

DISCUSSION PAPER SERIES

IZA DP No. 15289

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and Levels of Income Support**

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ABSTRACT

De-facto Gaps in Social Protection for Standard and Non-standard Workers: An Approach for Monitoring the Accessibility and Levels of Income Support*

Social protection systems play a key stabilising role for individuals and societies, especially in the recent context of heightened uncertainties. Income stabilisation and related social policy objectives hinge on the extent to which social protection is accessible for those requiring support. This paper proposes a new empirical approach for quantifying the accessibility and value of income transfers following an earnings loss. It first presents a methodology for assessing support levels for jobless individuals in specific circumstances that allows for comparisons across countries and over time. It then illustrates the approach using longitudinal survey data in 16 OECD countries. The illustration focusses on differences in entitlements between people who were in “standard” and “non-standard” employment prior to joblessness. Results show that, prior to the COVID pandemic, income support gaps between standard and non-standard workers were often sizeable. For instance, in Korea, job losers with prior standard employment were nearly twice as likely to receive income support as otherwise similar individuals with a history of non-standard work. Gaps were also large in Italy and Portugal. By contrast, gaps were statistically insignificant in Australia, Austria, Belgium, Germany, Hungary and the United Kingdom. As these latter countries follow very different social protection strategies, results suggest that limiting support gaps for non-standard workers is achievable with different policy designs and targeting mechanisms.

JEL Classification: I38, J65, H55, H53, C31, C35

Keywords: cash benefits, social insurance, redistribution, poverty, coverage, adequacy

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De-facto gaps in social protection for standard and non-standard workers: An approach for monitoring the accessibility and levels of income support

1 Introduction

1. Social protection plays a key stabilising role for individuals and societies alike. The recent prominence of social protection in governments' reform agendas can be seen in the context of unprecedented shocks during the COVID pandemic, heightened uncertainties about the paths of labour-market recoveries and costs of living, as well as structural transformations driven by digitalisation and other "mega trends", such as globalisation and climate change. While crises and uncertainties underscore the vital role of social protection, they also increase the individual and social costs of protection that is ineffective or inaccessible. A future world of work, with less stable career patterns and an emergence of new forms of employment, presents one set of distinct challenges that may erode the prevention, protection or promotion capacities of present-day social protection systems (OECD, 2019^[1]; European Commission, 2022^[2]).

2. To assess how future-proof existing social protection systems are, it is crucial to identify "blind spots", and to examine whether some population groups enjoy less protection than others against a drop in income, a loss of employment, or other social risks. This paper proposes a methodology for monitoring and comparing de-facto support levels for "standard" and "non-standard" workers experiencing out-of-work spells, due to unemployment or labour-market inactivity. The approach consists of estimating statistical models of benefit receipt controlling for the most important determinants of social benefit entitlements. The resulting models are then used to "predict" the benefits that people in specific circumstances ("vignettes") are likely to receive across different countries.

3. The presentation of empirical results highlights support gaps using consistent metrics for benefit accessibility (probability of receiving any support) and benefit levels for recipients (as a share of median incomes) to facilitate policy-relevant comparisons across countries and over time. The main variable of interest is the value of the total income support package, rather than any individual category of social transfer, reflecting the comparative and people-centred focus of this paper, and the fact that countries provide support through different channels and programmes. The target variable includes also support provided through the tax system that is akin to benefits (such as refundable child or in-work tax credits) when these are reported in the data.

4. The proposed approach extends and updates an earlier analysis first presented in (OECD, 2019^[1]). Income support entitlements are shaped by people's career trajectories and a multitude of individual and family circumstances. The approach therefore controls for previous labour market histories (as in many countries individuals build up entitlements to insurance-based benefits through contributions), and for individual needs and circumstance that can shape support entitlements (such as total household income, age or the presence of dependent children). Capturing these links in a statistically reliable way requires detailed longitudinal microdata with rich information on individual or family circumstances and characteristics and, crucially, a sufficient number of observations. Data requirements are more demanding still when results are to distinguish between very specific labour market groups, such as jobless people with a previous history of self-employment, unstable work or newly emerging forms of employment, such as platform (or "gig") work.

5. This paper implements the proposed approach using available longitudinal household surveys for 16 OECD countries. An alternative, and in several aspects ideal, data source for such an analysis may be administrative records with many observations and sufficiently detailed information on employment history and benefit receipt. National and international open-data and digital government initiatives seek to facilitate the preparation and accessibility of such data sources for research purposes, including in the social policy domain (OECD, 2021^[3]; OECD, 2018^[4]; European Commission, 2022^[5]). Yet, no comparative cross-country database of individual-level administrative data is currently available.

6. The analysis presented here is intended as an illustration using readily available survey data, and as a template for possible future applications with statistically more powerful data sources that may become available for some countries. In spite of the limitations inherent in available survey data, results are indicative of the approximate patterns of social protection gaps for standard and non-standard workers prior to the COVID-19 crisis, with data relating to a period shortly prior to the global health emergency. Results therefore point to structural social protection features and challenges that existed already prior to the COVID-19 crisis, and which may once again shape the reach and effectiveness of income support if/as governments retract crisis-related measures (see Section 2). Future updates using data from 2020 and later years might consider if the pandemic, and policy responses in its aftermath, have rendered income protection for different groups more or less accessible or generous.

7. This contribution of this paper is twofold. First, it presents an empirical approach for quantifying support levels and gaps in policy-relevant individual circumstances. The approach focuses on *de-facto* entitlements from the perspective of individuals. This people-centred approach complements past assessments of social protection gaps that focussed exclusively on *statutory* policy rules. Second, the paper presents new comparative results for income support that standard and non-standard workers receive following a job loss. The structure of the paper is as follows. Section 2 starts out by recalling social protection challenges during the global health emergency, in particular for non-standard workers. Section 3 presents an overview of statutory access gaps for non-standard workers across countries, and summarises key practical problems in making out-of-work support available for this group. Section 4 develops a statistical approach for measuring *de-facto* support gaps and describes the data used in this paper. Section 5 presents comparative results on social protection coverage and generosity for both standard and non-standard workers. Section 6 briefly discusses policy implications. A final section sketches directions for future work.

1.1. Key findings

8. Keeping in mind data-related caveats, results show that the accessibility of support varies markedly across countries, as do support levels for those receiving income transfers. For instance, in Belgium and France, low-income jobless individuals with a history of standard employment and a clear need for income support have a 95% chance of receiving support, compared to around 50% in Korea, Greece and Italy. In most other countries, the likelihood of receiving any income support during an extended spell of joblessness is about 70-80%. For support recipients, the predicted average size of total benefit packages also varies substantially, ranging from around 20% of the national median income in Korea and Greece, to around 30% or less in parts of Central and Eastern Europe (Poland, Lithuania, Estonia, Latvia and Hungary), Germany and Australia, and above 40% in Austria, Belgium, Spain, Portugal, Italy, and France.

9. Accessibility and entitlements are frequently considerably lower for people with a history of non-standard work, such as self-employment, part-time work or unstable/interrupted employment. Implied access gaps were largest in Korea, where standard workers were almost twice as likely as non-standard workers to receive income support following a job loss. Gaps were also sizeable in Italy (60% more likely), Portugal (50%) and in Latvia, Lithuania, Estonia and Poland (20-30% more likely).

10. Yet, for a number of countries (Austria, Belgium, Germany and Hungary), the analysis did not detect statistically significant gaps between standard and non-standard workers in either access (probability of receiving any support at all) or support levels. In Australia and Belgium, access gaps were also statistically insignificant. Moreover, receipt probabilities for non-standard workers, while lower than for standard workers, were above 70% in France and Spain (though the implied generosity was somewhat lower for non-standard workers). As these countries follow very different social protection strategies, results suggest that tackling social protection gaps for non-standard workers is in fact possible with quite different targeting mechanisms. For instance, out-of-work support in Australia and the United Kingdom is flat-rate and largely means-tested. Hungary and Belgium offer earnings-related unemployment protections to both standard and non-standard workers, and Germany and Austria have “layered” systems that combine earnings-related unemployment insurance benefits with “last-resort” means-tested support. These findings are relevant in the context of recent calls for a universal basic income, or for a stronger or exclusive reliance on means-tested “safety-net” benefits. In particular, they can help to ease concerns that a significant reliance on social insurance cannot achieve effective protection for non-standard workers..

11. For a subset of countries, available data allow exploring results for different types of non-standard work. Estimates suggest that access gaps for non-standard workers are mainly driven by the limited availability of income support for those with a history of self-employment, who often are excluded from earnings-related unemployment benefits. Part-time workers mostly have similar access to income support, but their benefit entitlements tend to be lower. Workers with unstable / interrupted work histories also have similar access to social protection as standard workers in the majority of countries, though with the exception of Italy, Poland and Germany, where gaps are significant.

12. All results in this paper refer to someone who has remained out of work for at least six months, whose household income before transfers is in the bottom 20% of the national income distribution, and who has worked prior to the reference period. In other words, this is an individual who would qualify as “deserving” of income support by most standards. Hence, the provision of accessible and adequate support in such circumstances arguably represents a modest benchmark for the effectiveness for social protection systems. Even where this objective is met (i.e. in cases when support accessibility is good for this group and benefit levels appear adequate), support gaps may still be significant and widespread for workers in other situations. Examples may include jobless individuals with no or very limited previous work history, or – notably in means-tested systems such as Australia’s or the United Kingdom’s – those with a working partner whose earnings lift household income beyond the poorest 20%. A more comprehensive assessment of social protection gaps for these and other population groups is a priority for future work.

2 Social protection systems under stress

13. The COVID-19 pandemic has accentuated a range of structural challenges of social protection systems, which existed already well before the crisis. As employees fell ill, were quarantined or lost their jobs, paid sick-leave schemes and unemployment insurance kicked in. Some countries expanded the support provided by unemployment benefits, made them more accessible, or extended their duration. Alongside this, many OECD countries have eased companies’ access to short-time work schemes, and made them more generous. On the back of these and other large-scale government support measures, real household gross disposable income grew by 3.9% between the last quarter of 2019 and the second quarter of 2020, even as GDP per capita collapsed by 12.4% (OECD, 2021^[6]).

14. Such measures have helped to provide a degree of income security for many, as illustrated by new OECD data monitoring recipients of different support measures on a monthly basis before and after

the onset of the crisis (Figure 1). Nevertheless, income transfers have not reached all those whose livelihoods were and are affected. For instance, unemployment benefits and short-time work schemes are, quantitatively, the most prominent tools in countries' early policy response, but they mostly benefited dependent employees.

15. Indeed, many emergency measures were subject to sizable “blind spots”: so-called non-standard workers, including those with fragmented or part-time work histories, as well as self-employed and own-account workers. For instance, according to a German survey, only one in five dependent employees stated in summer 2021 that the COVID-19 pandemic had negatively impacted them financially, compared to one in three self-employed workers (Schulze Buschoff and Emmmler, 2021^[7]). This is not a marginal group: across the OECD on average, one in seven workers is self-employed (OECD, forthcoming^[8]).

