

# **3** The evolution of growing occupations in online job postings in Alberta

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This chapter provides insights into the occupations that grew the fastest in terms of online job postings (OJPs) in the years before the COVID-19 pandemic. It also analyses the specific skills that are typically required by employers in Alberta and Canada to fulfil these roles, which include health related jobs, professionals in the logistics and transportation sector. Additionally, the chapter identifies which occupations that usually require post-secondary education experienced rapid growth, examining the skill demands within these roles as well. The chapter also addresses the impact of the pandemic on various occupations that were most heavily impacted, such as certain health-related jobs and welders/machinists. By providing insights into these factors, the chapter offers an understanding of the evolving labour and skill demand within Alberta's labour market.

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## Highlights

- Businesses are increasingly relying on data to drive decision-making and strategy, leading to rapid growth in digital occupations in Alberta and Canada. This particularly holds true for occupations that require post-secondary education, as seven out of ten fastest growing jobs that require PSE can be considered digital occupations.
- The ageing population in Alberta and Canada has increased the demand for healthcare professionals, particularly Home Health Aides and Licensed Practical Nurses, who provide care to individuals in their homes or in healthcare facilities. The pandemic has further boosted this demand as more people are seeking medical care due to health concerns and restrictions on travel and public gatherings.
- The rise of e-commerce and changes in consumer behaviour, including an increased preference for online shopping, has led to a growth in demand for delivery drivers and truck drivers in Alberta. These workers are responsible for transporting goods and products from one location to another, and play a critical role in ensuring that businesses can meet the demands of their customers.
- The average number of online job postings for Welders and Machinists (skilled workers who fabricate and repair metal products) in Alberta declined steeply in 2020. The steep decline in online job postings for these workers in 2020 was due to a combination of factors, including lockdowns and social distancing measures that reduced industrial and manufacturing activity, as well as the decrease in oil prices, which impacted the demand for workers in the oil and gas extraction industry.

In the previous chapter, trends at the sectoral level were discussed. This chapter adds to that analysis by exploring trends in OJPs at the occupational level, thereby adding a more detailed look. This makes it possible to study more specific impacts of the pandemic, as well as capturing occupational trends, identifying those that are in high demand as well as those that suffered the most during the pandemic. Furthermore, this chapter looks at qualification requirements and remunerations for the different occupations.

In order to strike a balance between examining occupations at the highest disaggregation level but, at the same time, capturing the most relevant dynamics, specific data choices were made. To maintain the highest level of disaggregation possible, the results presented in this chapter focus on occupations at the 8<sup>th</sup> digit occupational level as presented in Lightcast occupational taxonomy (see Chapter 1). However, only those occupations that had a sufficient number of job postings published online during the pre-pandemic period are analysed for their growth, as not every occupation in the full set of 679 different occupations has enough information in every month.<sup>1</sup> This chapter therefore studies occupations at the 8<sup>th</sup> digit level that have had an above average number of job postings over the period between January 2015 and end of February 2020, right before the beginning of the pandemic period. This guarantees that the occupations that are surveyed have sufficient information available. Analyses on this set of occupations are, run for three different periods: pre-pandemic between January 2017-February 2020, peak pandemic during March 2020-December 2020, and post-pandemic during January 2021-September 2022. The remainder of this chapter analyses the most notable trends in occupational demand, by comparing the statistics for Alberta to the trends observed in Canada as a whole.

The analysis of OJPs in Alberta shows that demand in the pre-pandemic period has been strong in a variety of occupations of a very different nature. Results in Table 3.1 show, for instance, that high skilled and digital occupations such as Data Mining Analysts or Business Intelligence Analysts have shown a steady and significant growth in the number of OJPs in the period between 2017 and the beginning of the

COVID-19 pandemic (end of February 2020). These two jobs are exemplary for the rise of digital occupations, and will be discussed in more detail in Chapter 4.

However, occupations in other sectors have also seen significant increases in the demand in the pre-pandemic period in Alberta. Home Health Aides, for instance, or Dispatchers and Schedulers in the logistics sector have been in high demand in the 'pre-pandemic world'.

**Table 3.1. Fastest growing OJP's demand in Alberta by occupation in the pre-pandemic period**

8<sup>th</sup> digit occupation level, the growth of average number of OJPs per month in between Jan 2017 and February 2020 relative to average monthly OJPs in the period 2015-2016.

Lightcast occupation code	Occupation titles	Alberta (2017 to pre-pandemic)	Canada (2017 to pre-pandemic)
15-1199.91	Data / Data Mining Analyst	104%	46%
15-1199.93	Business Intelligence Analyst	71%	46%
31-1011.00	Home Health Aide	81%	38%
43-5031.00	Dispatcher	96%	38%
43-5081.04	Order Processor / Order Entry Clerk	74%	42%
43-5061.00	Scheduler / Operations Co-ordinator	67%	33%
53-3033.00	Light Truck Delivery Driver	73%	96%
53-3032.00	Tractor-Trailer Truck Driver	71%	25%
53-3031.00	Sales Delivery Driver	68%	37%
51-4041.00	Machinist	79%	18%

Note: Occupations selected in the sample have above average OJPs over the period January 2015 and February 2020, before the COVID-19 pandemic. Lightcast occupation codes are based on the US Standard Occupational Classification (SOC), 2010. The reference period for the calculations of the growth rates is the average number of OJPs in the occupation for the period in between January 2015 and December 2016. Source: OECD calculations based on Lightcast data.

The top ten fastest-growing occupations require a variety of in-demand skills, as shown in Table 3.2. Three of the top eight occupations require digital skills, such as dispatchers who must use SAP software for order tracking, order processors/entry clerks who need e-commerce knowledge, and scheduler/operations co-ordinators who must have project management software expertise.

Table 3.2 also reveals that the required skills for light truck delivery drivers, tractor trailer truck drivers, and sales delivery drivers are alike. These jobs all require familiarity with product delivery and transportation operations. Light truck delivery drivers and tractor trailer truck drivers also require the ability to transport heavy products/equipment and knowledge of load security. Sales truck drivers, however, are typically expected to have knowledge of the transportation industry and the household appliance industry.

