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It's not (only) about the wage

Labour market (mis)match in social care services for older individuals

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Research Summary

Why was the research done?

We investigate the sources of (mis)match between increasing demand for caregiving services (with respect to older and dependent people) and insufficient labour supply. Previous research suggests that matching process in caregiving services is not only about the wage. Hence, using various data sources, including on-line data, administrative data and discrete choice experiment's results we explore to what extent particular job offers properties make both sides on the matching process pass each other. We refer to mismatch and matching directly. On one hand, we explore preferences of the potential caregiving workers and job offers properties. On the other, we estimate a set of logistic regression models to reveal how these features determine actual job creation process in caregiving services.

What were the key findings?

We find that wage is not a gamechanger. Potential workers rather perceive caregiving as a side job, and want to perform undemanding duties, while the needs for non-medical but more demanding care are much bigger. The public employment intermediation is not enough to meet increasing demand, and it is most successful when only one job vacancy is offered to a female residing in rural area. The success of the 'lack of alternatives strategy' further suggests that the job positions in caregiving services are not desired by potential workers.

What does this mean for policy and practice?

The discrepancy between demand and supply confirm that higher wages will not solely solve the problems of labour supply shortages. Potential wage rate increase might encourage the inflow of new workers to caregiving occupations, nevertheless since the mismatch primarily lays in others aspects, different public policy interventions should be created to address the increasingly urgent problem of supply shortages and labour market mismatch in caregiving sector.

Citation

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We acknowledge the Traditional Custodians of the lands on which we work and live across Australia.
We pay our respects to Elders past and present and recognise their continued connections
to land, sea and community.

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It's not (only) about the wage. Labour market (mis)match in social care services for older individuals

Abstract

We investigate the sources of (mis)match between increasing demand for caregiving services (with respect to older and dependent people) and insufficient labour supply. Using various data sources, including on-line data, administrative data and discrete choice experiment's results we explore to what extent particular job offers properties make both sides on the matching process pass each other. We refer to mismatch and matching directly. On one hand, we explore preferences of the potential caregiving workers and job offers properties. On the other, we estimate a set of logistic regression models to reveal how these features determine actual job creation process in caregiving services. We find that wage is not a gamechanger. Potential workers rather perceive caregiving as a side job, and want to perform undemanding duties, while the needs for non-medical but more demanding care are much bigger. The public employment intermediation is not enough to meet increasing demand, and it is most successful when only one job vacancy is offered to a female residing in rural area. The success of the 'lack of alternatives strategy' further suggests that the job positions in caregiving services are not desired by potential workers.

Keywords: discrete choice experiment, labour market matching, online data, admin data, caregiving services, worker heterogeneity

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Introduction

Caregiving services are of increasing importance worldwide, but especially in population aging societies (Kim et al., 2024; Pickard et al., 2007). Qian et al. (2023) reveal increasing unmet need for assistance among older adults in 31 countries from 2011 to 2018. Although extremely important and responsible, the profession of a caregiver is not ranked as desirable one by workers. This is due to not only heavy physical and mental burden on the caregiver (Duan et al., 2024), high requirements regarding availability and difficult and stressful working conditions (Gil, 2022), but this occupation does not pay well. England et al. (2002) prove that not only there is a wage penalty in care occupations but this penalty is more severe for females, more of whom work in this kind of occupations (Pardo-García, 2021). Readiness for the job and the nature of the job depend on the stage in one's life and the responsibilities involved (Duffy & Armenia, 2021). Gender also plays an important role in the employment of immigrants in caregiving services. This is the case in countries where immigration has a long tradition (Antonipillai et al., 2024; The Role..., 2010; Shutes & Chiatti, 2012), as well as in countries such as Poland, which has only recently become a destination for migration. Hallee et al. (2024) stress that care workers should be most often judged by their experience and soft skills, aspects much harder to be valued in usual procedures applied in wage setting negotiations. If not, the care work can be undervalued.

Previous research suggests that matching process in caregiving services is not only about the wage. Caregivers enumerate, among their labour supply determinants, the opportunity to interact with the elderly who have considerable life experience, the fact of having previously worked in health care, or the desire to be helpful in the community (Lindquist et al. 2012). The role of such intangible factors influencing decisions to work in caregiving services is limited by the reported poorer health condition of paid caregivers, compared to workers employed in other professions (Cuéllar-Flores et al., 2013). The question remains unanswered though, whether poorer health is the reason that job seekers leave better-paying jobs and take on caregiver roles, or whether poorer health is a consequence of working in this profession. Stress and depression are prominent among the factors affecting the health of caregivers. The latter leads to a high turnover of caregivers, making the search for new caregivers a result not only of the increasing number of dependents, but also the resignation of those who have previously worked. This applies not only to caregivers for people who remain in their homes, but also to those employed in institutions (Liang et al., 2018).

Hysong et al. (2007) catalogue the scope of primary care tasks stressing the fact that unsystematic matching can in fact lead to increased dissatisfaction and turnover. Given et al (2008) review the literature on knowledge and skill needs of caregivers. They point on mundane and difficult tasks of a caregiver, including cognitive, psychological, and psychomotor skills. They enlist following general tasks: make decisions and solving problems, supervising patients, providing emotional support and comfort, and coordinating care. Among detailed tasks there are administering medications, handling medical equipment, planning and providing meals, but also providing direct care, for example wound care or lifting and turning, providing custodial care, transportation, and advocacy, and finally managing household, modifying the environment and acquiring equipment and assistive devices. A more medical task is monitoring patients for new signs and symptoms. Other skills may be required depending on patient's illness type and acuity. The authors state that the caregiver's capacity and recipient's need to be thoroughly assessed. They also point out that interventions should

be used to test and assist caregivers in developing skills for dealing with certain illnesses (Given et al 2008).

A few papers examine the preferences of older people for care services (Kaambwa et al., 2015; Kleij et al., 2017; Meregaglia et al., 2025; Song et al., 2024). And, a few paper examine the preferences of care workers using discrete choice experiment. They refer to care coordination aspects and support needs (Jasper et al., 2018; McCaffrey et al., 2015; Plöthner et al., 2019). Mavromaras et al. (2022) directly focus on job preferences of workers in caregiving services for older people in Australia using a Discrete Choice Experiment. They consider nurses (medical care) and personal care workers (non-medical care). They investigate six job attributes: hourly earnings, working hours, adequacy of staffing numbers, trainings, possibility of dealing with work-related stress, and job autonomy. With mixed logit model they show that all of them are significant besides weekly working hours. Non-medical care workers have different preferences than medical ones. From the most to the least valued by non-medical carers were: enough staffing numbers, autonomy in job, work stress management. Less valued were: skill development opportunities and earnings. This shows a great value of non-financial factors behind the supply of non-medical caregivers. Mavromaras et al. (2022) do not consider other factors, such as type of responsibilities in household care.

Nevertheless, there are plenty of job offers available and waiting for a suitable job seeker, and people willing to work in this occupation. In this study we explore the job matching process between workers willing to work as a caregiver (for dependent adults) and job offers in this occupation. Although some of the job properties in this occupation might have in fact intangible character (like empathy or acceptance by the care recipient), we try to identify which factors are most important from either side of the matching process, that is labour demand and labour supply, and in particular where is the wage rate positioned? Hence, we examine the job matching process and potential scope of the mismatch between people looking for job in caregiving services and labour demand in this respect. We argue that the wage rate is not a gamechanger and cannot clear the market¹. Other aspects, broadly covered by the umbrella of unfriendliness, distress and difficulty of care giving services, can actually refrain people from such work.

We contribute to the literature by providing a detailed descriptive analysis of the extent to which labour supply and labour demand meet and to what extent pass each other in the care labour market in Poland. We achieve this, by looking at the on-line data on both labour demand and labour supply (based on dedicated web portals), administrative data (again on both labour demand and labour supply), and finally by conducting a Discrete Choice Experiment (DCE) which reveals preferences regarding the caregiving job properties by the potential workers in this occupation. Online data and administrative data provide granular and detailed information about job seekers' history and preferences and job offers' properties. We employ a range of methods to describe the job search and job matching process including the statistical and logistic regression models.

To address our perspective of working conditions preferences in caregiving services we use the occupational breakdown. In Poland occupations are classified according to the Classification of Occupations and Specialties (COS). It is fully compatible with the International Standard

¹ Pay level only marginally relates to the job satisfaction (Judge et al., 2010) and Scott et al. (2015) show that caregivers are even willing to forgo some of the pay for the sake of more pleasant and safe working conditions.

