



20ES15 - Implementing a new approach to the management of statistical and analytical information in the Spanish labour and social security administration

REFORM/IM2020/004

## Impact evaluation of the digital tool for employment counsellors in Spain: SEND@

Report on the design and implementation of an impact evaluation of the digital counselling tool for Spain's public employment services

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CONTRACT NO REFORM/IM2020/004

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Note by all the European Union Member States of the OECD and the European Union

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

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The current report is one of the main written outputs in the project "[Implementing a new approach to the management of statistical and analytical information in the Spanish labour and social security administration](#)" (Contract number REFORM/IM2020/004) that the OECD conducted together with the European Commission's Directorate-General for Structural Reform Support (DG-Reform), the Ministry of Labour and Social Economy and the Ministry of Inclusion, Social Security and Migrations (MISSM) through the [Structural Reform Support Programme \(SRSP\)](#).

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# Abbreviations

AI – Artificial Intelligence

ALMP – Active labour market policy

EC – European Commission

IT – Information technology

MISSM – Spanish Ministry of Inclusion, Social Security and Migrations

MITES – Spanish Ministry of Labour and Social Economy

PES – Public employment service

RCT – Randomised controlled trial

SEPE – Spanish national level public employment service, Servicio Público de Empleo Estatal

SISPE – IT system of SEPE

VDAB – Public employment service of Flanders (Belgium)

## Executive Summary

This report provides an overview of the design and results of a counterfactual impact evaluation of SEND@, a digital tool for employment counsellors developed by the Spanish public employment service (Servicio Público de Empleo Estatal, SEPE). The objective of the digital tool SEND@ evaluated in this report is to assist employment counsellors in guiding clients to job openings and/or active labour market policies (ALMPs) based on past outcomes amongst similar clients. Taking information on jobseekers who have successfully integrated to the labour market in the recent past, the digital tool displays the top occupations in which similar jobseekers found jobs as well as, if applicable, which ALMPs they participated in before becoming employed.

With SEND@, SEPE has developed an effective digital counselling tool that has positive effects on jobseekers' labour market outcomes. The impact evaluation finds that jobseekers counselled with SEND@ modify their job search behaviour and increase their participation in ALMPs. This mechanism translates into faster exits from unemployment into better quality jobs: individuals counselled with SEND@ are not only more likely to become employed and to enter into a permanent employment contract, but also to receive a boost to their career trajectories. SEND@'s recommendations which encourage jobseekers to look for jobs in more promising occupations appear to be effective: jobseekers counselled with SEND@ end up in better quality occupations relative to their target occupation compared to similar jobseekers who were not counselled with the tool. While SEND@ does have positive effects, the positive effects of SEND@ appear to be mostly transitory, lasting for some months for most outcomes examined. Furthermore, these results are not definitive and should not be interpreted as purely causal effects. Due to the challenges faced in the implementation of the randomised controlled trial (RCT), the evaluation uses a quasi-experimental approach (propensity score matching applied additionally to the data gathered within the RCT). This approach could not control for some important factors, possibly resulting in the estimated effects being overestimated.

In order to increase the positive effects of SEND@ and the digitalisation of employment services in Spain more generally, as well as improve evidence on digital tools and ALMPs, SEPE should consider the following actions:

### Improving the design of SEND@

- Consider fine-tuning SEND@ to minimise the risks of biased recommendations. For example, the user could have the option to switch off tailoring job search advice by variables that can be the cause of biases.
- Consider fine-tuning SEND@ by variables that are relevant to qualify for occupations (such as competencies and skills), as well as personal circumstances (such as possibility/acceptance to work on unsocial working hours or in shifts).
- Consider fine-tuning SEND@ design to make its recommendations more informative for the user. For example, the personalised labour market integration rates by occupations could be compared more explicitly with the average integration rates, and the user could have an option to choose the timeframe taken into account in SEND@'s recommendations.
- The Spanish authorities in charge of data in the Social Security register, SEPE and the respective ministries need to continue finding the technical and legal solutions to exchange wage data with

SEPE to be able to take the related indicators into account in SEND@ recommendations, improve services for jobseekers, as well as support generating better knowledge and evidence-based policy making more generally.

### **Ensuring that digital tools are useful, user-friendly and trustworthy**

- Develop (further) a digitalisation strategy to support the provision of employment services across Spain, outlining a comprehensive high-level vision of the digital infrastructure to support regional employment services, as well as jobseekers and employers directly. The digital strategy would help to prioritise investments in the different areas of the overall IT infrastructure and avoid developing a patchwork of tools, as well as enable making decisions on further developments regarding SEND@, its target user groups, functionalities, integration and complementarity to other tools.
- In fine-tuning and complementing SEND@ with other digital tools to support counselling and job matching services across Spain, SEPE could cooperate and learn from other countries which provide an inspiration on possible digital solutions.
- Develop a framework for thorough and systematic assessments of future digital tools throughout the development and adoption processes, as well as at the point of deployments and updates (and re-trainings in case of Artificial Intelligence (AI) tools). For guidelines and good practices in developing such an assessment and risk management system, particularly when moving towards the adoption of AI tools, SEPE could learn from Public Employment Services (PES) that have such systems in place, as well as align with the guidelines developed by the European Commission and the OECD.
- Consider conducting counterfactual impact evaluations similarly to the one presented in the current report as part of the assessment and risk management system of digital tools. In addition, impact evaluations should be complemented by process evaluations to assess whether the tool has been imbedded in the service provision processes as intended, and cost-benefit analyses to assess whether the tool generates net benefits taking into account its costs.

### **Encouraging the take-up of SEND@**

- Consider how to integrate SEND@ (and similar other digital tools) better in the counselling processes and technology. Provide guidelines for counsellors, such as on including SEND@ recommendations into Individual Action Plans and linking them to referrals to ALMPs. Consider how to integrate SEND@ with the user interfaces used by the employment counsellors (particularly in the Autonomous Communities supported digitally by SEPE) and the integration aspects in mind for future developments. The availability of user support needs to be maintained when the user groups would be extended.
- Continue with the plan to offer SEND@ for additional user groups, above all professional counsellors other than employment counsellors in regions. Opening SEND@ for an even wider use (such as jobseekers) might need some re-designing of the web application / smartphone application.
- Continue collecting feedback from SEND@ users, but collect information also from those counsellors that do not use SEND@ on what are the barriers to SEND@ adoption, for example via a survey or focus groups.
- Continue disseminating knowledge on SEND@, including the results of the current impact evaluation showing that SEND@ has positive effects on jobseekers' labour market outcomes.



**Generating good evidence on SEND@, digital tools and ALMPs more generally**

- Take anticipated implementation and data-sharing challenges into account when designing future RCTs. Given that implementing an RCT involves considerable coordination and monitoring efforts, design RCTs in a way that minimises additional data reporting requirements or involves excessive coordination costs.
- Continue improving data exchange between national level registers and the registers of Autonomous Communities, and consider additional possibilities for linking administrative and survey data. Such data exchange can be useful to support future evaluations through a wider array of interventions to be evaluated, a richer set of outcomes to be examined and the possibility to conduct detailed cost-benefit analyses.

# 1 Introduction

This report provides an overview of the design and results of a counterfactual impact evaluation of SEND@, a digital tool for employment counsellors developed by the Spanish public employment service, SEPE, within the Ministry of Labour and Social Economy (MITES). The report and the evaluation activities described in the report aim to equip SEPE and MITES with theoretical knowledge and practical example in designing and conducting a counterfactual impact evaluation, particularly via a randomised controlled trial framework. This first-hand knowledge contributes to the capacity in MITES and SEPE to either regularly carry out impact evaluations in the future or to outsource them to third parties. In addition, the report aims to provide further understanding of the effectiveness of the digital tool, and evidence to guide its fine-tuning and the future plans of SEPE regarding its use.

The current report is one of the main written outputs in the project "[Implementing a new approach to the management of statistical and analytical information in the Spanish labour and social security administration](#)" (Contract number REFORM/IM2020/004) that the OECD conducts together with the European Commission's Directorate-General for Structural Reform Support (DG-Reform), MITES and the Spanish Ministry of Inclusion, Social Security and Migrations (MISSM) through the [Structural Reform Support Programme \(SRSP\)](#). The overall objective of the project is to contribute to institutional, administrative and growth-sustaining structural reforms in Spain. The specific objective of this project is to support the efforts of Spanish authorities to define and implement appropriate processes and methodologies by taking into account good practices of and lessons learned by other countries in addressing similar situations. This project and the current report build extensively on the work done on the preceding OECD project funded by DG Reform ([Contract number SRSS/S2019/036](#)) which mapped the rich administrative data collected by the Spanish authorities and outlined a roadmap for implementing an impact evaluation framework.

The objective of the digital tool SEND@ evaluated in this report is to assist employment counsellors in guiding clients to job openings and/or ALMPs based on past outcomes amongst similar clients. The digital tool displays participation rates in ALMPs and shares of top occupations for jobseekers who have successfully integrated to the labour market. The figures are calculated for sub-groups of jobseekers using administrative data in SEPE, i.e. the digital tool is not based on counterfactual impact evaluations. The counterfactual impact evaluation described in the current report evaluates whether this information on ALMP participation rates and top occupations provided by the tool supports the counsellors in helping jobseekers achieve better labour market outcomes. The evaluation is based on a randomised controlled trial that ran from July 2021 until December 2021.

The next chapter provides a description of SEND@, discusses its key features, data use and methodology, and makes suggestions for future developments of digital tools in SEPE learning from similar experiences in other countries. The following two chapters describe the impact evaluation methodology and the evaluation results respectively. The final chapter makes recommendations for SEND@ implementation and future counterfactual impact evaluations in SEPE, based on the impact evaluation presented in the current report.

## 2 Overview of SEND@

This chapter gives an overview of the digital tool SEND@ that SEPE developed to support employment counsellors across Spain. The chapter discusses SEND@'s key features, the data and methodology it uses and possibilities to develop it further, as well as complement it with other digital tools, drawing from experience in other countries. The chapter also discusses the importance of evaluating the impact of digital tools to fully understand their value added, as well as implementing rigorous assessment frameworks to ensure adopting trustworthy digital tools.

### 2.1. SEND@ aims to support professional counsellors

As a response to the increased need to provide evidence-based individualised services to jobseekers, SEPE developed a digital tool called SEND@ in 2019-20 to support employment counsellors in the Autonomous Communities in Spain. SEND@ aims to provide tailored labour market insights on job search and employment opportunities that employment counsellors can rely on when advising jobseekers on labour market integration pathways. SEND@ has not been designed to replace the knowledge and experience of employment counsellors, but only to provide statistical information for the counsellors to support their work. The tool has been designed to support professional counsellors (above all employment counsellors, but potentially also career counsellors, case workers working with vulnerable groups in municipalities and non-governmental organisations - NGOs) and is not meant to be used by jobseekers directly.

Taking into account the personal data of the jobseeker, SEND@ provides guidance on occupations with better employment prospects, and potential ALMPs (above all training programmes) needed to improve the employment prospects. As the labour market needs changed significantly during the COVID-19 pandemic, an additional set of guidance was developed in SEND@ to account for the particular circumstances, above all by displaying recommendations considering only short-term trends in the labour market.

SEND@ is set up as an independent web application (Web App) where an authorised user (employment counsellor) can log in and launch a query for labour market advice by inserting the ID number of the jobseeker. As a result of the query, SEND@ displays tailored labour market advice on four dashboard pages (Figure 2.1). The employment counsellor can use the dashboard to discuss with the jobseeker the potential job search strategies, career choices and training needs, but as the application is not integrated with the (regional) user interfaces that enable employment counsellors to manage their jobseeker portfolios, it is not possible to make referrals to vacancies or adjust individual action plans directly via SEND@. Nevertheless, as SEND@ pulls data from the national register of jobseekers (SISPE), the counsellor does not need to insert any additional data in SEND@ to get the tailored outputs.

Figure 2.1. SEND@ provides tailored labour market advice in four dashboard pages

Examples of the four pages of the SEND@ dashboard

**Statistics by requested occupation**

- Situation and evolution of labour demand.
- Most requested jobs** by jobseekers with the same work experience / requested occupations / similar training.

**Evolución demanda de empleo y contratos de trabajo**

Datos Nacionales | Datos por Comunidad Autónoma | Anual | Mensual

Demandas por ocupación solicitada

**Training needs by requested occupation**

Training needs for the occupations requested by the jobseeker detected by the SEPE Occupational Observatory, in addition to those with better prospects in the labour market.

4309 - Empleados administrativos sin tareas de atención al público no clasificados bajo otros epígrafes

Fuente: Observatorio de las Ocupaciones del SEPE. Año: 2020

Necesidades formativas detectadas en competencias técnico / profesionales

| Necesidades formativas                                  | Tipo    |
|---|---------|
| Habilidades sociales en la atención al ciudadano.       | GENERAL |
| Materias de prevención.                                 | GENERAL |
| Gestión de documentación judicial. Archivos judiciales. | GENERAL |
| Gestión de salas de vistas.                             | GENERAL |
| Aplicaciones informáticas en el ámbito de la justicia.  | GENERAL |
| Actualización legislativa                               | GENERAL |

**Guidance for jobseekers**

Improvement of employability based on statistical evidence from past periods. This section identifies changes in occupations that have improved the employability of groups of jobseekers with similar characteristics.

Las siguientes variables han sido utilizadas para calcular las orientaciones:

|  |                            |
|--|----------------------------|
| Género: Mujer  | Idiomas: Nivel Bajo        |
| Nivel Formativo de Intermediación: Secundarios           | Edad: 40-49                |
| Ámbito de búsqueda: Ámbito estatal y Ámbito estatal p... | Comunidad Autónoma: MADRID |

Para promover la inserción laboral:

Inserción

En relación a la ocupación a solicitar

Se han encontrado 13564 personas con un perfil similar en cuanto a su Idiomas, Género, Edad y Comunidad Autónoma.

