Introducing two different approaches for estimating working hours obtained from The Survey on Time Use and Leisure Activities

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Abstract

Japan's Time Use Survey, which shows the types of activities people spend their time on, divides each day into 96 slots of 15 minutes each. Using the percentage of people participating in each activity helps calculate the percentage of people who are working during each time period of the day, so the number of hours and time periods people spend working each day can be ascertained by occupation. Furthermore, the amount of time that participants spend working each day and by aggregating data for each day of the week, the number of hours worked per week can be estimated. Adopting an approach that is different from this estimate of work hours, hours worked can be calculated from "usual working hours per week" obtained from the questionnaire. A comparison of estimated work hours from these two approaches was roughly consistent with work hours by occupation.

Keywords

Time Use Survey; Working Hours by occupation; Working hours by day of the week

Introduction

The Time Use Survey has been conducted every five years since 1976 with the aim of obtaining basic data to clarify the actual state of people's social lives, such as the distribution of their daily living hours and the main activities they engage in during their leisure time. The latest survey was conducted in 2021, and this was the 10th survey.

This study looks at the results of the 2016 survey, focusing on the time spent at work among the participate rates obtained for each time period, and compares the participate rates by attribute to get a sense of their characteristics. The purpose of this is to ascertain, from the paticipate rate, the amount of time spent at work per day with respect to a particular type of activity, and furthermore, to determine the amount of time spent at work per week by aggregating the data by work day. Apart from this, the results obtained from the items in the survey questionnaire and the hours worked as estimated from the above-mentioned participate rate, with the purpose of clarifying that comparisons by occupation show generally similar results, and to demonstrate the high reliability of the

surveys and result estimates of the Time Use survey.

1 Estimation of working hours based on the participate rate

Japan's Time Use Survey provides information on which types of activities are carried out across all 96 time segments of 15 minutes into which the day has been divided.

This Survey divides the 24-hour day into 15-minute time period and asks the surveyed household members about the types of activities they engage in during each time period. The questionnaire information data (micro data) for this survey is in matrix form as follows. In the row direction, one record is considered one day for each surveyed household member (individual). Similarly, in the column direction, there are 96 cells in 15-minute segments from 0:00–0:15 to 23:45–0:00, and each cell is assigned a code for the type of action undertaken.

The usual tabulation process involves totaling the time for each type of action on an individual basis, and then tabulating the results obtained from this process to produce a table of results by gender, age group, region and other such attributes. In other words, the matrix is horizontally aggregated.

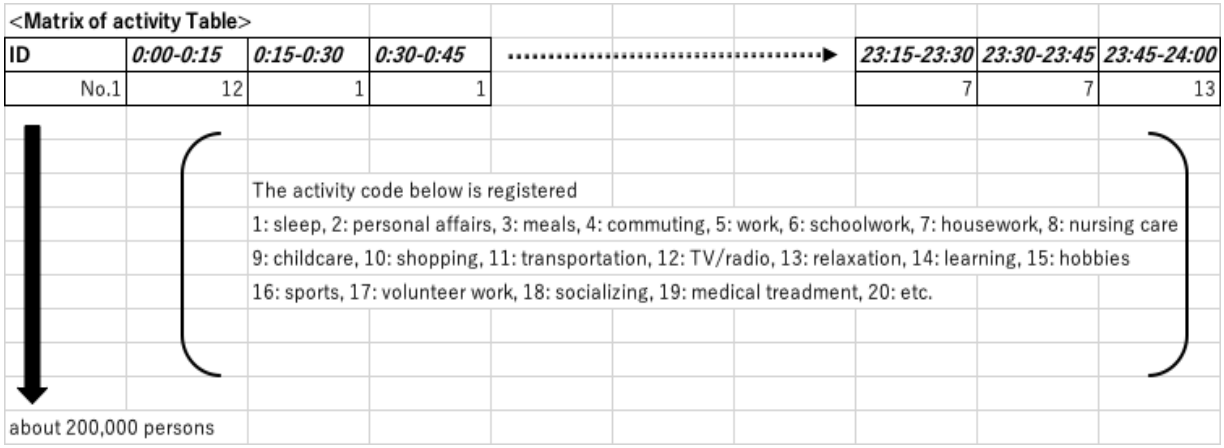


Diagram 1. Matrix of activity table by time segment

The aggregation method introduced here, which focuses on the participate rate for each type of behavior in each time segment, vertically aggregates this rate for each attribute, and compares the results to facilitate understanding the characteristics of the behavior. For example, the following graph shows the percentage of full-time employees who are active in terms of "work" by occupation.

