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Statistics on working time arrangements: Issues and the role of time use surveys

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Introduction

ATime@ is often described as our most fundamental resource. We all have time to spend, and how we spend it will influence our wealth, welfare and happiness as well as that of persons close to us. How we spend our time **depends** on a long list of factors: some are inherent to the human biology, but most are linked to individual choices made by us and by other individuals, as well as to collective Achoices@, either made by the institutions of the communities in which we live and work or emerging from the totality of the choices made by all other individuals of those communities. How time is spent can be **described** by the *types of activities* carried out and by the *length* of time spent in them, as well as by the *context* in which they are done and their *scheduling*[2]. Thus *type, length, context* and *scheduling* are the dimensions which need to be described by statistics on time-demanding activities, including those activities which we consider to be Awork@[3]. Together Alength@ and Ascheduling@ represent the **working time arrangements (WTAs)** of a job, and a persons overall WTAs for a reference period is determined by the number of jobs held during that period as well as the WTAs for each of them.

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[2] The *type of activity* describes **what** a person does: eating, typing, cleaning a building or a dwelling, driving a vehicle, digging a dwell, managing a firm, cutting sugar cane, sewing clothes, making shoes, etc.; the *context* of an activity relates to **where** the activity is carried out, **with whom** and **for what purpose**; the *scheduling of an activity* describes the location in the day, week or year of the activity: whether during the day, in the evenings, nights or on weekends, etc.

[3] See e.g. *Hoffmann & Mata (1998)* for a discussion of typologies for **type** and **context** of time use activities.

Differences in WTAs for jobs and thus also for workers reflect differences in the nature of the work that needs to be done. Such differences may lead to different working time patterns over the day, the week, the month and the year, for individuals in a society. Changes over time in WTAs will reflect changes in the preferences of employers, of workers or of society in general, for Awhen@ work should be done as well as in Awhat@ needs to be done, as income changes and as a consequence of demographic and social developments in general. It will be necessary to have relevant statistics to describe and understand such patterns and their changes, as well as how they differ for different groups of workers and the causes and consequences of the changes and differences. Thus an increased demand for statistics on WTAs has emerged with recent concerns in OECD countries for Aflexibility@ in WTAs as a necessary part of the perceived need for overall Aflexibility@ in their labour markets to be able to achieve lower rates of unemployment and higher rates of employment without increased rates of inflation; as well as concerns with workers= capacity to decide upon their own free time, which is seen as the reverse side of the flexibility-coin for employers. There have also been demands for such statistics to support discussions of other societal concerns, e.g. the households= capacity to care for children as well as sick and elderly family members when all able-bodied, adult members are working for pay or profit outside the household.

The objective of this note is to discuss the specific role which *Time Use Surveys (TUS)* can play in providing statistical information abot WTAs and some the methodological issues involved, in light of the tools and experiences already available.[4] Depending on the particular issues to be studied such statistics may e.g. relate to:

- Workers= contractual arrangements with respect to the scheduling of their working time, e.g. to establish whether different contractual patterns in different countries are related to differences in short or longer term macro-economic performance.
- The distribution of contractual working time arrangements across the employed population and differences for different groups of workers.
- The relationship between actual practices regarding WTAs and the contractual forms.
- The extent to which different groups of workers control their own working time arrangements and e.g. have the possibility of responding to family emergencies and other obligations without loss in employment-related income.
- The extent to which different patterns of WTA correlate with particular patterns of health related problems, including occupational accidents, injuries and illnesses.
- The extent to the WTAs differ for employed members of households with and without small children or other care-requiring members.

[4] Note that while statistics on the Anumber of hours worked=, whether Aactual hours=, Ausual hours= or Acontractual hours=, are part of the statistics on WTA, they may also be of interest in their own right, e.g. as basis for estimating e.g. Atotal annual hours actually worked= as a measure of total labour input to calculate labour productivity (when linked to total production), or to calculate implicit wage rates (when linked to income from employment).

