



Modernisation of the Harmonised European Time Use Survey

Grant agreement N - 07141.2017.001-2017.354

FINAL METHODOLOGICAL REPORT

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I. Background information

National Statistical Institute (NSI) of Bulgaria has a long tradition in conducting TUSs. The first whole-year one has been conducted in 1970/1971. Afterwards, 4 whole-year TUSs have been conducted: in 1976/1977, 1988, 2001/2002 and 2009/2010. The last two surveys are conducted following the HETUS guidelines and are fully comparable with results produced at European level. Surveys conducted till the moment used detailed diary records, filled in by the respondents. Coding and data entry procedures were performed after collecting data. Paper interviews were conducted both for diaries and questionnaires (household and individual ones).

Taking into account the great amount of human and financial resources required for conducting traditional TUS, as well as respondents burden, NSI applied for a grant to test new approaches and way for its conduction and namely to test CAPI interviews and use of light diaries. Main purpose of the activities undertaken is to test whether the results produced based on light diary are comparable with those produced based on detailed diary.

Aims of the project and expected results of the action

General and specific objectives of the Modernisation of the Harmonised European Time Use Survey will contribute to:

- ✓ Studying the opportunity of conducting TUS with less human and financial resources as well as respondents' burden;
- ✓ Assessing possibility for conducting TUS at shorter intervals using light diary;
- ✓ Gaining practical experience in the field of using Computer Assisted Interviews (CAI) for TUS purposes.

II. Description of the actions implemented on the basis of the planned activities

The work on 'Modernisation of the Harmonised European Time Use Survey' Project was organized and conducted in accordance with the objectives as well as to the planned activities in the Grant agreement.

The organization of the action in all phases of the project implementation was ensured by the project leader – Head of Department "Statistics of Population and Housing Fund" in the NSI of Bulgaria. Experts from the NSI with good experience in the field of methodological issues, conduction of sample surveys, data processing, weighting and analysis were selected, as well as an IT expert for elaboration of new data capture software. Coding of full diary was done by NSI's staff especially trained for the purpose. Supervisors of the field work, data coding and data entry were recruited and trained among experts working at "Demographic and Social Statistics" Directorate.

According to the actions, described in the Grant agreement and the planned timetable, following activities were done during the Project implementation:

1. Preparation of survey tools - diaries, questionnaires, instructions

Studying of basic documents related to the Project as in-depth study of methodological documents and best practices in the field of using of light diaries was a pre-requisite for good quality of planned activities implementation.

Two kind of diaries (full and light) were developed for the Project aims. The respondent had to describe his/her main activity for each 10-minute interval in the full diary. Light diary was developed in a way where the main activities were grouped into 22 groups so the respondent had to mark his/her main activity for each 10-minute interval. The respondent of both diaries had to mark whether he/she had performed the activity for each 10-minute interval alone or by somebody else (husband/wife; parent; children under 10 years; another household member).

The complete design of the Final version of the national diaries (full and light) in Bulgarian language is shown in Annex I and Annex II.

2. Sample design and selection procedures

Target population – The target population were the persons aged 10+ living in private households in 5 districts in the country (Blagoevgrad, Varna, Lovech, Silistra, Shumen). In general, 225 households were selected for the purposes of the TUS.

Sampling frame - Population Census 2011 database was used as sampling frame. That database is actualized annually through information from regular vital statistics (deceased and newborn).

The sample was stratified by administrative-territorial districts in the country (NUTS3) and the type of settlement (urban, rural). With aim to minimize the survey's expenditures and interviewers' burden it was planned to select 5 districts only (from 28 total in the country) that responds to NUTS3 level. It was decided to include following districts - Blagoevgrad, Varna, Lovech, Silistra and Shumen.

Number of households that was planned to be interviewed is shown in Table 1.

Table 1: Number of households in the sample

(number of households)

Regional Statistical Offices	Number of households in the sample		
	total	full diary	light diary
Total	225	113	112
Blagoevgrad	45	22	23
Varna	45	23	22
Lovech	45	22	23
Silistra	45	23	22
Shumen	45	23	22

Pilot survey started on 8, October and finished on 11, November 2018. The period consisted of five calendar weeks.

