



# UNIVERSITY OF ABERDEEN



ABERDEEN  
CITY COUNCIL

## ABERDEEN CITY COUNCIL DATA OBSERVATORY USER MANUAL

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# Introduction

## User Manual Introduction

The Aberdeen City Council Data Observatory (ACCDO) project was initiated by the Aberdeen City Council (ACC) and the University of Aberdeen. This User Manual was designed with the aim to guide the users of the ACCDO through the application's functionality. The User Manual provides a description of each feature and images displaying information on how these should be used, and how the displayed results should be interpreted. As the application was designed for internal use in ACC, with the potential for a public release in the future, this version of the software does not include user sign-up or administrator features, hence all guidelines apply to the general users of the system.

## Application Overview

Our Product Owner tasked us with building a tool that would aid the decision-making process of the ACC by visualising data gathered from open data sources. The software collates data collected from two reliable online sources, and visualises it in multiple forms – on a choropleth map, in tabular views, and on bar charts, line charts and pie charts. The datasets used were separated into 4 distinct categories – Child Benefits, Housing, Population and Scottish Index of Multiple Deprivation (SIMD). The user can select a category to view and further filter their selection by choosing options from two dropdown menus, as well as pick the form in which they want to see the data. The data was gathered from the Scottish Statistics website and data.gov.uk. The final product is a single page application, which dynamically updates the content as the user interacts with it without constant page reloads.

## Application Features

### Landing page, About page and Contact page

At the top of each page there is a global navigation bar, which provides shortcuts to the landing page, the about section and the contact section, as well as a dropdown menu containing the categories of data available.

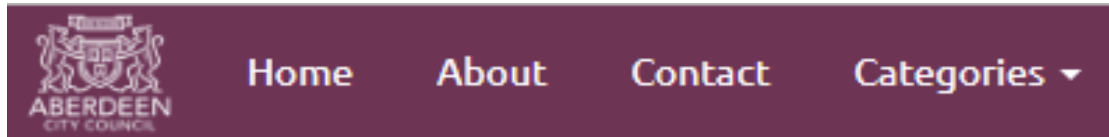


Figure 1 Global navigation bar

The landing page of the application provides easy access to all the functionality of the application. A welcoming section provides a description of its purpose and a link to the About section of the site, which is also accessible via the About link in the navigation bar.

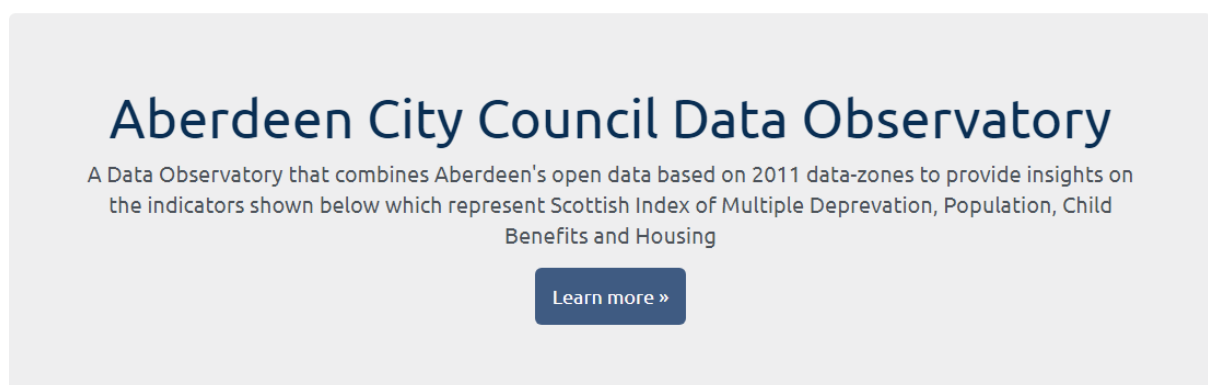


Figure 2 Landing page jumbotron

The landing page also displays four icons, correlating to the four different categories of data available. Depending on the option selected, the user is redirected to the choropleth map page with the corresponding radio button selected.

