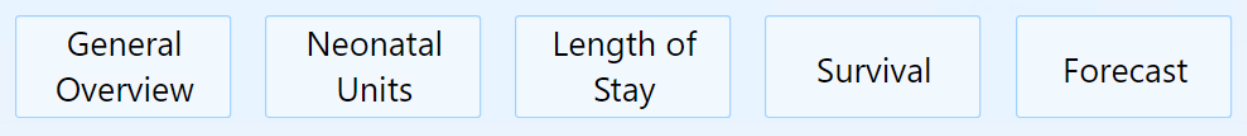
Neonatal Health Intelligence Model Guide
Survival & Length of Stay

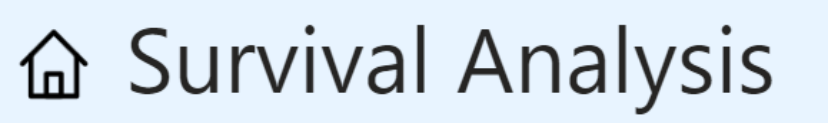
How to use the model

This health intelligence model, built on the principles of On-Line Analytical Processing (OLAP), is designed to provide different user groups with information and insights about patients admitted to NHS neonatal units.

The model is split into various pages that each focus on a particular topic. Use the buttons at the bottom of the homepage to navigate to the topic of your choice.



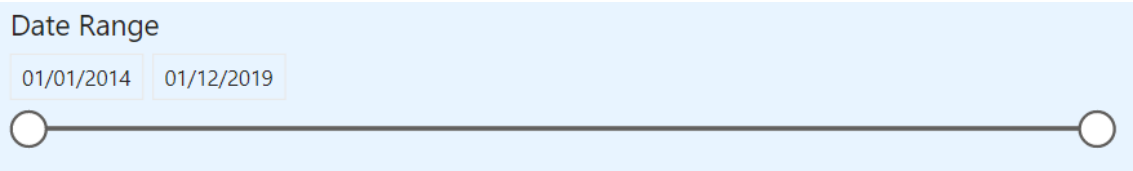
From any page, you can use the home button (in the top left corner) to return to this page.



On each page, there are various visualisations and filters. Almost all visuals show more detailed information when you hover-over them with the mouse.

Filters

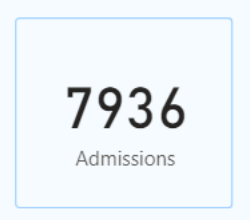
Filters allow you to specify which data to use to build the visualisations. Below are some filters you might find.



You can also filter by clicking on parts of certain graphs. For example, clicking on a bar on a bar chart will filter the other visualisations by that variable. If you want to apply multiple filters in

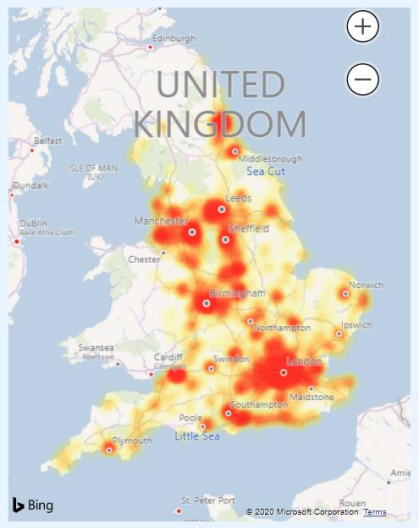
this way, hold the CTRL key when selecting. E.g. hold CTRL and click on two bars, either on different or the same graph, to filter by both variables. Please note that not all filters feature on each page, only relevant ones will be available.

On every page, you can see how many results match the filters that are being applied. This is important to note when lots of filters are applied, as any visible patterns may be misleading if very few results are used in the visualisations. Some of the pages focus on babies, and some on admissions.



Pages

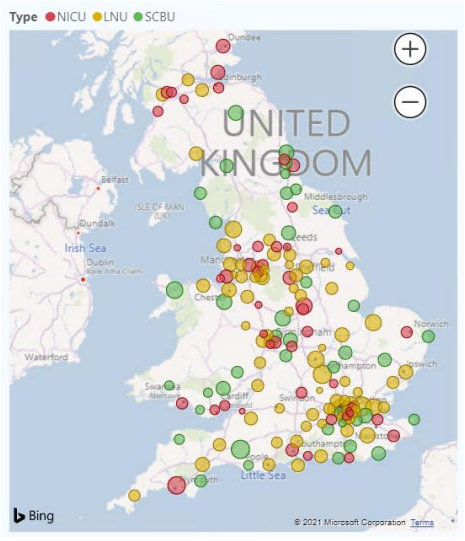
General Overview



As the name suggests, this page is not specific to any particular variable. There are various visualisations and filters that aim to provide a general overview of the neonatal data. The left-hand side features a heat-map, where density of births can be visualised.

There are filters for survival, birth date, length of stay, and birth weight. There is also a graph on gestational age (which can act as a filter if you click on the bars) and one on length of stay.