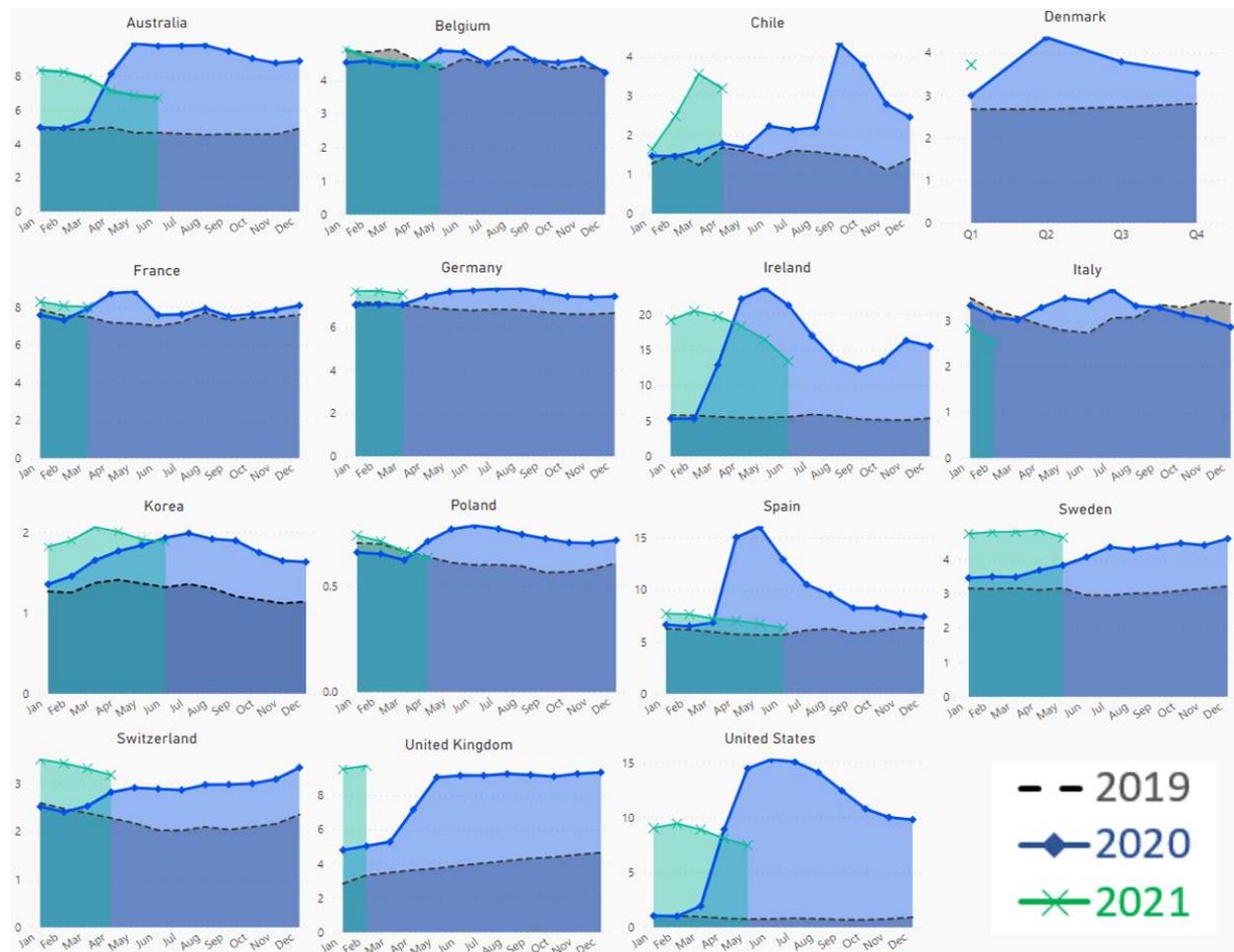
16. Before the COVID-19 crisis, and even in countries with well-developed social protection systems, many non-standard workers also had no or only partial access to out-of-work support. For instance, in most OECD countries, self-employed workers had limited access to unemployment and sickness benefits (OECD, 2020^[9]; OECD, 2020^[10]). As workers and their families faced sudden income losses during the pandemic, several countries introduced new cash transfers or added new modules to existing programmes. Sometimes, emergency support measures aiming to help non-standard workers and their families to service their regular outgoings during lockdowns were conditional on past earnings. In the United Kingdom, self-employed workers received a taxable grant of up to 80% of earnings they had during the previous three years. Similarly, Austria introduced a grant for self-employed workers, replacing 80% of the net income lost, relative to the same month in the previous full fiscal year. In the United States, the Federal Government's relief package extended the coverage of unemployment support to cover self-employed and so-called gig workers (OECD, 2020^[10]). As these emergency programmes were developed at speed to deliver support quickly, they often did not account for the often fluctuating nature of the earnings of self-employed workers, which led to uneven effective replacement rates – in the UK, for example, net benefits amounted to more than 100% of past earnings in some cases (Waters, Miller and Adam, 2020^[11]).

17. As governments often could not fall back on existing programme infrastructures to assess entitlement (e.g. past earnings and losses), many support seekers experienced delays (OECD, 2020^[12]). To speed up payments, administrations sometimes eschewed assessments of current needs or past earnings by introducing universal cash payments to all households or large segments of the population. Examples include the United States (USD 1 200 for those earning up to USD 75 000, plus USD 500 per child), Japan (JPY 100 000 for all residents) and Korea (KRW 250 000). Italy introduced a tax-free, flat-rate payment of EUR 600 payable to most self-employed workers (OECD, 2020^[10]). Although more straightforward to roll out quickly, flat-rate payments to everybody are poorly targeted by design and, therefore, very costly.

18. The income shock delivered by the COVID-19 pandemic has highlighted both the strengths of social protection systems across OECD countries to act as automatic stabilisers, and their blind spots and coverage gaps. This has further heightened interest in the accessibility of income support programmes. How inclusive and how accessible are social protection systems for different labour market groups? Which gaps must be closed to make them more inclusive and more resilient in the face of future crises?

Figure 1. Recipients of unemployment benefits prior and during the pandemic

Percent of working-age individuals, selected countries



Note: Similar monthly or quarterly data is available for job-retention schemes, and for minimum-income, disability and in-work benefits. Figures may be subject to revision by country administrations. Some programmes could not be included as monthly data were not available, see <https://www.oecd.org/els/soc/recipients-socr-hf.htm> for details. The number of working-age individuals refers to Q4 2019.

Source: Social Benefit Recipients Database, high-frequency supplement (SOCR-HF, <https://www.oecd.org/els/soc/recipients-socr-hf.htm>) using recent published data from national administrative sources.

3 Statutory access: Legal rules for standard and non-standard workers

19. Statutory access to income support varies by employment type and by programme / branch. Temporary and part-time workers are in principle covered in the same way as permanent full-time employees in most countries and for most risks, as long as they meet minimum contribution periods and earnings thresholds. Some countries in fact operate certain favourable provisions for specific, such as

casual employment, seasonal work or hybrid categories, e.g. by waiving or easing certain requirements for these groups (OECD, 2020^[13]).

20. By contrast, statutory access for self-employed workers is very frequently restricted. Indeed, contributory social protection systems that were mostly set up with a steady employer-employee relationship in mind do not easily accommodate the self-employed:

1. *Double contribution issue*: Who should be liable for employer contributions in the absence of an employer? Requiring the self-employed to pay both employer and employee contributions brings formal burdens in line with dependent employees. But effective burdens may be higher for the self-employed, especially those with lower earnings, because minimum wages typically do not apply to them or because they may lack the bargaining power to shift any contribution-related costs onto their clients by charging higher prices.
2. *Fluctuating earnings and avoidance*. The self-employed, along with some atypical employees such as on-call workers or those with zero-hours contracts, are often paid at irregular intervals, either because of time lags between work and payment, or because demand for their services is erratic (ISSA, 2012^[14]). This complicates the calculation of contributions (as well as the assessment of entitlements). In particular, self-employed workers may be able to avoid or lower contributions by optimising their contribution base, e.g., through timing their work or earnings.
3. *Moral hazard*. Demand or price fluctuations affecting self-employed workers are difficult to distinguish from voluntary idleness and this complicates the provision of unemployment insurance in particular. For instance, there is no employer to confirm a layoff and efforts to re-establish a business operation are more difficult to monitor than the search for dependent employment. When self-employed workers can claim unemployment benefits, they typically need to meet relatively stringent requirements to demonstrate that their business is no longer operational.

21. Where self-employed workers do have access to social protection, it has often been on a voluntary basis. This partly reflects specific risk patterns and fairness considerations, e.g., as entrepreneurs seek to make a profit in return for taking on business risks and therefore may not require insurance to the same extent as employees. However, the same rationale for opt-outs could be invoked more broadly, e.g., for employees who face lower risks or are less risk averse than others. Ultimately, strong reliance on selective or voluntary insurance membership widens the scope for gaming social risk-sharing systems, resulting in insurance becoming inefficiently narrow and unaffordable for those who need it. In particular, low-earning individuals may under-insure even when social insurance provisions offer attractive cost/risk ratios. Country experiences with voluntary schemes illustrate that selectivity typically leads to low coverage (e.g., under 1% of all self-employed workers in Austria and Korea, 3% in the Slovak Republic and 10-15% in Finland (European Commission, 2022^[2]; Park, 2020^[15])), or a need for significant subsidies (OECD, 2018^[16]).

22. Box 1 describes recent statutory entitlements to maternity benefits, social assistance or minimum income schemes and child allowances for non-standard workers, to unemployment benefits, and to incapacity benefits, drawing on (OECD, 2019^[1]; OECD, forthcoming^[17]; OECD, forthcoming^[8]), to aid the interpretation of the empirical support gaps presented in Section 4. The summary currently does not account for policy reforms that were implemented since (the Secretariat plans to undertake an update of statutory entitlements rules for self-employed workers to minimum income, child and maternity benefits during the course of 2022).

Box 1. Statutory entitlements to social protection for non-standard workers

Unemployment benefits have been the least accessible branch of income support for non-standard workers. In 2020, 11 of the 32 countries shown in Figure 2 did not offer any kind of unemployment

protection for self-employed workers. Access is also restricted for some forms of dependent non-standard work, e.g. casual workers in the United States, or para-subordinate workers in Italy (SSA and ISSA, 2017^[18]); (Raitano, 2018^[19]). (OECD, 2019^[1]) provides equivalent graphical overviews for other social-protection branches.

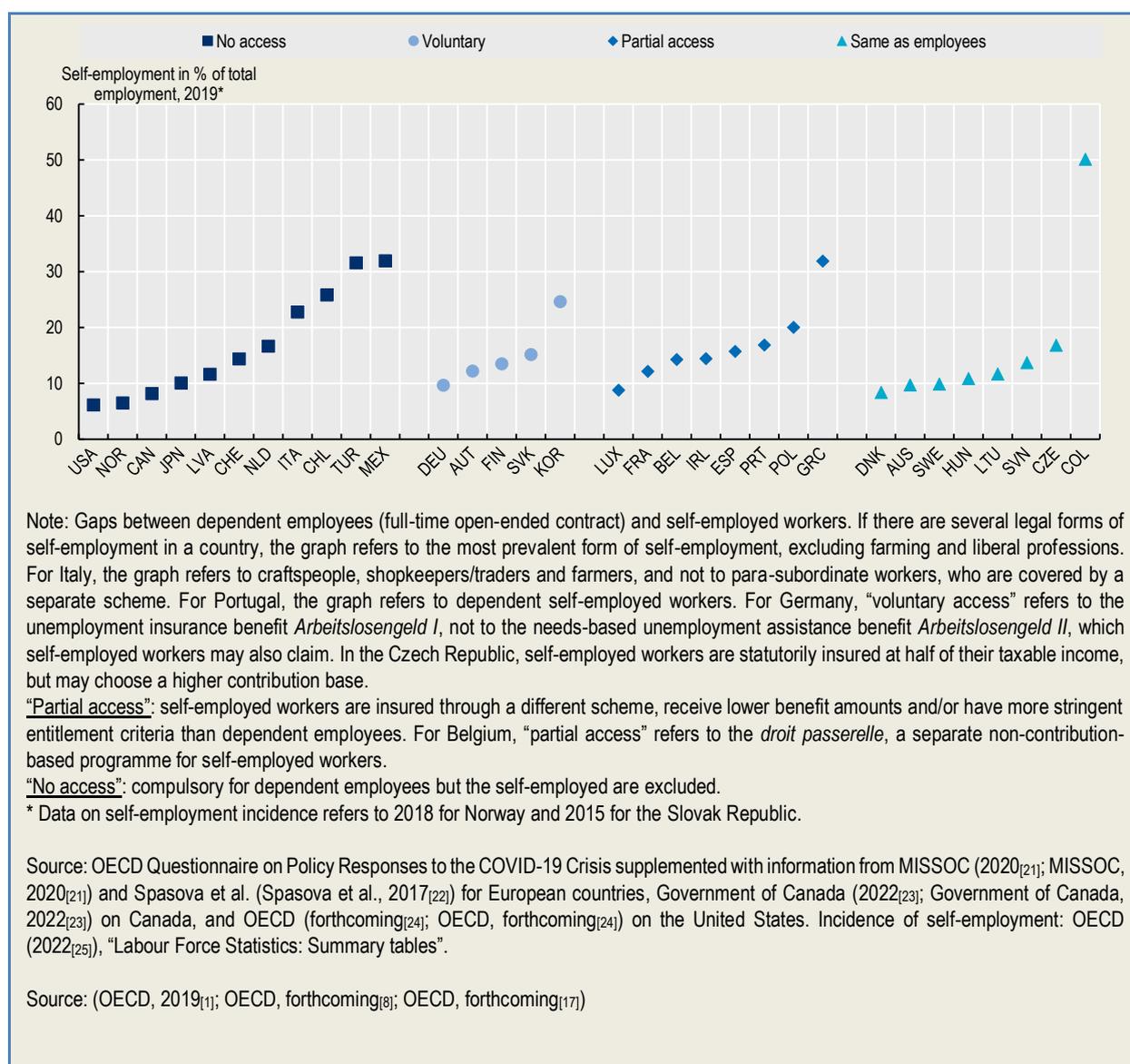
The rules for accessing **incapacity benefits** – covering cash sickness benefits, work accidents and disability – vary across countries and type of non-standard work. Statutory access for non-standard *dependent* employees was mostly similar to standard employees in all three types of incapacity benefits. Exceptions include Australia, where casual workers are not entitled to cash sickness benefits (which are an employer-provided benefit), the United States, where casual workers do not have access to accidents-at-work insurance, and Italy, where some para-subordinate workers are not covered by short-term sickness insurance. Access for self-employed workers, however, is typically more difficult. Statutory access was weakest for benefits following work accidents: only ten of 38 OECD countries offered self-employed workers the same protection as dependent employees. Many – although not all – genuine self-employed workers indeed have considerable control over their working environment and, as in the case of unemployment benefits, insurance against work accidents can therefore be prone to moral hazard. But the exclusion of self-employed workers does create important social protection gaps for those with genuinely risky activities, including for workers who are wrongly classified as independent, or who are in the “grey zone” between self-employment and dependent employment (e.g. workers who have very few or even only a single client). Self-employed workers have more ready access to (long-term) disability benefits: 29 countries offered them the same access as dependent employees (OECD, forthcoming^[17]).

