

**Indicators**  
**for monitoring implementation of the UNECE Regional Strategy**  
**of the Madrid international Plan of Action on Ageing**

**Methodological Notes and Definitions**

December 2009

## Demographic Indicators

### Main sources:

- World Population Prospects: The 2004 Revision, UN-DESA, Population Division CD-ROM Edition - Comprehensive Dataset
- EUROSTAT Database on Population and Health  
(website at: [http://epp.eurostat.ec.europa.eu/portal/page?\\_pageid=0,1136184,0\\_45572595&\\_dad=portal&\\_schema=PORTAL](http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL) )

### Projections:

All references to the World Population Prospects pertain to the projection variant *medium*. For the period 1950-2005, population estimates are used from the same source.

### DEM01c

Median Age:

The median age of a population is that age that divides a population into two groups of the same size, such that half of the population is younger than this age, and the other half older (UN World Population Prospects).

### DEM01d

Prospective Age:

The median age of a population standardized for expected remaining years of life.

See Sanderson W.C. & Scherbov S., "Average remaining lifetimes can increase as human populations age", *Nature* 435, 811-813, June 2005.

(article pp5-7, at: <http://www.iiasa.ac.at/Research/POP/POPNET/popnet37.pdf> )

### DEM01e

- Population Growth Rate = Average annual rate of population change (per cent) = Average exponential rate of growth of the population over a given period. It is calculated as  $\ln(P_t/P_0)/t$  where  $t$  is the length of the period. It is expressed as a percentage.
- Rate of Natural Increase = Crude birth rate minus the crude death rate. Represents the portion of population growth (or decline) determined exclusively by births and deaths
- Difference = (Population Growth Rate - Rate of Natural Increase) = Net Migration Rate

### DEMO1g

- Young age dependency ratio (YADR) = ratio of population aged 0-14 per hundred population 15-64
- Old age dependency ratio (OADR) = ratio of population aged 65+ per hundred population 15-64
- Total dependency ratio (TDR) = ratio of population aged 0-14 and 65+ per hundred population 15-64

### DEMO1h

Ageing of the Aged: measured by the share of the very old (80+) in the total elder population (65+)

### DEMO1i

Living Arrangements:

- (i) % of the population living in single households
- (ii) % of the population living in institutional households

Important to mention: whether institutional population is distinguished or not.

### DEMO2a

Life Expectancy at Certain Ages:

The mean number of years still to be lived by a person who has reached a certain exact age, if subjected throughout the rest of his or her life to the current mortality conditions (age-specific probabilities of dying) (definition Eurostat).

### DEMO2b

Survival Rates:

The survival rate to a specific age X is the proportion n of newborns in a given year who would be expected to survive at age X if current mortality trends were to continue for at least the next X years. Survival rates are derived from the life table, which is an analytic procedure designed to produce estimates of life expectancies and other measures of mortality, based on prevailing age specific death rates. (UN-DESA definition)

### DEMO2c

Effective retirement age, or effective labour market exit age (see Part on Labour Market Indicators).

### DEMO3a

Total Fertility Rate of a population (TFR):

The average number of children that would be born to a woman over her lifetime if she were to experience the current age-specific fertility rates through her lifetime. It is obtained by summing the age-specific rates for a given time-point.

### DEM03b

Net Reproduction Rate (NRR):

The average number of daughters a hypothetical cohort of women would have at the end of their reproductive period if they were subject during their whole lives to the fertility rates and the mortality rates of a given period.

It is expressed as number of daughters per woman (Hypothetical number of surviving daughters per woman)

### DEM05a

Health Indicators

- **Life Expectancy (LE):**

The average number of years of life expected by a hypothetical cohort of individuals who would be subject during all their lives to the mortality rates of a given period. It is expressed as years. (UN definition)

- (i) **Eurostat:**

Health expectancies extend the concept of life expectancy to morbidity and disability in order to assess the quality of years lived. It is a composite indicator that combines mortality data with data referring to a health indicator, such as disability.

- **Disability-Free Life Expectancy (DFLE):**

The proposed indicator Healthy Life Years (HLY) measures the number of remaining years that a person of a specific age is still expected to live in a healthy condition.

A healthy condition is defined by the absence of limitations in functioning/disability.

Therefore, the indicator is also called disability-free life expectancy - DFLE). The healthy life years indicator is calculated at two ages: at birth and at 65. (Eurostat definition). For more details, see:

[http://europa.eu.int/estatref/info/sdds/en/hlth/hlth\\_hlye\\_base.htm](http://europa.eu.int/estatref/info/sdds/en/hlth/hlth_hlye_base.htm)

- (ii) **World Health Organization (W.H.O.):**

Healthy life expectancy (HALE) at birth adds up expectation of life for different health states, adjusted for severity distribution making it sensitive to changes over time or differences between countries in the severity distribution of health states.

