When Borders Close: How the COVID-19 Pandemic Reduced Over-Coverage Among Nordic Migrants in Sweden

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Short Abstract

This study examines the impact of population over-coverage among foreign-born individuals in Sweden between 2003 and 2022, with a focus on changes during the COVID-19 pandemic. Over-coverage occurs when emigrants or deceased individuals remain registered as residents, leading to biased estimates of demographic and economic rates. Using Swedish administrative registers and applying both the cross register-trace and Multiple Systems Estimation (MSE) approaches, we estimate the extent of over-coverage during the pandemic. Our results confirm that overall over-coverage remained relatively stable during 2020 and 2021, but declined sharply for individuals born in Norway and Denmark—two groups with traditionally high circular mobility with Sweden. The exceptional reduction in over-coverage for these groups likely reflects the temporary disruption of cross-border commuting and the improved detection of out-migrants due to pandemic-related restrictions. For other migrant groups, including those from non-Nordic origins, changes were minor and largely consistent with pre-pandemic trends. The findings underscore the need to consider how international crises and border regimes affect the accuracy of population registers, especially for highly mobile groups. By extending earlier analyses of over-coverage in Sweden, this study demonstrates how the quality of register-based statistics is sensitive of short-term mobility disruptions.

Extended Abstract

Introduction

Register-based population systems are increasingly relied upon for demographic and socio-economic statistics across Europe. Their completeness and reliability depend on accurate registration and deregistration of residents. When individuals who have emigrated or died remain listed as residents, *population over-coverage* occurs, biasing the denominators used in rate calculations and thereby distorting key indicators such as fertility, mortality, and employment (Mussino et al. 2025). This issue is particularly relevant for migrant populations, who often engage in circular or temporary migration. Previous studies have shown that over-coverage among migrants in Sweden was relatively low—around 2–3% when estimated using Multiple Systems Estimation models (Mussino et al. 2024).

In this study, we extend earlier analyses covering 2003–2016 to include the period 2003–2022, allowing us to assess how the COVID-19 pandemic affected patterns of population over-coverage. The pandemic years introduced abrupt changes in mobility and registration behavior, especially among residents with close cross-border ties. By analysing nearly two decades of register data, we provide a long-term view of how over-coverage evolved in Sweden and identify the exceptional dynamics that occurred during 2020–2021.

Data and Methods

The study draws on Swedish administrative registers compiled by Statistics Sweden, including the Register of the Total Population (RTB), the Longitudinal Integrated Database for Health Insurance and Labour Market Studies (LISA), and event registers for births, deaths, and migration. The observation population includes all foreign-born individuals aged 18 and older who were registered in Sweden between 2003 and 2022.

To estimate over-coverage, we use two complementary approaches as in Mussino et al. (2024, 2025):

1. **The register-trace (sign-of-life) method**, which identifies individuals as potentially over-covered if they lack observable activity in any register for a given year.
2. **The Multiple Systems Estimation (MSE) method**, which models the probability that such "inactive" individuals are still present in the country, accounting for covariates such as sex, age, time since migration, and region of birth.

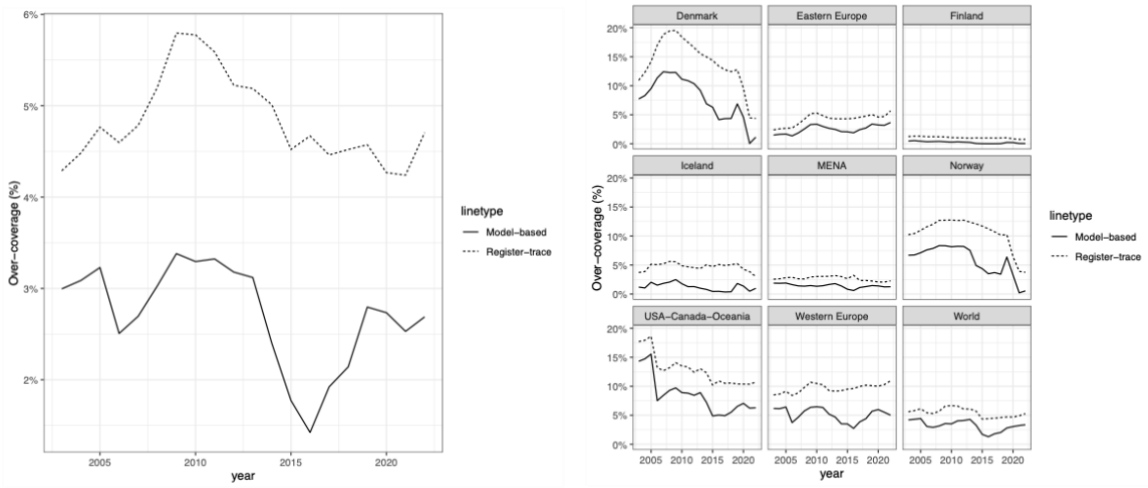
Findings

The extended time series reveals several key patterns. First, overall levels of over-coverage among foreign-born residents in Sweden remained low also in the additional pre-pandemic years 2017-2019, around 1.5–3.5% using the MSE method, while the register-trace approach continued to produce higher estimates (4–6%).

During 2020–2021, however, both methods indicated a sharp decline in over-coverage for migrants born in Norway and Denmark, whose estimated over-coverage dropped by more than half compared to the previous decade's average. This sudden change contrasts with the modest or unchanged levels observed for other origin groups.

The decrease among Nordic-born migrants coincided with the exceptional mobility restrictions introduced during the COVID-19 pandemic. Unlike Sweden, which maintained relatively open borders and fewer domestic restrictions, Norway and Denmark imposed temporary closures and stricter travel rules. These disruptions might have curtailed daily and seasonal cross-border commuting and reduced all types of migration, including short-term circular migration. Potentially, they also altered registration and deregistration incentives, thereby triggering more accurate deregistration. As a result, many individuals previously misclassified as residents may have been correctly removed from the registers.

Figure 1: Over-coverage estimates, Sweden period 2003-2022



Discussion

These findings highlight the interplay between international mobility regimes and the accuracy of register-based demographic data. Over-coverage is not solely a technical issue of data matching but also a behavioral and institutional phenomenon shaped by migration patterns and administrative responsiveness. The pandemic served as a natural experiment that temporarily reduced all types of migration, including circular migration, improving register alignment particularly in border regions.

The pronounced decline in over-coverage among Norwegian- and Danish-born migrants illustrates how short-term mobility patterns influence long-term data quality. These groups have long maintained fluid transnational lives, often retaining registration in Sweden while spending extended periods abroad. The pandemic's restrictions interrupted these patterns, which might have led to a short-lived convergence between the legal and factual populations.

References

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