Las ocupaciones en las que más se emplearon las personas que mejoraron su inserción son las siguientes:

|   |                             |  |
|---|-----------------------------|--|
| 9210 - Personal de limpieza de oficinas, hoteles... | 9100 - Empleados domésticos | 4500 - Empleados administrativos con tareas de atención... |
| 13,61%  | 7,34%                       | 6,56%  |

**Post COVID-19 Guidance for jobseekers**

This section addresses labour market integration statistics over the pandemic situation only.

Las siguientes variables han sido utilizadas para calcular las orientaciones:

|  |                            |
|--|----------------------------|
| Género: Mujer  | Idiomas: Nivel Bajo        |
| Nivel Formativo de Intermediación: Secundarios           | Edad: 40-49                |
| Ámbito de búsqueda: Ámbito estatal y Ámbito estatal p... | Comunidad Autónoma: MADRID |

Para promover la inserción laboral:

Orientaciones Post Covid-19

En relación a la ocupación a solicitar

Se han encontrado 5453 personas con un perfil similar en cuanto a su Idiomas, Género, Edad y Comunidad Autónoma.

Las ocupaciones en las que más se emplearon las personas que mejoraron su inserción son las siguientes:

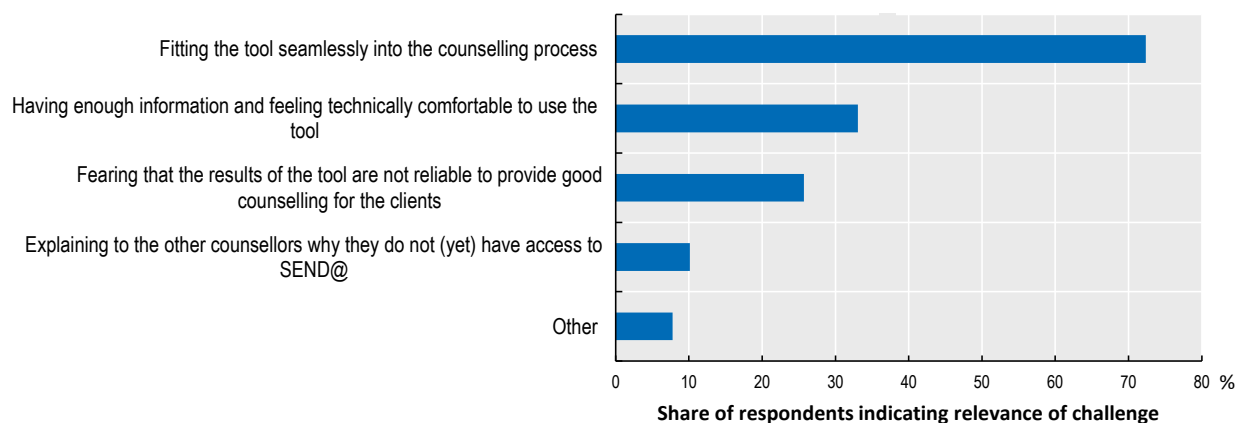
|  |  |  |
|--|--|--|
| 9210 - Personal de limpieza de oficinas, hoteles...        | 9100 - Empleados domésticos                                | 4424 - Teleoperadores                    |
| 18,28%   | 7,92%  | 5,34%                                    |
| 4500 - Empleados administrativos con tareas de atención... | 4309 - Empleados administrativos sin tareas de atención... | 5220 - Vendedores en tiendas y almacenes |
| 4,38%  | 3,94%  | 3,36%                                    |

Source: Servicio Público de Empleo Estatal (SEPE)

However, integration of digital tools within the overall IT infrastructure can be important to ensure user-friendliness of the tools and efficiency of the counselling process. The concerns over the possibilities to fit SEND@ seamlessly in the counselling process was also by far the top concern of the employment counsellors when the tool was about to be adopted first time by a wider group of counsellors for trial (Figure 2.2, see the discussion about the trial in Chapter 3).

**Figure 2.2. The concerns over fitting SEND@ seamlessly in the counselling process was a top concern when the first counsellors started using it**

What do you foresee will be the biggest challenges in implementing the SEND@ trial?



Note: The multiple-choice poll question “What do you foresee will be the biggest challenges in implementing the SEND@ trial?” was answered by 257 participants.

Source: Results of a pop-up poll during a capacity building webinar with SEPE and employment counsellors from the Autonomous Communities on April 14, 2021.

In order to support the take-up of SEND@ or other digital tools for employment counsellors in the future, SEPE could consider how to integrate these tools better in the counselling processes and technology. As SEPE is supporting ten out of the seventeen Autonomous Communities with the digital platform more generally, it would be more straightforward to integrate such tools with the main user interfaces for employment counsellors in these cases. In the other seven regions, integration of digital tools relies on the cooperation between SEPE and the regional authorities (technologically different options exist to integrate such tools to a higher or lesser extent). Furthermore, seamless integration of such tools within the counselling process requires guidelines and training for employment counsellors that go beyond introducing the technical features and algorithms of the tools. Although SEPE cannot make mandatory guidelines for the employment counsellors in the Autonomous Communities, it can make suggestions on how SEND@ could feed into the discussions on appropriate labour market integration pathways and the drawing up of the individual action plans, that could inspire employment counsellors to use such tool efficiently and effectively.

Further plans for SEND@ in 2022-23 include extending the access to the tool for other counsellors beyond employment counsellors in the offices of public employment services in the Autonomous Communities, such as counsellors supporting social and labour market integration of vulnerable groups in the municipalities and by NGOs. In addition to the web application, SEND@ would become available as a smartphone application. Extending the use cases for SEND@ is reasonable as it can generate further value added without significant additional cost. Nevertheless, it is important in this case to continue providing guidelines (for example accessible in the application) and ensure intuitiveness of the application as training all users by SEPE would potentially become too burdensome. Furthermore, SEPE can consider making SEND@ accessible to jobseekers/citizens directly. While user authentication to fully implement data protection regulation might be cumbersome in these cases, the application could function by asking the necessary key variables from the user to personalise labour market advice (without necessarily logging/collecting the inserted data). In such a case, the intuitiveness and user-friendliness of the application and the display of the results becomes even more critical. For example, the application could

provide results on job search and target occupations, but potentially not advise on ALMPs, for which the needs should be discussed and agreed upon with employment counsellors in the employment offices.

## 2.2. Data and methodology used in SEND@ have scope for further fine-tuning

SEND@ assists employment counsellors in guiding clients to job openings and/or ALMPs based on past outcomes amongst similar clients, i.e. individually tailored statistics using administrative data. The data on the characteristics of the jobseekers (both to calculate the historic outcomes, as well as to tailor the results when using SEND@ in counselling), come from the national administrative database of jobseekers called SISPE managed by SEPE. The data on jobseekers in SISPE are received via interfaces with operational databases of the Autonomous Communities (i.e. originally inserted by employment counsellors). Nevertheless the time lag between data collection and their availability for use in SEND@ is minimal (i.e. SEND@ uses near-live data). The data on employment outcomes comes from the Social Security database (affiliation) and the database of SISPE on employment contracts.

Although technically SEND@ is set up to be able to use a large set of variables and even from different data sources to tailor labour market advice, the current set of variables is somewhat limited. Labour market advice for jobseekers is currently tailored by age, gender, place of residence, educational attainment, language skills, geographical area of job search and employment history (occupations and duration), and in the future potentially also by digital skills.

On the one hand, the set of data to tailor labour market advice could be extended to ensure that the insights are provided based on credibly comparable other jobseekers, possibly even with Big Data on job search behaviour if SEND@ was to be opened for jobseekers and linked with other job search tools. On the other hand, the current (and potentially extended) list of data has a risk of intensifying gaps and biases on the labour market. For example, as labour market advice is dependent currently on gender, SEND@ has the risk of suggesting those occupations to females that have been historically more likely to have been occupied by women, but which do not necessarily take full advantage of the skills women possess or provide job and life quality these jobseekers could achieve. To overcome these risks, the user could have the option to switch off tailoring job search advice by variables that that can be the cause of biases (such as gender and age).<sup>1</sup> Furthermore, labour market advice could be further fine-tuned by variables that are relevant to qualify for occupations (such as competencies and skills), as well as personal circumstances (such as possibility/acceptance to work on unsocial working hours or in shifts). As an example, the Flemish (Belgium) public employment service (VDAB) has recently developed a digital tool called [Oriënt](#) for career and job search advice that relies entirely on jobseeker's interests and preferences, rather than jobseeker background information that can more easily lead to biases.

The data on labour market outcomes are used in SEND@ to calculate indicators on labour market integration, employment duration (number of days in employment) and job sustainability. As SEPE does not currently have access to wage data in the register of Social Security, it has not been possible to complement labour market advice using indicators of labour income. SEPE, MITES and MISSM need to continue finding the technical and legal solutions to exchange these data to be able to improve services for jobseekers, as well as support generating better knowledge and evidence-based policy making.

SEND@ recommendations are based on statistics on labour market outcomes by occupations (and variables used to tailor the advice) within the last 24, 12 and four months; statistics of vacancies and target

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<sup>1</sup> Another potential cause biases in SEND@ could be the variable for language skills. Nevertheless, language skills can be also relevant to be able to perform certain occupations, while gender and age not. To minimise a threat of a bias based language skills that can indicate nationality and migratory background, the variable on language skills should not distinguish between native speakers and others, but rather whether the person as proficiency to use the language in work or not.

occupations of jobseekers over time; and training needs by occupations (based on mapping done by SEPE, not quantitative labour market data). A planned future feature is the integration of available training options for specific jobseekers within the SEND@ tool. SEND@ does not use AI algorithms or other types of advanced analytics. The statistics used by the tool are updated manually (i.e. new statistical input are not generated automatically using near-live data). To ensure that the labour market advice by SEND@ is considering up to date labour market information, the generation of statistics used by the tool could be made automatic. In addition, instead of static thresholds of statistics on outcomes, the user could have the option to flexibly decide how long labour market history to take into account (implementation of such feature could be facilitated if SEND@ calculated the underlying statistics automatically).

A big plus in SEND@ methodology is that the recommendations are presented in relatively simple terms and are intuitive to understand. The downside of the current methodology in SEND@ is that the recommendations are not set in a relative context. Occupations that are very common on the labour market can show up as top recommendations across many different jobseeker profiles, somewhat irrespectively whether these occupations are particularly good options for the specific profiles compared to other jobseekers. To fine-tune SEND@, SEPE could consider highlighting the relative aspects more explicitly in the SEND@ dashboard. For example, simply depicting the “average recommendations across jobseekers” next to the tailored recommendations.

### 2.3. Opportunities for SEPE to further harness digitalisation to support the provision of employment services

While AI is currently not being used in the SEND@ tool, SEPE is planning to continue enhancing digital support for employment counsellors, jobseekers and employers, including exploring ways to benefit from AI technology. For example, SEPE is already working on an AI application that will be helping better tailor training programmes to match labour demand. Specifically, the AI tool SEPE is developing examines job openings posted within specific Autonomous Communities, both via the PES platform and on private job posting platforms. Within these job postings, the AI tool analyses the skills and competencies required, offering guidance on the types of training that should be provided.

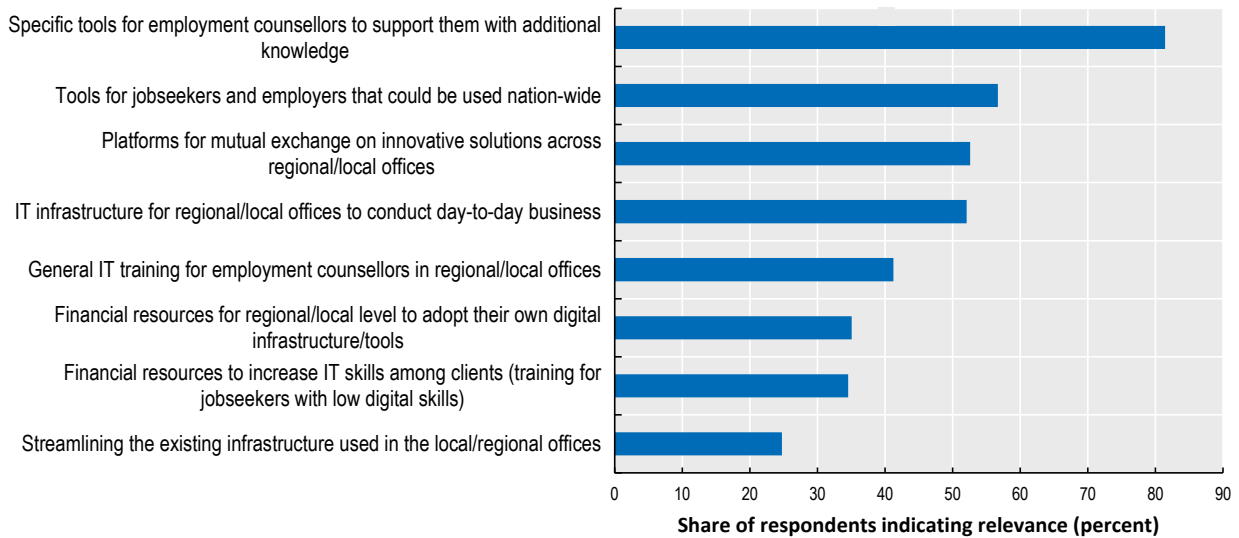
Indeed, public employment offices in the Autonomous Communities are looking forward to new and augmented digital tools developed by SEPE to support the work of employment counsellors, but also assist jobseekers and employers. Over 80% of participants in a webinar organised in October 2021 for employment counsellors in Spain considered specific digital tools for employment counsellors as a key element in supporting sub-national PES offices (Figure 2.3). Over half of the participants thought that providing tools for jobseekers and employers, platforms for mutual exchange across sub-national offices, as well as the general backbone of the IT infrastructure would be crucial as well. A webinar targeting a similar audience in December 2021 confirmed that indeed the key expectations for support concern SEND@, its potential extensions and complementing tools for counselling, whereas tools for interacting with jobseekers digitally come close second, but support with self-service tools for job-seekers is of less priority for the regional employment services.<sup>2</sup>

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<sup>2</sup> The single-choice poll question “Which type of digital tools do you think would be most helpful and necessary in the future?” was answered by 115 participants in a webinar for SEPE and regional employment services on December 16.