- **Healthy Life Expectancy (HALE):**

Average number of years that a person can expect to live in "full health" by taking into account years lived in less than full health due to disease and/or injury. (W.H.O. Definition. For more details, see: <http://www.who.int/healthinfo/statistics/indhale/en>) child can expect to live, based on the current mortality rates and prevalence distribution of health states in the population.

## Income Indicators

### Main Sources:

- EUROSTAT Database on Living Conditions and welfare (web site)  
The database on Living Conditions and welfare reports until the survey year 2001 data based on the European Community Household Panel. For the survey year 2004 onwards, the database reports data based on the EU-SILC, the Community Statistics on Income and Living Conditions, for 12 old Member States (excluding Germany, Netherlands and UK), Estonia, Norway and Iceland; for the survey year 2005 onwards, data are based on the EU-SILC for all the other Member States as well<sup>1</sup>. For remaining survey years, the data refer to national surveys. In both the ECHP and EU-SILC surveys, the actual year of reference for all income-related information is the year before the survey year, while the EUROSTAT web site refers always to the survey year.
- ECHP (European Community Household Panel)  
The ECHP is a longitudinal survey based on a standardised questionnaire that involves annual interviews of a nationally representative panel of households and individuals, covering a wide range of topics: household and personal incomes, health, education, housing, demographics and characteristics related to economic activity and labour market participation. The ECHP was developed by EUROSTAT in association with the Member States and includes observations for the old EU-15 Member States over 8 waves (1994-2001). For Germany, Luxembourg and the UK the files corresponding to the British Household Panel (BHPS), to the German Socio-economic Panel (GSOEP) and to the Luxembourg Household Panel (PSELL) have been considered. For Austria and Luxembourg (PSELL) the panel starts in 1995, for Finland in 1996, for Sweden in 1997.  
More information available from:  
<http://forum.europa.eu.int/irc/dsis/echpanel/info/data/information.html>
- OECD, Pensions at a glance (2005).

### IW01a

Average disposable income:

With disposable income we refer from now on to equivalised household income: the total household income divided by a factor (the equivalence scale) taking into account that households needs increase with household size but not in a proportional way, and assigning different weights to different household members with different age. A standard equivalence scale adopted in internationally comparable statistics on income distribution is the "OECD-modified" equivalence scale, which equals to:  $Eq. scale = (1 * household head) + (0.5 * number of each additional adult) + (0.3 * number of children aged below 14)$ . Values are supposed to be expressed in purchasing power parities whenever possible. See EU-SILC Database description, European Commission, Eurostat, Luxembourg, 2006.

**IW01b**

Relative Disposable Income:

The relative disposable income for a given age group is defined as the ratio between the average disposable income for that age group and the average disposable income of the total population, expressed as percentage.

**IW02a**

S80/S20 or "Quintile share ratio":

The S80/S20 ratio is the ratio between the share of total income received by the population with the 20% highest equivalised household income to the share of total income received by the population with the 20% lowest equivalised household income in any given age group.

**IW02b**

Income composition (by income groups):

Income composition is defined as the share of each main income component (income from work, private income, income from old-age related benefits and income from other benefits) in the total income for the population in a given age group, for three different population sub-groups: the population with the lowest 20% equivalised household income (in that age group), the one with the highest 20% and the intermediate 60%.

**IW03a**

Relative Income Poverty rate:

The relative income poverty rate is defined as the ratio between the number of poor people in any given age group and the population in the same age group, expressed as a percentage. The poor are defined as those individuals whose equivalised household income is below the poverty line, which is set (in line with standard international statistics on income distribution) equal to the 60% of the median national equivalised household income (the income level above/below which lies the 50% of the population when individuals are ranked according to increasing equivalised household income).

**IW03b**

Median Income Poverty Gap:

The median income poverty gap is defined as the difference of the median income of the poor population and the poverty line expressed as a percentage of the poverty line.

**IW03c**

Persistent income poverty rate:

It is defined as the number of individuals (in any given age group) who are poor in the survey year, and have been poor for at least two years out of the three years before the survey year expressed as a percentage of the population (in that age group) in the survey year.

**IW04a**

Minimum Income Guarantee:

Any contributory minimum pension scheme (or supplement, or minimum income guarantee targeted to individuals in or close to retirement age) for different household types (e.g. singles, vs. couples, with and without children). Also eventual non-contributory support schemes targeted to individuals in (or close to) retirement age should be mentioned.

