

Reference 3. The Calculation Method of the Imputed Values

In tabulating the 2020 Population Census, we calculated "Imputed Values" made by the method of proportionally distributing unknown values included in the main tabulation results (original values), and we provided a statistical table with the results as a reference table. For comparisons with five years ago, the results of the 2015 Population Census were retroactively tabulated by the same method as the 2020 Population Census.

The calculation method of the imputed values is as follows, and the Basic Complete Tabulation on the Population was processed in two steps.

Preprocessing of the Imputation (only for the “Basic Complete Tabulation on the Population”)

Subject of Processing: Of private households, household members’ age and nationality (Japanese or Foreigner) of households in which the age of all household members, relationship to head of household and marital status are all “unknown” (hereinafter referred to as “Basic Item Unknown Households”).

Overview of Processing:

① For two-or-more-person households, the ages and nationalities of household members are imputed by using the Hot-deck method^{*1} which adopts households excluding basic items unknown as donors by small area, sex, composition of household members and type of building.

*1) A method of finding similar data (donor) from which a response has been obtained and imputing the donor value in place of the unknown value.

② — 1 For nationality not reported in one-person households, the age and nationality are imputed by using the Cold-deck method^{*2}, based on data related to foreign residents in Japan (released by the Immigration Services Agency) by small area and sex.

*2) A method of finding similar data (donor) from the other data and imputing the donor value in place of the unknown value.

② — 2 Of the remaining one-person households, for age not reported for people who live in privately rented apartment houses or flats, proportionally imputing age by municipality and sex^{*3}.

*3) Population by municipality, sex and age is estimated by repeated proportional correction from the preliminary counts of the population by municipality and estimated population by age and prefecture. And then it is imputed by using probability according to the number of the estimated value minus the original value.

Processing of Proportionally Distributing

Subject of processing: Unknown items in the main tables^{*4} for each tabulation type (see the following table).

*4) Please refer the following URL for details of the reference tables representing imputed values (in Japanese only).

<https://www.e-stat.go.jp/stat-search/files?page=1&layout=datalist&lid=000001283576>

Overview of Processing:

- ① Detailed tables consisting of main classification item by municipality are made by each tabulation type shown in the following table.
- ② In the cross-tabulation of ①, unknown values are imputed by proportional distribution according to the composition ratio of the data excluding unknown values.
- ③ Reference Tables are made from ②.

Table. Cross-tabulation Classification Items

Tabulation type	Main classification items ^{*5}
Basic Complete Tabulation on Population and Households	Type of household, Sex, <u>Age</u> , <u>Nationality (Japanese or Foreigner)</u> , <u>Marital status</u> , Type of building
Basic Complete Tabulation on Labour Force	Type of household, Sex, Age (five-year groups), <u>Labour force status</u> , <u>Industry</u> , <u>Occupation</u> , <u>Employment status</u>
Tabulation on Place of Work or Schooling for Population and Labour Force	Type of household, Sex, <u>Labour force status</u> , <u>Place of working or schooling</u>
Tabulation on Internal Migration for Population	Type of household, Sex, <u>Age (five-year groups)</u> , <u>Place of usual residence five years ago</u>

*5) The underlined items are imputed, and these unknowns are processed.

In addition, the results (original values) before imputation are as follows.

Basic Complete Tabulation on Population and Households

The results before imputation (original values)

Population by Age (five-year groups)

Age	Population	
	2015	2020
Total	127,094,745	126,146,099
0 ~ 4 years old	4,987,706	4,516,082
5 ~ 9	5,299,787	5,089,093
10 ~ 14	5,599,317	5,350,517
15 ~ 19	6,008,388	5,617,440
20 ~ 24	5,968,127	5,931,306
25 ~ 29	6,409,612	6,031,964
30 ~ 34	7,290,878	6,484,594
35 ~ 39	8,316,157	7,311,567
40 ~ 44	9,732,218	8,291,077
45 ~ 49	8,662,804	9,650,293
50 ~ 54	7,930,296	8,539,851
55 ~ 59	7,515,246	7,767,482
60 ~ 64	8,455,010	7,297,190
65 ~ 69	9,643,867	8,075,268
70 ~ 74	7,695,811	9,011,795
75 ~ 79	6,276,856	6,930,928
80 ~ 84	4,961,420	5,296,728
85 years old and over	4,887,487	6,021,086
Age not reported	1,453,758	2,931,838
(Recount) Under 15 years old	15,886,810	14,955,692
(Recount) 15--64 years old	76,288,736	72,922,764
(Recount) 65 years old and over	33,465,441	35,335,805
(Recount) 75 years old and over	16,125,763	18,248,742