**Figure 2.3. Autonomous Communities are highly interested on digital tools to be developed by SEPE to support employment counsellors, jobseekers and employers**

Opinions of the webinar participants on the responsibilities of SEPE



Note: The multiple-choice poll question “What should the national level public employment services provide the regional/local level with to support digital transformation?” was answered by 194 participants, mostly staff from regional public employment services in Spain.

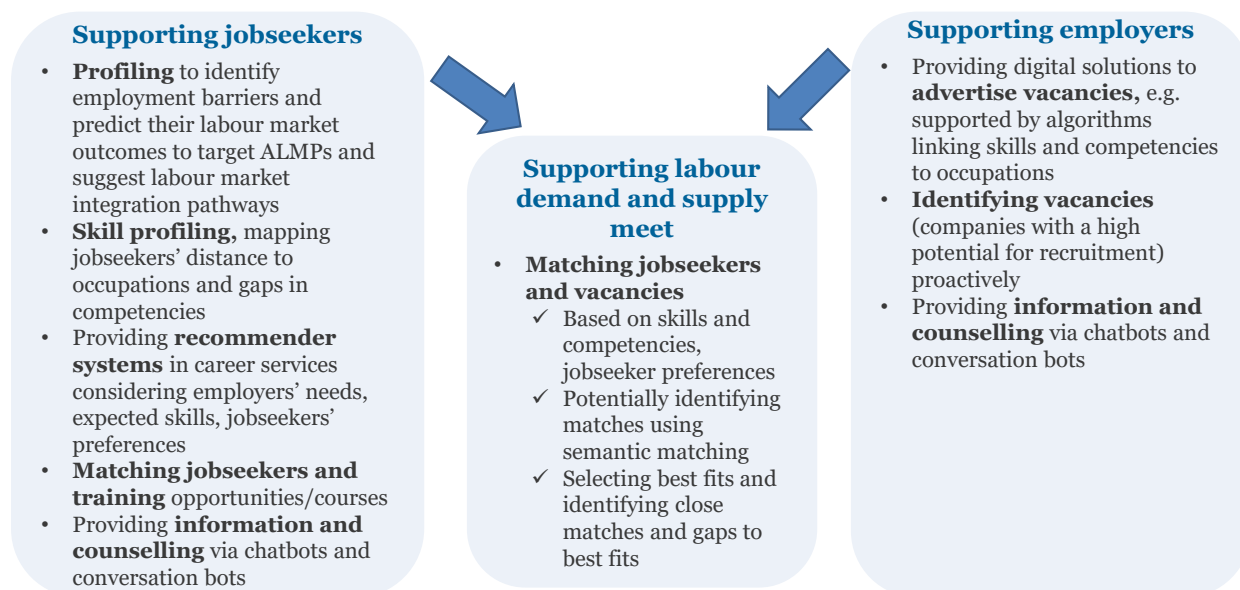
Source: Results of a pop-up poll during a workshop with SEPE and employment counsellors on October 25, 2021.

In fine-tuning and complementing SEND@ to support counselling and job matching services across Spain, recent examples from other countries can provide a lot of inspiration on possible digital solutions. Spurred on by the unprecedented challenges of the COVID 19 pandemic, public employment services across the OECD have accelerated digitalisation to improve the effectiveness and efficiency of their processes and services (OECD, 2022<sup>[11]</sup>). In addition to modernising the existing digital infrastructure and digitalising additional processes, employment services are investing increasing efforts in adopting advanced analytics and AI, particularly regarding tools for profiling jobseekers, identifying skill gaps and matching jobseekers and vacancies.

While employment services have many ways to improve their counselling and job matching services, supporting jobseekers find good jobs and employers find the employees they need should be the focal end goal of the different tools (Figure 2.4). Hence, the different tools need to be comprehensive (and sufficiently integrated with each other) to support the full process of helping labour demand and supply meet. The digital solutions need to be comprehensive also across user groups to maximise their potential effects. For example, a tool for matching jobseekers and vacancies is relevant for employment counsellors, jobseekers and employers, although the user interfaces and functionalities could differ (employment counsellors need to use the tool during the counselling process, jobseekers when looking for a job, and employers when uploading vacancies and looking for employees).



Figure 2.4. Digital tools to provide counselling and job matching services



Note: The figure outlines examples for digital tools that are specific to counselling and job matching. These tools should be complementing (integrated with) the core digital infrastructure, above all the operational IT system (operational database and user interfaces).  
Source: OECD Secretariat.

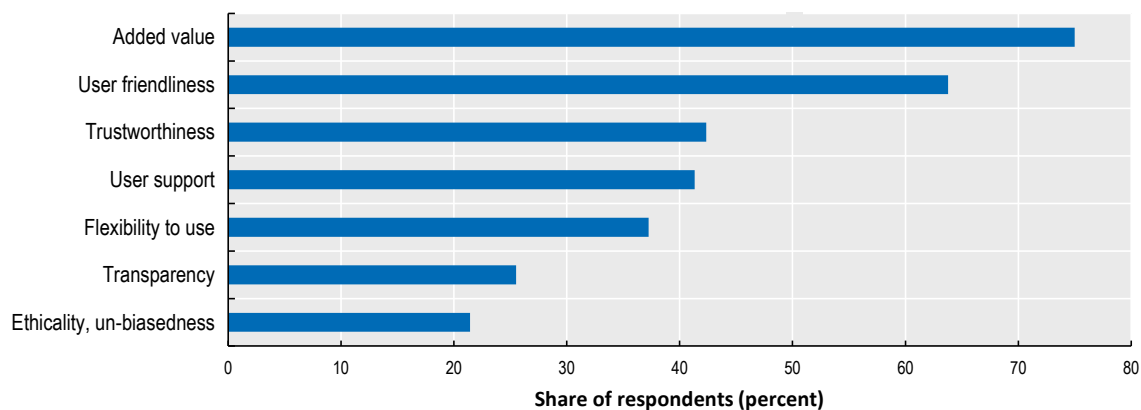
In proceeding with harnessing digitalisation to improve employment services, SEPE needs to (further) develop a digitalisation strategy to support the provision of employment services across Spain. A digitalisation strategy needs to outline a comprehensive high-level vision of the digital infrastructure to support regional employment services, as well as jobseekers and employers directly. The digital strategy would help to prioritise investments in the different areas of the overall IT infrastructure and avoid developing a patchwork of tools. A strategy should also enable SEPE to make decisions on further developments regarding SEND@, such as whether SEND@ should have in the future additional functionalities (or should these functionalities be developed within other tools), whether SEND@ should have links to other tools (such as to match jobseekers and actual vacancies based on SEND@ recommendations) or whether SEND@ could be tailored to additional user groups.

## 2.4. SEND@ is a good example of end-user involvement in the development process and thorough testing and evaluation before full roll-out

Digitalisation cannot be an objective of its own, as digital solutions only improve the provision of employment services if they are fulfilling their objectives well and are adopted by the users. The added value generated by a tool is critical determining whether a digital tool would be actually used by employment counsellors in Spain, closely followed by user-friendliness (Figure 2.5). To ensure that digital tools provide value for the users and are user-friendly, it is key to involve users throughout the adoption process – in the exploration phase, experimentation phase, as well as after the deployment – to collect their insights and feedback enabling to fine-tune the design.

## Figure 2.5. Added value and user friendliness are key to determine the take-up of digital tools by employment counsellors

Key features of digital tools, on the opinion of employment counsellors (webinar participants) in Spain



Note: The multiple-choice poll question “Which features are most important for you when using digital tools in your work?” was answered by 196 webinar participants.

The following definitions were used in the poll: Added value – the tool provides additional knowledge or efficiency; User friendliness – the tool is intuitive and easy to use; Trustworthiness – the tool is well tested and established; User support – training opportunities, I know whom to contact if questions; Flexibility – I can customise how to use the tool; Transparency – I know how the tool works, how the data are used; Ethicality, un-biasedness – the tool does not misuse data, does not discriminate.

Source: Results of a pop-up poll during a workshop with SEPE and employment counsellors on October 25, 2021.

The development process of SEND@ involved continuous communication with employment counsellors for their expertise, assessments and feedback. Employment counsellors from the Autonomous Communities were involved in the early stages in 2019, when the preliminary data analysis was carried out and the conceptual and functional forms of the tool were decided (Figure 2.6). In 2020, a pilot of two months with 25 employment counsellors from five Autonomous Communities was delivered and then up-scaled piloting of another two months with 100 counsellors from all 17 Autonomous Communities was conducted. While these pilots enabled the collection of rich qualitative information for SEPE to fine-tune the digital tool, they did not yet involve a quantitative evaluation of the tool’s impact on clients’ labour market outcomes.

## Figure 2.6. Phases of developing Send@ before full roll-out



Source: Inputs from SEPE and the OECD Secretariat.

Collecting user feedback is critical to fine-tune the design and improve the performance of a digital tool, but this information does not fully enable to understand how well does a tool fulfil its ultimate objectives, what are the effects on the users and other groups affected by the tool or whether the value added generated by the tool cover its cost of adoption process and deployment. Counterfactual impact evaluations are necessary to establish whether a specific digital tool meant to support the provision of employment services, also helps to provide more effective support to jobseekers and employers in practice. The key aim of counterfactual impact evaluations is to establish a causal link between an intervention (support via the tool) and labour market outcomes (see a detailed explanation of this concept in Chapter 3). Counterfactual impact evaluations

Counterfactual impact evaluations should be complemented by process evaluations to assess whether the tool has been imbedded in the service provision processes as intended, and cost-benefit analyses to assess whether the tool generates net benefits taking into account its costs (OECD, 2020<sup>[2]</sup>). For some IT developments, such as more general changes in the PES operational IT system or data management, only the latter types of evaluations are feasible, as the main objective of the new developments might be PES efficiency rather than effectiveness, and a counterfactual impact evaluation would not be applicable (OECD, 2022<sup>[11]</sup>).

To design an appropriate evaluation and monitoring framework for SEND@, SEPE requested support from the European Commission (EC) and the OECD via the EC's Technical Support Instrument. Already during the initial stages of SEND@ development, SEPE identified the need to rigorously evaluate the impact of the tool. Generating the evidence on the effects of the digital tool would not only support further fine-tuning of the tool (e.g. understanding better which groups of jobseekers and counsellors benefit from the tool the most), but also support achieving additional buy-in from the potential end-users. Since the end of 2020, the OECD and EC have supported SEPE to design and implement an RCT, and build SEPE's capacity to start conducting counterfactual impact evaluations systematically across ALMPs, including PES tools and activities. The next chapters (Chapters 3 to 5) give an overview of the evaluation process, methodology and results.

## 2.5. Developing trustworthy digital tools needs systematic risk management

Ensuring sustainable deployment of a digital tool and avoiding negative effects on people and the society requires attention to a wide range of features. While the added value for clients and users needs to be focal when deciding to develop a new digital tool, other features like un-biasedness, ethicality and transparency need to be paid attention to throughout the adoption process, and the development process needs to be stopped when some of the key criteria cannot be met. The risks of negative effects can occur when developing any digital tool, but are exacerbated when the methodology of the digital tool becomes more sophisticated, such as integrating AI algorithms.

While this report presents the evaluation results of SEND@ demonstrating its value added (see the next chapters), also other features of SEND@ should be thoroughly assessed. As highlighted earlier on in this chapter (Section 2.2), the current design of SEND@ might not provide the best possible insights to jobseekers considering potential biases on the labour market in terms of gender and age. Furthermore, thorough assessments of future digital tools needs to become systematic in SEPE already in the early stages of development, as well as at the point of deployments and updates (and re-trainings in case of AI tools). For guidelines and good practices in developing such an assessment and risk management system, particularly when moving towards the adoption of AI tools, SEPE could learn from PES that have such systems in place. For example, the French PES (Pôle emploi) that recently launched its own "Charter for an ethical use of AI" (Pôle Emploi, 2022<sup>[3]</sup>). The Flemish PES (VDAB) has developed a Model Risk Management framework for AI tools and in addition checks systematically each of its AI tools in terms of potential biases arising from seven sources – Conception flaws, Design issues, Data bias, Model bias, Execution issues, Communication failures, Operational bias (Scheerlinck, 2020<sup>[4]</sup>). Furthermore, the OECD Recommendation on AI provides comprehensive guidelines for AI tools (OECD, 2019<sup>[5]</sup>) and the European Commission has proposed requirements for trustworthy high-risk AI systems, which include AI systems in the field of employment services (European Commission, 2021<sup>[6]</sup>), see Figure 2.7.