**Table 3.2. Five most important skills for the top growing occupations**

	Skill 1	Skill 2	Skill 3	Skill 4	Skill 5	Requires Post-secondary Education
Data / Data Mining Analyst	SQL databases and programming	Microsoft power bi	Data visualisation	Extraction	Data mining	Yes
Business Intelligence Analyst	Business intelligence	SQL databases and programming	Microsoft power BI	Data warehousing	SAP	Yes
Home Health Aide	Basic living activities support	Healthy meal preparation	Geriatrics	Mental health diseases and disorders	Medical support	
Dispatcher	Monitoring road conditions	Radio frequency equipment	Order tracking in SAP	Ground transportation industry knowledge	Emergency services	
Order Processor / Order Entry Clerk	Order management	General shipping and receiving	Material handling	E commerce	Stock counting	
Scheduler / Operations Co-ordinator	Logistics	Supply chain management	Project management software	Transportation operations management	Supply chain planning	
Light Truck Delivery Driver	Transportation operations	Product delivery	Heavy hauling	Heavy equipment	Load security	
Tractor-Trailer Truck Driver	Transportation operations	Load security	Product delivery	Weigh station	Heavy hauling	
Sales Delivery Driver	Product delivery	Transportation industry knowledge	Transportation operations	Material handling	Household appliances industry knowledge	
Machinist	Machine tools	Computer aided manufacturing	Sawing machines	Radial drills	Powermill	

Note: Occupations indicated by \* require post-secondary education.  
Source: OECD calculations based on Lightcast data.

### The fastest-growing occupations that require post-secondary education

Examining the results in Table 3.2 it is evident that eight of the most rapidly growing occupations do not necessitate post-secondary education (PSE). However, when focusing on the top 25 most rapidly growing occupations, that proportion shifts, as 12 out of 25 do require PSE. Ten of these occupations are outlined in Table 3.3.

**Table 3.3. Fastest growing OJP's for jobs that require PSE in Alberta by occupation in the pre-pandemic period**

8<sup>th</sup> digit occupation level, the growth of average number of OJPs per month in between Jan 2017 and February 2020 relative to average monthly OJPs in the period 2015-2016.

Lightcast occupation code	Occupation titles	Alberta (2017 to pre-pandemic)	Canada (2017 to pre-pandemic)
15-1199.91	Data / Data Mining Analyst	104%	46%
15-1199.93	Business Intelligence Analyst	71%	46%
15-1133.00	Computer Systems Engineer / Architect	61%	19%
15-1199.01	Software QA Engineer / Tester	58%	15%
15-1134.93	UI / UX Designer / Developer	50%	27%
15-1131.00	Software Developer / Engineer	49%	22%
15-1199.95	IT Project Manager	46%	32%
25-2011.00	Preschool / Childcare Teacher	61%	26%
13-1021.00	Buyer / Purchasing Agent	59%	20%
17-2051.00	Civil Engineer	51%	38%

Note: Occupations selected in the sample have above average OJPs over the period January 2015 and February 2020, before the COVID-19 pandemic. Lightcast occupation codes are based on the US Standard Occupational Classification (SOC), 2010. The reference period for the calculations of the growth rates is the average number of OJPs in the occupation for the period in between January 2015 and December 2016. Source: OECD calculations based on Lightcast data.

Notably, seven of the occupations in Table 3.3 are digital professions. Aside from Data/Data Mining Analyst and Business Intelligence Analysts, which were also in the top ten occupations listed in Table 3.1, the other four digital occupations listed in Table 3.3 are among the 25 fastest-growing occupations, with and without PSE. These are computer systems engineer/architect, software QA engineer/tester, UI/UX designer/developer, software developer/engineer and IT project manager. All these roles necessitate a college or university degree. The fact that there are seven digital occupations among the fastest growing occupations that require PSE demonstrates the increasing importance of digitalisation in Alberta, which is described in more detail in Chapter 4.

However, not all of the fastest-growing occupations that necessitate PSE are digital professions (Table 3.3). The other three professions in the top 10, preschool/childcare teacher, buyer/purchasing agent, and civil engineer are roles that primarily call for non-digital skills (Table 3.4),<sup>2</sup> that nonetheless were in high demand in between January 2017 and February 2020.

**Table 3.4. Skills for preschool / childcare teachers, buyer / purchasing agents, and civil engineers.**

	Skill 1	Skill 2	Skill 3	Skill 4	Skill 5
Preschool / Childcare Teacher	Childhood education and development	Childcare	Child development	Child CPR	Changing diapers
Buyer / Purchasing Agent	Wholesale buying	Procurement	Supply chain management	Supplier relationship management	Supply chain planning
Civil Engineer	Civil and architectural engineering	Engineering software	Drafting and engineering design	Structural steel design	Geotechnical engineering

Source: OECD calculations based on Lightcast data.

Preschool/ childcare teacher fall under the categorisation of early childhood educators (NOC code 42202). Early childhood educators plan, organise and implement programs for children. This job usually requires completion of a two- to four-year college programme in early childhood education, or a bachelor's degree

in child development. This is reflected in the skills that are highly demanded of these professionals. Additionally, preschool/childcare teachers are often asked to have knowledge of child cardiopulmonary resuscitation (CPR), and a practical skill of changing diapers. Demand for this job is likely to keep increasing after 2022, as the Federal-provincial childcare agreement signed in November 2021 has further subsidised childcare resulting in improved affordability and accessibility of childcare programs (Government of Canada, 2022<sup>[1]</sup>). Therefore, more parents are expected to make use of these programs, which means more childcare teachers are required.

Buyer / purchasing agents (NOC 12102) “*purchase general and specialised equipment, materials, land or access rights and business services for use or for further processing by their establishment.*” This occupation usually requires a bachelor’s degree or college diploma in business administration, commerce, or economics. Looking at the most highly demanded skills, people in this job need to have strong knowledge on the supply chain and how to plan and manage the supply chain, as well as be good at wholesale buying and procurement, which is to be expected. Although this occupation was fast growing in between January 2017 and February 2020, this trend is not expected to continue (Government of Alberta, 2022<sup>[2]</sup>), with medium growth forecasted in between 2022 and 2024. This is reflected in the number of OJPs post-pandemic, in between January 2021 and September 2022, as buyers/purchasing agents saw a below average rate of growth in OJPs.

Civil engineers (NOC code 21300) plan, design, develop and manage projects for the construction or repair of all kinds of structures. This job requires a bachelor’s or masters civil engineering or in a related engineering discipline. Skills for civil engineers are also very much related to their professional knowledge and expertise, with them needing to be good at several aspects of engineering and designing. Most civil engineers in Alberta work in the sectors: professional, scientific, and technical services, public administration, and construction (ALIS, 2022<sup>[3]</sup>). These three sectors were all trending upwards in between 2017 and February 2020 (see Chapter 2), which could contribute to the increased demand for civil engineers.

## Ageing populations are boosting the demand for Home Health Aides in Alberta and Canada

Canada’s population is changing, and the balance between younger and older citizens is slowly shifting. In Canada as a whole, currently 19% of the population is 65 years or older (Statistics Canada, 2022<sup>[4]</sup>). Demographic challenges are modifying the demand for skills of workers in the health, medical research and care sectors and increasing the demand for certain professions in the personal care sector. The health sector is one of the largest sectors in terms of OJPs and saw an increase of 28% in Canada in between January 2017 and February 2020, see Chapter 2. And while Alberta has one of the youngest populations in Canada, with a median age of 38.4 years, and 14.8% of the population being 65+ (Statistics Canada, 2022<sup>[4]</sup>), the ageing population is leading to shifts in the labour market in this province as well (Government of Canada, 2022<sup>[5]</sup>). Against this backdrop, the analysis of OJPs indicates a demand for a specific occupation within the healthcare sector that has experienced one of the largest increases: Home Health Aides.