Classification of Occupations (ISCO), only more detailed. The ISCO classification contains occupational codes up to four digits, while Polish classification expands it to 6 digits. For the analysis we have chosen four occupations from the Social Work Associate Professionals, that is: personal assistant for persons with disabilities, caregiver of elderly persons, nursing home caregiver and community caregiver. Otherwise specified within the text we treat all these occupations as caregiving services for adults. Wherever possible we refer to care for elderly people, but from the perspective of occupations we start with adults since we cannot differentiate their age. All chosen occupations are vocational education occupations, formally learned in Poland in a post-secondary vocational schools.

1. Data and Methods

We explore different data sources to provide most comprehensive description of the labour market of caregiving services in Poland. These data sources are complementary to each other, hence provide a broader sense of the properties of the care labour market in Poland.

1.1 Online data

Online sources of information on labour demand include data from general-purpose online job boards, containing job offers for many sectors of the economy, and data from the website dedicated to seeking workers and jobs in social assistance of the elderly www.opiekaseniora.pl.

General-purpose online job boards do not focus on any specific sector and are general recruitment tools (see Table A1 in the Appendix for a full list). The process of collecting offers lasted 12 months from July 2021 to June 2022. Job offers were collected on a weekly basis.

The second online source was a portal dedicated to caregiving services of the elderly opiekaseniora.pl. It is a part of “Pomocni Group”, which are portals addressed to representatives of specific occupations, such as childcare, home help, repair work. According to data from SimilarWeb (<https://www.similarweb.com/>), Pomocni is the largest and most popular recruitment portal for social assistance in Poland. The process of collecting job offers from Pomocni lasted, similarly to other websites, from July 2021 to June 2022.

We collected online job offers in an automated way using web scraping method described in Beręsewicz et al. (2023). Once collected, job offers were parsed, i.e. key elements were extracted from the content of the advertisements (e.g. title, requirements, etc.). After processing job offers into a tabular form, they were deduplicated, because some job offers could be announced on more than one of the considered job boards. The deduplication process involved finding advertisements that, between online portals (data sources), had the following elements in common: title, employer firm, location, and publication date (month in which the offer was announced). After removing non-unique job offers, we classified the remaining ones according to occupation. Occupations were assigned using a dedicated artificial intelligence model based on the HerBERT language model², which, based on the title and the content of the job offer, assigns the most likely occupation code according to the Classification of Occupations and Specialties.

In “Pomocni” website we were able to identify to which sex the job offer is addressed thanks to the use of feminines. Unlike in English language, in which the names of occupations do

² Both models are publicly available at: <https://github.com/ONLABSPL/job-ads-classifier> and <https://github.com/allegro/HerBERT>

not have gender variations, in Polish language there are such variations. It enabled us to analyse job advertisements collected from the “Pomocni” website in terms of sex to which the advertisement was addressed. Sex identification was based on finding certain entries in the text with their variations:

- for females these were: *pani, kobieta, opiekunka, asystentka, pielęgniarka, pracowniczka*;
- for males these were: *pan, mężczyzna, opiekun, asystent, pielęgniarz, pracownik*.

For females, sex identification was unambiguous. For men, however, the assigned sex was not clearly identified, because the phrase “poszukuję opiekuna” (I am seeking for a caregiver) can mean both a female and male, while the female-addressed phrase “poszukuję opiekunki” can only be associated with a female.

Online data allowed us to collect information on labour supply as well. Here, we analysed job seekers characteristics with Pomocni, which also contains job seekers’ profiles. An employee's profile includes a list of personal characteristics, among which there are: age, sex, place of residence, skills, level of education and declared professional responsibilities. Job seeker profiles are more historical in nature, that is there are profiles created during previous years, unlike job offers, which quickly become out of date fast. During the period of data collecting, we found 67,973 unique job seeker profiles. These profiles were created in the years 2010-2022; while new profiles created in 2021-2022 made 10.4% of the total number of profiles.

The data collected from online job boards through webscraping and classified according to occupation and wages thanks to machine learning methods as well as according to other detailed information available directly at the websites, were used to describe the demand and mismatch in caregiving services in Poland. Based on them we calculated frequencies of analysed occupations and changes thereof, and mean and median wages offered in domestic and foreign job advertisements (posted on Polish websites). Data from job board dedicated to caregivers enabled us to calculate detailed information on demanded and sought working conditions and tasks. We used this information to compare the structures of demand and supply of work from the perspective of wages, work experience and schedule, and job tasks. We also analysed the relation between age groups of job seekers and their work expectations with Crammer’s V.

1.2 Administrative data

Administrative data include information on both labour demand and labour supply. Central Job Offers Database (*Centralna Baza Ofert Pracy, CBOP*) contains all job offers registered with public employment services in Poland, including powiat (county, LAU-1) employment offices, regional employment offices, and voluntary labour corps. Job offers officially submitted by a company to one of these institutions with all required details are visible in the dataset. A job offer is always classified by occupation.

Labour supply data come from CeSAR data warehouse. This data source includes information on unemployed workers registered with public employment offices. Data describe individuals in terms of sex, age, education, place of residence, occupation and participation in active and passive labour market policies.

Due to data availability, we explore 2014-2020 period. Our aim in analysing administrative data is to describe the properties of labour demand and labour supply available in public

employment offices and to identify who matches with whom. Job creation is directly identifiable since if the person has encountered a job by means of the public employment intermediation this information is denoted in the data.

To estimate the relative importance of particular properties of labour demand and labour supply for matching between them we estimated logistic regressions. Since we exactly know who was offered which job offer and what was the outcome of such pairing, we created observations of such pairs. The outcome was ascribed as success ($y = 1$) if the matching process resulted in employment and failure otherwise ($y = 0$). Hence, an observation in our logit model is a pair of job seeker and job offer. Our detailed data from employment offices supplies information on the properties of both labour supply and labour demand. We use this information to model the probability of a match.

1.3 Experimental data

In the next step we examined the preferences of unemployed workers on particular job offers characteristics in social assistance for adults. We conducted a discrete choice experiment (DCE) to prioritize particular properties of job offers. DCE is widely used in revealing preferences in product and job market (compare Bansback et al., 2012; Ewing & Sarigöllü, 2000; Kim & Park, 2017; Ubach et al., 2003). This method is also widely used in health economics (Clark et al., 2014) and in particular in examining health or care workers preferences (Arora et al., 2022). This method allows for better consideration of respondents and provides answers in a richer context than a simple questionnaire (see also Kjaer, 2005 and Mangham et al., 2009).

The experiment was conducted during July and August 2022 in the form of Tablet Assisted Personal Interview (TAPI) among 566 participants all of whom were registered as unemployed with public employment offices in Poland at the time of the survey and were willing to accept a job offer as a caregiver. The respondent group was randomized to reflect the general population in terms of age groups, gender, education level and geographical region. In the study the special focus was on the differences in preferences between two age groups: over and below age of 50, hence the sample was divided due to age: half of the respondents were less than 50 years old whereas the other half was at least 50 years old.

The experiment was conducted in the form of Discrete Choice Experiment (DCE). The respondents, after providing brief demographical survey, were asked to evaluate different pairs of caregiver job offers and decide which of the two are they more willing to accept. The overall structure of the available options is presented in Table 1. The properties of job offers differed in five dimensions: the wage rate, number of working hours, contract duration, job location and scope of duties. Each of dimensions had up to 5 attributes over each one was chosen in each job offer. Each of the attributes was constructed after reviewing the real job offers posted on job market websites.

Table 1. The Discrete Choice Experiment structure

| | | | | | |
|------------------------------------|------------------------------|---|---|-----------------------------------|---------------------------|
| Hourly wage (PLN, net) | 20 | 25 | 30 | 35 | 40 |
| Working hours | Few hours every week | Half-time (4 hours daily). | Half-time (3 days a week) | Full-time | |
| Contract length | 6 months. | 12 months. | 24 months. | indefinite | |
| Distance of the workplace | Offer includes accommodation | Close neighbourhood (no accommodation) | Requires travel to a neighbouring town (no accommodation) | | |
| Additional responsibilities | (none) | Assistance in dressing, washing, and getting up | Communication problems (hearing impaired) | Communication problems (dementia) | Assistance in drug dosage |

Source: own preparation.

