

Using pivot tables to take a deeper dive into COVID-19 data

In the previous tutorial, we sorted and filtered to learn more about the COVID-19 infection and death data. While these are excellent tools, they can only take us so far.

The pivot Tables becomes the next, logical step.

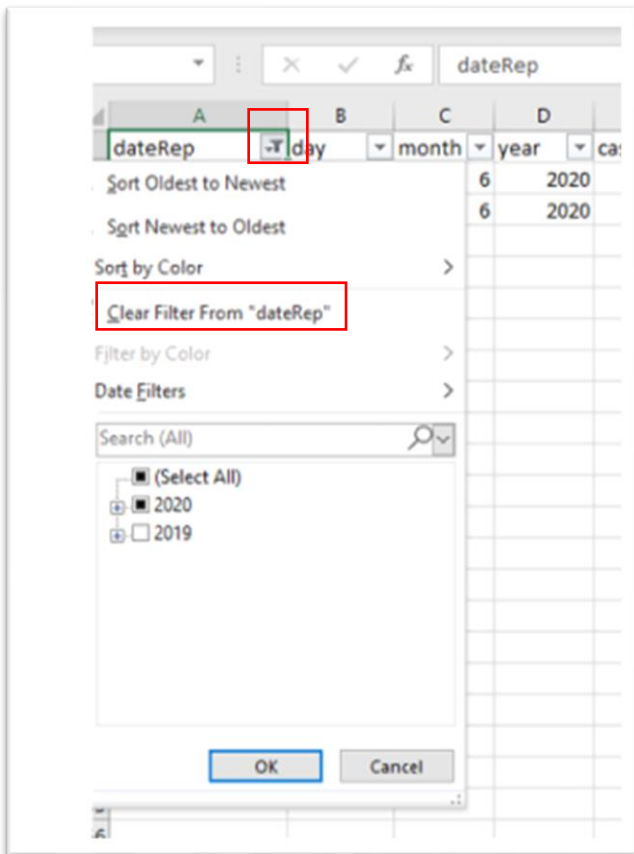
As we explain on page 69 of *The Data Journalist*, “pivot tables are arguably one of the most powerful and useful tools for journalists looking for patterns and stories in data.”

While the table we examined in the first exercise allowed us to use the filter to compare deaths in the United States, Canada and other countries on any given day, we were unable to easily group the countries, and sum the deaths. This can be done with a few clicks of the mouse in a pivot table.

Before creating the pivot table, we must clear the filters we applied in the first exercise to return to the original table.

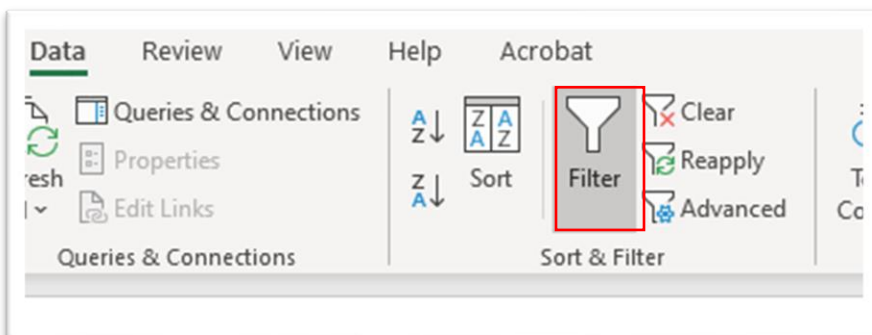
This can be accomplished two ways: clicking on the funnel-like icon the

filtered column and selecting the “Clear” option.



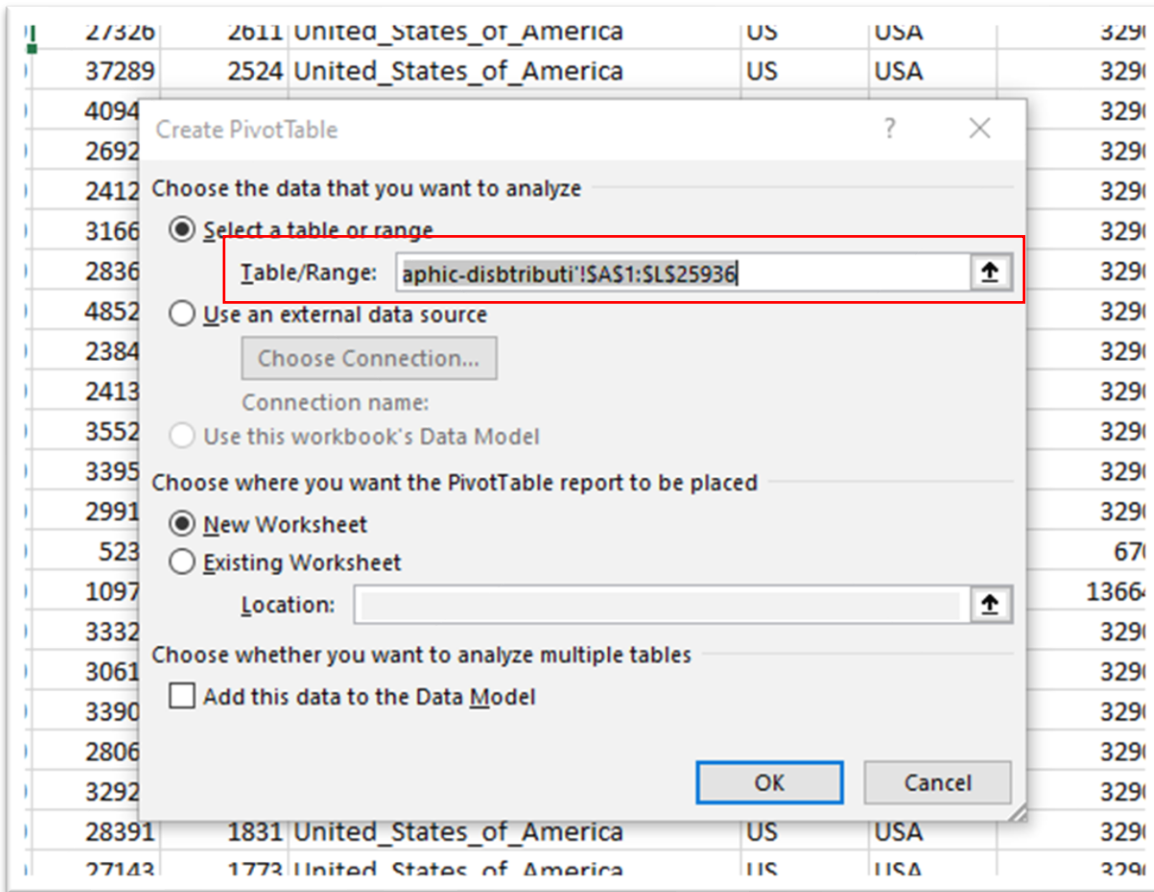
You would repeat this process for any other filtered column.

To lose all the filters simultaneously, click the funnel icon under the menu’s “Data” section.



Once you are back to the original table, place your cursor anywhere inside the table, go to “Insert” in your menu, and the “Pivot table” option. Mac users should find the pivot table option under “Data”.

Selecting the pivot table option produces a “Create Pivot Table” dialog box.



Before we select okay, a few important points to consider.

When creating pivot tables, always pay attention to the cell range to make sure you've captured all the data. The cell-range information is contained in the highlighted box in the screenshot above to the right of "Table/Range."

The "aphic-disbtributi...." is the name of the worksheet that contains the table. The cell references are anchored by dollar signs on either side of the letter in the cell references, and go from \$A\$1, the first cell on the table's top left-hand side to \$L\$25936, the last cell situated at the table's bottom right-hand corner. The dollar signs bracketing the letter

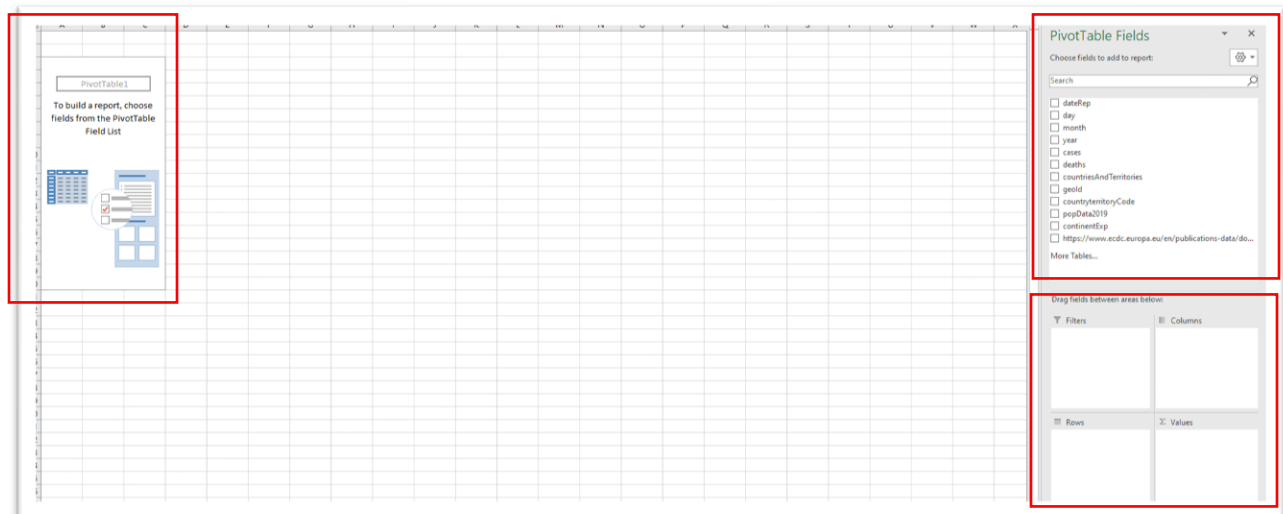
portion of the cell references are “anchors” designed to keep the cells in place.)

Chapter Four of The Data Journalist contains more information on anchors.) It’s important to pay attention to the cell references because there are situations where the dialog box may not capture the entire table, such as when there’s a space in the middle of your table. If this is the case, a spreadsheet stops at the space. In this scenario, your pivot table would only capture a subset of your data, rendering your analysis completely inaccurate. So, always pause and take a moment to analyse before clicking.

Under the next section of our dialog box, there’s a choice between a new worksheet and the existing one. The former is the default position, which it is almost always preferable to accept. We want to create the pivot table in a new worksheet.

Okay, we’re good to go.

Select OK.



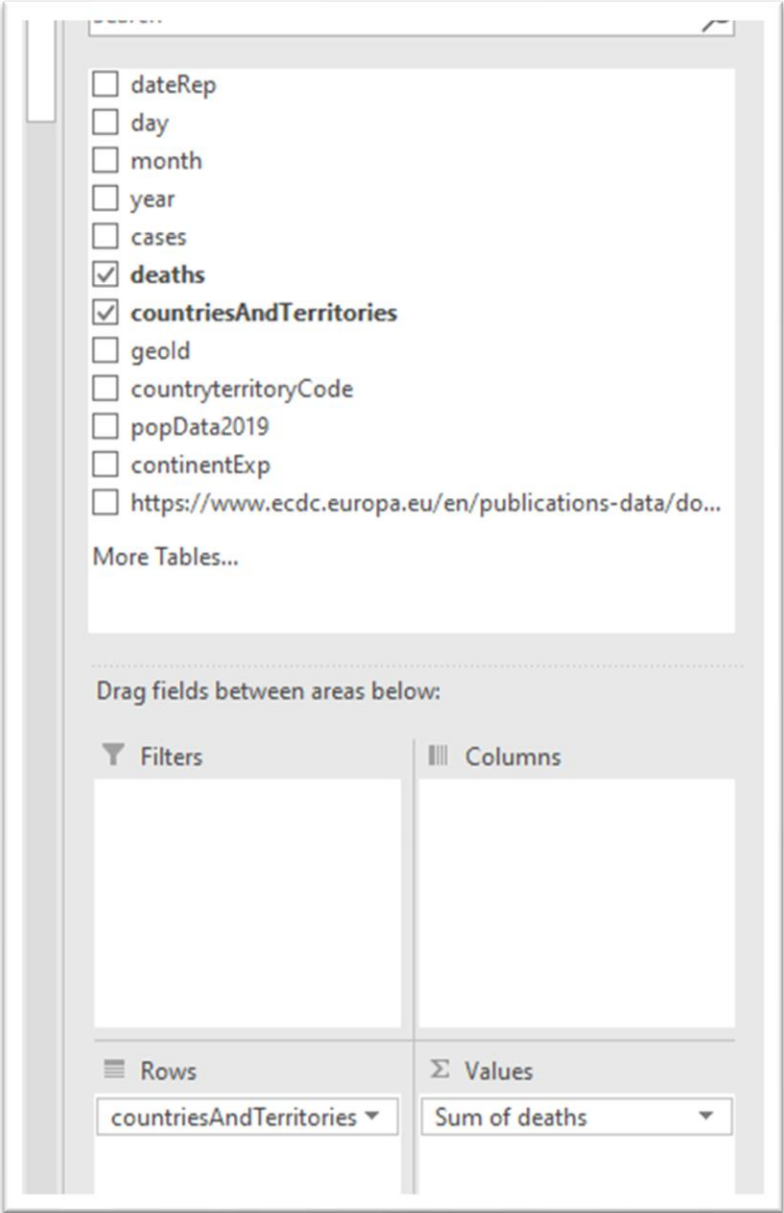
Your pivot table is on the left. The columns that will populate the table are on the right. You create the table by dragging the column titles into one of the four areas in the pane below your field list.