When contingencies are independent of a specific job or past career, protection for non-standard workers tends to be more readily available. For instance, **social assistance or minimum income** schemes are typically financed through general tax revenue, and legal entitlement rules are based on need, regardless of past employment type, duration or stability.

Family benefits, such as **child allowances**, are typically universal or means-tested, and statutory access to **maternity benefits** also tends to be similar for workers in standard and non-standard forms of *dependent* employment. An exception is Italy, where “workers on vouchers” and foreign seasonal workers do not have access to contributory family benefits (Jessoula M, Pavolini E and Strati F, 2017^[20]). For the self-employed, maternity benefits are often part of contributory schemes that have separate provisions for independent workers. In all countries with compulsory maternity coverage for standard employees, self-employed workers can either opt into the main scheme voluntarily, or they have access to a separate benefit that is, however, less generous than for dependent employees (lower benefit amounts and/or shorter duration).

Figure 2. Statutory access to unemployment benefits for independent workers is often limited

Statutory access to unemployment benefits for the self-employed compared to dependent employees (“employees”) in 2020, by incidence of self-employment (2019)



4 Effective access: How much support is available in practice?

23. This paper proposes a new approach for measuring and assessing income support gaps that are observed/reported in practice. It consists of estimating a statistical model of benefit entitlements for jobless individuals, controlling for the most important determinants of social benefits. Results are intended as shorthand summaries of benefit accessibility and generosity in a comparative perspective. They also allow quantifying the accessibility and generosity of support packages across different population groups, including standard and non-standard workers.

4.1. Why measure effective access?

24. A people-centred policy discussion requires information on the actual support that people receive in different labour market circumstances. For a number of reasons, a reliance on “systems focussed” comparisons, such as those based on differences in statutory access rules for different groups of worker, give an incomplete – and possibly a misleading – picture of the support that is available in practice.

25. First, non-standard workers may have characteristics, such as lower earnings or more patchy work records, which make it difficult for them to meet entitlement criteria, even when formal rules are exactly the same as for standard workers. Relatedly, a focus on *differences* in entitlement rules between standard and non-standard workers hides country differences in terms of the *overall* reach of support, and the coverage gaps that may exist for standard workers as well.¹ And beyond the availability of support, the content and generosity of income transfers differ across types of workers and across countries, determining the adequacy and effectiveness of support for those receiving it.

26. The implementation of support measures and associated entitlement rules may also differ between groups in practice, as can the implicit cost of claiming benefits that may dissuade eligible people from applying. As a result, non-take-up of benefits can vary systematically between standard and non-standard workers, including in cases where support programmes for non-standard workers are relatively recent (and less well known or established than for standard workers).

27. Contributions to some social protection programmes can be voluntary for some categories of workers (see Section 3) or allow some room for avoiding the costs associated with programme participation. Many of them may opt out (or seek to bypass applicable rules) if they perceive future benefits as small relative to the current individual cost. Indeed, available evidence suggests that participation rates in voluntary programmes can be very low (OECD, 2019^[1]; OECD, 2018^[16]).

28. Finally, access to the *overall* support package is difficult to assess from the rules that govern separate individual support programmes or elements. Depending on countries’ policy approaches, support for out-of-work or low-income groups is frequently spread across two or several social protection branches. In-work support or guaranteed minimum income programmes can, for instance, fill some of the gaps that first-tier out-of-work support leave for workers in independent, unstable, or part-time employment. A related issue is that identifying an uncovered *job* is not the same as an uncovered *person*. For example, a self-employed worker may have access to out-of-work support through a second (or first) job as a dependent employee (European Commission, 2021^[26]).

4.2. A people-centred perspective: Statistical approach

29. “Raw” empirical coverage rates can also be misleading. When entitlements differ between groups, observed total coverage rates are driven by the composition of the population of interest (e.g. the unemployed) to an important extent (OECD, 2018^[27]). As the incidence of non-standard work, and the characteristics of non-standard workers, differs markedly over time and across countries, comparing like with like is difficult or impossible when using aggregate or grouped data.

30. The proposed approach aims to estimate receipt probabilities and benefit levels for a specific set of circumstances, and seeks to control for the key characteristics that determine benefit receipt. As benefit access and amounts often depend on past events, the method relies on longitudinal household data that

¹ For instance, on average across OECD countries, two out of three jobseekers did not receive unemployment benefits in 2016, but coverage differed markedly between countries, ranging from under 10 percent in Italy, Slovak Republic, Poland, Greece and United States to more than 50% in Belgium and Finland (see OECD SOCR database, <http://oe.cd/socr>, and (OECD, 2018^[27])).

include information on current and past employment, earnings and other relevant individual and family characteristics. We illustrate the method using available survey data, which have the advantage of being accessible and comparable across countries. The drawback is comparatively small sample sizes, which can make the analysis of subgroups – such as the out-of-work population with a history of non-standard work – problematic. Data from administrative sources would be more appropriate for this type of analysis, but is currently not readily available for comparative work of the type proposed here.

31. The main variable of interest is the value of the *total* benefit package, rather than any individual category of social transfer, reflecting the fact that countries provide support through different channels and programmes. The policy scope comprises the most important social transfers to working-age individuals and their families: unemployment and disability benefits, (employer as well as publicly provided) sick pay², family (including maternity) benefits, any benefits tied to education (such as public student aid), in-work and minimum income benefits (means-tested transfers aimed at reduce poverty, most importantly social assistance and housing benefits).³ This includes also support provided through the tax system that is akin to cash benefits (such as refundable child or in-work tax credits) when these are reported in the data.⁴ Benefit receipt is measured over an entire year and therefore accounts for both the *generosity in a given month*, any *benefit reductions* for longer out-of-work spells, and the effective *duration* of entitlements (including any waiting periods or other possible gaps between benefit entitlement and pay-out). For benefits that are observed/reported at the household rather than the individual level (family benefits, minimum income benefits), amounts are divided equally across all adult household members on a per-capita basis.

32. The empirical assessment of income support for different labour market groups proceeds in two steps. A first step estimates the relationship between individual benefit receipt and a number of key structural drivers of support.⁵ The model specification includes the following independent variables, along with relevant interactions and higher-order terms: Main employment status and pre-transfer household

² Information on sickness benefits is not available for Germany, while data for other European countries as well as Australia include employer provided sick pay whenever available. Receipt information on employer-paid sickness benefits is not available in the KLIPS. A country-wide statutory paid sick leave currently does not exist in Korea; paid sick leave provided through private arrangements between employers and employees leaves significant parts of the workforce unprotected (KIHASA, 2018^[51]). Korea plans to pilot a scheme encompassing wage and non-wage workers from 2022 (Joint Ministries of the Republic of Korea, 2020^[52]).

³ The unemployment benefit variable includes severance payments for all countries; they are quantitatively important in Korea and in some Southern and Eastern European countries.

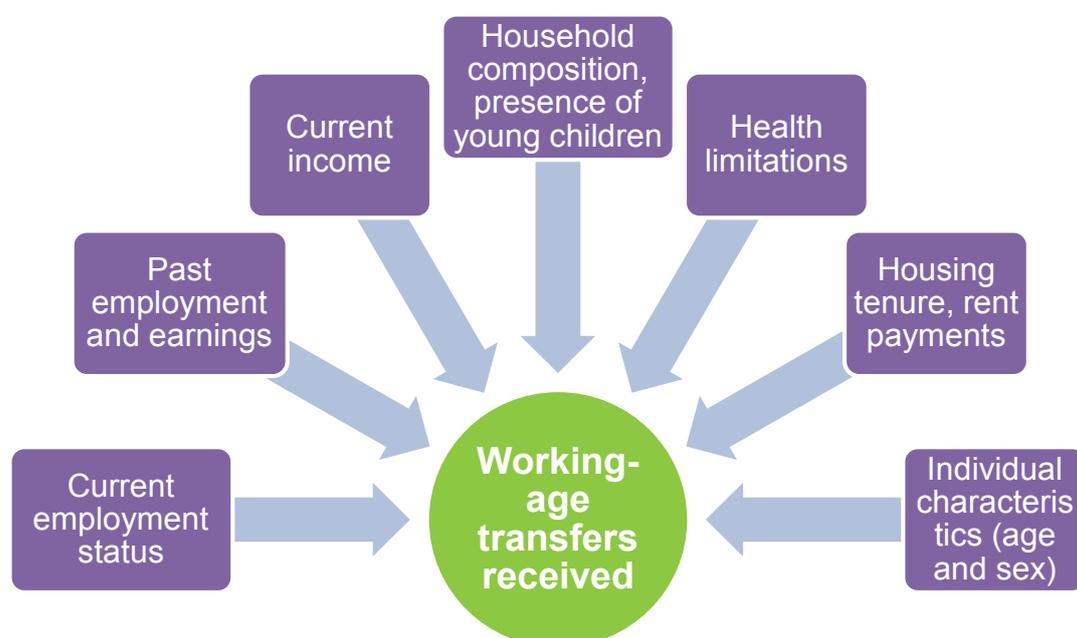
⁴ Note that the package of working-age benefits in the UK and Korea includes refundable, income-related child and in-work tax credits, whereas related programmes are not recorded as social transfers in other countries. Receipt of means-tested tax credits in Korea may be somewhat under-reported (both the Earned Income Tax Credit, and also the Childcare Tax Credit, though the latter is not relevant for adults living alone). There is in fact evidence of substantial under-reporting of tax credits in KLIPS data though the effect on the dependent variable (total benefit receipt, including means-tested tax credits) is difficult to assess. For 2016, KLIPS reports 437,380 households in receipt of these tax credits, compared to 2,597,071 reported by the National Tax Service. The Korean Labour Institute attributes this to respondent underreporting of tax credits as compared to other benefits (Nam, 2017^[50]).

⁵ Instead of relying on observed/reported benefit receipt, an alternative approach would be by means of deterministic tax-benefit microsimulation, using computer representations of theoretical entitlements in order to calculate benefit amounts at the individual level. Such models are widely used (see (Tamayo and Tumino, 2018^[56]) and (Browne and Immervoll, 2017^[55]) for recent multi-country applications). But they typically use cross-sectional data and cannot account for dynamic aspects, such as past work history and employment patterns, that are especially relevant for assessing entitlement gaps between standard and non-standard workers. The focus on theoretical entitlements means that key accessibility factors such as stigma, benefit sanctions or voluntary social protection opt-ins or opt-outs are difficult or impossible to account for. Together, these factors can cause differences between theoretical and actual benefit receipt. Importantly, these differences are likely to vary between countries and types of workers.

income during the reference period (*year 0*), main employment status and earnings during the two years preceding the reference period (*years -1 and -2*), household composition in *year 0*, including the presence of dependent children (plus children under the age of six to capture maternity / paternity benefits), as well as health status, housing tenure and housing costs, sex and age (all *year 0*). See Figure 3 and Annex A.

33. Previous work status draws on rich calendar information that is available in the surveys.⁶ It is defined as the main activity (full-time / part-time dependent employment, self-employment, or out-of-work) over the *year -1 and year -2* period. “Previous unstable work” is a residual category for those with multiple statuses during this period, i.e. those who transitioned between different types of employment and / or into and out of work.⁷ A consistent definition is informative in the context of this paper’s comparative focus. As the distribution of work statuses varies across countries, somewhat different definitions might result in statistically more powerful estimates for country-specific analyses.

Figure 3. Total benefit package at the individual level: Determinants included in the model



⁶ In all 16 countries considered in this paper, the economic activity reported in each month of the income reference period is self-assessed by the respondent at the moment of the interview. This may induce “recall” errors in cases of large time gaps between the moment of the interview and the last month of the income reference period. Respondents are also asked for their “main” activity in any given month; this may lead to further classification errors, e.g. for those who work only part of the month but define themselves as “out of work”. This analysis uses the survey data “as is” without attempting to correct for these potential classification errors.

⁷ “Previous standard work”, “previous part-time work” or “previously self-employed”: Individuals who were, respectively, a full-time dependent employee, a part-time dependent employee, or a self-employed worker for at least six months each during both *year -1* and *year -2*, and out of work for at most two months in total during *year -1* and *year -2*. Also workers who spent at least eight months during *year -1* and at least 12 months overall during the two-year period in standard / part-time or self-employed work are categorised as such.

“Previously out of work”: Individuals who were out of work for at least 16 months in total during *year -1* and *year -2*, or who were out of work for at least 6 months each in both *year -1* and *year -2*.

“Previous unstable work”: Individuals who do not fit any of the above categories. Individuals in this category worked in any one status (full-time, part-time, self-employed) for fewer than twelve months during the two-year period, but they were out-of-work for less than 16 months.