A job offer was constructed by combining a single random attribute in each of the five dimensions. This gives us 1200 different potential job offers which leads to over 10^{3176} possible comparison pairs. Hence, we used the Fedorov algorithm to determine 4 sets of 16 pairs of job offers over which respondents made their choice (compare Kessels et al. 2006, Vermeulen et al. 2008). The order of pairs as well as their placement on tablet (left or right panel) was randomized for each respondent. Hence, each respondent decided over 32 job offers stacked in 16 pairs by choosing which she was more likely to accept³.

The resulting dataset contains 18,112 observations, each for a single job offer considered. A single observation constitutes the respondent id, the id of a set (so the id of a pair that was compared), coded characteristics of a job offer, and a *choice* variable indicating whether such offer was chosen by a respondent. It also contains the demographic characteristics of a respondent who made the choice.

³ The sample screen on the tables was presented in Figure A1 in the Appendix.

The results of the experiment are examined using mixed-logit models as it is a standard approach in DCE analysis, cf. Hole & Kolstad (2012), Clark et al. (2014). The dependent variable is *choice* while the regressors are the job offer characteristics.

As the respondent group was deliberately divided into two age groups, we estimated two separate models for them. Moreover, we control for the set id (to indicate which alternative was chosen over which) and for age, gender, educational level, and time without a job.

2. Empirical evidence on the care labour market in Poland

2.1 Job seekers and job offers

On 13 general-purpose online job boards in Poland between July 2021 and June 2022 the number of advertisements published for caregiving services for adults amounted to 1,153 advertisements (75% of these offers concerned a caregiver of the elderly) and 777 advertisements for other care professions. In the end of June 2022, 128 advertisements were active, including 96 for a caregiver of an elderly individual (and 86 for other non-medical caregiver professions).

According to data collected from general-purpose online job boards regarding caregiving services for adults, 35.4% were foreign job offers (published on analysed Polish portals) and 87.2% of them originated in Germany. The others referred to the Netherlands, Ireland, Austria and Switzerland. If we break down the offers to particular occupations, most common were job offers of a caregiver for an elderly person (every second offer) and a nursing home caregiver (4 out of 10 offers). Foreign job offers' working conditions were of better quality than domestic ones. 80% of vacancies from abroad offered work with residence. Free meals were included in 30.7% of foreign job offers. Almost half of foreign job offers encouraged job seekers with various forms of additional work benefits (e.g. holiday allowances, paid leave, etc.), while domestic job offers did not offer this type of benefits for employees at all. Professional experience was more often required in foreign job offers than in domestic ones.

1,050 job offers advertised on general online job boards for caregiving services for adults included wages, most often the wage range (minimum or maximum values). We have converted all wages given otherwise (e.g. as hourly wage) to monthly ones and wages given in EUR to Polish zloty (PLN), using the average annual exchange rate of the National Bank of Poland: 1 EUR = 4.69 PLN (average 2022 exchange rate). To compare wages, we also converted part-time jobs to full-time equivalents. The results given in Table 2 show that the mean of wages offered abroad was 84% higher than in Poland, and the median was 135% higher abroad than in Poland. This proves that domestic offers are very uncompetitive compared to abroad ones.

Table 2. Distribution of wages offered on general online job boards for social assistance of adults

| | Min | Max | Mean | Median | No. of job offers |
|-----------------|------|-------|------|--------|-------------------|
| Poland | 1400 | 11500 | 4100 | 3000 | 329 |
| Other countries | 1500 | 22000 | 7535 | 7035 | 721 |

Notes: wages are given in PLN; No. of job offers is the number of job advertisements in which we identified wages. For comparison: the minimum wage in 2022 was PLN 3,010.

Source: own preparation, based on 13 largest general-purpose online job boards in Poland.

Specialized online job portals are increasing in popularity over the last years. Such portals are rich sources of information about offered and expected working conditions (see e.g. Azar et al. 2022; Marinescu and Wolthoff, 2020; Hensvik et al. 2021). A specialised job board has also two significant advantages over other sources of data; (i) it contains information on both job seekers and job offers, and (ii) it enables posting job offers by natural persons, not only by economic entities, to which public employment services and general job boards are limited.

Below, we compare job offers characteristics and job seekers' expectations on the basis of information posted on the online portal dedicated to the care of the elderly (www.opiekaseniора.pl). Such a comparison may indicate the potential source and scope of mismatch between demand and supply in the labour market of caregiving services for adults.

From July 2021 to June 2022, 3,033 unique job offers were posted on the website www.opiekaseniора.pl, and at the end of June 2022, there were 504 active job offers on this website. On the other side of the market, in the same time we encountered 67,973 profiles of job seekers in caregiving services for adults.

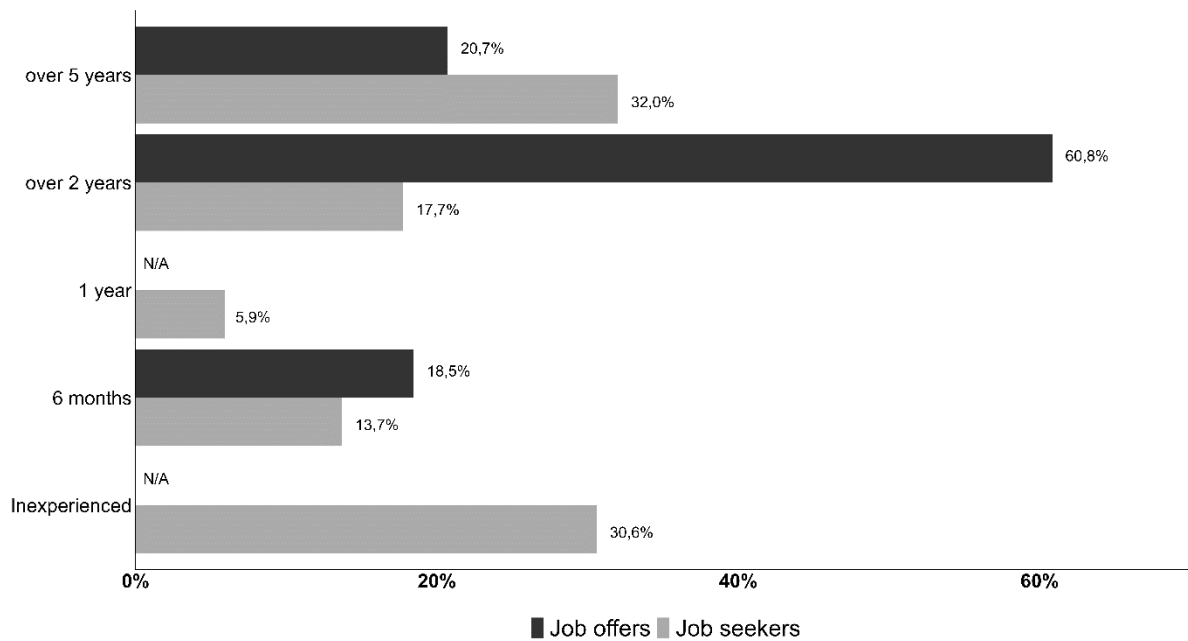
Job offers in more than 60% refer to assistance needed for individuals 80+ and subsequent 15% of job offers refer to 90+ years old people. If health conditions were provided, most often, job offers concerned assistance for lying elderly individuals (39.1%), having various forms of disability (23.6%), and dementia (19.1%). Following there were people after a stroke, with Alzheimer's disease, person after a surgery, Parkinson's disease, and diabetes.

Females dominated job seeker profiles (91.6%), while every third offer was directed specifically to females (job offers titles included feminatives). Job offers were primarily directed at working age population, and those directed at people over 66 accounted for 8.2% of the total job offers. Similar distribution, except for the youngest group, was observed for job seekers⁴. Almost every tenth profile was created by a person under 26 years of age, but the demand for such people was negligible. This shows that although young people are not seen as caregivers for older persons they are interested in such jobs. The distributions of job offers and job seekers by region were very similar to each other.

Professional experience was expected in 30.8% of the observed job offers, and most often (60% of cases) at least two years of professional experience was expected. While almost all job seekers provided information on prior work experience, every third of them had not been working in this profession. On the other hand, every third of them have been working for at least 5 years in caregiving services (compare Figure 1). Labour demand was concentrated in non-full-time employment, while job seekers more often preferred full-time employment (Figure 2). Another source of potential discrepancy lays in place of residence. All job offers specified preferred place of residence (distance to work), and 71% of job seekers revealed their preferences. Every third offered required living with a dependant, but only 7.6% of job seekers indicated such option (otherwise, job seekers expressed their willingness to negotiate this aspect of job offer).

