2.96	3.27	3.48	3.48
Audio-visual and computing equipment	1.82	1.54	1.52	1.54	1.93	2.05	2.05	2.05	1.34	1.84	1.84
Major recreational and cultural equipment	0.37	0.38	0.38	0.38	0.36	0.38	0.38	0.38	0.39	0.40	0.40
Other recreational equipment and supplies	2.04	2.05	2.01	2.02	1.99	2.12	2.12	2.12	2.19	2.28	2.28
Recreational and cultural services	2.38	2.39	2.39	2.39	2.29	2.43	2.43	2.43	2.79	2.85	2.85
Newspapers, books and stationery	1.35	1.36	1.35	1.35	1.26	1.34	1.34	1.34	1.26	1.26	1.26
Accommodation services	0.65	0.66	0.66	0.66	0.63	0.66	0.66	0.66	0.46	0.47	0.47
Package holidays	0.92	0.93	0.92	0.92	0.87	0.92	0.92	0.92	1.06	1.06	1.06
Early childhood education	0.25	0.25	0.25	0.25	0.38	0.40	0.40	0.40	0.15	0.24	0.24
Primary and secondary education	0.66	0.66	0.66	0.66	0.60	0.64	0.64	0.64	0.42	0.40	0.40
Tertiary and other post school education	0.83	0.84	0.84	0.84	0.80	0.85	0.85	0.85	0.89	0.89	0.89
Other education	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.04
Personal care	2.32	2.33	2.33	2.34	2.37	2.40	2.40	2.40	2.54	2.62	2.62
Personal effects	0.47	0.47	0.47	0.46	0.45	0.46	0.46	0.46	0.51	0.49	0.49
Insurance	1.82	1.83	1.83	1.84	1.85	1.87	1.87	1.87	4.20	4.25	4.25
Credit services	0.62	0.62	0.62	0.62	0.64	0.65	0.65	0.65	0.69	0.73	0.73
Other miscellaneous services	1.89	1.90	1.91	1.91	1.86	1.88	1.88	1.88	1.85	1.84	1.84
All groups	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 16

Consumers Price Index
Subgroups – June 2007 quarter index numbers
 Base: June 2006 quarter (=1000)

