



Retirement regimes for workers in arduous or hazardous jobs in Europe

**A study of national policies
2016**

David Natali, Slavina Spasova and Bart Vanhercke
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European Social Policy Network (ESPN)

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The European Social Policy Network (ESPN) was established in July 2014 on the initiative of the European Commission to provide high-quality and timely independent information, advice, analysis and expertise on social policy issues in the European Union and neighbouring countries.

The ESPN brings together into a single network the work that used to be carried out by the European Network of Independent Experts on Social Inclusion, the Network for the Analytical Support on the Socio-Economic Impact of Social Protection Reforms (ASISP) and the MISSOC (Mutual Information Systems on Social Protection) secretariat.

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Contents

PREFACE	4
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	6
Summary	6
Conclusions	8
Recommendations	9
1 OVERALL DESCRIPTION OF THE END-OF-CAREER POLICY MIX TARGETED AT WORKERS IN ARDUOUS OR HAZARDOUS JOBS	12
1.1 Recognition of the arduousness and hazardousness of work in national legislation	12
1.1.1 Categories and definitions	12
1.1.2 Working in arduous or hazardous situations: approximate numbers	13
1.2 End-of-career policy mix for WAHJ	14
1.2.1 Countries facilitating WAHJs' early exit from the labour market	15
1.2.2 Countries favouring prolonging the working lives of WAHJ	15
1.2.3 Countries combining early exit and prolonging working life measures	16
1.3 Policy shifts, on-going reforms and current debates	17
2 PENSION RULES FOR WORKERS IN ARDUOUS OR HAZARDOUS JOBS	21
2.1 Separate pension rules for WAHJ	21
2.1.1 Pensionable age for WAHJ	21
2.1.2 Career or contribution record requirements and accrual of pension rights	23
2.1.3 Funding rules for WAHJ pensions	24
2.2 Compensating for the absence of specific WAHJ provisions: early retirement rules and social protection benefits	26
2.2.1 Early retirement rules and disability/invalidity pensions	26
2.2.2 Sickness and occupational injury benefits	27
2.2.3 Unemployment benefits	27
3 RETIREMENT PATTERNS AND THE RETIREMENT INCOME OF WORKERS IN ARDUOUS OR HAZARDOUS JOBS	28
3.1 Retirement patterns of workers in arduous and hazardous jobs	28
3.2 Effective Retirement age of workers in arduous and hazardous jobs	31
3.3 Income situation of the retired workers in arduous and hazardous jobs	33
3.4 More recent and ongoing developments in the retirement patterns of WAHJ	34
ANNEX 1: PRESENTATION OF THE EUROPEAN SOCIAL POLICY NETWORK (ESPN)	35
A. ESPN Network Management Team and Network Core Team	35
B. ESPN National independent experts for social protection and social inclusion (Country Teams)	36
ANNEX 2: COUNTRIES' OFFICIAL ABBREVIATIONS	46
ANNEX 3: SPECIAL PENSION SCHEMES FOR WAHJ	47
ANNEX 4: COMPENSATING THE ABSENCE OF SPECIFIC WAHJ PROVISIONS	48
ANNEX 5. RECENT TRENDS IN THE RETIREMENT PATTERN OF WAHJ IN SELECTED COUNTRIES	49
ANNEX 6. REFERENCES	51

PREFACE

This report focuses on the retirement regimes for workers in arduous and hazardous jobs¹, which can be defined as: “Occupations involving the exposure of the worker over a period of time to one or several factors leading to professional situations susceptible to leave long-lasting and irreversible effects on his/her health; these factors are related to physical constraints, psychosocial risks, an aggressive physical environment, working organisation and working rhythms, including shift work”².

In a number of European countries workers employed in jobs recognised as “arduous” or “hazardous” seemingly benefit from more favourable pension rules, including advantageous accrual of pension rights and/or access to a (nearly) full pension before reaching the statutory pensionable age (SPA). In recent years though, pension systems across Europe have been experiencing a shift towards longer working lives and later retirement, against the background of population ageing and fiscal constraints. Statutory pensionable ages are being increased and early retirement pathways restricted, while policies increasingly focus on alternatives to early retirement, including for workers in arduous or hazardous jobs.

In the 2012 White Paper on Pensions³, the European Commission observed:

Workers in particularly arduous or hazardous jobs can be offered alternatives to early retirement, such as job mobility. In some Member States, eligibility rules are being tightened – for instance by increasing the eligibility age. Some countries are also either reducing the levels of benefits provided by special schemes or closing these schemes. Whenever early retirement options are eliminated, it is important to ensure that the individuals concerned are enabled to work longer or, if this is not possible, can enjoy adequate income security.

The 2015 Pension Adequacy Report (PAR⁴) further noted that: “[M]any governments have put great efforts and huge amounts of political capital into raising the pensionable ages: [including] reducing the scope of pension advantages for people in arduous jobs; restricting disability benefits to those ‘genuinely’ sick and unable to work; and so on”. The policy shift towards longer working lives may prove particularly challenging for workers in arduous and/or hazardous jobs – hereafter mostly referred to as WAHJ. Member States (and European countries in general) may address this challenge by leaving in place special retirement pathways for WAHJ, putting a greater focus on reactivation (e.g. training; mobility), or a combination of the two. As the European Commission continues to monitor pension policy developments and pension adequacy, it is important to obtain a more detailed analysis of the impact of this pension policy shift on the retirement patterns and income adequacy of WAHJ. The range of measures that have been implemented in this policy area, as well as the relevance of the topic and availability of data, vary a great deal among European countries. Moreover, existing studies⁵ typically only cover a limited number of countries.

¹ The report covers only workers in arduous and hazardous jobs in the private sector. Public sector provisions are not covered.

² ETUC et al. (2014), *Better Understanding ‘Arduous Occupations’ within the European Pension debate. Final Report*. Available [online](#).

³ European Commission (2012), *White paper. An Agenda for Adequate, Safe and Sustainable Pensions*, COM (2012)55. Available [online](#).

⁴ European Commission (2015), *The 2015 Pension Adequacy Report: current and future income adequacy in old age in the EU*, Volume I, pp. 181-183. Available [online](#).

⁵ See, for instance:

Zaidi, A. and E. R. Whitehouse (2009), *Should Pension Systems Recognise “Hazardous and Arduous Work”?*, OECD Social, Employment and Migration Working Papers, No. 91, OECD Publishing. Available [online](#)

ESIP (2016), *Career management, rehabilitation and early retirement in strenuous jobs (“Hard Jobs”)*, European Social Insurance Platform, Final report. Available online.

To support the Commission's analysis, the European Social Policy Network (ESPN) was asked to conduct an exploratory description and analysis of the policy orientations and measures for end-of-career of WAHJ, which was complemented with relevant data when these were available.

The present Synthesis Report draws on national contributions prepared by the 35 ESPN Country Teams⁶. It was written by David Natali, Slavina Spasova and Bart Vanhercke of the ESPN's Network Core Team⁷, with helpful comments and suggestions from the ESPN Country Teams and from colleagues in the Network Management Team⁸. Comments and suggestions from the European Commission are also gratefully acknowledged.

The purpose of the present Synthesis Report is to provide an overview of these policy measures in 35 European countries, the take-up of retirement by WAHJ and the impact on retirement income adequacy. The report covers recent and ongoing reforms, looking at pension rules and further policy measures for WAHJ. It identifies promising strategies which countries have found for the end-of-career of WAHJ within their social systems. It also refers to the state of the policy debate between policy makers and stakeholders and provides recommendations for EU countries and the EU alike. In doing so, the Synthesis Report seeks to answer the following two research questions: (a) *how do national policies strike a balance between prolonging working lives (including raising pensionable ages, career reorientation and reactivation policies) and facilitating early labour market exit (e.g. a more favourable pensionable age) for workers in arduous and/or hazardous jobs?*; and (b) *how has this balance changed as a result of recent reforms?*

The Synthesis Report's aim is to illustrate the main trends in national policies through a limited number of examples. In this respect, countries with similar developments are listed in brackets so that the reader can examine the ESPN national experts' reports for more information. In producing their reports, experts cite many different sources in support of their analysis. References to these are not included in this Synthesis Report. Readers wishing to follow up the original sources are again invited to consult the individual expert's reports (see reference above).

⁶ For a presentation of the ESPN Network Core Team and the 35 ESPN Country Teams, see Annex 1. This ESPN Synthesis Report and the 35 ESPN national experts' Reports can be downloaded from: <http://ec.europa.eu/social/main.jsp?catId=1135&intPageId=3589>.

⁷ The three authors are from the European Social Observatory (OSE, Brussels).

⁸ Hugh Frazer (Maynooth University, Ireland) and Eric Marlier (Luxembourg Institute of Socio-Economic Research, LISER).

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The present Synthesis Report examines the retirement regimes for workers in arduous or hazardous jobs (WAHJ). To this end, the 35 ESPN Country Teams provided, first, a brief description of the policy mix targeted at WAHJ, secondly a thorough assessment of the pension rules and other social protection benefits tailored to them and, finally, an analysis of their retirement patterns and the adequacy of their pensions. Based on the in-depth account of the various national policies, the Synthesis Report puts forward five key findings on the ways in which countries address the arduousness and hazardousness of work in national policies.

The **first key finding** is that there are two main and opposite legal approaches in the way countries tackle WAHJ. The first approach consists of the legal recognition of WAHJ through national statutory rules and, in most cases, specific policy provisions (most often pensions) for their end of career. Some countries following this approach provide recognition of the arduousness and the hazardousness of work for a broad category of workers based on a list of conditions/occupations/sectors (AT, BE, BG, EE, EL, ES, FI, FR, HR, IT, LI, LT, LU, LV, MK, PL, PT, RO, RS, SI, SK, TR⁹); others provide formal recognition of only one or two occupations (CZ, CY, DE, HU¹⁰, IS, NO). The second approach is to neither recognise WAHJ in legislation, nor to have specific policy measures to address them (CH, DK, IE, MT, NL, SE, UK)¹¹. Generally speaking, the arduousness and hazardousness of work can cover diverse situations ranging from physical or (less often) mental work conditions and/or occupations such as (a) harmful work environment/conditions (e.g. handling of chemical materials, nuclear plants, underground and underwater activities); (b) strenuous physical or mental activities such as mining, aircraft staff, metal-workers but also dancers or bullfighters; and (c) new or newly recognised risks such as optical radiation, electromagnetic fields or just sitting for long periods.

The **second key finding** is that, notwithstanding the relatively long lists of “arduous and hazardous” work conditions and occupations, the number of WAHJ represents a strictly limited proportion of the workforce in all countries under scrutiny. WAHJ represent between 1 and 4% of the total workforce¹² for the period 2015-2016. As for WAHJ pensioners¹³, they are estimated to represent between 5 and 8% of all pensioners for the same period. It should be noted however that data is often incomplete since they do not cover all the categories included in the aforementioned lists. Oftentimes, these WAHJ are treated in national policies through special retirement provisions: mainly pensions (AT, BG, CZ, FR, FI, EE, EL, ES, HR, HU, IT, MK, PL, PT, RO, RS, SI, SK, TR) or unemployment schemes (BE, LU). The majority of these countries favour WAHJs’ early exit from the labour market. Only a few of the countries which have special pension provisions for WAHJ provide a combination of both early exit and prolonging working life measures such as comprehensive active labour market policies and health and safety measures (AT, BE, DE, FI, FR).

⁹ For the countries’ official abbreviations used in this report, see Annex 2.

¹⁰ As a result of a reform passed in Hungary in 2011, there are no new eligibilities for special pension’s provisions for WAHJ since 2015. The WAHJ special provisions have been phased out with the exception of miners and ballet dancers. Those eligibilities that were collected before this date can still be converted to preferential retirement age under the original conditions.

¹¹ When describing these countries, the term WAHJ is still used, in a non-legal sense, for the purposes of this report.

¹² These are data for the period 2014-2015 on workers who have been in arduous or hazardous employment.

¹³ Pensioners who met the conditions (age and contributory period) and are receiving pensions under special pension rules or schemes for WAHJ for the period 2015-2016.

The **third key finding** is that social protection benefits for WAHJ, often perceived as advantageous, are in practice subject to strict conditionality. More particularly, the national experts' reports show that in some countries benefits for WAHJ are higher than the average old-age pension, which is partly the result of higher WAHJ and their employers' contributions in most of these countries. Other countries have pension provisions that are lower than the average old-pension, due to requirements of the contributory period as well as defined contributions schemes. As for countries which do not have any special provisions tailored to WAHJ, this report describes a variety of social protection benefits that can be used by WAHJ: early retirement schemes, disability pensions, sickness and occupational injury benefits. Most of these countries have a policy mix oriented towards prolonging the working life of all workers through restricted eligibility for early retirement and disability pensions, active labour market policies (re-training, life-long learning, job counselling, job handovers) as well as health and safety at work measures. In this respect, the Nordic countries in particular have emphasised improvements in in-work conditions through an approach which builds on work ability schemes comprising health and safety at work measures, rehabilitation and targeted activation policies. Still other countries (AT, BE, DE, CH, FI, FR, NL) combine early exit and prolonging working life measures such as active labour market policies (vocational training, counselling, job handovers), part time leave, reduced weekly working time) and work ability provisions.