Figure 1 depicts a graph of the participate rate of male office workers acting as full-time employees on weekdays, calculated as described above. (The horizontal axis represents the day from 0:00 to 24:00, and the vertical axis represents the participate rate.)

Generally, the participate rate for work is higher after 8:00 a.m., and is lower after 6:00 p.m. Figure 2 graphs Care Service Occupational Workers under similar conditions. Although the percentage of daytime workers is lower than that of office workers, it can be seen that a significant number of these workers are still at work during late night hours.

Figure 1. participation rate by working persons
(office workers, full time, weekday)

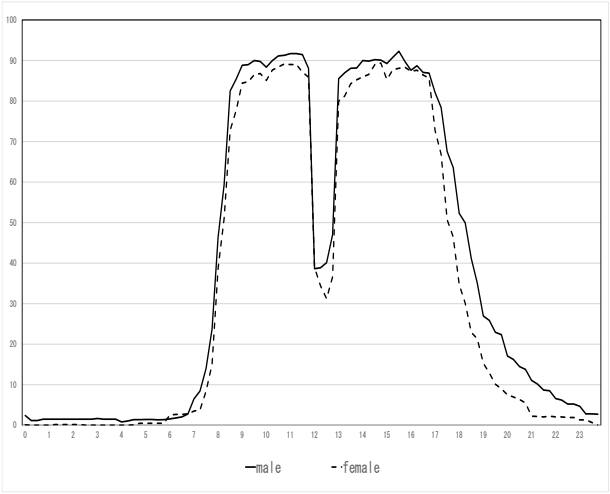
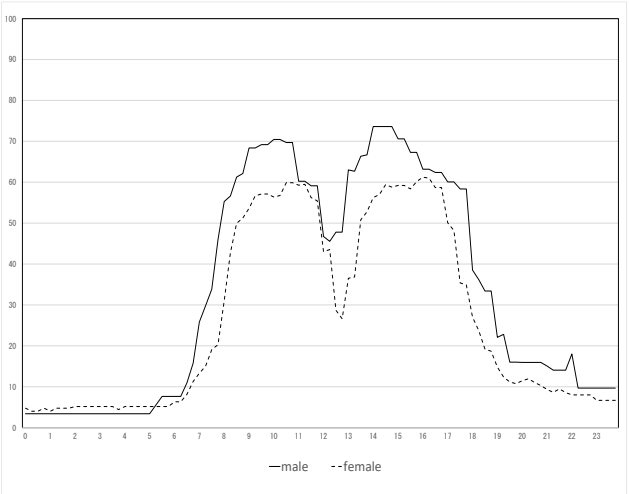


Figure 2. Participation rate by working persons
(care service, full time, weekday)



Furthermore, Figure 3 shows the participate rate of care service occupational workers who work on Saturdays, while Figure 4 shows the rate for those who work on Sundays. In both cases, the participate rate of people who are at work is lower than on weekdays; however, the difference between the two is not significantly different than other occupations, which also characterizes the time spent working by care service occupational workers.

Figure 3. participation rate by working persons
(care service, full time, Saturday)

