



College of Science, Department of Integrative Biology  
Oregon State University, 3029 Cordley Hall, Corvallis, Oregon 97331-2914  
Phone 541-737-2993 | Fax 541-737-0501 | <http://ib.oregonstate.edu/>

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Dear Dr. Ash,

As the current season indicates, influenza remains a significant threat to public health, as well as a key test bed for forecasting ecological and evolutionary dynamics. Here we use a unique dataset to show for the first time **persistent, predictable differences among US cities in the intensity of influenza epidemics**, with implications for the need for surge capacity in the health system.

Epidemic models that produce accurate historical forecasts of city-level incidence explain intensity differences based on fundamental patterns of organization in human populations of different sizes. **The counterintuitive result is that elevated transmission potential in metropolises renders them less sensitive to climate forcing, leading to more diffuse epidemics in urban centers.**

These results offer a reductionist explanation for recent associations between socioeconomic conditions and influenza dynamics and have implications for the intensity of future influenza epidemics under climate change and increasing urbanization, where our model suggests vaccination could attenuate the impacts of increased amplitudes in seasonal forcing, especially outside of major cities.

In sum, we believe that this paper makes a major contribution to research on the predictability and public health impact of influenza in a heterogeneous world.

Sincerely,

Benjamin Dalziel  
Departments of Integrative Biology and Mathematics  
Oregon State University