There were ten randomly chosen clusters (two by a district) for each week except the last one. This clusters included fifty households, which had to be interviewed. Ten households (two by a district) were interviewed in a weekday. Twenty-five households (five by a district) were interviewed in a weekend day.

Households were divided into two equal groups (one for the full diary and another for the light one).

There were five clusters, which had to be interviewed in the last week. They consisted from twenty five households. Five households (one by a district) were interviewed each weekday. Thirteen households were interviewed in Saturday and twelve in Sunday. Thirteen households completed the full diary and twelve the light one.

The households were not interviewed in two consecutive days according to requirements (Friday and Saturday or Sunday and Monday).

3. Decision on activity categories to be included in light diary

Decision on activity categories to be included in the light diary is based on the Activity coding list for HETUS. Main principles of the coding list were followed.

4. Elaboration, testing and uploading of software for conducting individual and household interviewers

Standalone application for conduction of individual and household part of questionnaire was elaborated. Technical specification for defining structure of the questionnaire, required limitations, filters and connections between questions and sections was developed as first step of that task implementation. One of the main requirements included in the specification was the IT application to be as much as possible user friendly in order to facilitate the interviewers' work. The application was elaborated for Windows Operating system. Other important requirement was protection of information and privacy assurance. The application for CAPI was developed by the BNSI expert. The coordinators of the fieldwork organisation at districts level had to appraise the CAPI application. They summarized that the application had been well designed and the instruction had been clear and very helpful. It is expected the same application (with modifications if needed) to be used for the next round of HETUS- survey.

The applications were developed using the Census and Survey Processing System (CSPro 7.1.3.). Testing with practical examples of the developed applications was conducted with participation of experts, involved in the Project realization as well as all interviewers engaged in fieldwork. The aim was to check the quality implementation of required filters, links, logical consistency and connections between sections and different questions of the questionnaire as well as its convenience for use by respondents.

Consistency and range checks are shown in the Annex III (in Bulgarian language).

5. Interim report

An interim report was developed and sent to Eurostat in October 2018. The report is presented in Annex IV (in English language).

6. Recruitment and training of interviewers and data coder

For implementation of the fieldwork 15 interviewers were selected (by 3 in a district). The selected interviewers are staff of the Regional Statistical Offices/“Statistical Surveys” Departments. All of them are with practical experience in the household’s sample surveys and with high skills in the field of personal interviewing.

Two-days training seminar was organised. The main purpose was to train interviewers and to get them familiar with the survey organisation, methodology, rules for completion questionnaires and diaries, etc. Trainers at the seminar were NSI staff engaged in the action. IT specialist presented the software developed. The whole survey process, questionnaire, sample design, survey technical organisation and support were discussed. The training seminar programme is presented in Annex V (in Bulgarian language).

7. Field work

Organisation of the field works

The fieldwork organization was done by five coordinators in the Regional Statistical Offices. These experts were responsible for fieldwork at districts level, control of the interviewers’ field works implementation.

Fieldwork was done according the NSI’s requirements for households’ surveys conducting.

To improve public trust and awareness of the population about the action short presentation for the survey conduction was published on the BNSI’s web site.

Data collection process

In accordance with the planed timetable, the fieldwork started at October 8th and finished on November 11th, 2018. The data collection process was implemented by the interviewers according to the instruction’s requirements.

Three interviewers were engaged in each district, as well as survey supervisors. Each interviewer had to survey 15 households or 225 households were interviewed during the pilot survey. Half of them (113) had to fill in the full diary and the rest (112) – the light one. Interviewers were provided lists of households included into the sample and survey days prior to the training seminar.

According to the Interviewer’s instructions in time of contacting with the household, after the interviewer’s presentation and before the start of the survey, the number of the household’s members was specified and household’s questionnaire was completed. After that interviewer completed an individual questionnaire for every household member aged 10+ were surveyed. Information for the individual questionnaire could be received in two ways: direct by the interviewed person or by another household member. Answers of the individual questions for the children had to be given by their parents or guardians. Questionnaires were filled by CAPI.

Next step was the completion of diaries (full or light). Each household member aged 10+ had to fill in two diaries – one for weekday and weekend day. The individuals completed the diaries by themselves via PAPI.