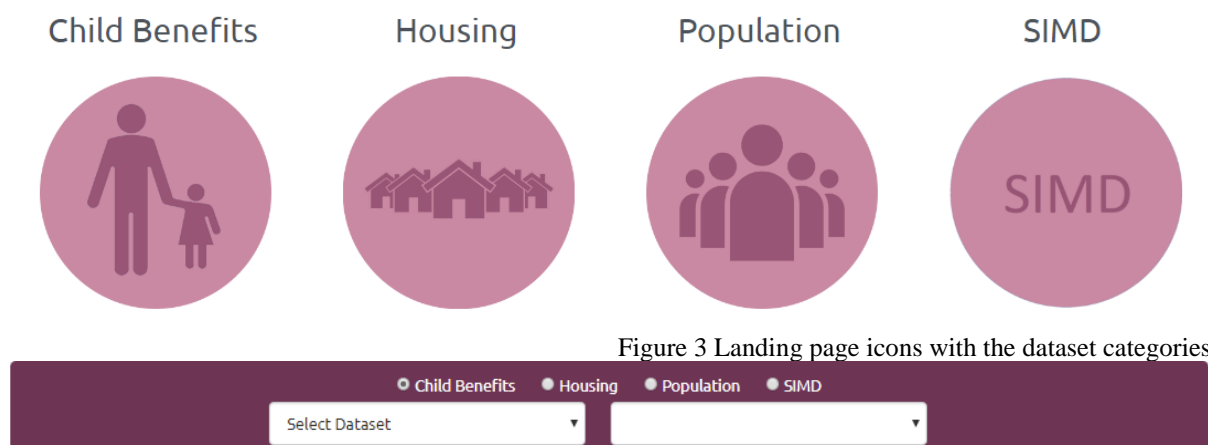


Figure 3 Landing page icons with the dataset categories

Figure 4 Choropleth map page with radio button selected

The About section of the application provides the user with some extra information on the categories of data, links to the original data sources and the names of all the team members, while the Contact page shows where can the team be found working and what email the team members should be contacted on.

## About the Project

### Purpose of the application

A Data Observatory that combines Aberdeen's open data based on 2011 data-zones to provide insights on the indicators which represent Scottish Index of Multiple Deprivation, Population, Child Benefit Claims and Housing.

### Categories

**SIMD** measured in decile and quintile form and the ranking of each of the data-zones which was evaluated in the year 2016.

**Housing** Housing data which includes the number of dwellings separated in terms of council tax bands, as well as the average dwelling price for each datazone.

**Population** estimates for the years ranging from 2011 to 2016 where the population is divided in the categories of 'Children', 'Working Age' and 'Pensionable Age'.

**Child Benefits** which displays the number of children whose parents are receiving child benefits for. The data is divided into age categories, the children's sex and number of families.

### Data

We gathered the data using the [Statistics.gov.scot](https://statistics.gov.scot) and [data.gov.uk](https://data.gov.uk) websites.

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Figure 5 About page

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Figure 6 Contact section

## Data Filtering

Once the user is on the main page of the application, they can select a category via radio buttons, which dynamically update the content of the two dropdown menus used for further filtering the content. The first dropdown allows the user to select a dataset and the second further filters the data by offering subcategory options.

