

Air Summit Review And Next Steps

March 17, 2017

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Robert Wood Johnson Foundation



INSTITUTE FOR HEALTHY
AIR WATER & SOIL

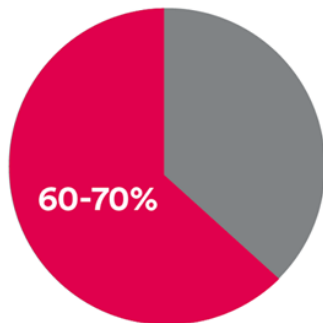


Poll Question

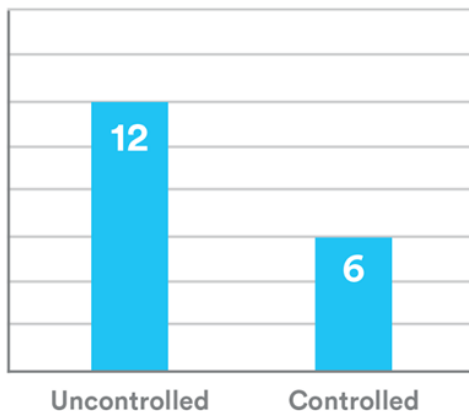
Have you ever shared with your physician data collected by a digital health device?

Asthma takes a toll on individuals ...

60-70 percent of
people with asthma
are uncontrolled



Missed work days/year
due to asthma

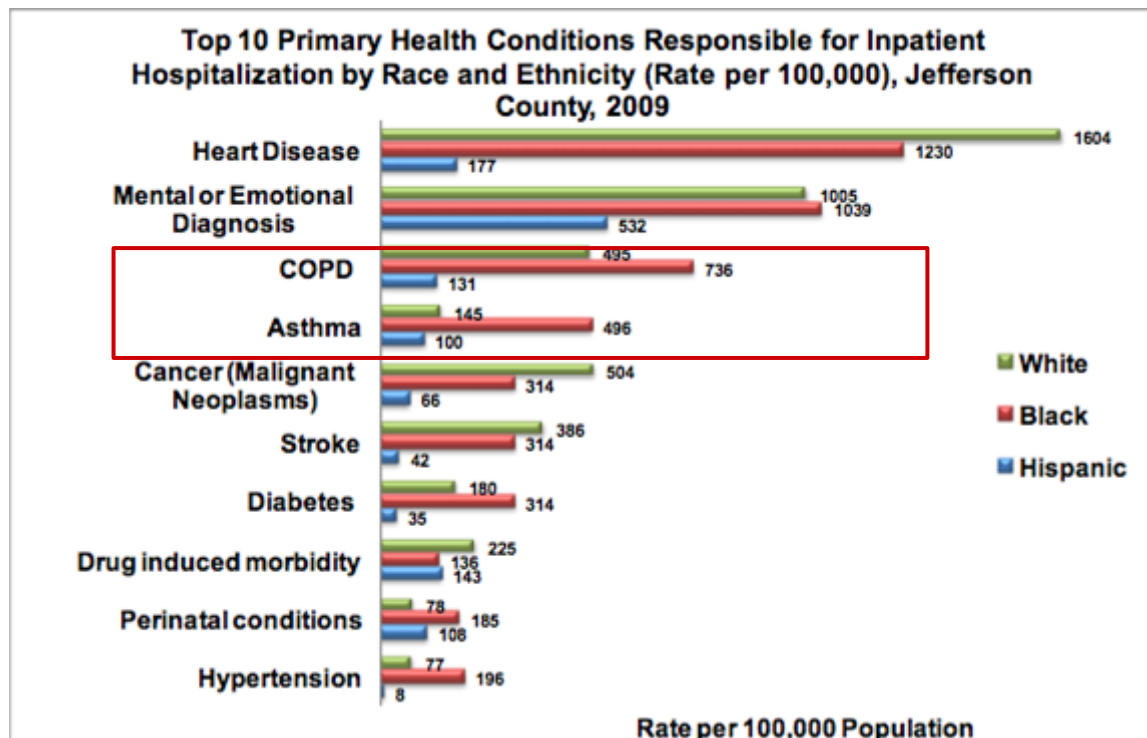


5.2%

Productivity decline
when working with
asthma symptoms

Dean et al. The Impact of Uncontrolled Asthma on Absenteeism and Health-Related Quality of Life. Journal of Asthma; 2009, 46(9): 861-866.
R Zeiger et al. Asthma costs and utilization in a managed care organization. J Allergy Clin Immunol 2008, 121:885-92.

