in Argentina, Belgium, Brazil, Denmark, Finland, Germany, Hungary, Italy, India, Mexico, Netherlands, Poland, Spain, South Africa, South Korea, United Kingdom, United States
www.wageindicator.org

The *WageIndicator* web survey for worldwide social science research on wages

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1. The *WageIndicator* concept

The *WageIndicator* is an international web-based operation. It provides free information about occupation-specific wages, controlled for individual factors by means of a *Salary Check*. In return for this free information, visitors are invited to complete a web survey and are offered a prize incentive. This survey is an international, comparable questionnaire on work and wages. The survey is accessible in all participating countries, 24 hours a day, 7 days a week, all year round. The survey data are used for multi-country research on data otherwise not available. The data is also used as input for the *Salary Check*, using regression coefficients.

WageIndicator currently operates 35 websites in 17 countries. A national website offers content about wages, working conditions, labor standards or other work-related topics. It has a *Salary Check*, and sometimes a lifetime earnings check, a minimum wage check, a VIP paycheck or a cross-country wage information check. In all countries a desire for this kind of wage information is apparent. After a start-up period, in most countries the websites attract large numbers of visitors, varying with publicity and web-marketing activities. Correspondingly, participation in the survey varies: one to ten out of hundred visitors complete the survey.

The findings so far reveal that worldwide the public at large appreciates information about occupation-specific wages. Moreover, the public at large is willing to complete the web survey. For updates and detailed information, see the project website www.wageindicator.org

2. A brief history

The project started in 2000 in the Netherlands with a large-scale, paper-based survey to collect data on women's wages. In 2001 a *WageIndicator* website was launched for the first time. Its *Salary Check* showed wage information for 45 occupations, using the coefficients of occupation-specific wage regression analyses, based on the survey data. Ever since, the *Salary Check* is updated annually, using the web survey data. After five years, thanks to increasing numbers of visitors completing the survey, it provides wage information for over 400 occupations.

With the help of a 3-year grant of the European Commission from its 6th Framework program for the WOLIWEB project (WOLIWEB stands for work life web, the project number is 506590), by the end of 2004 websites could be launched in Belgium, Denmark, Germany, Finland, Italy, Poland, Spain, and the United Kingdom. Hungary joined in 2006, funded by the EC EQUAL program.

In 2005 and 2006 teams were formed and websites were set up in Brazil, India, South Africa, South Korea, Argentina and Mexico, thanks to two 3-year grants of the Netherlands Development Aid Fund for this so-called GLOBAL project.

In 2006 the United States, funded through Harvard Law School, joined as www.worklifewizard.org.

Presently teams in 5 more countries - including Russia and China - consider joining *WageIndicator*. From 2007 onwards, when the initial grants expire, teams in most countries will finance the national website(s) from their own resources.

3. The *WageIndicator* Foundation

The *WageIndicator* Foundation owns the concept of the *WageIndicator*. The *Foundation* is a not-for-profit organization dedicated to contribute to a transparent labor market by providing accurate wage and wage related information. Its mission statement reads:

> *"Share and compare wage information. Contribute to a transparent labor market. Collect wage data through web-surveys. Provide free, accurate wage data through salary checks on national websites."*

Thus, the public at large contributes to scientific information gathering, and scientists in return provide accurate information free of charge to the public.

On 17-9-2003 the Foundation was founded, organized under Dutch law. It is a joint initiative of the Amsterdam Institute of Advanced Labor Studies (AIAS) of the University of Amsterdam, the Dutch Confederation of Trade Unions (FNV), and career network Monster. They make up the Board of Supervisors. The Foundation has a flat management structure with a director/project manager and four subcontracting companies for web programming, web design, data and questionnaire management, and web journalism.

The Foundation has adopted the *WageIndicator* data policy, regulating access to the data. The data policy is consistent with legal frameworks, particularly the *Declaration on access to research data from public funding* on behalf of the Organization for Economic Cooperation and Development (OECD), signed by Ministers of 34 countries in 2004. The *WageIndicator* datasets are available for research by third parties, subject to a few overriding concerns, notably protection of confidentiality and privacy, acceptable first use by principal investigators, respect for intellectual property rights, and respect for the *WageIndicator* concept. These conditions are laid down in so-called End Users Licenses.