Number of the units and filled diaries is shown in Table 2.

Table 2. Sample size, interviewed units and number of filled in diaries

Regional Statistical Offices	Number of households in the sample			Number of interviewed households			Number of persons aged 10+ who present in the interviewed household			Number of interviewed persons by the individual questionnaire			Number of persons filled in diaries			Number of filled diaries		
	total	full diary	light diary	total	full diary	light diary	total	full diary	light diary	total	full diary	light diary	total	full diary	light diary	total	full diary	light diary
Total	225	113	112	188	93	95	430	204	226	430	204	226	428	204	224	856	408	448
Blagoevgrad	45	22	23	45	22	23	123	59	64	123	59	64	123	59	64	246	118	128
Varna	45	23	22	8	3	5	13	3	10	13	3	10	11	3	8	22	6	16
Lovech	45	22	23	45	22	23	98	46	52	98	46	52	98	46	52	196	92	104
Silistra	45	23	22	45	23	22	96	44	52	96	44	52	96	44	52	192	88	104
Shumen	45	23	22	45	23	22	100	52	48	100	52	48	100	52	48	200	104	96

Response rate

The response rate was defined as the proportion of eligible elements in the sample for which a questionnaire has been fully completed.

The response rate of the survey for the household questionnaire is computed as follows:

Nominator: The number of interviewed households

Denominator: Number of households in the sample

The response rate is 83.6 %.

Response rate of the households is 100 % in all regions except Varna where it is 17.8%.

Fieldwork methodological assistance, supervision and quality control of interviewer performance

At *national level*, experts from the Central Statistical Office controlled the performance and assured a methodological unity, assistance and monitoring during the whole process of field work.

IT expert, responsible for the IT application ensured the fieldwork daily technical assistance concerning data entry, editing, validation and data transfer from interviewers' electronic devices (tablets) to the database.

8. Transmission of information gathered

Information from household's and individual's questionnaires are gathered by CAPI. Therefore, it was recorded at NSI's server.

Full and light diaries were submitted to the Central Statistical Office for coding and validation.

9. Data coding, entry, processing, checking and cleaning

Coding of full diaries was done by experts from the Central Statistical Office, especially trained for the purpose. All Eurostat's recommendation for coding were followed.

Data entry of the diaries was made by experts from the Central Statistical Office in a specially developed software.

The main rules for primary data quality were ensured by the developed IT application, which does not permit to enter wrong values of responses. In case of unacceptable response, software writes warning error correction message, which does not allow go to the next question before the error is removed.

A review of completed questionnaires were carried out. Individual contacts between experts and interviewers were established all the time. These actions were performed regularly by the project team in the NSI in order to check whether the questionnaires were correctly filled in.

Additional data checking for consistence, editing and validation were performed during the database's information review at national level.

Data of both datasets (full and light diaries) was processed by SPSS.

10. Production of survey results

Activities and time for their completion were coded and aligned with the positions of the nomenclature that is used in the light diary.

Next step was the calculation of the average time people spend on different activities in their everyday lives.

Average time per interviewed person and per participant were calculated on data received by full and light diaries and also by sex. Standard deviations were calculated, too. Results are presented in Tables 3, 4, 5 and 6.

Table 3. Average time per interviewed person

(Hours and minutes per day)