The **fourth key finding** is that a significant policy shift towards prolonging working life has taken place in all 35 countries over the past decade. There are three main trends in how countries are addressing the arduousness and hazardousness of work: (a) narrowing access to special schemes targeted at WAHJ by introducing stricter conditions on age and contributory periods; (b) individual assessments of work conditions and work ability for the purpose of granting pensions and disability, sickness and unemployment benefits; and (c) redesigning specific rules and schemes with a view to increasing efficiency and sustainability through means-testing, introducing contributory rates and mandatory insurance, and shifting schemes from the pension system to other social security budget regimes. Measures to enhance the ability to work by means of health and safety programmes and other innovative activation schemes have been implemented only in a few countries (e.g. BE, DE, DK, FI, FR, NO, SE). In general, the reduced access to special retirement provisions has not been matched by measures supporting longer working lives.

Recent reforms have aimed at simplifying the set of policies to regulate the end of career of WAHJ. Here, countries have followed different paths: some have prioritised special programmes for WAHJ, others have focused on the reform of disability, sickness and unemployment programmes while doing away with special rules for WAHJ. All in all, we have identified three main challenges for the future protection of WAHJ which result from the reform trends. First, in some countries WAHJ receive inadequate benefits (e.g. IT, LT, LV, UK). Secondly, many countries do not have well-developed active labour market policies (e.g. BG, CY, CZ, EE, EL, HR, HU, IT, LI, LT, LV, MK, MT, PL, RO, RS, SI, SK, TR). Thirdly, many of these countries need comprehensive strategies for the improvement of health and safety at work and rehabilitation services.

As a consequence of these three challenges, stricter retirement conditions for WAHJ are leading to the individualisation of old age risk, i.e. workers are required to maintain their employability and progressively bear the responsibility for their old-age income adequacy. In the area of pensions this implies the requirement for longer contribution records and thus longer careers.

The **fifth key finding** is the lack of systematic data collection on WAHJ. There are two main issues in this respect. First of all, less than half of the countries which recognise and have specific policies targeted at WAHJ provide up-to-date data (e.g. AT, BG, EE, EL, HR, IT, LT, LV, MK, PL, PT, RO, RS, SI). In this respect, Central and Eastern countries are good performers. Nevertheless, even among these countries in-depth and systematic

data on the number of WAHJ per category of workers are not always available (e.g. RO, RS). The second issue concerns countries which do not formally recognise WAHJ in their legislation. To this end, data are needed in order to assess which category of workers are potentially WAHJ, using, for instance, indicators of self-evaluation, life-expectancy etc. The lack of systematic data collection has implications at two levels. First of all, accessible data should be a priority for policymakers and stakeholders with a view to assessing the general need for special treatment for WAHJ, and especially the adequacy of their retirement incomes and the sustainability of their pension schemes. Secondly, in the context of the ageing of the population with fiscal constraints as well as the technological transformations at the workplace, original data are needed with regard to new occupational risks, in order to design innovative policy measures.

Conclusions

The Synthesis Report sheds light on the huge variation in the way workers in arduous and hazardous jobs are treated in Europe, and on their retirement pathways. While in many countries the group is legally recognised in national statutory rules and often enjoys special pension provisions, a few other countries do not recognise this group of workers and apply the general rules (old age pensions, disability, early retirement, unemployment benefits etc.) to them.

The diversity of regulations has an impact on the policy mix countries have applied so far. Many (in particular Southern and Eastern European) countries have implemented an “early exit strategy” with the aim of facilitating the exit of these workers from the labour market. A few others (in particular the Nordic countries, BE in the caring sector) have traditionally implemented a holistic approach to prolonging the working life of these workers. The latter has been based on a combination of measures: strategies aimed at improving health and safety at work, prevention and rehabilitation programmes, innovative active labour market policies as well as stricter early retirement conditions and access to some social benefits (disability, sickness etc.). A third group combines early exit and prolonging working life measures such as active labour market policies (vocational training, counselling, job handovers) part time leave, reduced working hours and work ability provisions.

In the majority of the countries under scrutiny, irrespective of the policy mix inherited from the past, recent reforms have aimed at prolonging working lives through reducing the scope of special provisions. Policymakers have pursued this reform path through different – sometimes contradictory – measures. In some countries, the general schemes have seen a tightening of conditions: this is especially true for early retirement and disability pensions. In some other countries, special programmes for WAHJ have been terminated, while general schemes (targeted at a larger proportion of workers) have been maintained and reformed in line with the objectives mentioned above.

A further common trait of recent reforms has been the simplification of the complex set of programmes and rules targeted at WAHJ. While in the past a mix of special schemes, rules and broader retirement as well as other social and unemployment schemes were part of the policy strategy, in recent years, policymakers have opted for less diversity. Here, again, countries have followed different paths: some have prioritised special programmes for WAHJ, others have focused on the reform of disability, sickness and unemployment programmes, while doing away with special rules for WAHJ. The main instruments to simplify the institutional set of schemes and the policy mix have consisted of: tightening the conditions for retirement; means-testing for more focused intervention; increased contribution rates; and more effective medical control of the difficulty of working conditions.

Recent reforms have largely contributed to reducing the opportunities for an early exit from the labour market, even in the case of WAHJ. Data in some national experts’ reports show increased employment rates for older cohorts of workers and a more limited number of pensioners leaving the labour market early. In some countries this has led to

an increase of the number of claimants of special WAHJ benefits, which has however been counterbalanced by a reduction in the number of claimants of disability and early retirement benefits. It should be noted that the lack of systematic monitoring in some countries raises concern. A more systematic collection of information on the topic would make it possible to develop a more evidence-based approach to future reforms.

We have identified two main challenges for the future protection of WAHJ. First, in many countries WAHJ receive low levels of benefit (pensions below the average level of general old age and disability benefits), or benefits similar to ordinary workers, but for a shorter period of time (given their lower life expectancy). This has led many WAHJ to postpone retirement and/or combine pensions with income from labour. In this respect, introducing stricter conditions for retirement leads to an individualisation of old age risks borne by the WAHJ. The second challenge is related to a lack of active labour market policies and measures for the improvement of health and safety at work. The tightened access to special retirement provisions has not been matched by measures supporting employability and work ability. The latter could be implemented through a more holistic approach to the arduousness and hazardousness of work: prevention, improving the work environment, rehabilitation and innovative active labour market policies.

Recommendations

This part of the Synthesis Report provides recommendations to both the countries under scrutiny and the European Commission. They build upon the recommendations proposed by the ESPN Country Teams in their national experts' reports.

Recommendations to countries with a legal recognition of WAHJ and special pension provisions for this category of workers

1. More targeted measures should be developed to improve the employability of WAHJ, notably through:
 - a) An integrated approach, combining pension policy and employment policy measures, to help this group of workers to remain active in the labour market while enjoying decent working conditions. This would also help to improve average pension protection through longer careers and thus contribution records.
 - b) A policy mix containing career reorientation, reactivation, re-training, and life-long learning aimed at WAHJ should be implemented.
2. Countries should consider introducing partial retirement schemes¹⁴ with a view to better addressing tensions in the labour market, including tough working conditions and unemployment.
3. Work ability of WAHJ should be improved through measures encouraging co-operation between medical experts and worker's representatives in order to properly assess the risks for occupational diseases and accidents at work.
4. Efforts are needed to find the best ways of integrating statutory Pay-As-You-Go (PAYG) schemes and supplementary funded schemes to provide better social protection to WAHJ. Statutory and supplementary pensions should be part of an integrated strategy to provide old age protection and flexible approaches to the end of career. Some countries have shown that supplementary pensions (voluntary or mandatory) can provide additional protection for WAHJ.

¹⁴ These schemes can consist of a combination of part-time work with partial retirement. For instance, the reduction of working hours which can be partially compensated by supplementary employers' payments. Additional leaves and job handover practices, combined with re-training, can also be envisaged. In Belgium this reduction is partially offset by unemployment insurance for leave, and is completely made up by employers in the case of reduced weekly working hours in the health and social care sector.

Recommendations to Countries lacking a legal recognition of WAHJ or special schemes for this category of workers

5. Countries which do not legally recognise WAHJ should improve their monitoring capacities to map this category of workers. This is crucial to monitor trends in the early retirement, disability and sickness schemes that are often used to address problems with arduousness and hazardousness of work.
6. Once countries have established more clearly the situation of WAHJ, consideration should be given to their legal recognition and to the development of a set of integrated and targeted schemes (as outlined in Recommendation 1 above) to address their situation.

Recommendations for all countries

7. Lessons should be drawn from the comprehensive strategies already present in some countries for addressing problems related to the end of career of workers. In particular:
 - a) Further efforts should be made to find out more about the interplay between the different parts of the policy mix, such as early exit (special retirement provisions) and prolonging working life (active labour market policies, health and safety) measures.
 - b) There is scope to identify “good practices” in existing holistic approaches, which emphasise improving WAHJ’s work ability and targeted activation measures.
8. The governance of the policy measures aimed at WAHJ should be improved, more particularly in view of the evidence of some ESPN national experts’ reports of the key positive role of collective bargaining in regulating the end of career of WAHJ:
 - a) Trade unions and employers’ representatives should be closely involved in providing more information about the arduousness and hazardousness of work and the most effective ways to provide protection to workers.
 - b) Interactions between statutory rules and collective agreements should be developed in view of the fact that WAHJ are clearly associated with targeted occupational groups and industrial sectors.
 - c) Social partners should be closely involved in designing active labour market policies which would benefit WAHJ.
9. Real efforts are needed to develop more effective and more systematic statistical data collection regarding the following:
 - a) The effective retirement age and average pension of workers performing arduous or hazardous jobs.
 - b) The gender balance or bias in the retirement patterns of WAHJ.
 - c) The adequacy of the protection provided by special schemes for WAHJ in view of their particular profile (average life expectancy etc.).

Recommendations to the European Commission:

10. Innovative policy measures introduced for WAHJ should be systematically identified and assessed to then be used to promote exchange on improving policies in the context of a wider active ageing strategy. In that respect:
 - a) The European Commission and the Social Protection Committee should systematise the exchange of information on this topic. It will be important to ensure that all relevant stakeholders are involved in this exchange.
 - b) The working conditions and end of career of WAHJ should be monitored in the context of the European Semester. The effective policy mix to address WAHJ

should be considered as part of the strategy to achieve the Europe 2020 employment and social inclusion targets.

- c) Exchange of information between different data sets – at the EU and international level (incl. the OECD) – could be further promoted, to improve knowledge about WAHJ.

1 OVERALL DESCRIPTION OF THE END-OF-CAREER POLICY MIX TARGETED AT WORKERS IN ARDUOUS OR HAZARDOUS JOBS

This section provides an overall description of the end-of-career policy mix targeted at workers in arduous or hazardous jobs (WAHJ), focusing on three main features of national policies: the recognition and definition of arduousness and hazardousness of work in national legislation (Section 1.1), the end-of-career options available to WAHJ (1.2) and finally, the policy shifts that are apparent in recent reforms (1.3).

1.1 Recognition of the arduousness and hazardousness of work in national legislation

1.1.1 Categories and definitions

Countries vary a great deal with regard to how they recognise the arduousness and hazardousness of work in their national legislation. They can be divided into two main clusters, as can be seen in Table 1. These clusters are not watertight, but help to grasp the “big picture” and variation among the 35 European countries.

The by far largest cluster is composed of countries that formally recognise WAHJ in national legislation. This cluster can be divided into two groups.

- The first one comprises countries which provide a recognition of the arduousness and hazardousness of work for a broad category of workers, namely through lists of either work or environment conditions or jobs occupations, or both. This is the case for AT, BE, BG, EE, EL, ES, FI, FR, HR, IT, LI, LT, LU, LV, MK, PL, PT, RO, RS, SI, SK, TR¹⁵.
- The second group of countries provides formal recognition only for one or two categories, as is the case in CZ, CY, DE, HU, IS, NO. For instance, some countries recognise and provide special policy treatment for seafarers (DE, IS, NO) and/or miners (e.g. CZ, CY, DE, NO). Within this group, some countries have established rules on the arduousness and hazardousness of work through collective agreements that cover a large part of the workforce (DE, IS and NO).

Table 1: Recognition of WAHJ in national legislation

Formal recognition of WAHJ		WAHJ not formally recognised
Arduousness and hazardousness of work enshrined in national legislation	Recognition of one or two categories of arduous and hazardous occupations in pension statutory rules**	
AT, BE*, BG, EE, EL, ES, FI, FR, HR, IT, LI, LT, LU*, LV, MK, PL, PT, RO, RS, SI, SK, TR	CZ, CY, DE, HU, IS, NO	CH, DK, IE, MT, NL, SE, UK

*BE and LU: statutory rules on night and shift work conditions. **DE and NO: statutory rules only for miners and seafarers; CZ and CY: statutory rules only for miners; IS: statutory rules only for seafarers; HU: since 2015, only miners and ballet dancers are recognised.

The second cluster is composed of countries which do not recognise arduous and hazardous work conditions in statutory rules: this is the case in CH, DK, IE, MT, NL, SE and the UK. In these countries workers who could plausibly be considered as being in this kind of occupation do not benefit from any specific policy treatment. Only in the Netherlands, Sweden and Switzerland national experts pointed to some examples of collective agreements which recognise the arduousness and hazardousness of work, but

¹⁵ Belgium and Luxembourg are included in this group because they recognise a narrow list of conditions related to night and shift work which cover different occupations or sectors. Belgium has some collective agreements which recognise the arduousness and hazardousness of specific work conditions and occupations.

in most cases these are not all-encompassing and refer only to some sectors and/or occupations.