**Figure 2.7. Several resources are available for SEPE to develop a framework of good principles for new digital tools**

Proposals by the European Commission and the OECD to develop trustworthy AI

|   |   |
|---|---|
| <p><b>The proposal of the European Commission concerning obligations of high-risk AI systems before they can be put on the market:</b></p> <ul style="list-style-type: none"> <li>• Adequate <b>risk assessment and mitigation</b> systems;</li> <li>• <b>High quality of the datasets</b> feeding the system to minimise risks and discriminatory outcomes;</li> <li>• <b>Logging</b> of activity to ensure traceability of results;</li> <li>• <b>Detailed documentation</b> providing all information necessary on the system and its purpose for authorities to assess its compliance;</li> <li>• Clear and adequate <b>information to the user</b>;</li> <li>• Appropriate <b>human oversight</b> measures to minimise risk;</li> <li>• High level of <b>robustness, security and accuracy</b>.</li> </ul> | <p><b>OECD principles for trustworthy AI</b></p> <ul style="list-style-type: none"> <li>• <b>Inclusive growth, sustainable development and well-being</b> - pursuit of beneficial outcomes for people and the planet;</li> <li>• <b>Human-centred values and fairness</b> - respect the rule of law, human rights and democratic values; mechanisms and safeguards;</li> <li>• <b>Transparency and explainability</b> - transparency and responsible disclosure regarding AI systems;</li> <li>• <b>Robustness, security and safety</b> - function appropriately and not pose unreasonable safety risk; ensure traceability, including in relation to datasets, processes and decisions made during the AI system lifecycle; systematic risk management approach to each phase of the AI system lifecycle on a continuous basis to address risks related to AI systems, including privacy, digital security, safety and bias.</li> <li>• <b>Accountability</b> - AI actors should be accountable for the proper functioning of AI systems and for the respect of the above principles, based on their roles and the context.</li> </ul> |
|---|---|

Source: European Commission (2021<sup>[6]</sup>), Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (artificial intelligence act) and amending certain Union legislative acts. OECD (2019<sup>[5]</sup>), Recommendation of the Council on Artificial Intelligence.

# 3 Evaluation design and implementation

This chapter discusses how the SEND@ impact evaluation was designed and implemented. It first outlines why counterfactual impact evaluation techniques are needed to identify the precise effect of a policy, and how the impact evaluation proposed to measure these effects by randomly assigning counsellors into treatment or control groups. It then reviews the challenges encountered during the trial's implementation, which involved coordinating SEND@ usage with 17 Autonomous Communities. This is followed by a discussion of how nearest-neighbour propensity score matching was used to account for the differing composition of the treatment and control groups in the original realised sample. The chapter concludes with a description of the outcome variables used in the evaluation.

## 3.1. The evaluation design envisioned a randomised controlled trial

This section first discusses the importance of using counterfactual techniques to evaluate the merits of a policy or intervention. It then discusses how the SEND@ evaluation was originally intended to measure treatment effects through a randomised controlled trial.

### ***3.1.1. Disentangling the precise effect of a policy requires applying counterfactual impact evaluation techniques***

Is a policy or programme effective in helping jobseekers? When faced with such a question, policymakers often turn to key performance indicators – job placement rates, participant satisfaction – or rely on anecdotal evidence based on feedback from staff or jobseekers. Both of these sources of information can play an important role in assessing the relative merits of a policy. For example, key performance indicators can be invaluable in deciding whether the performance of a certain provider of ALMPs has improved over time, or whether one provider is outperforming another. Similarly, subjective feedback can help provide a nuanced view of the benefits and drawbacks of a certain policy, as well as concrete suggestions for improvements. At the same time, however, both of these approaches cannot provide a rigorous answer to the question of what would have happened to individuals in the absence of the policy (“the counterfactual”). This can make it difficult to determine whether the benefits of a given policy can justify its costs – including the implicit costs from forgone opportunities.

To see why understanding the counterfactual is important for evaluating a policy, consider a hypothetical example of a classroom-based training programme for young jobseekers. Suppose that this intensive training programme lasts for two months and that jobseekers can enrol in the limited spaces available on a first-come, first-serve basis. Suppose also that six months after finishing the programme, 20% of jobseekers have become employed – and that this compares favourably to the 10% employment rate of young jobseekers who were not in the programme.

Can this hypothetical programme be judged to have been effective? In other words, would the programme participants also have had a lower job-finding rate if they had not undergone the training? The answer

depends critically on what the outcomes of the participants would have been in the absence of their inclusion in the programme. Are the young jobseekers who did not undergo training similar in terms of observable characteristics, such as their educational status, occupational skills or barriers to employment? Are they similar in terms of less easily observable characteristics, such as their motivation to find a job? Given that entry into the limited spaces in the programme was on a first-come, first-serve basis, it is likely that those who entered the training programme were more motivated or better informed than those who did not. In addition to differing on their observable characteristics, this also makes it likely that both groups differed systematically in terms of less easily observable characteristics.

Given the above considerations, it is quite possible that the training programme had no effect. In that case, the jobseekers undergoing the training would have experienced similar job-finding rates even if they had not undergone the training. Given that they were more motivated, if they had not entered the training, the programme participants could have spent the first two months intensively searching for a job. Perhaps some even received job-offers while undergoing the training, but turned them down to complete their training. Note that this does not mean that the training is not useful: the bottom line is we do not have enough information to decide.

### ***3.1.2. The SEND@ impact evaluation was designed as an Randomised Controlled Trial with counsellors assigned into treatment or control groups***

In an impact evaluation, the policy or programme to be evaluated are referred to as treatments and the group of participants is called the treatment group. The estimated impact is called the treatment effect. Individuals who are not subject to treatment – but who can otherwise be considered comparable to those in the treatment group – are called the control group. This terminology is adopted from the medical sciences, which also provide much of the methodological basis for evaluations in the social sciences.

The SEND@ impact evaluation was designed as an RCT. RCTs involve randomly assigning individuals into treatment or control groups before a treatment starts and is one of the most effective ways to accurately measure the effect of a policy. When the treatment group and control group are assigned at random from the same eligible population, both groups have the same characteristics before the treatment on average. In the case of the SEND@ tool, the randomisation procedure intended to ensure that both the treatment and the control groups of jobseekers would be directly comparable. The only systematic difference would have been that one group has been subjected to treatment while the other was not. Consequently, a simple comparison of average outcomes in the two groups would have yielded accurate estimates of the impact of the intervention on the outcome of interest.

In the case of the SEND@ digital counselling tool, the treatment group was comprised of jobseekers who were counselled by counsellors with access to SEND@. As discussed in greater detail in Section 2.1, the SEND@ tool makes suggestions about job search and training based on observed historical outcomes – job-finding rates, job-retention rates – of similar clients in the past. The “treatment group” of jobseekers thus benefited from better-informed counselling guidance from the counsellors. For the treatment group, suggestions for training or job-search took into account the client-specific suggestions provided by the digital counselling tool. Jobseekers in the control group, by contrast, were subject to the regular counselling guidance (without access to the additional information provided by SEND@).

#### *Minimum necessary sample size calculations*

The first step in designing an RCT is to assess how big the sample size needs to be in order to detect the effects if in fact such effects do exist. Samples are always subject to a random component, but increasing the sample size can diminish the significance of this problem in practice. This question can be addressed in two ways: (1) How large does the evaluation sample need to be in order to provide reliable estimates of a given expected programme impact? (2) How large does the programme impact have to be in order to be detectable with a given sample size? The key rationale is to determine whether the eligible group is

sufficiently large to detect the expected impacts. In case the treatment is assumed to deliver comparatively small (true) impacts, a larger sample size is required to ensure that the evaluation can reliably detect even potentially small impacts.

In the case of the SEND@ tool, OECD estimates based on the experience with similar evaluations in the past indicate that a relatively large sample of counsellors and a trial period running for at least several months were necessary in order to detect any possible effects. While the precise minimum sample size depends crucially on several assumptions – including the magnitude of SEND@ tool's actual effect – a sample size of approximately one thousand counsellors with the trial running for six months was deemed sufficient to detect an effect. These estimates are based on calculated effect sizes of comparable treatments from empirical studies in other countries (for example, examining the effect of decreasing counsellor caseloads to provide more intensive counselling to clients). Having a sufficiently long trial period increases the number of counsellor-client meetings, which also increases the likelihood of detecting the actual effects.

*A randomised block design was employed to improve the precision and representativeness of the estimates*

Even though randomising treatment is in principle a comparatively straightforward approach, many aspects in the practical implementation can lead to incorrect results. These challenges represent a threat to the internal validity of the evaluation, meaning that the evaluation may not provide an accurate estimate of the counterfactual through a valid comparison group. Identifying the various risks that can lead to distorted impact estimates often requires a good understanding of the programme design and implementation. Therefore, RCTs need to be designed and implemented carefully, considering all the practical aspects relevant for the programme.

In the case of the SEND@ tool, the randomisation of jobseekers into treatment or control groups was done indirectly, by randomising the jobseekers' counsellors. Even though the outcomes examined in the evaluation are at the level of the individual jobseeker (see Section 3.4.1), randomisation was conducted at the level of the counsellor. If a counsellor was given access to the tool, they were able to use it for all of their clients. Similarly, if a counsellor was *not* given access to the tool, they were not be able to use it for any of their clients. The reasons for such an arrangement instead of the alternative – selectively giving counsellors access for specific clients – were twofold. First, from a technical point of view, it would have been impractical to implement a randomisation on the jobseeker level. Second, it would have potentially subjected individuals in the control group to treatment: counsellors could have applied knowledge gained by using the tool to clients who were not supposed to have been subject to treatment.

While randomly assigning counsellors into treatment and control groups ensures that any observed systematic differences in labour market outcomes of the jobseekers can be directly attributable to the digital counselling tool, augmenting the random assignment with stratification can improve the precision and richness of the analysis. Stratified random sampling involves purposefully including balanced numbers of individuals with certain observed characteristics (e.g. gender) in both the treatment and control groups. It can improve the precision of the results because balancing the proportion of treated and untreated units has the effect of maximising the sample size for which meaningful comparisons can be made: such comparisons are best done when similar individuals are observed in both the treatment and control groups. Furthermore, an analysis based on a stratified sample is more likely to provide more nuanced results. If, for example, the usefulness of the SEND@ tool varies based on the counsellor's experience, ensuring sufficient numbers of counsellors across levels of experience in both the treatment and control group will make it more likely that such an effect can be discerned.

In the case of the SEND@ evaluation, the randomisation was conducted on a subset of all the counsellors. This was done due to the additional data reporting burden associated with participating in the trial, as each of the 17 Autonomous Communities had to provide SEPE with *ad hoc* data on counsellor attributes.

Ultimately, 987 counsellors were included in the trial, to be included in either the treatment or control groups. The following steps were taken to conduct the assignment into treatment and control groups.

- ▶ Step 1. Deciding on the relative importance of the stratification variables

The first step involved deciding on the ordering of the variables along which stratification was to be conducted. Note that this step was important because it was not possible to have precisely the same number of counsellors with the exact same characteristics along all of the stratification dimensions.

The OECD suggested the following ordering of the stratification variables (with the most important variable listed first, followed by the second most important variable, etc.):

- i. Autonomous Community
- ii. Counsellors' customer profile (youth counsellor, older workers, general, etc.)
- iii. Counsellor's years of experience (categorised to 3 groups)
- iv. Counsellor's gender
- v. Rural/city area
- vi. Counsellor's education

The above ordering was intended to guarantee that an equal number counsellors within each Autonomous Community were assigned into the treatment and control groups (+/- 1 counsellor in case of an odd number of counsellors). Within the second variable in the ordering – that is, within a given customer profile – it was likely that a similar number were assigned into treatment and control groups (but not guaranteed). Going further down the list, it was increasingly less likely that there were enough counsellors within each block to assign equal numbers into treatment and control groups. However, there were still be a roughly equal numbers of counsellors in treatment and control groups in total.

For the subsequent impact evaluation, the ordering of these variables was important because it is easier to make meaningful comparisons of effects across the variables that are balanced within through the stratification process. For example, given the above ordering, it is more likely that it is possible to detect differences in the usefulness of the SEND@ tool based on counsellors' customer profiles than across counsellors' education.

- ▶ Step 2. Generating a randomly generated number for each counsellor and sort accordingly

This involved first generating a random number for each individual counsellor and then arranging the data so that they are grouped by the most important stratification variable first; within this variable, that they are then arranged by the second most important variable; and so forth along all the stratification variables. As a last step, within each of the "blocks" of data defined by the stratification variables, the data should be sorted according to the randomly-generated number.

- ▶ Step 3. Generating pairwise combinations within blocks and splitting pairs into treatment/control groups

Within each block – where a block is defined as a combination of the stratification variables – generate pairs of counsellors from the sorted data. Within each pair, assign one counsellor into the treatment and the other into the control group.

- ▶ Step 4. Assigning non-paired counsellors into treatment or control groups

Given the large number of stratification dimensions and the presence of blocks with odd numbers of counsellors, the above algorithm likely results in non-paired counsellors that still need to be assigned into either the treatment or the control group. For such cases, individual counsellors were assigned counsellors into either the treatment or the control groups with equal probability based solely on their randomly generated number.



- Step 5. Checking whether balancing properties are satisfied (optional but recommended)

Stratifying along a large number of dimensions can result in many blocks with a small number of observations. This can offset the potential benefits of stratification and may result in an unbalanced panel. For this reason, as a final step, the OECD checked whether the proportions of counsellors along each of the stratification variables were balanced (i.e., represented in roughly equal proportions). In the end, several clusters were imbalanced and appropriate corrections were made based on this feedback.

It is important to note that the process of randomly assigning counsellors into treatment and control groups was done via pseudonymised identifiers which maintained the confidentiality of the counsellors. The variables necessary for the stratification did not include characteristics with which individual counsellors could be readily identified.

### 3.2. The trial's implementation encountered several challenges

Following the randomisation procedure, the next step was to train the counsellors who were in the treatment group on the use of the tool. This training was conducted by SEPE and involved coordinating with each of the Public Employment Services of the 17 Autonomous Communities, each of whom is responsible for administering employment services in their respective Autonomous Communities. Following this training, counsellors began using the tool with their clients beginning in July 2021. The trial period ran for six months, through the end of December 2021. Figure 3.1 provides an overview of the timeline for the design and implementation of the trial.