Activity	Full diary		Light diary	
	Mean	Standard Deviation	Mean	Standard Deviation
Sleep	9:38:59	1:56:40	8:42:46	1:30:29
Eating	1:53:04	0:49:27	1:52:43	0:58:41
Personal care - washing, dressing, make up	0:49:24	0:32:11	0:50:34	0:29:06
Main and second job	2:34:04	3:54:24	3:16:28	4:09:09
Classes, lectures, courses	0:14:53	1:17:47	0:24:45	1:39:13
Cooking, washing, cleaning, laundry, ironing, sewing, knitting	2:15:16	2:12:30	1:21:54	1:44:26
Gardening and pet care	0:34:47	1:13:18	0:41:26	1:24:45
Construction, repairs	0:05:46	0:32:15	0:14:31	1:03:16
Shopping, services	0:24:36	0:36:17	0:21:49	0:32:28
Physical care for a child - bathing, dressing, feeding	0:07:26	0:33:06	0:07:42	0:43:34
Teaching, reading, playing, accompanying of a child	0:09:39	0:37:56	0:06:27	0:28:45
Caring of an adult (family member, acquaintance)	0:03:24	0:21:07	0:02:24	0:13:57
Conversations, visiting, cinema, theatre, concert, exhibition	0:41:09	0:58:07	0:35:09	0:59:10
Resting-Time out (relax, smoking, thinking, beach)	0:07:17	0:17:01	0:39:52	0:54:41
Walking, hiking, sports, fitness, hunting, fishing, herbs	0:22:58	0:52:15	0:36:55	1:10:55
Arts, drawing, singing, hobbies, card games, craps	0:05:50	0:29:43	0:05:02	0:23:40
Computer and video games	0:03:43	0:23:03	0:04:38	0:25:04
Communication via computer	0:03:10	0:14:27	0:11:20	0:30:36
Searching, reading on Internet	0:09:48	0:30:13	0:16:03	0:33:50
Reading books, magazines, newspapers	0:07:28	0:23:02	0:11:48	0:27:23
TV, video and listening to the radio	2:44:23	1:52:06	2:38:35	2:04:00
Travel (walking or by vehicle)	0:42:55	0:48:57	0:37:10	0:48:36

Table 5. Average time per interviewed person by sex*(Hours and minutes per day)*

Activity	Full diary			Light diary		
	Male	Female	Total	Male	Female	Total
Sleep	9:26:44	9:50:45	9:38:59	8:29:23	8:53:57	8:42:46
Eating	1:54:39	1:51:33	1:53:04	1:55:18	1:50:34	1:52:43
Personal care - washing, dressing, make up	0:50:02	0:48:48	0:49:24	0:50:20	0:50:45	0:50:34
Main and second job	3:06:30	2:02:53	2:34:04	4:15:30	2:27:06	3:16:28
Classes, lectures, courses	0:22:39	0:07:25	0:14:53	0:17:31	0:30:47	0:24:45
Cooking, washing, cleaning, laundry, ironing, sewing, knitting	1:09:06	3:18:54	2:15:16	0:17:40	2:15:37	1:21:54
Gardening and pet care	0:41:22	0:28:27	0:34:47	0:43:35	0:39:39	0:41:26
Construction, repairs	0:11:45	0:00:00	0:05:46	0:26:23	0:04:36	0:14:31
Shopping, services	0:22:43	0:26:24	0:24:36	0:19:29	0:23:46	0:21:49
Physical care for a child - bathing, dressing, feeding	0:04:31	0:10:15	0:07:26	0:03:29	0:11:13	0:07:42
Teaching, reading, playing, accompanying of a child	0:07:22	0:11:50	0:09:39	0:04:40	0:07:56	0:06:27
Caring of an adult (family member, acquaintance)	0:04:33	0:02:18	0:03:24	0:02:28	0:02:21	0:02:24
Conversations, visiting, cinema, theatre, concert, exhibition	0:45:40	0:36:48	0:41:09	0:32:37	0:37:16	0:35:09
Resting-Time out (relax, smoking, thinking, beach)	0:06:43	0:07:51	0:07:17	0:41:18	0:38:41	0:39:52
Walking, hiking, sports, fitness, hunting, fishing, herbs	0:28:07	0:18:01	0:22:58	0:44:03	0:30:57	0:36:55
Arts, drawing, singing, hobbies, card games, craps	0:09:03	0:02:45	0:05:50	0:07:43	0:02:48	0:05:02
Computer and video games	0:06:50	0:00:43	0:03:43	0:06:45	0:02:51	0:04:38
Communication via computer	0:03:54	0:02:28	0:03:10	0:12:46	0:10:08	0:11:20
Searching, reading on Internet	0:14:46	0:05:02	0:09:48	0:19:11	0:13:26	0:16:03
Reading books, magazines, newspapers	0:05:47	0:09:06	0:07:28	0:09:05	0:14:04	0:11:48
TV, video and listening to the radio	2:44:33	2:44:13	2:44:23	2:34:19	2:42:09	2:38:35
Travel (walking or by vehicle)	0:52:41	0:33:32	0:42:55	0:46:27	0:29:24	0:37:10