Describing WTAs

The term *working time arrangements* refers to the length and scheduling of a job=s working time over various reference periods, such as the day, the week the month and the year. In particular in the OECD countries it is common to distinguish between Astandard@ and Anon-standard@ WTAs. Jobs with Astandard@ WTAs are considered those where workers in a regular week work between seven and nine daily hours from Monday to Friday, starting some time between 6 and 9 in the morning and stopping some time between 3 and 7 in the afternoon/evening, and working roughly the same amount of hours every week of the month and every month of the year, except for public holidays and contractual or statutory leave periods. Jobs with Anon-standard@ WTAs therefore include those of shorter or longer length, and/or where work is scheduled for only some of the five Aworking days@ in a regular week, where work is at night and on weekends, as well as schedules where the starting or exit times are at different hours of the day during the week or over a longer reference period, e.g. a month. AOvertime@, Apart-time@ work and Asplit shifts@ schedules are therefore seen as Anon-standard@ schedules, as are so-called "flexitime" and "work-bank" arrangements.

The two dimensions of WTAs, i.e., the Alength@ and Ascheduling@ of working time, together with information on their fixed or variable nature, can be combined in different ways to derive a vast number of different WTAs. Among the many possib le combinations, a number of formalised or contractual WTAs have taken shape with sufficient uniformity across countries to allow the identification of broad categories. Box 1 below presents summary descriptions for some of them. The categories do not pretend to be exhaustive of all possible WTAs, nor are the descriptions meant to be precise[5].

All workers have a WTA of one type of another, as long as Awork@ can be identified with a set of activities which are distinct from other time demanding activities. However, as formulated the descriptions in Box 1 relate to jobs and are pertinent only to employees with written or oral working

[5]That would be impossible at this stage, for at least three reasons: First, WTAs of the same type are not necessarily strictly comparable between countries, establishments or even workers within an establishment. This is because they develop in relation to national working time legislation, collective agreements and preferences of employers and workers to be specific to countries, industries, groups of workers or individuals. To the extent that WTAs reflect employers' needs regarding the organisation of work they will tend to be specific to each establishment. For other groups of workers the WTAs may be determined by workers' preferences, in which case they will tend to be specific to each worker. Second, the categories for WTAs described in Box 1 are not fully homogeneous: the same group may include arrangements which differ with respect to length of the working day or week and the period of time during which work is carried out. Third: the terminology used in a legislation or by establishments to denote the different WTAs is not sufficiently standardised. This means that the same term may refer to different WTAs in different contexts or when used by different persons.

Box 1. Descriptions of some WTAs categories

- **Annual hours contracts**, and other kinds of contracts with Along@ reference periods, allow variations in daily, weekly and monthly hours of work within a weekly or monthly average or an annual total, without any requirement that the employer pay overtime rates. Under an annualized hours contract, the distribution of the number of hours worked throughout the year is generally determined by the employer dependent on production or service needs; but they may allow employees to negotiate the length of their daily and weekly working hours, as long as output targets can be met.
- Under a **working time banking** arrangement, the hours accumulated can be taken off for extended leave in a subsequent period. Related to this arrangement are **flexible hour contracts** which allow workers to schedule their own daily and weekly hours of work beyond specified Acore@ and Aminimum@ hours, during which presence at the workplace is compulsory. Hours worked in addition to workers= contractual hours for the week (or month) may be taken as leave during subsequent weeks or months, often within a deadline and up to a maximum number.
- In a **staggered and block working arrangement** workers or groups of workers start and finish work at slightly different fixed times outside of Acore hours@, when presence is compulsory.
- **Min-max contracts** provide a guarantee for a minimum and maximum number of hours to be worked per reference period, but the number of hours actually worked and paid for will vary depending on production or service needs.
- **On call work or zero hours contracts** require that workers be available to work when called with a specified notice. These workers have no fixed contractual hours and can be called into work for as many hours as the employer requires (up to legal specified limits).
- In **shift-working contracts** workers succeed one another at the workplace so that the establishment can operate longer than the hours of work of individual workers. The successive daily periods are called "shifts". Depending on the establishment=s operating hours, workers may work a morning, evening, night or weekend shift. They may always carry out the same shift (e.g., the night shift, the weekend shift, etc.) but they may also alternate different types of shifts on a weekly or fortnightly basis, with a certain number of free days built into the programme; or have more than one work period on the same day with a gap of several hours in between each Awork episode@, i.e., Asplit shifts@.
- **Compressed working week** arrangements schedule the normal total weekly hours of work over fewer days. Workers may work on weekends in which case the average weekly hours of work can be shorter than for those who work on Aregular@ days.
- In **part-time work** arrangements the normal hours of work for the person are less than those of comparable full-time workers [Convention concerning part-time work, 1994].
- **Overtime** hours are worked in addition to the contractual working hours, understood as the hours of work that workers are expected to work per day, week or year, as stipulated in their working contracts. Overtime hours may be paid or not, and if paid they may be paid at higher rates of pay than Anormal@ hours.

