

Scaling of Mortality in 742 Metropolitan Areas of the Americas

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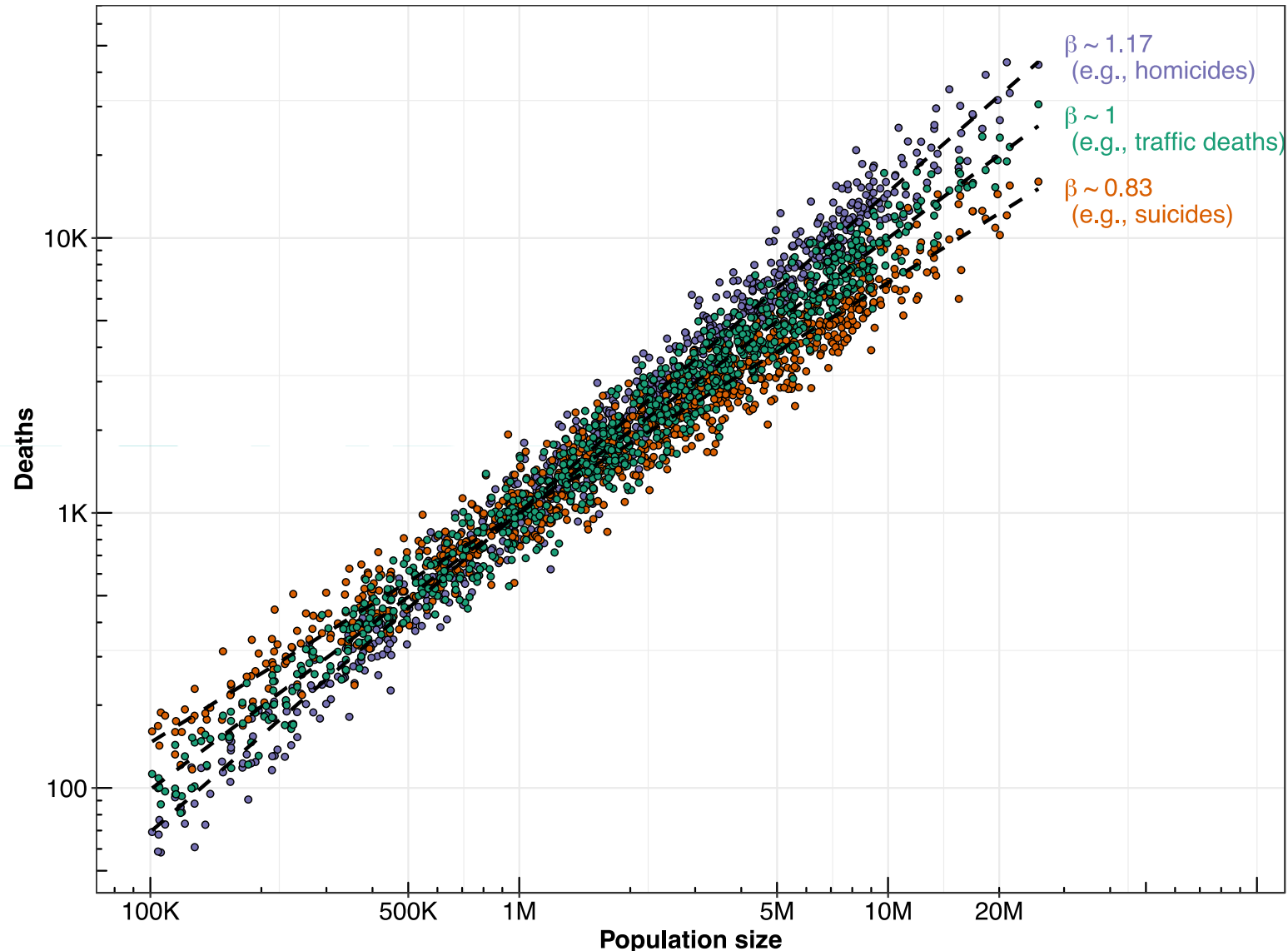
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The Salud Urbana en América Latina (SALURBAL)/ Urban Health in Latin America project is funded by Wellcome Trust [205177/Z/16/Z].



What is urban scaling?

- Like biological organisms, as cities grow the complexity of their processes also grows. Understanding the urban scaling of mortality can help us prioritize interventions by city population size.