Population by Japanese or Foreigner

Japanese or Foreigner	Population	
	2015	2020
Total	127,094,745	126,146,099
Japanese	124,283,901	121,541,155
Foreigner	1,752,368	2,402,460
Nationality not reported	1,058,476	2,202,484

Population (Aged 15 and over) by Marital status

Marital status	Population	
	2015	2020
Total	109,754,177	108,258,569
Never married	29,241,531	28,486,643
Married	62,624,975	60,468,842
Widow(er)ed	9,578,676	9,083,208
Divorced	5,596,116	5,601,755
Marital status not reported	2,712,879	4,618,121

Basic Complete Tabulation on Labour Force

The results before imputation (original values)

Population (Aged 15 and over) by Labour force status		
Labour force status	Population	
	2015	2020
Total	109,754,177	108,258,569
Population in labour force	61,523,327	59,949,767
Employed persons	58,919,036	57,643,225
Mostly worked	48,720,609	47,954,511
Worked besides doing housework	8,099,170	7,107,404
Worked besides attending school	1,005,733	1,105,592
Absent from work	1,093,524	1,475,718
Unemployed	2,604,291	2,306,542
Population not in labour force	41,022,456	36,603,968
Did housework	15,206,558	13,144,416
Attending school	6,196,077	5,276,382
Others	19,619,821	18,183,170
Labour force status not reported	7,208,394	11,704,834

Number of employed persons (Aged 15 and over) by Employment status		
Employment status	Population	
	2015	2020
Total	58,919,036	57,643,225
Employees	46,605,130	46,942,221
Regular employees	30,333,371	30,796,831
Temporary employees	1,543,683	1,522,141
Part-time employees and others	14,728,076	14,623,249
Board member of company, etc.	2,883,844	3,134,199
Self-employed (including Piece rate work)	5,196,474	4,864,876
Self-employed, employing others	1,154,651	1,064,884
Self-employed, not employing others (including Piece rate work)	4,041,823	3,799,992
Family employees	1,947,053	1,605,742
Employment status not reported	2,286,535	1,096,187
(Recount) Employees (including Board member of company, etc.)	49,488,974	50,076,420

Number of employed persons (Aged 15 and over) by Industry (major groups)		
Industry (major groups)	Population	
	2015	2020
Total	58,919,036	57,643,225
A Agriculture and forestry	2,067,952	1,830,697
B Fisheries	153,747	132,065
C Mining and quarrying of stone and gravel	22,281	18,891
D Construction	4,341,338	4,184,052
E Manufacturing	9,557,215	9,056,536
F Electricity, gas, heat supply and water	283,193	275,595
G Information and communications	1,680,205	1,955,619
H Transport and postal activities	3,044,741	3,117,623
I Wholesale and retail trade	9,001,414	8,805,576
J Finance and insurance	1,428,710	1,355,161
K Real estate and goods rental and leasing	1,197,560	1,253,905
L Scientific research, professional and technical services	1,919,125	2,103,074
M Accommodations, eating and drinking services	3,249,190	3,095,434
N Living-related and personal services and amusement services	2,072,228	1,979,446
O Education, learning support	2,661,560	2,829,694
P Medical, health care and welfare	7,023,950	7,633,170
Q Compound services	483,014	441,618
R Services, n.e.c.	3,543,689	3,801,218
S Government, except elsewhere classified	2,025,988	2,032,199
T Industries unable to classify	3,161,936	1,741,652
(Recount) Primary industry	2,221,699	1,962,762
(Recount) Secondary industry	13,920,834	13,259,479
(Recount) Tertiary industry	39,614,567	40,679,332