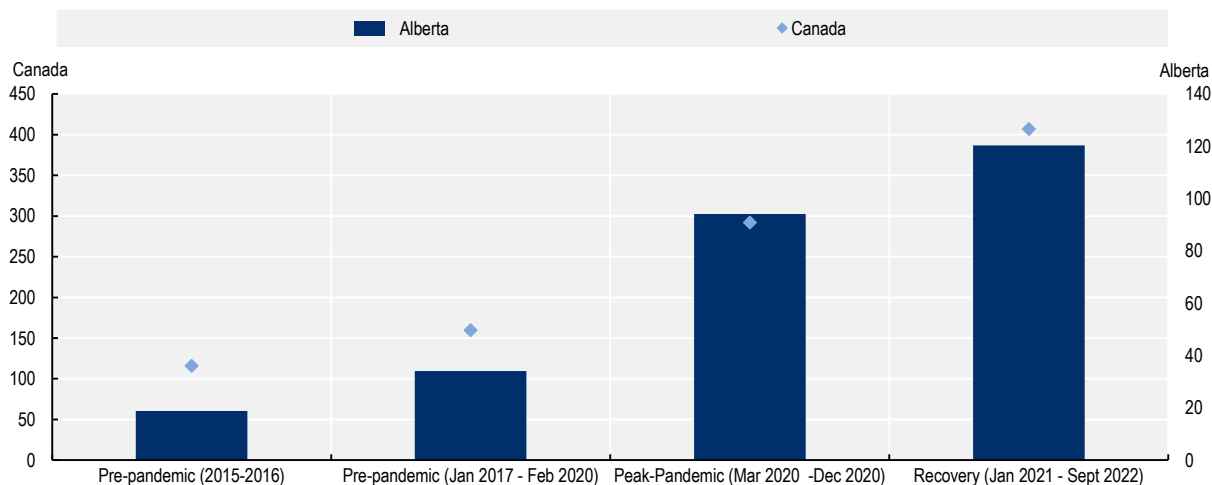
The title of home health aide is not commonly used in Canada, but based on the job description given by the US Bureau of Labour Statistics, home health aides would belong either to the group of home support workers, caregivers and related occupations (NOC 44101), or to nurse aides, orderlies and patient service associates (NOC 33102). These occupations are fulfilled by approximately 8 350 people, and 33 000 Albertans in 2022 respectively (Government of Canada, 2022<sup>[6]</sup>). Home health aides “*provide routine individualised healthcare such as changing bandages and dressing wounds, and applying topical medications to the elderly, convalescents, or persons with disabilities at the patient’s home or in a care facility. They also monitor or report changes in health status and may also provide personal care such as*

*bathing, dressing, and grooming of patient*” (U.S. Bureau of Labour Statistics, 2018<sup>[7]</sup>). According to the NOC 2021, home support workers “*provide care and companionship for individuals and families during periods of incapacitation, convalescence or family disruption and May perform routine health-related duties such as changing non-sterile dressings, assisting in the administration of medications and collecting specimens under the general direction of home care agency supervisor or nurse.*”, while nurse aides “*help with personal care tasks (such as bathing, grooming and dressing) and take vital signs and blood sugar readings to report to health professionals*” (ALIS, 2022<sup>[8]</sup>).

The necessary certifications to be a home health aide may vary, from having some secondary school education to requiring college or courses in home support, or having followed training programmes specialised for the care of the elderly or persons with disabilities (NOC 2021). The related job of Healthcare aide requires following a standardised training by Alberta Health, which can be followed at post-secondary schools (Alberta Health, 2022<sup>[9]</sup>). The five “skills” of greatest importance for home health aides are: basic living activities support, healthy meal preparation, geriatrics, mental health diseases and disorders, and medical support, see Table 3.2.

The analysis of OJPs in Table 3.1 shows that, in between 2017 and the beginning of the pandemic in 2020, the demand for Home Health Aides increased considerably in Alberta as compared to 2015-2016. In this reference period before the COVID-19 crisis, the number of job postings for Home Health Aides published every month in Alberta grew by 81%. Differently from the dynamics for other occupations, the analysis of OJPs Figure 3.1 shows that the volume of new job postings for home health aides has been increasing steadily over time and that the pandemic has not had any negative impact on this positive trend and, if anything, it has boosted the demand even more during the pandemic and the recovery phase that has started in 2021.

**Figure 3.1. Pre-, peak and post-pandemic: Trends in average monthly OJPs for home health aides**



Source: OECD calculations based on Lightcast data.

Despite being an occupation with an increasing demand as measured by OJPs, at CAD 18.53 per hour the wage received by these professionals is significantly below the average in the province, which is CAD 31.05 (AWWS, 2022<sup>[10]</sup>). Strong demand, coupled with low wages can create severe shortages of candidates as workers may find the profession not very attractive despite the demand. Data from the Albertan Wage and Salary Survey (AWSS) 2021 confirms the existence of shortages, with 67% of employers surveyed experiencing hiring difficulties and 13% of them having their vacancies unfilled for over 4 months.

### **Demand for professionals in the logistics and transportation sector was increasing before the pandemic and remains strong**

As seen in Chapter 2, Alberta's transport and warehousing sector is a sector that has been experiencing significant growth in the average number of OJPs per month, starting in the years before the pandemic. Unsurprisingly, evidence from OJPs shows that several occupations in the Transportation, Warehousing and Logistics areas have also been experiencing significant growth in demand, with the average number of new job postings growing steadily in between 2017 and the pre-pandemic period (up to February 2020). In particular, order processors and order entry clerks, scheduler and operations co-ordinators and dispatchers have been in high demand.

Table 3.1 shows, for instance, that the number of new job postings for Order Processors and Order Entry Clerks have been growing by 74% on average, compared to a 42% in the whole of Canada in the period of 2017-February 2020 compared to 2015-2016. Order Processors and Entry Clerks are at the end of the logistics chain and their tasks are typically to “receive, store, and issue sales floor merchandise, materials, equipment, and other items from stockroom, warehouse, or storage yard to fill shelves, racks, tables, or customers’ orders.” (U.S. Bureau of Labour Statistics, 2018<sup>[7]</sup>).