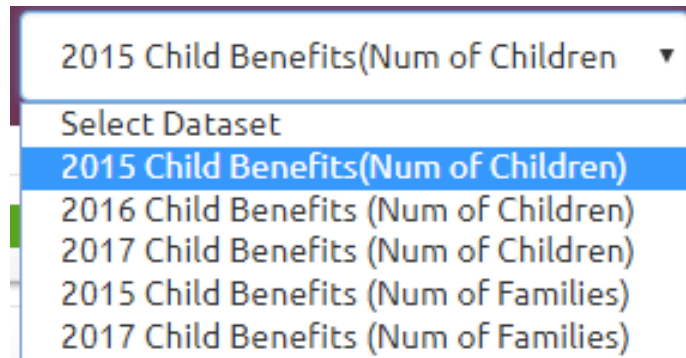


Figure 7 Child Benefits datasets dropdown

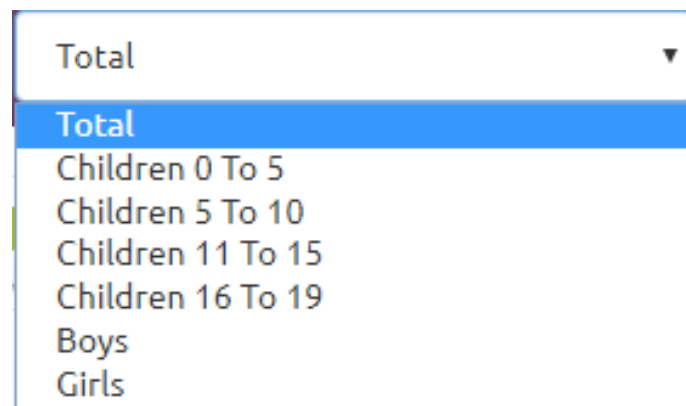


Figure 8 Child Benefits subcategories dropdown

Below is a list of the selection options available to the user:

### Child Benefits

#### *Number of Children Datasets:*

- 2015 Child Benefits (Number of Children)
- 2016 Child Benefits (Number of Children)
- 2017 Child Benefits (Number of Children)

#### *Number of Children Subcategories:*

- Total
- Children 0 to 5
- Children 5 to 10
- Children 11 to 15
- Children 16 to 19
- Boys
- Girls

### *Number of Families Datasets*

- 2015 Child Benefits (Number of Families)
- 2017 Child Benefits (Number of Families)

### *Number of Families Subcategories*

- Total
- One Child Families
- Two Children Families
- Three or More Children Families

## **Housing**

### *Datasets*

- 2014 Council Tax
- 2015 Council Tax
- 2016 Council Tax

### *Subcategories*

- Band A
- Band B
- Band C
- Band D
- Band E
- Band F
- Band G
- Band H

## **Population**

### *Datasets*

- 2011 Population
- 2012 Population
- 2013 Population
- 2014 Population
- 2015 Population
- 2016 Population

### *Subcategories*

- Total
- Children
- Working Age
- Pensionable Age

## **SIMD**

### *Datasets*

- Child Benefits

- Population
- Housing

#### *Subcategories*

- Decile
- Quintile

## Data Visualisation

The four distinct categories provide slightly different options to visualise the data:

### **Child Benefits, Population**

- Choropleth map
- Tabular view
- Bar chart
- Line chart
- Pie chart

### **Housing**

- Choropleth map
- Tabular view
- Bar chart
- Line chart

### **SIMD**

- Choropleth map
- Multiple tabular views

## Choropleth map

One of the main features of the application is the choropleth map, displaying the 2011 Aberdeen City data zone boundaries using GeoJSON polygons. The data zones are coloured on the map depending on the values of the data filtered via the categories radio buttons and the two dropdown menus. For the *Child Benefits*, *Housing* and *Population* categories, the colder colours on the map display the lower values while the warmer colours represent the higher values. This is reversed for the *SIMD* category. The minimum and maximum values change dynamically depending on the dataset selected.



Figure 9 Colouring bar for Child Benefits, Housing and Population

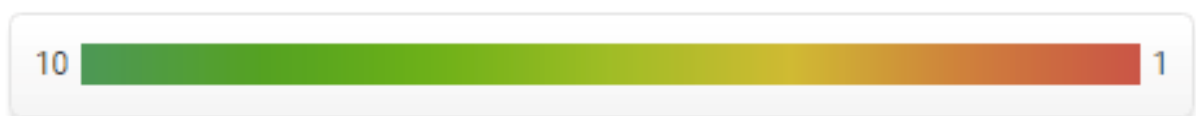


Figure 10 Colouring bar for SIMD



Once the user hovers over a data zone on the map, the corresponding name of the data zone and the value of the data selected are displayed on top of the map.