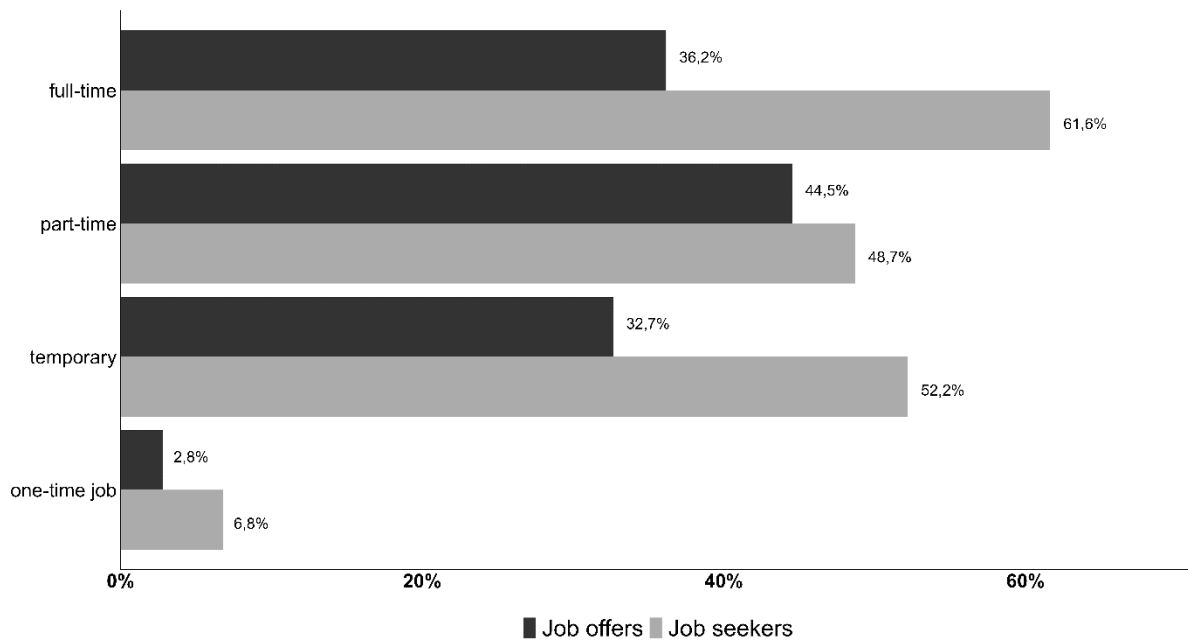
⁴ It is important to note that one job offer may contain more than one age groups, thus the shares do not sum to 100 in this case.

Figure 1. Work experience of job seekers and required in job offers



Source: own research based on job offers and job seeker profiles from “Pomocni” website.

Figure 2. Work schedule wanted by job seekers and required in job offers



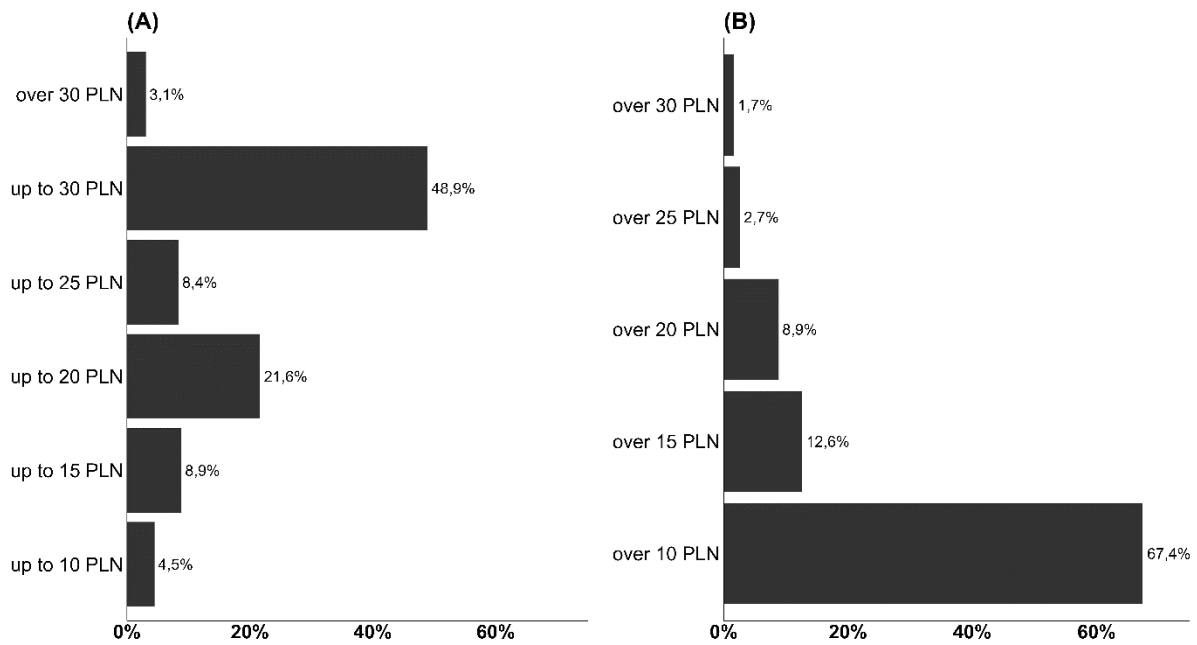
Notes: A job offer and a job seeker’s profile may include one or more work schedules, hence the shares do not sum up to 100%.

Source: own research based on job offers and job seeker profiles from “Pomocni” website.

Job offers include the upper limit of the proposed wage rate (the maximum amount that the employer is willing to offer), while job seekers indicated the lower limit of the required wage

rate (the minimal acceptable remuneration a worker is able to agree to work on). Figure 3 compiles the offered and required wage rate; job offers most often included remuneration up to PLN 30 per hour, and job seekers most frequently would agree to work for at least PLN 10 per hour. These findings strongly suggest that wage rate is not the primary source of mismatch between job seekers and job offers.

Figure 3. Wages offered in job advertisements and required in job seekers' profiles

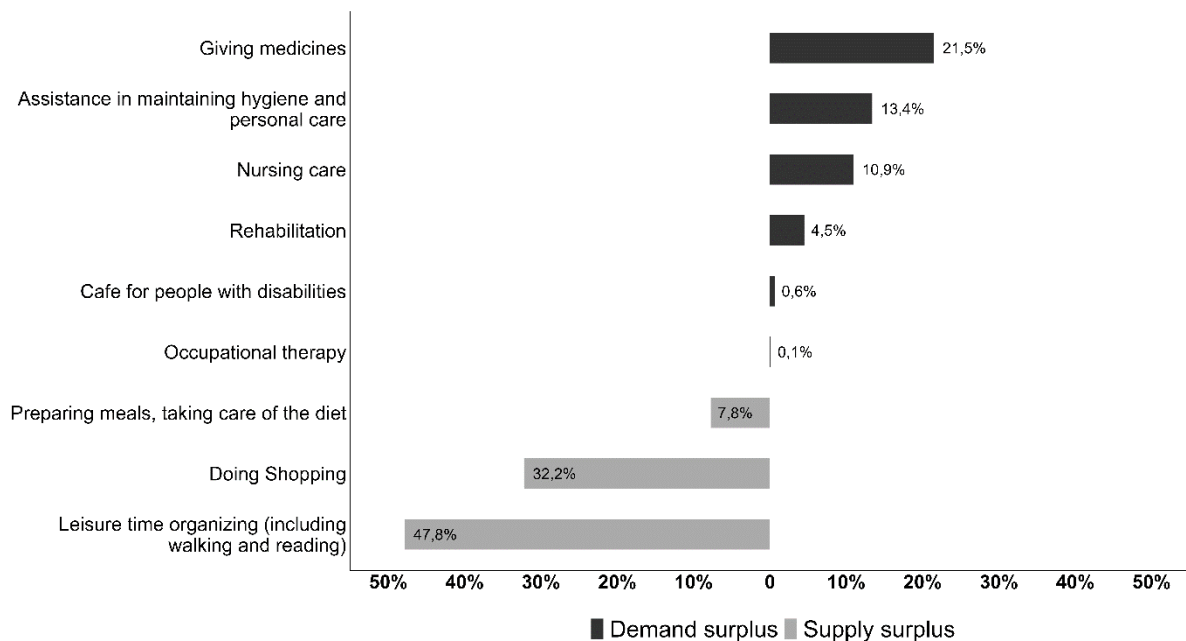


Notes: (A) – maximum hourly wages offered in job advertisements. (B) – maximum hourly wages required in job seekers' profiles. For comparison: the applicable official minimum hourly rate in 2022 was PLN 19.7.