Table 4. Average time per participant*(Average time per participant)*

Activity	Full diary		Light diary	
	Mean	Standard Deviation	Mean	Standard Deviation
Sleep	9:38:59	1:56:40	8:42:46	1:30:29
Eating	1:53:04	0:49:27	1:52:43	0:58:41
Personal care - washing, dressing, make up	0:51:01	0:31:25	0:51:09	0:28:45
Main and second job	8:03:32	1:51:38	8:07:25	1:47:54
Classes, lectures, courses	6:26:22	2:01:02	4:58:28	3:16:25
Cooking, washing, cleaning, laundry, ironing, sewing, knitting	3:00:02	2:03:39	2:33:15	1:37:16
Gardening and pet care	1:59:41	1:31:32	2:20:03	1:42:33
Construction, repairs	1:37:59	1:36:35	2:42:39	2:27:04
Shopping, services	0:49:53	0:37:32	0:53:07	0:30:01
Physical care for a child - bathing, dressing, feeding	1:31:33	1:18:04	2:01:55	2:11:11
Teaching, reading, playing, accompanying of a child	1:39:47	1:18:18	1:39:07	1:01:01
Caring of an adult (family member, acquaintance)	1:20:50	1:09:43	1:02:50	0:37:49
Conversations, visiting, cinema, theatre, concert, exhibition	1:22:04	0:58:07	1:26:47	1:04:34
Resting-Time out (relax, smoking, thinking, beach)	0:33:55	0:21:09	1:10:39	0:55:54
Walking, hiking, sports, fitness, hunting, fishing, herbs	1:32:55	1:07:42	1:50:27	1:23:24
Arts, drawing, singing, hobbies, card games, craps	1:51:04	1:14:33	1:28:46	0:50:59
Computer and video games	1:41:55	1:12:10	1:23:27	1:11:31
Communication via computer	0:42:44	0:34:29	1:04:37	0:43:48
Searching, reading on Internet	1:11:04	0:48:06	1:04:13	0:38:39
Reading books, magazines, newspapers	0:52:03	0:37:28	0:57:27	0:32:11
TV, video and listening to the radio	2:52:36	1:48:30	2:58:45	1:57:07
Travel (walking or by vehicle)	0:57:26	0:48:42	1:07:03	0:47:30

Table 6. Average time per participant by sex*(Average time per participant)*

Activity	Full diary			Light diary		
	Male	Female	Total	Male	Female	Total
Sleep	9:26:44	9:50:45	9:38:59	8:29:23	8:53:57	8:42:46
Eating	1:54:39	1:51:33	1:53:04	1:55:18	1:50:34	1:52:43
Personal care - washing, dressing, make up	0:51:35	0:50:28	0:51:01	0:50:29	0:51:43	0:51:09
Main and second job	8:08:57	7:55:51	8:03:32	8:28:10	7:40:09	8:07:25
Classes, lectures, courses	6:26:35	6:25:43	6:26:22	4:31:57	5:12:59	4:58:28
Cooking, washing, cleaning, laundry, ironing, sewing, knitting	1:58:33	3:37:45	3:00:02	1:39:17	2:42:53	2:33:15
Gardening and pet care	2:21:58	1:38:09	1:59:41	2:28:11	2:13:18	2:20:03
Construction, repairs	1:37:59	0:00:00	1:37:59	2:37:00	3:16:30	2:42:39
Shopping, services	0:51:08	0:48:54	0:49:53	0:54:20	0:52:19	0:53:07
Physical care for a child - bathing, dressing, feeding	1:38:45	1:28:49	1:31:33	1:07:18	2:34:31	2:01:55
Teaching, reading, playing, accompanying of a child	1:24:35	1:51:49	1:39:47	1:30:00	1:44:18	1:39:07
Caring of an adult (family member, acquaintance)	1:25:57	1:12:37	1:20:50	1:20:00	0:52:54	1:02:50
Conversations, visiting, cinema, theatre, concert, exhibition	1:24:48	1:19:02	1:22:04	1:25:00	1:28:09	1:26:47
Resting-Time out (relax, smoking, thinking, beach)	0:32:25	0:35:15	0:33:55	1:06:34	1:14:44	1:10:39
Walking, hiking, sports, fitness, hunting, fishing, herbs	1:39:24	1:24:39	1:32:55	1:59:08	1:41:39	1:50:27
Arts, drawing, singing, hobbies, card games, craps	1:47:17	2:05:00	1:51:04	1:36:40	1:14:41	1:28:46
Computer and video games	1:43:55	1:26:40	1:41:55	1:32:42	1:09:43	1:23:27
Communication via computer	0:43:20	0:41:52	0:42:44	1:06:01	1:03:13	1:04:37
Searching, reading on Internet	1:13:20	1:05:21	1:11:04	1:07:49	1:00:22	1:04:13
Reading books, magazines, newspapers	0:41:20	1:01:52	0:52:03	0:57:57	0:57:11	0:57:27
TV, video and listening to the radio	2:56:24	2:49:06	2:52:36	2:56:00	3:01:00	2:58:45
Travel (walking or by vehicle)	1:05:30	0:48:26	0:57:26	1:11:46	1:01:42	1:07:03