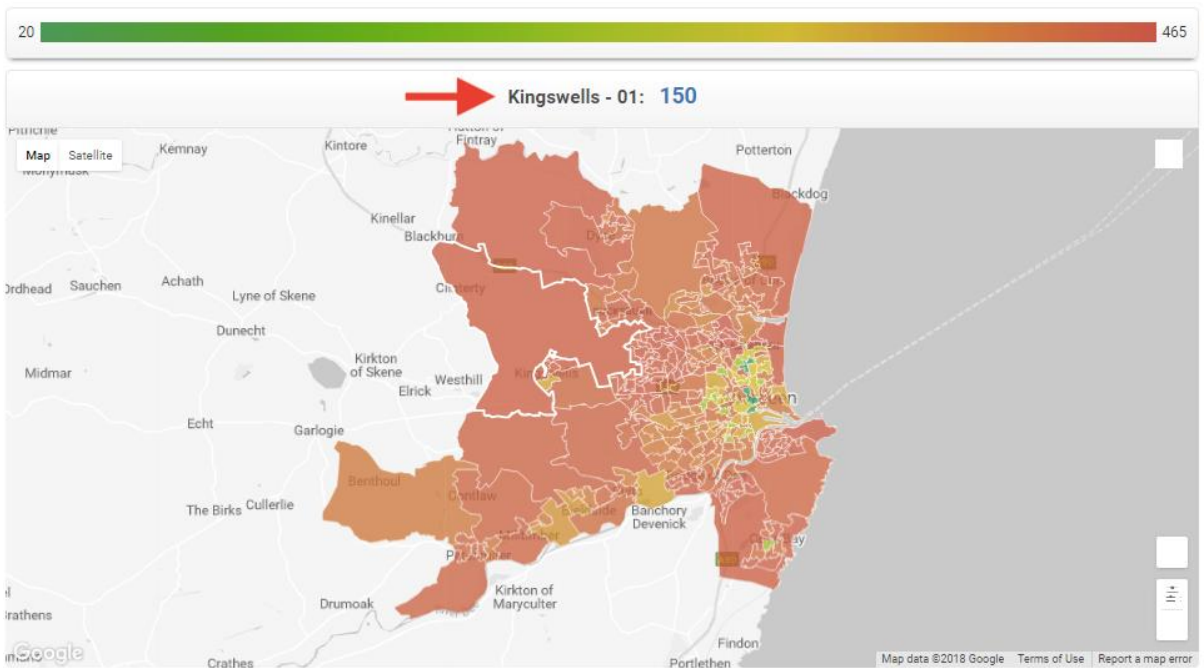


Figure 11 Choropleth map

The user can click on the data zone they are interested in and visualise the data in other forms, which are accessible from a sidebar that appears next to the map once the data zone is selected.

