

e-learning Resources for Training in Official Statistics

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History: the National Certificate of Official Statistics

- **Started:** in 2007 by the Network of Academics in Official Statistics (NAOS) – developed content, courses and assessment
- **Targeted:** Public sector employees (government, local authorities)
- **Focus:** statistical literacy skills in official statistics
- **Level:** roughly first year university
- **Assessment :** competency based
- **Participation:** 10/11 cohorts (9/10 in NZ, 1 in Tonga)
- **4 taught units** (2/3 of credits for certificate)
- **1 workplace research project** (1/3 of credits for certificate)

History: the App concept for Official Statistics

- Each taught unit in the certificate had a written workbook
- In 2013 a joint project of academics from New Zealand and the Royal Statistical Society Centre for Statistics Education at Plymouth University initiated
- Aim: to investigate the feasibility of producing e-learning tools such as Apps covering the certificate material
- Focus: international applicability encouraging use in particular countries (Africa, Pacific, ??)

Characteristics of the e-learning tools

From conception the resulting e-learning tools would :

- focus on **problem rather than technique**
- be **freely** available
- be accessible over the internet from **IT platforms** such as desktops, laptops, tablets and smart phones
- be self-contained for access in **developing nations**
- provide **interactive** content (less like static e-books and more like a miniature learning environment including questions, animation, videos, interactive tables and graphs)
- use or link to (rather than recreate) good tools

Three Apps currently under development

1. **Measuring Price Change** with focus on the CPI, working with price indices, change of base, time series in connection with the CPI, moving averages, trends, seasonality, and policy use.
2. **Comparing populations** (over time between countries and between groups within countries) including aspects of demography such as fertility, mortality, migration, life tables, population pyramids, age standardisation, odds ratios.
3. **GraphIt in Excel** emphasising data presentation and giving instructions for the creation of simple graphs including bar charts, boxplots, histograms, scatter plots, population pyramids and others with an instructional voice over.

Current status

Design specifications and a first draft of the content of the first two is completed.

(Examples mainly refer to New Zealand but future developments will have wider international content).

Working prototypes of two Apps on Measuring Price Change and Comparing Populations:

http://iase-web.org/islp/apps/govstats_priceindices/

http://iase-web.org/islp/apps/govstats_populations/

Some features:

Measuring Price Change App viewed on a desktop or laptop

Measuring Price Change

About Price Indices
History
Users
Consumer Price Index
Common Indices

Home

Watch the video 'Why Measure Prices?' below. If you are online the original clip can be viewed on the [3news website](#).

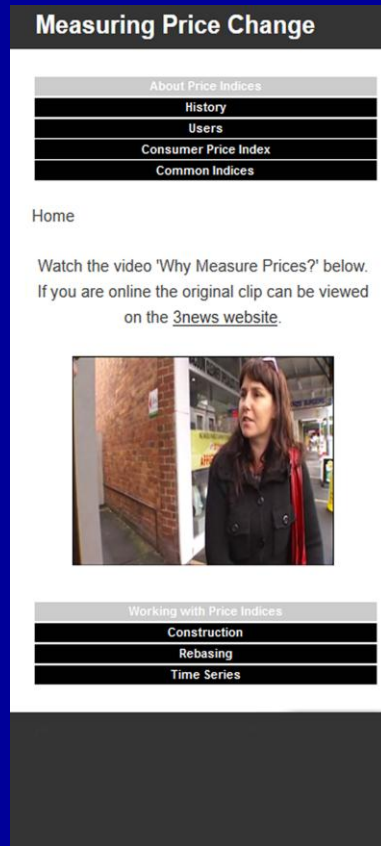
Working with Price Indices
Construction
Rebasing
Time Series



Some features (continued)

Measuring Price Change App viewed on a Smartphone

(automatic scaling from a horizontal to a vertical view)



Some features (continued):