11. Comparative analysis of the results produced based on traditional and light diary

Quantitate analysis

In general, results show that average time spent on an activity per a person who has filled in the full diary is from 0:03 to nearly 9:39. Average time for the other group of people (those who has filled in the light diary) is from 0:02 to nearly 8:43.

Average time per activity for respondents of two type of diaries is approximately with the same duration for a considerable part of the activities. The respondents of two types of diaries spend most time on the activity

sleep. They spend around 9:00 hours for this activity. The result for the duration of the sleep corresponds to the result that have been calculated from the HETUS 2010 data. Then the average duration of the sleep activity has been 9:14.

There are nine activities that respondents of the full diary spend minimum 0:30 per day. These activities are Sleep; Eating; Personal care - washing, dressing, make up; Main and second job; Cooking, washing, cleaning, laundry, ironing, sewing, knitting; Gardening and pet care; Conversations, visiting, cinema, theatre, concert, exhibition; TV, video and listening to the radio; Travel (walking or by vehicle). Respondents of the light diary spend minimum 0:30 per day per activity for 11 activities. They are the ones that are written above and the activities: Resting-Time out (relax, smoking, thinking, beach) and Walking, hiking, sports, fitness, hunting, fishing, herbs.

Activities which duration is minimum 0:30 could be grouped into 3 groups.

- First group – it includes the activity sleep. This is the activity that people spend the biggest part of their time. Persons who have filled in the full diary sleep average 9:38:59 or 40.2 % per twenty-four hours. Those who has filled in the light diary sleep 8:42:46 or 36.3 % per twenty-four hours.
- Second group – it includes the activities that the respondents of two type of diaries spend minimum 1:00 and maximum 3:30. These activities are Eating; Main and second job; Cooking, washing, cleaning, laundry, ironing, sewing, knitting; TV, video and listening to the radio.
- Third group - it includes the activities that the respondents of two type of diaries spend minimum 0:30 and maximum 1:00. These activities are Personal care - washing, dressing, make up; Gardening and pet care; Conversations, visiting, cinema, theatre, concert, exhibition; Travel (walking or by vehicle).

Smallest average time (under 0:05) respondents of two types of diaries spend on the activities: Caring of an adult (family member, acquaintance) and Computer and video games. Respondents of the full diary spend under 0:05 for communication via computer, too. Respondents of the light diary spend for this activity average 0:11 per day.

Comparative analysis of the average time per interviewed person by sex shows that biggest difference in the average spent time by sex (around 1:00-2:00) for respondents of the both diaries is about the activities: Main and second job and Cooking, washing, cleaning, laundry, ironing, sewing and knitting. The first one is an activity where men spends more time than the females. Second one is an activity where females spend more time than men.

Following one of the project's aim to compare the results received by full and light diaries the average time for an activity is calculated in minutes. Standard deviation is calculated, too. Results are presented in Table 7. Statistical hypothesis testing for checking whether there are a statistically significant deference between the average spent time per activity received on both types of diaries was made. Such testing was made for each of the activities. The calculated Z-values are presented in Table 7.