Surprisingly enough, only five countries use a precise definition of the arduousness and hazardousness of work: FR, LI, RO, SI and SK. For instance, the French definition emphasises physical strenuousness: "*marked physical constraints, an aggressive physical environment or certain work patterns likely to have lasting, identifiable and irreversible impacts on health.*" The Romanian definition covers "*jobs in which exposure to risk factors can lead to occupational diseases and have severe consequences for workers' health and safety at work*".

As mentioned above, in other countries arduousness and hazardousness of work is tackled by collective agreements. This is the case particularly in Belgium, Iceland, Germany, Sweden, Switzerland and Norway, and the agreements often cover entire sectors¹⁶. For instance, in the Netherlands, collective agreements cover around 90% of the workforce and typically use broad categories to distinguish between different types of work. In Germany, there is a variety of contractual regulations which define arduousness and hazardousness of work and include provisions on the duration and forms of working hours (reduced weekly or daily working hours, shift-work and/or night-work), safeguarding employment and wages (in periods of restructuring measures, changes of tasks), further training measures, dismissal provisions and early exit pathways.

More often, the arduousness and hazardousness of work is described through a list of strenuous physical or (in some cases) mental work conditions and/or jobs and occupations.

- harmful work environment/conditions, e.g. handling of chemical materials, nuclear plants, underground and underwater activities (e.g. AT, BG, EE, EL, ES, FI, FR, HR, IT, LI, LT, LV, MK, PL, PT, RO, RS, SI, SK, TR);
- strenuous physical or mental activities such as mining, air craft staff, metallurgy but also dancers (BG, EE, EL, ES, HR, HU, MK, PT, RO, RS, SI), musicians and actors (e.g. EL) or bullfighters (ES);
- new or newly recognised risks such as optical radiation, electromagnetic fields or just being seated for long periods (EE).

With regard to the measurement of these arduous conditions, some countries apply quantitative tools related to factors such as heaviness, energy expenditure, temperature and pressure, night work and shift work to all WAHJ (e.g. AT, BE, FR, LU, SI, SK). For instance, in France the minimum threshold for the daily manual handling of loads to be labelled as "arduous" is 7.5 tons/day and the minimum time threshold is 120 days/year. Austria defines "unfavourable" working conditions as those requiring energy expenditure above a certain threshold of kilojoules¹⁷. Arduous "night work" is also qualified differently between countries¹⁸.

1.1.2 Working in arduous or hazardous situations: approximate numbers

Notwithstanding the seemingly long lists of work conditions and occupations, it should be noted that WAHJ represent a strictly limited proportion of the workforce in all countries under scrutiny. However, the data provided below should be considered with due caution as they are incomplete since they do not cover all the categories included in the

¹⁶ More precisely, arduousness and hazardousness of work arrangements in collective agreements are particularly widespread in the public sector in Belgium and Norway. The Belgian report points out that there are 53 special regimes in the public sector with special early retirement conditions due to arduous working conditions.

¹⁷ In Austria, it is set at 8,374 kilojoules.

¹⁸ Six hours between 10pm and 6am for at least 6 days/month (AT); at least one hour between 12pm and 5am for at least 120 nights/ year (FR); and work between 10pm and 6am (except 11pm and 6pm in hotel and catering business) in Luxembourg.

aforementioned lists. Moreover, some national experts consider that many workers are *in practice* working in arduous or hazardous situations, even if they have *formally* been not included in these categories (e.g. RS).

The ESPN national experts' reports roughly estimate that WAHJ represent between less than 1% and 4% of the total workforce in European countries. In Estonia and Hungary, WAHJ account for around 1% of the employed population. In Spain the number of contributors to the sea workers' regime makes up 0.39% and coal mining workers 0.03% of the total contributors to the social security system. In the Czech Republic, workers in the mining industry represent less than 0.6% of the labour force, whereas miners considered as WAHJ represent only approximately 0.1% of the total labour force. In Romania, the category of *difficult work conditions* represents around 0.36%¹⁹ of the total employed population. In Poland and Croatia WAHJ represent around 2.2% of all insured workers, in Serbia 3.6% of the total workforce and in Slovakia 4.1 % of all employed persons. Greece is an exceptional case, where formally recognised WAHJ account for no less than 12.9% of all employed persons or 29.52% of all insured salaried employees in the private sector.

In many countries experts point to a decrease in the number of WAHJ over the past decade: this is the case in BG, EE, EL, ES, HU, LT, LV, MK, PL, RO, RS, SI, SK and TR. In Romania, where legislation recognises two categories of arduous and hazardous jobs, i.e. *special work conditions* and *difficult work conditions*, there was a significant decrease in the number of workers in the latter category of around 90% between 2004 and 2015. This is a result of a revision of the legislation, which reduced the number of jobs considered as arduous and hazardous and imposed improved work conditions on a significant share of them. In Greece, there was a significant decrease in the number of WAHJ during the period 2009-2014: from 17.1% to 12.9% of all employed persons (or from 42.6% to 29.5% of all insured salaried employees in the private sector). In general, there are multiple reasons for the overall decrease in the number of WAHJ in European countries: these include economic downturn in sectors employing WAHJ and revision of the lists of conditions and/or occupations, including for budgetary reasons (for further discussion, see Section 1.3 on reforms).

European countries have deployed a variety of policy instruments to tackle the end-of-career in arduous and hazardous work: these include pensions (old-age pensions, early retirement schemes, partial pensions, disability pensions), passive labour market policies (unemployment protection, sickness benefits), active labour market policies (re-training, life-long learning, job counselling, job handovers), health and safety at work measures. Two ideal type approaches can be identified for tackling the arduousness and hazardousness of work. The first one focuses on a single policy that is specifically tailored to WAHJ and/or available to all workers (namely in countries that do not recognise WAHJ per se). The preferred policy options are mostly early exit provisions such as pensions (old-age and disability schemes). The second approach is holistic, prioritising a variety of policies including pensions, but putting the emphasis on active labour market policies promoting employability, as well as health and safety at work with a view to enhancing the work ability of WAHJ.

1.2 End-of-career policy mix for WAHJ

The 35 European countries under scrutiny use various packages of policy measures and forms of regulation to address the arduousness and hazardousness of work. As can be seen in Table 2, countries can be grouped in three clusters with clearly distinguishable policy mixes as regards end-of career: countries facilitating early exit from the labour

¹⁹ While the WAHJ are divided between two categories of work conditions (i.e. "difficult work conditions" and "special work conditions"), statistics are available only for workers in difficult work conditions. According to an estimation issued by the Romanian government, the category of *difficult work conditions* numbered approx. 30,000 workers, representing approximately 0.36% of the total employed population.

market (Section 1.2.1), countries favouring prolonging working life measures (1.2.2) and countries combining early exit and prolonging working life measures (1.2.3). The present section refers to traditional policy packages while Section 1.3 provides a summary of more recent reforms that, at least in some cases, have shifted the logic of the policy mix inherited from the past.

Table 2: End-of-career policy mix for WAHJ

Countries facilitating early exit measures (Cluster 1)	Countries favouring prolonging working life measures (Cluster 2)	Countries combining early exit & prolonging working life measures (Cluster 3)
BG, EE, ES, EL, HR, IT, MK, PL, PT, RO, RS, SI, SK ²⁰ , TR	CY, CZ, DK, HU, IE, IS, LI, LT, LV ²¹ , MT, NO, SE, UK	AT, BE, DE, CH, FI, FR, LU, NL

1.2.1 Countries facilitating WAHJs' early exit from the labour market

The majority of the countries in the first cluster - mostly Central and Eastern European (CEEC) and some Southern countries - deal with the end-of-career of WAHJ through special pension provisions (i.e. separate rules or special pension schemes) and/or other social security benefits in order to facilitate early labour market exit of the workers concerned. This is the case in BG, EE, ES, EL, HR, IT, MK, PL, PT, RO, RS, SI, SK and TR, as can be seen in Table 2. WAHJ pension provisions vary widely, not only between the countries in this cluster, but also within the same country, depending on the category of workers and often gender.

Most of the countries in this cluster provide separate pension rules within the general pension system for WAHJ (EE, EL, ES, HR, IT, MK, PT, RO, RS, SI, SK, TR). A few countries have special pension schemes for this category of workers (BG, ES, PL, SI). Spain and Slovenia combine special pension schemes with separate rules in the general pension scheme, according to the categories of workers (Sections 2.1 and 2.2). All countries in this cluster also use other social security benefits as early exit routes by WAHJ. These include disability pensions, sickness benefits and unemployment schemes. However, such benefits usually provide low replacement rates and in some cases are used as bridging benefits²² until the conditions for old-age pensions are met. This is often the case for unemployment benefits, which can be claimed during an economic downturn in sectors employing WAHJ (e.g. construction, mining sector).

1.2.2 Countries favouring prolonging the working lives of WAHJ

The countries in the second cluster (see Table 2) do not have specific provisions for the end-of-career WAHJ²³: formally speaking, these workers have the same length of working life as ordinary workers. This is the case in CY, CZ, DK, HU, IE, IS, LI, LT, LV, MT, NO, SE, UK. Among these countries, Liechtenstein is the only one which recognises WAHJ in national legislation (based on a list of occupations) but, surprisingly perhaps, it does not provide any special provisions for them. In Latvia and Lithuania, arduousness and

²⁰ In Slovakia, there are special provisions only for workers in arduous and hazardous employment before 2000. However, the country is classified in this cluster because a 2016 agreement between the government and the trade unions proposes new early exit measures for WAHJ.

²¹ Latvia and Lithuania have special pension provisions, but only for those who were working in arduous or hazardous jobs before 1996 (LV) and 1995 (LT): workers who entered the labour market after these dates have no special treatment.

²² Bouget D., Frazer H., Marlier E., Peña-Casas R., Vanhercke B. (2015), *Integrated support for the long-term unemployed in Europe: A study of national policies*, European Social Protection Network (ESPN), Synthesis Report to the European Commission, Brussels: European Commission.

²³ With the exception of one or two categories of workers (such as miners and seafarers), as explained in Section 1.1.

hazardousness of work is still enshrined in law, but special pensions provisions apply only to WAHJ before 1996 (LV) and 1995 (LT).

In this cluster, social security provisions such as disability, sickness and unemployment benefits sometimes serve as bridging benefits until WAHJ reach the SPA.

Within this second cluster, there are two main approaches to tackling the end of a career, and particularly prolonging working life of WAHJ. The first, a “holistic” one, is taken by Nordic countries (DK, IS, NO, SE). As put forward by the Danish expert’s report, this approach builds on linking social and labour market policies and (more recently) health policies to support longer working lives. It aims at enhancing “workers’ functional capacities through empowerment and rehabilitation” in order to reduce “early exits and to increase retirement ages and employment rates” (DK expert’s report). The holistic approach towards WAHJ is pursued through a variety of policy instruments but there are typically only few early retirement possibilities through pensions while disability and sickness benefits have strict eligibility conditions. These countries have put the emphasis on improving in-work conditions and work ability of all workers. The holistic approach indeed builds on active labour market policies aimed at promoting employability; it also promotes work ability schemes comprising health and safety at work measures as well as rehabilitation.

The second approach stresses prolonging working life mainly through tightening eligibility conditions and providing incentives for later retirement rather than enhancing the employability and work ability of supposed WAHJ (CY, CZ, HU, IE, LI, LT, LV, MT, UK). These countries provide some early retirement schemes (except for the UK) but have restricted their conditions over the past decade. The same is true for disability and occupational injury schemes. For instance, the UK has replaced the previous Incapacity Benefit and Severe Disablement Benefit (which were considered as facilitating early exit and alternatives to unemployment benefits) by an Employment and Support Allowance, with tighter eligibility conditions.

1.2.3 Countries combining early exit and prolonging working life measures

The countries of the third cluster (AT, BE, DE, CH, FI, FR, LU, NL) combine early exit and prolonging working life measures. On the one hand, these countries provide special early exit options, either through national legislation or collective agreements. On the other hand, they provide comprehensive supporting working life measures such as active labour market policies (vocational training, counselling, job handovers) and work ability provisions. For instance, Austria has two special pension schemes for WAHJ: “heavy labour pensions” and “special retirement for WAHJ in heavy night work”. Likewise, France has several early retirement schemes for categories of WAHJ (e.g. for asbestos workers etc.). Belgium favours early labour market exit for WAHJ through the Scheme of unemployment benefit with employers’ supplement (*Régime de chômage avec complément d’entreprise, RCC*), along with a variety of active labour market policies (ALMP). Luxembourg has a limited pre-retirement scheme (paid by the unemployment system) which serves as a bridge to retirement, with a more generous benefit than for ordinary workers to be paid by the employer. Some countries, such as France, have introduced schemes that combine access to ALMP measures and early retirement (see Section 1.3 for more detail).