...and drives healthcare costs



> \$26.8m was spent on hospitalizations for asthma in 2012 in Jefferson County.

AIR Louisville Goals

1. Improve asthma and COPD outcomes among residents, demonstrating healthcare utilization reductions and cost savings.
2. Identify hotspots of respiratory disease in the community, and better understand how environmental drivers are influencing these patterns.
3. Create a direct loop from data collection to policy action.
4. Increase public awareness of air quality and respiratory disease in Jefferson County.
5. Create a sustainable partnership that will be supported into the future by local self-insured employers and health plans.

Unique public-private partnership

7 employers



3 providers



1 payer



3 community partners



How does a resident join?

Community members self-enroll into the program and receive a sensor kit in the mail.



Visit
<https://airlouisville.com>



Take the Propeller
quiz and enroll



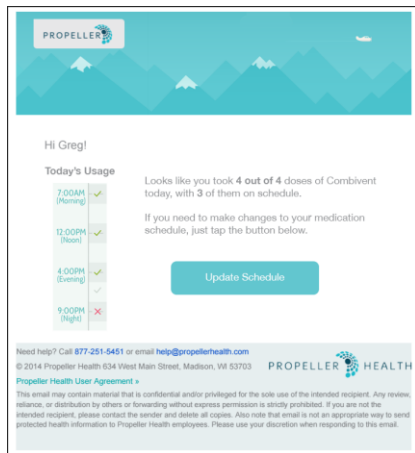
Download and log in
to the Propeller App



Receive the Sensor
and get started

Propeller Platform – patient, caregiver and provider alerts

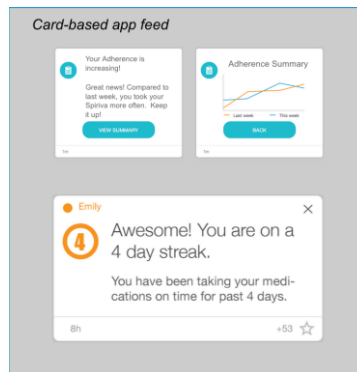
Personalized Emails



SMS/Push Reminders



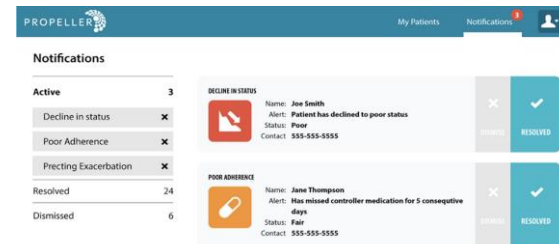
Personalized Adherence Feedback



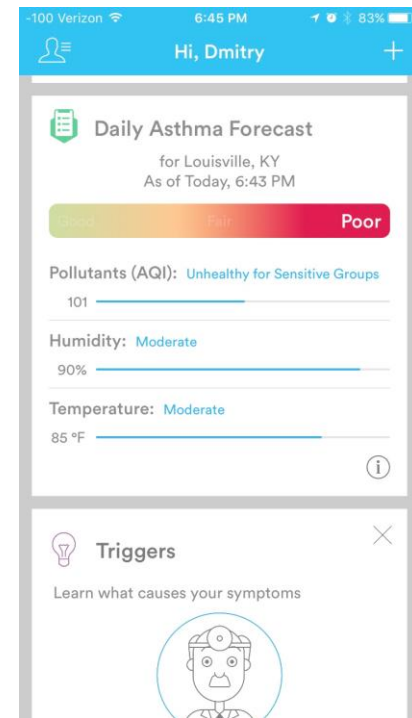
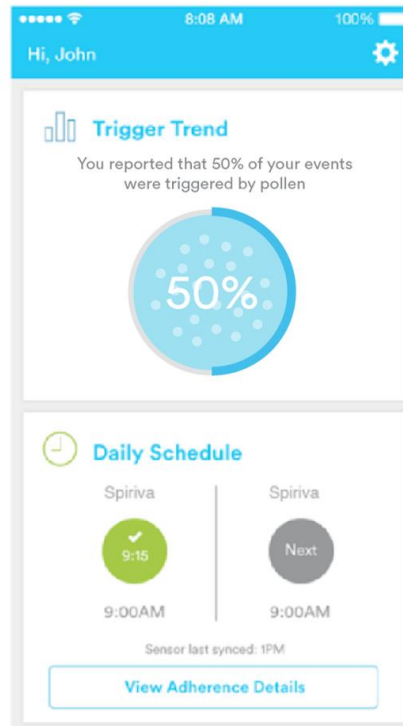
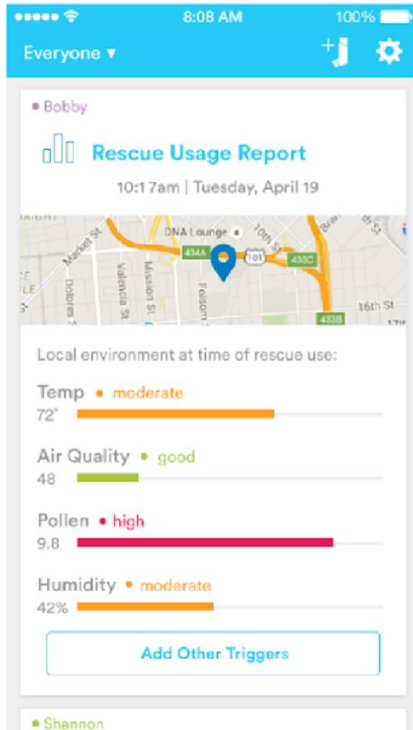
On-sensor A/V Reminders