4. The national *WageIndicator* websites

Each participating country has at least one website, but sometimes two or more, for example in multilingual countries. Thus Belgium has websites for two languages, and the US-team is currently planning to launch a website in Spanish. Quite a number of countries have a second website addressing women. The Netherlands has additional websites for youth, 40+, the health care sector, and the self-employed. These websites do indeed attract different segments of the population. Each website has its specific content and look-and-feel, but the web-survey is similar across all websites.

Early 2007, *WageIndicator* has 35 websites in 17 countries. Hundreds of partners link to these from their own websites. On average, after a two-year start-up period, national *WageIndicator* websites may attract up to 100,000 visitors a month. Each month the *WageIndicator* website in the Netherlands has over 300,000 unique visitors. The number of visitors is critical to the project. Next to accurate information given by the *Salary Check,* traffic highly depends on publicity and web-marketing activities.

The web-marketing strategy includes cooperation with many players in the Internet. In most countries, the national teams create coalitions, including media groups or publishing houses with a strong Internet presence, like Gazeta Wyborcza (Poland), Politiken (Denmark), Mail and Guardian (South Africa), El Pais (Spain), Rheinische Post, Stern, Stuttgarter Zeitung, Sueddeutsche, and a few other newspapers (Germany), Businessweek (USA), and De Telegraaf (Netherlands). Furthermore, cooperation exists with career site Monster, the world's largest and active in many countries, such as South Korea, USA, UK, Belgium and Netherlands. In the UK and the Netherlands the teams cooperate with MSN, the Microsoft portal to be found in countries all over the world. In Brazil, Meusalario cooperates with major web-portals, such as UOL. Finally, *WageIndicator* cooperates with trade union sites, temp agency sites, and employment agency sites. It also aims for free publicity by generating news from research on the dataset.

In recent years several new tools have been developed to attract the public, such as the gross-net checker, the minimum-wage checker, the lifetime earnings checker, and the time-budget checker. Whenever possible, these checkers are up-scaled to those countries who want such a checker on their website. A great success was and is the VIP-pay check, presenting the wages earned by football players, the pope, movie

stars, and other celebrities. These tools play a major role in attracting visitors to the national websites.

5. The survey

The web survey is a multi-lingual, multi-country questionnaire, aiming to collect information on wages and working conditions. The survey is accessible in all participating countries, 24 hours a day, 7 days a week, all year round. It allows for comparisons across countries and over time.

The questions are clustered in logical groups, providing a sense of order for respondents. Some 100 questions are divided into six sections, as the Table shows. Each section ends with attitudes and opinions regarding the issues addressed. A limited number of questions are obligatory, notably those needed for the calculation of hourly wages, for the *Salary Check*, for the weighting of the dataset, or for the routing through the questionnaire. To some extent the questionnaire varies across countries, because it has country-specific questions.

Table 1. The six sections of the *WageIndicator* questionnaire

Section	Topics
A	YOUR OCCUPATION employment status, education, industry, occupation, training
B	YOUR PLACE OF WORK firm characteristics, branch and firm size, percentage female, MNE, workplace characteristics, departmental staffing levels, cooperation, collective bargaining coverage, IT-use at the workplace, attitudes towards IT-adaptation
C	YOUR EMPLOYMENT HISTORY employment record, years of experience total, with current employer and in current job, career break, job search
D	YOUR WORKING HOURS working hours, overtime, timing of work, shift work, working time preferences
E	YOUR EMPLOYMENT CONTRACT AND SALARY employment contract, wages, payment period, fringe benefits, bonuses, and wage perceptions
F	PERSONAL QUESTIONS age, gender, ethnic background, country of birth, region, household composition, marital status, children's age, division of household chores, job and life satisfaction

The target population of the *WageIndicator* web survey is the labor force. Apart from workers in formal dependent employment the survey also addresses apprentices, employers, own-account workers, freelancers, workers in family businesses, workers in the informal sector, temporarily unemployed workers, individuals who never had a job, job seekers, and retired workers, housewives, school pupils or students with a job on the side. The respondent's employment status is determined in the first survey question: "Which description matches best your current employment activity?".

Thus the survey aims to include all groups in the labor force. A questionnaire with questions that primarily address the main group in the labor force will lead to high break-off rates of the small employment status groups. Therefore, all questions have been reviewed and phrased to address all groups. Where necessary, parallel questions were added, addressing the small groups. The unemployed for example, have questions about their work in the past tense, the self-employed get different questions about their earnings, students about their current education and trainees about traineeship. Individuals who never had a job follow a very short route, skipping all questions related to the job. These employment status groups are clustered into five categories, each with a unique routing through the questionnaire.