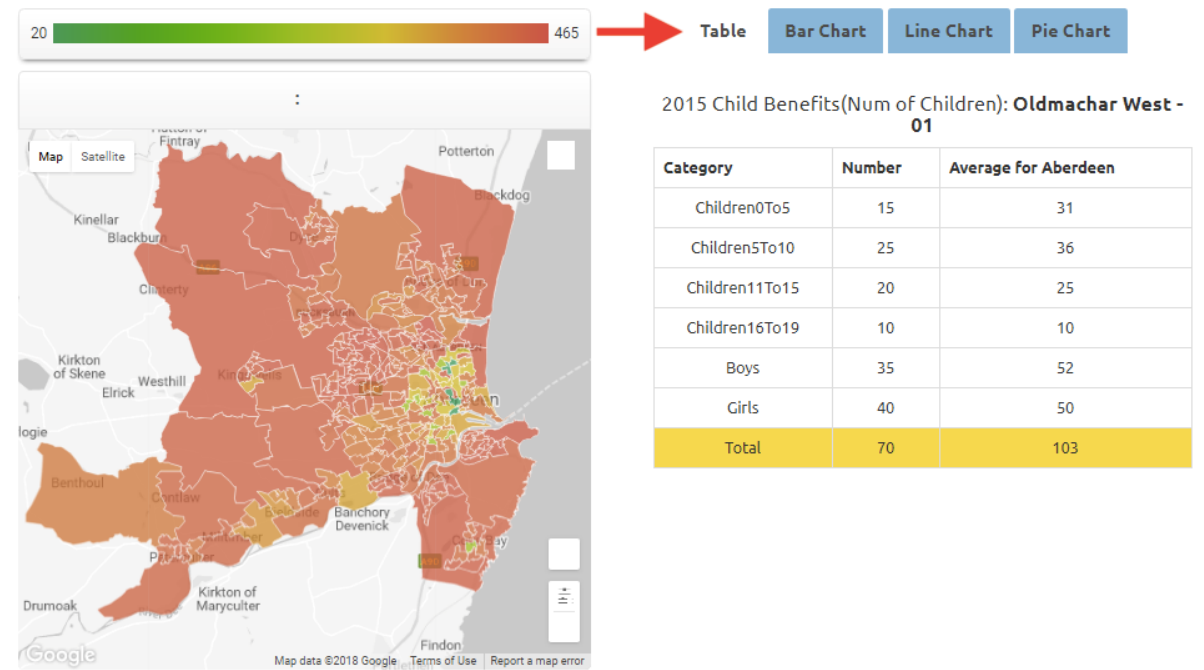


Figure 12 Sidebar

## Tabular Views

### *Child Benefits, Housing, Population*

The tabular view for these three categories opens by default **once the user selects a data zone on the map**. It displays the name of the selected dataset and data zone and the values of all subcategories for the respective dataset, with the subcategory selected from the dropdown menu highlighted in yellow.

#### 2016 Child Benefits (Num of Children): **Buckburn North - 06**

Category	Number	Average for Aberdeen
Children0To5	50	32
Children5To10	50	37
Children11To15	35	25
Children16To19	15	11
Boys	80	53
Girls	70	52
Total	150	105



Figure 13 Child Benefits tabular view

### ***SIMD***

The SIMD table combines data from the three other categories and groups the data zones by two of the measurements for deprivation – quintile (1-5) and decile (1-10). The lowest value of decile or quintile represents the most deprived areas, while the highest value represents the least deprived areas. The tabular view for the SIMD behaves differently to the other categories. The sidebar with the table appears **as soon as the user selects a dataset and a subcategory from the dropdown menus**. The data in the table is different depending on the dataset category selected.

#### Child Benefits dataset

This option allows the user to choose between data from 2015 and 2016. The table displays the decile or quintile values and groups the data zones according to these measurements of deprivation. The table shows calculation results of the total number of children, total population and what percentage the total number of children represent from the total population.

### Child Benefits by Decile

● 2016 ● 2015

Decile	Total Number of Children	Total Population	Children % of Population
<u>1</u>	605	2114	29
<u>2</u>	3740	15861	24
<u>3</u>	5225	24899	21
<u>4</u>	3455	20505	17
<u>5</u>	2575	20694	12
<u>6</u>	1625	15415	11
<u>7</u>	2000	18770	11
<u>8</u>	2325	21061	11
<u>9</u>	2525	25799	10
<u>10</u>	5500	64722	8

Figure 14 SIMD Child Benefits dataset selected

### Population dataset

This option shows the user a total value of the population for 2014, 2015, 2016 for the data zones grouped by decile or quintile, depending on the user's selection from the dropdown menu.

### Population by Quintile

Quintile	Population 2014	Population 2015	Population 2016
<u>1</u>	18070	18227	17975
<u>2</u>	45340	45616	45404
<u>3</u>	36375	36484	36109
<u>4</u>	38947	39413	39831
<u>5</u>	90188	90610	90521

Figure 15 SIMD Population dataset selected

## Housing dataset

This option enables the user to choose between data from 2014, 2015 and 2016. The data zones are grouped by quintile or decile, depending on the user's choice, as well as council tax band. The table displays calculation results of the total number of dwellings and total tax income for a specific council tax band and specific quintile/decile.

Housing by Quintile

☐ 2016   ☐ 2015   ☒ 2014

☐ 1   ☐ 2   ☐ 3   ☐ 4   ☒ 5

Band	Number of dwellings	Tax income
bandA	3132	£3,440,439
bandB	3661	£4,691,791
bandC	3922	£5,744,318
bandD	7300	£12,028,356
bandE	10450	£21,045,046
bandF	6642	£15,808,226
bandG	6044	£16,598,033
bandH	732	£2,412,262

Figure 16 SIMD Housing dataset selected

For the *Child Benefits* and *Population* options, the user can click on the decile or quintile values in the table and view a modal with all data zones with the same value of quintile and decile, alongside the relevant information about them, depending on the option selected. The user can sort the information in ascending or descending order by clicking on any of the headers in the modal table.

Table with datazones and populations for SIMD range Decile: 1

(Click on each title to sort the column)

DataZone	Population 2014	Population 2015	Population 2016
Torry East - 04	650	646	622
Torry East - 06	822	841	822
Woodside - 04	667	681	670

Figure 17 SIMD Population decile modal

## Charts

### **Bar Chart**

The bar chart displays the values of each category of a specific dataset for a chosen data zone, compared to the average value for the whole city. The user can click on the “Average for Aberdeen” toggle in the legend to hide/show the city average bar in the chart.