Care Team Alerts and Notifications



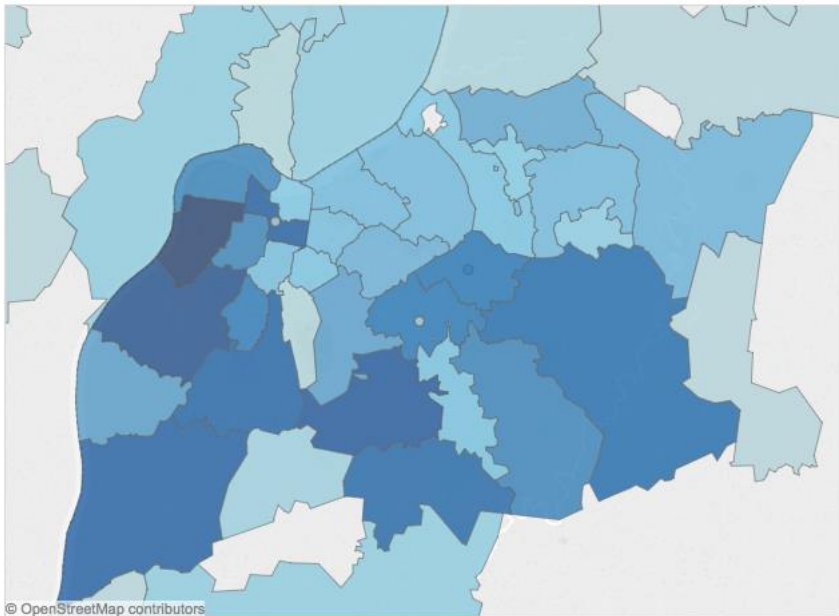
Giving participants control of their asthma



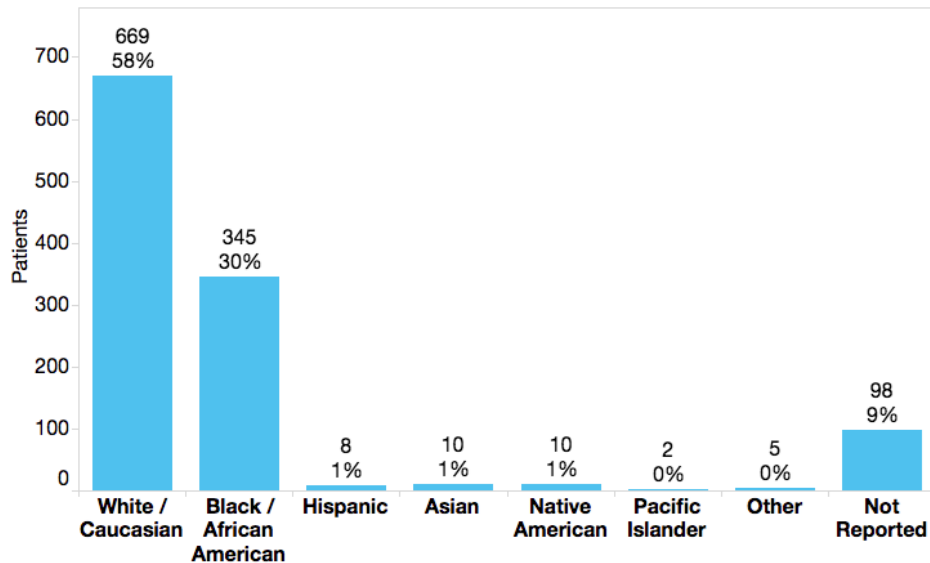
1,147 participants

We aimed to capture a signal that is representative of asthma in Metro Louisville by neighborhood, race, SES, and disease severity.