Multiple jobholders are identified, and so are the working hours and employment status in their second job. Workers in the informal labor market are identified by asking if the respondent has a green card, receives payment in cash, is paid in kind, and is paying taxes. In India, a few additional questions enquire about who is paying for the equipment the worker uses to perform the job.

The dataset has over 500 variables. Among others, it includes information on hourly wages, on contractual, waged and usual working hours, on country-specific education, and on occupation and industry. It includes all key variables to perform wage analyses. It has metadata concerning time and date of survey completion. It has a sound coding of user and system missing values.

6. The technique

The survey uses a sound web based Questionnaire Management System (QMS), designed exclusively for *WageIndicator*. The QMS is a database with a Master-questionnaire and language versions. It was fully renewed in the second half of 2006. The QMS facilitates routing, obligatory questions, and allows for switching questions and response items on/off per country. Thus, country-specific questions can be included. Finally, the QMS has a response library, whereby all responses are stored that are either not question-specific or that vary across countries, such as education. Technically, the QMS is managed in the Netherlands. Servers are in India, the United States, and the Netherlands. As much as possible, open source programming is used.

In the past years, search trees have been developed for questions, asking for occupation, industry, region or collective agreement. A search tree is the only workable solution for gathering detailed information about thousands of items, without being restricted to either a huge recoding effort or to a limited, aggregated list of items. The *WageIndicator* occupation and industries search trees enable the visitor to choose easily from a long list of items. Per screen the items are sorted alphabetically. The three-tier occupation search tree has almost 1,500 occupational titles with ISCO-coding. The two-tier industry tree lists more than 220 industries with NACE-coding. For European countries, region is coded according to the NUTS classification.

7. The response

Between 1 and 10 percent of the visitors complete the questionnaire, the percentages varying over time and across countries. The table shows the number of completed questionnaires. Incomplete questionnaires are not included in the datasets.

Table 2. Number of observations in the data, break down by years

Year of survey	Nr of observations	No of countries
2000	14,079	1
2001	14,335	1
2002	11,370	1
2003	13,710	1
2004	47,983	5
2005	133,532	11
2006	177,705	17
2007	2-300,000	19

Note 2006/Q4 is not known yet, but it is assumed to be the same as in Q3.
Note 2007 is a target – and depends on when the Russian and Chinese WageIndicator will be launched.

For several reasons, large sample sizes are advantageous. First, they allow for exploring small-scale units such as regional intersections, or occupations, because these units still have sufficient data for analyses. Additionally, these small-scale units mostly lack adequate sampling frames, so research could not be undertaken otherwise. Second, large numbers of respondents allow for randomized attitude items, presenting four to eight items at the screen, randomly drawn from a pool of >8 items. In large sample sizes, each single item still has sufficient numbers of observations. Third, large numbers of respondents allow for follow-up questions addressing sub-populations, e.g. asking respondents in some occupations about early signs of occupation-specific diseases. Finally, continuous web surveys with large numbers of respondents allow for highly flexible plug-in questions for specific and incidental research objectives.

8. Respondent-side feedback

Once a survey is held continuously, one can take into account the respondents' feedback. The *WageIndicator* survey receives feedback in three ways. First, by visitors' emails to the national web-managers. These emails in part consist of complaints when technical problems were encountered while trying to complete the questionnaire. With 35 websites in operation worldwide, this feedback is most helpful.

Second, feedback comes in by means of the open-ended question at the end: 'what did you like about the questionnaire'. Some comments concern the completion time, others that a question was not understood.

Third, web-visitors give passive feedback through break-off during questionnaire completion.

From all this feedback we have learned that web visitors use the *WageIndicator* web-sites for their decisions about schooling, occupational choice, wage negotiations, and job mobility. As for participating in the survey, it should not be a chore. We want respondents to enjoy completing the questionnaire and luckily they report that they do.