In Belgium, Germany, the Netherlands and Switzerland, WAHJ conditions and partial retirement schemes (through mostly occupational pensions) are negotiated exclusively through collective agreements. For instance, in the Netherlands the most common provision in collective agreements is extra leave for older workers, on the assumption that older workers need extra time off to remain healthy and fit for work. Some 62 collective agreements covering about 51% of workers include this type of measure. 52 of these collective agreements provide extra leave which increases with age from 50 to 60 (a maximum of 15 extra days of leave). In addition, 43 collective agreements covering 29% of workers allow older workers to benefit from reduced hours. This type of provision

usually applies to workers aged 45-64. Finally, 68 collective agreements (62% of all Dutch workers) exempt older workers from overtime, irregular working hours, weekend work and team work. In Germany, there is a great variety of contractual regulations which protect and favour older employees - with regard *inter alia* to the duration and form of working hours, to safeguarding employment and wages, to further training measures, dismissal provisions and early exit pathways. Of particular relevance are partial retirement agreements, which can refer not only to the age of employees but also to employees in shift- or night-work. The collective agreements that were concluded in 2015 for the metal and electrical industries in Baden-Württemberg allow employees who have worked night shifts and alternate shifts during a certain period to benefit from a partial retirement from the age of 58 onwards (for up to five years); the income reduction is partially compensated for by supplementary employer payments. In 2003 Swiss social partners reached a collective agreement - binding for all firms in the construction sector - which allows workers, under certain conditions, to retire at age 60 rather than the SPA at 65. It provides an income-replacement benefit for a period of 5 years at most, between the ages of 60 and 65. The agreement has been in force since 2003, and consists of an ad hoc foundation which provides pensions, jointly run by the social partners (Stiftung flexibler Altersrücktritt – Fondation retraite anticipée, the FAR foundation), that is separate from both the basic state pensions and company based occupational pensions. The FAR foundation is generally considered as a successful example of how to deal with the issue of providing access to adequate retirement provision to WAHJ within the framework of collective agreements rather than through general legislation. However, this agreement is rather exceptional (attempts by the unions to extend the agreement to construction-near branches such as electricians, plumbers, etc. have failed so far).

1.3 Policy shifts, on-going reforms and current debates

This section describes the main reform trends in recent years (2009-2016) for the policy instruments tailored specifically to the end-of-career of WAHJ. It also addresses other social security schemes that are used by these workers to provide a smooth end of career in countries which do not recognise arduousness and hazardousness of work in national legislation.

The main reform trend in all countries during the past decade has been towards introducing stricter conditions for favourable pension and other social security benefits. Countries can be divided into three main clusters, as can be seen in Table 3.

Table 3: End-of-career of WAHJ: main reform trends

Tightening early exit and promoting employability and work ability measures	Tightening early exit	Facilitating early exit
AT, BE, CH, DE, ES, IT, IS, FI, FR, LI, LU, NL, DK, NO, SE	BG, CY, EE, EL, HR, IE, HU**, LT, LV, MK, MT, PL, PT, RO, RS, SI, SK, UK	CZ*, TR*

*CZ and TR have implemented early retirement provisions only for miners. CZ implemented a pre-retirement benefit in 2013 for all workers within the voluntary funded individual schemes of the pension system.

**HU: the entire WAHJ pension provisions' system has been phased out since 31 December 2014 (except for miners and ballet dancers).

Slightly less than half of the countries under scrutiny have implemented strategies and programmes aimed at supporting longer working lives and promoting employability and work ability while tightening early exit schemes: this is the case in AT, BE, CH, DE, ES, IT, IS, FI, FR, LI, LU, NL, DK, NO and SE. This trend is particularly visible in Scandinavian countries, where further emphasis has been placed on promoting employability and

enhancing work ability. For instance, in Sweden, along with tightening eligibility conditions for occupational pensions, the emphasis has been put on prolonging work capacity through prevention and rehabilitation measures. In Denmark, even people with the weakest work capacity have been encouraged to join the labour market through the “Flex Job Reform” of 2013, which introduced intensive re-insertion programmes (“resource process programmes”). In Norway, enhancing work ability policies are enshrined in the Working Environment Act and the tripartite agreement on “An inclusive work life” (2014-2018), both of which have the clear objective of prolonging working lives of elderly workers. Similar measures based on agreements between social partners have been launched in Finland as well.

In some of the countries that followed this reform trend, early exit routes have been negotiated through collective agreements and are being implemented by occupational pensions or disability funds. However, these favourable conditions are being tightened in many countries. For instance, in Sweden and Norway, occupational pensions are moving towards stricter early retirement conditions. In Sweden, the age limit for earliest pension withdrawal from private pension plans (occupational and private individual) is to be increased from 55-years to 62-years by 2017. In Iceland, where prolonging working life has been a general trend for decades, the Occupational Pension Funds (OPFs) have been pushing during 2016 for a rise in the pensionable age to 70 and for tighter eligibility procedures for disability pensions. The German expert’s report points to the decrease in the coverage of collective agreements from 70% in 2003 to 57%. The on-going political debate is focused on the strengthening of the medical and professional/vocational rehabilitation measures, and on the assumption that active labour market policy is of major importance for activation and vocational integration measures for older employees. However, benefits for further vocational training have been sharply reduced in recent years. In the Netherlands, where the collective agreements cover 90% of all workers, these benefit from occupational pension schemes which are collectively organised and quasi-mandatory at firm, sectoral or professional level. In 2013, the Dutch government raised the pensionable age for the statutory basic pension, to 67 by 2021. Collectively negotiated occupational pension schemes followed the example of the statutory pension and raised pensionable age to 67.

Only few countries have implemented innovative schemes combining early exit with activation and improving work ability policies, such as the French “compte de prévention de pénibilité” and the Finnish “years-of-service pension”. The new French scheme (implemented in 2015) allows employees to acquire points according to their exposure to ten defined risk factors. These points can be used under certain conditions for (a) vocational training (b) part-time-work on the same pay and (c) early retirement. In Finland, along with an emphasis on work ability, there has been a process of harmonising the occupational pension provisions for WAHJ. Following the closing down of many early retirement routes for individual occupations, a specific *years-of-service* scheme for WAHJ has been created (implementation is scheduled as of 2017) which requires 38 years of contributory period and is applied to all major pension schemes. In Austria and Germany, the policy mix has also been clearly oriented towards activation and occupational health and safety²⁴. For instance, Austria has reformed early retirement schemes (while leaving a transitional period for WAHJ) as well as disability schemes. At the same time the focus was put on rehabilitation and ALMP such as retraining. The “temporary invalidity pension” in Austria has been replaced by two new benefits, namely “rehabilitation benefit” and “re-training benefit” which are aimed at all workers.

The second reform trend is towards tightening the eligibility conditions of pension schemes through three main measures: reducing the categories of working conditions/occupations considered as arduous and hazardous; increasing pensionable ages and insurance periods; and closing down favourable pension provisions for WAHJ. In

²⁴ In Italy, the *staffetta generazionale* scheme, which covers all workers aged 50+, allows them to shift from full-time to part-time employment if the employer hires at least one younger worker.

this group of countries, measures to invest in employability and work ability of workers in arduous and hazardous jobs are underdeveloped: prolonging working life is mainly approached through reducing opportunities to exit the labour market. For instance, in Hungary, the whole WAHJ system has been phased out since December 2014, and no new eligibilities can be accumulated. Advantages collected before 2015 can still be converted to a preferential retirement age, subject to the original conditions. Moreover, the eligibility conditions for disability and sickness benefits have been tightened. Significant changes in the list of WAHJ and to the preferential pension treatment have been planned in Croatia as regards jobs that have become automated and are therefore considered less arduous than in the past. For the past 20 years, Baltic countries have been reforming pension schemes inherited from the Soviet regime. In Latvia the pensionable age of some categories of WAHJ has increased rather spectacularly, i.e. by 10.5 years during the past 20 years. Special pension rules within the statutory retirement system remain only for workers who worked in arduous and hazardous jobs before 1996; the same as in Lithuania for WAHJ before 1995²⁵. In Malta the pension reform of 2004 has opened up early retirement routes for “manual workers”, but in 2014 incentive mechanisms for increasing the benefit amount were introduced in order to prolong working lives of workers between 62 and 65.²⁶ In Belgium, the unemployment benefit scheme with employers’ supplements has been made subject to far stricter conditions: the general minimum age condition is now 62 years for all workers and for WAHJ the age is 58, provided that they have contributed for 35 years.

While tightening eligibility conditions and closing down exit routes, the countries that follow the second reform trend have not implemented coherent working life extension measures targeted at these categories of workers. Some ESPN experts highlighted schemes targeted at older workers (45+) in general, but these remain underdeveloped or underused (e. g. BG, EE, LT, PL, RO). Some countries have targeted special schemes at older workers in certain sectors (e.g. in BE, the health and social care sector). In some countries there are discussions on implementing specific ALMP and rehabilitation policies which are mainly proposed by trade unions (e.g. BG, EE).

The third reform trend – which aims at facilitating early exit routes for WAHJ – is an exception (as can be seen in Table 3) and is mostly linked to peculiar economic conditions especially at sectoral level and for some occupational groups. For instance, in Turkey, along with promoting longer working lives by regulating pension accruals (i.e. the rate at which one builds up pension benefits while being an active member of the scheme), recent reforms have reduced the pensionable age of miners in order to facilitate labour market exit. This decision was a direct consequence of the 2014 coal mine disaster in Soma, the deadliest industrial catastrophe in Turkey’s history. Likewise, in the Czech Republic more favourable rules for the early retirement of miners were enacted in 2009 and in 2016²⁷ about further relaxing these due to economic downturn in the mining sector. Moreover, since 2013 it has become possible to claim pre-retirement benefit from the voluntary funded individual schemes under favourable age and income conditions. Although in the debates on introducing this measure the emphasis was on targeting WAHJ, it is accessible to the entire workforce.

²⁵ In Romania, as well, the general tendency is to reduce the number of WAHJ: as a result, there was a redefinition of some categories and a transition of many occupations from the “difficult work conditions” to the “normal work conditions” list. In Slovakia, the pre-existing classification of jobs according to their riskiness was abolished in 1999 and is now used only to calculate the pension entitlements for WAHJ employed before 2000. In Bulgaria, recent reforms planned an increase in the pensionable age of WAHJ as of 2017.

²⁶ In Cyprus, incentive mechanisms equally aim at increasing the effective retirement age to 68 years. In Liechtenstein, the emphasis is put on certain activation measures (consultations and retraining for career change) as well as prevention. There are occupational pension schemes for some categories of workers but the benefit structures are left to the employers’ discretion.

²⁷ A new law voted on 11 July 2016 which will enter into force as of 1 October 2016 decreases the pensionable age for WAHJ miners from 5 to 7 years below the SPA.

In Slovakia there is an ongoing discussion (2016) on introducing more favourable pension rules for WAHJ based on a trade union proposal inspired by the German and Belgium schemes. Likewise, in Belgium, along with government and social partners are preparing (originally planned for June 2016, now postponed until autumn 2016) a list of arduous jobs to benefit from special retirement conditions for a transition period until 2030. WAHJ pensions would use a notional points system. In the ongoing discussions in Belgium on the definition of arduousness and hazardousness of work there are proposals to tackle this issue at individual level, without referring to jobs or occupations.

2 Pension rules for workers in arduous or hazardous jobs

As discussed in Section 1.2.1, many of the countries which formally recognise WAHJ in national legislation provide early exit provisions through the pension system. This section focuses mainly on the two kinds of pension provisions specifically targeted at WAHJ: separate pension rules for WAHJ within the general pension scheme and special pension schemes tailored to WAHJ (2.1). It also briefly describes early retirement schemes and other social security schemes in countries which do not have specific pension provisions for WAHJ (2.2).

Countries providing special pension provisions for WAHJ can be divided into two clusters. The first cluster (15 countries) provides separate pension rules for WAHJ *within the general pension scheme*: CY, CZ, EE, EL, ES, HR, HU, IT, LV, MK, PT, RO, RS, SI, SK²⁸ and TR. The second cluster (10 countries) has *separate* pension schemes for WAHJ: AT, BG, DE, ES, FR, FI (as of 2017), IS, NO, PL, SI. Slovenia and Spain are included in both clusters because they have separate rules within the general pension scheme as well as special pension schemes according to the category of WAHJ.

A summary of the situation in the 35 countries under scrutiny is provided in Table 4.

Table 4: Pension rules for workers in WAHJ: general and special schemes

Separate pension rules for WAHJ within the general scheme	Special pension schemes for WAHJ	Absence of special pension provisions tailored to WAHJ
CZ*, CY*, EE, EL, ES, HR, HU**, IT, MK, PT, RO, RS, SI, SK**, TR	AT, BG, DE*, ES, FR, FI (as of 2017), IS*, NO*, PL, SI	BE*, CH, DK, IE, LI, LT**, LU*, LV** MT, NL, SE, UK

* Schemes with a narrow scope (only miners and/or seafarers; BE and LU only night and shift workers).

** LT and LV have separate pension rules within the general pension scheme only for a tiny number of workers employed in arduous or hazardous jobs before 1995 (LT) and 1996 (LV); HU: the whole WAHJ system has been phased out since the 31st December 2014 (except for miners and ballet dancers). SK provides separate pension rules only for WAHJ employed before 2000.

2.1 Separate pension rules for WAHJ

Separate pension rules within the general scheme and special schemes for WAHJ are determined by three main sets of rules. These pertain to (a) pensionable age (Section 2.1.1); (b) the career or contribution record that is required to access a pension and (c) the accrual of pension rights (2.1.2). The funding of these special schemes is discussed in Section 2.1.3.

