



## Excel add-ins

### Introduction

Excel users can create functions and provide them to other users using add-ins. Functions have been created to calculate Directly Standardised Rates (DSRs), along with their confidence intervals and also confidence intervals for rates and proportions using Byar's and Wilson's methods respectively. These add-ins are available on the Fingertips sites, on the [Technical Guidance page](#).

### Loading add-ins to Excel

1. Open Excel
2. File
3. Options
4. Add-ins (on the left)
5. Manage Excel Add Ins (at the bottom)
6. Go
7. Browse (then locate add in)

Note: you might be asked if you want to move the add-in into your directory. This will store the add-in locally on your machine. You might have a policy within your organisation for storing the add-ins centrally, and if they are then updated, they only need to be updated once and everyone will be using the same add-in

### Using the Wilson's add-in

The syntax to use the Wilson's add in is:

- “=wilson(Numerator,Denominator,0)\* 100” for lower confidence interval expressed as a percent
- “=wilson (Numerator,Denominator,1)\*100” for upper confidence interval expressed as a percent

The examples below show how these functions would look in Excel:

|    | A                      | B                            | C |
|----|------------------------|------------------------------|---|
| 4  |                        |                              |   |
| 5  | <b>Wilson examples</b> |                              |   |
| 6  |                        |                              |   |
| 7  |                        |                              |   |
| 8  | Numerator              | 12                           |   |
| 9  | Denominator            | 1537                         |   |
| 10 |                        |                              |   |
| 11 |                        | <b>Wilson (percent)</b>      |   |
| 12 | Value                  | 0.781                        |   |
| 13 | Lower CI               | =WILSON(\$B\$8,\$B\$9,0)*100 |   |
| 14 | Upper CI               | 1.360                        |   |
| 15 |                        |                              |   |
| 16 |                        |                              |   |

Figure 1 Wilson lower confidence intervals

|    | A                      | B                            | C | D |
|----|------------------------|------------------------------|---|---|
| 4  |                        |                              |   |   |
| 5  | <b>Wilson examples</b> |                              |   |   |
| 6  |                        |                              |   |   |
| 7  |                        |                              |   |   |
| 8  | Numerator              | 12                           |   |   |
| 9  | Denominator            | 1537                         |   |   |
| 10 |                        |                              |   |   |
| 11 |                        | <b>Wilson (percent)</b>      |   |   |
| 12 | Value                  | 0.781                        |   |   |
| 13 | Lower CI               | 0.447                        |   |   |
| 14 | Upper CI               | =WILSON(\$B\$8,\$B\$9,1)*100 |   |   |
| 15 |                        |                              |   |   |
| 16 |                        |                              |   |   |

Figure 2 Wilson upper confidence intervals

## Using the Byar's add-in

The syntax to use the Byar's add in is:

- “=rateci(Numerator,Denominator,0)\*100000” for lower confidence interval per 100,000 population
- “=rateci(Numerator,Denominator,1)\*100000” for upper confidence interval per 100,000 population

The examples below show how these functions would look in Excel:

|    | A           | B                               | C |
|----|-------------|---------------------------------|---|
| 4  |             |                                 |   |
| 5  |             |                                 |   |
| 6  |             |                                 |   |
| 7  |             |                                 |   |
| 8  | Numerator   | 12                              |   |
| 9  | Denominator | 1537                            |   |
| 10 |             |                                 |   |
| 11 |             | Byar (per 100,000)              |   |
| 12 | Value       | 780.742                         |   |
| 13 | Lower CI    | =rateci(\$B\$8,\$B\$9,0)*100000 |   |
| 14 | Upper CI    | 1363.881                        |   |
| 15 |             |                                 |   |
| 16 |             |                                 |   |

Figure 3 Byar's lower confidence intervals

|    | A           | B                               | C | D |
|----|-------------|---------------------------------|---|---|
| 4  |             |                                 |   |   |
| 5  |             |                                 |   |   |
| 6  |             |                                 |   |   |
| 7  |             |                                 |   |   |
| 8  | Numerator   | 12                              |   |   |
| 9  | Denominator | 1537                            |   |   |
| 10 |             |                                 |   |   |
| 11 |             | Byar (per 100,000)              |   |   |
| 12 | Value       | 780.742                         |   |   |
| 13 | Lower CI    | 402.961                         |   |   |
| 14 | Upper CI    | =rateci(\$B\$8,\$B\$9,1)*100000 |   |   |
| 15 |             |                                 |   |   |

Figure 4 Byar's upper confidence intervals

## Using the DSR add-in

The syntax to use the DSRa add-in is as follows (in a cell in excel):