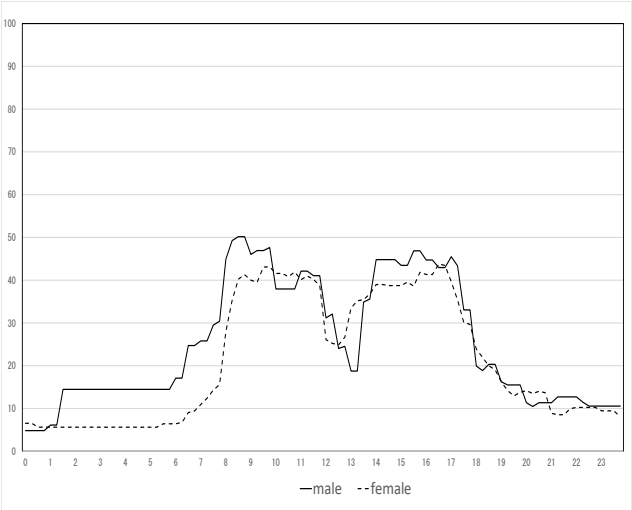
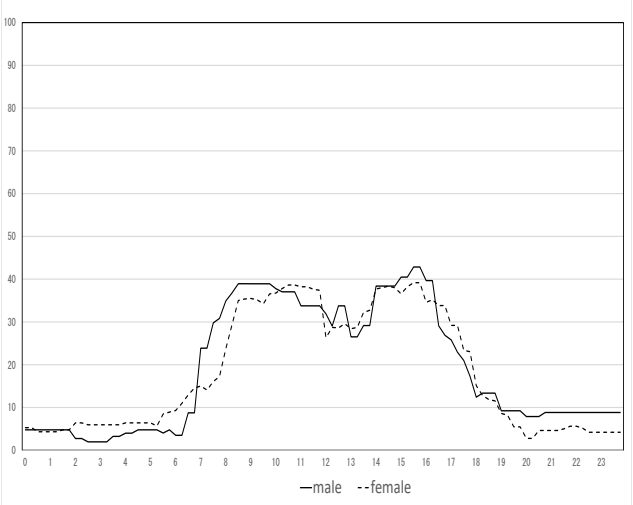


Figure 4. Participation rate by working persons
(care service, full time, Sunday)



By focusing on the participate rate of people who are working in each time category by paying attention to the percentage of people who are active from this point on, it is possible to grasp the characteristics of when people are working in each occupational unit. Furthermore, the area of the range depicted in this graph can be estimated as hours worked per day, and the total hours worked on the weekdays (Monday through Friday), Saturday, and Sunday, can be estimated as the hours worked per week.

2 Estimation from the "usual weekly working hours" on the questionnaire

On the other hand, the Basic Survey on Social Life survey asks about "usual weekly working hours." The figure below, which is an excerpt from the survey form, shows the "usual weekly working hours" as surveyed via the Time Use Survey.

When estimating the average hours worked by occupational unit, which can be ascertained as the seven categories of hours, excluding the "not decided" option, the median of the hours entered in this individual unit survey form is calculated as the individual's weekly working hours.

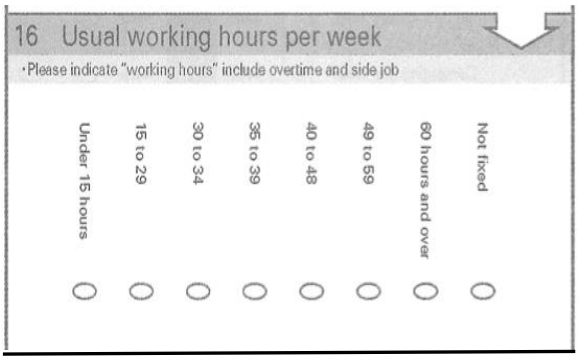


diagram 2. usual working hours in questionnaire

Figure 5 shows a histogram of male regular employees with respect to the working time periods obtained above. Half of all workers work 40–48 hours per week, which is the largest percentage, while roughly 30% work 49–59 hours per week. Figure 6, on the other hand, shows a histogram of women's working hours, with roughly 70% working 40–48 hours. The average was calculated for each hourly class of working hours obtained from this data by treating the median value as the same value for all data in that class. The following section presents the results of this calculation by occupation and compares them to the hours worked by occupation estimated from the participate rates in the previous chapter.