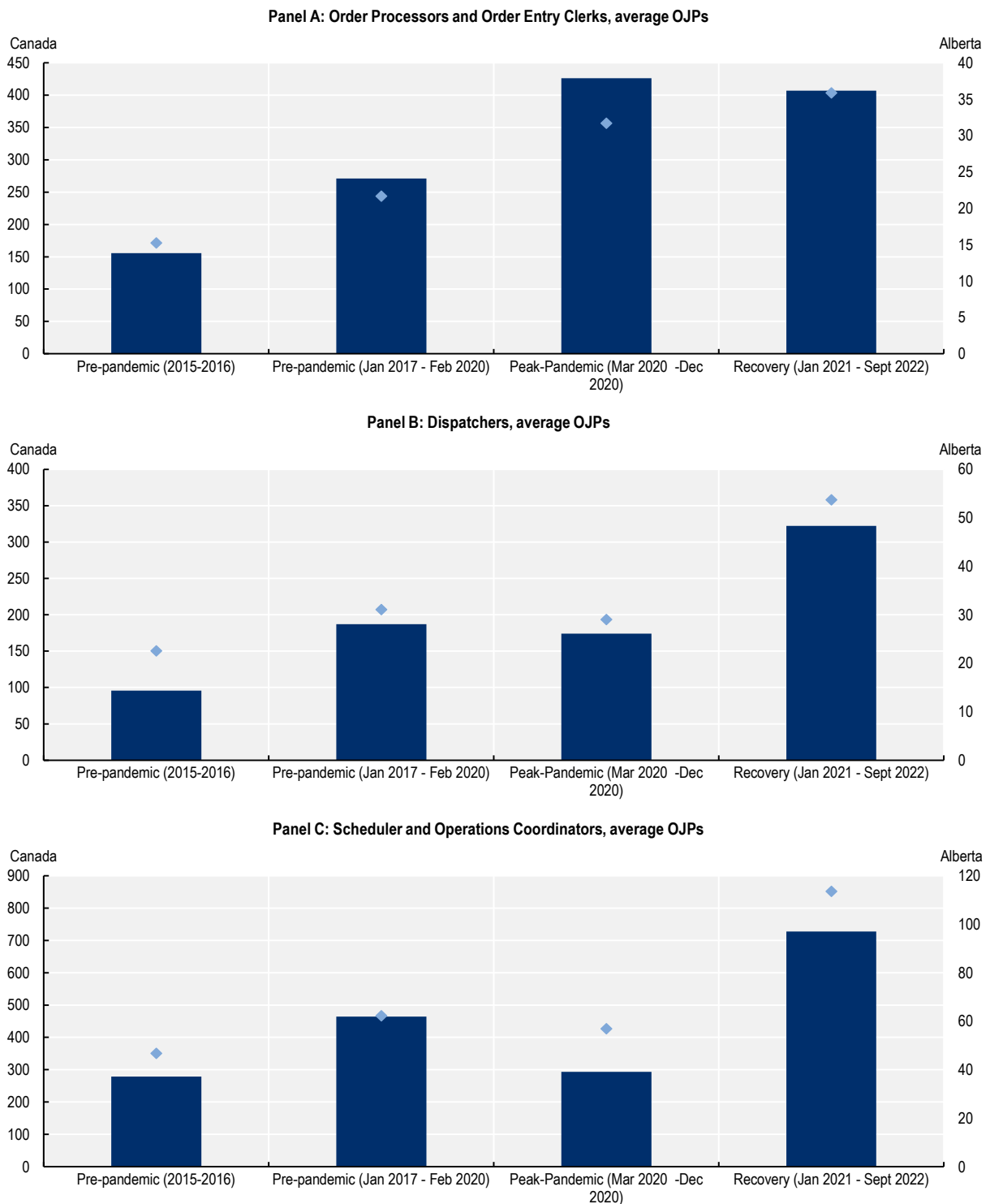
Related to merchandise's logistics and delivery, Scheduler and Operations Co-ordinators (belonging to the category of Transportation route and crew schedulers, NOC 1526) “create and prepare routes and schedules for transportation equipment and the crews that operate them” (ALIS, 2021<sup>[11]</sup>). OJPs for these professionals have also seen a significant increase in the demand, growing by 67% on average every month in between 2017 and the start of the pandemic.

Similarly, Dispatchers “dispatch workers according to written schedules, work orders, priorities, or protocols. They also prepare daily work schedules and activities, documents such as accident reports and tell workers about traffic problems, weather conditions, and other hazards on the route” (ALIS, 2018<sup>[12]</sup>). The demand for dispatchers has increased significantly in recent years in Alberta as well, with an average monthly growth of 96% in the pre-pandemic period compared to the years 2015-2016.

During the peak of the pandemic, the demand for occupations in the logistics area increased or remained relatively stable, showing the key role that this sector has played during the lockdowns, allowing people to keep receiving goods even when most people were forced to remain home and social distance (see Figure 3.2). The volume of new job postings for Order processors and entry clerks, for instance, increased at the peak of the pandemic (contrary to the strong declines experiences in most occupations in that period). Demand for Dispatchers and Scheduler and Operations Co-ordinators experienced a moderate decline at the peak of the pandemic, but a very strong recovery starting in 2021, with new job postings per month almost doubling the volumes experienced in the period in between 2015-2016.



**Figure 3.2. New online job postings for occupations in the area of logistics in Alberta and Canada**



Source: OECD calculations based on Lightcast data.

Other occupations in the transportation and warehousing sector have been increasing before the pandemic and remained in high-demand during and after the peak of the COVID-19 crisis. Results in Table 3.1 show, for instance, that the volume of OJPs for Light Truck Deliver and Tractor-Trailer Truck Drivers increased by roughly 70% in Alberta and that the demand for Sales Delivery Drivers experienced a similar increase.

The demand for drivers has been increasing over the last few years, as an increasing number of drivers reaches retirement age (Statistics Canada, 2019<sup>[13]</sup>). The Albertan Government has recently updated the qualifications needed to become a truck driver, starting a new training programme in 2019 and adding a grant programme to help people access this training (see Box 3.1).

### Box 3.1 Becoming a truckdriver in Alberta

#### Mandatory Entry-Level Training (MELT)

Starting from 2019, all commercial drivers in Alberta need to obtain mandatory entry-level training (MELT) (Therien, 2020<sup>[14]</sup>). This training is intended to make the road safer, by making truck and bus drivers more highly skilled. Training includes “a government-mandated number of training hours for in-class, in-yard and in-vehicle modules with standardised curriculums being taught at all licensed Alberta driver training schools.” (Government of Alberta, n.d.<sup>[15]</sup>) A Class 1 MELT programme (aimed at truck drivers) takes 113 hours to complete. The average cost of Class 1 MELT is CAD 8 900 (Therien, 2020<sup>[14]</sup>), and the Albertan Government has capped the costs at maximum CAD 10 000 (Government of Alberta, n.d.<sup>[15]</sup>).