Table 7. Average time per interviewed person (in minutes), standard deviation and Z test statistic values

Activity	Full diary			Light diary			Test statistic Z
	Mean	Number of interviewed persons	Standard Deviation	Mean	Number of interviewed persons	Standard Deviation	
Sleep	579	204	117	523	224	90	5.58
Eating	113	204	49	113	224	59	0.07
Personal care - washing, dressing, make up	49	204	32	51	224	29	0.39
Main and second job	154	204	234	196	224	249	1.80
Classes, lectures, courses	15	204	78	25	224	99	1.13
Cooking, washing, cleaning, laundry, ironing, sewing, knitting	135	204	132	82	224	104	4.64
Gardening and pet care	35	204	73	41	224	85	0.86
Construction, repairs	6	204	32	15	224	63	1.77
Shopping, services	25	204	36	22	224	32	0.83
Physical care for a child - bathing, dressing, feeding	7	204	33	8	224	44	0.07
Teaching, reading, playing, accompanying of a child	10	204	38	6	224	29	0.98
Caring of an adult (family member, acquaintance)	3	204	21	2	224	14	0.58
Conversations, visiting, cinema, theatre, concert, exhibition	41	204	58	35	224	59	1.05
Resting-Time out (relax, smoking, thinking, beach)	7	204	17	40	224	55	8.14
Walking, hiking, sports, fitness, hunting, fishing, herbs	23	204	52	37	224	71	2.29
Arts, drawing, singing, hobbies, card games, craps	6	204	30	5	224	24	0.31
Computer and video games	4	204	23	5	224	25	0.39
Communication via computer	3	204	14	11	224	31	3.47
Searching, reading on Internet	10	204	30	16	224	34	2.00
Reading books, magazines, newspapers	7	204	23	12	224	27	1.76
TV, video and listening to the radio	164	204	112	159	224	124	0.51
Travel (walking or by vehicle)	43	204	49	37	224	49	1.22

Comparison between computed test statistic Z with the critical test value - 1.96 ($\alpha=0.05$) shows that there is not a statistically significant difference in the average spent times by the respondents completed two types of diaries for 16 of the activities. These activities are: Eating; Personal care - washing, dressing, make up; Main and second job; Classes, lectures, courses; Gardening and pet care; Constructions, repairs; Shopping, services; Physical care for a child - bathing, dressing, feeding; Teaching, reading, playing and accompanying of a child; Caring of an adult (family member, acquaintance); Conversations, visiting, cinema, theatre,

concert, exhibition; Arts, drawing, singing, hobbies, card games, craps; Computer and video games; Reading books, magazines, newspapers; TV, video and listening to radio; Travel (walking or by vehicle).

Statistical hypothesis testing shows that there is a statistically significant difference in the average spent time in six of the activities. These activities are:

- Sleep – average time per interviewed person by the full diary is 9:38:59 and the average time calculated on the data received by the light diary is 8:42:46.
- Cooking, washing, cleaning, laundry, ironing, sewing, knitting - average time per interviewed person by the full diary is 2:15:16 and the average time calculated on the data received by the light diary is 1:21:54.
- Resting-Time out (relax, smoking, thinking, beach) – average time per interviewed person by the full diary is 0:07:17 and the average time calculated on the data received by the light diary is 0:39:52.
- Walking, hiking, sports, fitness, hunting, fishing, and herbs - average time per interviewed person by the full diary is 0:22:58 and the average time calculated on the data received by the light diary is 0:36:55.
- Communication via computer - average time per interviewed person by the full diary is 0:03:10 and the average time calculated on the data received by the light diary is 0:11:20.
- Searching, reading on Internet - average time per interviewed person by the full diary is 0:09:48 and the average time calculated on the data received by the light diary is 0:16:03.

