



## Methodology

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This monitor consists of two parts. A first set of maps shows worldwide data on Old-age Dependency Ratios (OADR, the percentage of people over 64 over those between 14 and 65). A second set of maps looks at projected developments of aging-related public expenditure. Below we will describe the methods used in creating the monitor.

### Old-age Dependency Ratio (OADR)

Aging means that there is a relative increase of older people in a society. The most commonly used indicator for measuring aging is the Old-age Dependency Ratio (OADR): the number of old people at an age of economic inactivity (i.e. 65 years and over) compared to those aged 15-64 (typically the working-age population).<sup>1</sup> OADR figures and projections are available for almost all countries in the world. This indicator thus allows us to visualize the development of aging worldwide.

We looked at the most recent projections up to 2050 from the United Nations. Although a 40-year time span is somewhat large, demographic changes are relatively inert: they develop slowly and over long periods of time. Fertility rates or life expectancy may change somewhat, but even if they do, the effect will be gradual and only felt in the long run. It should be noted though that this measure has some limitations. According to the definition of OADR, people 65 and older are 'economically dependent'. However in some countries the retirement age is higher or lower than 65, whereas in others the lowest age at which people are allowed to work differs. Furthermore, this may be influenced by changes in labor laws or the pension age. However, we can read OADR plainly as a measure of the share of older people (65 and over) in a country over population in younger age cohorts (14-65). Furthermore, since OADR is a widely used measure, it allows us to compare projections between countries worldwide.

In a first map, we show worldwide OADR predictions from 2010 to 2050, using 5-year intervals.<sup>2</sup> Countries scoring 20% or lower considered "green" populations with a relatively small share of elderly people. Countries with scores over 20% are colored progressively more gray. A second map shows absolute change in % points of OADR, with 2010 as the base year. If a country scores 10% in 2050, that means its OADR has increased by 10% from 2010 onwards. Negative scores are marked in green and indicate a decreasing share of people of 65 and over in relation to those between 14-65.

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<sup>1</sup> United Nations, Department of Economic and Social Affairs, Population Division (2011). World Population Prospects: The 2010 Revision. Available at: <http://esa.un.org/wpp/Documentation/glossary.htm>.

<sup>2</sup> United Nations, Department of Economic and Social Affairs, Population Division (2011). World Population Prospects: The 2010 Revision. Available at: <http://esa.un.org/wpp/Excel-Data/population.htm>.

## Age-related Public Expenditure

This monitor shows how aging affects government budgets. A first group of maps looks at two expenditure items that are most closely associated with graying: long-term care and pension spending. A second set of maps zooms in on Europe and shows the aging-induced projected change in three additional expenditure items.

### Worldwide (pensions and long-term care)

The negative effects of aging will be especially severe on pensions and long-term care. Based on data availability, a first set of maps shows scores for several countries worldwide on these two items. Pension and long-term care spending are generally reflective of the economic situation of a country. Developed countries are more likely to spend a relatively large share of their budgets on these two items. Thus we show projections for a group of developed and developing countries worldwide. This allows us to put the future situation in Europe into a global perspective. In addition to other high-income countries, we included a group of developing countries that are likely to experience economic development and aging to varying degrees (the BRICS, Mexico and Indonesia).

Developments in long-term care and pension expenditure are more difficult to predict than population aging rates. Governments may decide to increase the pension age or privatise long-term care, thereby altering the size of the 'dependent' part of the population and/or government spending. For the purposes of this monitor, we look at developments from a 'no policy change' perspective. Obviously, this does *not* mean we assume governments will not act - simply that it is impossible to predict such actions. Furthermore, projections of developments in aging-related expenditure will give us a measure of the efforts countries will need to make to cope with aging.

A first map shows aggregate scores for selected countries on long-term care and pension spending as a percentage of GDP. We also include a map indicating the absolute change in percentage points of GDP with 2010 as a base line, in 5 year intervals. If a country scores 5% by 2030 and 10% by 2050, this means public expenditure on the 2 scored items is projected to increase by 5% of GDP in the 20 years following 2010, and by 10% in 40 years. Finally, we include two maps on the separate expenditure items. Pension expenditure refers to "public pension spending before taxes and social security contributions paid out to the beneficiaries."<sup>3</sup> With long-term care spending we refer to "a range of services required by persons with a reduced degree of functional capacity, physical or cognitive, and who are dependent for an extended period of time on help with basic activities of daily living."<sup>4</sup> Whereas pension projections were available for all countries for 2050, this was not the case for the intermediate 5-year intervals. Where we lacked such projections, we linearly extrapolated the scores.

### EU-27 (all aging-related budget items)

Alongside pensions and long-term care expenditure, aging is likely to influence other budget items too. General health-care spending is likely to go up due to aging. Conversely, education and unemployment benefits are expected to be positively influenced. Having less young people generally

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3 Salomäki, A., Public pension expenditure in the EPC and the European Commission projections: an analysis of the projection results, Economic Papers N° 268, Directorate-General for Economic and Financial Affairs, European Commission, December 2006. Available at:

[http://ec.europa.eu/economy\\_finance/publications/publication825\\_en.pdf](http://ec.europa.eu/economy_finance/publications/publication825_en.pdf).