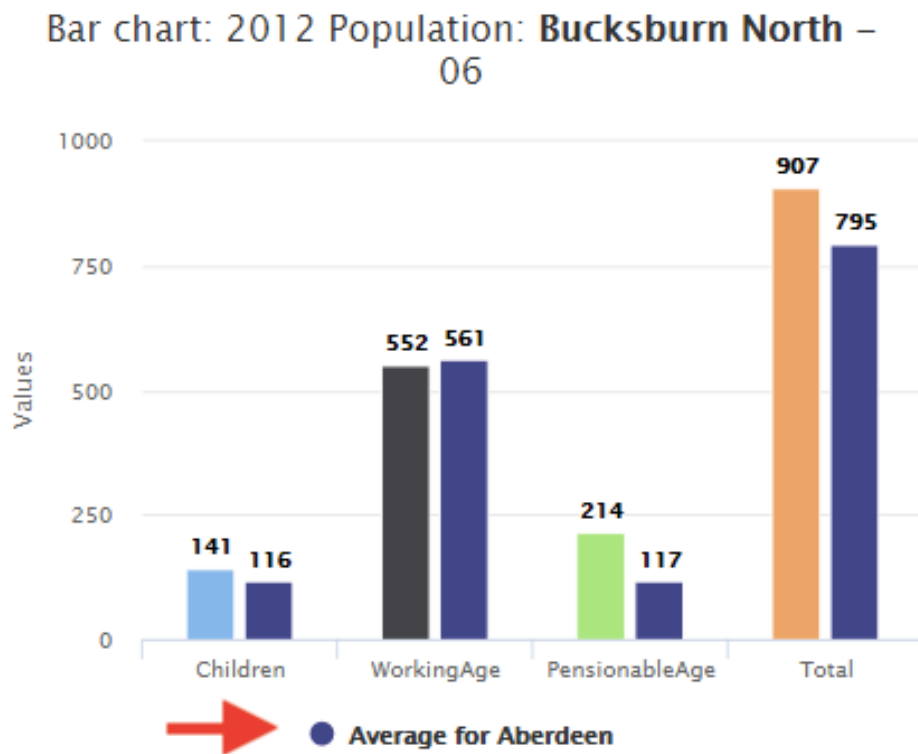


Figure 18 Population bar chart

## Line Chart

The line chart shows the change in values of the selected dataset throughout the years in which our data is available. By default, the user will see values from the Total subcategory, however multiple subcategories can be selected via checkboxes in order to compare the trends in values on a single chart.