**Figure 3.1. The trial timeline took into account the time necessary for the counsellors to use the tool with all their clients and for the clients to enter ALMPs**

Steps in designing and implementing the RCT



Prior to implementing the trial, two important potential factors were identified to have the potential to undermine a successful implementation of the trial.

- **Compliance with assigned treatment or control group.** In the case of the SEND@ tool, one potential type of non-compliance entails having counsellors who have been given access to the tool decide not to use it. Another potential type of non-compliance involves the comparison group, in case individuals in the control group are able to self-select into treatment. In the case of the SEND@ tool, this could occur if counsellors who were not supposed to have access to the tool nevertheless used it or still reaped its benefits, e.g. via conversations with colleagues who did have access.
- **Ethical considerations.** In the case of the SEND@ tool, counsellors assigned into the control group may consider it unfair that they have not been given access to the tool. As a result, they may conceivably alter their behaviour as a result of being excluded from the programme. Conversely, counsellors in the treatment group may also conceivably consider their

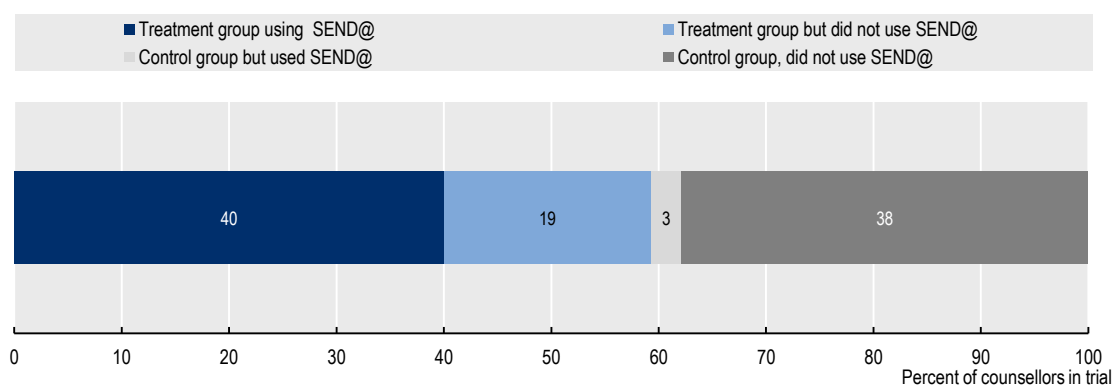
assignment to be unfair (for example, viewing it as increasing their workload during an already stressful period). They may thus also modify their behaviour as a direct result. As a result, estimates of the effects of the tool obtained during the trial period would differ from those that could be expected from a full-scale rollout.

In implementing the trial, SEPE, the OECD and the EC took steps to mitigate these factors. Most prominently, they conducted a series of capacity-building seminars with the counsellors in the Autonomous Communities. These provided counsellors in the treatment group information on the usefulness of the SEND@ tool and emphasized that their participation was crucial for the evaluation to be valid. Attention was paid to ethical concerns as well, with counsellors provided with information on the underlying rationale for such trials. Counsellors were made aware that assigning them into treatment and control groups is the best way to reliably estimate the effects of the SEND@ tool. The seminars emphasised that by being part of such trials, staff were providing an invaluable contribution to determining which policies work and which could be improved. Furthermore, the seminars discussed how making informed, evidence-based decisions on policies ultimately benefits a wide array of stakeholders

Despite the steps taken, non-compliance with the assignment into the treatment or control group nevertheless turned out to be a considerable challenge. The list of counsellors who were to be given access to SEND@ was communicated to the PES of the Autonomous Communities, but the implementation of the tool's usage was at the discretion of each individual Autonomous Community. As shown in Figure 3.2, a large majority of counsellors acted consistently with their assignment into the treatment or control groups. However, 22 percent of counsellors did not: 19 percent of counsellor trial participants were counsellors in the treatment group who did *not* use SEND@, and 3 percent were counsellors assigned to the control group who did use SEND@. Out of the total 987 counsellors in either the treatment or control groups, 218 did not comply with their assigned treatment status.

**Figure 3.2. Some counsellors in treatment group did not use SEND@ while some in control group did**

SEND@ usage by counsellors based on whether they were assigned into treatment or control groups



Note: Usage statistics refer to usage during the period from July-December 2021. Statistics refer to the 987 counsellors who were assigned into either the treatment or control groups.

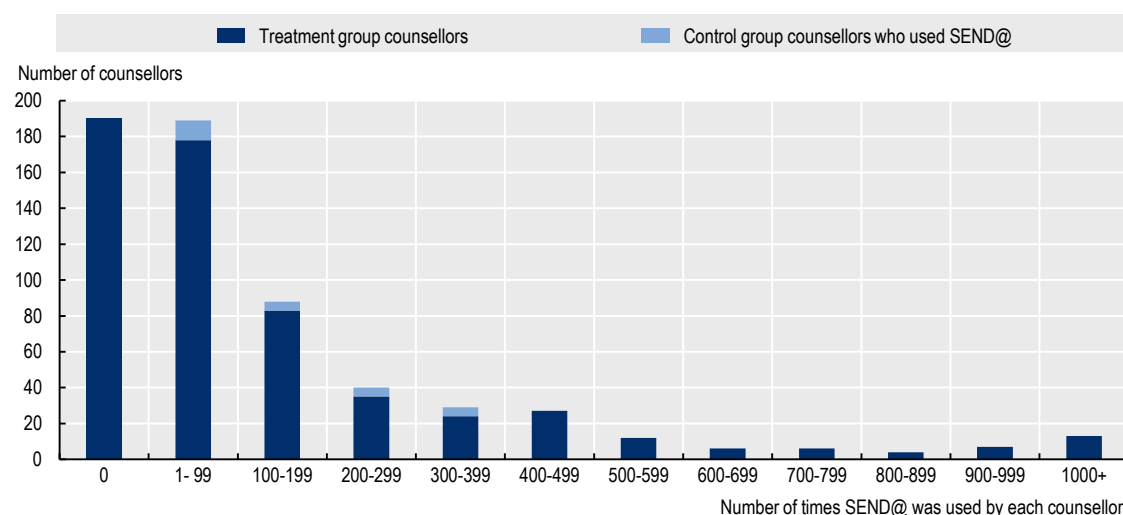
Source: OECD calculations based on SEPE data.

One additional challenge relating to measuring treatment effects relates to the wide variation in SEND@ usage rates across counsellors (Figure 3.3). Counsellors varied considerably in how much they used SEND@, with some counsellors using it over one thousand times during the July-December 2021 period, but the majority using it less frequently. Of the 585 counsellors assigned into the treatment group, 32.5% never used SEND@ during the period, 30.4% used it between 1-99 times, and 37.4% used it at least 100

times. While some of the differences in usage rates may reflect differences in the number of jobseekers counselled by each individual counsellors, much of the differences are likely to reflect differences in compliance rates. Such differences would not be as problematic if data on all counsellor-client meetings for these counsellors were available, as they would then permit “intent-to-treat” estimates to be calculated.

**Figure 3.3. SEND@ usage rates varied across counsellors**

Distribution of SEND@ usage rates for counsellors assigned to treatment group and control group using SEND@



Note: Usage statistics refer to usage during the period from July-December 2021. The counsellor is the unit of observation.  
Source: OECD calculations based on SEPE data.

Examining the patterns of SEND@ usage by counsellor attributes shows considerable differences in uptake and frequency of usage (Table 3.1). Women counsellors tended to use SEND@ considerably more than men, with both higher shares of women in the treatment group using SEND@ at least once (69%) and a higher average number of times using SEND@. Counsellors with intermediate levels of experience were more likely to use SEND@ compared to both their less and more experienced colleagues, but among the least experienced counsellors who did use it, they used it the most frequently. Counsellors working with specific client groups, such as the long-term unemployed, were considerably less likely to use SEND@. While the reasons for this should be explored in greater detail, it may be tied to perceptions on the usefulness of SEND@’s recommendations for their specific clients’ circumstances. Higher levels of education were associated with lower rates of SEND@ usage: while the uptake rates were only slightly lower among counsellors with at least university education, the usage rates were considerably lower.

**Table 3.1. SEND@ usage varied across counsellor’s attributes**

Share of counsellors using SEND@ and average number of times SEND@ was used for counsellors in treatment group

| Counsellor attributes                  | Share of counsellors using SEND@ | Average Number of times SEND@ was used |
|--|----------------------------------|--|
| <b>Gender</b>                          |                                  |  |
| Women                                  | 69%                              | 168                                    |
| Men                                    | 61%                              | 143                                    |
| <b>Years of Counselling Experience</b> |                                  |  |

|                                      |            |            |
|--------------------------------------|------------|------------|
| Less than 5                          | 71%        | 188        |
| Between 5 and 10                     | 78%        | 186        |
| More than 10                         | 63%        | 131        |
| <b>Client Group</b>                  |            |            |
| General                              | 73%        | 179        |
| Specific (e.g. long-term unemployed) | 53%        | 120        |
| <b>Education</b>                     |            |            |
| University education or higher       | 64%        | 99         |
| Less than University education       | 68%        | 170        |
| <b>Geographic Area</b>               |            |            |
| Rural                                | 66%        | 160        |
| Urban                                | 70%        | 166        |
| <b>Total</b>                         | <b>68%</b> | <b>163</b> |

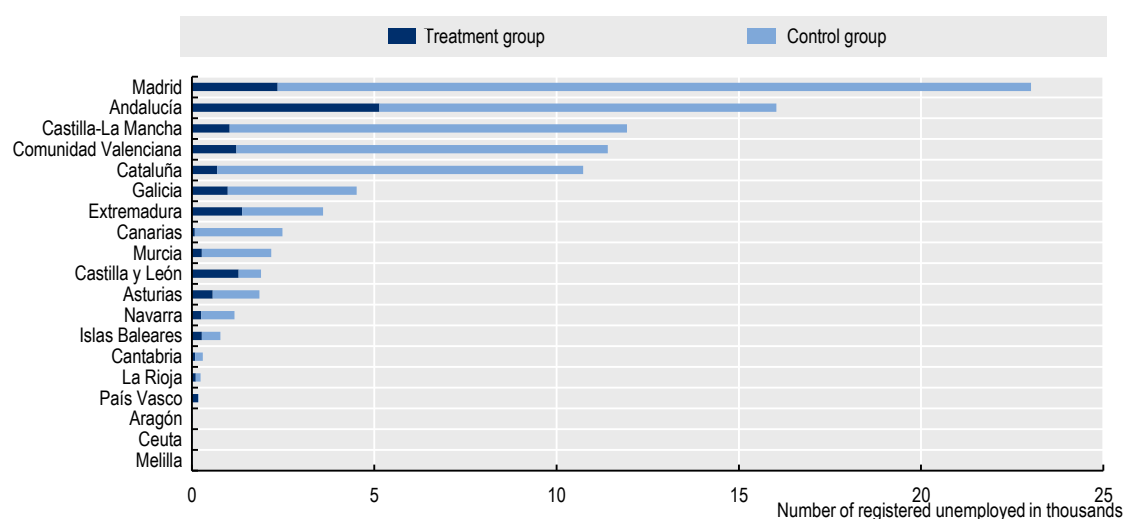
Note: Usage statistics refer to usage during the period from July-December 2021

Source: OECD calculations based on SEPE data.

Examining the shares of *jobseekers* in the treatment and control groups shows considerable differences in the shares of jobseekers who were in the treatment and control groups (Figure 3.4). The shares of jobseekers treated varied from 87% in País Vasco to 3% in Canarias. In addition to the factors discussed above - differences in SEND@ usage rates and differences in the shares of counsellors assigned into treatment groups – these differences also reflect differences in which jobseekers were included in the control group. More specifically, in Autonomous Communities such as Madrid and Castilla-La Mancha, the OECD was provided with data on *all* jobseekers registered during the period examined. This is in contrast to data provided for the other Autonomous Communities, where data were provided only on jobseekers who had been counselled by counsellors who had been assigned into the control group.

**Figure 3.4. Sample sizes and shares of jobseekers in treated and control groups varied considerably across Autonomous Communities**

Number of individuals in treatment and control groups by Autonomous Community



Source: OECD calculations based on SEPE data.

Evaluating the results of the treatment in an RCT can be very straightforward in principle. It can involve comparing the outcomes of individuals in the treatment group with outcomes of individuals in the control

group. In the case of the SEND@ tool evaluation, where pairs of similar job counsellors were randomly assigned into treatment and control groups, one way to estimate treatment effects would have been to simply compare outcomes of jobseekers in the two groups. However, the key assumption for this to yield a valid estimate is that individuals complied with their assignment into treatment and control groups.

In the case of the SEND@ impact evaluation, calculating the counterfactual impact results is complicated by two factors. First, as discussed above, large shares of individuals did *not* adhere to their assignment into treatment and control groups. As shown in the next section, this resulted in treatment and control groups which differed considerably in their observable characteristics. Second, information necessary to calculate intent-to-treat effects was not collected: this would involve information on which jobseekers were counselled by counsellors in the treatment group for whom SEND@ was not used. For this reason, the impact evaluation used in this report employed an econometric technique that controlled for the composition of the jobseekers in the treatment and control groups – propensity score matching.