Patients Synced by Zip Code

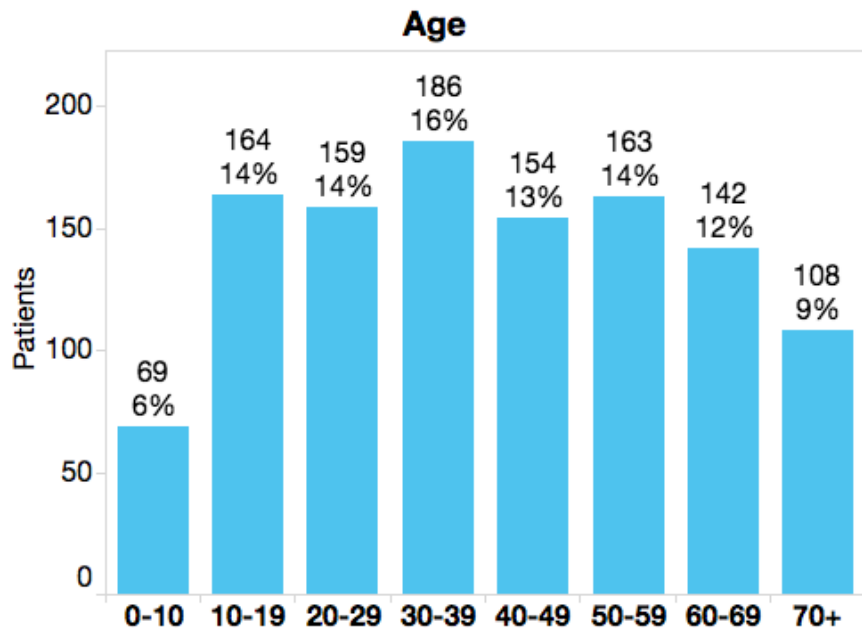


Pts Synced per Zip Code

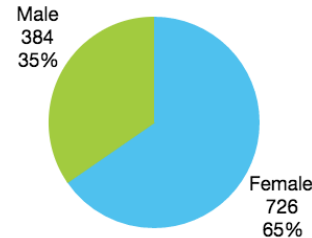


Participant Profile: age and gender

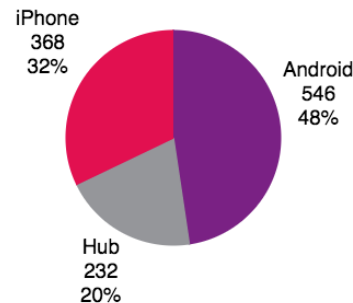
Enrollment across age groups



65% of participants are female



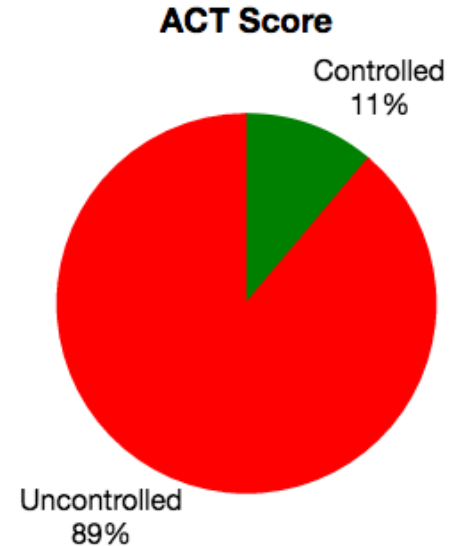
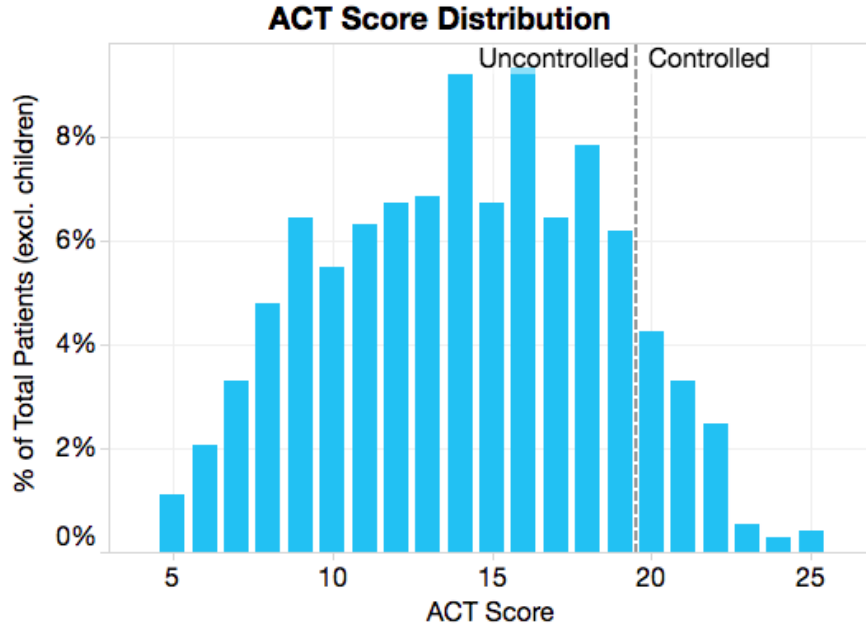
80% of participants use smartphones



