

RUPSubAdj

Version 5.20

Step-By-Step Guide

- (1) Create and run a national-level RUP input file. Be sure to note the location.
- (2) Create and run preliminary subnational input files. These files can all be stored in the same directory (e.g., C:\Work), separately for the national and subnational (e.g., C:\Work\National and C:\Work\Regions), or each region in a separate directory (e.g., C:\Work\Reg1, C:\Work\Reg2, etc.).
- (3) Create a folder where all the adjusted subnational projection files will be stored (e.g., C:\Work\ADJ). Note that the adjusted subarea input files will have the same names as the preliminary files, but with the “.agg” extension.
- (4) Open a new RUPSubAdj and on the Control sheet click on the button, “1. Get directory.” Navigate to the directory created in (3) above and click “OK.” This will place the directory location in cell C8 (Figure 1).

Figure 1. Control Sheet

	A	B	C	D
3	Table 5			
4	Republic of Demographica: 2000-2025			
5	RupSubAdj: Adjust Subnational RUP Projections to be Consistent with the National Projection			
6				Finished
7	Area	File	Directory	Title or comments
8	Directory for storage of output adjusted subnational area RUPs:	1. Get directory	C:\Work\ADJ	This is where the output adjusted subnational AGG files will be located with the same base file name
9		2. Select national RUP file		
10	National RUP file	NatA.IN	C:\Work\National	National Version A
11		3. Add preliminary subnational RUP files to list	4. Adjust subnational RUPs to agree with national RUP	
12	Preliminary subnational RUP files			
13	Optional:	1 Region1.in	C:\Work\Reg1	Area 1 Projection A (URBAN)
14	Clear	2 Region2.in	C:\Work\Reg2	Area 2 (INTERMEDIATE) Projection A
15	subnational RUP list	3 Region3.in	C:\Work\Reg3	Area 3 (RURAL) Projection B
16		4		
17		5		
18		6		
19		7		

- (5) Next, click on the button, “2. Select national RUP file” to select the national-level input file you created. Once selected, this file and its title information will automatically appear in row 10.
- (6) Click the next button, “3. Add preliminary subnational RUP files to list,” to add all of your preliminary first subnational administrative level (ADM1) input files. If the files are all in the same directory, you can select each one using Ctrl-click. Selection can also be made one at a time by clicking on the button for each one. If you make an error in selecting one of the files, the row can be deleted, or you can press the button “Optional: Clear subnational RUP list” to delete the whole list.

- (7) Save the RUPSubAdj file as a macro-enabled Excel workbook (extension.xlsm).
- (8) Now click the button, “4. Adjust subnational RUPs to agree with national RUP.”
 - a. This procedure may take some time. Progress will be indicated in cell D6.
 - b. The last step of the adjustment process is running each of the adjusted subnational .agg files. These will appear in multiple Command Prompt windows (one for each subnational file).
- (9) Once all of the files have run, you will have created and run new subnational files in the directory specified in cell C8 that are consistent with the national total. The individual adjusted subarea projections have been adjusted to agree with the national projected population, fertility, mortality, and international migration. In addition, and critically important for subnational projection, if the values for internal migration did not add to zero across all regions in the preliminary projections, RUPSubAdj has ensured that total net internal migration across all regions is zero.
- (10) The remaining sheets of the RUPSubAdj workbook present the adjustment factors for the population, deaths, and international and internal net numbers of migrants, by sex and single years of age for each year of the projection (see Figure 2). There are also two sheets displaying adjustment factors for births, one by age of the mother (BFAC) and one by sex of the child (BSEXFAC). Note that all of the adjustments are done by single years of age.

Figure 2. Population Adjustment Factors

	A	C	D	E	F	G	H	I	J	K	L
3	Table 5										
4	Republic of Demogra)-2025										
5	Male Population Adjustors (Single Years of Age)										
6	Year	1	2	3	4	5	6	7	8	9	10
7	2010	1.019	1.020	1.020	1.021	1.021	1.022	1.022	1.023	1.023	1.023
8	2011	1.019	1.019	1.020	1.020	1.021	1.021	1.022	1.022	1.023	1.023
9	2012	1.028	1.019	1.019	1.020	1.020	1.021	1.021	1.022	1.022	1.023
10	2013	1.027	1.028	1.019	1.019	1.020	1.020	1.021	1.021	1.022	1.022
11	2014	1.027	1.028	1.028	1.020	1.019	1.020	1.020	1.021	1.021	1.022
12	2015	1.026	1.027	1.028	1.028	1.020	1.019	1.020	1.020	1.021	1.021
13	2016	1.025	1.026	1.027	1.028	1.028	1.020	1.019	1.020	1.020	1.021
14	2017	1.025	1.026	1.026	1.027	1.028	1.028	1.020	1.019	1.020	1.020
15	2018	1.024	1.025	1.026	1.027	1.027	1.028	1.028	1.020	1.019	1.020
16	2019	1.023	1.024	1.025	1.026	1.027	1.027	1.028	1.028	1.020	1.019
17	2020	1.021	1.023	1.024	1.025	1.026	1.027	1.027	1.028	1.029	1.020
18	2021	1.020	1.022	1.023	1.024	1.025	1.026	1.027	1.027	1.028	1.028
19	2022	1.019	1.020	1.022	1.023	1.024	1.025	1.026	1.027	1.027	1.028
20	2023	1.017	1.019	1.020	1.022	1.023	1.024	1.025	1.026	1.027	1.027
21	2024	1.015	1.017	1.019	1.020	1.022	1.023	1.024	1.025	1.026	1.027
22	2025	1.014	1.016	1.017	1.019	1.021	1.022	1.023	1.024	1.025	1.026

Note that the interpretation of the factors for international and internal migrants is different from the factors for population, births, and deaths. The adjustment factors for population, births, and deaths are calculated as the ratios of national-level totals to the summation of subnational area totals. However, for internal and international migration, absolute numbers of net migrants are used to force net internal migration to sum to zero and net international migration by subnational area to match the national totals by age and sex, taking into account possible variability in

direction of migration by age and sex. Figure 3 shows sample internal migration adjustment factors for males.

Figure 3. RUMFACM Sheet: Internal Migration Adjustment Factors (Males)

	A	B	C	D	E	F	G	H	I	J	K	L
3	Table 5											
4	Republic of Demographica: 2000-2025											
5	Male Internal Migrants Adjustment Factors (Single Years of Age)											
6	Year	0	1	2	3	4	5	6	7	8	9	10
7	2010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	2011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	2012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	2013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11	2014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12	2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	2019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	2020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18	2021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000