

ECONOMIC OPPORTUNITY, DRUG OVERDOSE MORTALITY, AND DISABILITY

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Rates of drug overdose mortality and participation in Supplemental Security Income (SSI) and Social Security Disability Insurance (SSDI) programs among working age adults have increased in recent decades. Our research suggests that fading economic opportunities resulting from increasing automation may explain an important portion of these worrisome trends. Encouragingly, greater social capital and safety net program generosity appear to blunt the adverse consequences of this trend.

Automation-led declines in economic opportunity and their impact on working age mortality and disability program participation.

We used new data on automation – namely, the penetration of industrial robots across U.S. labor market areas between 1993 and 2007 – to examine the impacts of loss of area-level economic opportunities on mortality and SSI/SSDI applications and determinations. The automation measure is designed to measure shifts in industrial robot penetration that are independent of other forces that may influence how labor markets operate. As a result, it allows us to assess cause-and-effect.

We combined the automation measure with restricted access, county-level death certificate data (from which we derived age-sex-cause specific mortality rates) for 1993-2007 and restricted access, county-level SSI and SSDI applications and determinations data for 2000-2007. We used these data to estimate the effects of increasing automation on mortality and disability, independent of geographic location and pre-intervention sociodemographic, economic, and industry characteristics. We examined the impacts of automation across all counties and specifically among counties in the highest quartile of share of residing workers employed in manufacturing, the industry most affected by automation.

Finally, we investigated whether the relationship between automation, mortality, and disability varied by county-level social capital and state Medicaid and TANF programs. We focused this analysis specifically on working-age men. We also assessed whether mortality impacts varied depending on differences in opioid prescription rates.

Automation led to increases in rates of drug overdose mortality and disability application.

We found that increases in automation over the period 1993–2007 led to substantive increases in drug overdose mortality for both men and women, particularly in manufacturing counties (Figure). The largest impacts were for 30–44- and 45–54-year-old men living in manufacturing counties, for whom we also find significant increases in mortality from all causes, including suicide. We also found strong effects of automation on SSDI and SSI applications. However, automation did not lead to increases in SSDI and SSI rolls, since the increase in applications as a result of automation were primarily those that did not criteria for approval.

Collectively, the average increase in automation exposure can account for 12% of the rise in drug overdose mortality between 1993 and 2007, and 22% and 12% of the rise in SSI and SSDI applications, respectively, between 2000 and 2007.

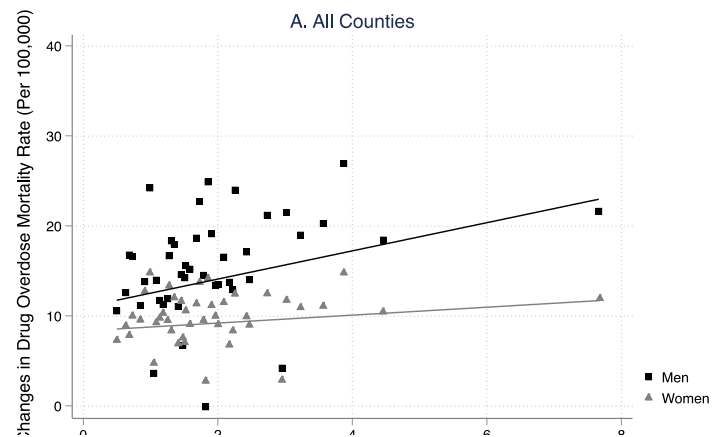


Figure – Changes in drug overdose mortality and automation, 1993–2007 (by ventile)

Impacts on drug overdose mortality were smaller in areas with higher levels of social capital and more generous Medicaid programs.

Counties with higher levels of social capital and more college graduates experienced fewer drug overdose deaths after similar changes in labor market automation, as did counties in states with more generous and more accessible Medicaid benefits. Counties in states with lower rates of opioid prescriptions experienced larger increases in drug overdose mortality as a result of automation.

Implications

- Rates of adoption of labor-displacing automation technologies are expected to increase in the next decades. These trends may adversely affect population health, particularly in terms of increased opioid use and increased rates of suicide, and will likely lead to increases in disability program applications in the short- and medium-term.
- Social capital and safety net social programs may help buffer the potential adverse health effects of rising automation.