<sup>4</sup> Help Wanted? Providing and Paying for Long-Term Care, OECD, 2011. p. 2. Available at:

<http://www.healthyageing.eu/sites/www.healthyageing.eu/files/resources/47836116.pdf>.

means having a smaller education demand. A decreasing labor market also usually translates into lower unemployment benefits.

These three budget items are influenced by a whole range of factors, of which aging is only one. A report from the European Commission tries to isolate the effect aging will have on these expenditure items. In the last set of maps we include these scores for all 27 countries within the European Union. A first map shows the aging-induced change in public expenditure on these 5 budget items combined (pensions, long-term care, health care, education expenditure and unemployment benefits). Per country, we show the cumulative change in percentage points from 2010 onwards. The Netherlands scores 8.2% in 2050, meaning that in the 40 years following 2010, aging is projected to drive up public expenditure by 8.2% of GDP. In five consecutive maps, we detail the cumulative change for each of the 5 budget items.

### Summary of indicators

Category	Indicator	Definition	Source	Year
<b>Rate of Population Aging</b>	Old-age Dependency Ratio	The ratio of the population aged 65 years or over, compared to the population aged 15-64. <sup>5</sup>	United Nations, 2011 <sup>6</sup>	2010-2050
<b>Public Aging-related Expenditure (Worldwide)</b>	Public expenditure on pensions	Public pension spending before taxes and social security contributions paid out to the beneficiaries. <sup>7</sup>	<b>EU-27 + Norway:</b> European Commission 2012 <sup>8</sup> <b>Other countries:</b> OECD, 2011 <sup>9</sup>	2010-2050
	Public expenditure on long-term care	Public spending on “a range of services required by persons with a reduced degree of functional capacity, physical or cognitive, and who are dependent for an extended period of time on help with basic activities of daily living. This personal care component is frequently provided with basic medical services, nursing care,	<b>EU-27 + Norway:</b> European Commission, 2012 <sup>11</sup> <b>Other countries:</b> OECD, 2012 <sup>12</sup>	2010-2050

<sup>5</sup> United Nations, Department of Economic and Social Affairs, Population Division (2011). World Population Prospects: The 2010 Revision. Available at: <http://esa.un.org/wpp/Documentation/glossary.htm>.

<sup>6</sup> Ibid.

<sup>7</sup> Salomäki, A., Public pension expenditure in the EPC and the European Commission projections: an analysis of the projection results, Economic Papers N° 268, Directorate-General for Economic and Financial Affairs, European Commission, December 2006. Available at: [http://ec.europa.eu/economy\\_finance/publications/publication825\\_en.pdf](http://ec.europa.eu/economy_finance/publications/publication825_en.pdf).

<sup>8</sup> *The 2012 Ageing Report: Economic and Budgetary Projections for the 27 EU Member States (2010-2060)*, European Economy (European Commission (DG ECFIN) and the Economic Policy Committee (AWG), 2012), [http://ec.europa.eu/economy\\_finance/publications/european\\_economy/2012/pdf/ee-2012-2\\_en.pdf](http://ec.europa.eu/economy_finance/publications/european_economy/2012/pdf/ee-2012-2_en.pdf).

<sup>9</sup> Pensions at a Glance 2011: Retirement-income Systems in OECD and G20 Countries, OECD 2011. Available at: <http://www.oecd-ilibrary.org/docserver/download/8111011e.pdf?expires=1375450488&id=id&accname=guest&checksum=6A2BFD44221B0E903EBDFF64E7B1ED51>.

prevention, rehabilitation or palliative care.”<sup>10</sup>

<b>Public Aging-related Expenditure (EU-27)</b>	Public expenditure on five aging-related budget items	Aging-induced cumulative change in public expenditure, in % of GDP, from 2010 onwards. Specified for five public expenditure items: Long-term care, Pensions, Health Care, Education and Unemployment Benefits.	European Commission, 2012 <sup>13</sup>	2010-2050
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<sup>11</sup> *The 2012 Ageing Report: Economic and Budgetary Projections for the 27 EU Member States (2010-2060)*, European Economy (European Commission (DG ECFIN) and the Economic Policy Committee (AWG), 2012), [http://ec.europa.eu/economy\\_finance/publications/european\\_economy/2012/pdf/ee-2012-2\\_en.pdf](http://ec.europa.eu/economy_finance/publications/european_economy/2012/pdf/ee-2012-2_en.pdf).

<sup>12</sup> Public Spending on Health and Long-term Care: A New Set of Projections, OECD Economics Department, 2012, p 27. Available at: <http://www.oecd.org/els/health-systems/OECD%20HC%20and%20LTC%20proj%2021nov12.pdf>.

<sup>10</sup> Help Wanted? Providing and Paying for Long-Term Care, OECD, 2011. p. 2. Available at: <http://www.healthyeageing.eu/sites/www.healthyeageing.eu/files/resources/47836116.pdf>.

<sup>13</sup> *The 2012 Ageing Report: Economic and Budgetary Projections for the 27 EU Member States (2010-2060)*, European Economy (European Commission (DG ECFIN) and the Economic Policy Committee (AWG), 2012), [http://ec.europa.eu/economy\\_finance/publications/european\\_economy/2012/pdf/ee-2012-2\\_en.pdf](http://ec.europa.eu/economy_finance/publications/european_economy/2012/pdf/ee-2012-2_en.pdf).