#### Driving back to work grant

The high costs for obtaining MELT can be prohibitive for people that want to become truck drivers. This could be problematic, as shortages in this occupation are pressing because many of the current drivers are reaching retirement age (Statistics Canada, 2019<sup>[13]</sup>). Alberta’s government therefore instituted the “Driving Back to Work” grant programme. This grant helps prospective drivers to pay for their mandatory training to obtain a class 1 licence, by covering more than 90% of the cost (Government of Alberta, 2022<sup>[16]</sup>). It is accessible for “unemployed and underemployed” Albertans, that are planning to seek full-time employment in the commercial transportation industry.

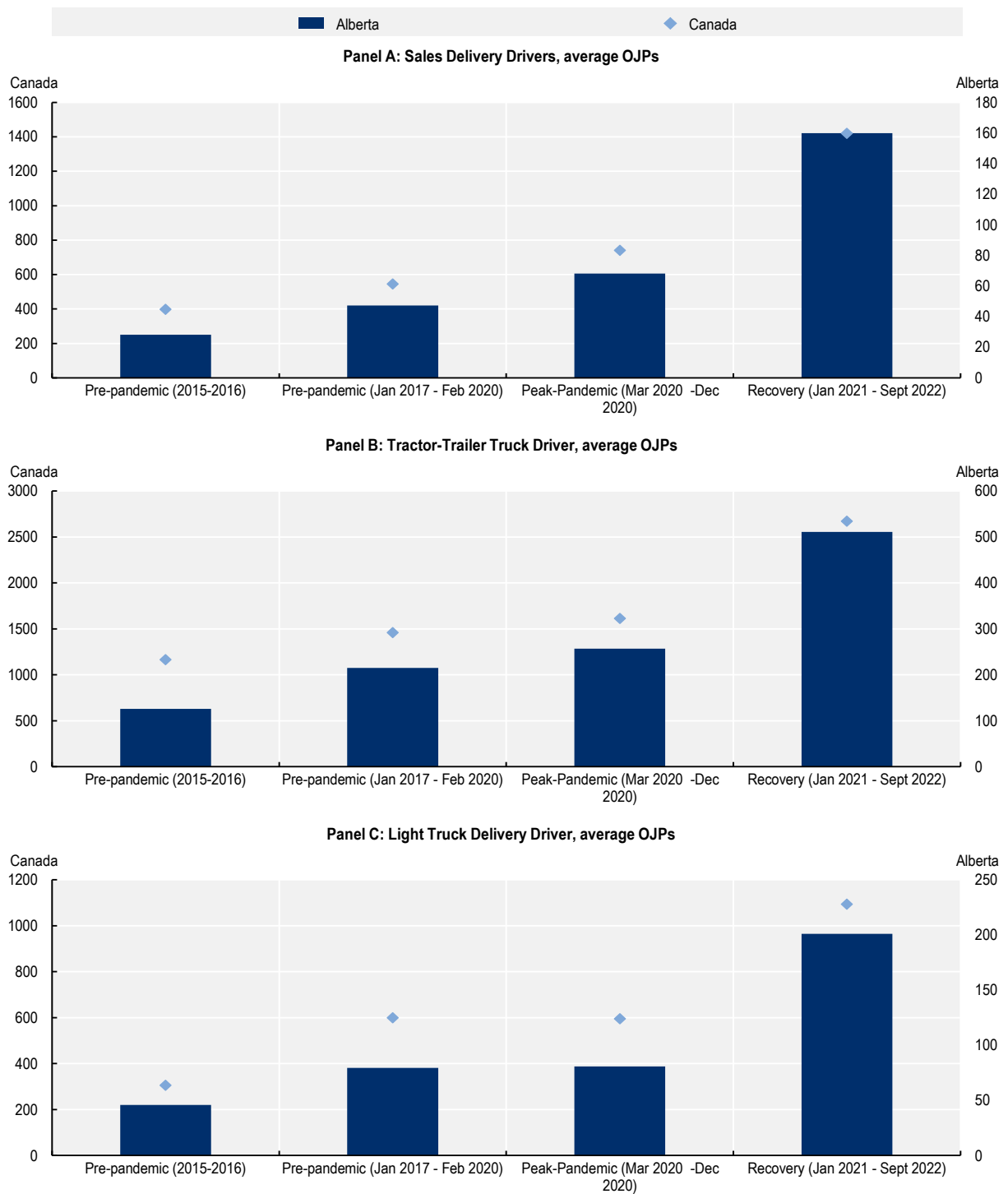
Results in Figure 3.3 show that the demand for workers in the transportation sector remained very strong during the peak of the pandemic (March to December 2020) and that it has then increased significantly in the recovery period. Labour shortages in this sector are likely behind the strong increase in the demand for workers. Those shortages, in turn, are intertwined with the recovery from the pandemic, current challenges stemming from the ageing labour force that is currently active in the transportation sector, and from increased geopolitical uncertainty which has disrupted global supply chains.

In particular, the unprecedented supply chain disruption caused by COVID-19 has had severe operational and financial consequences on many firms, with planners having to address several challenges including sudden demand drops and surges in the delivery of goods, supply shortages and inventory placement challenges. A recent report by (Attinasi et al., 2021<sup>[17]</sup>) for the European Central Bank also highlights how: *“the decline and subsequent recovery in economic activity during the COVID-19 pandemic have been unprecedented, reflecting the massive shifts in demand and supply triggered by the closing and reopening of economies, and amid considerable monetary and fiscal stimulus and high levels of accumulated savings, especially in advanced economies. [...] Faced with that strong surge in demand, suppliers of goods worldwide have been struggling to meet the increase in orders. In addition, idiosyncratic supply chain disruptions (owing to the waves of the pandemic and adverse weather events, for instance) have also played a role, capping activity and trade growth and ultimately pushing up prices”*.

In a recent report, the Retail Council of Canada (RCC, 2022<sup>[18]</sup>) is also anticipating that warehouse labour shortages will worsen, creating further pressure on supply chains in the near future. A combination of factors lies behind the challenges that Alberta (and Canada as a whole) are facing. First, COVID-19 created an unprecedented shift of consumers’ preferences pushing for a faster and more widespread adoption of e-commerce. Second, continuing wage inflation makes it challenging to hire warehouse workers. This creates bottlenecks and the sharp increase in OJPs is likely picking up the difficulty of firms in the sector to fill vacancies, likely having to repost the same job several times before being able to fill the vacancy.

Going forward, data seem to suggest further challenges and bottlenecks that will need to be addressed by both firms and policy makers.

**Figure 3.3. Demand in the Transportation sector has been strong before but grew stronger during and after the pandemic in Alberta**



Source: OECD calculations based on Lightcast data.

## The peak of the pandemic: Which occupations were most affected during the turmoil of the pandemic and how did they recover?

