A diaspora-based model of human migration

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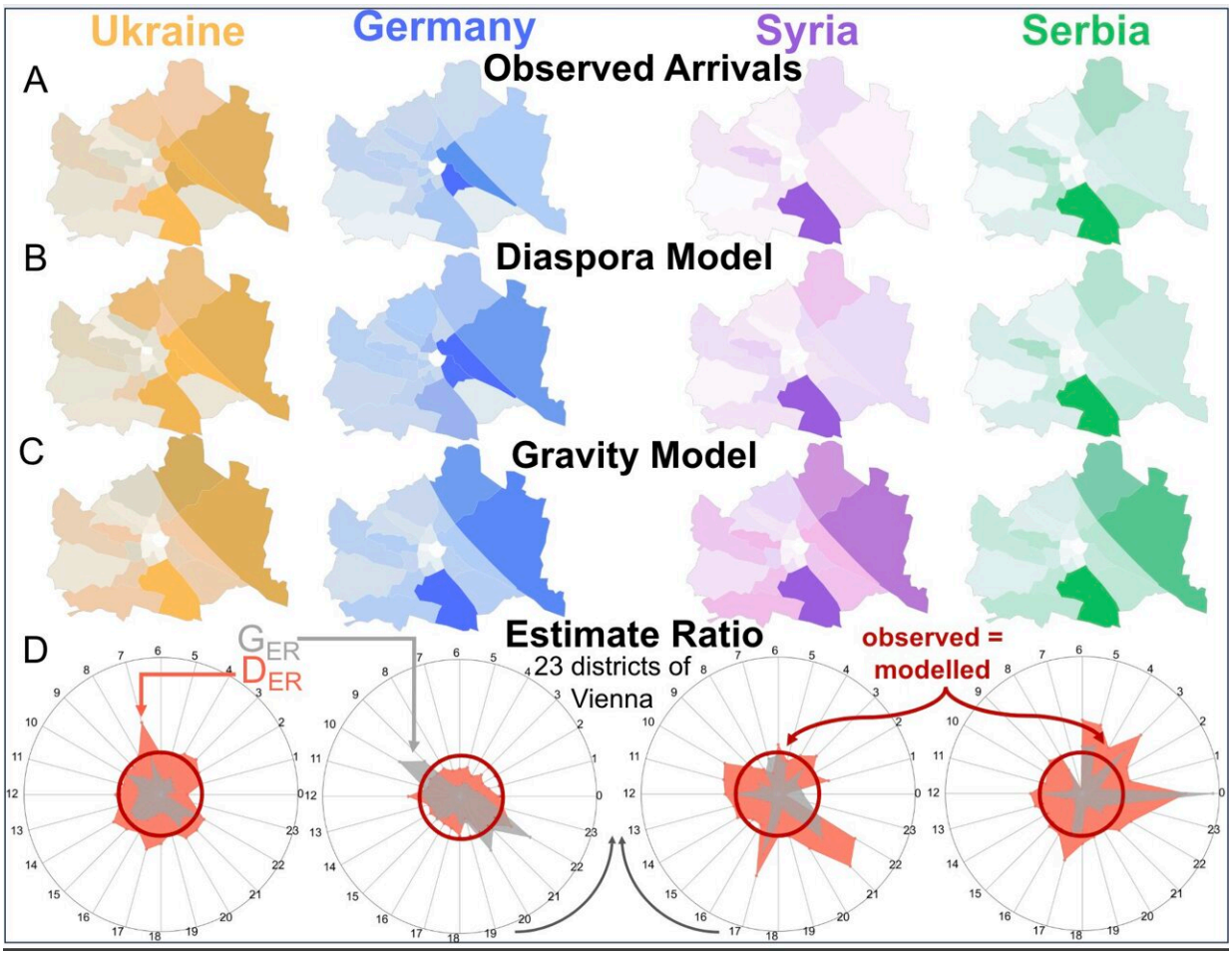