`"=DSRa(Data,Pop,RefPop,Stat,Multiplier,Confidence)"`

Note: when writing the function, if you have forgotten the inputs you can press Ctrl+Shift+A to reveal all of them or press the  $f_x$  button next to the formula bar

Where:

- Data = a range containing the observed data – no default value
- Pop = a range containing the local population – no default value
- RefPop = a range containing the standard population (eg, European Standard Reference Population) – no default value
- Stat = 0 for Lower confidence interval, 1 for upper confidence interval, 2 for DSR – default is 0
- Multiplier = number you want to multiply output by (eg, rate per 100,000) – default is 100000
- Confidence = Confidence Interval (between 0 and 100) – default is 95

The figures below give examples of how these functions would look in Excel.

|    | A | B                  | C | D | E | F |
|----|---|--------------------|---|---|---|---|
| 16 |   |                    |   |   |   |   |
| 17 |   | <b>DSR example</b> |   |   |   |   |
| 18 |   |                    |   |   |   |   |
| 19 |   |                    |   |   |   |   |
| 20 |   |                    |   |   |   |   |
| 21 |   |                    |   |   |   |   |
| 22 |   |                    |   |   |   |   |
| 23 |   |                    |   |   |   |   |
| 24 |   |                    |   |   |   |   |
| 25 |   |                    |   |   |   |   |
| 26 |   |                    |   |   |   |   |
| 27 |   |                    |   |   |   |   |
| 28 |   |                    |   |   |   |   |
| 29 |   |                    |   |   |   |   |
| 30 |   |                    |   |   |   |   |
| 31 |   |                    |   |   |   |   |
| 32 |   |                    |   |   |   |   |
| 33 |   |                    |   |   |   |   |
| 34 |   |                    |   |   |   |   |
| 35 |   |                    |   |   |   |   |
| 36 |   |                    |   |   |   |   |
| 37 |   |                    |   |   |   |   |
| 38 |   |                    |   |   |   |   |
| 39 |   |                    |   |   |   |   |
| 40 |   |                    |   |   |   |   |
| 41 |   |                    |   |   |   |   |
| 42 |   |                    |   |   |   |   |
| 43 |   |                    |   |   |   |   |
| 44 |   |                    |   |   |   |   |
| 45 |   |                    |   |   |   |   |

  

| Age band | Obs | LocalPop | RefPop |
|----------|-----|----------|--------|
| 0-4      | 36  | 9397     | 5000   |
| 5-9      | 78  | 8877     | 5500   |
| 10-14    | 40  | 8549     | 5500   |
| 15-19    | 77  | 9416     | 5500   |
| 20-24    | 25  | 8490     | 6000   |
| 25-29    | 66  | 9439     | 6000   |
| 30-34    | 63  | 8620     | 6500   |
| 35-39    | 51  | 8486     | 7000   |
| 40-44    | 81  | 10816    | 7000   |
| 45-49    | 38  | 11857    | 7000   |
| 50-54    | 46  | 11842    | 7000   |
| 55-59    | 26  | 10972    | 6500   |
| 60-64    | 42  | 11881    | 6000   |
| 65-69    | 44  | 13198    | 5500   |
| 70-74    | 99  | 9810     | 5000   |
| 75-79    | 56  | 8119     | 4000   |
| 80-84    | 95  | 6037     | 2500   |
| 85-89    | 23  | 3664     | 1500   |
| 90+      | 63  | 2015     | 1000   |

  

|          |  |
|----------|--|
| DSR      | =dsra(\$C\$21:\$C\$39,\$D\$21:\$D\$39,\$E\$21:\$E\$39,2) |
| Lower CI | 565.912  |
| Upper CI | 640.711  |

Figure 5 DSR example

|    | A | B                  | C | D | E | F |
|----|---|--------------------|---|---|---|---|
| 16 |   |                    |   |   |   |   |
| 17 |   | <b>DSR example</b> |   |   |   |   |
| 18 |   |                    |   |   |   |   |
| 19 |   |                    |   |   |   |   |
| 20 |   |                    |   |   |   |   |
| 21 |   |                    |   |   |   |   |
| 22 |   |                    |   |   |   |   |
| 23 |   |                    |   |   |   |   |
| 24 |   |                    |   |   |   |   |
| 25 |   |                    |   |   |   |   |
| 26 |   |                    |   |   |   |   |
| 27 |   |                    |   |   |   |   |
| 28 |   |                    |   |   |   |   |
| 29 |   |                    |   |   |   |   |
| 30 |   |                    |   |   |   |   |
| 31 |   |                    |   |   |   |   |
| 32 |   |                    |   |   |   |   |
| 33 |   |                    |   |   |   |   |
| 34 |   |                    |   |   |   |   |
| 35 |   |                    |   |   |   |   |
| 36 |   |                    |   |   |   |   |
| 37 |   |                    |   |   |   |   |
| 38 |   |                    |   |   |   |   |
| 39 |   |                    |   |   |   |   |
| 40 |   |                    |   |   |   |   |
| 41 |   |                    |   |   |   |   |
| 42 |   |                    |   |   |   |   |
| 43 |   |                    |   |   |   |   |
| 44 |   |                    |   |   |   |   |