9. Volunteer web-surveys and selection bias

Apart from all the advantages, the *WageIndicator* questionnaire has one major disadvantage. It is a volunteer survey, and therefore the data are not representative for the population. A three-step bias has to be taken into account. First, Internet access causes bias, as it may be related to wages, the prime variable in the data. Second, although the numbers of visitors of the *WageIndicator* websites are large and growing, it is still a minority of the extremely large and heterogeneous population visiting the Internet. These visits may be related to interest in wages, and therefore maybe high-wage earners could be under-represented. Third, when visiting a *WageIndicator* website, the visitor still has to decide whether or not to complete the questionnaire. This decision may be related to time availability, and therefore visitors with long working hours might be under-represented.

Several strategies are employed to cope with this self-selection. The first strategy relates to the web marketing, whereby a broad target population is defined, including marketing aiming at sub-populations, such as women or youth. The second strategy relates to the routing through the questionnaire, which is designed to address marginal groups in the labor force, as they have a higher likelihood of dropping out

during completion. The third strategy relates to weighting the dataset for under- and over-represented groups, currently developed for the European countries in the project. The fourth strategy relates to asking a few questions in the web survey, similar to those asked in other major surveys, such as the United States Labor Force Survey, the World Values Survey, and the European survey on working conditions, allowing for a comparison of the datasets and subsequent weighting. The fifth strategy relates to a full reference survey in one country, controlling for self-selection effects. These strategies combined are assumed to lead to a sample sufficiently corrected, so that it may confidently be used for analyses.

What can be noticed from the *WageIndicator* data when comparing to aggregate labor force surveys data? In all countries the small groups in the labor force are under-represented, f.e. workers in small part-time jobs. The elderly workers, over 55, are under-represented. The poorly educated in the labor force are increasingly represented proportionally though. The gender representation varies across countries. In the Netherlands the identified under-representation of socio-demographic groups has declined between 2002 and 2006, due to increasing heterogeneity of the growing Internet population. That seems to be the most likely trend everywhere.

10. The research undertaken

The research undertaken with the *WageIndicator* data covers a variety of topics. Current studies address topics such as listed here.

- Cross-country wage differentials for a selection of occupations
- The wage effect of parenthood
- Women's wages and motherhood
- Modeling preferences for a change in working hours
- Attitudes towards collective bargaining coverage in relation to actual coverage
- The effect of dismissals and reorganizations at the workplace on job insecurity
- The multi-dimensionality of the informal labor market within and across countries
- The determinants of part-time working hours
- Spill over effects of Multinational Enterprises in local employment

In 2007, a postdoctoral researcher will start a 3-year investigation of features related to volunteer web surveys. The research plan is made up of several studies.

- Increasing insight in web visitors' behavior, using the survey's feedback systems
- Exploring the break-off during completion in web surveys
- Exploring the possibilities of propensity score adjustment using a reference sample
- Exploring item non-response in web survey questions

11. What is new about this web survey?

Currently, on a global scale neither high quality aggregate data nor micro-data about wages are available. *WageIndicator* is worldwide the first web survey gathering wage data in so many countries in like manner. Moreover, the dataset allows for detailed cross-country analyses on wages, bonuses, working hours, occupation and industry, not possible before.

Above all, the *WageIndicator* web survey is new in its interaction with the public at large. Based on the web survey data volunteered by visitors, the project can give back reliable wage information to the public which has an apparent desire for this kind of information when faced with work-related decisions. The public shows its appreciation by its willingness to complete the survey.

Paper-based surveys, telephone surveys and face-to-face surveys used to be the major tools for collecting data for social science research. These tools are becoming less effective by increasing non-response, rising costs and the increased use of cell phones compared to fixed line phones, typically used for telephone surveys. Solicited web surveys may partly offer a way out. Volunteer web surveys may do so too, but differently, as they challenge survey design in general. This raises the need for developing high quality standards of volunteer web surveys.

12. A plan for a *GlobalWageIndicator*

Currently, a proposal for a worldwide *GlobalWageIndicator* is being prepared jointly with the ILO (details to be agreed), Harvard Law School, University of Belgrano, Argentina, Indian Institute of Management, Ahmedabad, and DIEESE, Sao Paulo, Brazil, to facilitate scaling up from the present 17 to 75 countries.

The proposal has been inspired by the globalizing economy. It aims at contributing to a transparent labor market by providing reliable data about wages to a worldwide public. It aims to gather data for annual reports on trends in wages in those 75 countries and for detailed research on the impact of globalization.

Thank you for your attention

www.wageindicator.org

www.worklifewizard.org

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