Chapter 4

Calculating Percents

Summary: When working with data, we frequently have to perform simple calculations to give the numbers meaning. In this instance, we will work with Canadian Citizenship and Immigration Canada's Refugee claimants by top 50 countries of citizenship, the fourth tab from the bottom that breaks down the numbers by country.

The "Refugee claimants by top 50 countries of citizenship" table tracks individuals who successfully make their asylum claims from within Canada, and then become so-called protected persons. They must then apply for permanent resident status. This is why the total numbers are lower than the overall yearly numbers for refugees, which include claims made outside Canada.

For this tutorial, we'll download the table to figure out the percent of totals (a skill also covered in "Calculating Rates and Percentages in a Spreadsheet" tutorial), and per cent increases.

What you will learn:
1. Percent of total
2. Percent increases
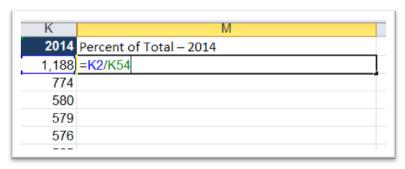
Task 1: Percent of total

Once you download the table, paste the website's URL into the first available cell in the first row, and save the table as an updated Excel version. Be sure to work from the copied version, as the most recent version of Excel, given that this dataset is provided in an earlier version.

Before working with the table, we always want to do the necessary clean-up, which means that the first row contains the column labels and there is nothing at the bottom. If there is a row that contains the total for each column, which there is in this case, you want to make sure that it is separated from the entire table so that those numbers don't get caught up in the sorting and skew your results.

Because column A doesn't have a title, let's give it one. Call it "Countries."

Countries	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
China, People's Republic of	1,643	1,500	1,343	1,475	1,449	1,528	1,794	1,666	760	1,188
Pakistan	645	609	356	387	421	516	895	865	630	774
Iraq	106	183	270	291	232	146	157	165	239	580
Nigeria	580	672	749	760	768	849	683	713	470	579
Colombia	1,110	1,373	2,589	3,066	2,256	1,336	864	701	598	576
Syria	58	33	69	64	87	120	176	345	495	565
Slovak Republic	8	6	7	74	355	263	316	443	33	480
Afghanistan	238	253	289	433	408	406	417	368	388	463
Hungary	21	29	23	307	2,539	2,350	4,454	1,883	96	391
Haiti	356	708	3,244	4,252	1,440	1,061	510	393	329	362
Ukraine	187	206	175	186	153	119	127	177	62	360
Congo, Democratic Republic of the	306	415	338	423	312	316	371	356	307	346
Somalia, Democratic Republic of	265	219	249	504	536	444	439	445	289	337
Bangladesh	169	119	79	92	110	121	118	125	156	321
India	804	757	540	550	481	523	642	688	228	293
Egypt	76	50	52	47	42	112	156	171	257	252
Eritrea	148	156	155	222	205	147	180	230	229	251
Sri Lanka	853	861	789	1,011	833	1,216	635	416	191	197
Jamaica	157	152	125	241	269	275	315	263	138	192
Honduras	220	182	239	469	365	347	334	299	150	182
Turkey	264	268	149	235	238	291	330	365	179	174
Cameroon, Federal Republic of	79	129	139	144	139	125	117	132	131	171
United States of America	526	650	1,817	2,297	1,115	771	626	391	124	168

Create a new column in M and label it "Percent of Total – 2014". Use the formula for calculating the percent of total, which is covered on pages 62 to 65 in The Data Journalist. The formula looks like this:

K	M	
2014	Percent of Total – 2014	
1,188	=K2/K54	
774		
580		
579		
576		

K2 is the first value in column K—"China, People's Republic of"—and K54 is the total at the bottom of the table. Before pressing enter, we want to anchor the total value in K54 to ensure that the numbers for each country are calculated as a percentage of the same total. To do this, we use a dollar sign at either side of the K in K54, format the number as a percent with one decimal place, and then copy it to the bottom.

K	M	N
2014	Percent of Total – 2014	
1,188		8.9%
774		5.8%
580		4.3%
579		4.3%
576		4.3%
565		4.2%
480		3.6%
463		3.4%
391		2.9%
362		2.7%
360		2.7%
346		2.6%
337		2.5%
321		2.4%
293		2.2%
252		1.9%
251		1.9%
197		1.5%
192		1.4%
182		1.4%
174		1.3%
171		1.3%
168		1.3%
163		1.2%
162		1.2%
161		1.2%
157		1.2%
156		1.2%
151		1.1%
140		1.0%
125		0.9%

You can now sort column M in ascending or descending order. To get the hang of this and determine how those percent of totals have changed over the years, perform the same calculation for each year, meaning that you will have to insert a new column after each year.

Task 2: calculating percent increases

Many stories have to do with at what rate things go up or down. In this case, we might find a story in the country that produced refugee claimants at the fastest rate. Copy and paste the table into a new worksheet.