34. Separate models are estimated for benefit receipt (yes/no) and benefit levels (benefit amounts) using a generalized Hurdle approach, as the process that determines whether a person receives social benefits is not necessarily the same as the process that determine the amount received (Wooldridge, 2010_[28]), (Cragg, 1971_[29]). The first model is a logistic regression for benefit receipt at the individual level. The second model is an exponential regression of benefit amounts (entitlements) estimated only on observations with positive benefits. The use of exponential regression, rather than a standard log-linear model, sidesteps inference problems that arise with predicting levels for log-transformed dependent variables (Wooldridge, 2010_[28]).⁸ Annex A provides further information on model fit and on the specific variables entering the model. In line with the comparative focus of this paper, the model specification is consistent across countries. It is worth noting that, for country-specific analyses, tailored specifications could improve the model fit further.

35. A second step uses the estimated relationships for inference on the benefit gaps between standard and non-standard workers in specific concrete circumstances (“vignettes”) that are defined in a consistent way across countries. The use of a vignette-based analysis facilitates the communication of complex statistical results in a comparative setting, and the identification of possible policy mechanisms driving entitlement gaps. Indeed, a direct interpretation of the estimated coefficients is complicated by interaction effects, and the presence of categorical variables and other nonlinear functional forms on the model’s right-hand side. More generally, significant interpretation difficulties arise in nonlinear models, including logistic regression, as the raw coefficients are often not of immediate interest. In these cases, “marginal effects” (i.e., statistics computed from model predictions for different values of the control variables) allow summarising the entire vector of estimated parameters into a single value using the same metric as the dependent variable (here the probability of receipt and the benefit amount). Standard errors, computed by means of the Delta method, allow inference on the estimated gaps and their statistical significance.

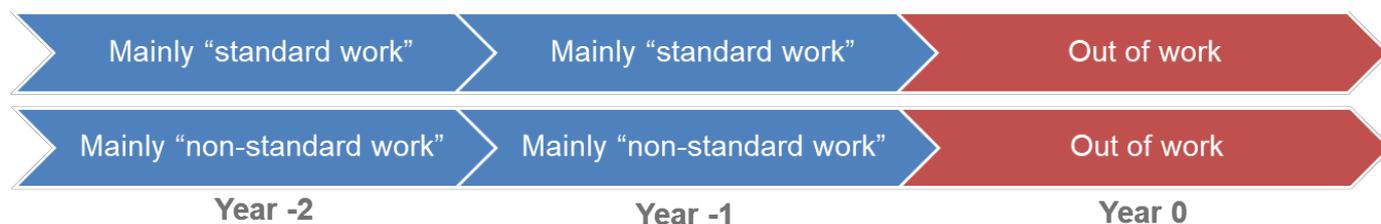
36. Benefit “gaps” for non-standard workers are calculated relative to a baseline standard worker, who is likely to require out-of-work support. This baseline standard worker is an individual who was out of work (either unemployed or labour-market “inactive”) for at least six months during the reference year, lives in a low-income household in the reference period (bottom 20% of the national distribution), and has neither significant health problems, nor young children under the age of six.⁹ In the two years prior to the reference period, the baseline standard worker was a dependent full-time employee with earnings at or above the 40th percentile of the national distribution.¹⁰ Relevant characteristics for the baseline and comparator vignettes are as described in detail in the notes to the result figures below.

⁸ The use of an exponential model is justified by the need to fit a non-negative and skewed dependent variable (benefit entitlements). The literature suggests two possibilities in these circumstances: Ordinary Least Squares regression with a log-transformed dependent variable, or a maximum-likelihood Poisson estimator with standard errors estimated via the Huber/White linearized estimator. With a correctly specified model, the two approaches lead to similar results. The second approach is typically advisable as predicted values are directly expressed in the original measurement unit, whereas the predicted values of the OLS model with log-transformed dependent variable require a ‘reverse’ transformation of the fitted values based the estimated variance of the error term.

⁹ The statistical model controls for age (including a higher order term), gender, education, household composition such as household size, presence of a partner and dependent children (under the age of 18) and young children (under the age of 6), as well as housing tenure and rent paid. The “vignette” only specifies the presence of children under the age of six, previous work status and earnings, income, health status, and that the worker worked for twelve months in the year before the reference period. This reflects the trade-off between the sample size and good comparisons across countries. Generally, given sufficient sample sizes (such as through administrative data), it would be preferable to estimate the model on as a homogenous subgroup as possible by defining vignettes in relation to a larger (or full) set of dependent variables.

¹⁰ In *year -1*, the baseline standard worker worked for the entire twelve months (this is to ensure recent contribution periods for contributory unemployment benefits), with at least six of them in full-time dependent employment, or five

Figure 4. Comparison of the benefit package: “standard” vs “non-standard” worker



Note: The vignette for standard workers is defined as follows: Able-bodied working-age adult who was out of work for at least six months during the reference period (*year 0*), worked mostly full-time prior to the reference period (*years -1 and -2*), worked without interruption throughout *year -1*, and for at least 10 months in *year -2*. Earnings prior to the reference period were at or above the 40th percentile of the national earnings distribution, and current *year 0* (equivalised) household income before any benefit payments is in the bottom 20% of the national distribution. No children under six years live in the household.

The vignette for non-standard workers is an otherwise similar individual whose past work history is “non-standard”: in *year -1 and year -2*, they worked at least six months part-time or were self-employed, with at most two months out of work, or they were in “unstable / interrupted” employment: out of work at most five months during *year-2*, and otherwise transitioned between full- and/or part-time work and / or self-employment. Subject to sample sizes, social protection gaps can be shown separately for these three categories of non-standard workers, see Figure 7 and Figure 9. See Table A.1 in Annex A for a detailed definition of the variables that enter the model. Note also that, while standard workers in the sample may be out of work for up to two months in both *year -1 and year -2*, and non-standard workers up to six months, the vignette is defined as having no out of work months at all in *year -1*.

4.3. Data

37. Our illustration of the proposed method relies on available household panel surveys that are readily accessible, include a broad range of individual and family characteristics that commonly determine income support entitlements, and facilitate consistent definitions of key variables across countries: Australia, Korea, United Kingdom and 13 EU countries (Austria, Belgium, Estonia, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Poland, Portugal, Spain). The resulting estimates rely on three-year panels from the EU Statistics of Income and Living Conditions for EU countries and the United Kingdom (EU-SILC, with observations pooled across the 2018, 2017 and 2016 waves to increase sample size), the German Socio-economic panel GSOEP (wave 2018), the Household, Income and Labour Dynamics Australia survey (HILDA, wave 2019) and the Korean Labour & Income panel study (KLIPS, wave 2019).¹¹ EU-SILC data for additional countries are available but were not included in this initial application because currently available effective sample sizes were considered too small (e.g. Ireland) or because key employment-status variables were recorded only for one individual per household (e.g. Denmark). Further countries can be added subject to suitable data becoming available. For instance, the authors are currently undertaking econometric work that draws on available data for the United States and builds on the methodology presented here.

38. The summary statistics in [online Annex B](#) show that women are strongly over-represented in the out-of-work estimation sample, especially so in Austria, Greece, Italy and Korea, where they account for more than two thirds of out-of-work individuals. In line with a more prevalent male-breadwinner model, out-

months in full-time dependent employment and three months in part-time dependent employment. In *year -2*, the baseline standard worker was in full-time dependent employment for at least six months, and out of work during at most two months.

¹¹ For Korea, KLIPS was chosen because its content and structure is broadly comparable with the data sources for other countries, and because it has been the dataset of choice for numerous studies relating to low-income households. An interesting alternative data source for future work is the Korea Welfare Panel Study (KOWEPS), which strongly oversamples low-income households. However, while KOWEPS provides more detailed information on social benefits, it does not contain information on employment status by calendar month, which is crucial for this paper.

of-work individuals in Greece, Italy and Korea are however markedly less likely than in other countries to be in the bottom income group. Raw benefit coverage rates range from around 20% of the entire sample in Greece and Korea, to more than 75% in Austria, Belgium, Estonia and France. They are higher for out-of-work adults with children, especially in countries with universal or near-universal child benefit programmes.

39. A challenge related to the use of survey data is the limited effective sample size. The sub-sample of interest comprises all working-age individuals aged 18-64 who are potentially in need of working-age support: individuals who (i) have not worked for pay or profit during the majority (6 months or more) of the observation/reference period (year 0:)¹², (ii) are not already retired¹³, and (iii) were not in education or compulsory military service in year -1 (and thus had the opportunity to accumulate entitlements to any insurance-based benefits). This is typically a small share of the working age population, with effective sample sizes for the 1st-stage coverage model ranging from fewer than 2 000 observations in Austria, Korea and the Baltic countries, to more than 6 000 observations in Australia, Greece, Italy, Spain (see Figure 10 and [online Annex B](#) for details).

40. Smaller observation numbers can be a direct consequence of survey design choices, but they can also be due to business-cycle fluctuations and the broader labour-market situation, with smaller out-of-work samples in countries/years that are characterised by strong labour-market performance. In these cases, standard errors for estimated model coefficients, and a resulting weaker statistical significance of the estimated social protection gaps, limits the number of characteristics that can be “fixed” in the vignette, and hence the cross-country comparability of results. Subject to these constraints, more granular results of social protection gaps for different types of non-standard work (self-employed, part-time workers and workers with unstable / interrupted work history) are available for a subset of countries (Section 5.3 below).

41. National administrative data could be a suitable alternative data source for this analysis, and could allow for a more detailed analysis of social protection gaps, including for more granular employment types (e.g. subtypes of self-employed workers). However, they often do not contain information on household composition and may not include full income information (e.g. for households whose incomes are too low to be taxable). They also typically do not contain full information on the incomes of other household members, unless the household has applied for income-tested benefits. Using administrative data for monitoring social protection gaps in individual countries is a topic for future research (OECD, 2021^[3]).

5 Results

42. This section presents results for social protection gaps between standard and non-standard workers, using the proposed metrics for accessibility and support levels. Results are based on data for 2018 (Germany and Korea), 2016-2018 (other European countries) and 2019 (Australia). They can therefore not account for policy reforms that have been implemented since. For instance, France extended

¹² This marks a departure from the precursor-study OECD (2019^[1]), that estimated the structural model using information on the entire working-age population (not just the jobless). Restricting observations to jobless individuals results in a smaller estimation sample, but it also makes it much more homogenous. The latter effect dominates and the resulting model is statistically more reliable.

¹³ Individuals are defined as retired if they receive an old-age pension during the reference year. This can lead to imprecisions in countries where pensions are provided as a lump sum and therefore a pension income stream cannot be observed. In the country sample for the present study, this is only the case for Australia. Any means-tested old-age pension payments, veteran’s pensions etc. can however be identified in the Australian data source (HILDA).

unemployment benefits to self-employed workers in 2019, Spain and Italy introduced new national Minimum Income Benefit Programmes in 2019 and 2020 respectively, and Greece has reformed its disability benefit system. Korea introduced a new unemployment assistance programme and relaxed the eligibility criteria of its national minimum income benefit in 2021, while also gradually extending contributory unemployment benefits to own-account workers (see below).

43. The presentation of results starts out by discussing receipt patterns for the standard worker “baseline vignette” (Section 5.1). The support available for standard workers is indicative of cross-country differences in income support architectures, and useful for building intuition for the resulting drivers of support patterns. Section 5.2 then presents the main results of this paper: the differences (gaps) between standard and non-standard workers in the support that they receive during joblessness. Section 5.3 further disentangles results for self-employed and part-time workers as well as those with unstable work patterns.

5.1. Baseline results: stable history of standard employment

44. Even for jobless individuals with a history of standard employment, and a significant need for income support, the likelihood of receiving support varies markedly across countries.¹⁴ In Belgium and France, the “baseline” standard worker’s chance of receiving support is 95% or more, compared to less than 60% in Greece and Italy, and below 50% in Korea (“baseline: past standard work” in Panel A, Figure 5).¹⁵ In most other countries, the share is about 70%-80%. The United Kingdom and, especially, Australia mainly condition benefit receipt on current need and, as a result, (working-age) social spending is closely targeted to the low-income population as represented by the vignette in the analysis. In other countries, e.g. Greece, Italy and Spain, benefits were largely insurance based and provided comparatively weak redistribution and poverty protection (for instance, in Italy in 2018, 43% of all working age benefits went to the top income quintile according to the OECD Income Distribution Database).