#### **IW04b**

Amount of minimum income protection level:

Amount of the minimum pension (as of IW04a) expressed in national currency and as percentage of different parameters: average pension; minimum wage; national poverty line.

#### **IW04c**

Share of persons relying on minimum income protection schemes:

Number of recipients of minimum income schemes (as of IW04a) expressed as a percentage of the population age 65 and above (or alternative thresholds, e.g. % of the population in retirement age).

#### **IW04d**

Per capita expenditure on minimum income protection schemes:

Total expenditure in minimum income protection schemes (as of IW04a) divided by the number of recipients (as of IW04c).

#### **IW05a**

Composition of total wealth:

It is defined as the share of each main component of total household wealth (e.g. wealth from housing, private pension, state pension, other financial wealth) in the total wealth for any given age group.

#### **IW05c**

Average individual wealth at retirement age:

It is defined as the expected (gross) wealth deriving from mandatory pension programs computed at retirement age for individuals with different earnings levels (0.5, 0.75, 1, 1.5, 2, 2.5 times the average earnings). For more details see OECD (2005).

#### **IW07a**

Net replacement rate:

The net replacement rate is defined as the ratio between the expected value of incomes from mandatory pension programs at retirement age for individuals with different earnings levels (0.5, 0.75, 1, 1.5, 2, 2.5 times the average earnings net of taxes) and the pre-retirement earnings level (net of taxes) expressed as a percentage.

For more details see OECD (2005).

## Labour Market Indicators

### Main Sources:

- EUROSTAT Database on Labour Market  
(web site at: [http://epp.eurostat.ec.europa.eu/portal/page?\\_pageid=0,1136184,0\\_45572595&\\_dad=portal&\\_schema=PORTAL](http://epp.eurostat.ec.europa.eu/portal/page?_pageid=0,1136184,0_45572595&_dad=portal&_schema=PORTAL) )
- OECD Database on Labour Market Indicators  
(web site at: [http://www.oecd.org/topicstatsportal/0,2647,en\\_2825\\_495670\\_1\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/topicstatsportal/0,2647,en_2825_495670_1_1_1_1_1,00.html))
- ECHP (European Community Household Panel)  
See description in the Income Indicators section.

### LM01a

i) Labour force participation rate:

The labour force participation rate for any given age group is defined as the ratio between the labour force (the sum of the number of unemployed and the number of employed persons) and the population in the same age group, expressed as percentage. The adoption of the ILO standard definition of unemployment is recommended (the unemployed are defined as those people who have not worked more than one hour during a short reference period, e.g. the current week or day, but who are available for and actively seeking work).

ii) Employment rate:

The employment rate for any given age group is defined as the ratio between the number of persons employed and the population in the same age group, expressed as percentage.

iii) Share of workers aged 55-64:

This indicators reports: 1) the share of employed persons aged 55-64 in the total number of employed persons aged 15-64 and 2) the share of the population aged 55- 64 in the population aged 15-64, both expressed as percentage.

iv) Median age of the labour force:

The median age of the labour force is the age dividing the labour force into two groups of the same size such that half of the labour force is younger than this age and the other half is older; the same indicator is computed for the total population.

### LM01b

Unemployment rate and inactivity rate:

The unemployment rate for any given age group is defined as the ratio between the number of unemployed persons and the labour force in the same age group, expressed as percentage. The inactivity rate for any given age group is defined as the ratio between the number of inactive (neither employed nor employed, or out of the labour force) persons e and the population in the same age group, expressed as percentage.

### LM01c

Long-term unemployment rate:

The long-term unemployment rate in a given age group is defined as the ratio between the number of long-term unemployed (persons who have been unemployed for more than one year) and the total number of unemployed persons in the same age group, expressed as percentage.

#### **LM01d**

Time spent in paid vs. unpaid work activity:

The indicator reports how the average daily time is allocated among the following activities: child care, paid work and unpaid work for different typologies of working households with children: men in full time work, women in full time, part time work and mainly at home.

#### **LM01e**

iii) Share of non-employed disability benefits recipients:

Ratio between the number of persons receiving disability benefits aged above 50 but younger than the statutory retirement age and a) the total population aged between 40 and 65 years; b) the retired population aged between 40 and 65 years, expressed as a percentage. For the countries for which the indicator was computed using the ECHP, the definition of disability benefits recipients included those persons whose economic activity status is "inactive" (neither employed nor unemployed, or "out of the labour force"), and who receive any kind of disability-related benefits.