Data as of
2/10/17

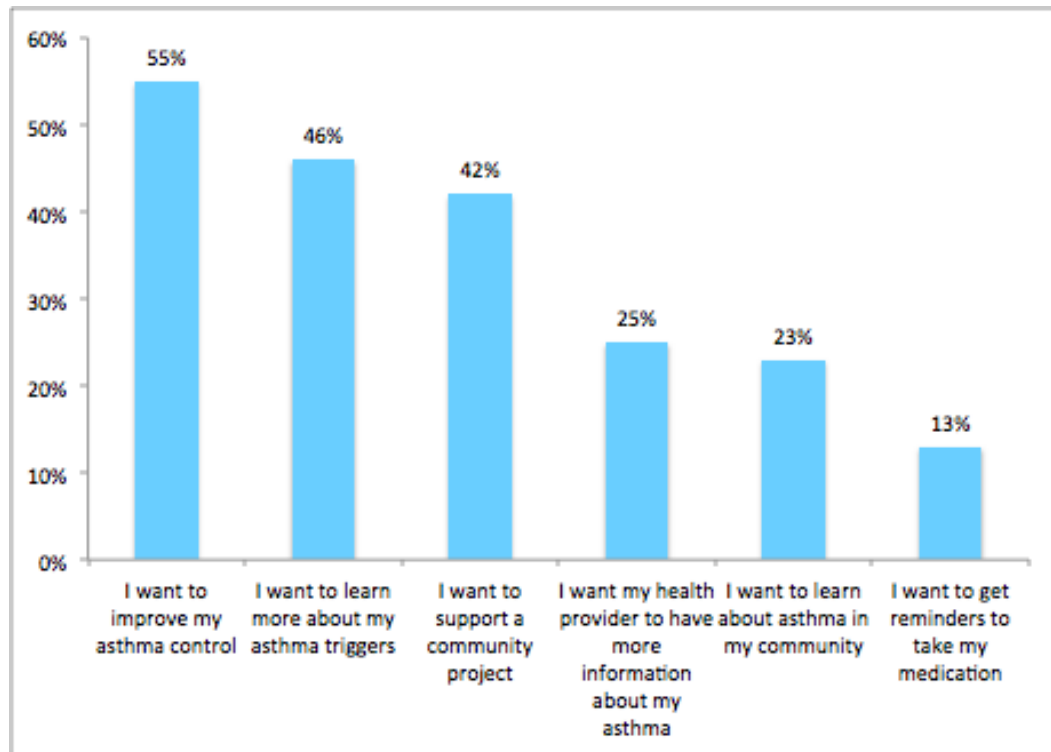
Participants were largely uncontrolled

89% of patients were uncontrolled based on the Asthma Control Test™ at the time of enrollment.