Neonatal Unit Analysis

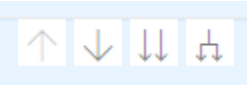


This page provides an insight into admissions at the different neonatal units. The markers represent individual neonatal units. The colour of the marker indicates the type of unit, and the size indicates the number of admissions.

As with most visuals, hovering over the markers will provide extra information. You can use this to see the name of each unit, and the exact number of admissions.

Along with some basic filters, there is also a bar graph that shows the number of admissions of each unit type by year. There are

some buttons in the top right-hand side of this graph that you can use to change the time periods visualised.



The up arrow can be used to return to this yearly view from any other view.

The down arrow allows you to drill down into a year. By clicking it and then one of the bars, the graph will display the data for that year, month-by-month. This is useful to inspect a particular year.

The double-down arrow allows you to see data month-by-month for all years. This can be useful to see annual trends e.g. are more babies admitted during particular months?

The far-right button is similar to the drill-down feature, except instead of showing a particular year, it expands all years into their individual months.

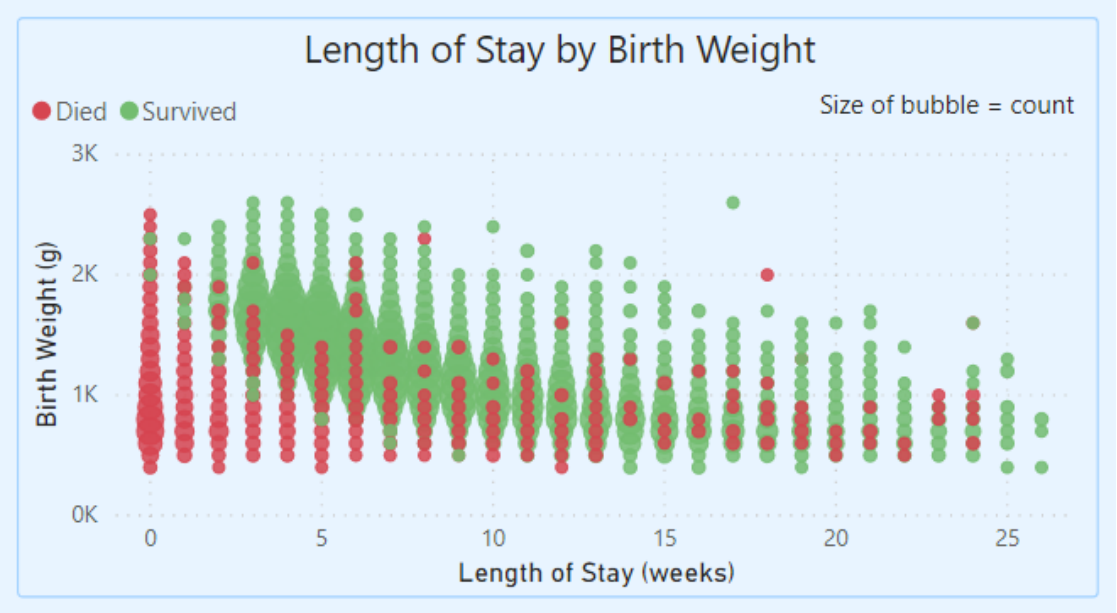
Length of Stay

This page provides analyses related to the total combined length of stay in neonatal care for a baby.

Length of Stay by Birth Weight

This graph shows the relationship between a baby's birth weight and the amount of time they spent in neonatal care. The birth weight has been rounded to the nearest 100g.

The size of each bubble indicates the number of babies at that position. The colour of the bubble indicates whether that group represents babies that died or survived.



Length of Stay Distribution

This graph simply shows how common certain lengths of stay are. There are two lines drawn here, one for babies who survived, and one for those who did not.

Avg. Length of Stay by Gestational Age

This graph shows the average length of stay for babies of different gestational ages. This can also be useful as a filter, by clicking on individual bars.

Survival

This page provides analyses related to survival rates between babies.

Survival Rate

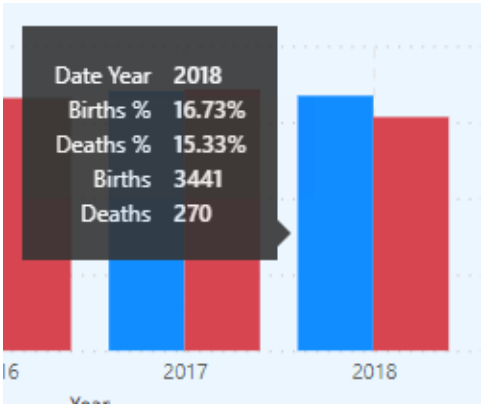
This is a simple pie chart that shows the survival rate for the babies that match the current filters. There are some basic filters around this pie chart that can be used to narrow-down the babies included in the data.

Neonatal Unit Comparison

This graph shows the number of babies in each individual neonatal unit, along with the number of babies who didn't survive. This is a large list, so you may need to scroll to find a specific unit. It is also important to note that units can evolve over time, so consider using the date range filter to exclude old data.