Subgroup	Official Series	Analytical Series									
		1	2	3	4	5	5a	6	7	8	8a
Fruit and vegetables	1093	1093	1113	1115	1115	1115	1115	1092	1093	1115	1115
Meat, poultry and fish	1090	1090	1094	1094	1094	1094	1094	1089	1090	1094	1094
Grocery food	1006	1006	1005	1006	1006	1006	1006	1004	1004	1004	1004
Non-alcoholic beverages	1034	1034	1034	1034	1034	1034	1034	1034	1036	1036	1036
Restaurant meals and ready-to-eat food	1038	1038	1038	1038	1038	1038	1038	1038	1038	1038	1038
Alcoholic beverages	1031	1031	1030	1030	1030	1030	1030	1030	1030	1029	1029
Cigarettes and tobacco	1041	1041	1041	1041	1041	1041	1041	1041	1041	1041	1041
Clothing	1004	1004	1004	1004	1004	1004	1004	1004	1005	1005	1005
Footwear	982	982	981	981	981	981	981	981	983	982	982
Actual rentals for housing	1026	1026	1026	1026	1026	1026	1026	1026	1026	1026	1026
Home ownership	1061	1061	1061	1061	1061	1061	1061	1061	1061	1061	1061
Property maintenance	1051	1051	1050	1049	1049	1049	1049	1049	1051	1049	1049
Property rates and related services	1079	1079	1079	1079	1079	1079	1079	1079	1079	1079	1079
Household energy	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070
Furniture, furnishings and floor coverings	1022	1022	1022	1022	1022	1022	1022	1021	1022	1022	1022
Household textiles	978	978	978	978	978	978	978	977	978	978	978
Household appliances	1003	1003	1003	1001	1001	1001	1001	1000	1003	1001	1001
Glassware, tableware and household utensils	991	991	991	991	991	991	991	991	991	991	991
Tools and equipment for house and garden	1018	1018	1017	1017	1017	1017	1017	1016	1017	1017	1017
Other household supplies and services	1021	1021	1022	1021	1021	1021	1021	1020	1021	1020	1020
Medical products, appliances and equipment	988	988	987	987	987	987	987	985	984	983	983
Out-patient services	1027	1027	1025	1024	1024	1024	1024	1021	1008	1005	1005
Hospital services	1067	1067	1067	1067	1067	1067	1067	1067	1064	1064	1064
Purchase of vehicles	982	981	981	981	981	981	981	981	982	982	982
Private transport supplies and services	950	950	950	960	960	960	960	957	944	954	954
Passenger transport services	1015	1014	1013	1013	1013	1013	1013	1010	1019	1016	1016
Postal services	1028	1028	1028	1028	1028	1028	1028	1027	1028	1028	1028
Telecommunication equipment	803	829	814	814	813	813	813	812	829	813	813
Telecommunication services	1011	1012	1011	1011	1011	1011	1011	1011	1012	1011	1011
Audio-visual and computing equipment	875	891	888	881	880	880	880	875	894	885	885
Major recreational and cultural equipment	1025	1025	1023	1023	1024	1024	1024	1023	1025	1023	1023
Other recreational equipment and supplies	1009	1009	1008	1007	1007	1007	1007	1006	1009	1007	1007
Recreational and cultural services	1019	1020	1019	1019	1019	1019	1019	1018	1020	1019	1019
Newspapers, books and stationery	1057	1057	1057	1058	1058	1058	1058	1056	1058	1059	1059
Accommodation services	1039	1039	1038	1038	1038	1038	1038	1038	1039	1038	1038
Package holidays	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018
Early childhood education	995	995	995	995	995	995	995	995	995	995	995
Primary and secondary education	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072
Tertiary and other post school education	1017	1017	1016	1016	1016	1016	1016	1016	1021	1021	1021
Personal care	1014	1014	1014	1013	1013	1013	1013	1012	1014	1013	1013
Personal effects	1071	1071	1067	1065	1065	1065	1065	1062	1071	1065	1065
Insurance	1012	1012	1012	1012	1012	1012	1012	1011	1016	1016	1016
Credit services	982	982	982	982	982	982	982	982	981	981	981
Other miscellaneous services	1082	1082	1083	1081	1081	1081	1081	1081	1080	1080	1080

Table 17

Consumers Price Index
Subgroups – June 2008 quarter index numbers
 Base: June 2006 quarter (=1000)