Sources: *ILO (1985)*, *Eurostat (1999*)

contracts which stipulate an explicit and formalised arrangement of working time. This is generally the situation only for a subset of all employees. Thus, the number of workers directly subject to such contracts in an economy can be relatively small, particularly in developing countries, as these arrangements are generally not explicit for self-employed workers or for many employees in the informal sector. Furthermore, formalised WTAs may not be applicable to some groups of employees in the formal sector, such as managers, out-workers and casual employees. Still, the **actual** pattern of working time for any such group of workers may correspond to the WTAs which fall in one of these groups, **thus WTA categories such as those outlined can be relevant for all groups of workers.**

Underlying the descriptions in Box 1 there are four characteristics or defining criteria for WTAs of jobs:

- The number of hours worked during the day, week, month and year, and the number of days worked during the latter three reference periods. We may call this criterion the **length** of time spent in work activities.

- The degree of stability in the number of hours worked during the day, week, month and year; or in the number of days worked. We may call this criterion the **stability of the length** of work.

- The period(s) during the day, week or month when work is done, e.g., in the morning, afternoon, evening, from Monday to Friday, on weekends, as overtime, etc. We may call this criterion the **scheduling** of work activities.

- The degree of stability of daily entry and exit times and weekly working days, e.g., whether work starts at the same hour every day of the week or whether work is always carried out the same days of the week, etc. We call this criterion the **stability of scheduling.**

These criteria can be used to outline a typology for WTAs, as illustrated in Box 2 on the next page.

Measurement approaches

There are two complementary approaches to measuring WTAs. The first will focus on a set of **labels** or **titles** of formalised (categories of) WTAs and will try to determine directly the number of workers (or establishments) experiencing them, e.g., by asking an establishment to provide information about the number of workers on, e.g., Aflexi-time arrangements@, on Anight shifts@, etc. during a specified reference period. The second approach will focus on the **defining criteria** for WTAs, and will try to determine actual practices, e.g. whether individual workers have entry and exit times as well as total working hours which vary from day to day, while being bound by a set norm of weekly working hours against which surpluses or deficits are counted. Such workers may then be defined as the workers in Aflexi-time arrangements@. Instead of identifying Anight shift workers@, one may seek to identify those who generally work after core hours or between the relevant hours in the evening and next morning. Using both approaches simultaneously will provide the most comprehensive information on WTAs.

The first approach will provide valid estimates of the various WTAs in those countries where (a) terminology and establishments= practices are reasonably well regulated and/or standardised; and (b) the number of employees with working contracts to whom such arrangements apply is numerically significant. With this approach it will not be possible to provide estimates on unusual or ad hoc WTAs. Furthermore, estimates based on this approach will not necessarily be internationally comparable because of differences in institutional conventions and arrangements.

Box 2. Working Time Arrangements and defining criteria

Arrange-ment	Length	Stability of length	Scheduling	Stability of scheduling
Standard contracts	daily and weekly full-time	fixed daily and weekly hours	core hours	fixed
Annual hours contracts	any	fixed annual hours, variable daily and weekly hours	any	variable
Working time banking	any	fixed weekly/monthly hours against which deficits and surplus hours are counted	core hours + any other	variable
Flexitime	any		core hours + any other	variable
Staggered hours	any	fixed weekly hours	core hours + any other	fixed
Min-max contracts	any	variable daily and weekly hours within set range of hours	any	variable
On call work	any	variable daily and weekly hours; fixed minimum hours (= 0)	any	variable
Shift working	any	variable daily and weekly hours within fixed monthly hours/fixed pattern	any	variable
Compressed working week	more hours/day less days/week	fixed weekly hours	any	fixed
Part-time work	less than full-time	fixed weekly hours	any	fixed/ variable
Overtime	beyond full-time	none	non-core hours	variable
Variable hours	any	none	any	variable

The second approach can be independent of terminology and workers' perceptions regarding the type of WTAs they follow. Therefore, with sufficient questions properly formulated (a) it will be possible to provide reliable information on the way working time is organised even when terminology and establishments' practices are not harmonised within a country; (b) it will be possible to apply a typology for WTAs to workers without work contracts; (c) it will be possible to identify unusual and ad hoc WTAs; and (d) international comparability can be facilitated. However, this approach will not provide indications of formalised WTAs, and will involve significantly higher data collection and processing costs than the first approach.