Figure 5. Histogram of working hours(male)

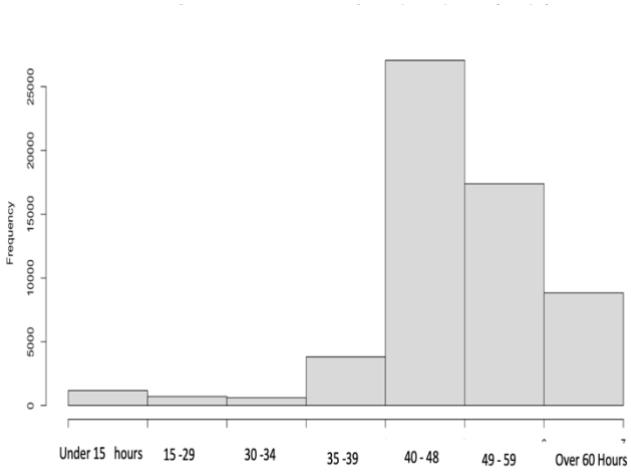
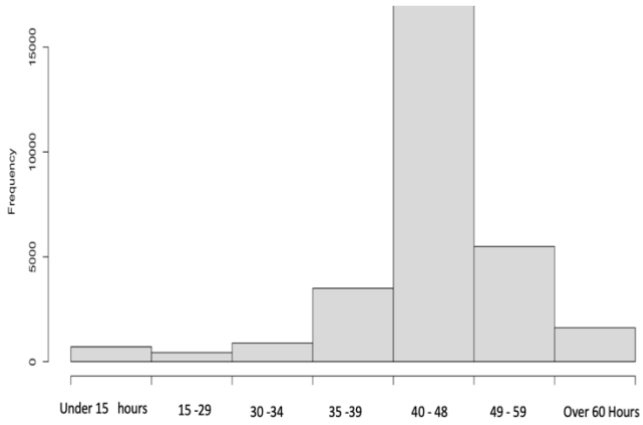


Figure 6. Histogram of working hours(female)



3 Comparison of working hours estimated from two different approaches

Comparing the estimates of working hours by the two occupations described in the previous chapters, there is a high positive correlation for both men (Figure 7) and women (Figure 8), as shown in the scatterplot below.

We believe that the fact that the estimated results obtained from different survey items yield generally similar working hours is proof of the high degree of precision with which the results of this survey are compiled.

Figure 7. comparison of working hours from questionnaire and estimated(male)