If you have never used a pivot table, it may take a while to get the hang of the concept. So, be patient if you initially struggle to understand. It will eventually make sense if you stick with it.

A good analogy is a deck of cards, which is comprised of colours, suits, numbers. The cards can be arranged in many ways, depending on what you want to find out. If you wanted to make sure that each suit had the correct number of cards, you would group the suits and count them. In the case of a pivot table, the grouping happens in the “Rows” section. Counting happens in the “Values” section.

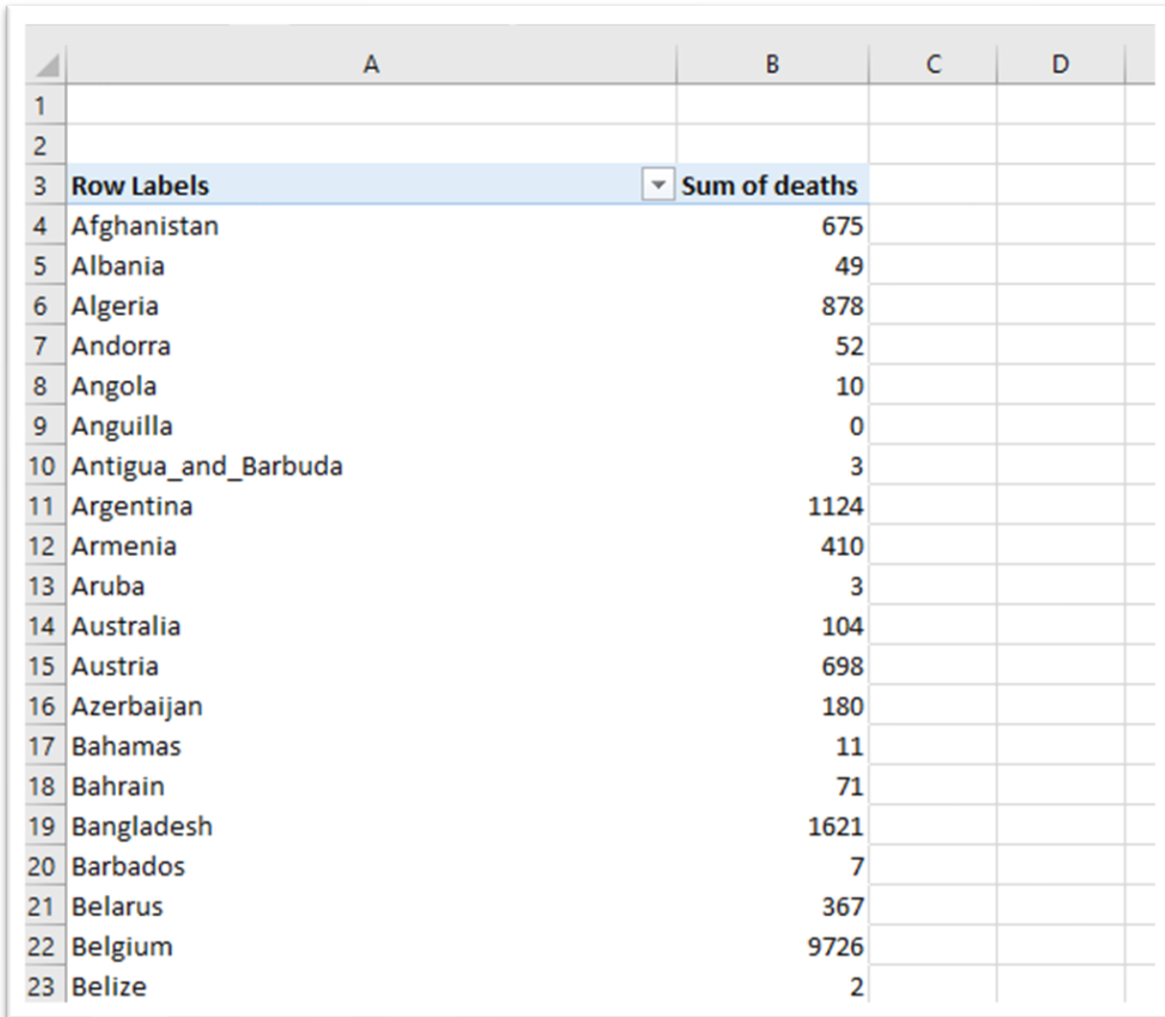
In the case of our table, we might want to know which country has the highest number of deaths. To find this out, we must group the countries and sum the number of deaths.

Drag the “countriesAndTerritories” column into “Rows”, and “deaths”



into “Values.

You can see what that produces in your table to the left.

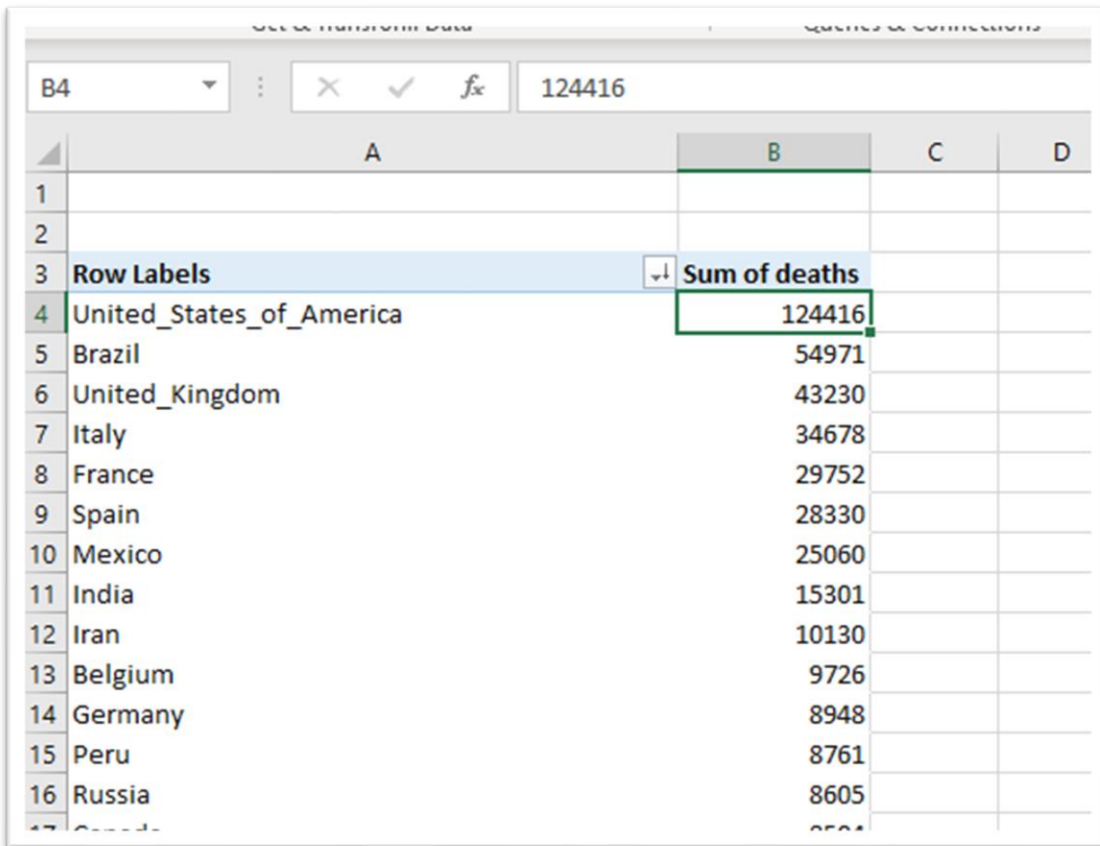


The image shows a screenshot of an Excel pivot table. The table has four columns labeled A, B, C, and D. Row 3 is the header row, with 'Row Labels' in column A and 'Sum of deaths' in column B. The data rows (rows 4-23) list countries in column A and their corresponding sum of deaths in column B. The countries are sorted alphabetically. The sum of deaths for each country is: Afghanistan (675), Albania (49), Algeria (878), Andorra (52), Angola (10), Anguilla (0), Antigua_and_Barbuda (3), Argentina (1124), Armenia (410), Aruba (3), Australia (104), Austria (698), Azerbaijan (180), Bahamas (11), Bahrain (71), Bangladesh (1621), Barbados (7), Belarus (367), Belgium (9726), and Belize (2).

| | A | B | C | D |
|----|---------------------|----------------------|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | Row Labels | Sum of deaths | | |
| 4 | Afghanistan | 675 | | |
| 5 | Albania | 49 | | |
| 6 | Algeria | 878 | | |
| 7 | Andorra | 52 | | |
| 8 | Angola | 10 | | |
| 9 | Anguilla | 0 | | |
| 10 | Antigua_and_Barbuda | 3 | | |
| 11 | Argentina | 1124 | | |
| 12 | Armenia | 410 | | |
| 13 | Aruba | 3 | | |
| 14 | Australia | 104 | | |
| 15 | Austria | 698 | | |
| 16 | Azerbaijan | 180 | | |
| 17 | Bahamas | 11 | | |
| 18 | Bahrain | 71 | | |
| 19 | Bangladesh | 1621 | | |
| 20 | Barbados | 7 | | |
| 21 | Belarus | 367 | | |
| 22 | Belgium | 9726 | | |
| 23 | Belize | 2 | | |

The pivot table has sorted the countries in alphabetical order. To sort the deaths from highest to lowest, select cell under the “Sum of

deaths” title, go do “Data”, and sort in descending order (Z to A).



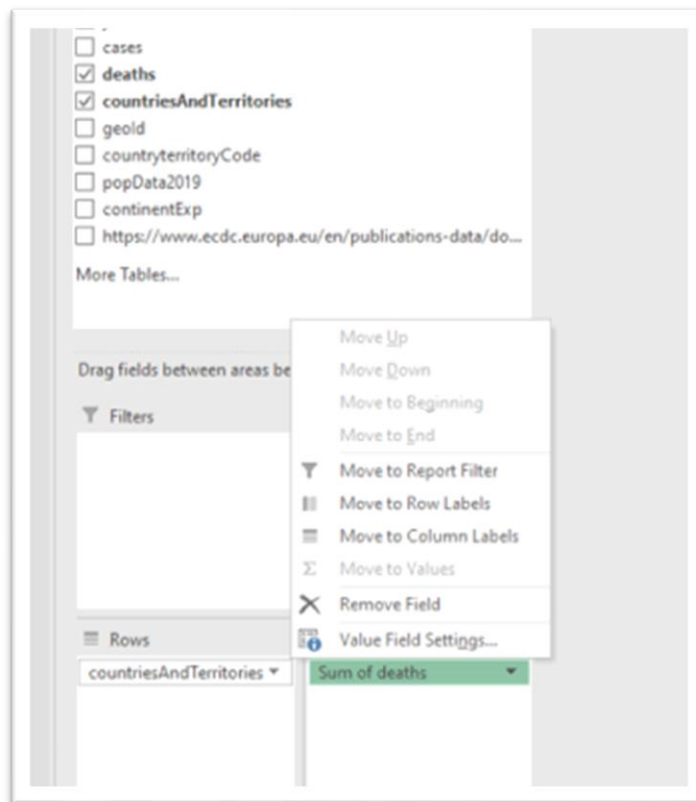
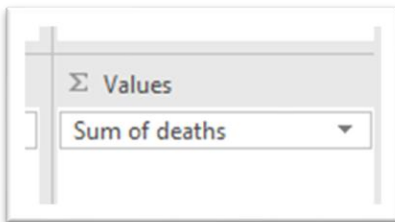
The screenshot shows an Excel spreadsheet with the following data:

| | A | B | C | D |
|----|--------------------------|----------------------|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | Row Labels | Sum of deaths | | |
| 4 | United_States_of_America | 124416 | | |
| 5 | Brazil | 54971 | | |
| 6 | United_Kingdom | 43230 | | |
| 7 | Italy | 34678 | | |
| 8 | France | 29752 | | |
| 9 | Spain | 28330 | | |
| 10 | Mexico | 25060 | | |
| 11 | India | 15301 | | |
| 12 | Iran | 10130 | | |
| 13 | Belgium | 9726 | | |
| 14 | Germany | 8948 | | |
| 15 | Peru | 8761 | | |
| 16 | Russia | 8605 | | |
| 17 | Canada | 8504 | | |