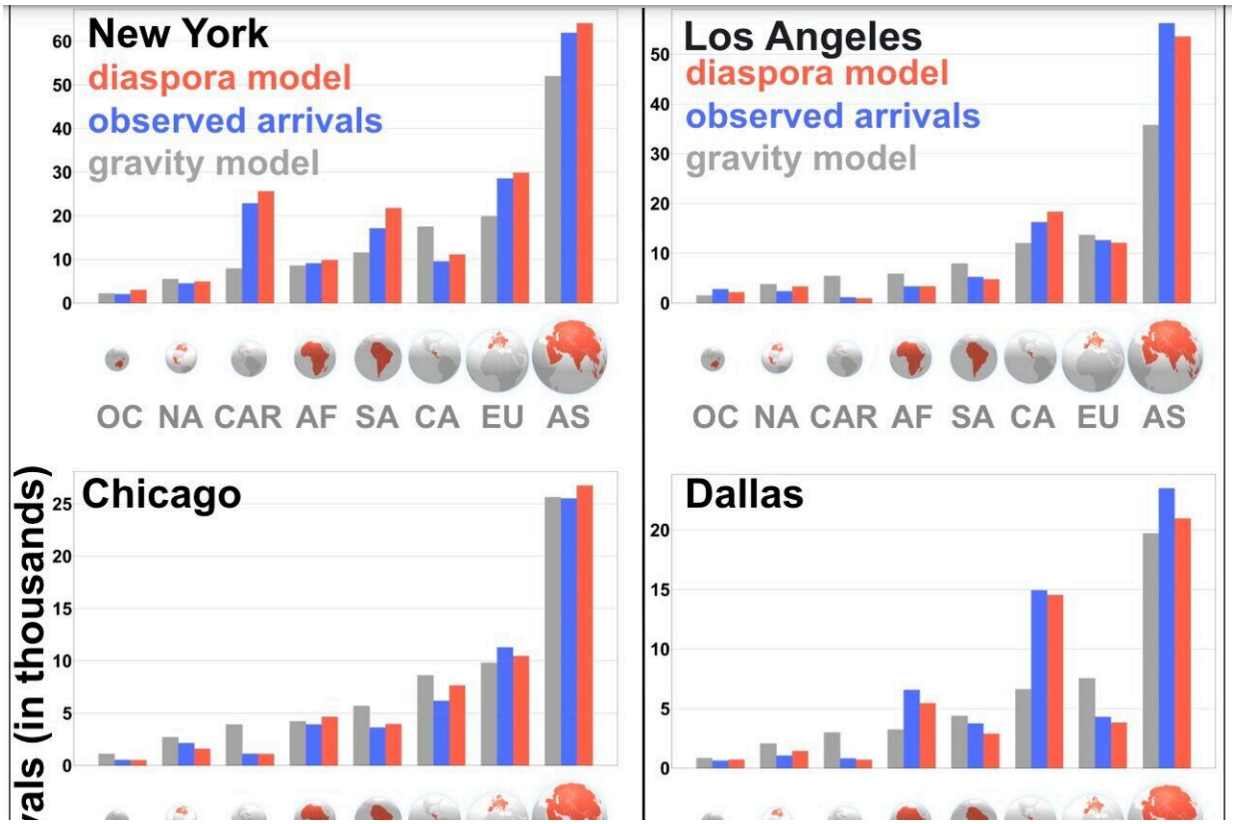
Vienna model results. A) Heat map of Vienna of the observed arrivals in Austria for the four top diasporas in Austria. B) Heat map of the diaspora model estimates in Vienna. C) Heat map of the gravity model estimates in Vienna. D) Spider plots of the top four diasporas in Austria, where each section is one of Vienna's 23 districts. The ratio between the modeled and the observed arrivals—the estimate ratio—is displayed for each district for both the gravity model in gray (GER) and the diaspora model in red (DER). The inner circle

(dark red) is when the observed and the modeled arrivals are equal. When the polygons are smaller than the circle, the model underestimates the number of migrants but overestimates that number when it is bigger. Credit: Prieto-Curiel et al

How do migrants choose their destinations? Existing models, known as "gravity models," use population size and travel distance as explanatory variables—and often fail, especially at the neighborhood scale. Many migrants prefer to move to a location near friends, family, or co-nationals.

This pattern might be partly driven by factors that repeat (such as the cost of living) and partly driven by homophily, the tendency to interact with others who are similar. Early migrants tend to reduce uncertainty and provide information for later arrivals. Building on these observations, Rafael Prieto-Curiel and colleagues construct a migration model based on the power of the diaspora to shape migration flows.

In one study, published in *PNAS Nexus*, the authors explore arrivals to Austria from other parts of the world, estimating that 10,000 individuals of a given nationality will attract roughly 1,204 new arrivals from that same nationality to the same postcode each year.



Results of the arrival flows of the top metropolitan areas in the US: New York, Los Angeles, Chicago, Dallas, Houston, and Miami. We plot the observed flows (blue), the diaspora model estimates (red), and the gravity model estimates (gray) for eight estimated diasporas: Oceania (OC), North America (NA), Caribbean Islands (CAR), Africa (AF), South America (SA), Central America (CA), Europe (EU) and Asia (AS). The diasporas are ranked according to their total arrival flow in the US in 2019. The smallest diaspora is from Oceania, with around 110,000 individuals, while the largest is from Asia, with more than 25 million migrants. Credit: Prieto-Curiel et al

In the United States, the model can predict arrivals from a given country to a given city from previous migration figures from that country to that city.

The model helps explain why people from South America are four times more likely to move to Miami than to Houston, despite the cities being roughly similar in size and roughly equidistant to both regions of origin. The diaspora model outperforms the gravity model at the city and neighborhood scale and can be used to inform infrastructure planning and policy.

More information: Rafael Prieto-Curiel, The diaspora model for human migration, *PNAS Nexus* (2024). DOI: 10.1093/pnasnexus/pgae178. academic.oup.com/pnasnexus/art …/3/5/pgae178/7674968

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