### 3.3. Propensity score matching was used to account for the differing composition of the treatment and control groups

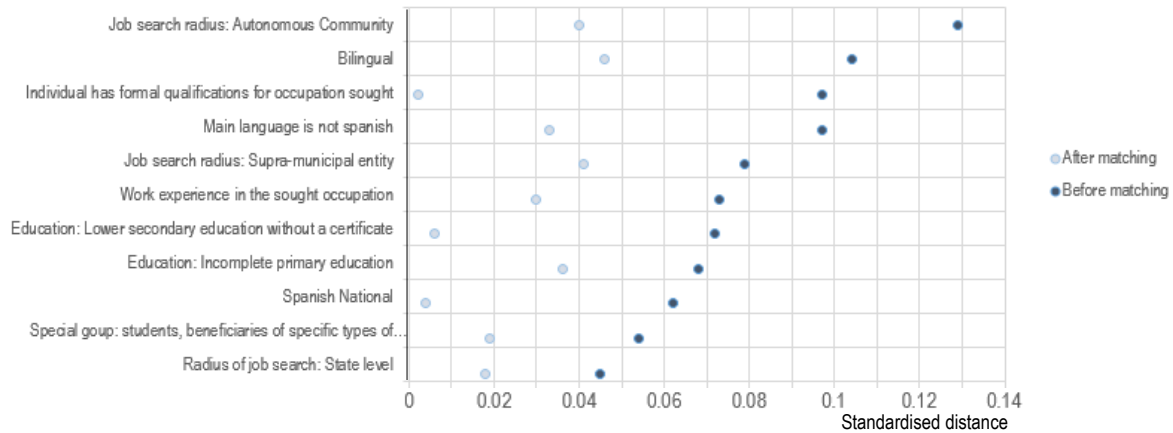
In order to account for the differing composition of jobseekers in the treatment and control groups, an econometric approach that matches individuals on observable characteristics is adopted in this evaluation. The goal of this approach is to attempt to ensure the comparability of the treatment and control groups and provide reliable estimates of the effects of SEND@. Specifically, a rich set of personal characteristics are used to identify individuals with similar probabilities of being counselled with the SEND@ tool. Individuals are then paired with similar individuals based on this probability and their outcomes compared. Such an approach – based on a so-called propensity score – is commonly used in the literature to address the difficulty of otherwise accounting for a wide array of additional personal characteristics (Card, Kluve and Weber, 2018<sup>[7]</sup>). The propensity score is a measure of the probability of participating in the policy under analysis – in this case, being counselled with the use of the SEND@ tool.

The calculations of the propensity score take into account many factors:

- **Demographic characteristics:** age, gender, citizenship, level of education, Spanish and other language skills, presence of a disability;
- **Unemployment-spell attributes:** duration of unemployment before the trial, unemployment benefit receipt and the type of benefit, employment status prior to becoming unemployed;
- **Geographic indicators:** Autonomous Community of residence, job search target radius (e.g. municipality, autonomous community, Spain or Europe);
- **Occupation-specific indicators:** experience in the target occupation, whether the target occupation has better than average employment prospects at the levels of the province or Spain (respectively), having a diploma or degree related to the target occupation.

**Figure 3.5 Propensity score matching improved the comparability of the treatment and control groups**

Standardised distance between treatment and control groups (0=no difference)



Note: Figure presents standardised differences for the variables used in the propensity score matching with the greatest standardised differences before matching. Standardised differences are calculated as the difference in means between the treatment and control groups for the matching variable divided by the square root of the sums of the variances for that variable.

Source: OECD calculations based on SEPE data.

Prior to matching, jobseekers counselled by counsellors in the treatment and control groups had markedly different characteristics (Figure 3.5). For example, prior to matching, 51.5% of jobseekers counselled with SEND@ were bilingual, compared to 58.1% of jobseekers in the control group. After matching, the reconstituted control group had 52.8% of jobseekers who were bilingual. Matching thus reduced this difference from 6.6 percentage points to only 1.3 percentage points.

### 3.4. Multiple data sources were combined to conduct the impact evaluation

The data used to conduct the evaluation in this report come from several sources, as outlined in Table 3.2, and span the period from July 2021 to March 2022. Unique individual identifiers allow the data to be combined, providing a rich understanding of individuals’ participation in ALMPs, their background characteristics as well as their labour market outcomes.

**Table 3.2. Several data sources are used in the evaluation**

| Dataset                          | Purpose  | Source  | Variables used   |
|----------------------------------|--|---|--|
| Jobseekers’ characteristics      | Finding jobseekers with similar observable characteristics (Propensity-score matching) | SISPE: Empleo                                     | Gender, age (year of birth), education level, nationality, region, previous occupation, language skills, job search radius (e.g. within Autonomous Community, Spain, etc.) |
| Receipt of unemployment benefits | Finding jobseekers with similar observable characteristics (Propensity-score matching) | SISPE: Prestaciones                               | Type of benefit  |
| Employment counsellor attributes | Stratification of counsellors into treatment or control groups                         | Data from Autonomous Communities shared with SEPE | Main characteristics of counsellors  |

|  |  |   |   |
|--|--|---|---|
| Employment counsellor – jobseeker meetings       | Determining treatment/control group status | Data from Autonomous Communities shared with SEPE | Counselling sessions (monthly data)                           |
| Complementary data on SEND@ use                  | Determining treatment/control group status | SEND@ monitoring system                           | Linked counsellor-jobseeker data for SEND@ use (monthly data) |
| Employment contracts                             | Measuring outcomes                         | SISPE: Contratos                                  | Start and end date of contract, occupation, type of contract  |
| Jobseekers' participation in training programmes | Measuring intermediate outcomes            | SISPE: Formación                                  | Start and end date of training course                         |

Although in many ways the data contain information on a rich set of characteristics, they suffer from several shortcomings. *First*, they do not contain information on which individuals were counselled by counsellors assigned into the SEND@ treatment group but who were *not* counselled with the aid of SEND@. Such individuals were in fact excluded from the data provided (along with jobseekers counselled by counsellors who were in neither the treatment or control groups). This precluded the calculation of treatment effects which would take into account non-usage of SEND@, so-called intent-to-treat effects. *Second*, the data provided do not contain information on individual's earnings. These would be useful both as an additional outcome variable, as well as to control for individual characteristics in the propensity score calculations.

### 3.4.1. Several outcomes are examined

Counterfactual impact evaluations of labour market interventions typically examine outcomes such as the change in the probability of becoming employed for those subject to treatment compared to similar individuals who are not. The effects of ALMPs on employment probability have been widely studied, with a meta-analysis by Card, Kluve and Weber (2018<sup>[7]</sup>) including employment probability estimates from 111 impact evaluations of ALMPs. While this outcome is certainly important given one ultimate aim of ALMPs is to help individuals become employed, the focus on this outcome may also be partly dictated by data availability: data on other outcomes are often more difficult to obtain.

In the case of Spain, the data allow for several labour market outcomes to be examined, as well as several intermediate outcomes. The outcomes are tracked on a monthly basis from the beginning of the trial in July 2021 through March 2022, when the most recent data are available.

The following three outcomes are examined:

- **Employment:** whether an individual is employed at any point during a calendar month,
- **Type of contract:** indefinite or other<sup>3</sup>, and
- **Occupational mobility:** how the occupation of individuals becoming employed compares with their reported target occupation.

In addition, to gain a better understanding of the mechanism through which the above outcomes may be achieved, two intermediate outcomes are also examined:

- **Number of ALMPs entered:** every ALMP recorded in SISPE is counted as a distinct ALMP, and
- **Total duration in ALMPs entered:** the total duration in ALMPs entered during the period from July 2021 through March 2022 (in calendar days).

<sup>3</sup> These include all permanent full-time contracts, defined as those whose code begins with 1 in SISPE (for example, 109 or 189, which denote transformations from a temporary contract to a permanent full-time contract).

Occupational mobility is analysed with the use of an occupational index, whose construction is described in the next section.

### ***3.4.2. An occupational index is constructed to measure occupational mobility***

In addition to analysing outcomes typically examined in counterfactual impact evaluations of ALMPs, such as employment probability, the work with Spain aims to address another important question: the effect on occupational mobility. A large body of empirical evidence has documented the “scarring” effect of job loss, with measurable effects on wages that can persist long after an individual becomes re-employed (for example, Lachowska, Mas and Woodbury (2020<sub>[8]</sub>)). Empirical evidence also shows that jobseekers exiting employment tend to disproportionately enter (or return to) low-skills occupations compared to the employed population (Bisello, Maccarrone and Fernández-Macías, 2020<sub>[9]</sub>). Better guidance on which types of jobs to apply for or which ALMPs to enter may help counteract these effects, mitigating or conceivably even reversing the typically-observed negative effects of job loss on an individual’s career trajectory. For example, training programmes may offer the opportunity to acquire skills or credentials necessary for employment in more high skills occupations.

In order to provide a tractable measure of occupational mobility, the analysis relies on an occupational index, which is calculated from observed wages. Following the approach adopted by Laporšek et al. (2021<sub>[10]</sub>) and used in OECD (2022<sub>[11]</sub>), a wage index is calculated for each detailed occupational code using data on the wages and employment from a survey of 15 European countries.<sup>4</sup> The survey data for other European countries are used because the detailed data necessary, with at least 3-digit ISCO codes, are not available for Spain. This index maps 137 distinct occupational codes into an index that has an intuitive and practical interpretation: an occupation whose index value is one unit larger than another occupation’s index value has an average real monthly wage that is one percentage point larger. Furthermore, increases and decreases in the index can be interpreted, respectively, as positive and negative changes in an individual’s occupation: climbing up or down the occupational ladder.

The occupational index distribution for Spain shows that jobseekers tend to be overly optimistic in their job search (Figure 3.6). Among jobseekers who become employed, the job they find generally pays lower wages than the one they were looking for. Jobseekers who become employed search for occupations which on average pay 80.8% of the average wage, but end up finding jobs in occupations which on average pay 79.0% of the average wage. Following an unemployment spell, a larger share of individuals become employed in occupations whose mean hourly wages are below the average (denoted by an index value of 100); conversely, while searching for a job, a proportionally larger share of individuals target higher ranked occupations.

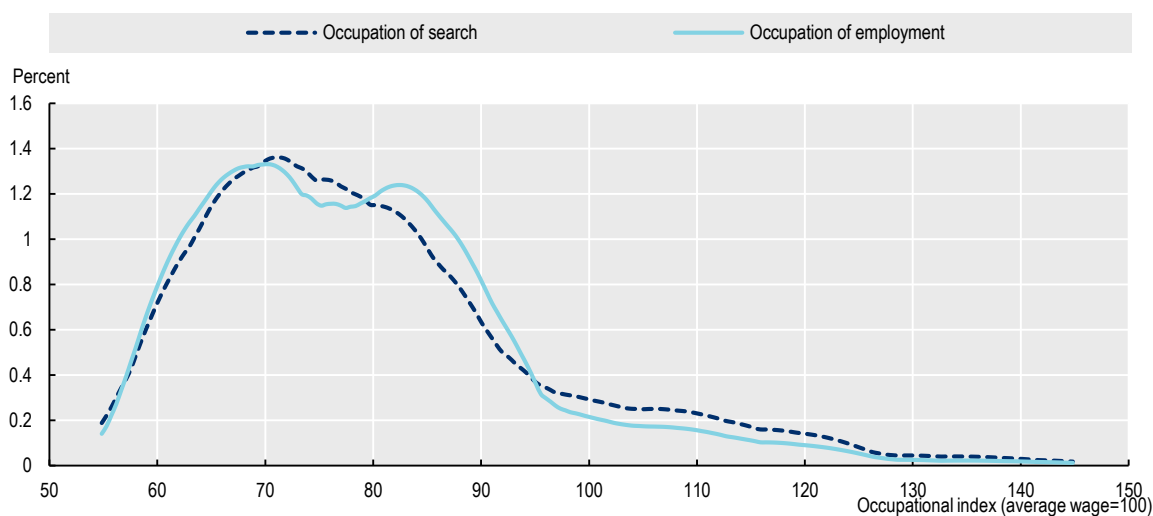
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<sup>4</sup> The survey data is used because the detailed employment data necessary, with ISCO codes available at the 3-digit level, is not available in Spain. In order to map the index onto the data for Spain, a conversion table was used which took the CNO-11 codes used in Spain and matched them with the ISCO-08 codes used in the SES data. Examples of three digit ISCO-08 codes include: Waiters and Bartenders (ISCO code = 513) and Medical doctors (ISCO code = 221). The occupational index is calculated based on Structure of Earnings Survey data referring to 2018 for the following 15 countries: Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, France, Greece, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Slovakia. The countries selected are ones for which 3-digit ISCO codes are available; in other countries, including Spain, 2-digit ISCO codes are reported.



**Figure 3.6. Jobseekers tend to be overly optimistic in their job search**

Distribution of occupational index for jobseekers' target occupation and occupation of employment in Spain



Note: Distributions are plotted only for jobseekers in Spain who were registered as unemployed in July 2021 and who were employed in March 2022. The occupational index is calculated based on Structure of Earnings Survey data referring to 2018 for the following 15 countries: Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, France, Greece, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland and the Slovak Republic. The index is first calculated for each country separately, taking the hourly wage excluding the top and bottom 1 percent in the sample. The resulting occupation and country-specific values are normalised so that each country-specific index has a mean of 100. For each of the 137 3-digit ISCO codes observed in the data, the occupational index is taken as a simple average of this normalised hourly wage across each of the 15 countries.

Source: OECD estimates based on SEPE data and Structure of Earnings Survey Scientific use microdata files.

The descriptive analysis of occupational index distributions as presented in Figure 3.4 is instructive for understanding the underlying data. The impact evaluation results in the next section take the analysis a step further by matching individuals counselled with SEND@ with similar jobseekers who were not counselled with Send@, thus taking into account the counterfactual outcomes of jobseekers and attempting to identify the effect of the SEND@ digital counselling tool.

# 4 Evaluation results

This section presents the estimation results on the outcomes of jobseekers being counselled with SEND@ digital tool. The sample studied consists of jobseekers registered as unemployed in SEPE in July 2021, when the trial was launched. Outcomes are measured from one to eight months after this point. The discussion first focuses on the employment probability and on the probability of being employed on a permanent contract. The second section explores the impact of SEND@ on occupational mobility. The last section shows the effects of the tool on intermediary outcomes: the use of ALMPs and their duration.