We'll use column M to create our percent change from 2013 to 2014. Label M1 "Percent Change:23-14", and plug in the formula for percent change, which is covered on page 64 of our textbook

Formulas	Data	Review	View	Developer	Tableau	♀ Tell me what you want to do

=(K2-J2)/J2

	E	F	G	H	I	J	K	L	M	N
	2008	2009	2010	2011	2012	2013	2014	Percent Change:2013-14		
1343	1475	1449	1528	1794	1666	760	1188	0.563158		
356	387	421	516	895	865	630	774			
270	291	232	146	157	165	239	580			
740	760	768	840	683	713	470	570			

Format the number as a percent change, and the copy of the formula to the bottom of the column.

First screenshot

Formula bar: `=(K2-J2)/J2`

Countries	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Percent Change:2013-14
China, Peo	1643	1500	1343	1475	1449	1528	1794	1666	760	1188	56.3%
Pakistan	645	609	356	387	421	516	895	865	630	774	22.9%
Iraq	106	183	270	291	232	146	157	165	239	580	142.7%
Nigeria	580	672	749	760	768	849	683	713	470	579	23.2%
Colombia	1110	1373	2589	3066	2256	1336	864	701	598	576	-3.7%
Syria	58	33	69	64	87	120	176	345	495	565	14.1%
Slovak Rep	8	6	7	74	355	263	316	443	33	480	1354.5%
Afghanista	238	253	289	433	408	406	417	368	388	463	19.3%
Hungary	21	29	23	307	2539	2350	4454	1883	96	391	307.3%
Haiti	356	708	3244	4252	1440	1061	510	393	329	362	10.0%
Ukraine	187	206	175	186	153	119	127	177	62	360	480.6%
Congo, De	306	415	338	423	312	316	371	356	307	346	12.7%
Somalia, D	265	219	249	504	536	444	439	445	289	337	16.6%
Banglades	169	119	79	92	110	121	118	125	156	321	105.8%
India	804	757	540	550	481	523	642	688	228	293	28.5%
Egypt	76	50	52	47	42	112	156	171	257	252	-1.9%

Now we can sort column L in descending order to see which country experienced the fastest increase.

Second screenshot

Formula bar: `=(K2-J2)/J2`

Countries	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Percent Change:2013-14
Slovak Republic	8	6	7	74	355	263	316	443	33	480	1354.5%
Czech Republic	10	--	109	845	2076	30	25	27	12	110	816.7%
Venezuela	91	100	141	183	185	145	106	103	27	161	496.3%
Ukraine	187	206	175	186	153	119	127	177	62	360	480.6%
Libya	26	30	26	21	28	43	181	19	30	156	420.0%
Hungary	21	29	23	307	2539	2350	4454	1883	96	391	307.3%
Chad, Republic of	73	90	91	55	38	8	11	17	29	96	231.0%
Country not stated	20	10	42	47	43	34	14	15	10	27	170.0%
Georgia	54	75	50	82	65	85	53	82	33	81	145.5%
Zimbabwe	626	532	216	346	212	51	43	55	30	73	143.3%
Iraq	106	183	270	291	232	146	157	165	239	580	142.7%
Israel	289	479	402	333	349	197	182	183	26	55	111.5%
Bangladesh	169	119	79	92	110	121	118	125	156	321	105.8%
Djibouti, Republic of	6	15	24	57	137	164	133	113	63	125	98.4%
Palestinian Authority (Gaza/We	36	56	64	89	55	45	34	37	58	108	86.2%
Sudan, Democratic Republic of	38	45	56	35	24	45	67	115	52	87	67.3%
Uganda	43	160	33	71	54	58	52	49	31	49	58.1%

It was the Slovak Republic. The percent figure is so large that it's difficult for readers to grasp. So we might want to express it as a ratio. Create new column, which you can call "Ratio: 2013-14". Divide the values in column J into those of column K, and format the result as a number with one decimal place.

B	C	D	E	F	G	H	I	J	K	L	M
2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Percent Change:20	Ratio: 2013-14
8	6	7	74	355	263	316	443	33	480	1354.5%	14.5
10	--	109	845	2076	30	25	27	12	110	816.7%	
91	100	141	183	185	145	106	103	27	161	496.3%	
187	206	175	186	153	119	127	177	62	360	480.6%	
26	30	26	21	28	43	181	19	30	156	420.0%	
21	29	23	307	2539	2350	4454	1883	96	391	307.3%	
72	90	91	55	38	8	11	17	29	96	231.0%	

L	M
Percent Change:20	Ratio: 2013-14
1354.5%	14.5
816.7%	9.2
496.3%	6.0
480.6%	5.8
420.0%	5.2
307.3%	4.1
231.0%	3.3
170.0%	2.7
145.5%	2.5
143.3%	2.4
142.7%	2.4
111.5%	2.1
105.8%	2.1
98.4%	2.0
86.2%	1.9
67.3%	1.7
58.1%	1.6

Copy the formula to the bottom.

So now we can say that the rate of claims of refugees from the Slovak Republic increased 14-fold, a more conversational way of saying it than. 1354.5%. Sometimes it makes more sense to use percent increases, when value is, say, 50%. But once something increases by 100 or 200 percent, it makes more sense to say that it doubled or tripled, respectively. Using per cent increases is a good habit because in many instances, the story is not with the country or the entity that has the most, but with the one that is increasing at the fastest rate.