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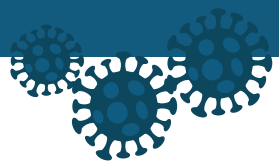

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by Kristyn Frank and Marc Frenette

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Automation, workers and COVID-19

by **Kristyn Frank and Marc Frenette**

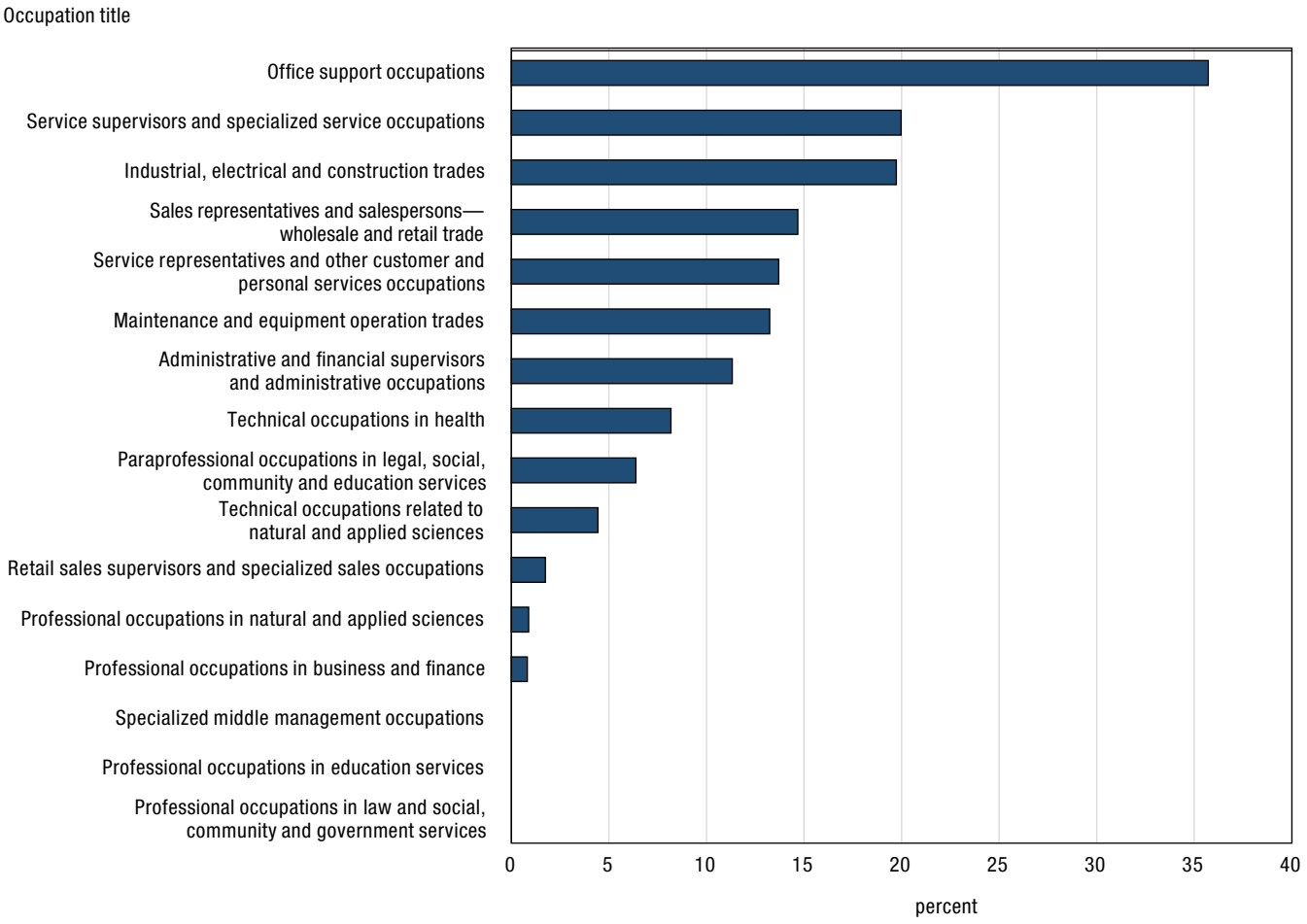
Over the past few decades, computer technology has gradually changed workplaces, leading to a reduction of routine and manual job tasks, and an increase in non-routine, cognitive tasks. More recent developments in artificial intelligence and machine learning could be even more far-reaching, as they are designed to execute tasks that were traditionally considered non-automatable.

While it is not known how quickly the latest technology will affect human jobs (for better or worse), this article describes which workers face the greatest risks of job transformation due to automation based on an approach developed by Frey and Osborne (2013) and Arntz, Gregory, and Zierahn (2016) and adapted to Canadian data. A longer study describes the approach in detail and presents more results (Frenette and Frank 2020).

Understanding which workers may be affected by automation has become very important in light of the COVID-19 pandemic. The closure of workplaces during the pandemic and efforts to minimize physical contact between people may motivate employers to "virus-proof" their production practices by adopting technological solutions. Additionally, many businesses have moved much of their sales and customer services online, increasing their reliance on digital technologies. These actions could lead to job transformation for a broad range of workers.