2.1.1 Pensionable age for WAHJ

First, with regard to pensionable age, countries provide early retirement rules tailored to WAHJ (see illustrations in Box 1 below). On average, WAHJ can benefit from a full pension 5-6 years before the SPA.

The pensionable age rules depend on three main elements: the categories of WAHJ (BG, CY, CZ, EE, EL, ES, FI, HR, HU²⁹, IT, MK, PL, PT, RO, RS, SI, SK, TR)³⁰, the contributory period (BG, EE, EL, ES, FI, HR, HU, IT, MK, PT, RO, RS, SK, TR) and gender (AT, BG, HR, HU, MK, PL, RO, RS, SI). Gender is an important variable in both groups, women being entitled to retire on average 5-6 years earlier than men (e.g. AT, BG, MK, PL, RO, RS, SI). In this respect, some countries have implemented transitional equalisation periods

²⁸ In Slovakia, special pension provisions cover only workers in arduous or hazardous employment before 2000.

²⁹ As pointed out above, the Hungarian system has been phased out in December 2014. New eligibilities are no longer possible.

³⁰ See Annex 3 for countries having special pension schemes for WAHJ.

for gender pensionable ages (e.g. BG, HR, SI). For instance, in Bulgaria the pensionable age for WAHJ will start to increase as of 2017 by 2 months for men and 4 months for women each year, until the same age is reached for women and men in 2037. For Bulgarian workers whose jobs belong to “labour category I” the target age for early retirement is 55 years and for “labour category II” the target age is 60 years. In Croatia, the pensionable age for women is being increased by 3 months a year between 2011 until 2030. In Slovenia both pensionable age and contributory period have been equalised for men and women.

Box 1. Pensionable age of WAHJ: illustrations

In **Germany**, the pensionable age for miners varies between 60 and 62 depending on the contributory period, but they can retire earlier if there is an economic downturn in the sector.

In **Greece**, the pensionable age for WAHJ is 62 for a full pension while the SPA is 67 years. Some categories of WAHJ are entitled to a reduced pension at the age of 60 (construction sector, municipal cleaning sector), others at 57 years (mining, underwater and air activities, some categories of artists).

In **Italy**, WAHJ retire at 61 years/7 months, i.e. five years before the SPA, if they attain the required contributory period.

In **Croatia**, the pensionable age varies widely depending on the category of WAHJ, on their contribution period in this kind of employment and on gender. For instance, ship crew members can retire at 60 years, while pensionable age for asbestos workers can vary from 45 to 48 for women and from 50 to 53 for men. For most WAHJ the effective retirement age is between 60 and 62 years.

In **Hungary**, men are entitled to a reduction of pensionable age of 2 years after 10 years in an arduous or hazardous job, which is extended by one year for each additional five years of activity. For women the condition is more favourable: 2 years' reduction for each additional 8 years spent in an arduous or hazardous job and 1 year for each additional 4 years.

In **Macedonia**, the age reduction can vary from 7 to 3 years compared to the SPA, depending on the category of WAHJ, the entitlement to an extension of the contribution period and on gender.

In **Romania**, the pensionable age is lowered by 6 months for each year of arduous and hazardous employment for “special work conditions”: the reduction ranges from 1 to 13 years depending on the contributory period. For several other categories (i.e. miners, artists and employers exposed to nuclear radiation), the pensionable age is even lower.

In **Portugal**, the pensionable age can vary (from 45/ 50 years for miners to 60 years for embroiderers from Madeira) and is calculated according to the contributory period.

In **Spain**, bullfighters and artists can retire respectively at the age of 55 or 60 according to the contributory period but with a benefits deduction of 8% for each early retirement year after the age of 60. For some other categories of WAHJ, there are special age reduction coefficients (for miners and aircraft personnel).

In **Slovakia**, the SPA is 62 years with at least 15 years of contributions, while WAHJ can retire between 56 and 59 years (depending on the category) provided that they have a contributory period of at least 25 years as WAHJ.

As a general rule, miners can retire between the ages of 55 and 57. Sometimes there are opportunities for earlier retirement, depending on the period spent underground, the contributory period and also the economic situation of the sector.

Special pension schemes are typically narrower in scope than the separate pension rules within the general pension system (Section 2.1). Many countries provide special pension

schemes only for very specific categories of WAHJ, such as miners and seafarers, or in sectors where activity is expected to considerably diminish (or even be abolished). Even then, several ESPN national experts' reports point to the very low proportion of WAHJ (as compared to the total workforce) in these sectors (Section 1.1.1). Typically, special pension schemes for WAHJ - which often provide low incomes - act as "bridging benefits" for some years, until the worker is eligible for the statutory old-age pension. Afterwards beneficiaries can qualify for a full statutory old-age pension. This is for example the case for the "heavy labour pension" in Austria, the "bridging pension" in Poland, the "seafarer pension" in Germany, and the "fishermen's pension" in Norway.

2.1.2 Career or contribution record requirements and accrual of pension rights

Career and/or contribution record provisions vary among the different countries and often within the same country, according to the categories of WAHJ. In most cases, the accrual of pension rights depends on the contributory period (counted with or without extended duration) and in some cases on the level of paid contributions.

In this respect, historically recognised occupations such as miners (and in some cases seafarers) have favourable pensionable conditions for a full pension at a lower age and following a shorter contributory period. In many cases, miners benefit from pension-accrual which can be calculated using a multiplier coefficient per contributory month (e.g. PL), an age reduction coefficient according to the danger and the toxicity of the activity (e.g. coal mining in ES) or a preferential pension formula (e.g. CZ). The required career record for miners varies between 25 years in Germany and 10 years in Poland: in the latter country, miners can retire at the age of 55 after a career of 10 years, at 50 years after a career of 15 years, and there is no minimal pensionable age if they have had a 25-year career.

Apart from these special pension provisions for miners (and in some cases for seafarers), the remaining special schemes for WAHJ show a great deal of variation – both between countries and among schemes in a single country – as regards contributory periods and accrual rights. Some countries apply twofold conditions with regard to the contributory period that gives the right to a pension: these pertain to the contributory period over the whole working career, and to the contributory period as WAHJ (e.g. AT, EL, ES, FR, IT, PT, SI). For instance, in Greece the contributory period needed to reach the pensionable WAHJ age (62 years) and qualify for a full pension is 35 years; at least 25 years of these should concern arduous and hazardous work. For a reduced pension the contributory period in arduous and hazardous employment is limited to 12 years. In other countries a contributory period as WAHJ is all that is required in order to qualify for a full pension (e.g. ES, HR, MK, PT, RO, RS, SK, TR). In Romania, the complete contributory period for a full pension for an ordinary worker is 35 years as a result of additional seniority accruals, while for WAHJ it can vary between 23 and 28 years according to individual occupations and category of arduous and hazardous jobs. In Austria both the "heavy labour pension scheme" and the "special retirement pension for those who worked heavy night work" apply twofold conditions as regard the contributory period³¹. In other countries a contributory period as WAHJ suffices in order to qualify for a full pension (e.g. BG, FI, PL, SI). The new "years-of-service" pension in Finland (as of 2017) requires both reduced work capacity certification and a working career of 38 years in arduous or hazardous conditions.

With regard to accrual rights, many countries have advantageous rules (BG, EL, ES, HR, MK, PL, RO, RS, SI, TR). In some countries the contributory period is counted with an extended duration (years/months of career) which provides favourable accrual rates (e.g. HR, MK, RS). For instance, in Croatia, the regular maximum pension contributory period

³¹ The first scheme requires 45 years in total, and 10 years as a WAHJ within the last 20 years; the second scheme requires a contributory period of 20 years, with 15 years of contribution within the last 30 years.

within a year is 12 months, while for WAHJ each 12-month contribution period is counted as 14, 15, 16 or 18 months, depending on the category of occupation. Croatian benefit formula is based on a points system, as a consequence of contributory periods counted with extended duration, WAHJ accumulates a higher number of pension points within a shorter effective contributory period than an ordinary worker. Likewise, In Romania WAHJ pensions are calculated through a points system: a WAHJ accumulates a higher number of pension points than an ordinary worker, and benefits from a higher accrual rate. The increase in pension points varies between 25% and 50% according to the category of WAHJ. In Greece, accrual of pension rights is based on additional WAHJ contributions, starting from 14% (for 15 years of contributions as WAHJ) up to 20% (for 35 years of contributions as WAHJ).

In Slovenia and Bulgaria, the contributory period is also counted with an extended duration (years/months of career). However, in both Bulgaria³² and Slovenia³³, some WAHJ need to contribute to a special statutory funded scheme. In Bulgaria, all WAHJ need to be insured under the statutory PAYG scheme³⁴ and also be members of the statutory funded and defined contributions scheme³⁵, so the total benefits depend on the accumulated contributions. The Bulgarian experts' report points to the fact that in many cases persons with a long service as WAHJ have a low level of accrued rights: this could be the consequence of the practice of paying contributions only on a lower declared income than that received in reality. In Austria the "heavy labour pension" is calculated using the same formula as for old-age pensions, and there are deductions for each month of early retirement.

2.1.3 Funding rules for WAHJ pensions

Alongside more favourable pensionable ages and accrual of pension rights, WAHJ (AT, EL, ES, MK, RS, SI) and their employers (BG, EL, ES, HR, MK, PT, RO, RS, SI, TR) pay higher contributions than ordinary workers and their employers. In some countries, part of the WAHJ pension is financed by state contributions (e.g. AT, BG, PL, PT, SI). In Portugal, many pensions are financed by employers, but some are funded by both employers and the social security budget (e.g. miners and air traffic controllers)³⁶, by the state budget and the social security budget (embroiderers from the island of Madeira), or only by the social security budget (some artists and dancers).

In most countries of the first cluster, i.e. those which have special rules within the general scheme (e.g. CZ, CY, EL, ES, MK, PT, RO, RS, SI and TR), WAHJ are covered by

³² WAHJ must, regardless of their age, become a member of the statutory funded scheme (called "professional second pillar pension fund") in addition to the PAYG pension scheme. Professional pension funds are not organised by the employer and individuals may join the fund of their choice.

³³ In 2000, the pension reform separated insured persons into two categories according to the age of the workers at the time of the reform. The first remained only in the statutory PAYG scheme ("first pillar"). The second were enrolled in the statutory funded scheme ("second pillar").

³⁴ "Different types of pension schemes are usually grouped into two, three, four or more pillars of the pension system. There is however no universally agreed classification. Many pension systems distinguish between statutory, statutory funded, occupational and individual pension schemes" (European Commission 2015, Vol.1: 277). For the purpose of this report, we use the term PAYG statutory public pension schemes, i.e. "pension schemes where current contributions finance current pension expenditure" (European Commission 2015, Vol.1:277).

³⁵ Many ESPN experts use the term "second pillar" to (mostly) refer to fully funded defined contribution plans with independent investment management. The second pillar can cover a variety of statutory funded pension schemes, "access to which is based on legislation". "In statutory funded schemes, part of participants' social security contributions is converted into funded assets, typically administered by authorised private fund managers". (European Commission 2015, Vol. 1:278). In some other cases second pillar schemes are voluntary. In the case of Slovenia, for instance, the "second pillar" comprises statutory funded schemes only for some categories of workers, including WAHJ, but also various voluntary schemes organised by employers and regulated by employment contracts or collective agreements.

³⁶ In nearly all cases, these employers are public companies.

the statutory PAYG schemes. For instance, in Greece, the statutory PAYG scheme also includes supplementary pensions.

One of the exceptions is Croatia³⁷, which has statutory funded pension scheme for workers under a certain age, including WAHJ.

Employees working in arduous jobs typically pay supplementary contributions, compared to ordinary workers, on their gross salary: the difference can vary between 1.5% and 11%, depending on the countries, or within the same country according to the category of WAHJ³⁸.

As for the second cluster, special pension schemes for WAHJ are mostly part of the statutory PAYG scheme. The only exceptions are Bulgaria and Slovenia, where WAHJ employers make a mandatory contribution to the funded schemes. In most of the countries the latter schemes are funded by both employers and employees (except for PL and BG) and in some cases there is supplementary funding from the social security budget (e.g. AT, BG, PL, SI). For instance, in Bulgaria the contributions to the supplementary funded schemes are paid only by employers: 12% for “labour category I” and 7% for “labour category II”. In Poland, employers pay a supplementary contribution of 1.5% to the Bridging Pensions Fund which is also financed by a state budget subsidy. In Austria, both special pension schemes are funded by a mix of social insurance contributions and resources from the largely tax-financed federal budget. Pension schemes for miners and seafarers are, in most of the countries, statutory PAYG schemes (e.g. DE, PL). For instance, in Poland the source of funding is the Social Insurance Fund³⁹.

Employers' contributions for WAHJ are usually higher than those for ordinary workers, and can range from around 1.5% to 26% depending on the category, the length of the contributory period (e. g. HR, MK, RO, RS) and on the pillar to be funded (e.g. HR). For instance, in Croatia the employer's additional contribution rate depends on whether the WAHJ is covered only by the statutory PAYG scheme or also by the mandatory funded pension scheme, as well as on the length of the pension contributory period. It can vary between 4.86% and 17.58% according to the length of the contributory period for first public pillar WAHJ pension⁴⁰. In some countries there has been a tendency over the past decade to decrease the level of employers' contribution rates (e.g. RO⁴¹).