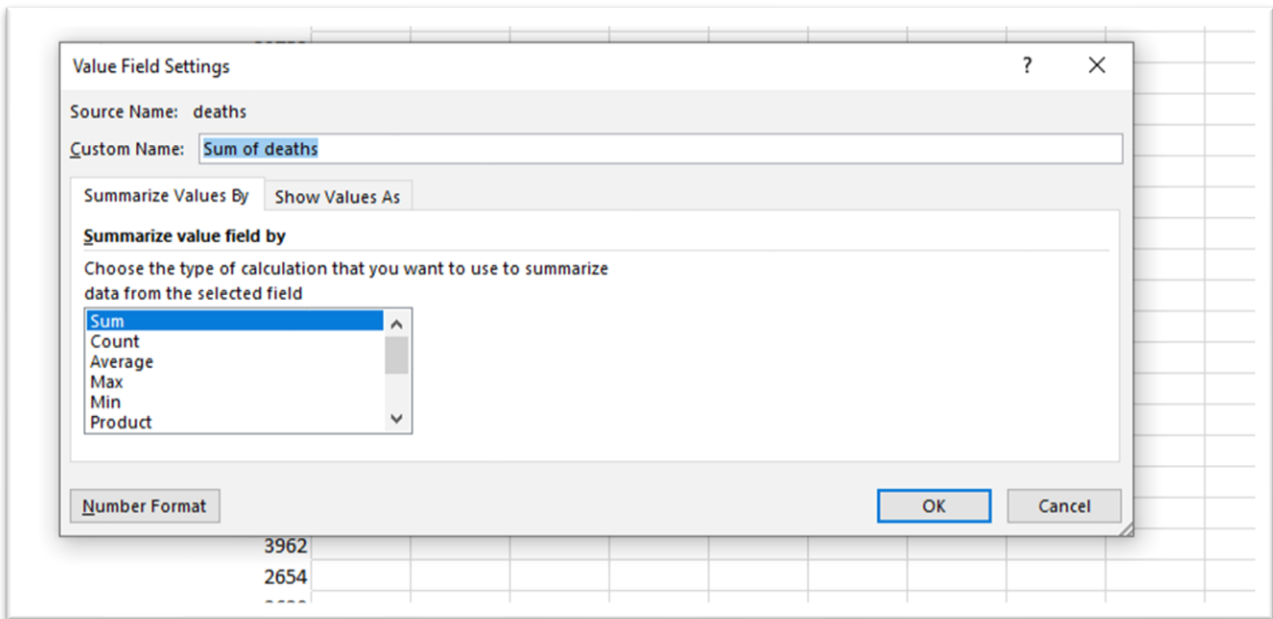
The U.S. tops the list. No huge surprise there.

Add a decimal to the numbers to make them easier to read.

Go back over to the “Values” section and click the downward arrow or caret to the right of “Sum of deaths”.

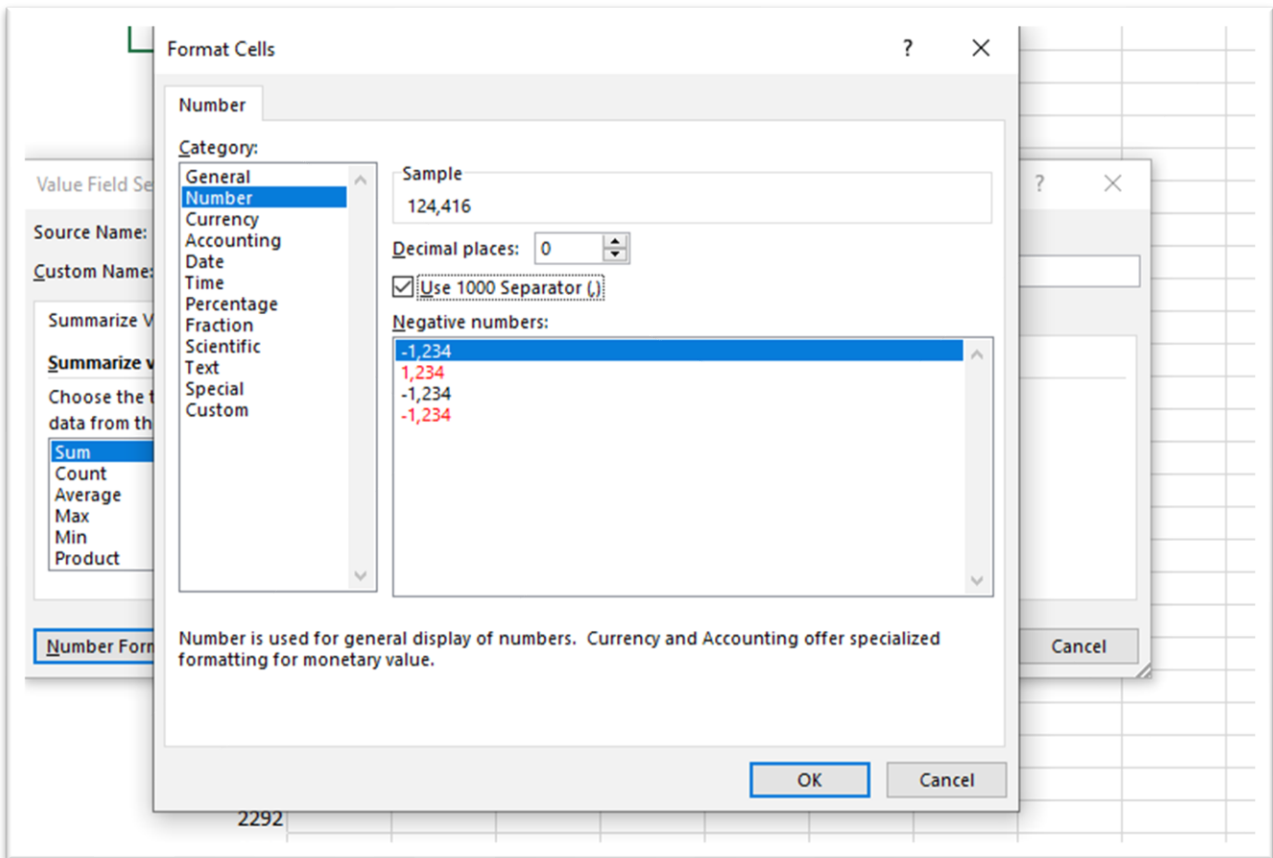


Select “Value Field Settings”. Mac users can click on a similar icon to produce a dialog box like the one in the screen grab below.

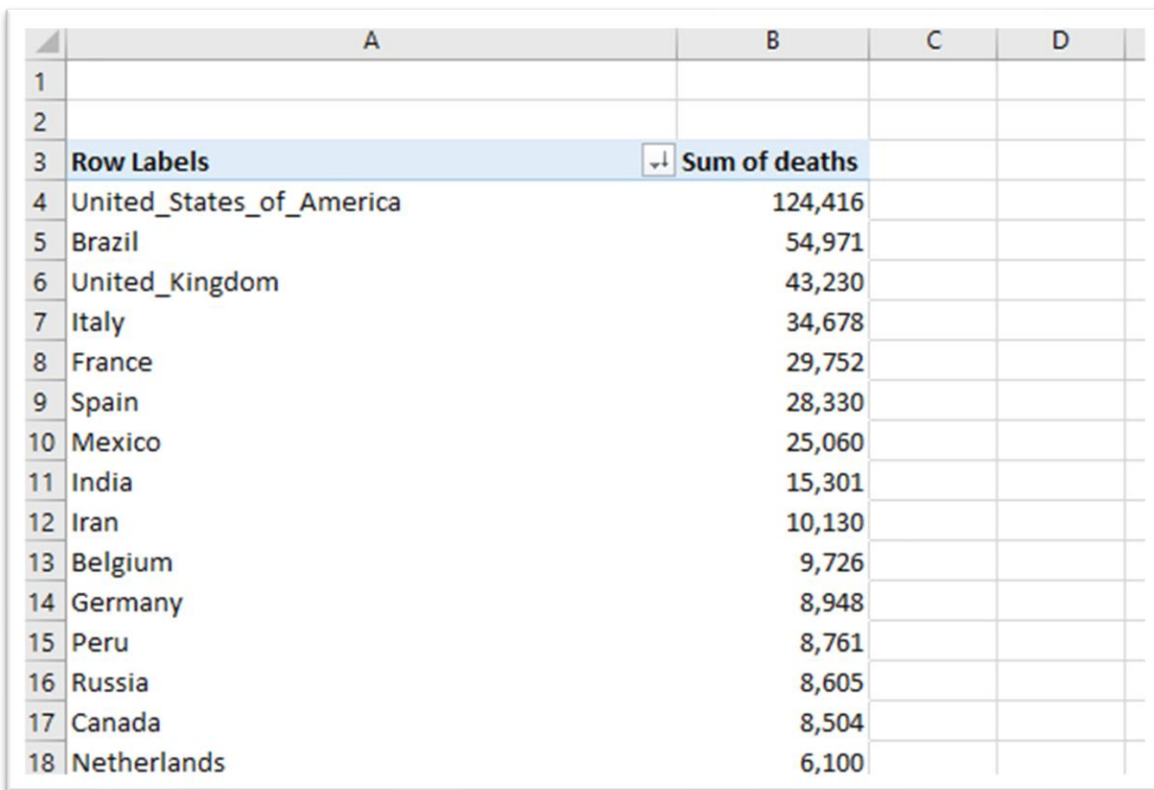


The pivot table has guessed correctly that we want to sum the number of deaths.

To format the number, select the “Number Format” tab.



Select “Number” under category, zero decimal places, check the “Use 1000 Separator” option, and OK.



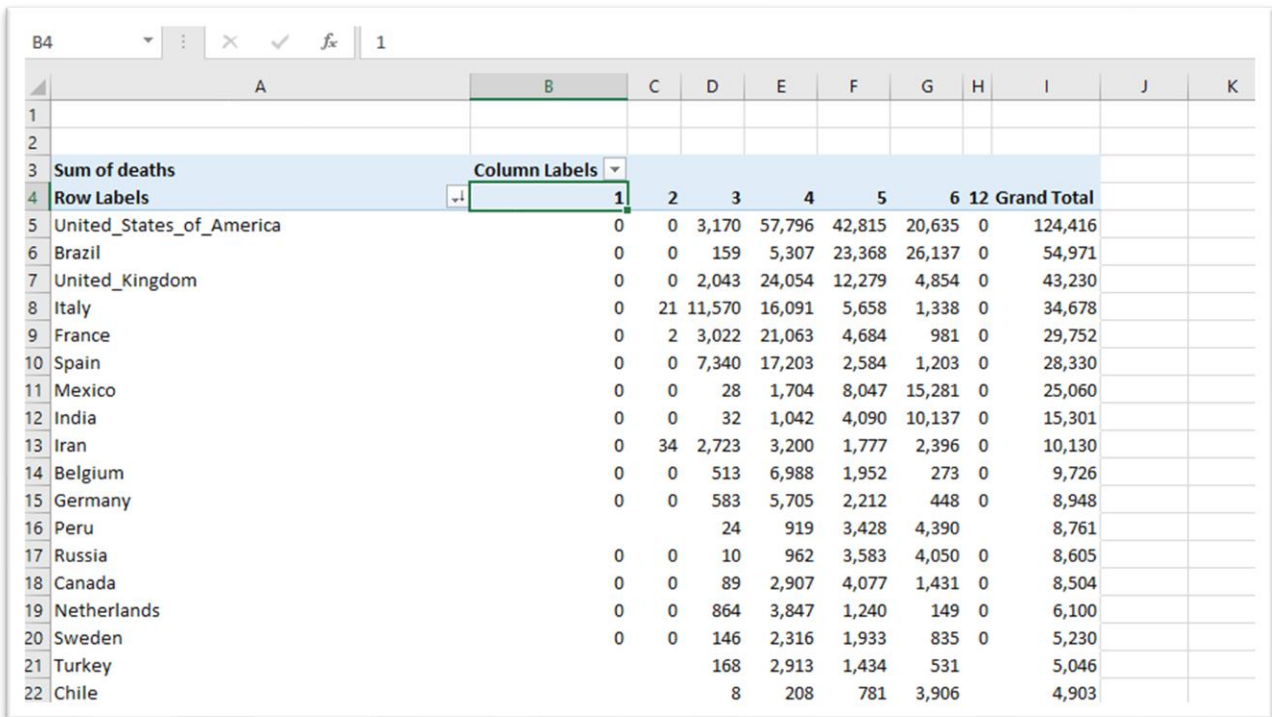
| | A | B | C | D |
|----|--------------------------|---------------|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | Row Labels | Sum of deaths | | |
| 4 | United_States_of_America | 124,416 | | |
| 5 | Brazil | 54,971 | | |
| 6 | United_Kingdom | 43,230 | | |
| 7 | Italy | 34,678 | | |
| 8 | France | 29,752 | | |
| 9 | Spain | 28,330 | | |
| 10 | Mexico | 25,060 | | |
| 11 | India | 15,301 | | |
| 12 | Iran | 10,130 | | |
| 13 | Belgium | 9,726 | | |
| 14 | Germany | 8,948 | | |
| 15 | Peru | 8,761 | | |
| 16 | Russia | 8,605 | | |
| 17 | Canada | 8,504 | | |
| 18 | Netherlands | 6,100 | | |

Much better. Especially if you want to create a visualization such as a bar chart.