Subgroup	Official Series	Analytical Series									
		1	2	3	4	5	5a	6	7	8	8a
Fruit and vegetables	1137	1137	1160	1160	1161	1161	1175	1137	1137	1160	1175
Meat, poultry and fish	1122	1122	1127	1126	1126	1126	1124	1118	1122	1126	1124
Grocery food	1121	1121	1120	1120	1120	1120	1123	1113	1121	1119	1122
Non-alcoholic beverages	1082	1082	1081	1082	1082	1082	1082	1080	1082	1082	1082
Restaurant meals and ready-to-eat food	1093	1093	1093	1092	1092	1092	1092	1092	1092	1092	1091
Alcoholic beverages	1060	1059	1058	1058	1058	1058	1058	1057	1056	1054	1054
Cigarettes and tobacco	1078	1078	1078	1078	1078	1078	1078	1078	1079	1079	1079
Clothing	1003	1003	1003	1002	1002	1002	1002	1001	1004	1003	1003
Footwear	966	966	966	966	966	965	965	964	969	968	967
Actual rentals for housing	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058	1058
Home ownership	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116	1116
Property maintenance	1105	1105	1104	1103	1103	1103	1103	1102	1104	1103	1102
Property rates and related services	1155	1155	1155	1153	1153	1153	1153	1152	1155	1153	1153
Household energy	1146	1146	1146	1145	1145	1145	1145	1144	1146	1145	1145
Furniture, furnishings and floor coverings	997	997	997	996	996	996	995	995	997	996	995
Household textiles	995	995	994	994	994	994	994	993	995	994	994
Household appliances	1004	1004	1004	1001	1001	1001	1000	998	1004	1001	1000
Glassware, tableware and household utensils	978	978	977	977	977	977	977	976	978	977	977
Tools and equipment for house and garden	1020	1020	1019	1019	1019	1019	1019	1018	1016	1015	1015
Other household supplies and services	1029	1029	1027	1026	1026	1026	1027	1023	1032	1028	1029
Medical products, appliances and equipment	888	888	881	883	882	881	865	810	863	855	838
Out-patient services	1028	1028	1024	1022	1022	1022	1015	1007	991	985	974
Hospital services	1124	1124	1124	1124	1124	1124	1124	1124	1122	1122	1122
Purchase of vehicles	969	968	968	968	968	969	969	968	971	971	971
Private transport supplies and services	1122	1122	1120	1109	1109	1109	1116	1106	1126	1113	1120
Passenger transport services	1043	1043	1042	1047	1047	1047	1048	1043	1052	1055	1056
Postal services	1112	1112	1114	1114	1114	1114	1114	1110	1112	1114	1114
Telecommunication equipment	634	708	664	664	663	663	657	649	708	663	657
Telecommunication services	1010	1011	1010	1010	1010	1010	1009	1009	1011	1010	1009
Audio-visual and computing equipment	735	766	761	744	742	743	735	725	769	748	740
Major recreational and cultural equipment	1048	1048	1045	1045	1045	1045	1044	1043	1048	1045	1043
Other recreational equipment and supplies	1008	1008	1006	1004	1004	1004	1003	1001	1008	1004	1004
Recreational and cultural services	1040	1042	1041	1040	1040	1040	1039	1037	1042	1040	1039
Newspapers, books and stationery	1095	1094	1094	1094	1094	1094	1095	1092	1093	1092	1093
Accommodation services	1083	1083	1082	1082	1082	1082	1082	1082	1083	1082	1082
Package holidays	1088	1088	1088	1088	1088	1088	1089	1088	1088	1088	1089
Early childhood education	661	661	670	670	670	670	672	652	661	670	672
Primary and secondary education	1133	1133	1133	1133	1133	1133	1133	1133	1133	1133	1133
Tertiary and other post school education	1050	1050	1049	1049	1049	1049	1049	1049	1055	1054	1054
Personal care	1033	1033	1033	1031	1031	1031	1030	1029	1034	1031	1031
Personal effects	1113	1113	1106	1102	1102	1102	1098	1094	1113	1102	1098
Insurance	1042	1042	1042	1040	1040	1040	1040	1039	1063	1061	1062
Credit services	990	990	989	989	989	989	989	989	986	986	986
Other miscellaneous services	1111	1111	1111	1111	1111	1111	1111	1110	1108	1108	1108

Table 18

Consumers Price Index
Subgroups – March 2009 quarter index numbers
 Base: June 2006 quarter (=1000)