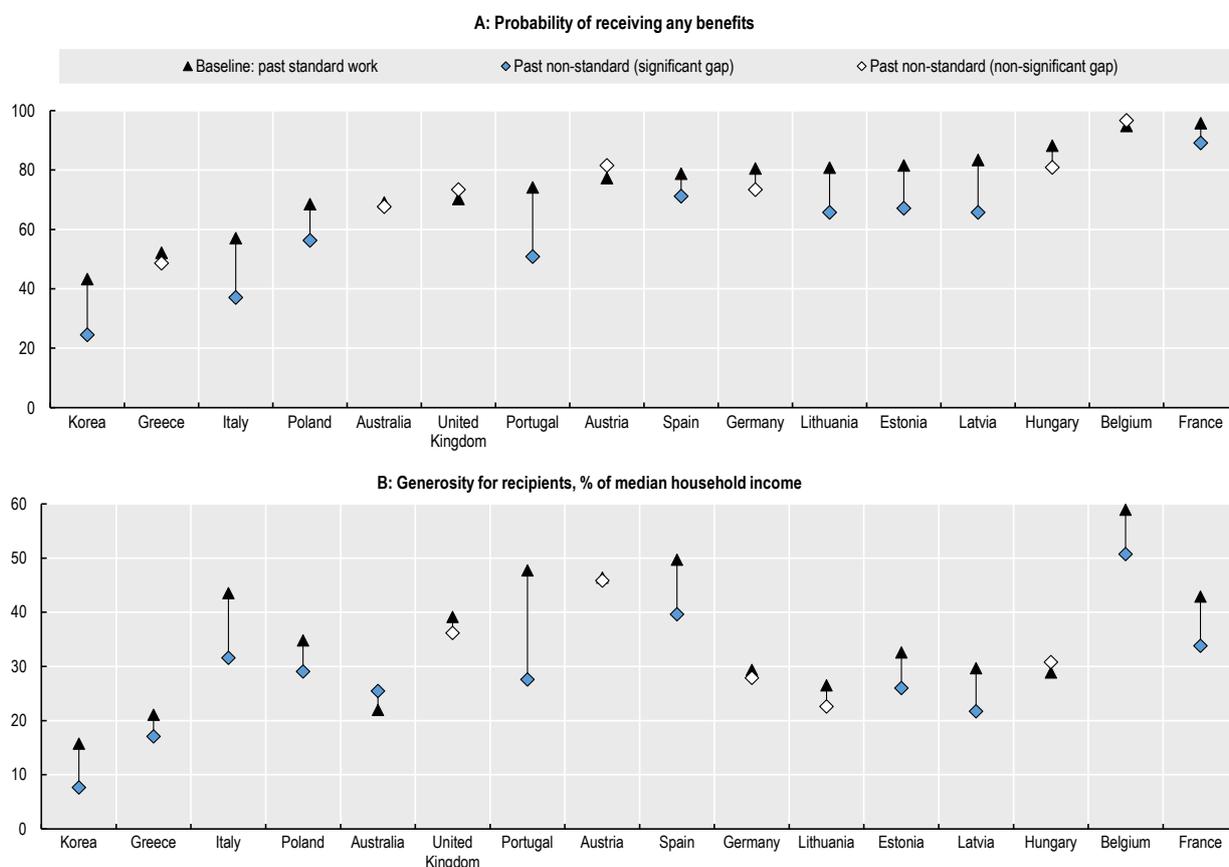
45. The support patterns reflect variations in aggregate benefit payments and targeting mechanisms across countries. For instance, in Belgium government transfers represent around 10% of total income of working-age households, but less than 5% in Greece, Korea and Australia (Figure 6). Belgium, Korea and Southern European countries place strong emphasis on insurance and income maintenance following specific life events (unemployment, illness or disability, the birth of a child etc.), whereas substantial shares of benefit payments in Australia, United Kingdom and Greece are means-tested and targeted based on needs. Categorical or universal benefits, such as child allowances, account for large shares of benefit spending in Austria, Germany, United Kingdom and in several Eastern European countries.

¹⁴ Recall that estimates refer to an individual who is jobless, lives in a low-income household and was in standard (full-time) dependent employment prior to job loss (see Section 4.2, Figure 4 and notes to Figures Figure 7 to Figure 8).

¹⁵ The well-documented under-reporting of means-tested tax credits in Korea affects this result. But under-reporting is also documented in other countries and, in most of them, refundable tax credits are not recorded in the data at all. See footnote 4.

Figure 5. Non-standard workers receive little out-of-work support in some countries

Overall support package for working-age individuals, at or before 2018/2019



Note: Data refer to 2018 (Germany), 2016-2018 (pooled waves, other European countries) and 2019 (Australia and Korea). Statistical significance refers to the gaps between baseline and comparator cases (90% confidence interval). (Early) retirees and those who were in education or military service during the year before the reference period are excluded from the sample.

Standard worker: Able-bodied working-age adult who was out of work for at least six months during the reference period (year 0), worked mostly full-time prior to the reference period (years -1 and -2), was dependently employed without interruption throughout year -1, and for at least 10 months in year -2. Earnings prior to the reference period were at or above the 40th percentile of the national earnings distribution, and year 0 (equivalised) household income before any benefit payments is in the bottom 20% of the national distribution. No children under six years live in the household.

Non-standard worker: An otherwise similar individual whose past work history is “non-standard”: in year -1 and year -2, they worked at least six months part-time or were self-employed, with no months out of work in year -1 and at most two months out of work in year -2, or they were in “unstable / interrupted” employment: working uninterrupted in year -1, and out of work at most five months during year-2, and otherwise transitioned between full- and/or part-time work and / or self-employment).

Source: OECD calculations using EU-SILC, GSOEP, HILDA and KLIPS panel data.

46. Country differences reported in Figure 5 are also driven by differences in the composition of the out-of-work population. For instance, individuals who report to be labour-market inactive are less likely to receive unemployment support than those who are actively looking for work. They may also not have the same need for support, e.g. some of them may not look for work because they live with an employed partner. The share of inactive individuals in the out-of-work sample varies significantly across countries: from 86% in Korea to 21% in France and Portugal (not shown in the [online Annex B](#), but consistent with the high shares of women in the sample for Korea and other countries as discussed earlier). By contrast,

Korea has the lowest reported long-term unemployment rate across the OECD (less than 1% of total unemployment in 2020, compared to 67% in Greece and 37% in France).¹⁶

47. Yet, benefit receipt probabilities can also be low for the unemployed who are available for work and actively looking for a job. For instance, the reach of unemployment benefits is limited in Korea (Korea Labor Institute, 2017^[30]) (OECD, 2018^[31]). Unlike in many other OECD countries, standard workers who are ‘voluntarily’ unemployed, as well as seasonal and domestic workers, are not entitled to unemployment benefits. Statutory benefit receipt durations are also comparatively short (3 to 8 months in 2018, depending on age, contribution history).^{17,18} In addition, minimum income benefits were comparatively inaccessible in 2018 (Hyee et al., 2020^[32]): The means test for the main programme (the Livelihood Benefit) featured a support obligation for parents and children of claimants (regardless of whether they lived in the same household), which reduces eligibility and recipient numbers. The predicted average sizes of overall benefit packages also varies enormously across countries. They range from under 20% of national median income in Korea, to around 30% or less in parts of Central and Eastern Europe (Lithuania, Estonia, Latvia and Hungary), Germany and Australia, 35 to 40% in Poland and the United Kingdom, and 40 to 50% in Spain, Portugal, Italy, and France. At 60% of median income, estimated benefit levels are highest in Belgium (Panel B of Figure 5).

48. In terms of country rankings, these benefit levels are broadly in line with “theoretical” benefit entitlements, as calculated with policy simulation models (e.g. <http://oe.cd/TaxBEN>). For a number of reasons, however, actual values as estimated here differ from – and are generally lower than – theoretical levels implied by headline indicators for “typical workers”, such as replacement rates at the beginning of an unemployment spell. First, de-facto estimates are based on actually observed spells of joblessness. Unlike “typical worker” replacement rates, the resulting entitlements reflect the characteristics of those experiencing job loss, such as past earnings histories. Since those with lower earnings or shorter career histories tend to be over-represented among job losers, the resulting entitlements to any earnings-related insurance benefits can be noticeably lower than those for an “average” worker. Second, results refer to support received over an entire calendar year. They therefore capture differences in benefit amounts in a given month, in benefit duration limits (often shorter than 12 months), and in the average duration of out-of-work spells. The latter varies across countries, even among the selected sample with jobless spells of six months or longer. For instance, the spell duration in this group in Korea and Australia is almost two months shorter than in Italy (see Table B-1 in the [online Annex](#)). Finally, estimates of de-facto benefit levels refer to recent job losers receiving any type of cash support. In some cases, this can include people who do not qualify for out-of-work benefits for one reason or another, but who receive transfers of a lower value. This includes benefits that address specific needs (such as housing benefits or in-work support for those with occasional earnings while out of work) or “universal” benefits (e.g. jobless people with children who may receive universal child benefits in Austria and Germany). The summary statistics presented in the

¹⁶ OECD (2022), Long-term unemployment rate (indicator). <https://doi.org/10.1787/76471ad5-en> (accessed on 06 March 2022)

¹⁷ Compliance is also not complete. In 2018, 35% of dependent employees were not covered by the contributory unemployment benefit scheme in Korea – half of them were not eligible to join the scheme by the statutory rule and the other half did not join the scheme despite their eligibility. According to the administrative data of Korea Employment Information Service, only 12% of employees who were insured did receive the benefit in 2016, despite being ‘involuntarily’ unemployed and satisfying the minimum contribution duration (Kim, 2020^[61]). In 2016, 46% of employees were not eligible to receive the benefit because they quit their job voluntarily though the minimum contribution period was satisfied (Korea Labor Institute, 2017^[30]).

¹⁸ Since October 2019, the benefit duration and level increased to 4 to 9 months and 60% of the average wage for the last three months, respectively (Ministry of Employment and Labor, 2019^[60]).

[online Annex](#) allow gauging some of these factors in more detail (e.g. the number of families with children in the estimation sample).¹⁹

49. With that in mind, the (comparatively small) group of out-of-work Italians with past standard employment who do qualify for benefits receive significantly more generous support on average (over 40% of median household income) than, for example, an equivalent individual in Australia, where (flat-rate and means-tested) benefits amounted to about 20% of median household income. In both cases (and in most other countries), those relying on benefit income alone would typically have income below commonly used relative poverty cut-offs, but poverty *gaps* would be significantly bigger for benefit recipients in Australia.

50. Across countries, there is no obvious general link between accessibility and generosity. As noted, benefit access in Italy was comparatively difficult, but benefit levels for recipients were higher than in the majority of other countries. Hungary, Germany and the Baltic countries follow the opposite pattern, with implied coverage above 80%, but with comparatively low benefit levels around 30% of median household incomes. Accessibility and generosity scores were both high in Belgium, but comparatively modest in Australia and Poland, and very low in Greece and, especially, in Korea. In Korea, low annual support levels are partly driven by short durations of (unemployment) benefits as noted above. A comparatively low benefit ceiling also limits entitlements at average-to-higher levels of previous earnings (OECD, 2018^[31]). In addition, effective minimum-income entitlements also tend to be lower than in many other countries, especially for those with incomes from other sources, such as a working family member (Hyee et al., 2020^[32]).

51. Several countries have implemented or initiated significant reforms after the reference period of the estimates reported here; these recent or ongoing reforms are therefore not yet (or not fully) visible in the results. For instance, Korea has introduced a new unemployment assistance programme in January 2021, has gradually eased the familial support obligation in the minimum income benefit, and is planning to extend eligibility to unemployment benefits to some forms of non-standard work by 2025.²⁰ Several other countries, including France and Spain, have strengthened unemployment support for self-employed workers.²¹ Italy introduced a nationally applicable Minimum Income Scheme in 2016, further extending it in 2019 (Bulman et al., 2019^[33]), Greece introduced a national Minimum Income Benefit Scheme in 2017 (OECD, 2020^[34]) and Spain began rolling out a new national minimum-income programme in from mid-2020.

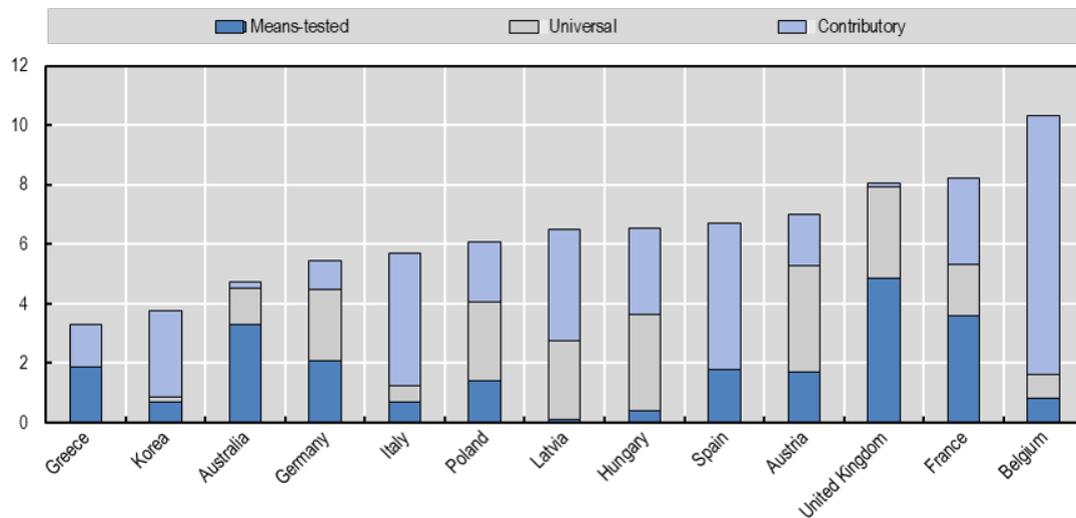
¹⁹ For instance, 50% of individuals in the estimation sample for Austria live in households with children, compared to only 37% in the estimation sample for Australia. Child benefits are universal in Austria.