Already, we can do much more with this data. For instance, there’s a top-ten list of countries from the U.S. to Belgium. Additionally, you can filter column A to compare individual countries.

But we can also do much more. The “Columns” section allows us to subdivide the data. In this case by month.

Drag the “month” field into “Columns”.



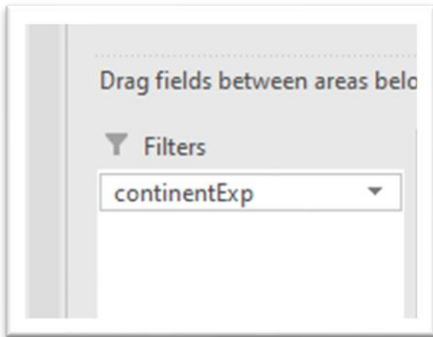
| Row Labels | 1 | 2 | 3 | 4 | 5 | 6 | 12 | Grand Total |
|--------------------------|---|----|--------|--------|--------|--------|----|-------------|
| United_States_of_America | 0 | 0 | 3,170 | 57,796 | 42,815 | 20,635 | 0 | 124,416 |
| Brazil | 0 | 0 | 159 | 5,307 | 23,368 | 26,137 | 0 | 54,971 |
| United_Kingdom | 0 | 0 | 2,043 | 24,054 | 12,279 | 4,854 | 0 | 43,230 |
| Italy | 0 | 21 | 11,570 | 16,091 | 5,658 | 1,338 | 0 | 34,678 |
| France | 0 | 2 | 3,022 | 21,063 | 4,684 | 981 | 0 | 29,752 |
| Spain | 0 | 0 | 7,340 | 17,203 | 2,584 | 1,203 | 0 | 28,330 |
| Mexico | 0 | 0 | 28 | 1,704 | 8,047 | 15,281 | 0 | 25,060 |
| India | 0 | 0 | 32 | 1,042 | 4,090 | 10,137 | 0 | 15,301 |
| Iran | 0 | 34 | 2,723 | 3,200 | 1,777 | 2,396 | 0 | 10,130 |
| Belgium | 0 | 0 | 513 | 6,988 | 1,952 | 273 | 0 | 9,726 |
| Germany | 0 | 0 | 583 | 5,705 | 2,212 | 448 | 0 | 8,948 |
| Peru | | | 24 | 919 | 3,428 | 4,390 | | 8,761 |
| Russia | 0 | 0 | 10 | 962 | 3,583 | 4,050 | 0 | 8,605 |
| Canada | 0 | 0 | 89 | 2,907 | 4,077 | 1,431 | 0 | 8,504 |
| Netherlands | 0 | 0 | 864 | 3,847 | 1,240 | 149 | 0 | 6,100 |
| Sweden | 0 | 0 | 146 | 2,316 | 1,933 | 835 | 0 | 5,230 |
| Turkey | | | 168 | 2,913 | 1,434 | 531 | | 5,046 |
| Chile | | | 8 | 208 | 781 | 3,906 | | 4,903 |

The numbers 1 to 6 are January to June 26. December is represented by the number 12. If you were going to visualize this table, you would have to replace the numbers with month names. But this is good enough for our analysis. Subdividing by month conveys more information. April seemed to be the deadliest month for many countries.

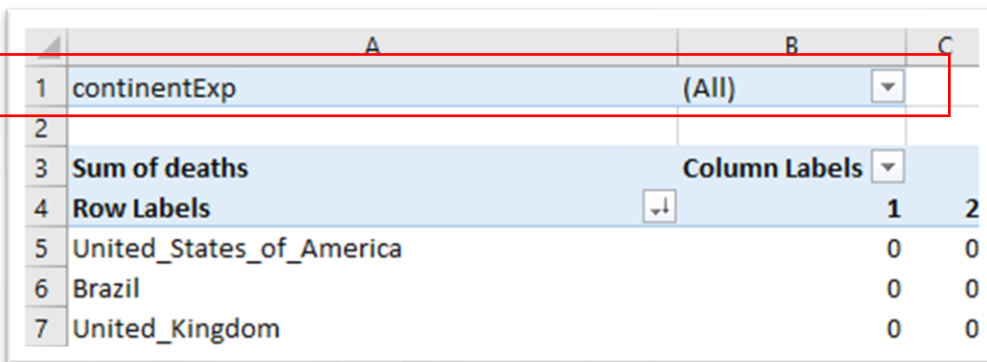
Countries like Sweden with relatively small populations are high on the list, which begs questions about their containment policies.

You can also use the filter to limit your selection to countries in a specific region.

Drag "continentExp" into "Filters."

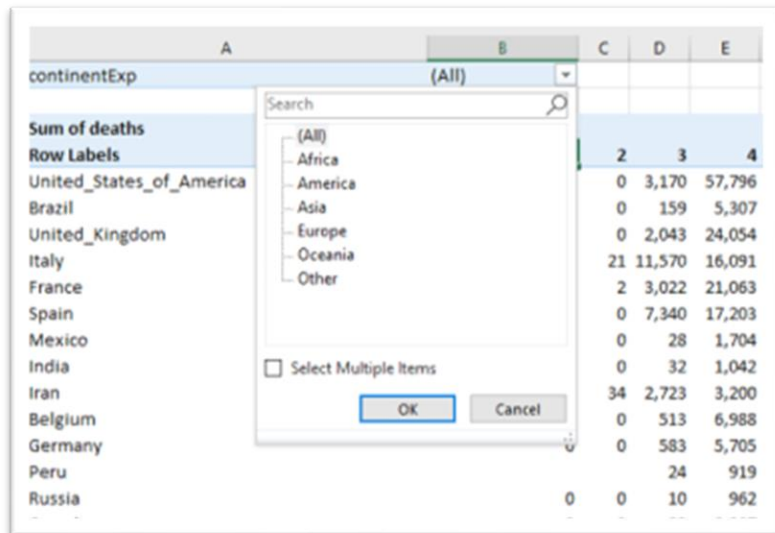


This produces a new section in your pivot table.



A screenshot of a PivotTable. The table has columns A, B, and C. Row 1 is the filter section, with "continentExp" in column A and "(All)" in column B. Row 2 is empty. Row 3 is the "Sum of deaths" section, with "Sum of deaths" in column A and "Column Labels" in column B. Row 4 is the "Row Labels" section, with "Row Labels" in column A, a downward arrow in column B, and "1" and "2" in columns C and D. Rows 5-7 show data for "United_States_of_America", "Brazil", and "United_Kingdom" respectively, with values 0 in column C and 0 in column D.

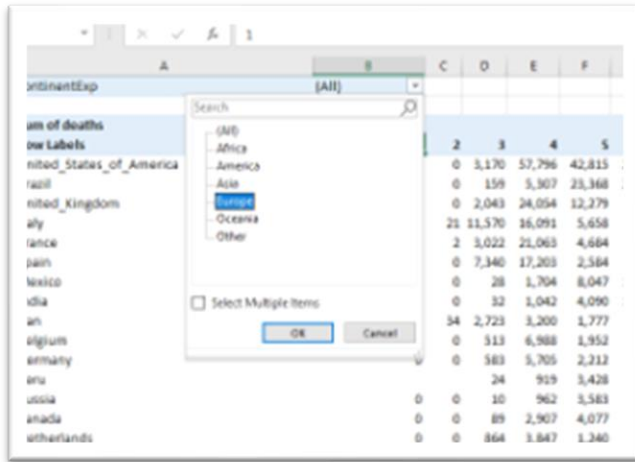
Select the arrow to obtain the drop-down menu.



A screenshot of the PivotTable with the "continentExp" dropdown menu open. The menu is titled "Search" and contains a list of options: "(All)", "Africa", "America", "Asia", "Europe", "Oceania", and "Other". There is a search box at the top of the menu and a "Select Multiple Items" checkbox at the bottom. The "OK" button is highlighted. The background shows the same PivotTable as in the previous image, but with the dropdown menu open over it.

You can select one or many.

Choose Europe.



| | A | B | C | D | E | F | G | H | I | J |
|----|----------------|---------------|---|----|--------|--------|--------|-------|----|-------------|
| 1 | continentExp | Europe | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | Sum of deaths | Column Labels | | | | | | | | |
| 4 | Row Labels | | 1 | 2 | 3 | 4 | 5 | 6 | 12 | Grand Total |
| 5 | United_Kingdom | | 0 | 0 | 2,043 | 24,054 | 12,279 | 4,854 | 0 | 43,230 |
| 6 | Italy | | 0 | 21 | 11,570 | 16,091 | 5,658 | 1,338 | 0 | 34,678 |
| 7 | France | | 0 | 2 | 3,022 | 21,063 | 4,684 | 981 | 0 | 29,752 |
| 8 | Spain | | 0 | 0 | 7,340 | 17,203 | 2,584 | 1,203 | 0 | 28,330 |
| 9 | Belgium | | 0 | 0 | 513 | 6,988 | 1,952 | 273 | 0 | 9,726 |
| 10 | Germany | | 0 | 0 | 583 | 5,705 | 2,212 | 448 | 0 | 8,948 |
| 11 | Russia | | 0 | 0 | 10 | 962 | 3,583 | 4,050 | 0 | 8,605 |
| 12 | Netherlands | | 0 | 0 | 864 | 3,847 | 1,240 | 149 | 0 | 6,100 |
| 13 | Sweden | | 0 | 0 | 146 | 2,316 | 1,933 | 835 | 0 | 5,230 |
| 14 | Ireland | | 0 | 0 | 54 | 1,136 | 460 | 77 | 0 | 1,727 |
| 15 | Switzerland | | 0 | 0 | 295 | 1,112 | 249 | 25 | 0 | 1,681 |
| 16 | Romania | | 0 | 0 | 44 | 631 | 578 | 312 | 0 | 1,565 |
| 17 | Portugal | | | | 140 | 849 | 407 | 153 | | 1,549 |
| 18 | Poland | | | | 31 | 593 | 437 | 351 | | 1,412 |
| 19 | Ukraine | | | | 11 | 239 | 446 | 371 | | 1,067 |
| 20 | Austria | | 0 | 0 | 108 | 472 | 88 | 30 | 0 | 698 |
| 21 | Denmark | | 0 | 0 | 77 | 366 | 128 | 32 | 0 | 603 |
| 22 | Hungary | | | | 16 | 296 | 212 | 53 | | 577 |

The U.K. comes out on top. Sweden move up from 20th place on the unfiltered list to 13th place on this one.

The nice thing about pivot tables, is you can create as many of them as you want.

The easiest two to do this is select the entire table and paste it into another worksheet by selecting a “worksheet” tab at the bottom of the table. You can create a new tab by either selecting a generically labeled sheet tab (“Sheet 2,3, etc”), or if you run out of sheets, the plus “+” sign.

