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Using probabilistic linkage to improve estimates of access to services among the migrant population: The case of access to immunisation programs in Chile

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Objectives

Governments often struggle to accurately estimate the number of migrants using public services due to the lack of a unique national ID. We aim to study this in the context of migrant access to immunization programs in Chile and estimate vaccine coverage in school-age children.

Methods

To estimate vaccine coverage for migrant school-age children, we combined data from two databases: the Chilean National Immunization Register (which contained 77.9 million records) and the School Enrollment database (which contained around 68 million records, representing about 3.6 pupils per year). Using Splink, a Python package developed by the UK Ministry of Justice, we created a probability linkage model to link and deduplicate records of migrants who lack a unique national ID. The following linkage keys were considered in the model: first and second name, first and last name and date of birth. Linkage quality was evaluated using 'gold standard data'.

Results

In 2022, we find that out of 3,644,467 students enrolled in school, 140,317 of them were migrants who didn't have a Chilean national ID. Additionally, in the NIR database, 5.2 out of 77.9 million records belonged to migrants without a national ID. After removing duplicates from both databases, our linkage model determined that 52,524 of the 140,317 students without a national ID in SE were linked to NIR (37.4%). We find that excluding migrants without national IDs when estimating national vaccine coverage for school-aged children leads to an underestimation of 2%, from 86% to 88%.

Conclusion

Our findings emphasize the significance of utilizing linkage techniques in order to accurately estimate access to public services for migrant populations who typically lack a national ID. By linking their records across public institutions, more reliable data can be obtained.