²⁰ The newly introduced unemployment assistance programme absorbed an earlier benefit for jobseekers not entitled to unemployment insurance or minimum-income benefits. The Employment Success Package Programme (ESPP) existed since 2009 and was initially targeted to jobseekers with very low incomes. Recipient numbers have continuously increased but nevertheless remained comparatively low (OECD, 2018^[31]). The familial support obligation in the minimum-income benefit programme (Basic Livelihood Support Programme) was abolished in 2019 for claimants whose family members were unable to work because of disability or old age. In October 2021, it was abolished for family members with annual salaries below KRW 100 Million (USD 84 000) and assets below KRW 900 Million (USD 755 000) (Ministry of Health and Welfare, 2021^[59]).

²¹ For instance, Spain took legislative measures to reduce the gaps in out-of-work support and contributions burdens between the self-employed and dependent employees (Royal Decree-Law 28/2018, of 28 December). France has also taken legislative measures to provide access to unemployment benefits for the self-employed: Starting in late 2019, France provided for up to 6 months of flat-rate unemployment benefits (EUR 800 per month) for jobseekers who become unemployed after at least two years of self-employment with earnings of at least 10 000 euro per year and subject to liquidation of the former business (MISSOC, 2021^[49]).

Figure 6. Shares of cash benefits in total household incomes

Selected countries, by entitlement criterion, at or before 2018/ 2019, in percent



Note: Working-age households. Countries are ranked by the share of working-age benefits in total gross household incomes. Benefits that are both contributory and means-tested (e.g. unemployment assistance in Austria) are shown in the “contributory” category.
 Source: OECD calculations using EU-SILC, GSOEP, HILDA and KLIPS survey data.

5.2. Social Protection gaps: standard vs. non-standard workers

52. In 4 of the 16 countries, both coverage and generosity gaps between standard and non-standard workers were statistically insignificant: Austria, Germany, Hungary and the United Kingdom. In Australia and Belgium, access gaps were statistically insignificant, and receipt probabilities were at around 70% or above for both the standard and non-standard vignettes. While results for France and Spain point to statistically significant gaps, with somewhat lower point estimate for the implied coverage for non-standard workers, receipt probabilities for both types of worker were also above 70%. As these eight countries follow very different social protection strategies, these results suggest that accessible support for non-standard workers is achievable with different targeting mechanisms. For instance, out-of-work support in Australia and the United Kingdom is flat-rate and largely means-tested (and therefore unrelated to previous employment and earnings). By contrast, Hungary and Belgium offer earnings-related unemployment protection to both standard and non-standard workers. A finding of small or insignificant gaps in the protection afforded to standard and non-standard workers in such a diverse set of countries is notable. For instance, it raises questions about recent prominent calls for a strong reliance on means-tested safety-net benefits, or for a universal basic income, that were sometimes motivated by concerns that insurance-based systems cannot provide effective protection for non-standard workers (World Bank, 2018^[35]; Gentilini et al., 2019^[36]; Browne and Immervoll, 2017^[37]).

53. In Hungary, non-standard workers, including the self-employed, are entitled to unemployment benefits (Albert, Gáspár and Gal, 2017^[38]). In Belgium, non-standard workers can qualify for unemployment insurance support though benefit amounts are much more generous than in Hungary, and benefits for self-employed workers in Belgium account also for household needs (De Wispelaere and Pacolet, 2017^[39]). In both countries, means-tested support provides further layers of protection for those not entitled to insurance benefits. Austria and Germany also combine a first-tier unemployment insurance system with a second layer of means-tested support. In France, a key explanation for the insignificant coverage gaps is the very short qualification period for unemployment benefits, paired with the possibility to retain unused

benefit entitlements for future out-of-work periods, and to cumulate benefit rights across successive out-of-work spells for the (large and growing number) of workers with short-duration employment contracts.²² Like Austria, Belgium and Germany, France also provides multi-layered income support that benefits workers across different types of non-standard employment (as well as others who may not qualify for first-tier insurance benefits).

54. Implied access gaps were largest in Korea, Portugal and Italy, where standard workers were between 50% (Italy, Portugal) and 100% (Korea) more likely than non-standard workers to receive income support following a job loss (Figure 5, Panel A, “past non-standard work”). Gaps were also large in Latvia, Lithuania and Estonia.

55. The example of Portugal, in particular, illustrates the need to consider effective access in addition to statutory entitlements: Portugal has one of the biggest access gaps of all considered countries, mostly driven by the low coverage of self-employed workers (see Section 5.3). This is despite unemployment benefits being open to owners of businesses and independent contractors with only one client (Perista and Baptista, 2017_[40]), see also Figure 2. But not all self-employed workers have access (e.g. unincorporated self-employed workers, or those working for more than one client), and the required contribution period for self-employed workers is twice as long as for employees. Self-employed workers also have legal access to cash sickness benefits, but the maximum entitlement period is one third of the duration for employees. For both reasons, effective access to cash support is reduced for self-employed workers in Portugal, even though they do have better statutory protection than in other countries (see Section 3).

56. Generosity gaps for non-standard workers were largest in Southern Europe (Portugal, Italy and Spain), exceeding 10% of median household income (Figure 5, Panel B). Estimated entitlements for non-standard workers were also significantly lower in Belgium, Korea and France. Reasons include part-time workers receiving lower benefits by design (see Section 3) and self-employed workers being excluded from unemployment insurance. Belgium, Korea and France all provide additional layers of targeted income support that benefits non-standard workers and others who may not qualify for first-tier insurance benefits, but these are typically lower than earnings-related income replacement benefits (De Wispelaere and Pacolet, 2017_[39]).^{23,24} By contrast, estimated support levels were statistically identical for the two types of workers in the United Kingdom, and even slightly higher for non-standard workers in Australia. Slightly higher benefit payments to non-standard workers are consistent with the means-tested nature of support in Australia, the fact that many benefit recipients in Australia are working, and the household incomes of self-employed workers tend to be lower than for dependent employees (Whiteford and Heron, 2018_[41]).

5.3. Social protection gaps: granular results

57. Statutory entitlement rules vary significantly across different types of non-standard work (Section 3). For many programmes, self-employed workers have no coverage at all, while part-time workers and those with interrupted / unstable work histories may suffer reduced effective access, because they fail to meet the required earnings or contribution histories. Results on the gaps between standard workers on one hand, and a heterogeneous group of all non-standard workers on the other may therefore mask

²² Responding to a steep increase in the number of “micro contracts” in France over the past 10 years, a 2021 reform reduced benefit generosity for those alternating repeatedly between short-duration employment and unemployment.

²³ Korea: see footnote 20. France: Although non-takeup remains significant for means-tested benefits (Castell et al., 2019_[57]), recipient numbers are comparatively high for these assistance benefits. See OECD SOCR database at www.oecd.org/social/recipients.htm.

²⁴ Korea introduced a new unemployment assistance programme in January 2021, and the ‘familial support obligation’ that acted as a barrier to access to its social assistance programme was mostly abolished in October 2021.

significant differences between some of them. Understanding these differences is necessary for designing tailored policy strategies for tackling unintended gaps. This section disentangles results for self-employed, part-time workers and those with unstable work patters.

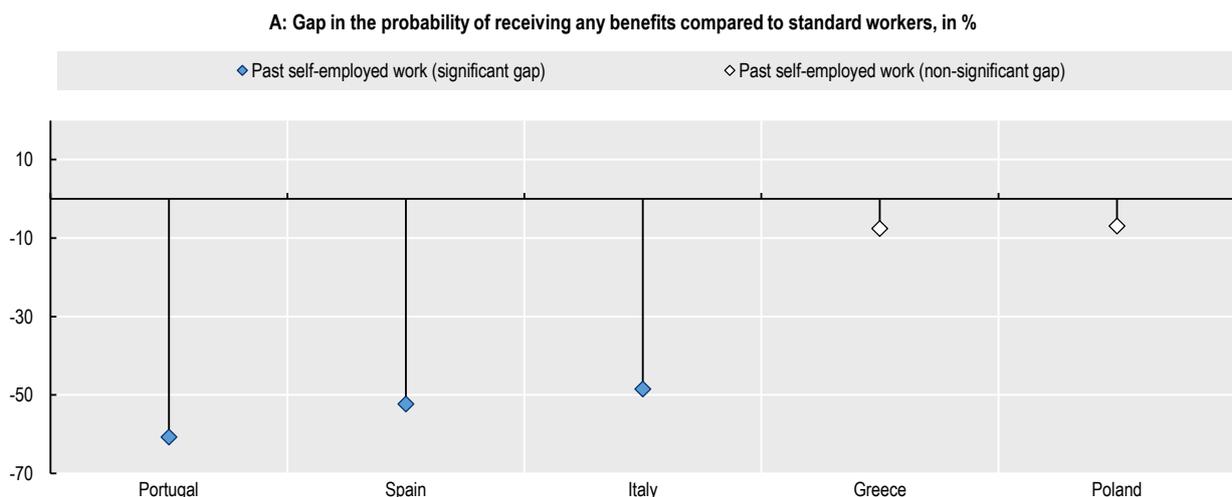
58. As noted above, the granular analysis is undertaken for a selected sub-group of countries where sample sizes allow such disaggregation (see [online Annex B](#)). We used 50 observations as the threshold for granular results by type of non-standard employment. The purpose of these granular results is to facilitate comparisons of support across different types of non-standard worker. We therefore report results for countries with 50 or more observations in at least two of the three relevant sub-categories of non-standard work, i.e., previously self-employed, working part-time or in unstable employment (in *year -2* and *-1*) and jobless in the reference period (*year 0*).²⁵

59. Results highlight that self-employed workers are typically least likely to receive support, while gaps are less common, and tend to be smaller, for part-time and unstable workers. Accessibility gaps for those with past self-employment were sizeable in three of the six countries considered: In Portugal, Spain and Italy, implied coverage gaps (the difference of estimated receipt probabilities between previous standard and self-employed workers) were around 50 percent (Figure 7). In Italy and Spain, self-employed workers did not have access to unemployment benefits, and in Portugal, access was incomplete (see Section 3). Self-employed workers thus had to rely on lower-tier income support such as social assistance and housing benefits, which typically feature strict eligibility requirements including income and asset tests, and are subject to significant non-take-up, lowering their effective reach. For instance, receipt of means-tested support was particularly low in a number of southern European countries (Hyee et al., 2020^[42]). Minimum-income benefits also tend to be less generous than insurance transfers.

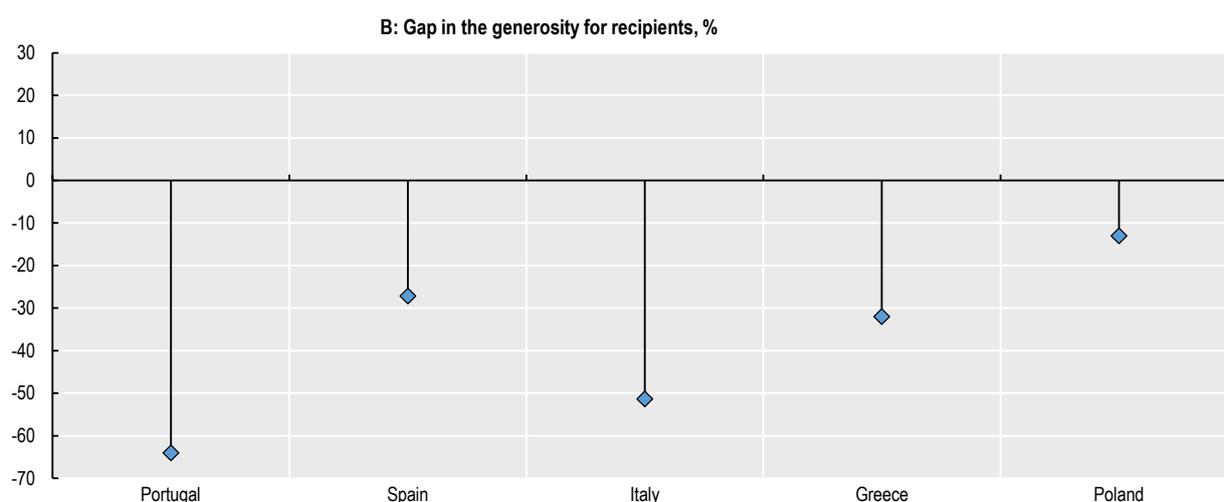
60. In Poland, self-employed workers could receive unemployment benefits, but only after a 90-day waiting period (compared to seven days for dependent employees). The benefit is not linked to previous earnings, which explains the small and insignificant gap between self-employed and standard workers in access, and the comparatively small gap in generosity (Chłoń-Domińczak, Sowa and Topińska, 2017^[43]).

Figure 7. Self-employed workers receive little out-of-work support in some countries

Difference in the overall support package: Standard vs self-employed workers, at or before 2018/2019



²⁵ Despite the exclusion of very small cell sizes, standard errors still “punish” moderate observation counts, such that gaps for some types of non-standard employment might not show up as statistically significant.