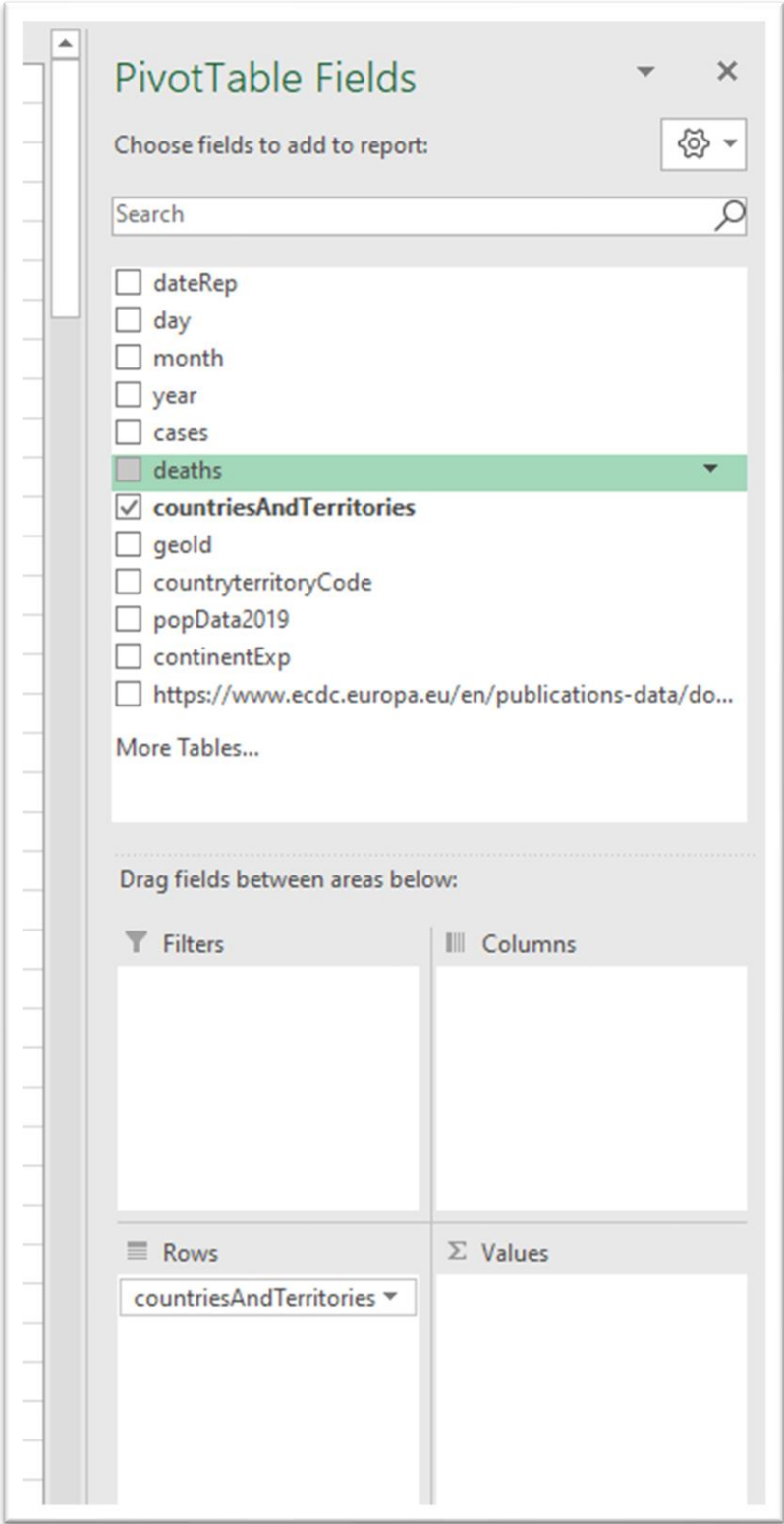
Once you’re in a new worksheet, you can perform a different analysis, for example dragging “deaths” out of the values column and replacing it with “cases”. You will have to reformat the numbers and re-sort the “Grand Total” column.

As we mentioned in the previous tutorial, these numbers are illuminating, but more meaningful comparisons between countries are best illustrated by calculating rates: that is, the number of deaths divided by the population and multiplied by 100,000 to obtain a rate of frequency of deaths for every 100,000 people. Rates are common. In addition to death rate, think of birth rate, homicide rate, etc.

Create a third pivot table, using the technique described above.

In this pivot table, we will create two columns: A sum of deaths and a maximum population number for each country.

Remove all the columns from the Pivot Table Fields box's lower panel except for "countriesAndTerritories."

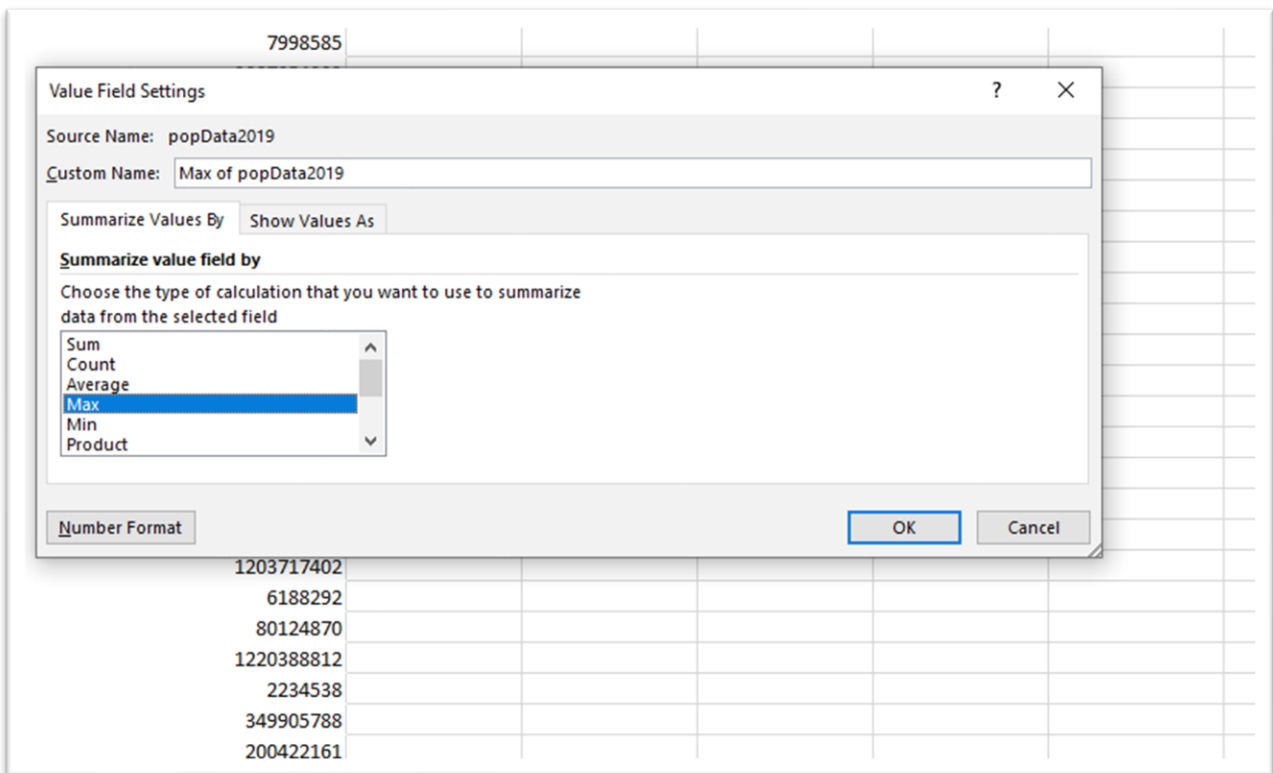


Add “popData2019” to Values.

| | A | B | C | D |
|----|---------------------|--------------------|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | Row Labels | Sum of popData2019 | | |
| 4 | Afghanistan | 6429056933 | | |
| 5 | Albania | 314866970 | | |
| 6 | Algeria | 7491231396 | | |
| 7 | Andorra | 7998585 | | |
| 8 | Angola | 3087054003 | | |
| 9 | Anguilla | 1368224 | | |
| 10 | Antigua_and_Barbuda | 9614385 | | |
| 11 | Argentina | 5015435600 | | |
| 12 | Armenia | 502813760 | | |
| 13 | Aruba | 10205760 | | |
| 14 | Australia | 4511372800 | | |
| 15 | Austria | 1585720725 | | |
| 16 | Azerbaijan | 1728207668 | | |
| 17 | Bahamas | 39338086 | | |
| 18 | Bahrain | 292127192 | | |

Clearly, Afghanistan does not have six billion people. So, what’s going on? You will recall that during our interviewing process when we first imported the data, we noticed that each row represented a daily snapshot, which included the population count. While it makes sense to sum all the deaths, or cases to get a total for the time period in question (Dec 31, 2019, to June 26, 2020), it makes no sense to sum the population counts for each daily entry. We only need one population count. To obtain this result, we must trick the pivot table.

Click the same downward arrow in the “Values” section we used to reformat the numbers.



Here what we have done is change the selection from “SUM” to “Max.” Since we know that the daily population entry is the same for each country, the Max will provide one, accurate number. We could also use “Average.” Once again, if you’re still struggling to understand this, not to worry. It will make more sense once you become more familiar with pivot tables.

Also be sure to format your population numbers by adding a comma.

The image shows an Excel spreadsheet with a pivot table. The pivot table has a field named 'Sum of popData2019' and a summary function of 'Max'. The 'Format Cells' dialog box is open, showing the 'Number' category selected. The 'Use 1000 Separator' checkbox is checked. The 'Negative numbers' list shows '-1,234' selected. The background spreadsheet shows the following data:

| Source Name | Sum of popData2019 |
|-------------|--------------------|
| 2234538 | |
| 349905788 | |
| 2234538 | |

| A3 | | | |
|------------|---------------------|---------------------------|---|
| Row Labels | | | |
| | A | B | C |
| 1 | | | |
| 2 | | | |
| 3 | Row Labels | Max of popData2019 | |
| 4 | Afghanistan | 38,041,757 | |
| 5 | Albania | 2,862,427 | |
| 6 | Algeria | 43,053,054 | |
| 7 | Andorra | 76,177 | |
| 8 | Angola | 31,825,299 | |
| 9 | Anguilla | 14,872 | |
| 10 | Antigua_and_Barbuda | 97,115 | |
| 11 | Argentina | 44,780,675 | |
| 12 | Armenia | 2,957,728 | |
| 13 | Aruba | 106,310 | |
| 14 | Australia | 25,203,200 | |
| 15 | Austria | 8,858,775 | |
| 16 | Azerbaijan | 10,047,719 | |
| 17 | Bahamas | 389,486 | |
| 18 | Bahrain | 1,641,164 | |
| 19 | Bangladesh | 163,046,173 | |
| 20 | Barbados | 287,021 | |
| 21 | Belarus | 9,452,409 | |
| 22 | Belgium | 11,455,519 | |
| 23 | Belize | 390,351 | |
| 24 | Benin | 11,801,151 | |

Much better. Afghanistan has a population of just over 38 million. Canada's is about 37.4 million.

| | | | |
|----|--|---------------|------|
| 29 | Bosnia_and_Herzegovina | 3,300,998 | |
| 30 | Botswana | 2,303,703 | |
| 31 | Brazil | 211,049,519 | |
| 32 | British_Virgin_Islands | 30,033 | |
| 33 | Brunei_Darussalam | 433,296 | |
| 34 | Bulgaria | 7,000,039 | |
| 35 | Burkina_Faso | 20,321,383 | |
| 36 | Burundi | 11,530,577 | |
| 37 | Cambodia | 16,486,542 | |
| 38 | Cameroon | 25,876,387 | |
| 39 | Canada | 37,411,038 | |
| 40 | Cape_Verde | 549,936 | |
| 41 | Cases_on_an_international_conveyance_Japan | | |
| 42 | Cayman_Islands | 64,948 | |
| 43 | Central_African_Republic | 4,745,179 | |
| 44 | Chad | 15,946,882 | |
| 45 | Chile | 18,952,035 | |
| 46 | China | 1,433,783,692 | |
| 47 | Colombia | 50,339,443 | |
| -- | - | ---- | ---- |

If you want to verify the population numbers, return to your main worksheet to see the population entry for the country in question. Or you could simply click the population number in column A which produces a new table containing the rows that comprise that number.