The beginning of the year 2020 has seen one of the most unprecedented shocks to economies worldwide. Virtually all countries introduced health mitigation strategies at the onset of what would become one of the worst pandemic periods in recent human history. The pandemic, in turn, led to one of the strongest shocks to labour markets worldwide in the last century. What started as an health crisis, quickly turned into an economic crisis. In order to contain the spread of the SARS-CoV-2 governments imposed severe limitations to social contact and to the movement and travel of individuals, closing schools and other educational institutions, halting non-essential productive activities. This led to one of the largest negative shocks to economic activity in recent history, with a significant downturn in employment levels and in the demand for workers worldwide and profound economic depression. Several occupations stand out as instead having an increased level of demand, like nursing jobs. Other occupations stand out as having a larger than average decrease in demand, like welders and machinists. Trends for these occupations, and what those jobs entail are explored in this section.

### ***The job of licensed practical nurse in Alberta saw a spike in demand during the pandemic***

The nature of the COVID-19 shock, being a health emergency to start with, triggered a significant increase in the demand for specific professionals who have played a key role as first line of defence against the spread of the virus, as discussed previously in Chapter 2. Data on OJPs shows that during the peak of the pandemic Alberta's demand for home health aides (see previous section) and Licensed practical/Vocational nurses increased significantly (see Table 3.5) The average number of OJPs looking for Licensed practical/Vocational nurses increased from 35.2 per month up to 71.7. Both of these occupations employ workers who have been battling against the spread of the SARS-CoV-2 virus.

**Table 3.5. Examples of fastest growing and declining demand during the peak of the pandemic in Alberta and Canada**

Average monthly growth in OJPs between March 2020 and December 2020

Lightcast occupation code	Occupation title	Alberta	Canada
		Growth during the pandemic	Growth during the pandemic
31-1011.00	Home Health Aide	176%	83%
29-2061.00	Licensed Practical / Vocational Nurse	104%	78%
51-4121.00	Welder / Solderer	-65%	-20%
51-4041.00	Machinist	-36%	-60%

Source: OECD calculations based on Lightcast data.

Licensed practical nurses (NOC 3233), in particular, *“provide care for individuals, families and groups in a variety of healthcare settings. They may practice independently or as part of a healthcare team”*. Licensed practical nurses work in a range of healthcare roles (such as acute care, long-term care, community and primary health clinics, education, occupational health, public health and leadership). In 2018, there were 9 900 workers employed as licenced practical nurses in Alberta. Depending on the setting, licenced practical nurses may perform many different tasks, in many cases working with other healthcare professionals (such as registered nurses, psychiatric nurses, doctors and physiotherapists). From an education-requirement standpoint, certification requirements to access the profession in Alberta are quite stringent (see Box 3.2). (ALIS, 2018<sub>[19]</sub>)

### Box 3.2. Becoming a Licensed Practical Nurse in Alberta

In Alberta, licensed practical nurses must graduate from an approved practical nursing education programme, or complete other education considered equal by the Registrar of the College of Licensed Practical Nurses of Alberta (CLPNA). Practical nursing programs combine classroom learning, lab instruction, and clinical experience in different healthcare settings.

Legislation requires licensed practical nurses who specialise to complete an approved programme or advanced certification. The CLPNA must authorise them to perform in that capacity. Specialties may include perioperative nursing/operating room, advanced orthopaedics, dialysis, immunisation or advanced foot care.

Notably, The Alberta Learning and Information Service mentions that, despite the high demand, “Completing a programme does not guarantee entrance into an occupation” (ALIS, 2018<sup>[19]</sup>). This is partly because registration with the CLPNA is mandatory to provide professional services directly to the public, teach the practice of the profession to members or students of the profession, or supervise registered members who provide services to the public, as ordered by Alberta’s Health Professions Act and Licensed Practical Nurses Profession Regulation. Registered members who are authorised by the College may perform restricted activities specified in the Regulation and only registered members may call themselves licensed practical nurses (CLPNA, n.d.<sup>[20]</sup>).

Since the pandemic, the number of new OJPs for Licensed practical and vocational nurses has grown (Figure 3.4).<sup>3</sup> This increase in the demand can be partially attributed to the emergency triggered by the COVID-19 crisis but structural shortages and lack of sufficient personnel mentioned in previous chapters have also likely played an important role. Many argue that the low attractiveness of the profession contributed to the emergence of shortages that are reported in most provinces in Canada even before the pandemic. On top of a high stress working environment, workers employed in this occupation receive a wage per hour of CAD 30.17, which is slightly below the average for the province (CAD 31.05). Looking at the labour supply, the Canadian Nurses Association reported that while the number of nurses who are eligible to work grew by 1.9% in 2019, the nursing work force actually diminished by 1.5% (CNA, 2019<sup>[21]</sup>). In Alberta specifically there were 14 805 licensed practical nurses in 2018 (Canadian Institute for Health Information, 2020<sup>[22]</sup>), while 9 900 were employed. This adds to the idea that the job was not attractive enough to succeed in retaining nurses.

The health industry in general faces a shortage of workers, including in supporting roles like home health aides, licensed practical nurses and registered nurses. These three occupations are discussed in Box 3.3, which also provides more information on registered nurses.

### Box 3.3. Home health aides, licensed practical nurses & registered nurses in Alberta

Home health aides, licensed practical nurses and registered nurses, while all highly in demand jobs in the healthcare sector, perform very different tasks. They also require different levels of education and receive different levels of remuneration.

The average number of OJPs searching for home health aides (HHA) (NOC code 44101) increased by 176% during the pandemic. As discussed previously, home health aides do not necessarily require post-secondary education, although healthcare aides need to undergo standardised training following a curriculum set by Alberta Health. Home health aides receive an average wage that is significantly below the average wage in Alberta, at CAD 18.53 per hour compared to the average of CAD 31.05. Home health aides provide care at home, and their health-related tasks are usually “*routine health-related duties such as changing non-sterile dressings, assisting in the administration of medications and collecting specimens under the general direction of home care agency supervisor or nurse.*”