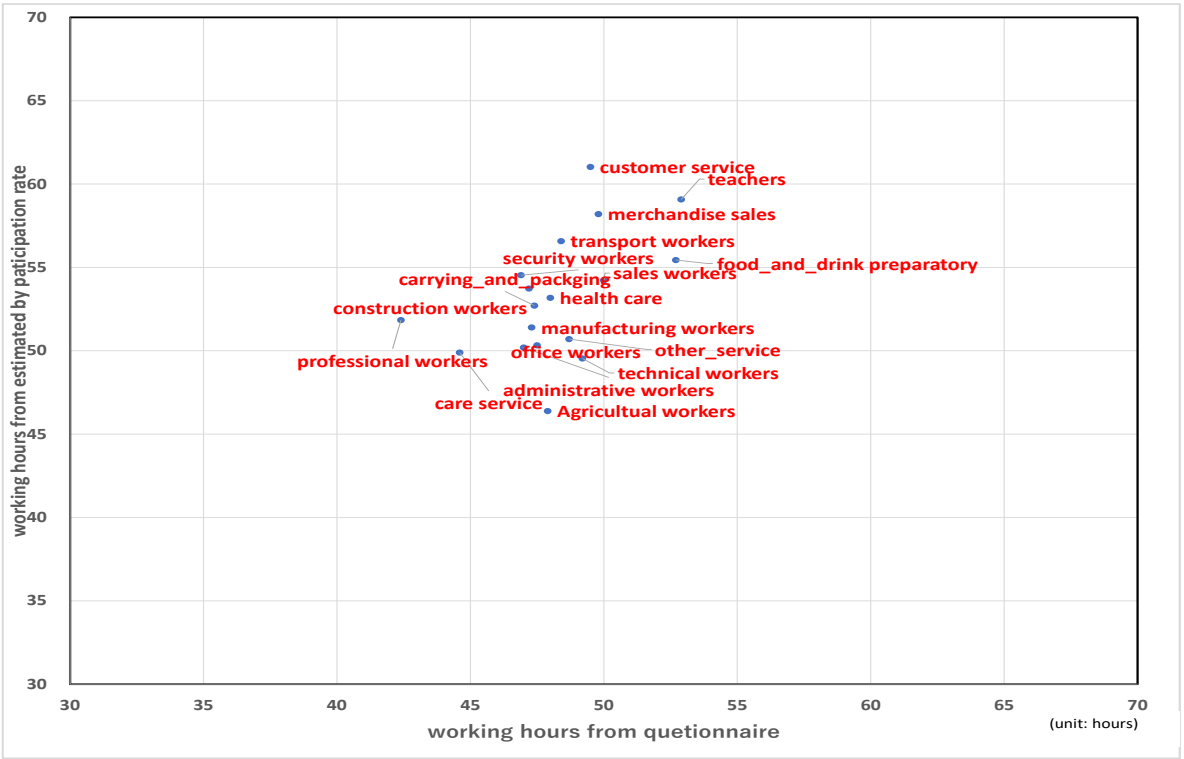
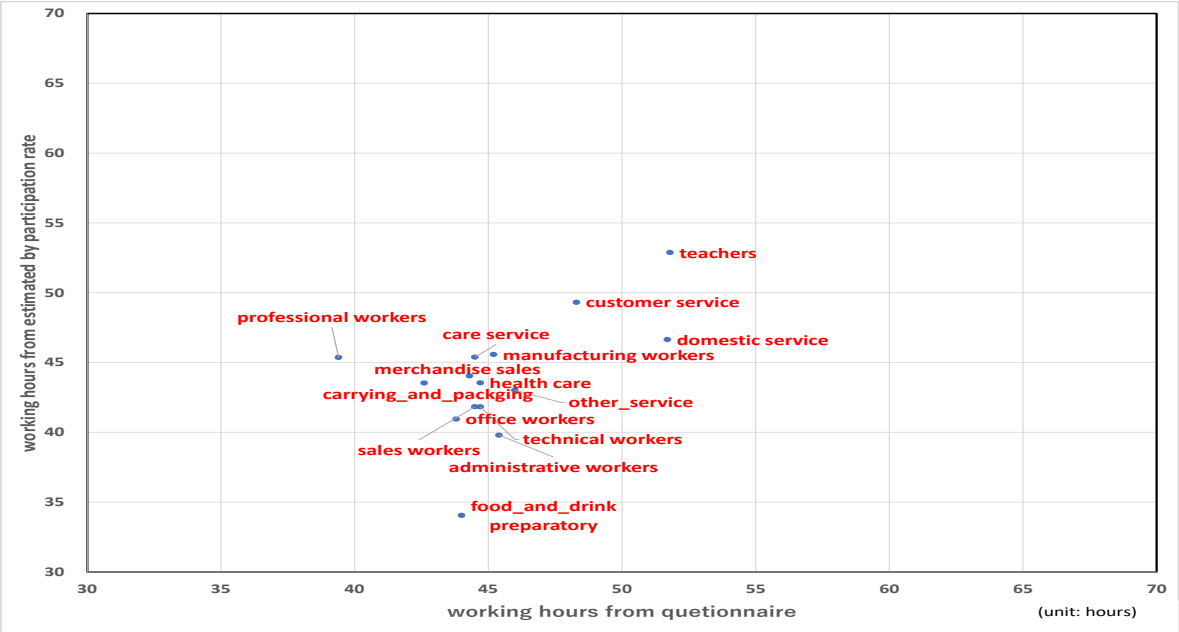


Figure 8. comparison of working hours from questionnaire and estimated(female)



In addition, regarding the understanding of working hours, there are several statistics in Japan, one of which is the Labor Force Survey. it is well-known, from previous studies, etc., that these generally follow the same trends regarding working hours by occupation that were obtained in the results of this Survey.

We believe that the fact that the working hours calculated by the two estimation methods from the Time Use Survey are consistent with the characteristics of working hours by occupation obtained from the results of the Labor Force Survey is very useful not only for understanding the characteristics of individual working hours, but also for obtaining more detailed information about individuals, such as how much they work on each day of the week, during each time period of the day.

References

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