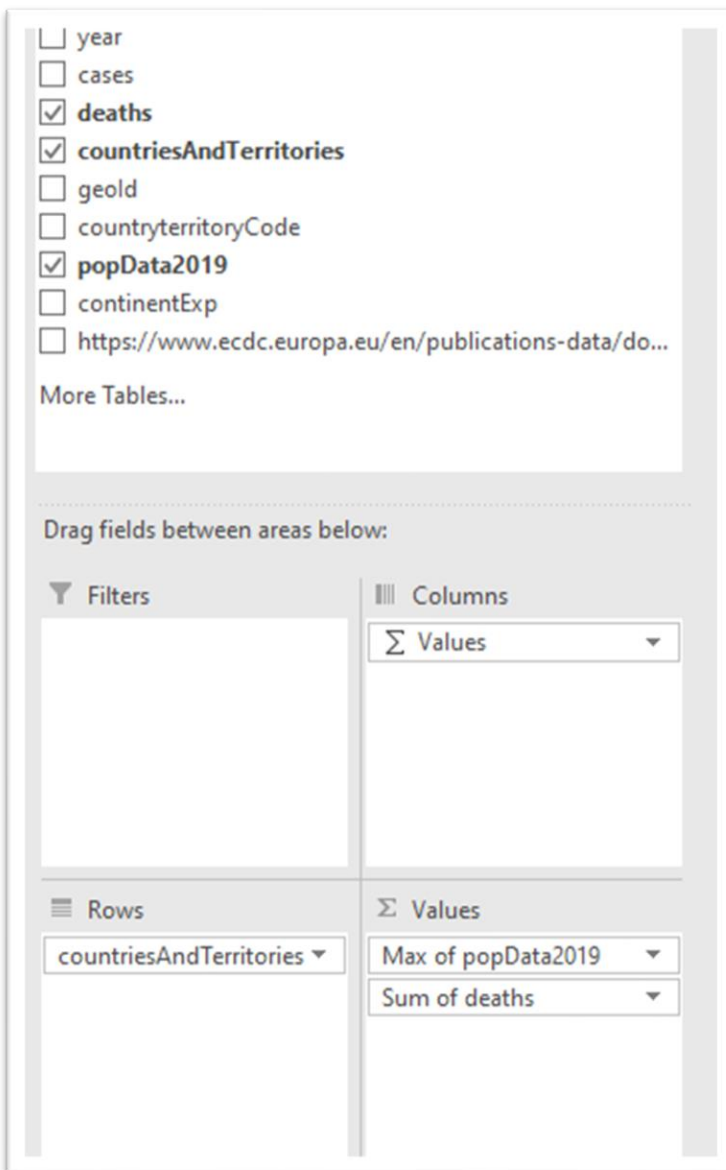
| | | | |
|---|--|------------|--|
| 6 | Burundi | 11,530,577 | |
| 7 | Cambodia | 16,486,542 | |
| 8 | Cameroon | 25,876,387 | |
| 9 | Canada | 37,411,038 | |
| 0 | Cape_Verde | 549,936 | |
| 1 | Cases_on_an_international_conveyance_Japan | | |
| 2 | Cayman_Islands | 64,948 | |
| 3 | Central_African_Republic | 4,745,179 | |
| 4 | Chad | 15,946,882 | |
| 5 | Chile | 18,952,035 | |

| dateRep | day | month | year | cases | deaths | countriesAndTerritories | geoid | countryterritoryCode | popData2019 | continentExp | https://www.ecdc.europa.eu/en/public |
|------------|-----|-------|------|-------|--------|-------------------------|-------|----------------------|-------------|--------------|--------------------------------------|
| 2020-03-16 | 16 | 3 | 2020 | 60 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-15 | 15 | 3 | 2020 | 68 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-14 | 14 | 3 | 2020 | 38 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-13 | 13 | 3 | 2020 | 35 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-12 | 12 | 3 | 2020 | 10 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-11 | 11 | 3 | 2020 | 16 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-09 | 9 | 3 | 2020 | 5 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-08 | 8 | 3 | 2020 | 6 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-07 | 7 | 3 | 2020 | 6 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-06 | 6 | 3 | 2020 | 12 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-05 | 5 | 3 | 2020 | 3 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-04 | 4 | 3 | 2020 | 3 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-03 | 3 | 3 | 2020 | 3 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-02 | 2 | 3 | 2020 | 4 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-03-01 | 1 | 3 | 2020 | 4 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-02-29 | 29 | 2 | 2020 | 2 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-02-28 | 28 | 2 | 2020 | 2 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-02-27 | 27 | 2 | 2020 | 1 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-02-26 | 26 | 2 | 2020 | 0 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-02-25 | 25 | 2 | 2020 | 2 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-02-24 | 24 | 2 | 2020 | 0 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-02-23 | 23 | 2 | 2020 | 0 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-02-22 | 22 | 2 | 2020 | 0 | 0 | Canada | CA | CAN | 37411038 | America | |
| 2020-02-21 | 21 | 2 | 2020 | 1 | 0 | Canada | CA | CAN | 37411038 | America | |

All the population numbers are the same. You can also use these tables for further analysis. But for the purposes of this tutorial, we'll keep going with the task at hand. You can delete this worksheet.

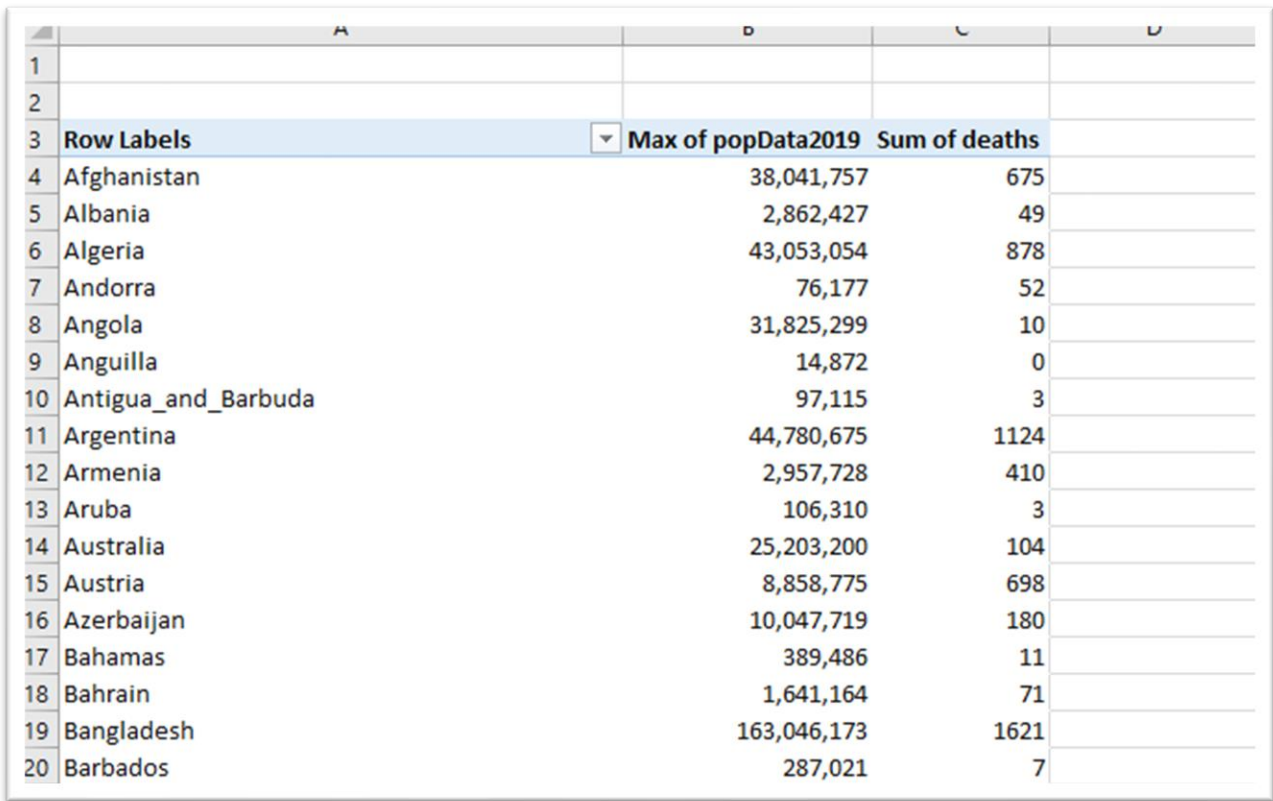
Return to the pivot table and scroll to the top.

Add deaths by dragging the “deaths” column into “Values,” which will create a second column.



Although we placed deaths in the Values section, the pivot table also recognizes it as a column for the AGGREGATE death totals for each

country.



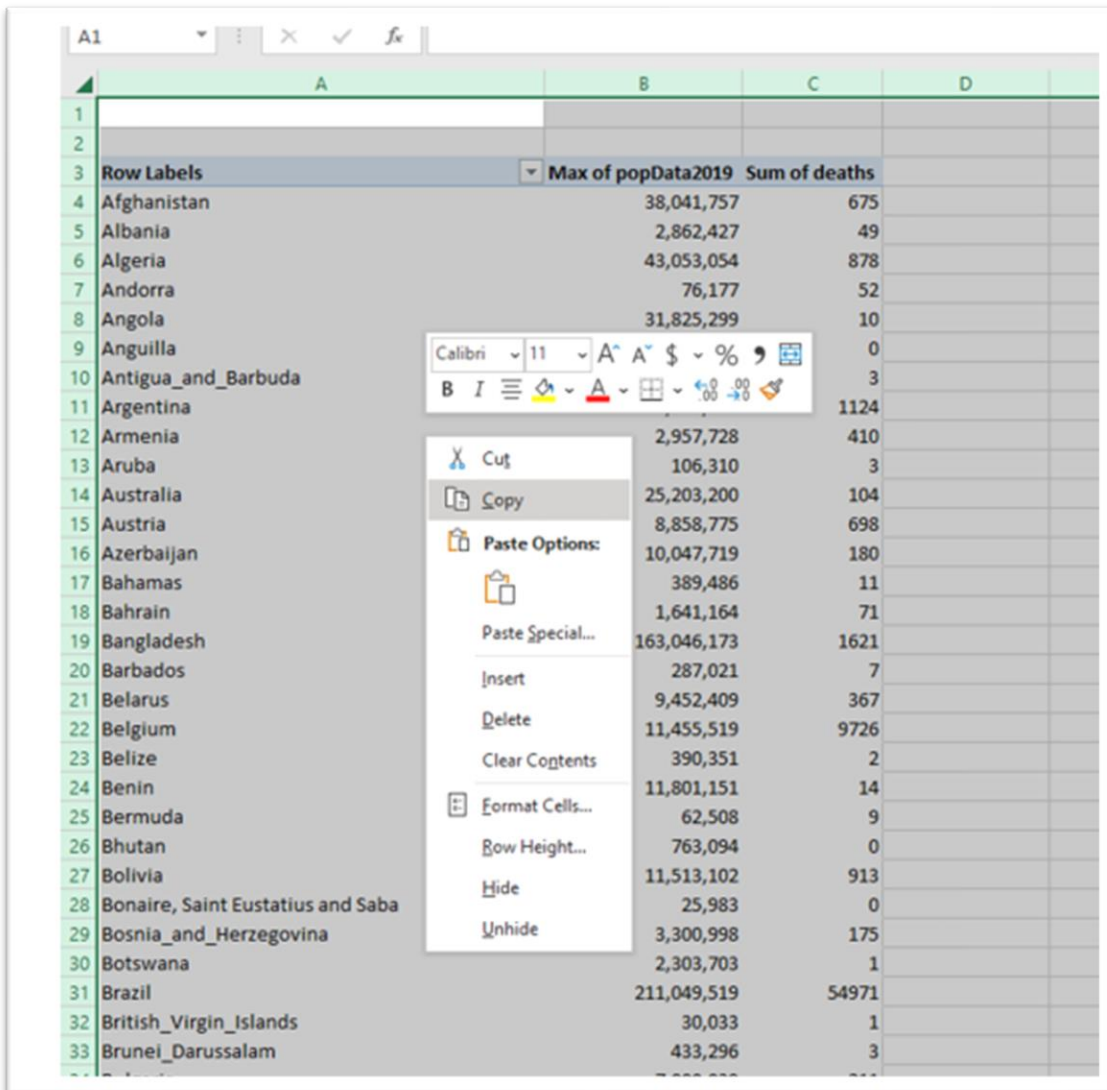
The image shows a screenshot of an Excel pivot table. The pivot table is structured with 'Row Labels' in column A, 'Max of popData2019' in column B, and 'Sum of deaths' in column C. The data rows list 20 countries from Afghanistan to Barbados, with their respective population and death counts.

| Row Labels | Max of popData2019 | Sum of deaths |
|---------------------|--------------------|---------------|
| Afghanistan | 38,041,757 | 675 |
| Albania | 2,862,427 | 49 |
| Algeria | 43,053,054 | 878 |
| Andorra | 76,177 | 52 |
| Angola | 31,825,299 | 10 |
| Anguilla | 14,872 | 0 |
| Antigua_and_Barbuda | 97,115 | 3 |
| Argentina | 44,780,675 | 1124 |
| Armenia | 2,957,728 | 410 |
| Aruba | 106,310 | 3 |
| Australia | 25,203,200 | 104 |
| Austria | 8,858,775 | 698 |
| Azerbaijan | 10,047,719 | 180 |
| Bahamas | 389,486 | 11 |
| Bahrain | 1,641,164 | 71 |
| Bangladesh | 163,046,173 | 1621 |
| Barbados | 287,021 | 7 |

Do not drag deaths directly into the Columns sections because the pivot table will attempt to create a SEPARATE column for each of the thousands of deaths and potentially crash your computer.

We will calculate the death rate in a separate worksheet.

Select and copy this entire table.