Measuring WTAs through Time Use Surveys (TUSs)

TUSs are designed to account for the nature, duration and location of all activities which are carried out by the population during a reference period. They typically consist of two data collection instruments: a Ademographic@ questionnaire for >background information and a Atime@ diary. The demographic questionnaire is designed to obtain personal and labour force information, and tend to follow the structure and content of a LFS questionnaire: i.e., it collects information on employment status and hours worked during a reference week which covers the period of the time diary. Thus information for the same individuals from the two instruments can be used together, and compared when they deal with the same or closely related variables. The time dairy collects information on all activities carried out during a short reference period, normally during one to three days and rarely for as long as a full week. Respondents are expected to report their activities, whether economic or non-economic, in sequence throughout the day(s) of the reference period, together with information on the context of the activities, i.e., Awhere@ the activities are performed, Awith whom@ and Afor what purpose@.

TUSs are appropriate tools for studying some forms of WTAs. The main reason is because of the enhanced quality of some of the information obtained: With a complete account of the time spent on economic and non-economic activities, as well as on their timing during the day, the length and timing of the episodes which satisfy the analyst=s definition of >work= can be derived *post facto*, instead of being Aguesstimated@ by the respondent when answering a question about >the number of hours actually worked=, as is done in LFSs. Therefore, it can be expected that TUSs provide better estimates of working time than LFSs, especially for workers for whom the distinction between periods of >work= and >non-work= may be unclear or when such periods are frequently interchanged. As a result, they will also provide better estimates of **when** work is carried out, i.e., on WTAs.

TUSs can also obtain information on the usual contractual WTA commitments, through the demographic questionnaire, and then compare these with their manifestations during the reference period, through the time diaries. The latter will record the length and sequence of all activities performed during the diary period. Some workers, for example, will work only Acore@ hours. If this is a fixed pattern they can be identified as working Astandard@ schedules. If on the contrary, the length and scheduling is variable, they could be identified as working flexitime schemes. Some workers will record >work= before the core hours or after, e.g. in the evening or on weekends. Depending on the pattern of these variable time locations during the week, they may e.g. be identified as >shift workers=. Workers on >split shifts= may be identified on the basis of the length and location of their various work episodes within each day.

However, it is clear that traditional TUSs also have short-comings if the objective is to obtain statistics on the full range of WTAs suggested by the typologies:

a. The first is that it will probably be strongly preferable to have time diary information for at least a full week for each individual, as well as relevant supplementary information from the >demographic= questionnaire, which most national TUSs have not had, see e.g. the discussion in the concluding section of *Harvey et al (2000)*. Current practices means that the resulting statistics describe what people in the aggregate do during

any given day of the week and identify daily patterns of work, but they cannot describe patterns of individual behaviour over a full week. To do so is important also for understanding and describing WTAs, mostly because for most people life=s activities, including those related to work, are organised according to weekly cycles. Additionally, for some groups of workers the sample days may not be representative of the whole week, or even for the >normal= working days Monday to Friday. An additional consideration is that using a fixed reference period also causes Aleft@ and Aright@ censoring, because it truncates the available information and it is therefore not possible to know whether work episodes present at the beginning of the reference period, e.g. at midnight, have in fact started before the reference period, and for how long it has been going on. The same happens with persons who report work episodes which finish at the end of the reference period. While simple modifications to the time diary format should make it possible to eliminate this problem, more modifications and experiments are need to develop a recording system for activities over a whole week which is not so burdensome to the respondents that the drop-out or non-response rates become so high that they undermine the quality and usefulness of the resulting statistics.

b. A second shortcoming is that the traditional TUS does to a large extent leave it to the respondent to decide whether an activity represents >work=. Because these surveys mostly have been designed to study the time spent in unpaid or non-economic activities and for the valuation of non-market production, it has been left to the respondent to designate certain activities as >paid work= or similar and virtually no detailed recording have been made of what the persons actually do during such periods. Nor have there been many instructions to those who record and code the activities of what to include as >paid work=, except to identify separately longer meal breaks and travel time. Therefore the measurement of working time and of WTAs in a TUS still reflects to a large extent, although perhaps less than in a LFS, the respondents' opinions of what "work" is. At present, therefore, the potentials of TUSs for providing statistics on working time and the way it is organised have not been fully realized.[6]

c. A third shortcoming is the limited sample size for most TUS, caused both by the costs of the individual interview to the organisation undertaking the surveys. As a result meaningful statistics will mostly be limited to broad patterns of WTAs for the total employed population, or for large sub-groups. Over-sampling of special industries and groups of workers, or special surveys for them, may therefore be necessary to throw light on forms of the WTAs which are of particular concern, or on the WTAs of workers of particular interest. (See *Harvey & Spinney (2000)* for a presentation of a TUS for teachers.)