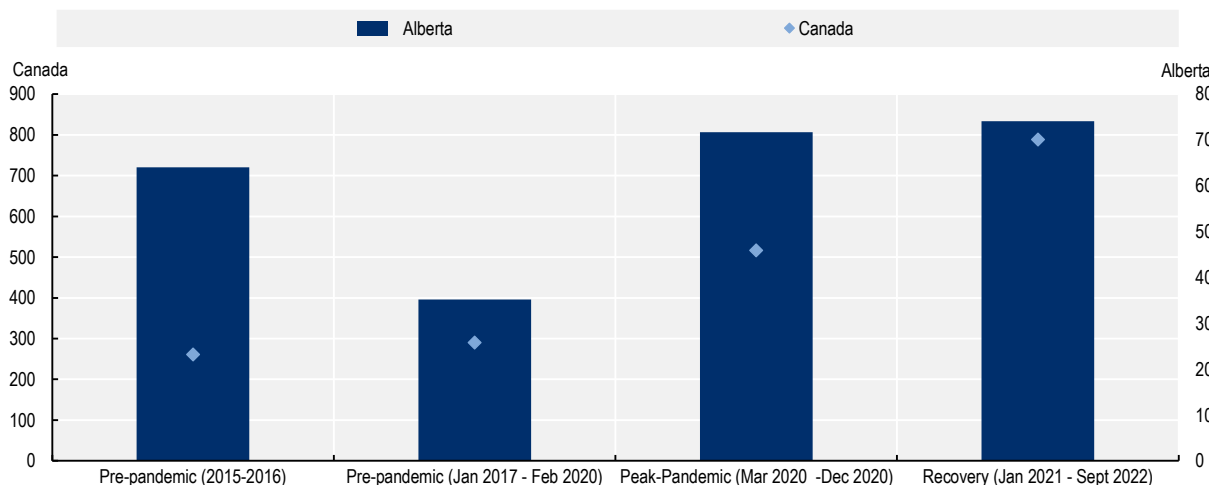
The growth in average number of OJPs searching for licensed practical nurses (LPN) (NOC code 32301) reached 104% during the pandemic. As mentioned, licensed practical nurses need to pass a practical nursing education programme, which is generally two years post-secondary education. Their average income is CAD 30.17 per hour. While the work of a LPN is generally still of a practical nature, they carry out their duties independently, and can even be in leadership roles (ALIS, 2018<sub>[19]</sub>)

The demand for registered nurses (NOC code 31101) as measured by OJPs grew by 21% during the peak of the pandemic, which is significantly less growth than the other two positions, but still considerable growth. However, the number of Albertans employed as RNs is much higher than the number of LPNs and HHAs. In 2022 Alberta had 38 900 registered nurses, compared to 9 900 licensed practical nurses and 8 350 home support workers, only some of which are home health aides (AWSS, 2022<sub>[23]</sub>). This is reflected in the number of OJPs, which are the highest for registered nurses in each year. For instance, in 2020 there were 3 361 OJPs for HHAs, 5 975 for LPNs and 12 907 for RNs. 33% of employers looking to employ RNs in 2021 experienced difficulties finding candidates, and 15% had unfulfilled vacancies for over 4 months (AWSS, 2022<sub>[23]</sub>). Some of this increased demand, as seen in increased OJPs, could potentially be due to burnout experienced by Registered Nurses during the pandemic.

Becoming a registered nurse requires even more education than becoming a LPN or a HHA, as it involves passing a 4-year nursing degree programme and passing a national licensing exam (ALIS, 2017<sub>[24]</sub>). However, a registered nurse’s income is above average at CAD 46.21 per hour, unlike the income for the other two positions. At the same time, it is a very demanding position, mentally, physically and emotionally and also requires irregular working schedules.

In line with the recent trends observed in OJPs, the AWSS places licensed practical nurses among occupations that, in Alberta, face a “high demand” (AWSS, 2022<sub>[23]</sub>). Around 55% of recruiting employers declare to have experienced hiring difficulties in Alberta and 16% of employers have vacancies for these professionals that remain unfilled for over 4 months. Against this backdrop, the Alberta Regional Occupational Demand Outlook projects employment in this occupation to increase by 3.6% by 2023, above the average in the country.

**Figure 3.4. The evolution of OJPs for Licenced Practical and Vocational Nurses, pre-, peak and post pandemic**



Source: OECD calculations based on Lightcast data.

***Alberta’s Welders and Machinists had one of the steepest declines in the average number of OJPS during the peak of the pandemic***

Among the occupations that suffered the most during the economic downturn during the pandemic in Alberta, Welders/Solderers and Machinists have seen some of the steepest declines in the average number of OJPs published monthly in between March and December 2020 in Alberta (-65% and -36% respectively),<sup>4</sup> see Figure 3.5.

Machinists are typically employed by companies that manufacture or repair equipment, such as large government organisations or repair and maintenance firms. They usually set up and operate precision metal cutting and grinding machines such as lathes, milling machines, drills and grinders to make and repair products made from metals, non-ferrous materials (materials that do not contain iron) and new alloys. Machinists are part of the larger occupation “Machinists and machining and tooling inspectors” (NOC 7231) and, in Alberta, 78% of people employed in this occupational group work in the Manufacturing or in the Mining and Oil and Gas Extraction industries.

The average wage paid to Machinists is in line with the average for the province, though the wage rate for journeyman machinists varies. It generally ranges from CAD 28 to CAD 34 an hour plus benefits (2019 estimates, see (AWSS, 2022<sup>[23]</sup>; ALIS, 2021<sup>[11]</sup>). Apprentices earn at least 55% of the journeyman wage rate in their place of employment in the first year, which increases up to 85% in the fourth year. In order to work in Alberta a Machinist must be either a registered apprentice (see Box 3.4), an Alberta-certified journeyman, or someone who holds a recognised related trade certificate. Individuals are also allowed to work as machinists if their employer is satisfied with that the worker has the skills and knowledge expected of certified journeyman.

### Box 3.4. Machinists in Alberta: Becoming one through apprenticeships

Alberta requires Machinists to acquire particular competencies and one suitable way to do so is to enrol in an apprenticeship programme (AWSS, 2022<sup>[23]</sup>). To register with Alberta Apprenticeship and Industry Training, apprentices must find a suitable employer who is willing to hire and train them. They must also meet one of the following:

- Have an Alberta high school transcript with at least English Language Arts 10-2, Math 10-3, and Science 10, or equivalent
- Have a pass mark in all 5 Canadian General Educational Development (GED) tests

Most employers prefer to hire high school graduates and basic computer knowledge is required.

The term of apprenticeship is relatively long, summing up to 4 years (four 12-month periods) and including a minimum of 1 560 hours of on-the-job training and 8 weeks of classroom instruction each year. High school students can earn credits toward apprenticeship training and a high school diploma at the same time through the Registered Apprenticeship Program (RAP). Applicants who have related training or work experience may also be eligible for admission, credit, or certification and these credits may reduce the period of apprenticeship. At the end of the apprenticeship, machinist apprentices may take the interprovincial exam in the final period of their apprenticeship training to earn a Red Seal (certification recognised in most parts of Canada).

More than 18 000 Welders (NOC 7237) were employed in Alberta and this employment is concentrated in the Manufacturing and the Construction sectors (ALIS, 2020<sup>[25]</sup>). “Welders and related machine operators” earn an hourly wage of CAD 37.56 in Alberta, but their wage rate can vary significantly depending on the experience and the tasks associated with the job. Data from the 2021 Alberta Wage and Salary Survey indicates that a welder journeyperson’s wage rate varies, but generally ranges from CAD 25 to CAD 40 an hour plus benefits (2019 estimates). Apprentices earn at least 60% of the journeyman wage rate in their place of employment in the first year, 75% in the second and 90% in the third. Similar to the case of Machinists, Welders in Alberta also need to have developed specific competencies. For instance, to work in Alberta, a welder must be either a registered apprentice, an Alberta-certified journeyman or hold a recognised related trade certificate. Apprenticeships for Welders are shorter than those for Machinists (in between 2 to 3 years).