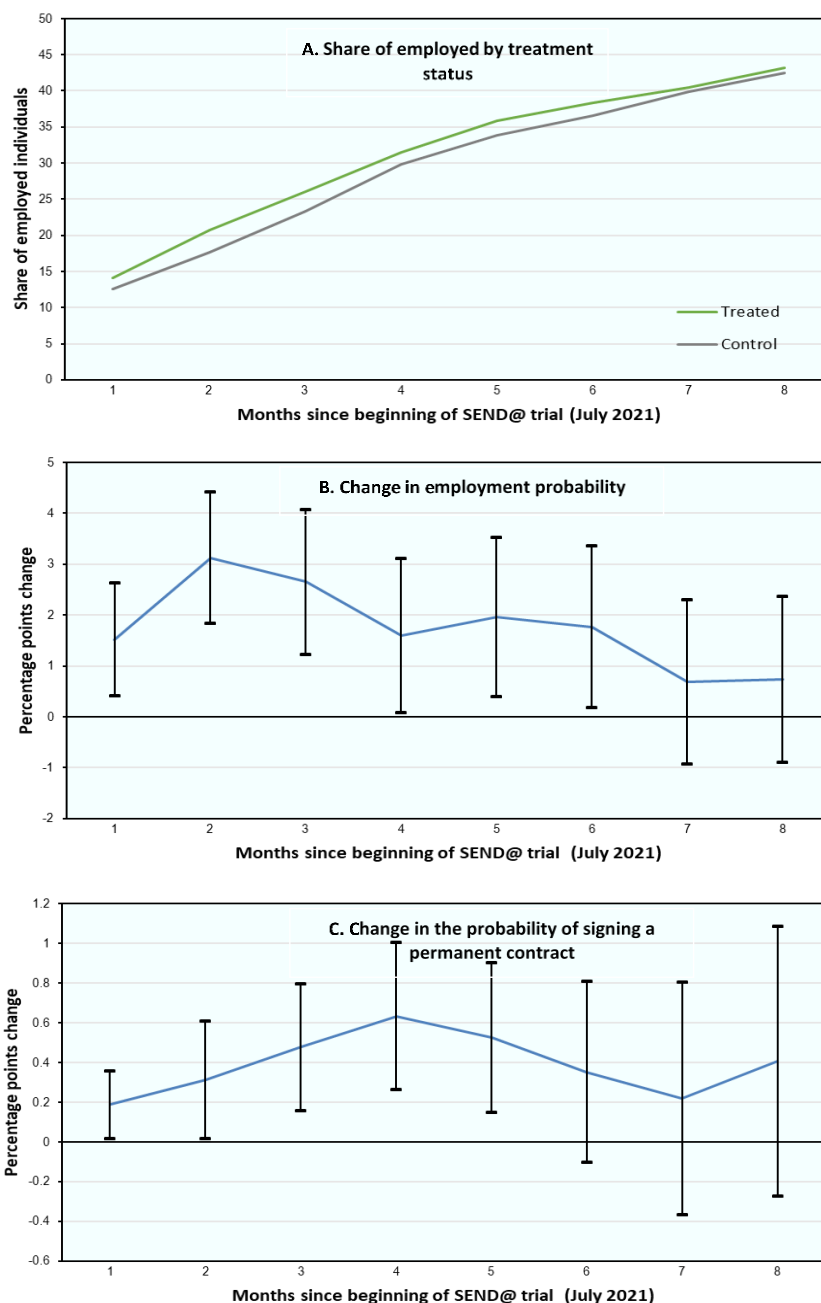
## 4.1. SEND@ helps jobseekers become employed and find permanent jobs only in the short-term

The estimation results show that SEND@ has a short-term, positive effect on job finding rates. Jobseekers counselled with SEND@ exit unemployment faster in the first months after the beginning of the trial. The effects of SEND@ reach a peak two months after the beginning of the trial. At this point, 20.7% of individuals counselled with SEND@ (the treated group) are employed compared to only 17.6 % of individuals not counselled with this tool (the comparison group) (Figure 4.1, Panel A). This gap diminishes afterwards and becomes insignificant seven months after the trial (Figure 4.1, Panel B). This result is robust to the inclusion of controls.

SISPE's data on whether the contract signed is a permanent contract is used to proxy for the quality of employment. The results indicate that jobseekers who are counselled with SEND@ are more likely to be employed on a permanent contract (Figure 4.1, Panel C). This effect is however insignificant after five months.

### Figure 4.1. SEND@ helps jobseekers become employed and find permanent jobs in the short-term

Share of employed individuals by treatment status (Panel A), percentage point change in employment probability (Panel B) and change in the probability of signing a permanent contract (Panel C).



Note: The analysis presents nearest-neighbour propensity score matching results which matches individuals based on a number characteristics: duration of unemployment before the trial, age, gender, education, foreign citizen, level of education, presence of a handicap, unemployment benefit receipt and the type of benefit, language, autonomous community, willingness to work outside of the autonomous community Spain and Europe, experience on the target occupation, whether the target occupation has better than average employment prospects at the level of the province and Spain, having a diploma or degree related to the target occupation and previously employed indicator. Every individual in the treatment group is matched to an individual with similar values of these characteristics that was not counselled with SEND@. The confidence intervals are shown at the 5% level of significance

Source: OECD calculations based on SISPE data on Unemployment claims, Employment spells and Services provided; data from SEND@ monitoring system and additional data shared by Autonomous Communities.

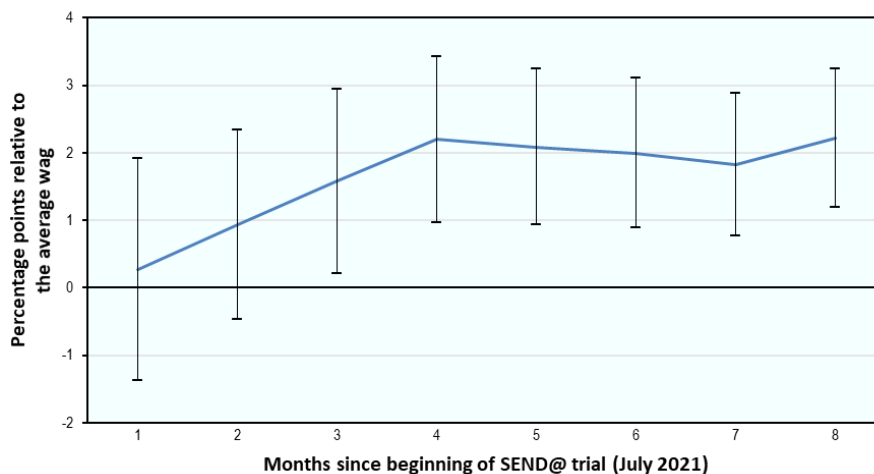
## 4.2. SEND@ improves the occupational mobility of jobseekers

SEND@ recommendations encourage jobseekers to explore different career paths and open job search to new occupations with better employment opportunities. The aim of this sub-section is to see if this objective is accomplished, and thus to see if treated jobseekers who found a job ended up in better quality occupations than the one they were originally targeting as compared to their counterparts in the control group, that is those jobseekers who were not counselled with SEND@.

As explained in Section 3.4.2, the quality of occupations is measured by an occupational index that builds on data from 15 European countries. It measures quality in percentage points relative to the average wage. Here, the outcome of interest is the difference between the quality of the occupation of the employment found and the quality of the main target occupation of jobseekers. The estimation shows positive and sizeable effects of SEND@ from the third month after the trial (Figure 4.2). The difference in the occupational index between the obtained occupation and the target occupation is around two percentage points higher for individuals counselled with SEND@ than for similar individuals in the control group. This effect remains constant over time and is remains significant at the end of the observation period eight months after the trial. In fact, consistent with the discussion in Section 3.4.2, jobseekers in both the treatment and the control groups tend to become employed in lower-paying occupations than the ones they were originally seeking. However, jobseekers counselled by SEND@ tend to become employed in better-paying occupations than those who are not. As such, the positive effect of SEND@ should be interpreted as mitigating adverse effects on occupational mobility otherwise experienced by jobseekers after being unemployed.

**Figure 4.2. SEND@ improves the occupational mobility of jobseekers**

Change between the occupational index of the job found and the occupational index of the target occupation for those who found a job



Note: The analysis presents nearest-neighbour propensity score matching results which matches individuals based on a number characteristics: duration of unemployment before the trial, age, gender, education, foreign citizen, level of education, presence of a handicap, unemployment benefit receipt and the type of benefit, language, autonomous community, willingness to work outside of the autonomous community Spain and Europe, experience on the target occupation, whether the target occupation has better than average employment prospects at the level of the province and Spain, having a diploma or degree related to the target occupation and previously employed indicator. Every individual in the treatment group is matched to an individual with similar values of these characteristics that was not counselled with SEND@. The confidence intervals are shown at the 5% level of significance

Source: OECD calculations based on SISPE data on Unemployment claims, Employment spells and Services provided; data from SEND@ monitoring system and additional data shared by autonomous communities.

### 4.3. SEND@ boosts the use of active labour market policies

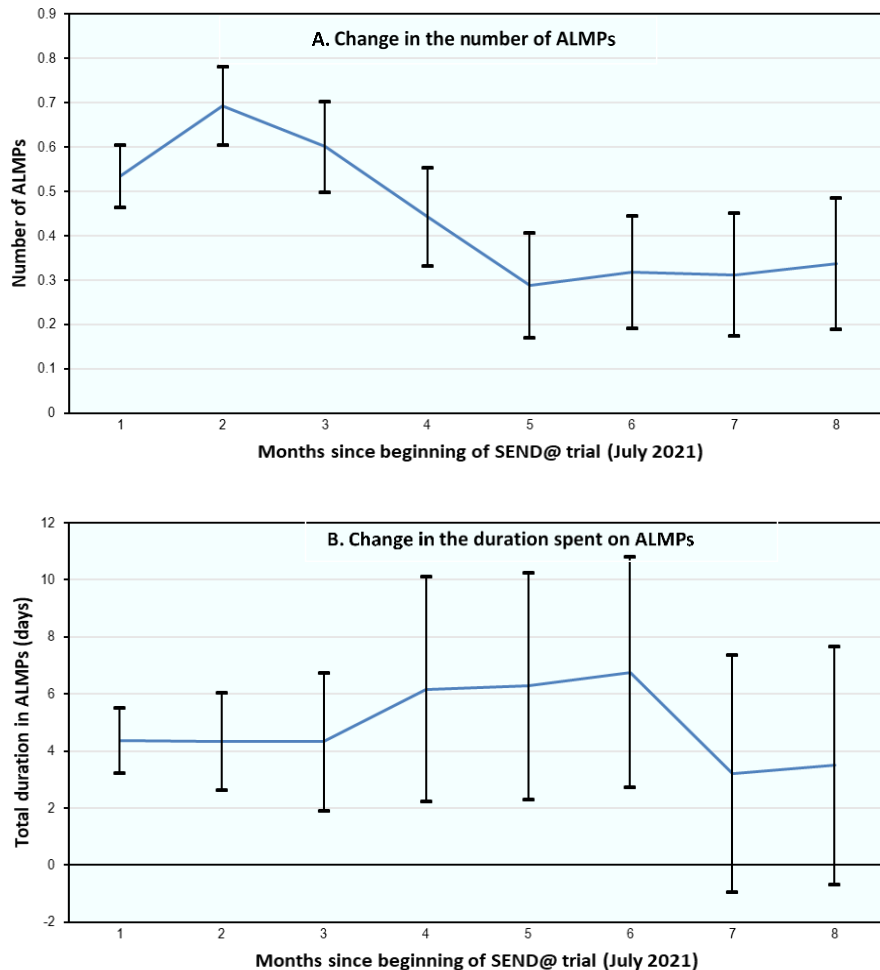
The SEND@ tool aims at improving jobseekers' employment outcomes by suggesting them occupations with better employment perspectives, in which jobseekers similar to them have found jobs; and by directing them towards the ALMPs necessary to obtain the skills required for such occupations. If jobseekers improve their employability by using SEND@, it is expected that they do so by looking for jobs in the occupations recommended by SEND@ and by enrolling into the associated ALMPs. To understand the mechanisms behind the effects of SEND@ on employment outcomes, it is thus important to investigate whether the use of SEND@ has modified jobseeker's job search behaviour in the first place.

Because the data on the recommendations made to jobseekers through SEND@ are not available, it is not possible to see to what extent they were directly followed by jobseekers. However, gaining an insight into whether SEND@ changed jobseekers' perspectives on the usefulness of training is possible through their use of ALMPs. Given the numerous and varying ALMPs offered throughout Spain, making detailed comparisons of ALMP participation by type of programmes entered is difficult. For this reason, the analysis examines two high-level, broad indicators of ALMP participation: number of ALMPs entered and total time spent in them.

The estimated effect of SEND@ on the *number* of ALMPs in which jobseekers participated (Figure 4.3, Panel A) is positive and significant. After two months, treated individuals enrolled on average into 0.7 ALMPs more (increase of 35 pp) than individuals in the comparison group. The effect diminishes in magnitude afterwards but remains positive and significant after eight months. SEND@ also had a positive effect on jobseekers total duration in these ALMPs. Treated jobseekers spent on average between 4 to 6 days more in ALMPs than their control counterparts (Figure 4.3, Panel B). Nevertheless, this effect on the duration of ALMPs loses its significance from the seventh month after the beginning of the trial.

### Figure 4.3. SEND@ boosts the use of ALMPs and their duration

Change in the number of ALMPs in which jobseekers participated (Panel A) and change in the total duration in days jobseekers spent on ALMPs (Panel B).