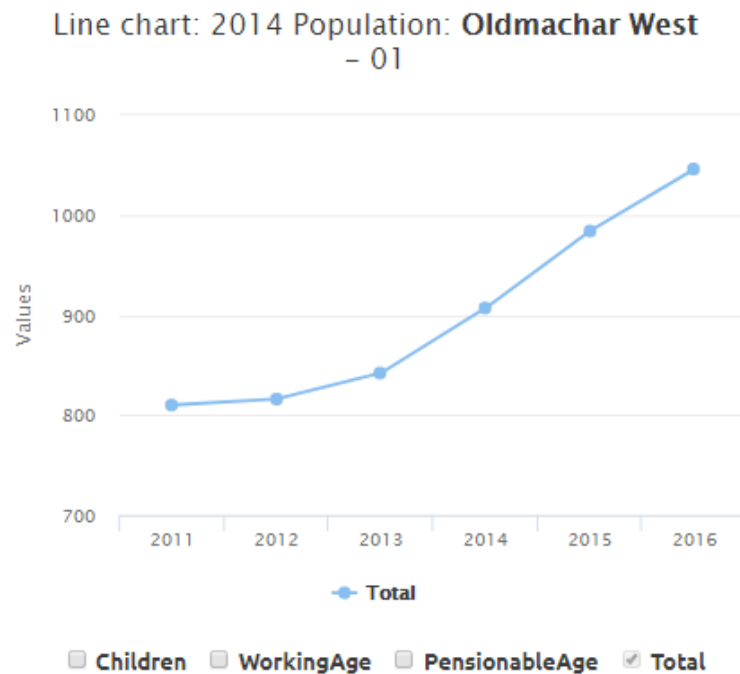


Figure 19 Population line chart

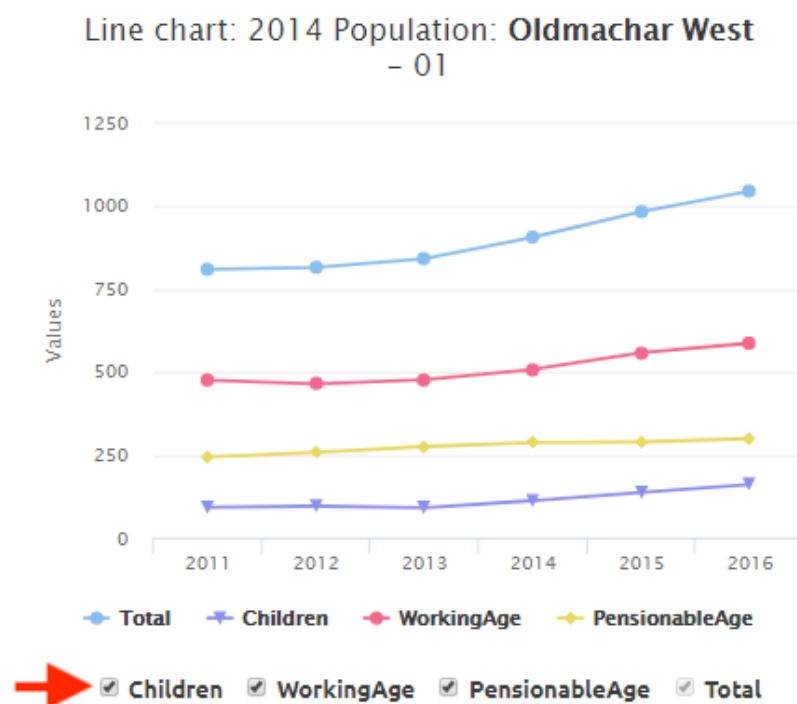


Figure 20 Population line chart multiple subcategories selected

## Pie Chart

We used the pie chart as a visualisation tool to show the proportion of a specified subcategory from the total value in the corresponding dataset for the selected data zone. For example, if the user has chosen to view the number of children between the ages of 0 and 5 in a specific data zone, who receive child benefits, in the pie chart they can see what percentage do these children represent from the total number of children in the data zone.

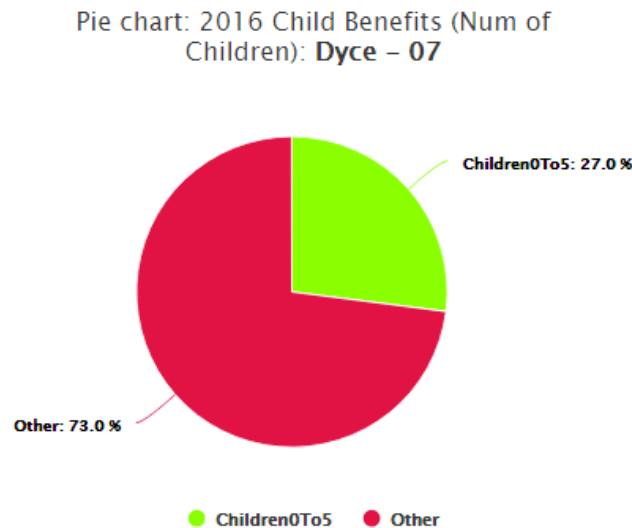


Figure 21 Child Benefits (Number of Children) pie chart

If the user has selected the **Total** subcategory when viewing data relating **Population** or **Number of Families** receiving **Child Benefits**, they will see what percentage do all subcategories represent compared to one another.