d. For international comparisons it is also a disadvantage that there has also been a lack of a uniform methodology across TUSs in different countries. The resulting comparability problems across time and countries arise from differences in (a) the selection of days for which diaries are collected, i.e., whether all days of the week, selected weekdays and weekend days; etc. (b) the time period covered by diaries, i.e., whether part of a day, a full day, etc.; (c) the time scale used to record activities from, i.e., whether 5 minutes intervals, 30 minute intervals, open intervals, etc.; and (d) the starting time of the daily diary, i.e., whether midnight, 4 am; etc..

In 1999 the ILO commissioned a study on the use of TUSs to measure WTAs. The results are presented in *Harvey et al (2000)*. Based on micro-data from TUSs in Canada, the Netherlands, Norway and Sweden it analysed the Aspread@ of working time throughout an average day in these countries. The main daily work patterns identified were:

[6] See *Hoffmann & Mata, 1998* for further discussions and a proposal for an alternative approach to the classification of time use activities.

- schedules which are totally within "core" hours, defined as the most common entry and exit times of the employed population;
- schedules which are totally before core hours;
- schedules which are exclusively after core hours;
- schedules which start before core hours and end within core hours;
- schedules which start within core hours and end after core hours.

Among possible topics not studied was the incidence of different lengths of working time, nor the incidence of WTAs which contain more than one work episode (e.g. in the case of "split shifts"). Neither did the study explore the permanence of particular work patterns throughout the reference period.

Still, on the basis of the resulting daily patterns of working time, it was found, for example, that the extent to which working time was spread across the day varied between countries and occupations; that working time was more spread throughout the day among men than among women, whose hours tend to be concentrated in core hours; marital status was not a determinant of work patterns but the age of the youngest child was. For countries with observations from two years, it was found that working hours have become more concentrated around "core" hours. This seems to contradict the popular perception also in these countries that there has been a relative reduction in the number of persons who work only during core hours. In addition a correlation was found between the spread of daily working patterns and particular WTAs: the spread was higher among workers with compressed working schedules, and was lower and concentrated around core hours among part-time workers; it was higher for workers "on call"; etc.. An interesting feature, which has consequences for measurement, is related to the observed correlation between the dispersion of the hours in the day and the divergence between working time reported in the demographic questionnaire and that calculated from the time diary. This seems to confirm that TUSs is the better method for measuring the length of working time for "non-standard" WTA situations.

Measuring WTAs through other data collection instruments

WTAs can also be measured using other general data collection instruments which are also used for other types of official statistics: i.e. household surveys, establishment surveys and administrative registrations.

Information about WTAs stemming from **administrative registrations** *identify labels or titles of formalised WTAs*. They provide descriptions of WTA laws and regulations, whether national in scope or only covering particular groups of workers. But they cannot provide a direct basis for any statistics, as they contain information about what the WTAs are supposed to be for different groups rather than what the WTAs actually are. Administrative registrations also provide systematic information on recent on collective bargaining agreements, mainly at the firm level, that allow employers and employees to enter negotiations reasonably well-informed about current trends in settlements. However, the demand for such information may be different in different labour markets and may not provide internationally comparable data.

Another form of administrative registrations would provide information on the number of workers who are covered by one or more WTAs[7] but such primary data for WTA statistics are generally not compiled at present.

Establishment surveys (ESs) are used to request information from establishments on e.g. operations, staffing, work arrangements etc. The possibility for an establishment to give information about the number of workers who work according to different WTAs, together with information about their wages and demographic characteristics, or about the characteristics of WTAs themselves, will depend on whether this information can be easily extracted or deduced from the records it keeps for its own use. ESs are more suited to provide information on particular WTAs, e.g. on "overtime" or "shift-work", often as business cycle indicators.[8] The potential of ESs for obtaining information on the causes of the various WTAs on the operation of the establishment needs to be mentioned as well.