Note: The analysis presents nearest-neighbour propensity score matching results which matches individuals based on a number characteristics: duration of unemployment before the trial, age, gender, education, foreign citizen, level of education, presence of a handicap, unemployment benefit receipt and the type of benefit, language, autonomous community, willingness to work outside of the autonomous community Spain and Europe, experience on the target occupation, whether the target occupation has better than average employment prospects at the level of the province and Spain, having a diploma or degree related to the target occupation and previously employed indicator. Every individual in the treatment group is matched to an individual with similar values of these characteristics that was not counselled with SEND@. The confidence intervals are shown at the 5% level of significance

Source: OECD calculations based on SISPE data on Unemployment claims, Employment spells and Services provided; data from SEND@ monitoring system and additional data shared by autonomous communities.

## 4.4. Summary assessment

Jobseekers counselled with SEND@ change their job search behaviour and increase their participation in ALMPs. This activation mechanism translates into faster exits from unemployment and into better quality jobs. Individuals in the treatment group are more likely to be employed and to have signed a permanent contract. SEND@ effects manifest mainly in the short-term – after 6 months the effects on these two outcomes are no longer visible. Furthermore, the use of SEND@ also leads to a change in occupational mobility. SEND@'s recommendations encourage jobseekers to look for jobs in occupations in which

jobseekers similar to them have had promising employment outcomes. The results of the evaluation show that treated jobseekers who found a job ended up in better quality occupation than their main target occupation as compared to similar jobseekers who were not counselled with the tool.

However, these results are to be taken with caution and not interpreted as purely causal effects. As explained in Section 3.2, due to the challenges faced in the implementation of the RCT design, the evaluation applies propensity score matching. This methodology relies on the use of jobseekers' observable characteristics to build a comparable control group. As a result, the evaluation faces the limitation that remaining unobservable confounding variables may still be present, potentially leading to biased results. Furthermore, the underlying factors for why counsellors did or did not use SEND@ makes it difficult to interpret differences in outcomes. For example, it may have been the case that SEND@ was used to a greater extent by more motivated counsellors (both within the treatment group as well as in the control group). Assuming that such counsellors are more effective in placing their clients into –good quality-employment even without the use of SEND@, this may mean that the true effects of SEND@ are lower than the ones presented in this evaluation.

A final caveat in interpreting the results relates to spill-over effects – the potential for SEND@ to indirectly affect the outcomes of jobseekers in the control group. Spill-overs occur when treatment affects – positively or negatively –the outcomes of individuals outside the treatment group. Spill-overs can occur, for example, due to social interactions, treatment externalities, or other broader effects. They are a threat to the validity of an evaluation if they affect the outcomes of the control group. In such instances, the outcomes of the control group do not adequately reflect the hypothetical outcomes in the treatment group had the treatment not taken place.

In the case of the SEND@ tool, the main likely channel for spill-over effects is through “crowding-out” effects. One of SEND@'s features is that it recommends that jobseekers apply to specific types of jobs which, in the past, resulted in high job-finding rates or sustained employment. This could have broader labour market effects, with jobseekers in the control group less likely to become employed in such jobs. This would threaten the validity of estimates of the tool's effectiveness: the estimated effects based on a sub-sample of jobseekers would be higher than the true effects if the tool were rolled-out for all jobseekers.

# 5 Recommendations based on the evaluation of SEND@

## 5.1. Recommendations on using SEND@

With Send@, SEPE has developed an effective digital counselling tool that has positive effects on jobseekers' labour market outcomes. Given that the cost of adding additional users is small and that the cost of using SEND@ in counselling process is negligible, its further adoption should be encouraged by SEPE and the PES of the Autonomous Communities. During 2022-23, SEPE plans to make SEND@ available to a wider set of users. This includes extending access to the tool to other counsellors beyond employment counsellors in the offices of PES in the Autonomous Communities, such as counsellors supporting social and labour market integration of vulnerable groups in the municipalities and by NGOs. In addition to the web application, there are plans for SEND@ to become available as a smartphone application. Extending the use cases for SEND@ is reasonable as it can generate further value added without significant additional cost.

The current evaluation has shown, however, that sizable barriers exist to the widespread adoption of SEND@ among individuals who have been given access to it. In the case of the SEND@ trial, almost one third of counsellors who were given access to the tool never used it during the six-month trial period, and a further third used it only a small number of times. SEPE has in place a framework for receiving feedback on SEND@ and is receptive to suggestions for further refinements and improvements. However, these channels likely involve mainly existing, active users of SEND@. Gaining a better understanding of the reasons for the low uptake among some of the counsellors should be one of SEPE's priorities. This could be done through surveys examining the barriers to SEND@ adoption, or focus groups which could provide more extensive feedback.

**To increase the use of SEND@ across Spain, SEPE could take the following actions:**

- Continue with the plan to offer SEND@ for additional user groups, above all professional counsellors other than employment counsellors in regions. Opening SEND@ for an even wider use (such as jobseekers) might need some re-designing of the web application / smartphone application.
- Ensure that all users have user-support and guidelines on SEND@ available for them. The most essential explanations should be available within the application. Users that are expected to use SEND@ frequently should access training before they become SEND@ users.
- Continue collecting feedback from SEND@ users, but collect information also from those counsellors that do not use SEND@ on what are the barriers to SEND@ adoption, for example via a survey or focus groups.
- Continue disseminating knowledge on SEND@, including the results of the current impact evaluation showing that SEND@ has positive effects on jobseekers' labour market outcomes.



The magnitude of the potential positive effects of SEND@ are likely dependent on how employment counsellors include the use of SEND@ in the counselling process. As such, the guidelines from SEPE to the Autonomous Communities could suggest when and how to use SEND@, and how to use SEND@'s recommendations to achieve the best possible results for the jobseekers.

**To increase the effects of SEND@, SEPE's guidelines for employment counsellors in the Autonomous Communities could have the following suggestions:**

- Employment counsellors should include SEND@ recommendations on ALMPs and target occupations systematically in the Individual Action Plans (and the respective fields in the IT system) to ensure that the jobseeker is well informed about SEND@ recommendations and can thus benefit from SEND@. The counselling session using SEND@ should include the discussion on the benefits of participating in the ALMPs suggested by SEND@, identifying the needs for the respective regional programmes and if possible, referring the jobseeker to these programmes.
- To complement the benefits of SEND@ recommendations, it should be used together with other (digital) tools and accompanying information for the jobseeker, such as tools to match jobseeker to vacancies (vacancies of occupations suggested by SEND@), mapping of what the different occupations entail and their match to jobseeker's preferences and soft skills (e.g. career tests) and tools to map gaps to the occupations across skills and competencies.
- Employment counsellors could consider using SEND@ particularly in the case of displaced workers where returning to the previous occupation is less likely than for other jobseeker groups. In case an Autonomous Community uses a jobseeker profiling tool, using SEND@ could be prioritised for jobseeker groups that are not close to the labour market, as they need more likely more support in identifying their labour market integration pathways, including potential target occupations and ALMPs to be able to successfully apply to these occupations.

## 5.2. Recommendations on future evaluations in SEPE

The current impact evaluation of the SEND@ tool can be used as a basis for further work on examining SEND@'s effectiveness as well as for future evaluations conducted by SEPE. The lessons learned during the course of the implementation of the RCT can also be applied to future RCTs in Spain, including ones conducted within Autonomous Communities.

### 5.2.1. Possible additional work to better understand the results

One interesting set of questions that the analysis in this impact evaluation did not explore concerns the effects of SEND@ on different subgroups of jobseekers. This could help understand the extent to which SEND@ is useful across different sub-groups, such as groups with barriers to employment, men or women, and younger or older jobseekers. A better understanding of how SEND@ works for these groups could be useful to inform future guidelines for SEND@ usage. For example, examining the finding that SEND@ has a positive effect on the career trajectories of counselled jobseekers in greater detail may conceivably show that it is particularly useful for certain sub-groups, such as jobseekers early on in their careers who may consider alternative career paths based on its recommendations. These types of analysis have shown different effects in other contexts: recent related OECD work on Lithuania, for example, found that vocational training programmes can in fact have a slightly *negative* effect on younger men's career trajectories, likely reflecting the types of training most commonly undertaken (OECD, 2022<sub>[11]</sub>).

In addition to clarifying whether SEND@ is more useful for certain segments of the population, an analysis of SEND@'s effects by sub-groups could provide guidance on future modifications to the SEND@ tool. A finding that SEND@ is not as useful for certain segments of jobseekers could focus future refinements of

SEND@ on these jobseekers. This could involve refining the methodology or the data used in making the recommendations, and could possibly be done only for these specific segments of the population.

Another possibility for potential future work relates to SEND@'s differential effects across counsellors. The current analysis attempted to make use of the available data on the jobseeker-counsellor pairings to examine the role of counsellor attributes in SEND@'s effectiveness. However, the relatively low number of individuals for whom such data were available – roughly one third of jobseekers in the treatment or control groups – made it difficult to make causal inferences based on the available data.

Finally, a natural follow-up to the current impact evaluation relates to the longer-term effects of the SEND@ tool's use. Given the timeline of the OECD-EC project, the current evaluation tracks participants up to eight months after they were counselled with SEND@. The positive estimated effects of SEND@ appear to dissipate after several months for many – but not all – of the outcomes examined. Lengthening the periods examined could help understand if any of these effects can be permanent. Research examining the time horizons over which even seemingly minor effects can persist has shown that these periods can be surprisingly long (e.g. De Fraja, Lemos and Rockey (2021<sup>[12]</sup>)).

### **5.2.2. Recommendations on evaluation design for future trials**

Several challenges were encountered during the design and implementation the SEND@ RCT. Conducting the stratified randomisation required obtaining data on counsellor attributes on an *ad hoc* basis from each of the individual Autonomous Communities, with inconsistent coding of some of the key variables. After the randomisation was completed, the lists of counsellors who were to be given access to SEND@ were communicated to the PES of each of the Autonomous Communities. The implementation of the tool's usage was at the discretion of each individual Autonomous Community. In practice, non-compliance with the assignment into the treatment or control group turned out to be a considerable challenge.

Given SEPE's experience in implementing the RCT of the SEND@ trial, the Spanish authorities may consider several recommendations for future RCTs. These include:

- **Ensuring tighter coordination between SEPE and each participating Autonomous Community in the case of an RCT.** Implementing an RCT involves considerable coordination and monitoring. Such coordination is challenging even in the absence of multiple independent actors who are involved in implementing the RCT in their own region. If coordination at a national level is too costly, the Spanish authorities could consider conducting an RCT in a selection of Autonomous Communities, allowing implementation to be coordinated more closely. Furthermore, it would make sense to consider ways to lower the administrative burden of reporting ad hoc data, such as on counsellor-client meetings.
- **Consider using an alternative method of RCTs - randomised phase-in design.** Such a research design involves randomising the sequence in which groups of participants are assigned to the intervention. Typically, this is done by randomising roll-out across geographic regions in a staggered manner, but one can also establish other criteria to determine earlier or later participants. In the case of the SEND@ tool, for example, randomisation could have been conducted within local PES offices of each of the Autonomous Communities.

### **5.2.3. Recommendations on data collection and exchange to support future evaluations**

The impact evaluation presented in the current report studied the effects of SEND@ on labour market integration, career choices and ALMP participation. The selection of the outcome variables was constrained by the data available for the evaluation. For example, the data did not allow to evaluate the SEND@ effects on wages or incomes more generally.

Data were also not available to take into account which jobseekers who should have been counselled with SEND@ were not. These missing data are a concern given that SEND@ usage rates varied considerably across counsellors in the RCT, meaning that the number of such jobseekers is likely to be large. Having these data for the evaluation exercise would have enabled calculating the effect of SEND@ usage that could be expected in wider rollout (assuming SEND@ usage rates would be similar), i.e. the “intent-to-treat” effect.

To generate credible evidence on the effectiveness of digital tools (including SEND@) and ALMPs more generally in the future, SEPE and other stakeholders of the ALMP system in Spain need to cooperate to make better data available. Data availability has scope for improvement in terms of data exchange between national level registers, between SISPE and the registers of Autonomous Communities, as well as in linking SISPE data with survey data.

**Additional data for impact evaluations needed from other national registers:**

- It is particularly crucial to access wage data from the Social Security register to evaluate the effect of ALMPs on wages and income.
- Data on additional benefits (such as the minimum income scheme) would enable to evaluate the effects on benefit receipts/dependency (i.e. whether participation in ALMPs cuts benefit costs).
- The data listed above would also ensure more accurate comparisons of ALMP participants and other jobseekers in the counterfactual impact evaluations using quasi-experimental design.
- Making additional data available for evidence generation could build on the results of the project conducted by the OECD and DG Reform in cooperation with the Spanish authorities "[Modernisation of the management of statistical and analytical information at the Spanish Ministry of Labour, Migration and Social Security](#)" (Contract number SRSS/S2019/036). This project mapped the rich administrative data collected by the Spanish authorities in the fields of labour, social security and migration, proposed a holistic framework to improve data processing for evidence generation, and outlined a roadmap for implementing an impact evaluation framework.

**Additional automatic data exchange needed between SISPE and the Autonomous Communities to support evaluation activities:**

- Data on identified ALMP needs and referrals to ALMPs in addition to the actual start dates of ALMPs would enable to evaluate the “intent-to-treat” effects and can sometimes facilitate a better evaluation design.
- Data on job-search counselling dates would enable more accurate comparisons, as well as evaluating counselling effects.
- Data on ALMP expenditures would enable to conduct Cost-Benefit Analysis to understand whether investments in ALMPs generate sufficient value-added for the society.

**Ad-hoc data collection and data exchange that can be relevant in some evaluations:**

- Data on regional benefit schemes and other types of services (social services) would enable to control for these interventions in the evaluation.
- Survey data to complement administrative data can help to analyse effects on wellbeing and social integration, control for jobseeker motivation etc.

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