Center for Public Health Systems Science

GEORGE WARREN BROWN SCHOOL OF SOCIAL WORK

BACKGROUND

Tobacco control policy and research are increasingly focused on the retail environment because it is the dominant channel for tobacco marketing in the United States. Neighborhoods with higher tobacco retailer density have a higher incidence of adolescent smoking and adult smokers who smoke more cigarettes per day than neighborhoods with lower tobacco retailer density.¹ However, relatively little is known about which policies most effectively reduce retailer density and their subsequent public health benefits.

METHODS

Using population and retailer data from US communities we created an agent-based model (ABM) to test and compare the potential impacts of various policy strategies to reduce tobacco retailer density and increase costs, and ultimately reduce tobacco use.

> 10 is a type of dynamic modeling that uses computer simulations to examine how elements of a system behave as a function of their interactions with each other or their environment.

In *Tobacco Town*, each "town" is populated by individuals ("agents") who are smokers, has an area of 10 mi², and contains a street network, key locations where agents spend time, and tobacco retailers. Agents travel about the town, making periodic choices about whether and where to purchase cigarettes. Four archetypal town types represent low- and high-income categories in both urban and suburban environments.



We test the potential impacts on overall cost of cigarette acquisition (travel plus purchase costs) of four policies at various intensities:

- Retailer licensing cap (10-50% reduction);
- Store type sales restriction (drug or convienence store prohibition);
- School-to-retailer buffer (500,1000,1500ft);
- Retailer-to-retailer buffer (500,1000,1500ft); &
- Combinations of these at moderate & high intensities.

Tobacco Town: Comparing retail-focused tobacco policy impacts across contexts through computational modeling

PILOT STUDY RESULTS



'Layered' policies have larger predicted cost impacts together than individual policies

Expected % increase in total (travel plus purchase) costs per pack



Figures adapted from Luke et al. Using the Tobacco Town computational model to study policy options to reduce tobacco retailer density. AJPH. 2017, In press.

- Buffer policies may have larger impacts in densely populated areas
- Combined policies may have greatest equity impact for density





Tobacco retailer density

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Tobacco Control Legal Consortium

CURRENT STUDY

Tobacco Town Minnesota

Currently in the model development phase, we are testing policies in virtual towns based on Minnesota communities, with additional agent, product, and policy specifications

Minnesota town types



- Adding menthol policy tests
- Diversifying agents
- Modeling cessation
- Considering rural town types

NEXT STEPS

More towns, agent & policy types

Future iterations to address youth, OTPs, price policies and more

- Tobacco 21
- Flavor sales restrictions
- Price floors
- Discount restrictions



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