Essential differences in average times calculated on data received by full and light diaries are observed in the some activities. Differences and their reasons are following:

- Considerable difference is observed in time spent on **“sleep”** (per interviewed person and per participant), based on the two types of diaries. In general, based on previous whole year surveys results, time spent on “sleep” in Bulgaria is longer than in other countries and almost the same as in pilot (if full diary is reviewed). The last is due to a great extent to so called “afternoon naps”, typical for Bulgarian population and especially for elderly and children aged up to 12-13. Also based on the analysis of episode data from previous surveys, the same is “popular” among young parents at weekends. Thus, pilot data produced based on full diary is considered more reliable and close to the reality. Moreover, the conclusion above is proved by data spent on “resting”. Pilot data show that “resting” takes 30 minutes more based on light diary, than on full one. Traditionally, in Bulgaria people consider “afternoon nap” as “resting”, not “sleep”, but according to HETUS guidelines on data coding, “nap” should be coded as “sleep”. Results produced based on full diary (coded by expert in TUS data coding) are considered as more accurate and reliable than people’s “classification” of an activity. So, in respect these two activities, we could summarize, that full diary is better choice than short one if nationally representative data is aimed.
- A little bit different is the situation when time spent on **“main and second job”** is considered. There is a difference if “interviewed persons” are considered and quite small one if “participants” only. One can presume that participants classify their activities on job properly, no matter the type of diary. What concern “interviewed persons”, the difference could be explained by “inclusion” or “exclusion” of lunch breaks, which should be classified under the activity performed during the lunch break, but the last is possible to be followed if “primary” and “secondary” activities are asked. In Bulgarian

case, in order to be comparable to the light one, the full diary used in pilot survey do not asked for “primary” and “secondary” activity. So, data produced based on light diary should be considered carefully in respect reliability and representativeness.

- Next important activity in respect its share in time use and gender equality is **“housework”**. In case of pilot, we try to group more of the housekeeping activities in one category in order to produce comparable results from both types of diaries. Pilot results show that “light” diary data somehow underestimate time spent on such activities. It is difficult to state firmly, but seems that people have difficulties with classifying some types of household activities and reported them under other categories. The challenge here will be to try a specialized survey, directed to these activities in order to estimate better these differences. Regardless, results produced based on full diary are closer to previous whole year surveys, based on full self-completed diary.
- Time spent on next activity of interest **“physical care for children”** show small differences – the last is less than 30 minutes per participant. Taking into account considerations listed in previous point, it could be presumed that some of activities connected to “physical care for child” are classified by respondents as “housework”. Nevertheless, light diary seems good enough tool for studying care for children.
- **“Communication via computer”**- the light diary produces results on this activity that are higher than full diary, both for interviewed persons and participants. In the case, again we suppose misclassification of activities by respondents. Probably some computer activities like “surfing”, “liking” are wrongly classified as “communication”.

Qualitative analysis

The coordinators of the field works organisation at districts level had to summarize the problems which had occurred in the process of the information collection by the both type of diaries if there were any. They resumed that the both types of diaries have had a very good example with directions of how to fill them in. Respondents have had difficulties in completing the light diary. Respondents find easier to give a short description of the activities they have done than to select a predefined category for them. They could complete the activities they have done quickly in the full dairy than in the light diary.

In addition to the mention above HETUS collect information about additional activity and the location of the person. Pilot survey didn’t collect such an information. Information about the additional activity and location would be difficulty collect if the light diary was used.

Conclusion:

Overall opinion of the staff, interviewers and respondents is that:

- Light diary is not adequate for receiving of comprehensive and quality information for assessment of the time people spend on different activities in their everyday lives. Full diary would give more accurate information about time use.
- Full diary would give more information about the time use as it gives information about an additional activity and location of the person.

- Full diary is easier and more convenient for filling in by the respondents than the light one. Light diary (used for the pilot survey's purposes) forms conditions for inaccuracy during the filling in process and makes difficulties for the respondents.
- Light diary would be used for conduction of intermediate survey between two HETUS waves. Such a survey would be faster and cheaper. It could give indicative results for any changes in time use.
- Light diary would be used for studying of the time use on specific population groups or particular age groups. The pilot survey shows that younger people prefer light diary better than the full one and they fill it in easier.

The application that was developed in the project frame for the CAPI interview will be used for the HETUS which will be held in Bulgaria within the period 2021-2022. It will be modified according to the requirements of the next survey round.

Annexes:

Annex I – Full diary (in Bulgarian language);

Annex II – Light diary (in Bulgarian language);

Annex III – Logics (in Bulgarian language);

Annex IV – Interim report (in English language);

Annex V – Programme training seminar (in English language).