Prior to the pandemic, occupations facing above-average risks of automation-related job transformation were largely associated with non-professional administrative functions and various trades, whether in personal services or in heavy industrial trades (Chart 1). More than one third (35.7%) of office support workers were at a high risk of transformation, almost twice as high as any other occupation. In contrast, virtually no one (about 0.0%) employed in Professional occupations in law and social, community and government services, Professional occupations in education services, and Specialized middle management occupations in administrative services, financial and business services, and communications had a high risk of job transformation. Other occupations at low risk included Professional occupations in business and finance (0.8%), and Professional occupations in natural and applied sciences (0.9%).

Chart 1
Predicted share of workers at high risk of automation-related job transformation, by occupation

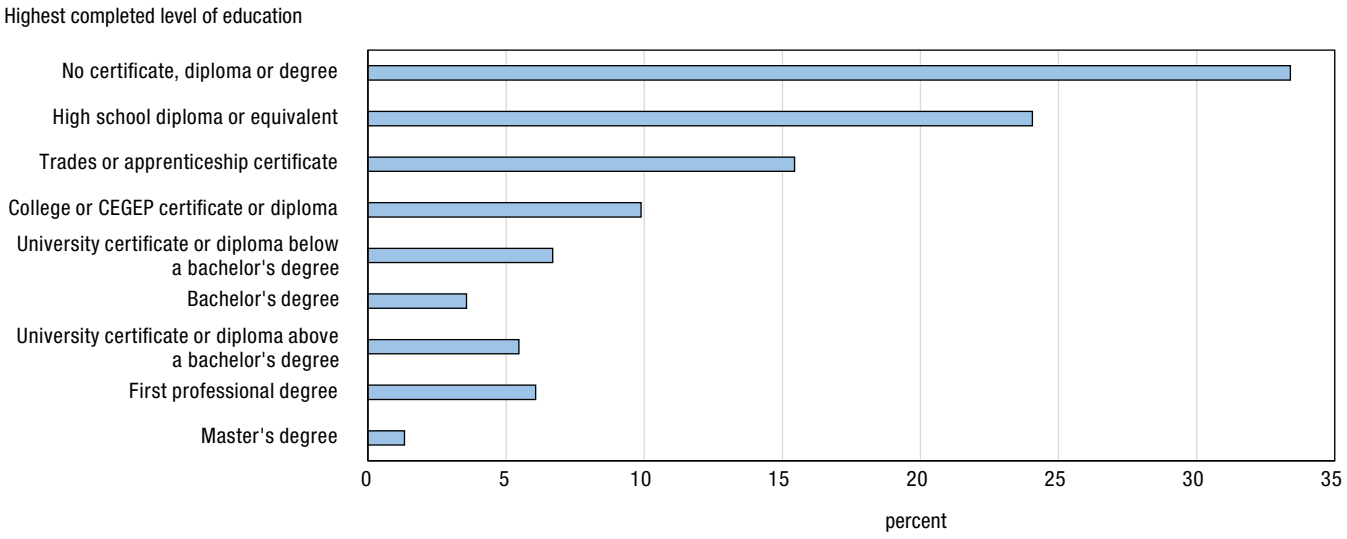


Note: Specialized middle management occupations in administrative services, financial and business services, and communications (except broadcasting).
Source: Statistics Canada, Longitudinal and International Study of Adults, Wave 3 (2016).

More highly educated workers generally worked in occupations facing lower risks (Chart 2). About one third (33.4%) of workers with no certificate, diploma or degree and 24.1% of workers whose highest level of completed education was a high school diploma faced a high risk of automation-related job transformation. In comparison, only 3.6% of workers with a bachelor's degree and 1.3% with a master's degree were in the same position. Since more highly educated workers were more likely to be employed in professional occupations, it follows that they faced lower risks of automation-related job transformation.

Among workers with a postsecondary degree, graduates from every discipline that could be examined (based on sufficient sample sizes) faced below-average risks. In all cases, less than 5.0% of graduates were at high risk. Workers who graduated from Education (1.0%), Health and related fields (1.8%), and Business, management and public administration (2.2%) programs had the lowest probability of facing a high risk.

Chart 2
Predicted share of workers at high risk of automation-related job transformation, by highest level of completed education



Source: Statistics Canada, Longitudinal and International Study of Adults, Wave 3 (2016).

Finally, there were notable variations by age group. Specifically, 13.3% of workers between the ages of 18 and 24 and 14.6% of those 55 or older were in jobs that are at high risk of transformation. Workers aged 25 to 34 and 35 to 54 were at a lower risk of job transformation (only 7.6% and 10.1% at high risk, respectively). Generally, young workers have not completed their education and, as a result, may end up working in jobs with more routine tasks which are more susceptible to automation. Conversely, older workers have generally been out of school for some time and may not have had the opportunity to train for more modern jobs that are less susceptible to automation.

The degree to which automation technology will transform workers' jobs and the rate at which these changes will happen is largely unknown and dependent on several factors. While the pandemic may expedite automation in some cases, the process may be slowed by legal and financial constraints, and perhaps also by society's willingness to be served by automated technology. Furthermore, job transformation may not always result in job loss, and may in fact result in new jobs or tasks that complement the technology.

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