  

| Age band | Obs | LocalPop | RefPop |
|----------|-----|----------|--------|
| 0-4      | 36  | 9397     | 5000   |
| 5-9      | 78  | 8877     | 5500   |
| 10-14    | 40  | 8549     | 5500   |
| 15-19    | 77  | 9416     | 5500   |
| 20-24    | 25  | 8490     | 6000   |
| 25-29    | 66  | 9439     | 6000   |
| 30-34    | 63  | 8620     | 6500   |
| 35-39    | 51  | 8486     | 7000   |
| 40-44    | 81  | 10816    | 7000   |
| 45-49    | 38  | 11857    | 7000   |
| 50-54    | 46  | 11842    | 7000   |
| 55-59    | 26  | 10972    | 6500   |
| 60-64    | 42  | 11881    | 6000   |
| 65-69    | 44  | 13198    | 5500   |
| 70-74    | 99  | 9810     | 5000   |
| 75-79    | 56  | 8119     | 4000   |
| 80-84    | 95  | 6037     | 2500   |
| 85-89    | 23  | 3664     | 1500   |
| 90+      | 63  | 2015     | 1000   |

  

|          |  |
|----------|--|
| DSR      | 602.457  |
| Lower CI | =dsra(\$C\$21:\$C\$39,\$D\$21:\$D\$39,\$E\$21:\$E\$39,0) |
| Upper CI | 640.711  |

Figure 6 DSR lower confidence interval

|    | A | B                  | C   | D               | E             | F |  |
|----|---|--------------------|---|-----------------|---------------|---|--|
| 16 |   |                    |   |                 |               |   |  |
| 17 |   | <b>DSR example</b> |   |                 |               |   |  |
| 18 |   |                    |   |                 |               |   |  |
| 19 |   |                    |   |                 |               |   |  |
| 20 |   |                    |   |                 |               |   |  |
| 21 |   | <b>Age band</b>    | <b>Obs</b>  | <b>LocalPop</b> | <b>RefPop</b> |   |  |
| 22 |   | 0-4                | 36  | 9397            | 5000          |   |  |
| 23 |   | 5-9                | 78  | 8877            | 5500          |   |  |
| 24 |   | 10-14              | 40  | 8549            | 5500          |   |  |
| 25 |   | 15-19              | 77  | 9416            | 5500          |   |  |
| 26 |   | 20-24              | 25  | 8490            | 6000          |   |  |
| 27 |   | 25-29              | 66  | 9439            | 6000          |   |  |
| 28 |   | 30-34              | 63  | 8620            | 6500          |   |  |
| 29 |   | 35-39              | 51  | 8486            | 7000          |   |  |
| 30 |   | 40-44              | 81  | 10816           | 7000          |   |  |
| 31 |   | 45-49              | 38  | 11857           | 7000          |   |  |
| 32 |   | 50-54              | 46  | 11842           | 7000          |   |  |
| 33 |   | 55-59              | 26  | 10972           | 6500          |   |  |
| 34 |   | 60-64              | 42  | 11881           | 6000          |   |  |
| 35 |   | 65-69              | 44  | 13198           | 5500          |   |  |
| 36 |   | 70-74              | 99  | 9810            | 5000          |   |  |
| 37 |   | 75-79              | 56  | 8119            | 4000          |   |  |
| 38 |   | 80-84              | 95  | 6037            | 2500          |   |  |
| 39 |   | 85-89              | 23  | 3664            | 1500          |   |  |
| 40 |   | 90+                | 63  | 2015            | 1000          |   |  |
| 41 |   | <b>DSR</b>         | <b>602.457</b>  |                 |               |   |  |
| 42 |   | <b>Lower CI</b>    | <b>565.912</b>  |                 |               |   |  |
| 43 |   | <b>Upper CI</b>    | <b>=dsra(\$C\$21:\$C\$39,\$D\$21:\$D\$39,\$E\$21:\$E\$39,1)</b> |                 |               |   |  |
| 44 |   |                    |   |                 |               |   |  |
| 45 |   |                    |   |                 |               |   |  |

**Figure 7 DSR upper confidence interval**

## References

See [Technical Guide – Confidence Intervals](#) for full documentation of these methods.