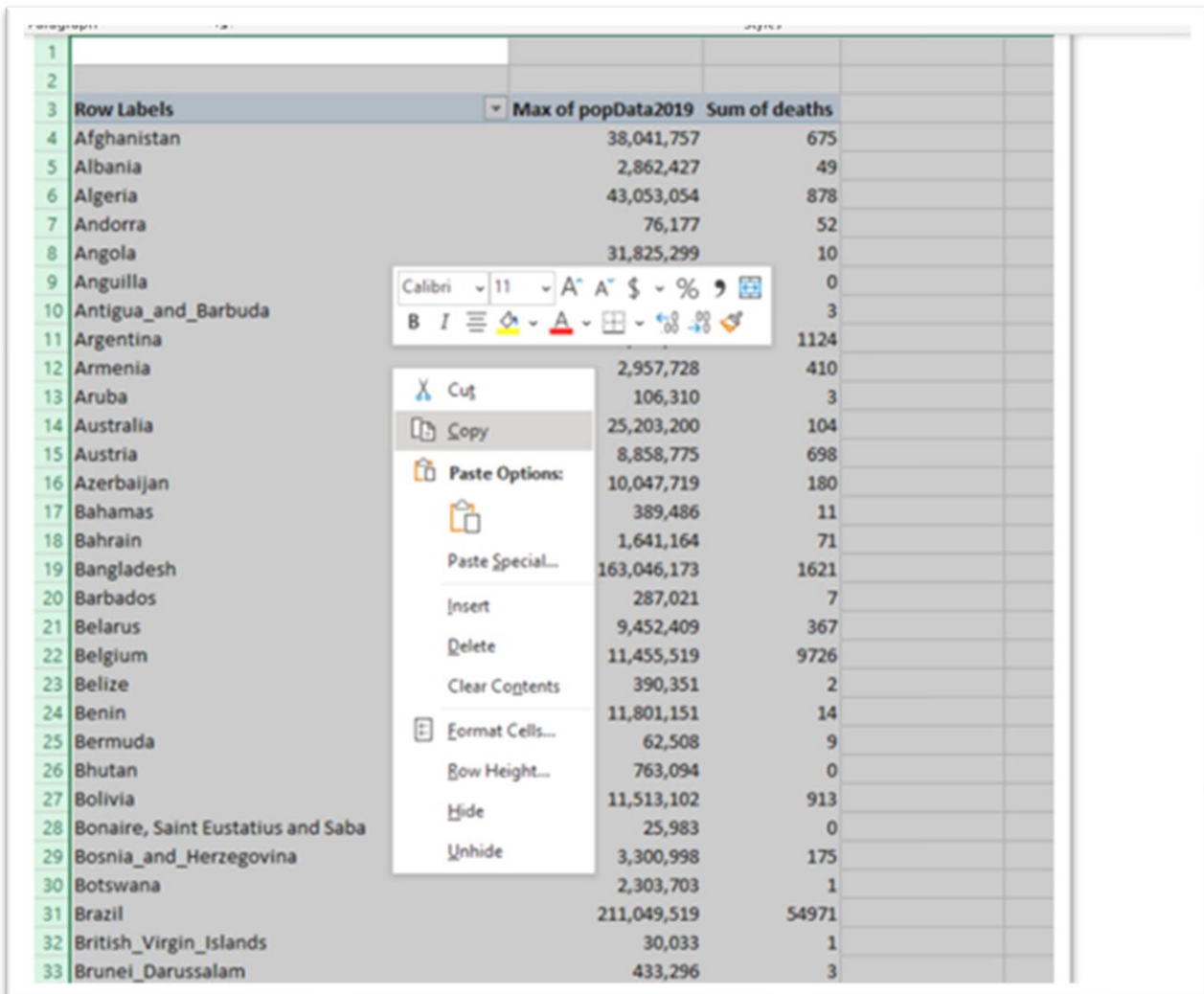


The screenshot shows an Excel spreadsheet with a table of data. The table has three columns: 'Row Labels', 'Max of popData2019', and 'Sum of deaths'. The rows list various countries from Afghanistan to Brunei_Darussalam. A context menu is open over the table, showing options like Cut, Copy, Paste Options, Paste Special..., Insert, Delete, Clear Contents, Format Cells..., Row Height..., Hide, and Unhide. The 'Copy' option is highlighted.

| Row Labels | Max of popData2019 | Sum of deaths |
|-----------------------------------|--------------------|---------------|
| Afghanistan | 38,041,757 | 675 |
| Albania | 2,862,427 | 49 |
| Algeria | 43,053,054 | 878 |
| Andorra | 76,177 | 52 |
| Angola | 31,825,299 | 10 |
| Anguilla | | 0 |
| Antigua_and_Barbuda | | 3 |
| Argentina | | 1124 |
| Armenia | 2,957,728 | 410 |
| Aruba | 106,310 | 3 |
| Australia | 25,203,200 | 104 |
| Austria | 8,858,775 | 698 |
| Azerbaijan | 10,047,719 | 180 |
| Bahamas | 389,486 | 11 |
| Bahrain | 1,641,164 | 71 |
| Bangladesh | 163,046,173 | 1621 |
| Barbados | 287,021 | 7 |
| Belarus | 9,452,409 | 367 |
| Belgium | 11,455,519 | 9726 |
| Belize | 390,351 | 2 |
| Benin | 11,801,151 | 14 |
| Bermuda | 62,508 | 9 |
| Bhutan | 763,094 | 0 |
| Bolivia | 11,513,102 | 913 |
| Bonaire, Saint Eustatius and Saba | 25,983 | 0 |
| Bosnia_and_Herzegovina | 3,300,998 | 175 |
| Botswana | 2,303,703 | 1 |
| Brazil | 211,049,519 | 54971 |
| British_Virgin_Islands | 30,033 | 1 |
| Brunei_Darussalam | 433,296 | 3 |

Select a new worksheet

We will use the “paste special” option.



The screenshot shows an Excel spreadsheet with a table of data. The table has three columns: 'Row Labels', 'Max of popData2019', and 'Sum of deaths'. The rows list various countries and territories. A context menu is open over the table, showing options like Cut, Copy, Paste Options, Paste Special..., Insert, Delete, Clear Contents, Format Cells..., Row Height..., Hide, and Unhide. The 'Paste Special...' option is highlighted.

| Row Labels | Max of popData2019 | Sum of deaths |
|-----------------------------------|--------------------|---------------|
| Afghanistan | 38,041,757 | 675 |
| Albania | 2,862,427 | 49 |
| Algeria | 43,053,054 | 878 |
| Andorra | 76,177 | 52 |
| Angola | 31,825,299 | 10 |
| Anguilla | | 0 |
| Antigua_and_Barbuda | | 3 |
| Argentina | | 1124 |
| Armenia | 2,957,728 | 410 |
| Aruba | 106,310 | 3 |
| Australia | 25,203,200 | 104 |
| Austria | 8,858,775 | 698 |
| Azerbaijan | 10,047,719 | 180 |
| Bahamas | 389,486 | 11 |
| Bahrain | 1,641,164 | 71 |
| Bangladesh | 163,046,173 | 1621 |
| Barbados | 287,021 | 7 |
| Belarus | 9,452,409 | 367 |
| Belgium | 11,455,519 | 9726 |
| Belize | 390,351 | 2 |
| Benin | 11,801,151 | 14 |
| Bermuda | 62,508 | 9 |
| Bhutan | 763,094 | 0 |
| Bolivia | 11,513,102 | 913 |
| Bonaire, Saint Eustatius and Saba | 25,983 | 0 |
| Bosnia_and_Herzegovina | 3,300,998 | 175 |
| Botswana | 2,303,703 | 1 |
| Brazil | 211,049,519 | 54971 |
| British_Virgin_Islands | 30,033 | 1 |
| Brunei_Darussalam | 433,296 | 3 |

To learn more about Paste Special, you can consult page 75 of The Data Journalist and other Excel tutorials, as it is a useful option for analysing data. Essentially, it allows you to ONLY past the values in the table, not the formula Excel used to create the table. For Mac users, you want to

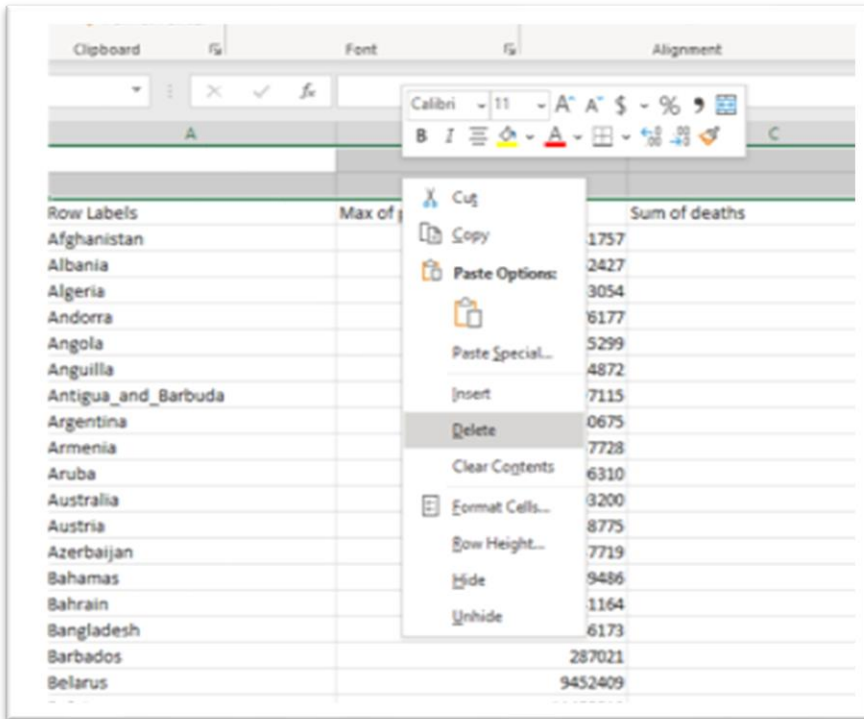
select the “values” option if you cannot find paste special.

| Row Labels | Max of popData2019 | Sum of deaths |
|---------------------|--------------------|---------------|
| Afghanistan | 38041757 | 675 |
| Albania | 2862427 | 49 |
| Algeria | 43053054 | 878 |
| Andorra | 76177 | 52 |
| Angola | 31825299 | 10 |
| Anguilla | 14872 | 0 |
| Antigua_and_Barbuda | 97115 | 3 |
| Argentina | 44780675 | 1124 |
| Armenia | 2957728 | 410 |
| Aruba | 106310 | 3 |
| Australia | 25203200 | 104 |
| Austria | 8858775 | 698 |
| Azerbaijan | 10047719 | 180 |
| Bahamas | 389486 | 11 |
| Bahrain | 1641164 | 71 |
| Bangladesh | 163046173 | 1621 |
| Barbados | 287021 | 7 |
| Belarus | 9452409 | 367 |

The paste special has also stripped all the formatting used to add commas to the numbers.

Time for clean-up.

Delete the first two rows.



| | A | B | C |
|----|---------------------|--------------------|---------------|
| 1 | Row Labels | Max of popData2019 | Sum of deaths |
| 2 | Afghanistan | 38041757 | 675 |
| 3 | Albania | 2862427 | 49 |
| 4 | Algeria | 43053054 | 878 |
| 5 | Andorra | 76177 | 52 |
| 6 | Angola | 31825299 | 10 |
| 7 | Anguilla | 14872 | 0 |
| 8 | Antigua_and_Barbuda | 97115 | 3 |
| 9 | Argentina | 44780675 | 1124 |
| 10 | Armenia | 2957728 | 410 |
| 11 | Aruba | 106310 | 3 |
| 12 | Australia | 25203200 | 104 |
| 13 | Austria | 8858775 | 698 |
| 14 | Azerbaijan | 10047719 | 180 |
| 15 | Bahamas | 389486 | 11 |

Rename the columns.

The screenshot shows an Excel spreadsheet with a table. The table has four columns: A, B, C, and D. The first row (row 1) has headers: 'Countries' in column A, 'Population' in column B, and 'Deaths' in column C. The second row (row 2) is the first data row, starting with 'Afghanistan' in column A, '38041757' in column B, and '675' in column C. The table continues down to row 13, which is 'Austria' with '8858775' in column B and '698' in column C. The spreadsheet interface includes a ribbon with 'Clipboard', 'Font', 'Alignment', and 'Number' tabs, and a formula bar containing 'Countries'.

| | A | B | C | D |
|----|---------------------|------------|--------|---|
| 1 | Countries | Population | Deaths | |
| 2 | Afghanistan | 38041757 | 675 | |
| 3 | Albania | 2862427 | 49 | |
| 4 | Algeria | 43053054 | 878 | |
| 5 | Andorra | 76177 | 52 | |
| 6 | Angola | 31825299 | 10 | |
| 7 | Anguilla | 14872 | 0 | |
| 8 | Antigua_and_Barbuda | 97115 | 3 | |
| 9 | Argentina | 44780675 | 1124 | |
| 10 | Armenia | 2957728 | 410 | |
| 11 | Aruba | 106310 | 3 | |
| 12 | Australia | 25203200 | 104 | |
| 13 | Austria | 8858775 | 698 | |

Scroll to the bottom of the table and delete the “Grand Total” row.

The screenshot shows an Excel spreadsheet with a table. The table has four columns. The first column contains country names, the second column contains population values, and the third column contains death counts. The last row (row 12) is a 'Grand Total' row, which is highlighted in grey. The 'Grand Total' row shows a population of 1433783692 and 489182 deaths. The table continues down to row 16, which is empty.