Source: own research based on job offers and job seeker profiles from “Pomocni” website.

Most demanded activities from labour demand perspectives included assistance in maintaining hygiene and care, giving medicines, preparing meals and taking care of the diet. Job seekers most frequently indicated the option to perform the following activities: organizing leisure time, doing shopping, and maintaining hygiene and care. This indicates a surplus of demand for professional activities over supply in case of more demanding activities, requiring more physical help and possibly strength (Figure 4). The surplus of the supply of activities over the demand occurs in less demanding activities, with minimum physical contact.

Figure 4. The surplus between the share of demand (required in job offers) and the supply (stated in employee profiles) of professional activities



Notes: A job offer and a job seeker’s profile may include one or more professional activities.

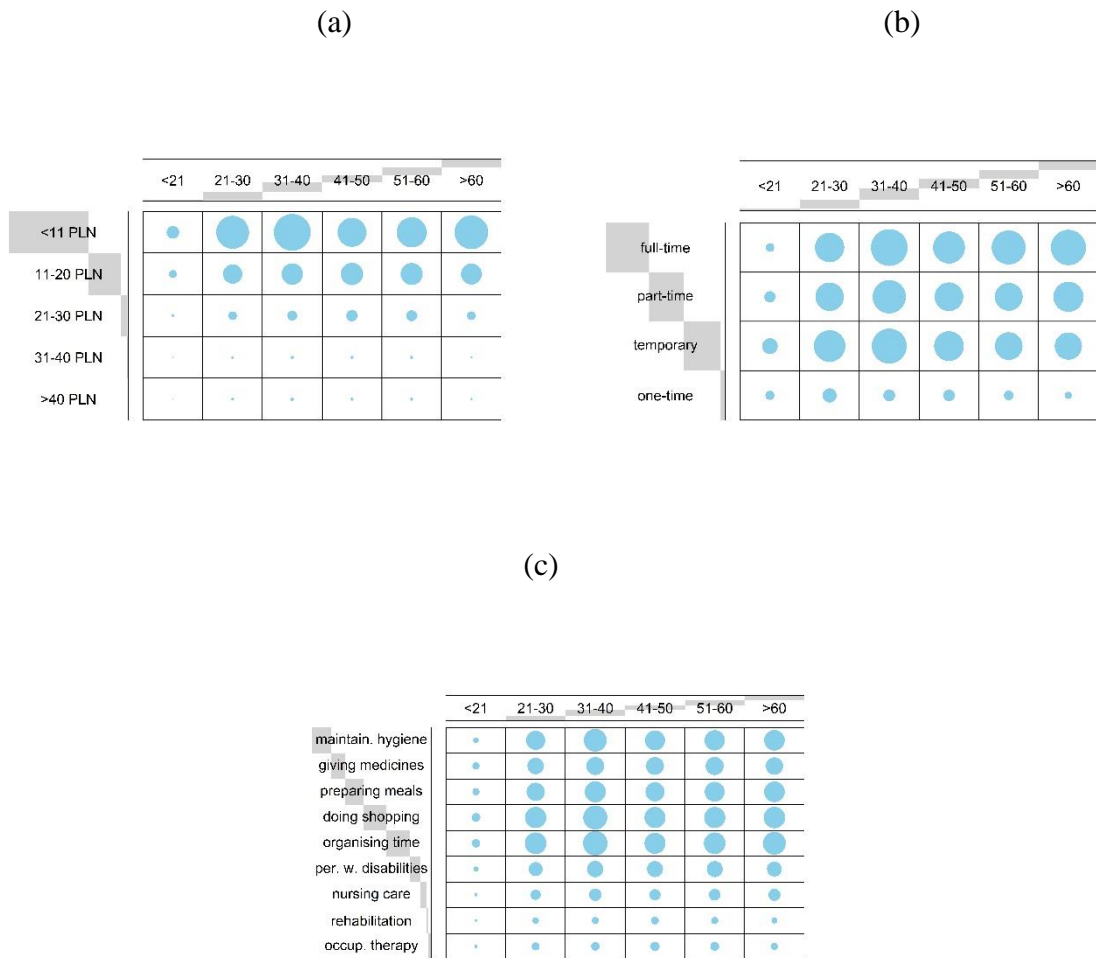
Source: own research based on job offers and job seeker profiles from “Pomocni” website.

To identify potential range of heterogeneity, we examined job seekers work expectations across age groups (Figure 5). Globally, there is no significant correlation between professional activities across age groups when we take 10-years groups of age, starting with <21, and ending with >60 (Crammer’s $V = 0.04$). However, we do find that the willingness to do several professional activities change with age. Older people are more willing to undertake nursing care and dietary care. Younger ones are more willing to do shopping. The youngest assistants (below age 21) do not want to maintain hygiene or personal care of the people they care for.

Having analysed wage expectations, we can see that the most striking discontinuity appears at the age of 40, when wage expectations change. However, the correlation is not high (Crammer’s $V = 0.09$). Considering two age groups, people up to 40 years old are more willing to accept lower wages (up to PLN 15 an hour). People aged 40-60 expect higher wage, PLN 20-25 an hour. However, after the age of 60, wage expectations decrease, so the potential relation is not linear in character.

Considering the same age groups and working hours, older job seekers clearly more often want full-time work, and the younger ones prefer occasional or one-time work. For the division to less than 50 and over 50 years this relation is even slightly stronger (Crammer’s $V = 0.12$).

Figure 5. Plots of relations between job seekers' age groups and their work expectations



Notes: Correlations between job seekers' age groups and (a) hourly wage in PLN, (b) work schedule, (c) work tasks. The balloon size represents larger shares of workers in particular age.

Source: own research based on job seeker profiles from "Pomocni" website.

2.2 Matching

Administrative data included information on 15,832 job offers and around 25% of them were matched with individuals registered with public employment offices willing to work in care services⁵. The structure of the job offers matched and not matched did not differ significantly (compare Table 3). Small differences were observed in particular characteristics, though. Job offers in the occupation: caregiver of elderly persons were more often rejected than offers in other examined occupation. Accepted job offers more often offered exactly the minimum wage. The regular employment contract predominated in both groups, but the contract of mandate was less often observed among accepted job postings. Conditions of work expressed in number of shifts suggested that one shift was mostly chosen.

⁵ Technically the unmatched job offers could have been offered to other registered workers for whom we did not observe in the data that they were willing to work in one of the examined four occupations.

Table 3. Job offers (matched and not matched) available in public employment offices in 2014-2020

| | Accepted job offers | Not accepted job offers |
|--|---------------------|-------------------------|
| occupation: | | |
| personal assistant for persons with disabilities | 16% | 13% |
| caregiver of elderly persons | 40% | 49% |
| nursing home caregiver | 33% | 30% |
| community caregiver | 11% | 8% |
| minimum wage (yes) | 76% | 61% |
| contract type | | |
| employment contract | 50% | 47% |
| contract of mandate | 12% | 23% |
| others | 38% | 30% |
| number of shifts | | |
| one | 53% | 42% |
| two | 18% | 17% |
| others | 29% | 41% |
| share of job offers from companies operating in social welfare | 67% | 62% |
| number of observations | 4,029 | 11,803 |

Source: own preparation, based on CBOP dataset.

The description of the sample of unemployed individuals is less straightforward. We observe multiple observations for workers, on average 2.6 spells per individual. In each case workers can deregister due to different reason. Moreover, a worker can find a job by means of public employment intermediation or in any different manner. In this latter case we cannot ascribe a job offer with which a job seeker was matched to (in such case we assume that a worker has found a proper job offer outside of the public employment office and not necessarily in care service sector). Hence, with respect to individuals we describe spells and not exactly the workers, although the spells refer to unemployed individuals who had expressed willingness to work in caregiving sector. Moreover, we divide a sample into workers who: (i) exited to employment (by means or not the public employment intermediation), (ii) exited to employment by means of public employment intermediation, and (iii) exited from unemployment but not to employment. Table 4 compiles the structures of these three samples, whereas Figure 6 presents regional distribution (at the county level) of the number of unemployed individuals matched by means of public employment intermediation, that is the sample (ii) (the regional distribution does not differ among the subsamples). The samples are in some aspects very similar (sex composition and median age), while in others differ. It seems that workers who have found a job (regardless how they did it) were slightly better educated than those who did not find a job. Similar shares of individuals collected the benefit (those who exited to employment compared to those who did not find a job). On the other hand, individuals who benefited from successful public employment intermediation more often resided in rural areas, had less total tenure (compared to those who exited to employment in general, but more alike to those who exited to non-participation). Workers who found a job by means of public employment intermediation did receive much more support than all other individuals. This is visible in terms of provided ALMP instruments and services and what differs the most, only 10% of this group was not offered a job offer in public employment office (still they could have found one available therein on their own). In 40 out of 380 counties no worker was

matched to a job offer in caregiving services between 2014-2020. One to 10 caregivers were matched in subsequent 55% of counties.