³⁷ Regarding right of participation in a “multi-pillar system” (according to the terminology used by the Croatian ESPN report) there are three situations that should be differentiated between: 1) all persons under the age of 40 (either at the time of the 2002 reform or at the time of becoming an insuree) have to participate in the two-pillar mandatory system, i. e. both in the statutory PAYG scheme and the statutory funded scheme; 2) persons aged between 40 and 50 at the time of the reform can choose between staying within the PAYG scheme or joining the new “two-pillar mandatory system”; and 3) persons over 50 have to remain within the PAYG scheme only.

³⁸ For instance, in Greece, WAHJ and their employers pay a total of 45.66% of their gross salary in contributions, compared to 40.06% for ordinary workers. The additional contributions paid by WAHJ in comparison to other workers amount to 2.2% paid by employees to the PAYG pension, and 0.75% for the supplementary pension within the statutory PAYG scheme. A further special contribution of 1% is paid on top of the additional contributions by workers employed in specific arduous and hazardous jobs such as in underground mines and lignite mines, as well as those working in airborne or underwater activities. In Croatia, WAHJ who have only PAYG pensions pay a pension contribution rate of 20%. Those who are subject both to the PAYG scheme (defined benefits) and the mandatory funded scheme (defined contributions) pay 15% to the former and 5% to the latter scheme.

³⁹ Miners who claim miners' pensions cannot be members of open pension funds in the statutory funded schemes.

⁴⁰ In Greece, the additional contributions paid by WAHJ employers are set at 1.4 % for the main pension and at 1.25% for the supplementary pension within the PAYG scheme. In Romania, employers' contribution rates differ according to the category of arduous and hazardous work conditions: 25.8% of taxable income for special work conditions, 20.8% for difficult work conditions and 15.8% for normal work conditions.

⁴¹ This downward tendency – in the RO case - refers to all social contributions for pensions. As a consequence, it has also affected the level of social contributions payable for arduous and hazardous work; yet it is not specific to these.

2.2 Compensating for the absence of specific WAHJ provisions: early retirement rules and social protection benefits

This section addresses the main policy instruments providing early exit from the labour market in three groups of countries: (a) those that do not have special pension provisions for WAHJ (CH, DK, IE, LI, MT, NL, SE, UK); (b) countries that do have special pension provisions, but only for a narrow category of WAHJ (BE, DE, CZ, CY, HU, IS, LU, NO); and (c) countries that have special pensions for a broad category of WAHJ, but which are accessible only to workers employed in arduous and hazardous conditions before a certain date (LT, LV, SK), or where these schemes are in a transitional stage (FI (as of 2017) and SI). In other words: these are countries where the absence of specific WAHJ provisions may be compensated for through early retirement rules and other social protection benefits.

All these countries provide a mix of policy instruments which are formally targeted at all workers but are in practice likely to be more often used by WAHJ. The section assesses mainly three sets of provisions: early retirement and disability pensions (Section 2.3.1), sickness and occupational injury benefits (2.3.2) and unemployment schemes (2.3.3). A more detailed overview of early exit options other than pension provisions specifically targeted at WAHJ can be found in Annex 4.

2.2.1 Early retirement rules and disability/invalidity pensions

Early retirement schemes within the statutory pension system are available in all of the 35 countries except in the Netherlands and the United Kingdom. Most countries have considerably tightened or even closed down early retirement schemes over the past two decades (e.g. AT, DK, FI, IE, NO, SE). In many countries, early retirement is subject to eligibility conditions relating to age and contributory period which do not considerably differ from the full retirement conditions (e.g. CH, DK, IS, IE, LT, LV, MT, NO, NL, SE). The legal early retirement age in these countries is, on average, 2-4 years before the SPA and the contributory period is not considerably shorter than for the full old-age pension. For instance, in Malta the legal retirement age is 61 years for a 40 years' contribution history, while the SPA is 62 years with a contributory period of 40 years. In Denmark there is a voluntary early retirement scheme (VERP) funded on a contributory basis and through general taxation. The pensionable age for this scheme will be rising from 60 to 64 years and the SPA from 64 to 67, by 2023. In the Netherlands early retirement is not allowed under the statutory pension system but can be provided through collective agreements where rules vary considerably. Collectively negotiated occupational pension schemes followed the example of the statutory pension, and most of them enacted the pensionable age at 67⁴².

In most countries, early retirement triggers penalties. In Lithuania and Estonia, for example, the pension is reduced by 0.4% for each month of early retirement. The reduced pension amount is paid for the full period of retirement. In Latvia an ordinary worker receives only 50% of the full pension until the SPA. For WAHJ employed before 1996 in Latvia there is a favourable condition allowing such workers to retire 2 years before the SPA with 15-20-25 years of work experience and receive 100% pension. In the Czech Republic, retiring one year before the SPA (62 for men and 60 for women) reduces the pension by about 4-6%, depending on the personal calculation basis and the length of the contributory period.

⁴² In Norway, the legal early retirement age is 62, which is 8 years lower than the SPA at 70, but this pension is subject to strict eligibility conditions on accumulated pension rights. In Latvia and Lithuania, which restricted WAHJ access to special pension provisions only for those employed before 1996 (LV) and 1995 (LT), the early retirement age does not considerably differ from the SPA. In Latvia, pension legislation allows early retirement 2 years prior to the SPA (63 years in 2017) for a contributory period of 30 years. Likewise, in Lithuania, workers can retire 5 years prior to the SPA, with a 30-year contributory period.

Eligibility conditions and funding rules for disability pensions equally vary among countries. Usually these pensions are granted after an individual medical assessment and consist of flat rate amounts (e.g. IE); in other cases, they are calculated on the basis of earnings or household situation (e.g. DK) or the contributory period (e.g. LV). In Denmark there is also a strict eligibility condition relating to age: persons under 40 years of age cannot apply for a disability pension but instead undergo a process focusing on assessing the person's work ability. Moreover, a new disability pension (SDP) has been implemented since 2014, which is specifically targeted at workers five years before reaching the SPA, providing an accelerated administrative procedure for applying for a disability pension.

2.2.2 Sickness and occupational injury benefits

There are short-term or long-term benefits related to occupational sickness and injuries and resulting disabilities. In some cases, the difference between invalidity/disability benefits and invalidity/disability pensions is that the latter are part of the pension system while the former are part of the health system, occupational injury funds etc. For instance, in 2003 Sweden replaced the disability pension by sickness cash benefits and separated disability pensions from old age pensions, the former now falling under the universal sickness insurance.

Sickness and injury benefits are in most cases temporary and can act as bridging benefits, pending permanent ones such as invalidity and old-age pensions. For instance, in Ireland, workers who (a) receive Illness Benefit for a year, (b) are unable to work because of long-term illness or disability, and (c) are likely to be unable to work for 12 months, can transfer to a long-term invalidity pension. In Germany occupational illness and accident benefits and services are provided by the statutory occupational accident insurance. If rehabilitation measures are not possible or ineffective, the insured employees can claim a reduced earning capacity pension⁴³.

In some countries, these benefits are subject to strict conditionality (e.g. IE, UK). In the UK, disabled workers can claim Employment and Support Allowance (ESA). This allowance replaced the incapacity benefit and the severe disablement allowance. The ESA is contributory and/or income-related (means tested). It requires a Work Capability Assessment to be carried out by a private contractor using standard assessment rules. The emphasis is put on retaining people at work and getting them back to work through regular medical assessments of "fitness" and work-focused interviews.

2.2.3 Unemployment benefits

Unemployment benefits represent a significant early exit option only in a few countries (e.g. BE, LU). Belgium provides early labour market exit for WAHJ through the scheme of unemployment benefit with employers' supplement (see Section 1.2.3), through which WAHJ are entitled to retire as of 58 years (with 35 contributory years of contributory period). However, since mid-2015 such schemes have been considerably tightened and already over the last decade their general use has been declining significantly in relative terms and is scarcely used by the 50-59 age group. In Luxembourg the pre-retirement scheme is an instrument to prevent unemployment, and falls under the unemployment regulation. It can be considered as "benefits for the older unemployed" which can be received for a maximum of three years.

In most countries, unemployment benefits are short-term and subject to activation measures. For instance, in the UK an unemployed person is able to claim a contributory jobseeker's allowance (JSA) for up to six months, and income-related JSA as a top-up and/or thereafter. Claimants are expected to actively seek work and there are elaborate

⁴³ In Lithuania, the Social Insurance of Accidents at Work and Occupational Diseases Scheme provides a lump sum and short-term benefits but also long-term regular compensation in cases of permanent incapacity. It acts as a supplementary long-term benefit over and above the general social insurance disability pension.

activation measures in place to ensure that they do so. In Estonia, the new work ability allowance scheme is gradually replacing the incapacity for work pension scheme, and those with partial loss of work capacity have to be registered with the Unemployment Insurance Fund and may be required to participate in active labour market measures to receive their benefit. In Cyprus, persons entitled to an unemployment benefit who do not satisfy the insurance conditions for an old-age pension at the age of 63, are allowed to receive unemployment/sickness benefits up to the date on which they satisfy the relevant insurance conditions, but only until the age of 65. In some cases, the benefit can thus be used to enable early exit from the labour market.

3 Retirement patterns and the retirement income of workers in arduous or hazardous jobs

This part of the Synthesis Report is concerned with the actual retirement pathways which workers in arduous and hazardous jobs follow in the 35 countries under scrutiny. Section 3.1 identifies the policy measures used in the different countries, and the number of workers that have access to them. Section 3.2 describes the main characteristics of the retirement pattern of WAHJ: the focus is on the effective retirement age of WAHJ, as compared with that of ordinary workers. Section 3.3 provides information on the level of income of WAHJ: we focus on pension benefits, comparing the benefits provided to WAHJ (through special schemes, special rules of early and/or disability benefits) with the pension benefits provided for ordinary workers. Section 3.4 discusses the more recent trends in the retirement patterns of WAHJ.

3.1 Retirement patterns of workers in arduous and hazardous jobs

This section assesses the implementation of the end-of-career policy mix for WAHJ. An important caveat applies though: as discussed in Section 1.1.1, in many countries empirical evidence and relevant statistical data are very limited. Very few studies provide systematic and complete information; when data are available, these are often incomplete regarding at least some WAHJ categories. Consequently, we provide tables with a focus on a selection of countries, i.e. those that provide more or less systematic information. As discussed in Section 2.1, in some countries special pension schemes are the main tool to regulate the retirement pathway of WAHJ (AT, BG, FI, FR (as of 2017), EE, ES, PL, and SI). Other countries provide special pension schemes only for some categories (e.g. CZ, DE, IS, NO). Table 5 gives an overview of the countries for which information on the number of beneficiaries is available; some of them provide special schemes for WAHJ in general (AT, BG, FR, FI (as of 2017), EE, ES, LT, LU, PL), others only for some occupations (e.g. CZ, DE, IS, NO).

The significance of special pension schemes for WAHJ depends on the specific occupational groups (e.g. miners in Poland), on the interaction with the general social protection rules and the economic situation. In Austria, for instance, special schemes for WAHJ are increasingly important, as a consequence of the more stringent conditions to access early retirement schemes. The number of WAHJ can be significantly affected by economic downturns in certain sectors (e.g. RS).

Table 5: Number of beneficiaries in a selection of countries with special pension schemes for WAHJ

Country	Main retirement pathways and number of beneficiaries
AT	Heavy labour pensions: 10,860 pensioners in 2016. Special retirement pension after heavy night work: 1,566 pensioners in 2015. Early retirement: 62,865 pensioners in 2016.
BG	Professional pension funds: 264,763 beneficiaries in 2015. WAHJs receiving pensions for old age and service from the public pension fund: 91,734 persons in 2015.
EE	Superannuated pensions or pensions with favourable conditions: about 5% of all new retirees (including incapacity for work pensioners).
ES	Miners with a "major disability" pension represent 6% of total disability pensions and 1.2% of the total pension costs; seafarers only 1.4% of the total disability pensions but 1.5% of the total cost of pensions.
FR	About 500,000 workers in arduous and hazardous conditions.
LT	2 % of all old-age pensioners.
LU	Pre-retirement scheme (" <i>pré-retraite</i> ", which is part of the unemployment scheme) for night and shift work. It accounted for 413 beneficiaries at end of 2015.
NO	About 1/3 of all public sector employees exit the labour force via the disability scheme before turning 62. Early retirement scheme for about 30,000 seamen and fishermen represent less than 1% of the total work force and below 2 % of the private sector work force.
PL	206,000 ex-miner pensioners. 13,700 bridging pensioners.
SI	45,871 insurees in the compulsory Supplementary Pension Insurance Fund on 20 April 2016.

Table 6 provides information on WAHJ pensioners in the countries providing separate pension rules for this category of workers. These special rules were used to provide easier exit paths to retirement, with a loose link with the existence of hard working conditions. It can be estimated that WAHJ pensioners represent between 5 and 8% of all pensioners in the countries under scrutiny (Table 6) with the exception of Greece.