Number of employed persons (Aged 15 and over) by Occupation (major groups)		
Occupation (major groups)	Population	
	2015	2020
Total	58,919,036	57,643,225
A Administrative and managerial workers	1,394,894	1,170,866
B Professional and engineering workers	9,380,461	10,275,114
C Clerical workers	11,206,028	11,670,626
D Sales workers	7,410,702	6,862,265
E Service workers	6,856,820	6,802,033
F Security workers	1,086,118	1,097,989
G Agriculture, forestry and fishery workers	2,145,116	1,895,441
H Manufacturing process workers	7,960,081	7,641,867
I Transport and machine operation workers	2,009,402	1,945,557
J Construction and mining workers	2,591,087	2,461,426
K Carrying, cleaning, packaging and related workers	3,897,093	4,194,830
L Workers not classifiable by occupation	2,981,234	1,625,211

(Note) Population (Aged 15 and over) by Labour force status excludes "Age not reported." Number of employed persons (Aged 15 and over) by Employment status, Industry (major groups), and Occupation (major groups) count except for "Age not reported" and "Labour force status not reported."

Tabulation on Place of Work or Schooling for Population and Labour Force
The results before imputation (original values)

Population by Labour force status		
Labour force status	Population	
	2015	2020
Total	127,094,745	126,146,099
Employed persons	58,919,306	57,643,398
Persons attending school	15,100,211	13,972,648
Neither working nor attending school	44,386,143	39,843,592
Labour force status not reported	8,689,085	14,686,461

Population by Place of working or schooling		
Place of working or schooling	Population	
	2015	2020
Population based on place of usual residence (Nighttime population)	127,094,745	126,146,099
Neither working nor attending school	44,386,143	39,843,592
Working or schooling in the same Shi, Ku, Machi or Mura	42,335,347	40,816,442
Working at home	5,882,836	5,766,887
Working or schooling in the same Shi, Ku, Machi or Mura (excluding working at home)	36,452,511	35,049,555
Working or schooling in other Shi, Ku, Machi or Mura	28,432,341	28,072,270
Working or schooling in the same prefecture	22,306,205	22,099,347
Working or schooling in other prefecture	5,812,650	5,455,865
Shi, Ku, Machi or Mura of working or schooling is not reported or outside Japan	313,486	517,058
Place of working or schooling not reported	11,940,914	17,413,795

Tabulation on Internal Migration for Population
The results before imputation (original values)

Population by Age (five-year groups)		
Age	Population	
	2015	2020
Total	127,094,745	126,146,099
0 ~ 4 years old	4,987,706	4,516,082
5 ~ 9	5,299,787	5,089,093
10 ~ 14	5,599,317	5,350,517
15 ~ 19	6,008,388	5,617,440
20 ~ 24	5,968,127	5,931,306
25 ~ 29	6,409,612	6,031,964
30 ~ 34	7,290,878	6,484,594
35 ~ 39	8,316,157	7,311,567
40 ~ 44	9,732,218	8,291,077
45 ~ 49	8,662,804	9,650,293
50 ~ 54	7,930,296	8,539,851
55 ~ 59	7,515,246	7,767,482
60 ~ 64	8,455,010	7,297,190
65 ~ 69	9,643,867	8,075,268
70 ~ 74	7,695,811	9,011,795
75 ~ 79	6,276,856	6,930,928
80 ~ 84	4,961,420	5,296,728
85 years old and over	4,887,487	6,021,086
Age not reported	1,453,758	2,931,838

Population by Place of usual residence five years ago		
Place of usual residence five years ago	Population	
	2015	2020
Total (persons usually live)	127,094,745	126,146,099
Present address	90,569,650	87,851,473
Migration	25,323,189	23,342,281
From in Japan	24,806,027	22,572,899
From the same Shi, Machi or Mura	13,038,016	11,574,927
From other Shi, Ku, Machi or Mura of the same prefecture	5,554,781	5,010,009
From other prefecture	6,213,230	5,987,963
From outside Japan	517,162	769,382
Shi, Ku, Machi or Mura of usual residence five years ago not	57,625	56,958
Migration status not reported	11,144,281	14,895,387