#### **LM01g**

- i) Existence of mandatory retirement age
- ii) Existence of age limits to the application of dismissals law
- iii) Existence of age-related reasons to force people out of work
- iv) Existence of protection laws against forced retirement

Based on institutional information stating: i) whether it is compulsory to retire at a given age; ii) whether law on collective or individual dismissals cannot apply to a selected number of persons for age-related reasons; iii) whether it is possible to fire workers because of their age; iv) whether there is any law protecting workers against the risk of being forced to retire involuntary.

#### **LM02a**

i) Average effective labour market exit age:

The average effective labour market exit age is defined as the average age at which individuals withdraw permanently from the labour force.

#### **LM02b**

Effective retirement age for 25% and 75% of the labour force:

Is the age at which 25% and 75% of the labour force respectively withdraw permanently from the labour market activity. For the countries for which the indicator was computed using the ECHP, the population of interest is the number of persons in the labour force (employed or unemployed) in the survey year  $t$  who move to inactivity in the survey year  $t+1$  and receive any



kind of old-age related benefits in the survey year  $t+1$ , expressed as percentage of the labour force in survey year  $t$ .

### **LM02c**

Early Exit:

Difference between the effective retirement age and the statutory retirement age:

The effective retirement age is provided by LM02a, the statutory retirement age is the age at which individuals are fully entitled to withdraw state (or mandatory) pensions.

### **LM02d**

Early/Late retirement:

Number of persons retiring in a given year before/after statutory retirement age expressed as percentage of the total number of persons retiring in the same year. For the countries for which the indicator was computed using the ECHP, the population of interest is the number of persons aged below/above the statutory retirement age who move into inactivity from survey year  $t$  to the survey year  $t+1$  and receive any kind of old-age related benefits in the survey year  $t+1$ , expressed as percentage of the total number of persons who move into inactivity from survey year  $t$  to the survey year  $t+1$  and receive any kind of old-age related benefits in the survey year  $t+1$ .

### **LM02e**

Average age of entry into employment:

It is the average age at which individuals get their first job and become employed.

### **LM02f**

Life-time allocation of work and non work activities:

The indicator provides the share in the total life-time allocation of the following phases: childhood and education, length of working life and length of retirement. The estimation of the length of each phase provided by the OECD is based on average expected ages of entry and exit into the labour force calculated for the year 2000 and on estimates of life expectancy at birth.

### **LM02g**

Implicit tax on work:

The indicator provides an estimate of the implicit tax embedded in national pension schemes, early retirement schemes and other old-age related benefit schemes for postponing retirement up to 5 years later than ages 55, 60 and 65 years; the indicator is given by the expected replacement rate (the ratio between the expected amount of benefits and the pre-retirement wage, as a percentage) obtained by averaging over 5 years after different retirement ages (55, 60 and 65) the expected benefits for workers with three different earnings level (60%, 100% and 140% of average earnings) and for two household types (single persons and married couple with a dependant spouse in the same age).

## **LM02h**

- i) Existence of flexible retirement corridors at the national levels
- ii) Spread of the retirement corridor.

The indicator illustrates the type of retirement schemes or incentives in place under different social security systems for retiring both before and after the statutory retirement age, as well as special active or passive labour market programs target to the workers in retirement age.

## **Social Protection Indicators**

### **SUS01a**

Stylised (individual) replacement rates:

Refer to current and prospective replacement rates (system indicator, not empirical RRs).

RR: level of pensions as a percentage of previous individual earnings at the moment of take-up pensions.

Assumptions: workers covered by most general scheme; career length: 40 years; age at retirement: 65; type of employment: full-time work; earnings level: 100% of average earnings.

Pension schemes included as income: first pillar, supplementary (occupational or personal) provision and means-tested supplements as applicable to the selected case

### **SUS01b**

Replacement ratio, early retirees:

Hypothetical individual (unmarried and without dependants) who begins to work at age 20 and has a full work career before taking retirement. Age-earnings profile over the working life is assumed to be flat, i.e. earnings are assumed to grow in line with countrywide average earnings.

### **SUS01c**

Aggregate replacement ratios:

Average monthly pensions of retirees aged 65-74 as a percentage of average monthly earnings of employed aged 50-59, excluding social benefits other than pensions (if available also for retirees and employed as a whole).

### **SUS01d**

Pension Wealth:

Present value of the future stream of (net of tax) pension payments to which a person is entitled over his/her life in retirement (multiple of economy-wide average earnings).

Pension-wealth numbers show size of lump sum that would be needed to buy a flow of pension payments equivalent to that promised by the pension system in each country.

Gross pension wealth by earnings level: to analyse low, average and high earnings levels of 0.5, 1 and 2.5 time average earnings are used.