Table viewed on a desktop or laptop

Construction - Percentage Change

Consumer Price Index: Base Period October 2010 = 100

	Mar 13	Apr 13	May 13	Jun 13	Jul 13	Aug 13	Sep 13	Oct 13	Nov 13	Dec 13	Jan 14	Feb 14	Mar 14
Summary Index													
All Items	106.3	107.1	107.0	106.9	106.4	106.6	106.8	106.9	105.9	107.1	109.5	110.1	111.4
Food	108.4	109.5	109.1	110.1	108.8	108.0	108.8	108.5	106.6	109.3	112.8	114.0	116.5
Housing	100.0	100.6	100.6	100.6	101.3	101.2	101.2	101.2	101.4	101.4	101.4	101.6	101.6
Household Operations	101.8	103.3	104.8	103.2	102.8	104.0	104.2	104.2	104.2	104.3	104.4	104.5	104.6
Clothing and Footwear	104.6	104.6	104.6	104.6	104.6	104.6	104.6	104.6	104.6	104.6	117.8	117.8	117.8
Transportation	115.1	114.7	112.1	110.5	112.2	114.1	114.4	114.1	112.7	112.3	113.9	114.9	114.4
Tobacco, Alcohol and Kava	99.1	99.2	99.2	99.2	99.2	100.3	100.3	100.3	100.3	100.4	100.4	100.4	100.4
Miscellaneous Goods and Services	102.5	102.5	102.5	102.5	102.5	102.5	102.5	102.5	102.6	102.6	104.1	104.1	104.2
Local	102.5	104.5	105.2	105.8	104.7	103.8	102.9	102.3	99.9	102.7	105.8	107.6	110.1
Imported	109.2	109.0	108.2	107.7	107.7	108.7	109.6	110.2	110.3	112.1	112.1	111.9	112.4

Source: Tongan Statistics Office 2014

Some features (continued)

Table viewed on a Smartphone

(automatic scaling from a horizontal to a vertical view)

Food	
Mar 13	108.4
Apr 13	109.5
May 13	109.1
Jun 13	110.1
Jul 13	108.8
Aug 13	108.0
Sep 13	108.8
Oct 13	108.5
Nov 13	106.6
Dec 13	109.3
Jan 14	112.8
Feb 14	114.0
Mar 14	116.5

Housing	
Mar 13	100.0
Apr 13	100.6
May 13	100.6
Jun 13	100.6
Jul 13	101.3
Aug 13	101.2
Sep 13	101.2
Oct 13	101.2
Nov 13	101.4
Dec 13	101.4
Jan 14	101.4

Some features (continued)

Interactive exercise

Measuring Price Change

About Price Indices
History
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Consumer Price Index
Common Indices

[Construction](#) > [Percentage Change](#)

Working with Price Indices
Construction
Rebasing
Time Series

The change in an index number time series from one period to another is expressed as a percentage of its value in the first period (percentage change).

Working with Percentage Change

$$\text{Percentage Change} = \frac{\text{Change in X}}{\text{Original value of X}} \times 100$$

Can be written as:

$$\% \text{change} = \frac{\text{Final} - \text{Initial}}{\text{Initial}} \times 100\%$$

The changes measured by the Consumers Price Index are usually expressed as percentages. The percentage changes most frequently calculated and published are:

1. The change between the current quarter and previous quarter
2. The change between the current quarter and the same quarter of the previous year.

If there has been an increase from one period to the next then the percentage change will be positive. If there has been a decrease from one period to the next then the percentage change will be negative.

EXAMPLES

a) If the CPI for the December 1997 quarter was 997 and that for the June 1988 quarter is 1004 then the quarterly percentage change in the index between the June and September 1998 quarters is calculated as follows:

$$\frac{\text{ } - 1004}{\text{ }} \times \text{ } = 0.5\%$$

Some features (continued)

Interactive exercise

View Table

EXERCISE A

The percentage change between the September and October months.

$$\frac{106.9 - 106.8}{106.8} \times 100 = 0.09 \%$$

CORRECT

EXERCISE B

The annual percentage change for the year from March 2013 to March 2014.

$$\frac{111.4 - 106.3}{105} \times 100 = 4.79 \%$$

TRY AGAIN

EXERCISE C

The percentage change between the February 2014 and March 2014 months for the Food Group.

ClickTap 2.19 %

The future

- Apps will be located on the *International Statistics Literacy Project* (ISLP) website hence freely available.
- Potential for statistics **project work**
- Relevant for **Geography and Economics** at school
- Appropriate for **business statistics** course at university

The future

- The web designer will be in NZ for three weeks next January/February to complete the Apps
- Extension of research group to include representatives for Africa, Mexico, Portugal and United Nations Bangkok
- Prepare translation into Spanish and Portuguese?
- Meeting in Uganda next January with support of African Development Bank and Statistics South Africa. National Statistics office assistance sought with country specific material and examples?

Thank you for listening

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