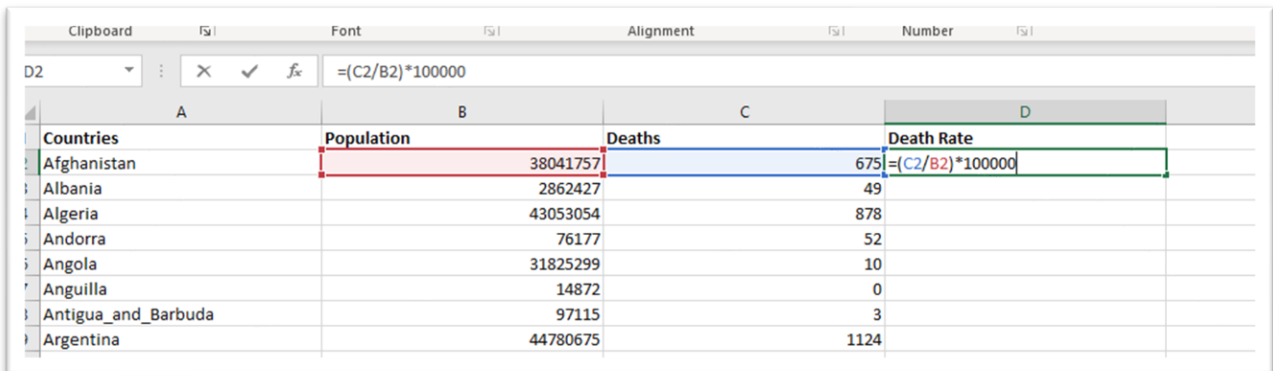
| | | | |
|----|------------------------------|------------|--------|
| 18 | Ukraine | 43993043 | 1007 |
| 19 | United_Arab_Emirates | 9770526 | 308 |
| 20 | United_Kingdom | 66647112 | 43230 |
| 21 | United_Republic_of_Tanzania | 58005461 | 21 |
| 22 | United_States_of_America | 329064917 | 124416 |
| 23 | United_States_Virgin_Islands | 104579 | 6 |
| 24 | Uruguay | 3461731 | 26 |
| 25 | Uzbekistan | 32981715 | 20 |
| 26 | Venezuela | 28515829 | 39 |
| 27 | Vietnam | 96462108 | 0 |
| 28 | Western_Sahara | 582458 | 1 |
| 29 | Yemen | 29161922 | 288 |
| 30 | Zambia | 17861034 | 18 |
| 31 | Zimbabwe | 14645473 | 6 |
| 32 | Grand Total | 1433783692 | 489182 |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 | | | |

This will avoid including the grand total value in our sort. To keep the “Grand Total” row, insert a space between it and Zimbabwe.

What we can now do is create a new, sortable field for death rate, something we could have done in a pivot table by creating a calculated field.

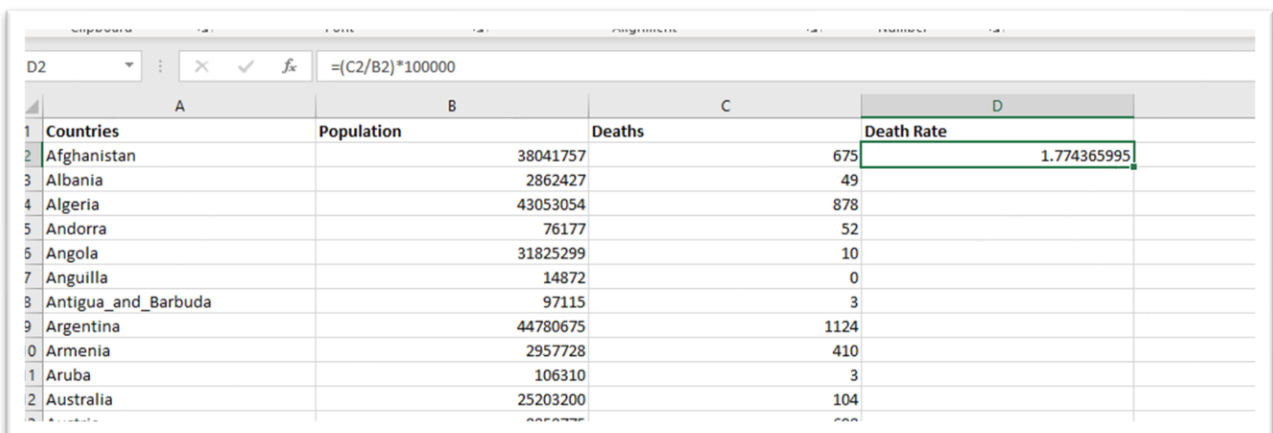
Type "Death Rate" into D1.

In D2 type the formula for death rate $\ll=(c2/b2)*100000\gg$



The screenshot shows an Excel spreadsheet with the following data:

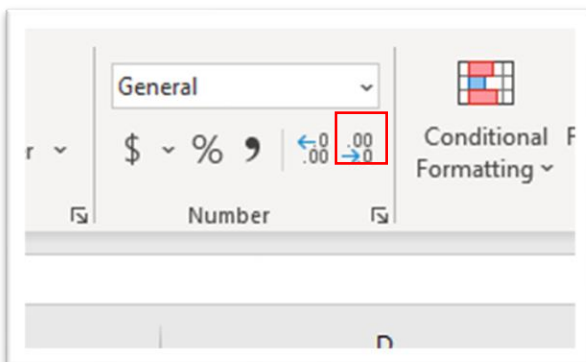
| Countries | Population | Deaths | Death Rate |
|---------------------|------------|--------|-----------------|
| Afghanistan | 38041757 | 675 | $=C2/B2*100000$ |
| Albania | 2862427 | 49 | |
| Algeria | 43053054 | 878 | |
| Andorra | 76177 | 52 | |
| Angola | 31825299 | 10 | |
| Anguilla | 14872 | 0 | |
| Antigua_and_Barbuda | 97115 | 3 | |
| Argentina | 44780675 | 1124 | |



The screenshot shows the same Excel spreadsheet with the Death Rate column now populated with calculated values:

| Countries | Population | Deaths | Death Rate |
|---------------------|------------|--------|-------------|
| Afghanistan | 38041757 | 675 | 1.774365995 |
| Albania | 2862427 | 49 | |
| Algeria | 43053054 | 878 | |
| Andorra | 76177 | 52 | |
| Angola | 31825299 | 10 | |
| Anguilla | 14872 | 0 | |
| Antigua_and_Barbuda | 97115 | 3 | |
| Argentina | 44780675 | 1124 | |
| Armenia | 2957728 | 410 | |
| Aruba | 106310 | 3 | |
| Australia | 25203200 | 104 | |

Give the number one decimal place by using the decimal decrease icon number on the menu's "Number" section.



| | C | D | E |
|--|---------------|-------------------|-----|
| | Deaths | Death Rate | |
| | .757 | 675 | 1.8 |
| | .427 | 49 | |
| | .054 | 878 | |
| | .177 | 52 | |
| | .299 | 10 | |
| | .872 | 0 | |
| | .115 | 3 | |
| | .675 | 1124 | |
| | .728 | 410 | |
| | .310 | 3 | |

Copy the formula for the rest of the cells in column D, by placing your cursor over the thick black square at the bottom right-hand corner of the D2 cell reference, and double clicking once the cursor turns into a black cross. If for some reason it doesn't work, you can copy the formula, highlight the row to the bottom of the table and paste. Either method will populate each cell in the column with the death rate

number.

The screenshot shows an Excel spreadsheet with the following data:

| Countries | Population | Deaths | Death Rate |
|---------------------|------------|--------|------------|
| Afghanistan | 38041757 | 675 | 1.8 |
| Albania | 2862427 | 49 | 1.7 |
| Algeria | 43053054 | 878 | 2.0 |
| Andorra | 76177 | 52 | 68.3 |
| Angola | 31825299 | 10 | 0.0 |
| Anguilla | 14872 | 0 | 0.0 |
| Antigua_and_Barbuda | 97115 | 3 | 3.1 |
| Argentina | 44780675 | 1124 | 2.5 |
| Armenia | 2957728 | 410 | 13.9 |
| Aruba | 106310 | 3 | 2.8 |
| Australia | 25203200 | 104 | 0.4 |
| Austria | 8858775 | 698 | 7.9 |
| Azerbaijan | 10047719 | 180 | 1.8 |
| Bahamas | 389486 | 11 | 2.8 |
| Bahrain | 1641164 | 71 | 4.3 |
| Bangladesh | 163046173 | 1621 | 1.0 |
| Barbados | 287021 | 7 | 2.4 |
| Belarus | 9452409 | 367 | 3.9 |
| Belgium | 11455519 | 9726 | 84.9 |
| Belize | 390351 | 2 | 0.5 |
| Benin | 11801151 | 14 | 0.1 |
| Bermuda | 62508 | 9 | 14.4 |

Sort the “Death Rate” column in descending order.

The screenshot shows the same Excel spreadsheet, but with the 'Death Rate' column sorted in descending order. The first row now shows '#DIV/0!' in the Death Rate column, indicating a division by zero error.

| Countries | Population | Deaths | Death Rate |
|--|------------|--------|------------|
| Cases_on_an_international_conveyance_Japan | | 7 | #DIV/0! |
| San_Marino | 34453 | 42 | 121.9 |
| Belgium | 11455519 | 9726 | 84.9 |
| Andorra | 76177 | 52 | 68.3 |
| United_Kingdom | 66647112 | 43230 | 64.9 |
| Spain | 46937060 | 28330 | 60.4 |
| Italy | 60359546 | 34678 | 57.5 |
| Sweden | 10230185 | 5230 | 51.1 |
| France | 67012883 | 29752 | 44.4 |
| United_States_of_America | 329064917 | 124416 | 37.8 |
| Sint_Maarten | 42389 | 15 | 35.4 |

D1 contains an error message: dividing by zero creates a null value.

Apply the filter and de-select the error message.

| Deaths | Death Rate |
|------------|------------|
| 34453 | 42 |
| 11455519 | 9726 |
| 76177 | 52 |
| 66647112 | 43230 |
| 46937060 | 28330 |
| 60359546 | 34678 |
| 10230185 | 5230 |
| 67012883 | 29752 |
| 329064917 | 124416 |
| 42389 | 15 |
| 17282163 | 6100 |
| 4904240 | 13 |
| 1433783692 | 1 |
| 107796 | 1681 |
| 84589 | 25060 |
| 32510462 | 110 |
| 211049519 | 13 |
| 18952035 | 1 |
| 17373657 | 1681 |
| 37411038 | 25060 |
| 64468 | 110 |
| 4991 | 13 |
| 8544527 | 1 |
| 127575529 | 1681 |
| 613894 | 25060 |

| Countries | Population | Deaths | Death Rate |
|--------------------------|------------|-----------|------------|
| San_Marino | | 34453 | 42 |
| Belgium | | 11455519 | 9726 |
| Andorra | | 76177 | 52 |
| United_Kingdom | | 66647112 | 43230 |
| Spain | | 46937060 | 28330 |
| Italy | | 60359546 | 34678 |
| Sweden | | 10230185 | 5230 |
| France | | 67012883 | 29752 |
| United_States_of_America | | 329064917 | 124416 |
| Sint_Maarten | | 42389 | 15 |
| Netherlands | | 17282163 | 6100 |

Countries with small populations will have higher death rates. Still, this now allows for a better comparison.

Filter for Canada and the United States.

| Countries | Population | Deaths | Death Rate |
|--------------------------|-------------|---------|------------|
| United States of America | 329,064,917 | 124,416 | 37.8 |
| Canada | 37,411,038 | 8,504 | 22.7 |

The U.S. death rate is higher.

For good measure, throw Sweden into the mix.

| Countries | Population | Deaths | Death Rate |
|--------------------------|-------------|---------|------------|
| Sweden | 10,230,185 | 5,230 | 51.1 |
| United States of America | 329,064,917 | 124,416 | 37.8 |
| Canada | 37,411,038 | 8,504 | 22.7 |

There was a reason that country featured so prominently on our previous lists of death numbers. A much smaller country with a population (10.34 million) of less than a third of Canada's population has double the death rate.

| Countries | Population | Deaths | Death Rate | Ratio |
|--------------------------|-------------|---------|------------|-------|
| Sweden | 10,230,185 | 5,230 | 51.1 | 2.2 |
| United States of America | 329,064,917 | 124,416 | 37.8 | |
| Canada | 37,411,038 | 8,504 | 22.7 | |

We can see how pivot tables, the paste special and simple math to determine ratios allow a deeper dive into the data for more meaningful analysis and story ideas.

You can use the data from Public Health Agency of Canada's [website](#) to practice the steps in this tutorial. The data is only available in csv format (highlighted in red), which you can see in the screen grab below.