Note: Data refer to 2018 (Germany), 2016-2018 (pooled waves, other European countries) and 2019 (Australia and Korea). Statistical significance refers to the gaps between baseline and comparator cases (90% confidence interval). (Early) retirees and those who were in education or military service during the year before the reference period are excluded from the sample. Panel A: Difference in the probability of receiving any benefit payments between standard and self-employed workers, in % of the receipt probability of standard workers. Panel B: Difference in the generosity of payments, measured in percent of amounts received by standard workers.

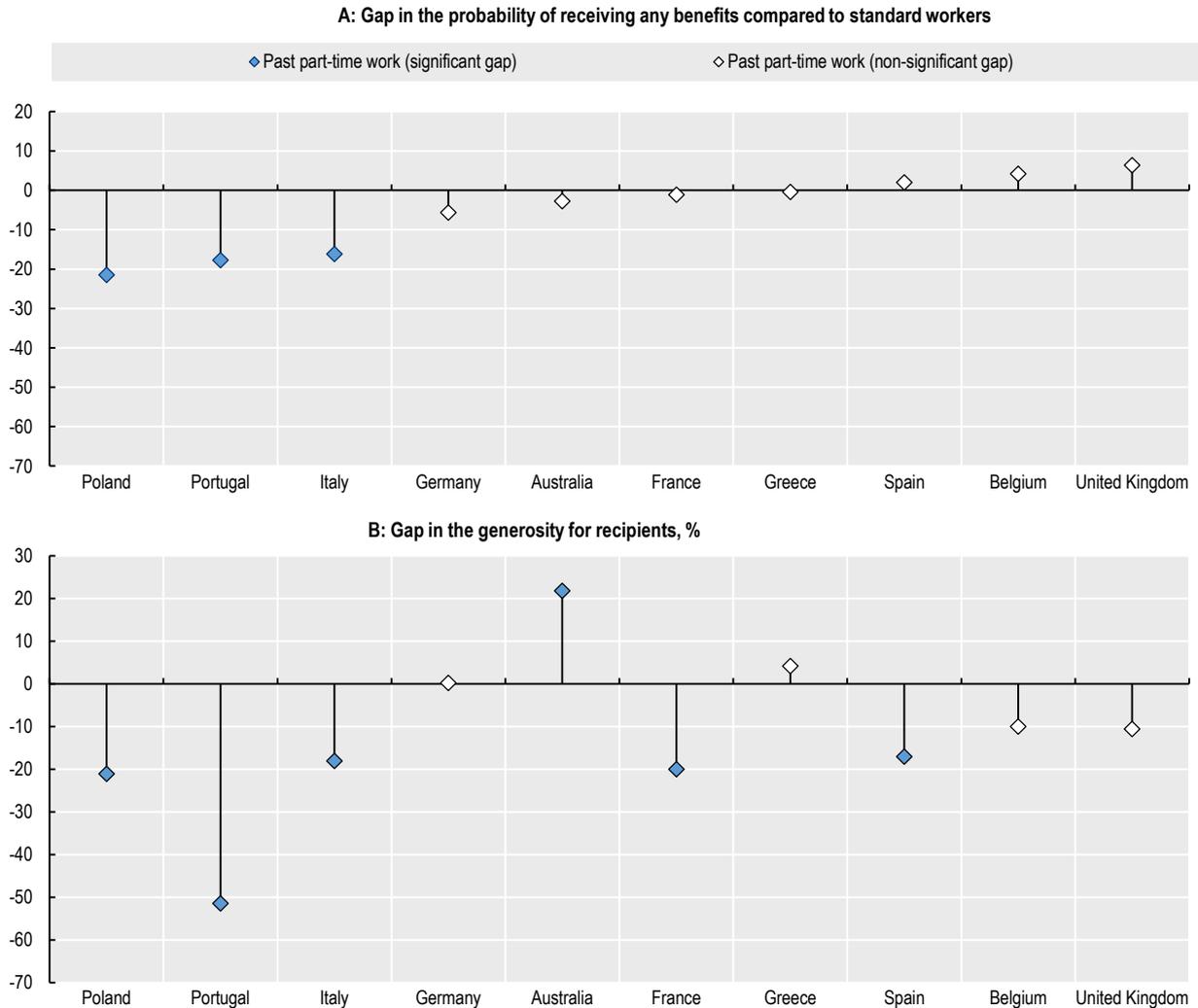
Standard worker: Able-bodied working-age adult who was out of work for at least six months during the reference period (year 0), worked mostly full-time prior to the reference period (years -1 and -2), was working without interruption throughout year -1, and for at least 10 months in year -2. Earnings prior to the reference period were at or above the 40th percentile of the national earnings distribution, and year 0 (equivalised) household income before any benefit payments is in the bottom 20% of the national distribution. No children under six years live in the household. Self-employed workers: an otherwise similar individual who, in year -1 and year -2, was self-employed for at least six months, with no out-of-work spell in year -1 and at most two months out of work in year -2.

Source: OECD calculations using EU-SILC panel data.

61. Access gaps for part-time workers were less common, in line with the statutory entitlement results (Section 3), affecting only three out of ten countries (Figure 8, Panel A). Benefit levels for part-time workers were significantly lower than for standard workers in six of the eleven countries considered, in line with the strong previous earnings link that shapes entitlements in many unemployment benefit programmes (Figure 8, Panel B). Gaps in levels were largest in Southern European countries where insurance-related benefits dominate. In Australia, and similar to the mechanism described in Section 5.2 above, somewhat higher benefit payments to those with previous part-time work likely reflects the importance of means-testing in combination with lower household incomes of households with (past) part-time work.

Figure 8. Part-time dependent employment: Comparatively good accessibility of out-of-work support, but lower entitlements than full-time employees

Difference in the overall support package: Standard vs part-time workers, at or before 2018/2019



Note: Data refer to 2018 (Germany), 2016-2018 (other European countries) and 2019 (Australia and Korea). Statistical significance refers to the gaps between baseline and comparator cases (90% confidence interval). (Early) retirees and those who were in education or military service during the year before the reference period are excluded from the sample. Panel A: difference in the probability of receiving any benefit payments between standard and part-time workers, in % of the receipt probability of standard workers. Panel B: difference in the generosity of payments, in percent of percent of the amounts received by standard workers.

Standard worker: Able-bodied working-age adult who was out of work for at least six months during the reference period (*year 0*), worked mostly full-time prior to the reference period (*years -1 and -2*), was working without interruption throughout *year -1*, and for at least 10 months in *year -2*. Earnings prior to the reference period were at or above the 40th percentile of the national earnings distribution, and *year 0* (equivalised) household income before any benefit payments is in the bottom 20% of the national distribution. No children under six years live in the household. Part-time worker: An otherwise similar individual who, in *year -1* worked at least six months part-time with no out-of-work spell and, in *year -2*, with at most two months out of work.

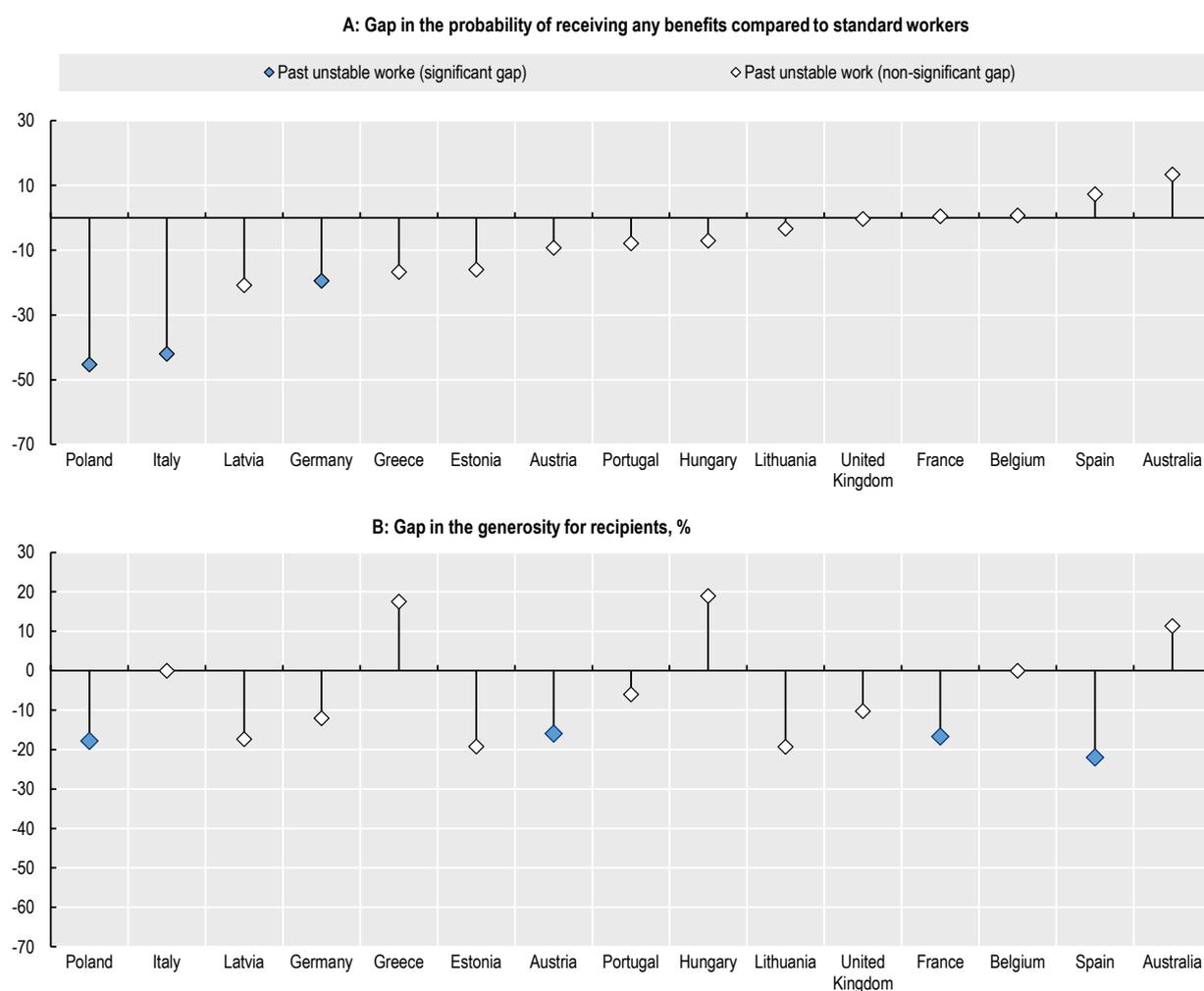
Source: OECD calculations using EU-SILC, GSOEP and HILDA panel data.

62. In Italy and Poland, those with interrupted work histories were less likely to receive out-of-work support than standard employees (Figure 9, Panel A). In some countries, workers can qualify for unemployment insurance support after comparatively short periods in work, e.g. three months in France,

(OECD, 2019_[11]). In Austria, qualification periods are shorter for workers with repeated unemployment spells (such as seasonal workers). And in some countries, jobseekers were able to keep unused unemployment benefit entitlements for future claims if they found work prior to benefit expiration, among them Australia, Austria, France, Spain and the UK (OECD, 2020_[13]). This is, however not the case in Latvia and Poland. In France, a recent reform in 2021 has reduced entitlements of workers with short contracts and repeated unemployment spells by taking out-of-work spells into account when assessing the earnings base for benefit entitlements.

Figure 9. Unstable dependent employment: Comparatively good out-of-work income protection in most countries

Difference in the overall support package: Standard vs unstable/interrupted work, at or before 2018/2019



Note: Data refer to 2018 (Germany), 2016-2018 (other European countries) and 2019 (Australia and Korea). Statistical significance refers to the gaps between baseline and comparator cases (90% confidence interval). (Early) retirees and those who were in education or military service during the year before the reference period are excluded from the sample. Panel A: difference in the probability of receiving any benefit payments between standard and unstable workers, in % of the receipt probability of standard workers... Panel B: difference in the generosity of payments, measured in percent of the amounts received by standard workers.

Standard worker: Able-bodied working-age adult who was out of work for at least six months during the reference period (year 0), worked mostly full-time prior to the reference period (years -1 and -2), was working without interruption throughout year -1, and for at least 10 months in year -2. Earnings prior to the reference period were at or above the 40th percentile of the national earnings distribution, and year 0 (equivalised) household income before any benefit payments is in the bottom 20% of the national distribution. No children under six years live in the household.

“Unstable / interrupted work patterns”: An otherwise similar individual who worked the entire year -1, but not more than five months either as full-time or part-time employee or as self-employed, and in year -2, was out of work at most five months, and otherwise transitioned between full- and/or part-time work and / or self-employment.

Source: OECD calculations using EU-SILC, GSOEP and HILDA panel data.

