Children's Hospital of Philadelphia
PolicyLab

Model Projects County-Level COVID-19 Spread with Multiple Reopening Scenarios

Philadelphia, Pa. – May 1, 2020 – New data released today by PolicyLab at Children's Hospital of Philadelphia (CHOP) show projected COVID-19 cases by county based on when and how aggressively communities reopen non-essential businesses. Overall, the findings indicate that even our most densely populated cities have opportunities to begin safely reopening as temperatures rise—if they take a measured approach.

The new data updates a model the researchers first released on April 22 and includes two additional weeks of information across the 211 counties with ongoing outbreaks that they are tracking. The updates reveal that weather is having a greater impact on the spread of COVID-19 than previously indicated. Rising temperatures appear to be reducing the risk for large second peaks of coronavirus cases during the summer in many locations, as long as communities remain cautious in their reopening strategies.

"The warming spring temperatures have made me more optimistic about our ability to manage transmission of this dangerous virus even in our country's hardest hit areas, as long as our communities are cautious and vigilant as they reopen," said Dr. David Rubin, director of PolicyLab at CHOP and a professor of Pediatrics at the University of Pennsylvania's Perelman School of Medicine. "Still, for those living in areas where the forecasts from our models look good, we would warn against complacency. No matter where you live, our ability to safely return to normal activities depends on developing strong plans to safeguard workers and consumers, protecting each other in public by minimizing crowding and wearing protective masks, and by ensuring we have the capacity to test and identify new cases quickly and quarantine the sick."

The model, known as COVID-Lab: Mapping COVID-19 in Your Community, was developed by researchers at PolicyLab at CHOP and the University of Pennsylvania to track and project COVID-19 transmission across 260 U.S. counties (211 with active outbreaks). The new data forecast the number of coronavirus cases communities could experience over the next 120 days if they relax social distancing measures, defined by travel to non-essential businesses. The model illustrates four scenarios in which social distancing practice reduces from its current national average of 70%, back to either 50% or 33%, as compared to normal activity in February before the epidemic began. The model also considers two options for reopening: May 15 or June 1.

"While we're encouraged to see evidence that communities across our country could begin to safely reopen soon, our models are not yet able to project into the fall to forecast what a resurgence of cases could look like with a rise in cooling temperatures," said Dr. Gregory Tasian, faculty member at PolicyLab, assistant professor of Urology and Epidemiology and senior scholar in the Center for Clinical Epidemiology and Biostatistics at the University of Pennsylvania's Perelman School of Medicine. "Fall not only brings cooler weather, but the start of flu season, so every community will need to implement strategies to continue to protect those most vulnerable to severe illness from COVID-19 and to reduce the risk of additional widespread outbreaks."

Utilizing data from a variety of publicly available sources, the researchers built their model to observe how social distancing, population density, and daily temperatures affect the number and spread of COVID-19 infections over time across a county, accounting for population characteristics, such as age, insurance status and smoking prevalence. The model shows that social distancing policies, population density and temperature are all important factors in the spread of COVID-19, with social distancing being the strongest predictor. The

team will continue updating the model based on policy changes and mitigation strategies that counties make to forecast viral transmission well into fall and winter when they anticipate more counties will have significant outbreaks. The data are publicly available in the form of interactive maps and graphs, here: https://policylab.chop.edu/covid-lab-mapping-covid-19-your-community

“What’s unique about our model is that we built it with the underlying assumption that every community is uniquely experiencing the impacts of COVID-19,” said Dr. Jing Huang, faculty member at PolicyLab at CHOP, assistant professor of biostatistics in the Department of Biostatistics, Epidemiology and Informatics, and a senior scholar in the Center for Clinical Epidemiology and Biostatistics at the University of Pennsylvania’s Perelman School of Medicine. “Local data will be the most important tool we have to make informed decisions about how to protect workers and families as we lift shelter-in-place directives and begin to define our new normal.”

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About PolicyLab at Children’s Hospital of Philadelphia: PolicyLab at Children’s Hospital of Philadelphia (CHOP) is dedicated to achieving optimal child health and well-being by informing program and policy changes through interdisciplinary research. Founded in 2008, PolicyLab is a Center of Emphasis within the CHOP Research Institute, one of the largest pediatric research institutes in the country. With more than 30 highly regarded faculty and 60 passionate staff who bring expertise from myriad of fields covering health, research and health policy, our work focuses on improving public systems, improving health care delivery and improving child health outcomes. For more information, visit **http://www.policylab.chop.edu**.