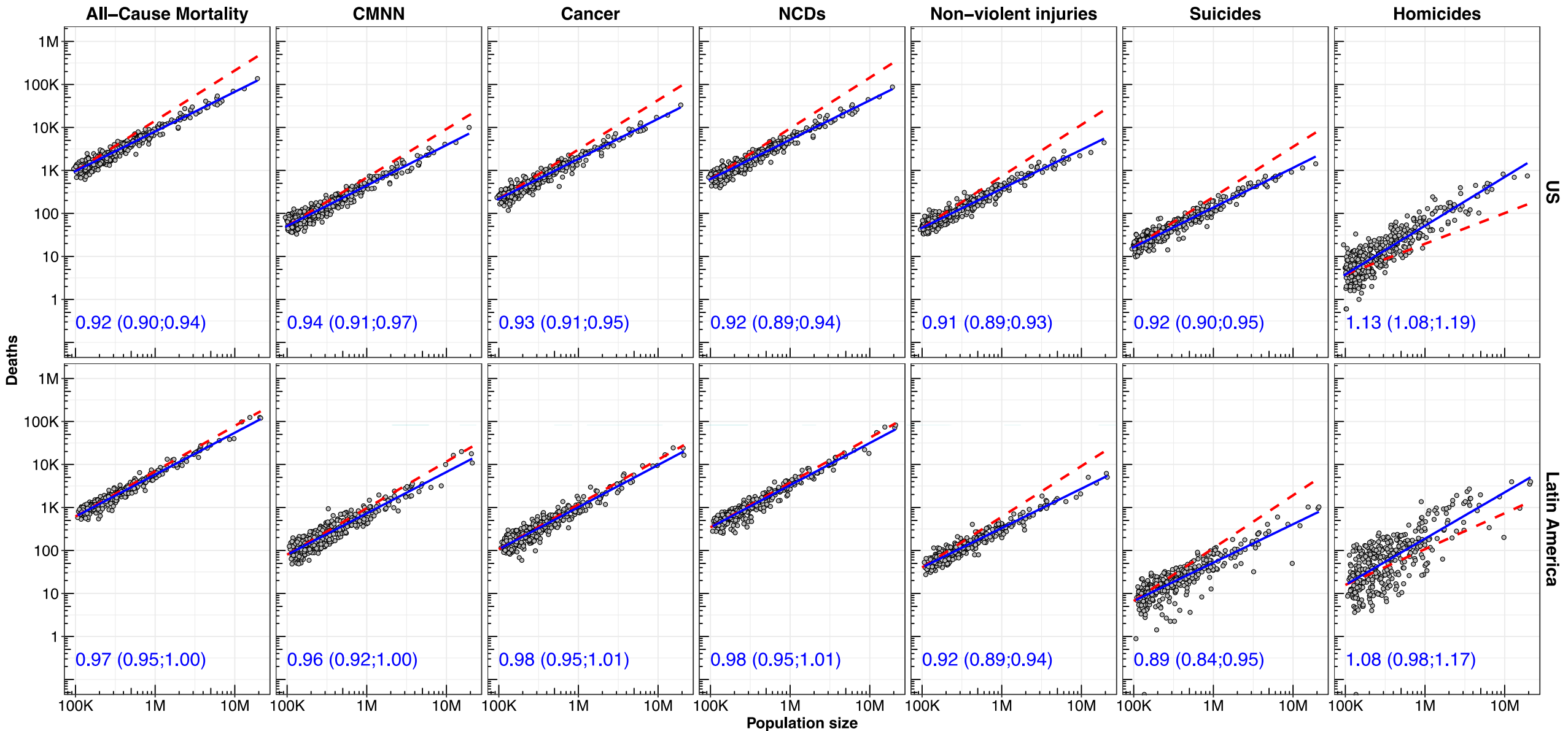


Objectives

- **We examined scaling properties of mortality across 742 cities with >100,000 residents in the US and Latin America from 2010 to 2016**

Methods

- Latin America: 366 cities from 10 countries (SALURBAL study)
- US: 376 Metropolitan Statistical Areas
- Sources: vital registration mortality data, population projects
 - LA data corrected for undercounting
- Categorization of causes of death (based on Global Health Estimates):
 - All-cause mortality
 - 5 large groups
 - 25 smaller groups
- Unadjusted model: $\log(mortality_i) = \alpha + \beta * \log(population_i) + \epsilon_i$
- Subsequent models: adjusted by country and age distribution (% aged 0-14, 15-39, 40-64, 65+).