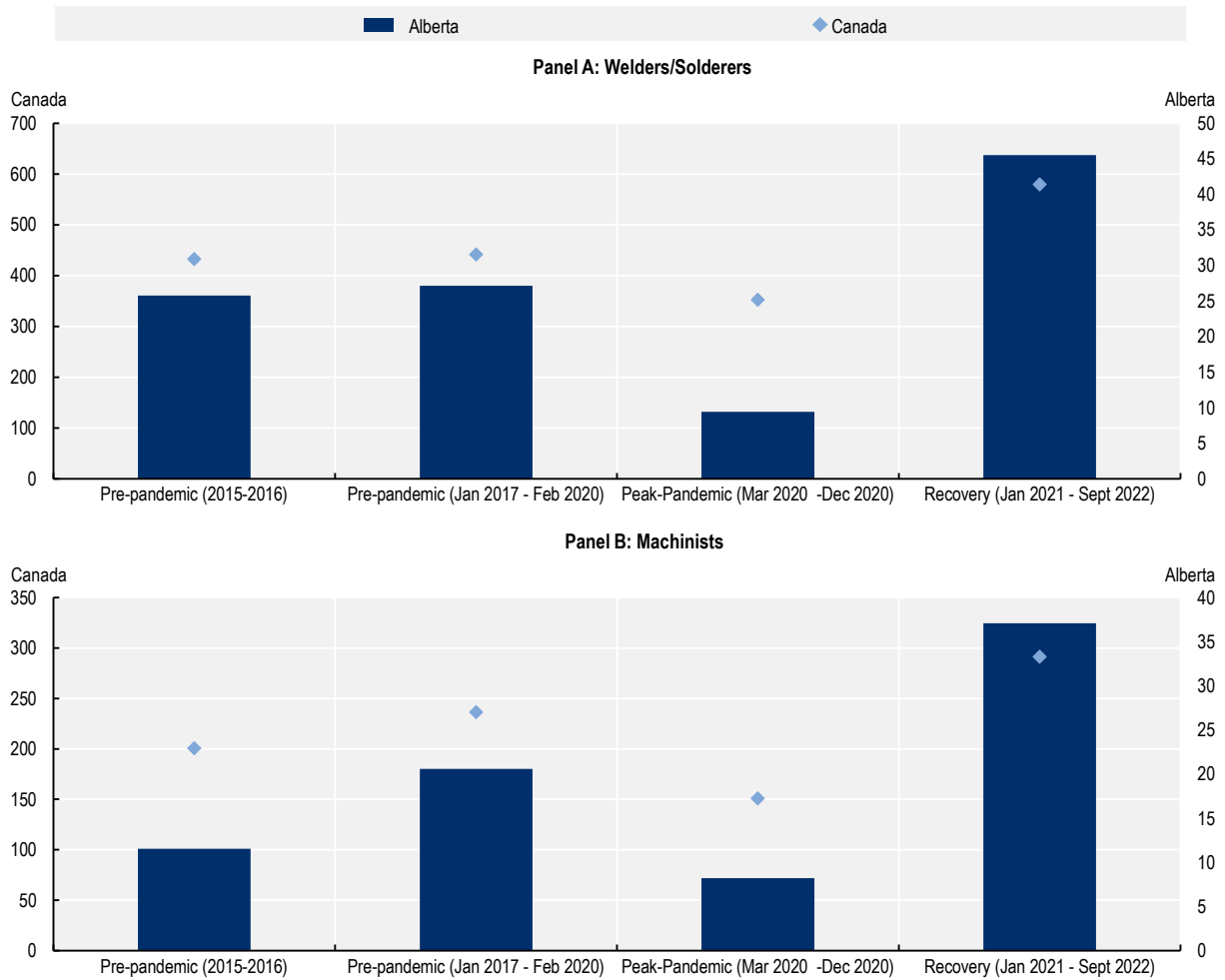
The analysis of OJPs for Alberta indicates that the demand for both occupations decreased substantially during the peak of the COVID-19 crisis, with this trend likely to be related to the lockdowns and the social distancing measures, as well as the low oil prices, which affected most jobs in Alberta’s labour market. Notably, the percentual decline in 2020 was larger for Alberta than for Canada as a whole. Potentially the situation in Alberta was exacerbated by the oil prices, because the mining, quarrying, oil and gas extraction industry employs more machinists and welders in Alberta, while in other provinces welders and machinists are employed in other sectors. The demand for Machinists, however, was steadily growing before the pandemic, while that for Welders was relatively flat. Though job postings for Welders accounted for a larger volume of overall job postings.

Despite the decrease in demand during the pandemic, the demand for both welders and machinists has picked up in 2021, with a volume of new job postings that is now exceeding the pre-pandemic trends. Evidence seems to suggest the emergence of short-term labour shortages, in particular in the case of Machinists. Demand for Machinists was growing in the pre-pandemic period, and it has experienced a significant rebound in the post-pandemic period, starting in 2021. It is still unclear, however, whether such shortages will also persist in the medium and long run. Projections for Canada, for instance, seem to suggest that about 17 400 new Machinist, Machining/Tooling Inspectors, and Tool and Die Makers will be



needed over the period 2019-2028. This is due to expansion demand, which is created because more goods and services are necessary than before, and replacement demand, which occurs when previous employees leave their jobs, due for example retirement or career switches. At the same time, 18 500 new job seekers (arising from school leavers, immigration and mobility) are expected to be available to fill them (Government of Canada, 2022<sup>[26]</sup>), leading to a surplus in job seekers.

**Figure 3.5. Average monthly job postings for Welders/Solderers and Machinists in Alberta, pre-, peak and post pandemic**



Source: OECD calculations based on Lightcast data.

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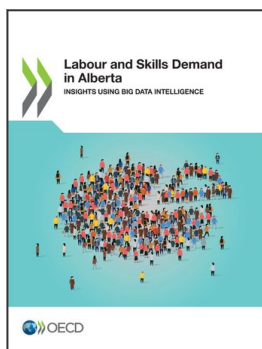
## Notes

<sup>1</sup> Annex B presents the list of occupations analysed in the chapter and the associated statistics.

<sup>2</sup> The sole exception being civil engineers who must be able to employ engineering software.

<sup>3</sup> Notably, the volume of new OJPs for Licensed practical and vocational Nurses had been trending downwards in Alberta in the years preceding the pandemic.

<sup>4</sup> It should be noted that the average number of OJPs for these two occupations is rather low (27 and 20 per month pre-pandemic respectively), adding to volatility in the trend analyses.



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