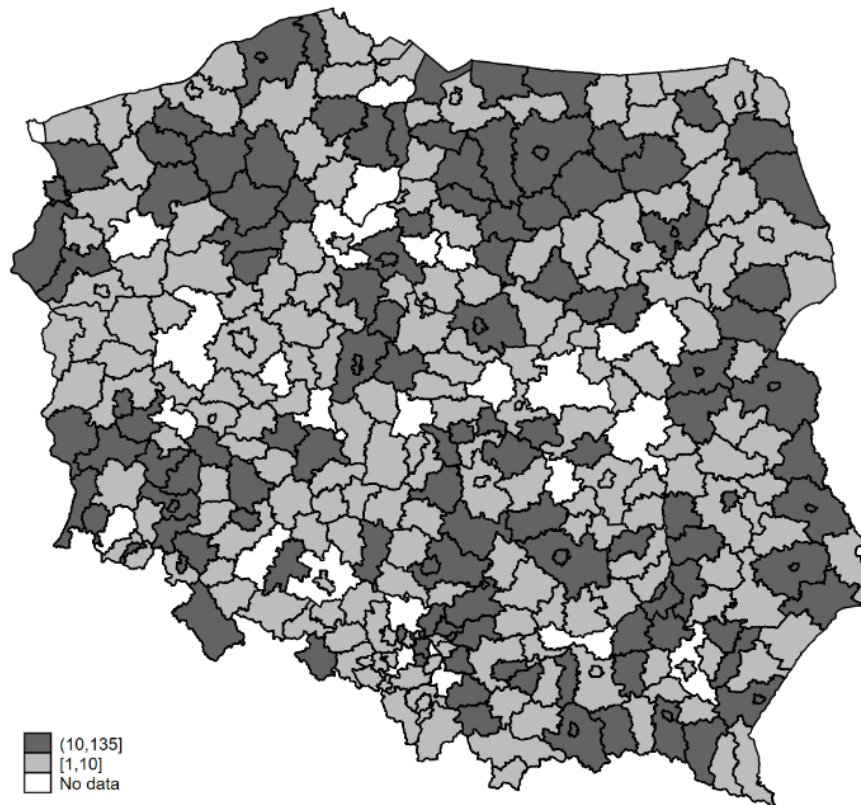
Table 4. Job seekers registered with public employment offices willing to work in caregiver services by outcome of their unemployment spell completion, in 2014-2020

| | exited to employment | exited to employment by means of public employment intermediation | exited unemployment but not to employment |
|---|-------------------------|--|---|
| gender: | | | |
| females | 94% | 95% | 95% |
| education: | | | |
| at most primary | 18% | 23% | 31% |
| vocational | 19% | 20% | 20% |
| general secondary | 11% | 10% | 11% |
| vocational secondary | 15% | 12% | 13% |
| post-secondary | 25% | 26% | 18% |
| tertiary | 12% | 9% | 7% |
| place of residence: | | | |
| rural | 37% | 48% | 37% |
| age (median) in years | 42 | 41 | 43 |
| unemployment benefit (yes) | 26% | 23% | 14% |
| Total tenure in years * | 8.2 (5) | 6.6 (4) | 6.8 (3) |
| Mean (median) | | | |
| Share of workers who received support by means of ALMP instruments | | | |
| none | 87.2% | 68.5% | 94.8% |
| once | 9.0% | 12.1% | 3.7% |
| twice | 1.5% | 3.8% | 0.8% |
| three and more | 2.3% | 15.6% | 0.7% |
| Share of workers who received support by means of ALMP services | | | |
| none | 81.3% | 68.9% | 78.0% |
| once | 7.5% | 11.0% | 8.4% |
| twice | 6.2% | 10.0% | 6.4% |
| three and more | 5.0% | 10.1% | 7.1% |
| Share of workers who received support by means of job offers | | | |
| none | 78.3% | 10.7% | 78.7% |
| once | 12.2% | 66.4% | 11.6% |
| twice | 4.3% | 10.0% | 4.3% |
| three and more | 5.2% | 12.9% | 5.4% |
| No. of observations | 27,390 | 4,566 | 24,406 |

* Total tenure regards total length of employment spells that contributes to the eligibility for unemployment benefits.

Source: own preparation, based on CeSAR dataset.

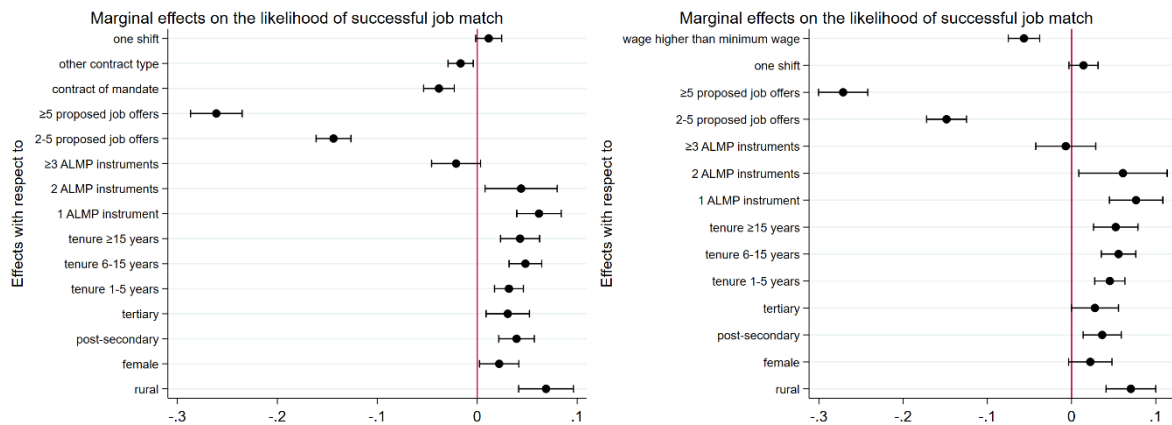
Figure 6. The number of individuals that were matched by means of public employment intermediation



Source: own preparation, based on CeSAR dataset.

We used data from public employment offices to model the probability of a match between registered unemployed workers and jobs offered them in the office. We applied a logit model. We present two most informative results. Figure 7 presents marginal effects and Table A2 (in the Appendix) presents point estimates. The first model includes the job offer properties apart from salary. The second one includes also the information on salary, although the sample size is substantially reduced. The findings are consistent and the contract type is used interchangeably with the covariate on the minimum wage rate. Results indicate that females, residing in rural areas with any professional experience with some help from public employment offices are more likely to form a job match. What strikes the most is that if workers are offered more than one offer we observe significant and substantial discouraging effect of accepting a job offer. The wider range of offers to choose from the smaller chance of job match. Alike, if a job offer offers a wage rate that is higher than minimum wage it is associated with a lower job match probability.

Figure 7. Marginal effects for the logistic regression



Source: own preparation, based on CeSAR dataset.

2.3 Preferences of job seekers

566 individuals participated in the Discrete Choice Experiment (Figure 8). The average time of experiment was 32 minutes, including the demographic and labour market questions. The respondents were rewarded for their participation.

Figure 8. Socio-demographic structure for the Discrete Choice Experiment

| | | count | mean | median | min | max |
|-------------------------------------|----------------|-------|-------|--------|-----|-----|
| sex | male | 231 | | | | |
| | female | 335 | | | | |
| age | | | 46.94 | 50 | 25 | 64 |
| education level | primary | 19 | | | | |
| | vocational | 209 | | | | |
| | secondary | 285 | | | | |
| | post-secondary | 51 | | | | |
| time without occupation (in months) | | | 90.56 | 12 | 1 | 192 |

Source: own research.

The high level conclusions that can be derived from parameters relative significance and magnitude indicate the importance of particular job characteristics in the following order: (i) additional duties; (ii) working hours; (iii) contract length; (iv) distance to workplace. Moreover, it seems that: (i) higher wage is not a significant factor for job acceptance; (ii) full-time contracts or occasional work are more preferred than half-time job (especially for older workers); (iii) immobility or mental disorder are strongly unpreferred.