As with all establishment surveys, one advantage over household surveys is that they are less subject to reporting error when responses are based on records of working time for the purpose of calculating pay. The main disadvantage is the incomplete coverage of the total work-force, as certain establishments, normally the small and unstable ones, may have to be excluded, and this will also mean that certain disadvantaged groups of workers will also be excluded, in addition to those who are "self-employed". Furthermore, management and irregular or peripheral staff may be excluded.

The main general advantage of **household surveys** is well known: It is normally possible to design samples which will be representative of the whole resident population, and thus cover all possible WTAs, at least in principle. The main disadvantage is the high cost of collecting information when each unit of observation has to be contacted individually or as member of a unit with few members, i.e. a household. This means that for many groups of interest the sample will be too small to provide estimates with a precision adequate for the types of comparisons one would like to carry out, either with other groups or over time. To some extent the LFSs have been designed to reduce this disadvantage by (i) accepting that the costs of a relatively large sample is warranted when the objective is to describe and monitor a country's most valuable resource, its labour force; (ii) focusing the scope of the survey to issues related to persons' participation in economic activities and the relevant personal and job related characteristics; and (iii) designing both the survey sample and its operation to facilitate comparisons over time. From the perspective of international comparability of the resulting statistics it is also an advantage that the different national surveys follow reasonably similar formats and aim at providing statistics according to concepts for which there exists reasonably precise international recommendations.[9]

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[7] These registrations are different from those kept by employers about the actual WTAs of individual workers for staff supervision and pay determination.

[8] See e.g. *Bellmann et al (1996)* for examples from Germany.

[9] See *ILO (2000, forthcoming)* for up-to-date summary descriptions of a large number of these surveys.

With respect to WTAs in particular, LFSs also have the advantage that they can detach themselves more easily from written contractual arrangements and payment practices and are therefore able to report on Aactual@ as well as on Acontractual@ practices. *They can provide informaiton on the characteristics of working schedules as well as on formalised WTAs.* A disadvantage relates to their reliance on workers= or their proxies= recollection of the WTAs. This may be more prone to error than responses provided in establishment surveys.

LFSs which focus on measuring total weekly hours of work are not well-suited to capture the main elements of WTAs for both longer and shorter reference periods, e.g. standard LFS questions on weekly hours are unlikely to pick up the potential instability of zero hours contracts. Without specific information on the type of contract that the worker holds, questions on hours of work will not convey the uncertainty that this form of working time arrangement implies for workers. Nor will these questions in themselves be sufficient to provide the information needed to make good estimates on e.g. total annual hours worked, except perhaps for those LFS which cover reference weeks in all months of the year.

Suggestions for Further Work

Statistics on WTAs need to be linked with definitions used in labour laws, regulations and collective agreements. Therefore, information is needed on the nature of the worker=s contract, i.e., it is necessary to know not only that the worker is a shift-worker, but also the type of shift system that is being worked. Typologies reflecting these formal instruments should be extended to also be applicable to actual WTA patterns, as observed in e.g. time use surveys.

Bell and Elias (2000) has recommended the inclusion of the following WTA relevant items in a LFS: (a) usual daily start and finish times; (b) weekly, monthly and annual working hours (contractual, usual and actual); (c) distribution of hours worked over a day, week and a month; (d) distribution of hours worked over a calendar year; (e) location of hours worked (e.g. at office, at home, elsewhere); (f) workers' latitude to vary over a specified reference period in respect of their total working time and the scheduling of working time; (g) and for employees, the hours paid at standard rates, at premium rates and at zero rates. Further work is needed to establish the costs of collecting such information and which of these items one should measure on an on-going basis because short-term variations are significant, and which items are better suited for special modules to be repeated only at longer intervals.

For the TUS four issues stand out, in addition to the more technical problems of over-sampling/special surveys and modifications of diaries to eliminate sensoring at the start and end of the recording period:

1. There is a need to open the “black box” of employment. Unless respondents provide information about their work activities with the same detail as they do for other activities, the measurement of working time and of WTAs will continue to be dependent on workers perceptions of what work is or is not. Doing so would bring about a reexamination of existing classifications of time use activities. Currently, most TUS classifications, with some exceptions, e.g. those used for some surveys conducted in India, see Hirway (1999), only allow the incorporation of work activities with the same detail as non-work activities by including burdensome duplications in the coding schemes, because the traditional schemes for coding time

use activities require that activities be coded differently depending on the context in which they are carried out.