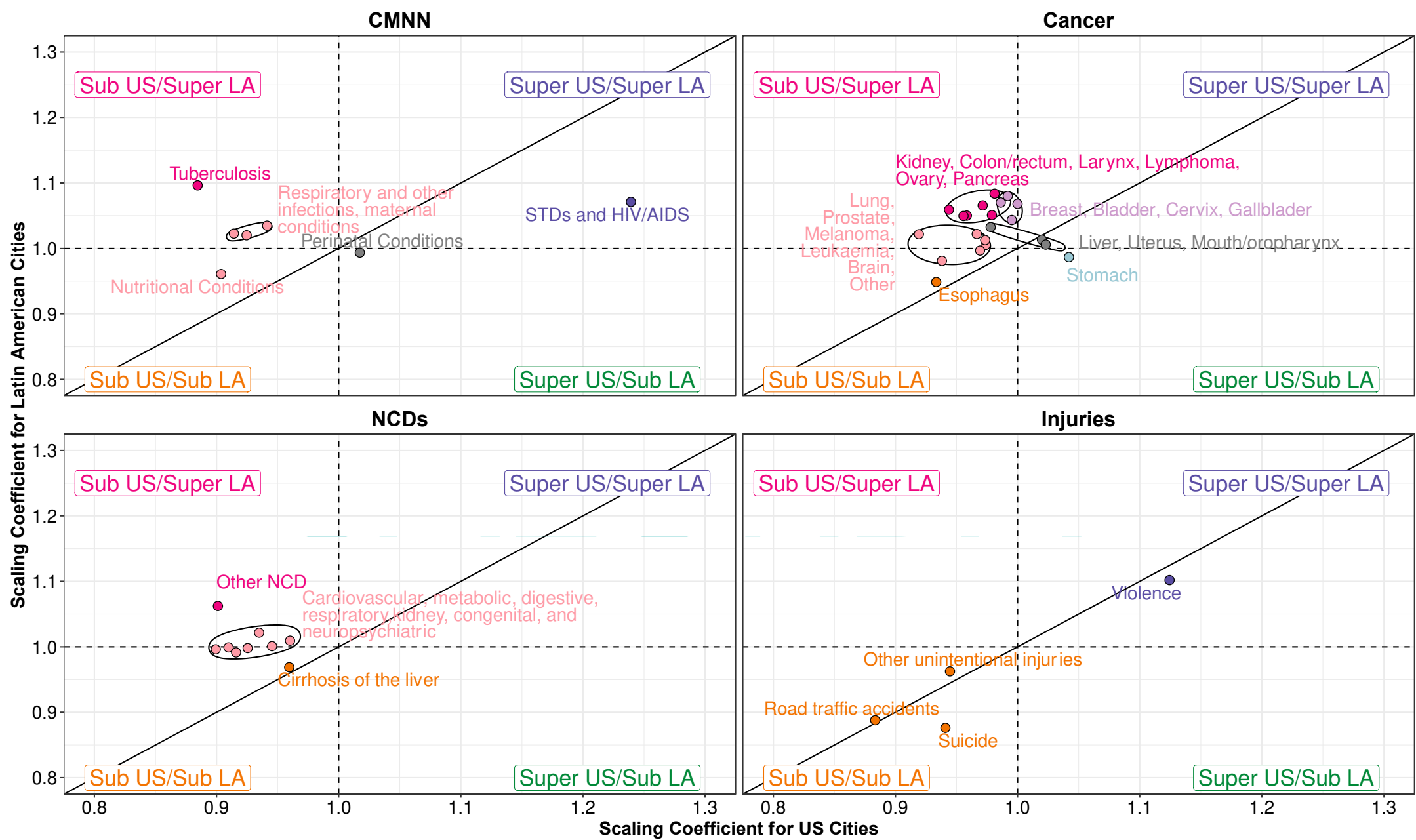


(Note: unadjusted model)

— Linear Fit — Reference Line

Cause/group	US**	LA**
All-Cause Mortality	0.94 (0.93;0.95)	1.00 (0.99;1.01)
CMNN	0.95 (0.92;0.97)	1.01 (0.98;1.03)
Cancer	0.95 (0.94;0.97)	1.01 (1.00;1.03)
CVD/NCDs	0.94 (0.92;0.95)	1.00 (0.99;1.01)
Non-violent injuries	0.92 (0.90;0.94)	0.93 (0.90;0.95)
Suicides	0.94 (0.92;0.97)	0.88 (0.84;0.92)
Homicides	1.12 (1.07;1.18)	1.10 (1.04;1.17)

(Note: ** all are adjusted by country and age distribution)



- Sub US / Sub LAC
- Sub US / Linear LAC
- Sub US / Super LAC
- Linear US / Sub LAC
- Linear US / Linear LAC
- Linear US / Super LAC
- Super US / Sub LAC
- Super US / Linear LAC
- Super US / Super LAC

Conclusions

- **Heterogeneous pattern regarding the scaling of mortality in cities of the Americas.**
- **All-cause mortality was higher in smaller cities of the US, and similar across city sizes in Latin America.**
- **Non-violent injuries were consistently less common in bigger cities, while homicides were more common in larger cities of both regions.**
- **These general patterns can help prioritize interventions for specific conditions by city size.**

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