The detailed results indicate, in turn, that there is little consensus in job characteristic preferences due to large heterogeneity between individual preferences. Hence, apart from estimating the model for the entire sample, we also executed the one for a split sample in age (for people older and younger than 50). Splitting the sample also provides us with preference differences in these two age groups.

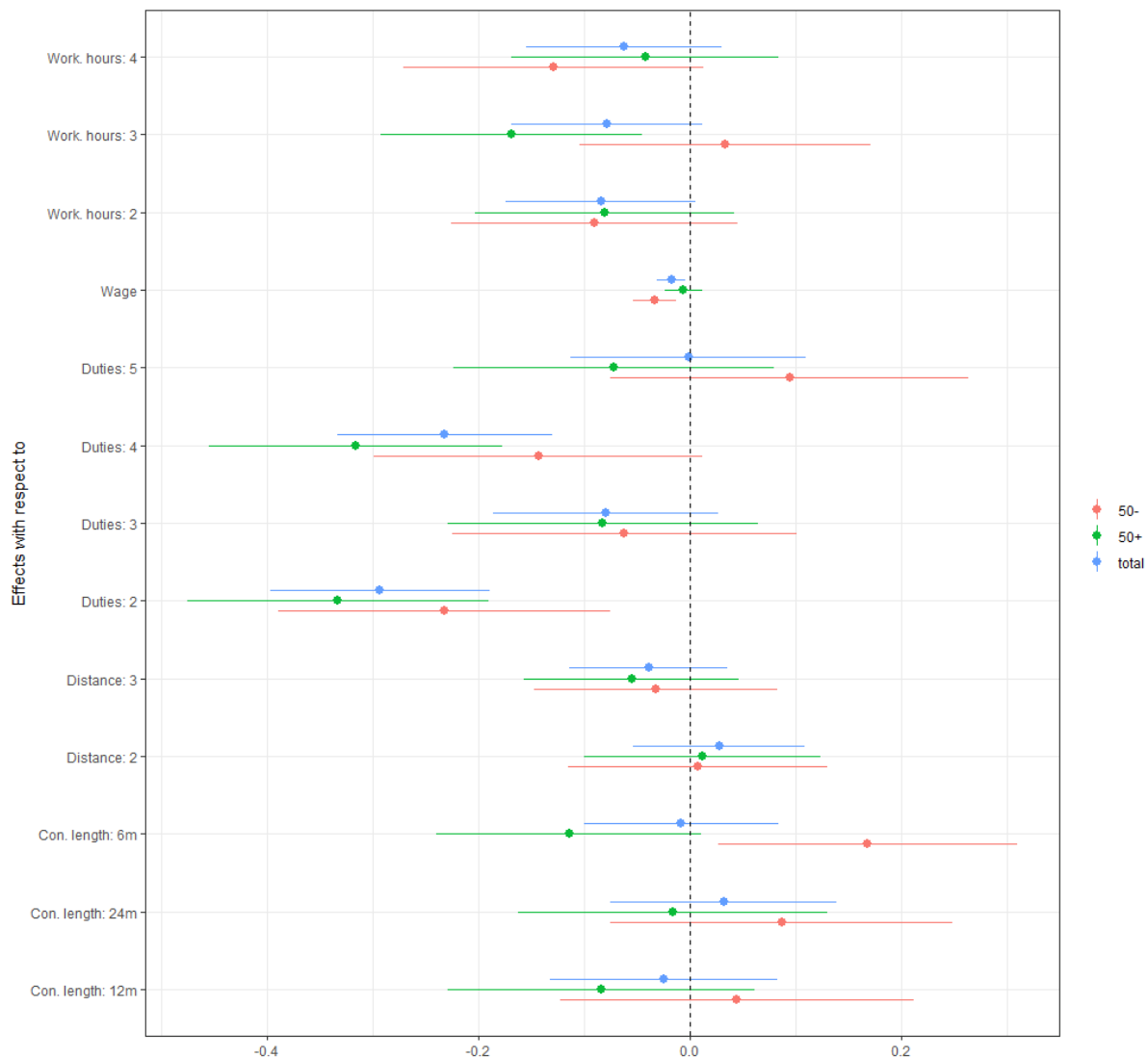
Most surprising is the negative wage coefficient, which is significant for younger workers (Figure 9, see also Table A3 in the Appendix for full results). However, this value is small enough not to have the impact on preferences. It may be due to the fact, that the hourly wage rate is a less important factor than working hours and conditions.

When it comes to working hours, a generally preferred option is either an occasional work or a full-time job. There is a significant preference difference between age groups when it comes to assessment of the half-time job: for the older workers the full-day, half-week working hours are the worst option while it is most preferred by the young.

Analysing the preferred contract length, while there are no large preference differences in the whole sample, there is a significant distinction between older and younger workers. The older workers prefer an indefinite contract versus a definite one (with significant difference over 6-month one), while for the younger 6-months duration contracts are the most preferred ones..

The least significant preference variation comes in distance to the workplace: there are no significant differences between options and among examined groups. The most significant preference occurs over job responsibilities. The workers prefer that the elderly they are taking care of do not suffer from physical nor mental disabilities. This is true for both age groups but especially underlined in the older one. Hence, the job description matters more than the payment in the wage range that was proposed in the study.

Figure 9. Marginal effects for the Discrete Choice Experiment



Source: own research.

Discussion of the results

Complementary data coming from administrative and on-line source provide a broad perspective on the caregiving services in Poland. The picture that emerges from undertaken analyses indicates that caregiving services are biased towards female workers (regardless it is done intentionally or not). The age distribution is connected with the expected professional duties. Younger workers more often (although it depends on the data source) treat the profession of caregiving services as a part-time job, and less demanding activities (less physical contact and easier duties are more frequently sought after). Older workers are more willing to engage in more demanding activities, but more often treat this profession as a full-time job. Interestingly enough, what is consistent with our initial argument, wage rate does not clear the market. Job offers and job seekers profiles indicate that labour demand and labour supply do not pass each other in terms of the wage rate. Most often, it is about the other job offer characteristics. Quite consistent picture arises from public employment intermediation analysis. Here, it looks that the job offer in caregiving services is most likely to be accepted if

it is the only offer proposed to an unemployed individual. Otherwise, the outcome of job matching is far from actual job creation. Other properties of the job offers point to the fact that secure aspects of employment contract might have the prevailing power – regular employment contract, one shift etc.

Our data, although rich in details regarding the job properties, are not representative and do not provide the full picture. Rough estimates based on official data indicate that between 56,9 and 85,4 thousand people were working in caregiving services for adults in 2021 in Poland (Gałęcka-Burdziak et al., 2023). However, this number refers to formal employment only. Labour demand is to large extent covered by immigrants. Duszczyk and Matuszczyk (2018) show that immigration to Poland is mostly temporary and from Ukraine (nearly 90% of total immigration). While accounting for migrants Matuszczyk (2022) estimates the number of people working in caregiving services for older people in Poland to 110-130 thousand.

The above estimates show the scale of employment in care services for adults. But, what are the needs? Gałęcka-Burdziak et al. (2023) tried to estimate the potential demand for caregiving services for older people that results from the needs in Poland using different data sources: 8th round of SHARE (Börsch-Supan, 2022) and the PolSenior2 (Błędowski et al., 2021) studies. Estimates vary significantly depending on the adopted measure, yet the estimates show that the real needs of caregiving services are higher than the current employment by 70-290% (Gałęcka-Burdziak et al. 2023). Moreover, due to ongoing demographic changes, the demand for care services will increase in the future. The demand for non-medical services is forecasted to increase by up to 70 thousand persons by 2030 and by up to 200 thousand by 2040 (Gałęcka-Burdziak et al. 2023).

Conclusions

Demographic change strengthens increasing demand in caregiving services for older people. Rough macroeconomic estimates indicate a huge (and about to increase in the future) discrepancy between labour supply (even when accounting for migrants) and labour demand. Fragmentary but detailed micro perspective provides more details on the sources and scope of the mismatch between labour demand and labour supply in caregiving services in Poland. The job matching process we examined takes place by means of the public employment offices intermediation. The empirical study based on logistic regression suggests that the process is random, and as long as an unemployed individual is offered one job offer the likelihood of accepting a job offer is relatively big. However, if an individual has more options to choose from the chances of a successful job match decrease.

