NEW IZA World of Labor Report: Statistical Profiling of Unemployed Jobseekers: Big data combined with closer collaboration between policymakers and researchers can improve labor market outcomes

Statistical models can help public employment services to identify factors associated with long-term unemployment and to identify at risk groups. Such profiling models are likely to become more prominent as the increasing availability of big data combined with new machine learning techniques improve their predictive power.

A new IZA World of Labor Report shows that statistical profiling can help identify individuals at risk of becoming long-term unemployed, highlight appropriate predictive variables, and, under some circumstances, statistical models can reduce existing patterns of discrimination. Governments are increasingly developing and implementing statistical profiling models based on administrative and/or survey data to predict whether a jobseeker will become long-term unemployed. These techniques are better at predicting which jobseekers are at risk of becoming long-term unemployed or exhausting their benefits than standard regression models.

However, the report by Bert Van Landeghem, Sam Desiere and Ludo Struyven emphasises that policymakers need to evaluate the ethical implications of their use: profiling practices often misclassify individuals and have the potential to reinforce, or indeed prevent, existing patterns of discrimination. In particular, governments need to be aware of the potential for reinforcement of the stigmatization of minorities. In practice, states complying with privacy laws like the GDPR have adopted rules making it unlawful to include contentious variables such as gender, age, and ethnicity in a statistical model.

A potential mitigation is to include contentious variables in the model, but only in the prediction stage, with the contentious variables then replaced with the average for the population. This reduces the predictive power of the model but also the risk of discrimination towards minority groups. After these adjustments, statistical profiling models may actually prevent discrimination in comparison to granting case workers discretionary powers to allocate people to programs. One study found that when hiring managers' ability to overrule test results was limited, the quality of the pool of hired workers increased. Algorithms can be more transparent than human decision-makers, who are prone to unconscious bias.

While statistical profiling models might help identify at-risk people, they do not reveal which policy programs are most effective for whom. In order to maximise the benefits of statistical profiling models and reduce the risks of misclassifying individuals and increasing discrimination, it is important for policymakers to maintain consistent dialogue with data scientists and researchers to determine the best approach for the outcomes sought.

It is likely that complex statistical profiling tools will ultimately improve the labor market outcomes of jobseekers. More research is needed but a 2019 study found that statistical profiling rules can outperform case workers in assigning jobseekers to the optimal program. However, statistical profiling models are likely to support rather than replace case workers with governments looking to strike the right balance between automated and human decision makers.

Bert Van Landeghem, Sam Desiere and Ludo Struyven suggest that combining statistical profiling models with causal inference methods like large-scale randomized controlled trials with machine learning may be most effective. They conclude: *"Statistical profiling can provide an additional source of information for case workers and public employment services. While it does not inform about causal relationships, it can help raise the question of why one group is more at risk than another. In this way, statistical profiling can serve as a guide to develop research projects that investigate causal mechanisms…. Instead of profiling jobseekers with respect to the predicted unemployment duration, [policymakers] could then be profiled with respect to the predicted effectiveness of a program."*

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Notes for editors:
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