Weighted average pension wealth: averaged over individuals earning across the range of 0,3 to 3 times average economy-wide earnings using earnings-distribution weights.

### **SUS02b**

Stylised (individual) replacement rates by different earnings levels:

Refer to current and prospective replacement rates (system indicator, not empirical RRs).

RR: level of pensions as a percentage of previous individual earnings at the moment of take-up pensions.

Assumptions: workers covered by most general scheme; career length: 40 years; age at retirement: 65; type of employment: full-time work; earnings level: 2/3 of average earnings.

Pension schemes included as income: first pillar, supplementary (occupational or personal) provision and means-tested supplements as applicable to the selected case.

### **SUS03a**

Implicit contribution rate:

Necessary contribution level / alt. Necessary pensions adjustment ("implicit contribution rate") to balance pensions expenditure (where it applies) vs. effective contribution rate

### **SUS04a**

Public and total pension spending in % of GDP:

- i) Public pension spending projected for a defined period of time (2004-2050) as % of GDP
- ii) Total pension spending

### **SUS04b**

Public and total pension spending in % of all social expenditures:

- i) Public pension spending projected for a defined period of time (2004-2050) as % of GDP
- ii) Total pension spending

### **SUS04c**

Contribution of decomposed factors to the change in public pensions in % of GDP:

- i) Decomposition of projected public pension spending increase by changes in: dependency; employment; take-up; relative benefit level
- ii) Decomposition of projected total pension spending increase (if available)

The following equation is used: public pensions relative to GDP = dependency ratio + employment rate + take up ratio + benefit ratio.

Dependency ratio = Population 65+ / Population 15-64

Employment rate = Employed / Population 15-64

Take up ratio = Pensioners / Population 65+

Benefit ratio = Average pension / GDP per worker

### **SUS04e**

Public pension spending covered by contributions:

- i) Public pension spending covered by contributions (operationalisation: yearly contribution revenue as a % of pension expenditure)
- ii) Total pension spending (if available)

### **SUS05a**

Age-related public expenditure (pensions, health and long-term care) in % of GDP

### **SUS06a**

Sustainability gap indicators:

System dependency ratio (SDR) in public pension schemes: empirical data and projections.

The tax gap indicator provides an order of magnitude on the budgetary adjustment needed to ensure sustainable public finances. A positive value indicates that there is a financing gap and a negative value a surplus.

S1 indicates the required change in tax revenues as a share of GDP over the projection period that guarantees to reach a debt-to-GDP ratio of 60% in 2050.

S2 indicates the change required in tax revenues as a share of GDP that guarantees the respect of the inter-temporal budget constraint of the government.

RPB (Required Primary Balance) indicates that the average minimum required cyclically adjusted primary balance as a share of GDP over the first five years of the projection period that guarantees the respect of the inter-temporal budget constraint of the

### **SUS07b**

Exploring the incentive to retire:

i) Accrual: change in social security wealth by postponing retirement for 1 year

ii) Tax rate: the accrual divided by the (potential) gross earnings, during the year of postponement

iii) System accrual rates, decreases for early retirement, increases for deferral of retirement

### **SUS07e**

Take-up Ratio:

Number of pensioners receiving public pensions relative to the population aged 65+.

### **SUS08a**

System dependency ratio (SDR) in public pension schemes:

$SDR = \text{number of pensioners} / \text{number of insured workers}$

### **SUS08b**

System dependency ratio divided through old age dependency ratio:

Difference between SDR and old-age dependency ratio (OADR) (as a measure of the system's efficiency).

### **SUS08c**

Benefit ratio: Ageing (pension) burden indicator:  $(\text{replacement rate} * SDR)$

The original terms of the ageing burden indicator by Lefebvre/Perelman are:  $AB = RR * ED$ .

AB (ageing burden): Pension expenditures/GDP

RR (replacement rate incl. health care): Pension per pensioner/ GDP per worker

ED (effective old age dependency ratio): Number of pensioners/ number of workers

\*For more information on the concept and measurement, see The impact of ageing on public expenditure, EPC and EC: Ageing burden indicators, Lefebvre/Perelman (2006)

**SUS09a**

Life cycle support ratio:

The number of working years to the number of retirement years over time \* inheritance gains [deaths prior to retirement] \* expected growth (interest rate).

**SUS10a**

Share of active population participating in private pension schemes: % of working age population / active population participating in private pension schemes

**SUS10b**

Average contribution of private pensions to income of retirees

**SUS11a**

Age differential in statutory retirement age:  
(Between men and women)

**SUS11c**

Contribution base for child caring times:  
(How child care does / does not count for pension benefit calculations)

**SUS11d**

Parental leave schemes