2. The possibility and means of extending the reference period to at least a full week needs to be further researched, in the context of potential reductions in data quality. This will call for innovations to the time diaries. Time related censoring may be reduced by requesting respondents in such situations to indicate when the first and/or last work activity actually started and/or ended.

3. There is a pressing need to arrive at a broadly common TUS methodology that allows reasonable international comparability of results. The work which for many years have been undertaken by members of the non-governmental International Association for Time Use Research (IATUR), and which have had an impact on the of Eurostat to launch a programme for harmonised European Time Use Surveys (ETUS) should be placed on the agenda of the formal international cooperation in statistics, and on the work-programme of one or more of the international statistical secretariats.[10] The results from the Eurostat initiative will provide valuable experiences which could be nefit other countries, even though this programme stays within the traditional format of TUSs, as the main focus is on activities outside the work situation.

4. Finally, it is important that the demographic questionnaire of TUSs follow closely the LFS formats, include questions designed to establish contractual situations and formal WTAs for reference periods longer than the reference period which can be covered by the time use diary.

References:

Bell, D. & P. Elias (2000): *The Definition, Classification and Measurement of Working Time Arrangements: A survey of issues with examples from the practices in four countries*. A report for the International Labour Office. Conditions of Works Series (Forthcoming). Geneva.

Bellmann, L. et al (1996): *Patterns of Enterprise Flexibility in Germany: Results of IAB Establishment Panel 1993 to 1995*. Institute for Employment Research of the Federal Employment Institute. Nuremberg, 1996.

Cully, M. (1998): *A survey in transition: The design of the 1998 Workplace Employee Relations Survey*. Department of Trade and Industry. July (On http://dfinfo1.dti.uk/emar/1998wirs.htm)

Bureau of Labor Statistics (1998): AOccupational Employment and Wages, 1997. Technical Note@. *Occupational Employment Statistics* on http://stats.bls.gov/news.release/ ocwage.htm

Eurostat (1999): *Task force on length and patterns of working time, LFS ad hoc module for 2001*, Doc. Eurostat/E1/EMPL/9/99, Eurostat, Luxembourg, June.

Eurostat (2000): *Labour force survey: Ad hoc module 2001 on length and patterns of working time - list of variables*, Doc. E1/EMPL/3/2000, Eurostat, Luxembourg, January.

Harvey, A. et al (2000): *Statistics on Working Time Arrangements Based on Time Use Survey Data*. A report for the International Labour Office. Conditions of Work Series. (Forthcoming) Geneva.

Harvey, A.S. and J.E.L. Spinney (2000): *Life on & off the job: Time-Use study of Nova Scotia teachers*. Time-use Research Program, Saint Mary=s University, Halifax, Canada.

[10] The United Nations Statistical Division=s (UNSD) work to develop a *Trial International Classification of Time Use Activities* as well as the discussions at this may be seen as steps in this direction.

Hirway, I. (1999): *Time Use Studies: Conceptual and Methodological Issues with Reference to the Indian Time Use Survey*, International Seminar on Time Use Surveys, Ahmedabad, December 1999.(Mimeographed).

Hoffmann, E. and A.G. Mata (1998): AMeasuring working time: An alternative approach to classifying time use@, in *Bulletin of Labour Statistics*, 1998-3, Geneva.

Hoffmann, E. and A.G. Mata (2000): AStatistics on working time arrangements: An overview of issues and some experiences@, Invited paper for the ECE-Eurostat-ILO Seminar on Measurement of Quality of Employment. Geneva, 3-5 May 2000.

ILO (1985): *Introduction to working conditions and environment*, International Labour Office, Geneva.

ILO (1990): *The hours we work: New work schedules in policy and practice, Conditions of Work Digest, 2/1990*, International Labour Office, Geneva.

ILO (1995): *Employment, Wages, hours of work and labour (establishment surveys)*. Vol. 2, 2nd edition of *Sources and Methods: Labour Statistics*. International Labour Office, Geneva.

ILO (2000): *Economically active population, employment, unemployment and hours of work (household surveys)*. Vol. 3, 3rd edition of *Sources and Methods: Labour Statistics*. International Labour Office, Geneva. (Forthcoming)

Niemi, I. (1983): ASystematic bias in hours worked?@ in *Statistiskt Tidskrift*, 1983:4. Stockholm..