Table 6: Number of beneficiaries in a selection of countries with separate rules for WAHJ in the general schemes

Country	Main retirement pathways and number of beneficiaries
EL	227,718 WAHJ pensioners in 2015, i.e. 27.94% of the total number of 815,046 old age and disability pensioners covered by the main Social Insurance Fund (IKA) for salaried private sector workers, or 10.1% of the total number of 2,258,463 old age and disability pensioners.
CZ	4,200 current miners who are expected to take up the WAHJ rules in the second half of 2016.
HR	88,189 WAHJ pensioners. The yearly share of WAHJ new pensioners in the total number of new pensioners ranges between 6 and 8%.
HU	The number of new annual benefits prior to 2011 varied between 1,500 and 3,900 (including miners and artists) ⁴⁴ that is 1.0-2.0% of all new pensions over this period. Early retirement at 55 has practically stopped; it has significantly decreased below 60; and older workers increasingly stay in the labour market.
IS	Special provision for long-term seafarers to retire at age 60, but this is used by very few individuals.
IT	811 WAHJ pensions beneficiaries in the private sector in 2016
LV	The number of newly-granted old-age pensions for WAHJ in absolute figures has been is going down from 1,326 persons in 2009 to 233 in 2015, as well as the share of such pensioners among all new pensioners – from 3.5% in 2009 to 1.4% in 2015. There were 74,024 persons in 2015 who received disability pensions.
MK	11% of the total number of pensioners used the “risk-related early retirement” scheme in 2014. Out of 2,541 “risk-related early retirements” in 2014, 71% were old-age pension beneficiaries, 24% were family pension beneficiaries (survivor pensions) and 5% were disability pension beneficiaries.
PT	18,800 WAHJ pensioners out of 1.9 million old-age pensioners. The vast majority of WAHJ pensioners exited the labour market through early retirement schemes tailored to them (86.9%), one out of four WAHJ pensioners overall. Only 5.7% WAHJ pensioners retired through the pathway of the statutory old-age pension.
RO	Approximately 0.36% of the total employed population (30,000 persons), working mainly in the health, mining and energy sectors, are considered as exposed to difficult work conditions, while these jobs are expected to become jobs with normal working conditions by 2018. No data is available for the category of special working conditions.
RS	In December 2014 127,638 pensioners were retired under the WAHJ scheme (23% female pensioners); i.e. 7.3% in the total number of pensioners ⁴⁵ .
SI	In 2015 1.165 or 10.3% (1.165 or 15.8% for men and 218 or 2.8% for women) of WAHJ pensioners of the total new old age pensioners
TR	The number of registered workers classified as WAHJ under a service contract was 66,928 as of July 2012. While this number represents a very tiny fraction of the more than 20 million employed, estimates of the actual number run as high as 1.5 million. The huge discrepancy is due in part to employers’ desire to avoid the higher social security contributions that they are required by law to pay for employees officially registered as WAHJ.

⁴⁴ Central Administration of National Pension Insurance
<https://www.onyf.hu/m/pdf/korai%20nyugdjak%20szolgidvel.pdf>.

⁴⁵ PIO Fund, Annual Statistical Bulletin 2015.

Other countries have activated yet different pathways. In those countries with no or narrow⁴⁶ special provisions for WAHJ, pathways of these workers are governed by general pension schemes. This is the case for Sweden with the key role played in the past by early retirement programmes. In Lithuania, the number of early retirement pension recipients increased by more than 60% since 2008, and in 2016 accounts for about 2% of all old age pensioners. In other countries WAHJ exit the labour market mainly through unemployment benefits (BE, LU, UK), disability benefits (CH, FI, SK) and other policy instruments such as leaves and partial retirement, sickness benefits, and occupational injury benefits. For instance, in Ireland workers with hard working conditions are likely to use Illness benefits and Invalidity pensions to exit the labour market (see Table 7).

Table 7: Number of beneficiaries in a selection of countries without special provision for WAHJ

Country	Main retirement pathways and number of beneficiaries
DK	By the end of 2015 only 427 persons had applied for Seniority Disability Pensions (SDP). 105,000 pensioners on disability pension. 80,000 pensioners on voluntary early retirement (VERP).
FI	In 2015 about 25% of new retirees used the disability path. At the beginning of the 2000s, about 30% of new retirees used the various early pension routes, 40% used the disability pathway, and the remaining 30 percent were granted an old age pension. In 2014 the early exit routes were closed, and 30 % of new pensioners were granted a disability pension.
IE	At the end of 2014 there were 57,024 recipients of Illness Benefit and 54,223 recipients of Invalidity Pension.
IS	Disability pensioners make up 10.4% of people of working age. WAHJ are a relatively small part of this group.
LI	2,089 Invalidity Pensions by the end of 2015 (5.7% of 36 680 employees)
LT	Early retirement pension recipients increased by more than 60% since 2008, and in 2016 they account for about 2% of all old age pensioners.
SE	From 1985 to 2008 the proportion of early retirees in the population aged 30-64 increased from 8 to 12 percent, but with great variations in inflow. However there has been a strong decline during the last ten years, both trends generally reflecting policy changes.
UK	Increase in older claimants of Employment and Support Allowance since 2011. Also an increase in the proportion of JSA claimants. This trend is likely to continue for women as their retirement age has been increased. ESA claims increased from 579,000 in 2010 to 2.23 million in 2014/15.

3.2 Effective Retirement age of workers in arduous and hazardous jobs

The national experts' reports provide some information about the age when WAHJ actually withdraw from the labour market. Most countries have not developed systematic monitoring of the exit of WAHJ from the labour market. It should be stressed that in some countries, pensioners continue to work (e.g. EE, LT, LV, RS). For instance, in Estonia, more than half of the people who receive WAHJ pensions and about one quarter of old-age pensioners also continue to work. Table 8 summarises the information on the retirement age from the best-well-documented countries.

⁴⁶ A narrow scope in terms of WAHJ categories or timing of the scheme.

Table 8: Effective retirement age of WAHJ compared with the effective retirement age under ordinary old age schemes: selection of countries

Country	Effective retirement age for WAHJ	Effective retirement age under ordinary old age schemes
AT	60.5	63.2
CZ	55/54 (miners 2015/2017)	62/59 (men/women 2014)
EE	62/58 (Superannuated pensions) 56/55 (level 1) 60/60 (level 2)	63/62
ES	59.1 seafarers 57.5 miners (male)	63.5 (male)
FI	51.7 invalidity 61.9 part-time 61.7 unemployment (data for 2011)	63.7
LV	58.1 (level 1) 60.3 (level 2)	61.5
PT	50 (miners, and specific performance age related professions)	63.5% of all workers retire after the age of 60
RS	54.5 50 (miners, and specific performance age related professions)	65.0 (male), 61 female
SE	62.8 disability benefits 64 sickness benefits	64.6
SI	2015: 58 male 57 female	60 male 58 female
TR	57.5/55.5 (assuming maximum active service increment of five years is achieved)	60/58 (male/female)

Two categories of countries can be distinguished in which the average effective retirement age of WAHJ is lower than the effective retirement age of workers who are covered by the general old age pension scheme. The first category primarily comprises countries having special pension provisions for WAHJ (separate rules and/or schemes) which provide lower pensionable ages for WAHJ (see Sections 2.1 and 2.2). In this category the effective retirement age for workers in arduous and hazardous jobs is on average 3 to 4 years lower than for ordinary workers (AT, EE, ES, LV, PT). In Spain, for example, male coal miners retire on average at the age of 57.5 while for male workers covered by the general old age scheme retire at 63.5. WAHJ rules for miners working at great depths provide a guaranteed pension 8 years prior to the SPA in the Czech Republic. However, a new law voted in 2016 extends this even to 10 years prior to the SPA, from October 2016.

In the second category of countries, there is not a large difference between the effective retirement age of WAHJ and that of ordinary workers. This applies to two cases: a) countries which do not provide any specific pension provisions tailored to WAHJ; and b) countries which have pension provisions for WAHJ but where pensions' income is inadequate (e.g. EE, RS).⁴⁷ With regard to the first case, in Sweden for instance, workers access retirement through old age and sickness schemes at the same age while workers with disability have an earlier exit (about 20 months earlier). With regard to the second case, the reason for the very similar career path is the inadequacy of pension benefits: workers in arduous and hazardous jobs have special rights but they stay in the labour market because they need to improve old age protection and to receive an adequate

⁴⁷ Their adequacy is primarily measured by pensions' ability to prevent poverty, to replace the earnings people had before retiring and to ensure a living standard on par with younger age groups (European Commission 2015, Vol. I).

income. For instance, in Serbia the average contribution record of workers is about 34 years, while that for the workers who belong to the special scheme for WAHJ is 32 years.

3.3 Income situation of the retired workers in arduous and hazardous jobs

This section provides a comparative reading of the income situation of workers in arduous and hazardous jobs compared with “regular” workers. The information provided in the national experts’ reports varies: most of the experts refer to average absolute benefits (in the national currency), very few used replacement rates, while others provide a qualitative assessment.

Table 9 distinguishes between three groups of countries. The first group comprises countries where WAHJ enjoy more favourable conditions (e.g. higher benefits) than the average pensioners or the pensioners covered by the general old age scheme. These include some Southern European countries (PT and EL), Continental countries (e.g. AT and LU) and Eastern countries (e.g. BG, CZ, HR). However, the higher level of benefits for WAHJ needs to be assessed with some caution because higher pensions are often related to higher contributions (see Section 2): workers (in EL, MK, RS) and their employers (in EL, ES, HR, MK, PT, RO, RS, SK, TR) pay higher contributions than the ordinary workers and their employers. In addition, these benefits are often paid for a period of time after retirement that is much shorter as a consequence of lower life expectancy than for other occupational categories (e.g. CZ, HR, NO).

Table 9: Retirement benefits for WAHJ compared to those for ordinary pensioners

Higher benefits than general pension schemes	Lower benefits than general pension schemes	Average benefits or mixed situation
AT, BE, BG, CZ, EL, HR, LU, MK, PT, RS, TR	CH, CY, DE, IS, IE, IT, LI, LT, MT, NO, SE, SK, UK	DK, EE, ES, FI, HU, LV, NL, PL, RO, SI

In a second group of 13 countries benefits of WAHJ (special old age schemes, disability benefits, early retirement, etc.) are below the average benefits of ordinary workers. This is the case for Germany where benefits from the “reduced earning capacity pension” are very low. In Lithuania the average amount of early retirement pension is 185 EUR, or 73% of the average old age pension. In some cases, this low level of pensions is the result of the application of the general rules for accruing pension benefits. In Italy, WAHJ are entitled together with ordinary workers to the application of the Notional Defined Contribution (NDC) rules for the calculation of pensions. The NDC system is applied to the new entrants in the labour market after 1995. The NDC system applies actuarially neutral coefficients to calculate pensions. These coefficients increase with retirement age. For these workers, retiring five years prior to the pensionable age roughly implies a 20% reduction of pension benefits. In the UK, if a WAHJ retires before the pensionable age they would expect a lower pension.

The third group includes countries where the income situation of the WAHJ who exit the labour market is largely the same of other workers. This is for example the case for Romania, where the pension benefits received by a former WAHJ (through a legally reduced age and contributory period) is comparable with the benefit received by an ordinary pensioner. In some other countries the situation of WAHJ is mixed: for some categories, retirement conditions are more favourable than those for ordinary workers; for other categories they are less favourable. In Slovenia, average new pensions for WAHJ were somewhat higher for men, and lower for women when compared to ordinary workers. This is the case for old age (1.6% higher for men, 15.2% lower for women) and disability (1.1% higher for men and 7.1% lower for women). In Spain special retirement conditions for miners lead to pension benefits that are much higher than the general old

age entitlements (54% higher than the average pension), while sea workers have a considerably less favourable situation.

3.4 More recent and ongoing developments in the retirement patterns of WAHJ

Recent developments in the retirement pattern of WAHJ are consistent, at least in some countries, with the reduction of the number of workers that have access to special rules for WAHJ (e.g. EE, SK). This is partly related to the reforms tightening access to retirement, or to economic changes and the more limited role of these occupations in the country's economy. In Greece the percentage of WAHJ pensioners (out of the total number of old age and disability pensioners) has declined from 10.5% to 10.1% between 2009 and 2015, and from 37% to 27% when calculated as a percentage of the total number of old age and disability pensioners. Changes in early retirement rules introduced in Poland in the 2000s resulted in a reduction in the number of people receiving early retirement transfer as well as an increase in the employment rate in the age group 55-64.

In very few countries (e.g. CZ, TR), special rules for WAHJ have been relaxed and/or expanded (resulting, in some cases, in a growing number of beneficiaries). In Italy the number of WAHJ that will have access to special pension rules is expected to broaden as of 2018 because of the implementation of new rules (Annex 5).

The general tendency in many countries is towards increasing effective retirement age and tightening conditions to access schemes that allow for an earlier exit from the labour market. This is mainly the consequence of policy mixes that are more oriented towards prolonging working life through tightening eligibility conditions, and only in few countries through measures improving employability and working conditions (e.g. DK, FI, FR, NO). In other countries, rehabilitation has been the focus, so the symptoms are being treated rather than preventive actions being taken (e.g. SE). In the UK the tightening of the conditions for unemployment and disability schemes has increased employment rates for older workers. In Belgium the strategy of allowing a reduction in weekly working hours for older workers, maintaining income, in the health and social care sector, was also a retention strategy for a sector confronted with physically and mentally stressful jobs and confronted with presumed or real shortages.