63. It should be noted that the gaps in Figure 9 were calculated assuming the same levels of past earnings for the different worker categories (see figure notes). This allows focussing the comparison on different employment patterns, rather than across earnings levels. Results therefore do not reflect accessibility issues that may exist for low-paid workers in particular, and gaps may be systematically larger for some of them. For instance, some countries require minimum earnings levels for employment to count towards unemployment insurance entitlements. As a result, accessing support can be more difficult for individuals with very short working hours or with frequent out-of-work periods in-between employment spells.

6 Social protection gaps: A challenge for individuals and for policy

64. Technological advances make alternative work arrangements a viable option for a growing share of jobs and provide opportunities for organising work through contractual arrangements that may bypass traditional employer-employee relationships. Legal safeguards and social protection provisions that were designed around traditional forms of employment may no longer apply to workers with "non-standard" contracts, or not to the same extent. This not only creates inequitable, and possibly regressive, treatment of workers based on their employment status but also erodes the effectiveness and financial sustainability of social protection provisions.

65. Accessing social protection can be especially difficult for workers in less secure forms of employment even though their need for support can be more urgent. Prior to the COVID-19 pandemic, workers engaged in independent work were 50-60% less likely to receive any form of income support during an out-of-work spell than standard employees in some countries (Portugal, Spain, Italy). For non-standard workers who do receive support, the level of benefits that are available during an out-of-work spell can be markedly lower than for standard employees (e.g. Italy, Korea, Portugal, Spain). Unless access gaps are closed, further increases in non-standard employment will have negative consequences for inclusiveness and equity.

66. Income support typically also serves as the main gateway to labour market reintegration measures, and tackling gaps in income support provisions is therefore key in this context as well (OECD, 2019^[11]). Comprehensive and tailored employment-support packages can be difficult to access for those in alternative work arrangements, reducing their chances of benefiting from the career opportunities that dynamic labour markets offer, and complicating efforts to facilitate and encourage labour-market reallocation at a scale that a successful “green transition” will require (Causa et al., forthcoming^[44]).

67. At the same time, a more fluid labour market with more options for when and how long to work creates more opportunities for acting on positive and negative incentives. This has significant implications for the scope of job-search and other behavioural requirements for benefit claimants, and for the design of tax-benefit systems more generally. For instance, governments should review whether benefit reforms that tackle benefit coverage gaps create a need to rebalance the demanding and supporting elements of existing rights-and-responsibilities frameworks. An emergence of alternative working arrangements, with additional scope for arranging work or earnings patterns in a way that is compatible with benefit receipt, calls for additional efforts to formulate and enforce clear and reasonable responsibilities for benefit recipients. Likewise, extending the scope of job-search responsibilities and provisions for active

participation in re-employment measures may be a necessary counter-weight to any extensions of benefit rights to previously uncovered groups, such as part-time unemployed, those with intermittent employment, or those who entered unemployment after periods of self-employment.

Concerns about the effectiveness of social support in the context of rapid job reallocation and a growth of alternative work arrangements are shared across much of the OECD area. Yet, results in this paper point to specific policy challenges that differ markedly between countries. Given countries' specific labour markets and institutions, a pursuit of generic policy prescriptions, such as a universal basic income or an exclusive reliance on last-resort safety nets, may be counter-productive as it can distract attention from positive reform steps that countries can take – or have already initiated – in the context of existing social protection strategies. Central social protection pillars, such as insurance or income-targeted assistance, can remain viable and effective, including for non-standard forms of employment, but they will need to keep adapting to new and changing risks.

7 Directions for future work

68. This paper presents a new empirical approach to quantify the accessibility and value of income transfers following a loss of employment and earnings. The aim is to facilitate meaningful like-for-like comparisons across labour-market groups and countries, as well as over time. The proposed method captures variations in the de-facto implementation of statutory entitlement rules, sidestepping the numerous problems of assessing and interpreting social protection gaps based on statutory rules alone. The resulting estimates are also more informative than raw empirical coverage rates, as they control for differences in the characteristics of non-standard workers across time and countries. Regular updates of the paper's estimates would allow monitoring the evolution of social protection gaps after the pandemic, as labour markets recover and as the future of work takes shape.

69. The empirical approach comes with stringent data requirements as income support entitlements are shaped by people's career trajectories and a multitude of individual and family circumstances. Capturing these links in a statistically reliable way requires comprehensive longitudinal data with sizeable samples. This paper illustrates the proposed approach using available longitudinal household surveys for 16 OECD countries.

70. A promising alternative data source for this type of analysis may be information drawn from administrative records with sufficiently detailed information on employment history and benefit receipt. As information requirements are substantial (cf. Figure 3), it is likely that some linking between data sources would be needed, in a way that ensures appropriate anonymization and confidentiality. Where this is feasible, the large observation numbers would make results statistically more powerful and enable more finely grained breakdowns of social protection gaps for different forms of non-standard work, including emerging ones (e.g. own-account work or platform work). It could also facilitate distinguishing support systems across different situations of joblessness or low work intensity (e.g. due to ill-health, maternity/paternity or care responsibilities).

71. Although an internationally comparable database of individual administrative records does not yet exist, there are initiatives for building such data sources for research purposes at the national or international level (OECD, 2021^[3]; OECD, 2018^[4]; European Commission, 2022^[5]). The approach presented in this paper illustrates one concrete future use of administrative data and, hence, the value that open data initiatives can bring in terms of highlighting policy challenges and informing countries' reform agendas.

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Annex A. Model specification and goodness of fit

Table A.1 below describes the variables that enter both models for benefit receipt and generosity. Key interaction terms are those between the monetary variables (current household income and previous earnings) and the characteristics that may affect the entitlements to and/or eligibility for specific benefit programmes. For instance, the household income interacts with the health status and the presence of young children.

It is important to note that the analysis in Section 5 defines “vignettes” by built around specific values of variables listed in Table A.1. This should not be confused with the estimation sample, where these variables are allowed to vary. A “vignette” is a device to facilitate the interpretation of model estimates: the vector of characteristics at which the margins of the model are evaluated. In the estimation sample, however, these characteristics necessarily vary. For example, “standard workers” who enter the estimation sample, may have been unemployed for up to two months in both year -1 and year -2 before the observation period. The individual represented by the vignettes in Section 5, however, worked during the entire year -1 and, therefore, had a recent employment/insurance history.

Table A.1. Description of the independent variables

	Definition	Content	Other comments
Household type	Household composition based on the number of adults and number of dependent children in the household	- One adult - Couple without children - Lone parent - Couple with children - 3+ adults no children - 3+ adults with children	
Gender	Gender	0 = male 1 = female	
Age	Age (in years)	Continuous variable ranging between 18 and 64	
Education	Highest education level achieved	- low (ISCED 0 – 2) - medium (ISCED 3 - 4) - high (ISCED 5+)	
Health limitations	If the person suffered from any limitations in daily activities because of health problems (both physical or mental)	- 0 = no - 1 = yes	Poor health is self-declared. Category 1 includes both ‘some and ‘strong’ limitations
Young children	Presence of children under the age of six the household	- 0 = no - 1 = yes	
Annual earnings during the calendar year immediately before the job loss	Percentiles of the earnings distribution	- 0 = no previous earnings - 1 = 1 st or 2 nd quintile of the earnings distribution - 2 = 3 rd , 4 th or 5 th quintile of the earnings distribution	The distribution of earnings includes all the working age individuals with a non-missing monthly activity in the sample.
Annual earnings in the two calendar years before the job loss	Percentiles of the earnings distribution	- 0 = no previous earnings - 1 = 1 st or 2 nd quintile of the earnings distribution - 2 = 3 rd , 4 th or 5 th quintile of the earnings distribution	The distribution of earnings includes all the working age individuals with a non-missing monthly activity in the sample.
Tenure status	Type of tenure for the main residence	1 = Outright owner 2 = Owner paying mortgage 3 = Tenant or subtenant paying rent	

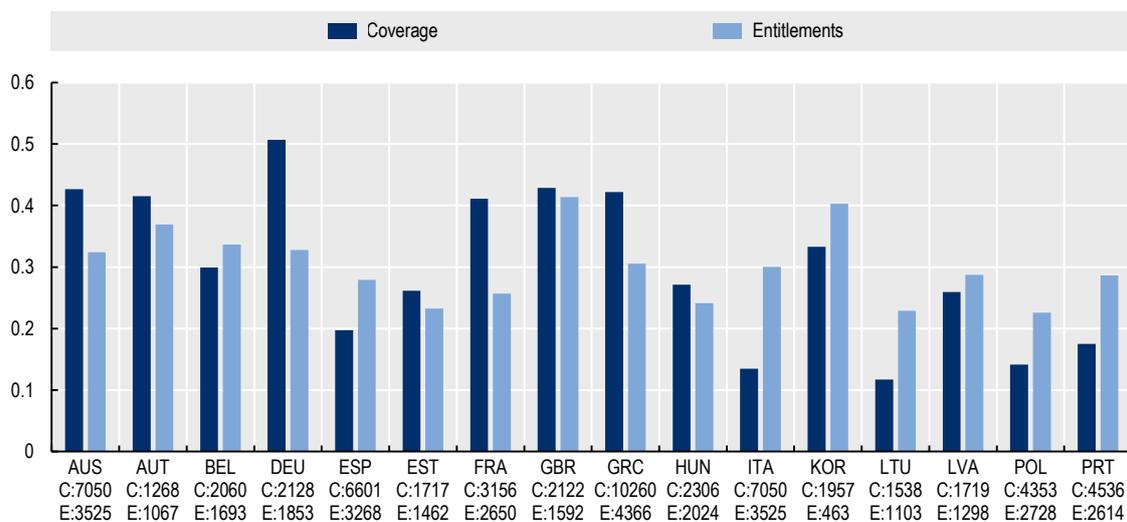
		4 = Accommodation rented at a reduced rate 5 = Accommodation provided free	
Rent paid	Amount of rent paid by tenants	Continuous variable	Expressed as % of the median disposable income in the population
Income before social transfers	Total disposable household income before social transfers during the reference year	- 1 = Quintile 1 - 2 = Quintile 2 - 3 = Quintile 3 - 4 = Quintile 4 - 5 = Quintile 5	Income equalized by the square root of the household size. The social transfers excluded are those that enter the dependent variable
Months spent out of work in the reference year*	Number of months spent out of work during the income reference year	Range between 7 and 12 months	The main activity status in each month of the reference year is self-declared.
Months spent out of work in the year before the reference year*	Number of months spent out of work in the year before the reference year	Range between 0 and 12 months	The main activity status in each month of the reference year is self-declared.
Main labour market status over the two years before the income reference year	Whether the person observed out of work during the reference year* was, during the two years before the reference year, a standard / non-standard worker, or was already out of work.**	1 – the person was a standard worker 2 – the person was a non-standard worker 3 – the person was already out of work	For the analysis of social protection gaps for different types of non-standard workers, category number 2 is broken down into three groups: part-timers, self-employed, and unstable jobs.

Notes: * Data refer to 2018 (Germany), 2016-2018 (pooled waves, other European countries) and 2019 (Australia and Korea).

** A person is defined to have been a “previous standard worker (full-time, dependent employee)”, “previous part-time worker” or “previously self-employed” if, in the years -1 and -2 before the reference year (that is, 2016 and 2017 for European countries and Korea, 2017 and 2018 for Australia), they were, respectively, a full-time dependent employee, a part-time dependent employee, or a self-employed worker for at least six months each during both year -1 and year -2, and out of work for at most two months in total during year -1 and year -2. Also workers who spent at least eight months during year -1 and at least 12 months overall during the two-year period in standard / part-time or self-employed work are categorised as such. An individual is defined to have been “previously out of work” if they were out of work for at least 16 months in total during year -1 and year -2, or who were out of work for at least 6 months each in both year -1 and year -2. An individual is categorised as a “previous unstable worker” if they do not fit either of the above categories. Individuals in this category worked in any one status (full-time, part-time, self-employed) for fewer than twelve months during the two-year period, but they were out-of-work for less than 16 months.

The explanatory variables that enter the regression models are able to explain a significant part of the variation of the dependent variables in most countries (Figure 10). Model fit is highest in Austria, Australia, Germany, Greece, France, Korea and the United Kingdom. For all these countries except Korea (where the value of unemployment benefits is very similar for most recipients, (OECD, 2018_[31])), the binary model for benefit receipt outperforms the model for benefit entitlements. In some countries with a more decentralized institutional setting for the delivery of social protection, such as Spain, Italy, Hungary and Poland, the goodness of fit is lower and the models predict better benefit entitlements than receipt.

Figure 10. Goodness of fit



Notes: Histograms show the values of the McFadden's pseudo R2 for the two regression models ("Coverage" and "Entitlements") by country. Values next to country names refer to the size of the estimation sample for the coverage ("C") and entitlements ("E") models. The McFadden's pseudo R2 can be interpreted as a goodness of fit measure for maximum likelihood models. It ranges between 0 and 1 (1 means perfect fit). The formula for this measure is $R2 = 1 - L1/L0$, where L1 is the log likelihood value for the fitted model and L0 is the log likelihood for the "null" model (fitted with only an intercept). With poor explanatory power, L0 and L1 are similar and the pseudo-R2 tends to zero.