The study on preferences of labour demand (job offers) and labour supply (job seekers on-line profiles and DCE experiment) proves that wage rate does not clear the market. Job seekers do not expect elevated wages, but these potential workers are mostly willing to perform undemanding duties. Help in maintaining hygiene was mentioned more often in job offers than in the profiles of job seekers. Among job seekers, the organization of free time and shopping for seniors were more often offered. The scope of activities performed varies depending on the health condition of people requiring care. It should be taken into account when recommending work in the care profession, because this, like the scope of activities performed, may be an important factor in choosing a caregiver's job. Some people may have strong preferences for performing specific activities or caring for someone with certain ailments. 80% of job offers

required more than two years of experience. Among job seekers, approximately 30% had no experience as a caregiver.

Workers who have higher wage expectations and are more likely to accept more demanding job requirements, have the option to work abroad, where wages are twice as high as in Poland and they are offered additional benefits, such as accommodation, almost non-existent in Polish job offers. Our analysis showed that working hours and conditions are more important than wages. Occasional work or full-time job are most welcome by job seekers.

Age heterogeneity is apparent. Older job seekers more often want full-time work, while younger ones prefer occasional or one-time work. Older workers also prefer a contract for indefinite period, while younger ones prefer short contracts, 6-month contract being the most preferred.

The discrepancy between demand and supply confirm that higher wages will not solely solve the problems of labour supply shortages. Potential wage rate increase might encourage the inflow of new workers to caregiving occupations, nevertheless since the mismatch primarily lays in others aspects, different public policy interventions should be created to address the increasingly urgent problem of supply shortages and labour market mismatch in caregiving sector.

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Appendix

Table A1. List of online job boards used in the analysis

| Website | Number | Share |
|---|---------------|--------------|
| https://www.nuzle.pl/ | 3,240 | 31,1% |
| https://www.aplikuj.pl/ | 2,154 | 20,6% |
| https://www.jobdesk.pl/ | 1,200 | 11,5% |
| https://www.egospodarka.pl/ | 1,089 | 10,4% |
| https://gratka.pl/ | 995 | 9,5% |
| https://www.praca.pl/ | 844 | 8,1% |
| https://www.gowork.pl/ | 566 | 5,4% |
| https://www.pracuj.pl/ | 193 | 1,9% |
| https://www.jober.pl/ | 59 | 0,6% |
| https://www.infopraca.pl/ | 50 | 0,5% |
| https://www.jobs.pl/ | 42 | 0,4% |
| Total | 10,432 | 100% |

Source: own research.

Table A2. Logistic regression estimates, full sample without salary and reduced sample with salary

| covariate | full sample | reduced sample with a salary |
|-------------------------------|----------------------|-------------------------------------|
| place of residence | | |
| • rural | 0.619*** (0.118) | 0.601*** (0.122) |
| sex | | |
| • female | 0.220** (0.103) | 0.209* (0.127) |
| education | | |
| • post-secondary | 0.359*** (0.083) | 0.316*** (0.100) |
| • tertiary | 0.284*** (0.094) | 0.245** (0.120) |
| total tenure | | |
| • 1-5 | 0.324*** (0.070) | 0.437*** (0.081) |
| • 6-15 | 0.471*** (0.072) | 0.524*** (0.089) |
| • more than 15 years | 0.424*** (0.084) | 0.496*** (0.109) |
| no. of ALMP instruments | | |
| • 1 | 0.521*** (0.092) | 0.608*** (0.122) |
| • 2 | 0.383** (0.150) | 0.498** (0.196) |
| • 3 or more | -0.220 (0.136) | -0.065 (0.175) |
| no. of job offers | | |
| • 2-5 | -0.883*** (0.059) | -0.881*** (0.078) |
| • 6 or more | -2.529*** (0.148) | -2.452*** (0.164) |
| contract type | | |
| • contract of mandate | -0.380*** (0.078) | - |
| • other | -0.154*** (0.057) | - |
| no. of shifts | | |
| • one | 0.108* (0.062) | 0.127 (0.077) |
| wage higher than minimum wage | - | -0.493*** (0.071) |
| No. of observations | 27504 | 13369 |
| Sensitivity | 75.7% | 77.8% |
| Specificity | 64.0% | 63.9% |
| Correctly classified | 65.6% | 66.0% |

Standard errors in (). *** – significant at 0.01, ** – significant at 0.05, * – significant at 0.10.

Source: own preparation, based on CeSAR dataset.

Table A3. Discrete Choice Experiment model estimates

| covariate | full sample | 50+ | 50- |
|---|----------------------|-----------------------|----------------------|
| wage | -0.017** (0.007) | -0.006 (0.009) | -0.033** (0.010) |
| working hours | | | |
| • half-time (4 hours daily) | -0.084* (0.046) | -0.080 (0.062) | -0.090 (0.069) |
| • half-time (3 days a week) | -0.078* (0.046) | -0.169*** (0.063) | 0.034 (0.070) |
| • full-time | -0.062 (0.047) | -0.042 (0.065) | -0.129* (0.072) |
| contract length | | | |
| • 6 months | -0.008 (0.047) | -0.114* (0.064) | 0.168** (0.072) |
| • 12 months | -0.025 (0.055) | -0.084 (0.074) | 0.045 (0.085) |
| • 24 months | 0.032 (0.054) | -0.016 (0.075) | 0.087 (0.083) |
| distance to the workplace | | | |
| • close neighbourhood | 0.028 (0.041) | 0.012 (0.057) | 0.007 (0.063) |
| • neighbouring town | -0.039 (0.038) | -0.055 (0.052) | -0.033 (0.059) |
| additional duties | | | |
| • assistance in dressing, washing, and getting up | -0.293*** (0.053) | -0.333*** (0.073) | -0.232*** (0.080) |
| • communication problems (hearing impaired) | -0.080 (0.054) | -0.082 (0.075) | 0.062 (0.083) |
| • communication problems (dementia) | -0.232*** (0.052) | -0.0316*** (0.071) | -0.143* (0.079) |
| • Assistance in drug dosage | -0.002 (0.057) | -0.072 (0.077) | 0.094 (0.087) |
| gender (male = 1) | 0.072 (0.057) | 0.141* (0.080) | -0.063 (0.090) |
| age | -0.009*** (0.003) | -0.001 (0.011) | -0.006 (0.007) |
| education | -0.014 (0.031) | (-0.044) (0.046) | -0.009 (0.045) |
| duration of unemployment | 0.00001 (0.0001) | 0.0001 (0.0002) | -0.0001 (0.0002) |
| No. of observations | 9056 | 4768 | 4288 |
| R2 | 0.076 | 0.067 | 0.092 |
| Log Likelihood | -5801.0 | -3083.2 | -2696.8 |
| LR Test (df = 31) | 951.74*** | 441.53*** | 544.15*** |

Standard errors in (). *** – significant at 0.01, ** – significant at 0.05, * – significant at 0.10.

Source: own research.

Figure A1

Proszę wskazać ofertę pracy, którą uważa Pani za najkorzystniejszą ze swojego punktu widzenia. Proszę pamiętać, aby każdy ekran był rozpatrywany osobno.

Oferujemy pracę w charakterze opiekuna osoby starszej. Do obowiązków opiekuna należyć będzie pomoc w zaspokajaniu codziennych potrzeb życiowych, takich jak gotowanie, sprzątanie i spacer.

Szukamy osób pozytywnie nastawionych, uczciwych, sumiennych i cierpliwych. Opieka nad osobą starszą odbywać się będzie w domu podopiecznego bezpośrednio w sąsiedztwie (bez zakwaterowania).

Oferujemy:

- pracę na pół etatu przez mniej więcej 3 dni w tygodniu.
- wynagrodzenie w wysokości: 30 zł netto (na rękę).
- umowę na czas nieokreślony.



Oferujemy pracę w charakterze opiekuna osoby starszej. Do obowiązków opiekuna należyć będzie pomoc w zaspokajaniu codziennych potrzeb życiowych, takich jak gotowanie, sprzątanie i spacer. **Warto mieć na uwadze, że podopieczny ma problemy z komunikacją jest osobą niedosłyszącą.**

Szukamy osób pozytywnie nastawionych, uczciwych, sumiennych i cierpliwych. Opieka nad osobą starszą odbywać się będzie w miejscu zamieszkania podopiecznego, oferta z zakwaterowaniem.

Oferujemy:

- pracę dorywczą, od czasu do czasu na kilka godzin.
- wynagrodzenie w wysokości: 35 zł netto (na rękę).
- umowę na 6 miesięcy.



Source: own preparation.