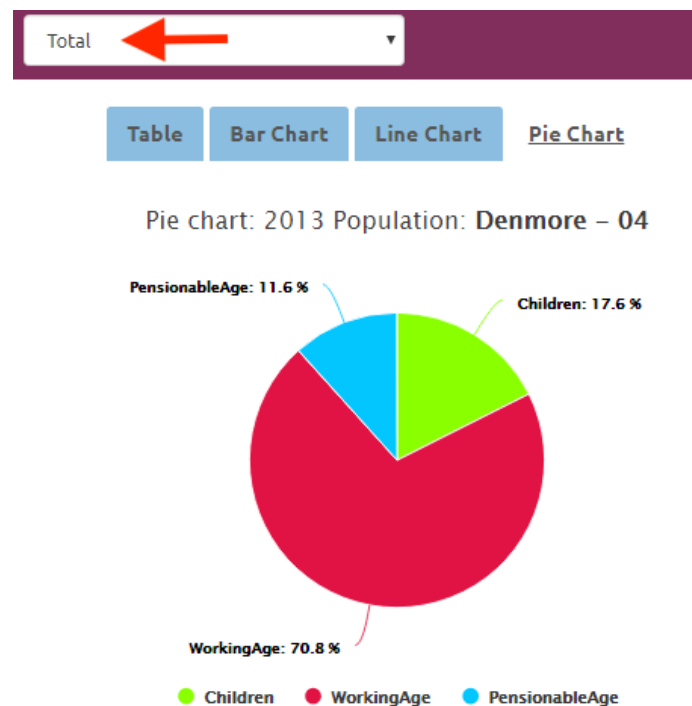


Figure 22 Population bar chart (Total selected)

If the user has selected any of the **Total** subcategories when viewing data relating **Number of Children** receiving **Child Benefits**, they are given two options via radio buttons under the chart. If they select **Gender** they will see what proportion do girls and boys represent from the total number of children receiving child benefits in the selected data zone. If they select **Age** they will see the proportion each age group represents from the total number of children receiving child benefits in the selected data zone.

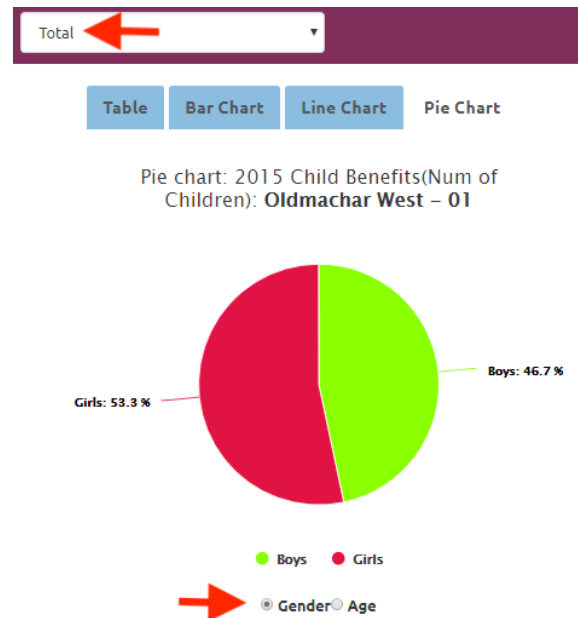


Figure 23 Child Benefits (Number of Children) bar chart (Total, Gender selected)

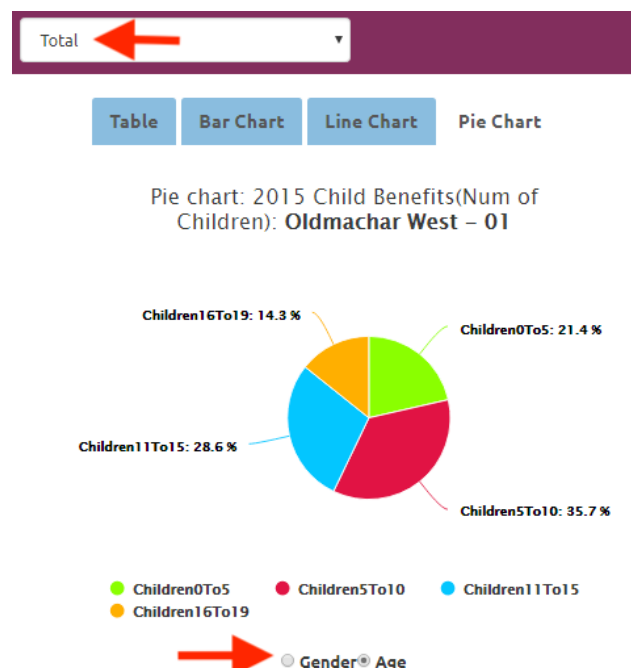


Figure 24 Child Benefits (Number of Children) bar chart (Total, Age selected)