Change in Survival Over Time

This graph shows how the survival rates change over time.



The value at each date is the percentage of births/deaths that the date accounts for. For example, the image on the right shows that 2018 accounts for ~17% of all births in the data, but only ~15% of deaths.

The important part to look at here is the difference between the two bars. If the mortality rate remains unchanged then there won't be a difference. If it increases/decreases, then the difference between the bars will change over time.

You can interact with this graph in a similar way to the 'Number of Admissions Over Time' graph on the 'Neonatal Unit Analysis' page.

Birth Weight

On the survival page, there is a button that takes you to another page that focuses on the relationship between birthweight and survival.

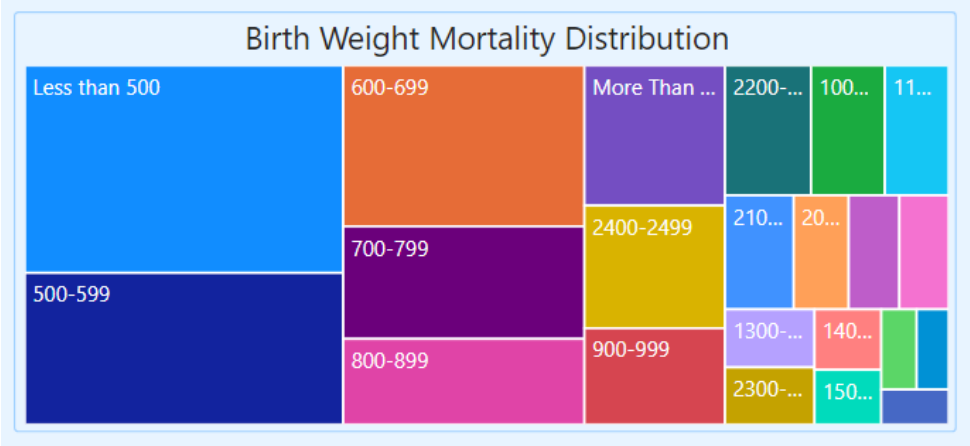
Birth Weight Distribution

Here, you can see the distribution of birth weights between infants in the data. There is also a line to show the number of deaths at each birth weight. Note, the 'total' is not just those who survived, it includes all births. There are also 'zoom sliders' on both axes. You can use these to zoom-in to certain parts of the graph.

Birth Weight Mortality Distribution

This treemap shows the distribution of deaths for each 100g birth weight group. The size of each square represents the percentage of infants with that birth weight who passed away (i.e.

larger square = higher mortality rate). If you hover-over the sections, you can see the actual percentages.

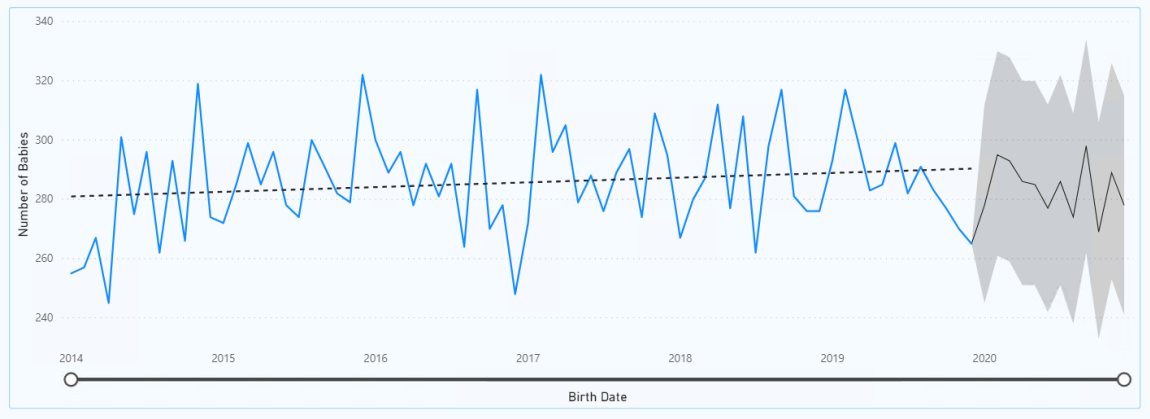


Birth Weight by Gestational Age

This graph shows how gestational age and birth weight are related. The position of each bubble represents a group of babies with a certain gestational age and birthweight. The size of each bubble represents the number of babies in that group. This graph is interesting to see not only the trend, but also the spread of the data as gestational age increases.

Forecast

This page can be used to experiment with Power BI's forecasting capability. The blue line indicates the number of babies with each birth date, and the grey section is a prediction based on this data, spanning the following year and assuming a 12-point (12 month) seasonality. The shaded area indicates a 95% confidence interval.



Use the filters above this graph to narrow-down the data. For example, you could use it to predict the future mortality rate, just take note that the dates in this case will still be birth dates, not the date of death.