Subgroup	Official Series	Analytical Series									
		1	2	3	4	5	5a	6	7	8	8a
Fruit and vegetables	1216	1216	1269	1278	1278	1278	1295	1201	1216	1278	1294
Meat, poultry and fish	1235	1235	1243	1242	1242	1242	1240	1231	1234	1240	1238
Grocery food	1193	1192	1194	1194	1194	1194	1198	1185	1193	1195	1199
Non-alcoholic beverages	1141	1141	1140	1140	1140	1140	1140	1138	1143	1142	1142
Restaurant meals and ready-to-eat food	1136	1136	1135	1135	1135	1135	1134	1134	1134	1133	1133
Alcoholic beverages	1093	1093	1091	1091	1091	1091	1091	1090	1086	1085	1084
Cigarettes and tobacco	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124	1124
Clothing	1004	1004	1004	1004	1004	1004	1004	1002	1006	1005	1005
Footwear	964	964	964	963	963	963	963	962	966	965	965
Actual rentals for housing	1073	1073	1073	1073	1073	1073	1073	1073	1073	1073	1073
Home ownership	1128	1128	1128	1128	1128	1128	1128	1128	1128	1128	1128
Property maintenance	1128	1128	1128	1127	1127	1127	1127	1125	1128	1127	1127
Property rates and related services	1222	1222	1222	1220	1220	1220	1220	1220	1222	1220	1220
Household energy	1185	1185	1185	1185	1185	1185	1184	1183	1185	1185	1184
Furniture, furnishings and floor coverings	1002	1002	1002	1002	1002	1002	1002	1000	1002	1002	1002
Household textiles	1003	1003	1003	1003	1003	1003	1003	1001	1003	1003	1003
Household appliances	1013	1013	1012	1009	1009	1009	1008	1005	1011	1007	1006
Glassware, tableware and household utensils	965	965	964	964	964	964	964	963	965	964	964
Tools and equipment for house and garden	1096	1096	1094	1094	1094	1094	1094	1092	1092	1090	1091
Other household supplies and services	1050	1050	1048	1047	1047	1047	1048	1044	1052	1049	1050
Medical products, appliances and equipment	903	903	894	896	895	894	878	822	878	868	851
Out-patient services	1053	1053	1049	1047	1047	1047	1039	1030	1017	1010	1000
Hospital services	1187	1187	1187	1187	1187	1187	1187	1187	1185	1185	1185
Purchase of vehicles	964	963	963	964	964	964	964	962	961	962	962
Private transport supplies and services	993	992	992	999	999	999	1006	984	984	991	997
Passenger transport services	1016	1015	1015	1023	1023	1023	1024	1012	991	995	997
Postal services	1112	1112	1114	1114	1114	1114	1114	1110	1112	1114	1114
Telecommunication equipment	568	638	595	595	595	595	590	582	638	595	589
Telecommunication services	999	1003	1001	1001	1001	1001	1001	1000	1003	1002	1001
Audio-visual and computing equipment	659	695	687	668	667	667	660	648	705	676	670
Major recreational and cultural equipment	1094	1094	1091	1091	1092	1091	1090	1089	1093	1091	1090
Other recreational equipment and supplies	1044	1044	1042	1039	1039	1039	1038	1034	1048	1043	1043
Recreational and cultural services	1066	1068	1066	1065	1065	1065	1064	1061	1068	1065	1064
Newspapers, books and stationery	1135	1134	1137	1138	1138	1138	1139	1130	1130	1135	1136
Accommodation services	1148	1148	1147	1147	1147	1147	1147	1147	1148	1147	1147
Package holidays	1223	1223	1224	1224	1224	1224	1225	1223	1223	1223	1224
Early childhood education	682	682	691	691	691	691	693	672	683	692	694
Primary and secondary education	1188	1188	1188	1188	1188	1188	1188	1187	1180	1181	1181
Tertiary and other post school education	1096	1096	1095	1095	1095	1095	1095	1095	1102	1101	1101
Other education ⁽¹⁾	1053	1053	1053	1053	1053	1053	1053	1053	1053	1053	1053
Personal care	1057	1057	1057	1055	1055	1055	1054	1052	1058	1056	1055
Personal effects	1180	1180	1170	1163	1163	1162	1158	1148	1180	1162	1158
Insurance	1103	1103	1103	1100	1100	1100	1101	1099	1136	1133	1134
Credit services	999	999	998	998	998	998	998	998	995	995	995
Other miscellaneous services	1085	1085	1085	1085	1085	1085	1085	1083	1072	1072	1072

(1) Base: June 2008 quarter (=1000).