In conclusion, recent reforms have largely contributed to reducing the opportunities for early exit from the labour market, even in the case of WAHJ. Data in some national experts' reports indeed show increased employment rates for older cohorts of workers and a more limited number of pensioners leaving the labour market early. Yet, quantitative data still represent a caveat in assessing WAHJ pathways and especially adequacy of income. In some countries, there has been an increase of the number of claimants of special WAHJ benefits, which has however been counterbalanced by a reduction in the number of disability and early retirement claimants. In general, WAHJ receive low levels of benefit (pensions below the average level of general old age and disability benefits) or benefits similar to ordinary workers, but for a shorter period of time (given their lower life expectancy). This has led many WAHJ to postpone retirement and/or combine pensions with income from labour.

ANNEX 1: PRESENTATION OF THE EUROPEAN SOCIAL POLICY NETWORK (ESPN)

A. ESPN Network Management Team and Network Core Team

The European Social Policy Network (ESPN) is managed jointly by the Luxembourg Institute of Socio-Economic Research (LISER) and the independent research company APPLICA, in close association with the European Social Observatory.

The ESPN Network Management Team is responsible for the overall supervision and coordination of the ESPN. It consists of five members:

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ANNEX 2: COUNTRIES' OFFICIAL ABBREVIATIONS

A. EU countries

EU countries prior to 2004, 2007 and 2013 Enlargements (EU-15)		EU countries that joined in 2004, 2007 or 2013	
BE	Belgium	2004 Enlargement	
DK	Denmark	CZ	Czech Republic
DE	Germany	EE	Estonia
IE	Ireland	CY	Cyprus
EL	Greece	LV	Latvia
ES	Spain	LT	Lithuania
FR	France	HU	Hungary
IT	Italy	MT	Malta
LU	Luxembourg	PL	Poland
NL	The Netherlands	SI	Slovenia
AT	Austria	SK	Slovakia
PT	Portugal	2007 Enlargement	
FI	Finland	BG	Bulgaria
SE	Sweden	RO	Romania
UK	United Kingdom	2013 Enlargement	
		HR	Croatia

In EU averages, countries are weighted by their population sizes.

B. Non-EU countries covered by the ESPN

Former Yugoslav Republic of Macedonia (MK), Iceland (IS), Liechtenstein (LI), Norway (NO), Serbia (RS), Switzerland (CH), Turkey (TR).

ANNEX 3: SPECIAL PENSION SCHEMES FOR WAHJ

Country	Special pension schemes for WAHJ	Pensionable age
AT	1) Heavy labour pension. 2) Special retirement pension for those who worked heavy night work.	1) 60 years. 2) 57 years for men and 52 years for women.
BE	Unemployment benefit scheme with employers' supplement for arduous jobs	58 years
BG	Pension schemes for: 1) First category of WAHJ. 2) Second category of WAHJ.	1) 55 years target for both genders in 2037 (as of 2016 gradual increase by 2 months for men and 4 months for women per year) 2) 60 years target for both genders in 2037 (as of 2016 a gradual increase by 2 months for men and 4 months for women per year).
CZ	Special scheme for miners.	57 years
DE	1) Old-age statutory pension for long-term employed miners. 2) Old-age statutory pension for seafarers.	1) 60-62 years. 2) 56 years.
EE	1) Old-age Pensions Under Favourable Conditions. 2) Superannuated Pension scheme.	1) 5-10 years before the SPA (63 in 2016 for both genders). 2) 10-25 years required working in arduous and hazardous conditions; for some occupations not earlier than 5 years before the SPA.
ES	1) Coalminers' scheme. 2) Sea Workers' scheme.	1) 60 years. 2) 55 years.
FI	"Years-of-service" scheme (as of 2017).	N/A; 38 years of contributory period in arduous and hazardous conditions.
FR	1) "Compte de prévention de pénibilité". 2) Early retirement package for asbestos workers.	1) 55 years.
HU	1) General WAHJ scheme for workers in over 700 professions is being phased out from 2015 (no new eligibilities can be established) 2) Special schemes for miners and ballet dancers.	1) Depending on SPA as a function of time served as WAHJ (gender differences). 2) Depending on length of contributory period (25 years).
IS	Seamen's pension scheme.	60 years.
LT	Compensation for special working conditions scheme.	SPA (gender differences).
LU	Early retirement shift and night workers scheme (paid by the unemployment system).	57 years.
NO	1) Seamen's pension scheme. 2) Fishermen's pension scheme.	1) 60 years. 2) 60 years.
PL	1) Bridging pension schemes. 2) Miners' pension schemes.	1) 55 years (women) and 60 years (men) (general rule). 2) 50-55 years.
SI	Supplementary occupational pension for WAHJ.	Ranging between 52 and 56 for men and women

ANNEX 4: Compensating the absence of specific WAHJ provisions

Country	Early exit options other than pension provisions specifically targeted at WAHJ
BE	Unemployment benefit with employer supplement (RCC) Time credit for WAHJ (part-time employment) Reduced weekly working hours for older workers, maintaining income in the large sector of health and social care
CH	Invalidity insurance
CZ	Early retirement scheme Early retirement benefit (from the voluntary individual funded schemes "third pillar")
DE	Early retirement pension Reduced earnings capacity pension Sickness and injury benefits
DK	Disability pension Flexi job Voluntary early retirement pay scheme (VERP)
EE	Work incapacity pensions (until 2015) Work ability allowance (from 2016)
FI	Disability pensions
HU	Disability pensions
IE	Illness benefits Disability pensions Occupational injury benefits
IS	Disability pensions Part-time jobs
LI	Early retirement
LT	Compensation for lost capacity of work Early retirement
LU	Pre-retirement (unemployment scheme)
LV	General Old age pensions (special rules) Disability pensions Combination of retirement (with full pension) and employment (full salary)
MT	Early exit through a loophole initially intended for persons working in "manual" jobs, an escape clause is being used by persons who by that age would have paid enough social security contributions to qualify for a full pension.
NL	Flexible leave arrangements and part-time retirement Early retirement (set through sectoral collective agreements)
NO	Ordinary old age pensions Disability pensions Special schemes (with earlier pensionable age) for specific groups
RO	Disability pensions
SE	Work-accident and sickness insurance programmes Early retirement
SI	Disability pension
TR	Disability pension
UK	Jobseeker's Allowance Employment Support Allowance

ANNEX 5. Recent trends in the retirement pattern of WAHJ in selected countries

Country	Trends
AT	Increased number of HLP and decline in early retirement.
BE	Complete abolition of early exit via unemployment for older workers not available for work and early retirement system of unemployment benefit with an employer supplement for age category 50-54, substantial reduction for the age group 55-59 and reduction for age group 60+.
BG	Gradual increase in the retirement age for WAHJs starting in 2016. Even with the reform WAHJs will be able to retire 5 or 10 years earlier than ordinary workers. The number of retired WAHJs is decreasing.
CZ	The new law decreases retirement age for miners (WAHJ) 7 years below SPA (originally was 5 years). Further on, miners may utilise the standard early retirement rules, which would decrease their retirement age to even 10 years below the SPA (originally 8 years).
DK	Decline in the number of disability pensioners.
EE	Decline in the number of new WAHJ pensioners in the last ten years, reflecting the changing occupational structure of the economy.
EL	In 2014, the majority of male new WAHJ pensioners from (62% or 1,769 persons) were granted a full pension as WAHJ; 32% (or 913 persons) of male new pensioners from AHJ were granted an early full pension as WAHJ; a small minority (6% or 171 persons) of male new WAHJ pensioners were granted a reduced pension; as regards female new WAHJ pensioners the vast majority (97.8% or 1,019 persons) were granted a reduced pension as WAHJ. In the period 2009-15, in absolute terms there has been some stability. As a percentage of the total population of old age and disability pensioners, there has been a decline from 10.5% to 10.1% or in terms of the total number of old age and disability pensioners covered by the main Social Insurance Fund (IKA) for salaried private sector employees there has been a significant decline from 37% to 27%.
ES	The 2014/2013 year-on-year variation in the number of retirement pensions for seafarers shows a drop of 13.83%, while the number of pensions for coal miners has risen 9.92%.
HU	The WAHJ system is being phased out. Since 2015 no new eligibilities can be accumulated. Eligibilities collected before 2015 can still be converted to preferential retirement age subject to the original conditions.
IE	At the end of 2014 there were 57,024 recipients of Illness Benefit or 8 per cent less than the 61,845 recipients at the end of 2005. At the end of 2014 there were 54,223 recipients of Invalidity Pension or 7 per cent less of the 58,352 recipients at the end of 2005.
IT	Projected increase of beneficiaries (from 811 in 2016 up to 3 084 in 2023) due to broader definition of WAHJ since 2018.
LU	Limited use of early retirement system.
LV	Special transitional rules for workers who entered the labour market before 1996. The number of workers involved in the scheme is going to decline.
NO	Subsidised early retirement through the AFP-scheme was abolished and replaced with an actuarially neutral system of drawing benefits from age 62. The reform has led to a significant increase in labour force participation.
PL	Changes in early retirement rules that were introduced in Poland after 2004, particularly the 2009 reform of early retirement, resulted in a reduction in the number of people receiving early retirement transfer as well as an increase in the employment rate in the age group 55-64. In the future, due to the shorter period of contribution payments, those who receive bridging pensions or teachers' compensation benefits can expect lower pension levels.

RO	<p>Projected decline of beneficiaries of special WAHJ pensions, resulting from a more restrictive definition of WAHJ work conditions.</p> <p>An increase in the pensionable age for women in arduous and hazardous jobs, due to the general increase in the SPA (the general SPA for women is scheduled to reach 63 years in 2035).</p>
RS	<p>The last amendments introduced in 2014 tightened the conditions for WAHJ early retirement at 54 years and 4 months if a worker has spent 2/3 of his/her employment in the jobs listed as arduous and/or hazardous; an exception has been made for the jobs which carry the highest extension of the insurance period (6 months), for which retirement is admissible at 50 years of age.</p>
SE	<p>Newly granted disability pensions have decreased substantially for persons aged 30-64. Although the absolute numbers are lower, they have simultaneously increased for persons below 30 years of age, for men and women alike, where psychological diagnoses account for the great majority of cases.</p>
SI	<p>The 2012 pension reform introduced additional retirement restrictions for WAHJ increasing contributory period, increased and unified the minimum pensionable age for both genders, abolished the reduced occupational pension and limited the minimum occupational pension. The last amendments for the existing Pension and disability insurance act increased the lowest occupational pension amount and introduced solidarity reserves.</p>
TR	<p>Following the major mine accident of 2014 in Soma, the eligibility conditions for retirement (pensionable age and active service term increment) for workers employed in underground works were modified through with particular reference to miners. The pensionable age was reduced and the rules on active service term increment were improved.</p>
ES	<p>The 2014/2013 year-on-year variation in the number of retirement pensions for seafarers shows a drop of 13.83%, while the number of pensions for coal miners has risen 9.92%.</p>
UK	<p>ESA claims have been increasing but JSA claims have been falling in line with unemployment.</p>

ANNEX 6. References

Brys, Y. (2016), *Het concept "zware beroepen" in de pensioenwetgeving van enkele Europese landen, Le concept de "métiers lourds" dans la législation de pensions de certains pays européens*, Centre d'Expertise des pensions, Kenniscentrum pensioenen, Bureau fédéral du Plan, Federaal Planbureau, Available [online](#).

d'Addio, A.C. Boulhol, H., Lundberg, K. and Reilly, A. (2015), *Contribution to the EU Adequacy report 2015*, Interim report on penibilite schemes in the EU, OECD, February.

ESIP (2016), *Career management, rehabilitation and early retirement in strenuous jobs ("Hard Jobs")*, European Social Insurance Platform, Final report. Available [online](#).

ETUC et al. (2014), *Better Understanding 'Arduous Occupations' within the European Pension debate. Final Report*. Available [online](#).

European Commission (2012), *White paper. An Agenda for Adequate, Safe and Sustainable Pensions*, COM (2012)55. Available [online](#).

European Commission (2015), *The 2015 Pension Adequacy Report: current and future income adequacy in old age in the EU*, Volume I and II, Available [online](#).

Ilmarinen, J. (2006), *Towards a longer worklife. Ageing and the quality of worklife in the European Union*, Finnish Institute of Occupational Health, Ministry of Social Affairs and Health, Helsinki.

Ilmarinen, J. (2012), *Promoting active ageing in the workplace*, Report, European Agency for Safety and Health at Work.

Maltby, T. (2011), "Extending Working Lives? Employability, Work Ability and Better Quality Working Lives", *Social Policy & Society*, Vol.10, N°3, pp. 299–308.

OECD (2011), Pensionable Age and Life Expectancy, 1950-2050, in *Pensions at a Glance 2011: Retirement-income Systems in OECD and G20 Countries*, OECD Publishing. Available [online](#).

Pestieau, P. and Racionero, M. (2016), "Harsh occupations, life expectancy and social security", *Economic Modelling*, 58, 194–202.

Zaidi, A. and Whitehouse, E. R. (2009), *Should Pension Systems Recognise "Hazardous and Arduous Work"?*, OECD Social, Employment and Migration Working Papers, No. 91, OECD Publishing. Available [online](#).

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