Data as of 2/10/17

Survey Data: Why Participants Signed Up



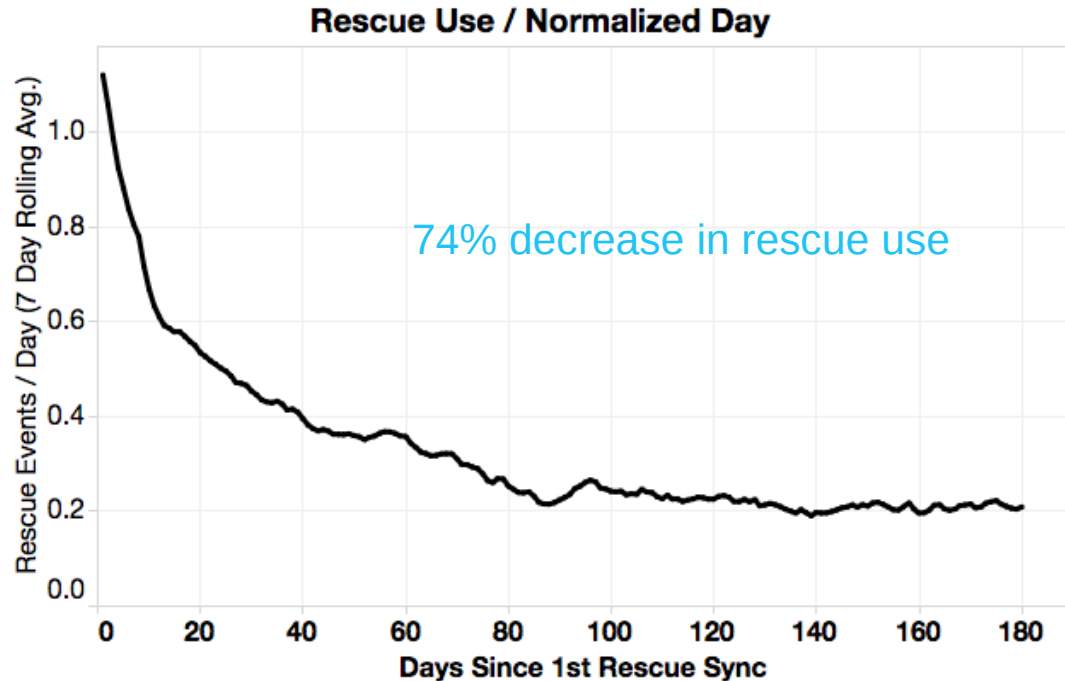
Motivations:

1. Help myself
2. Help my community

Participants could select multiple answers

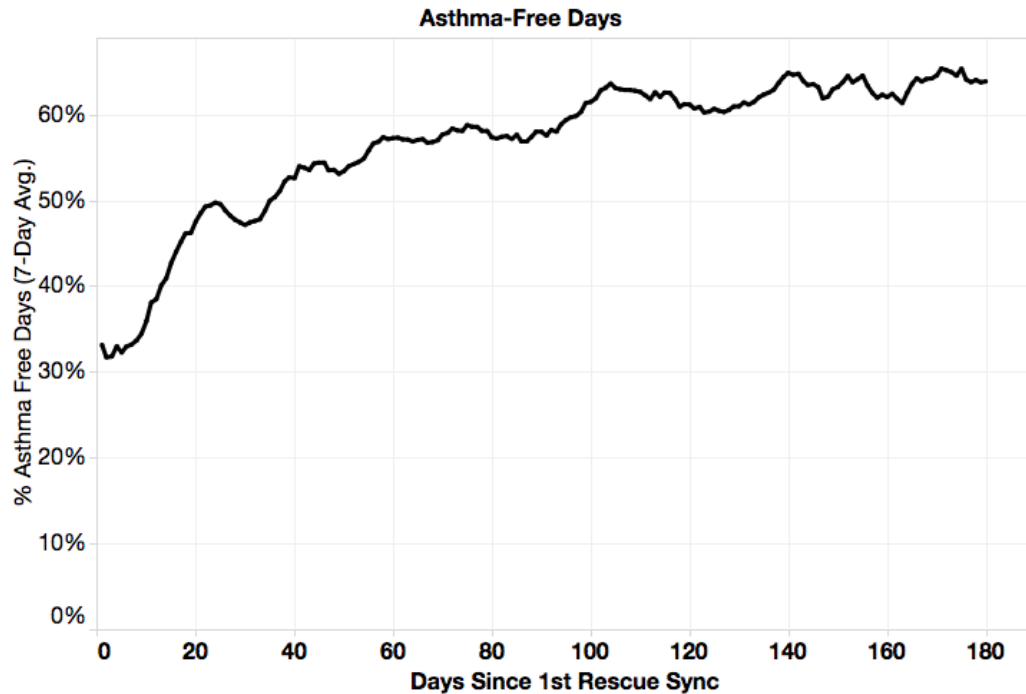
Clinical outcomes

74% reduction in rescue inhaler use for asthma



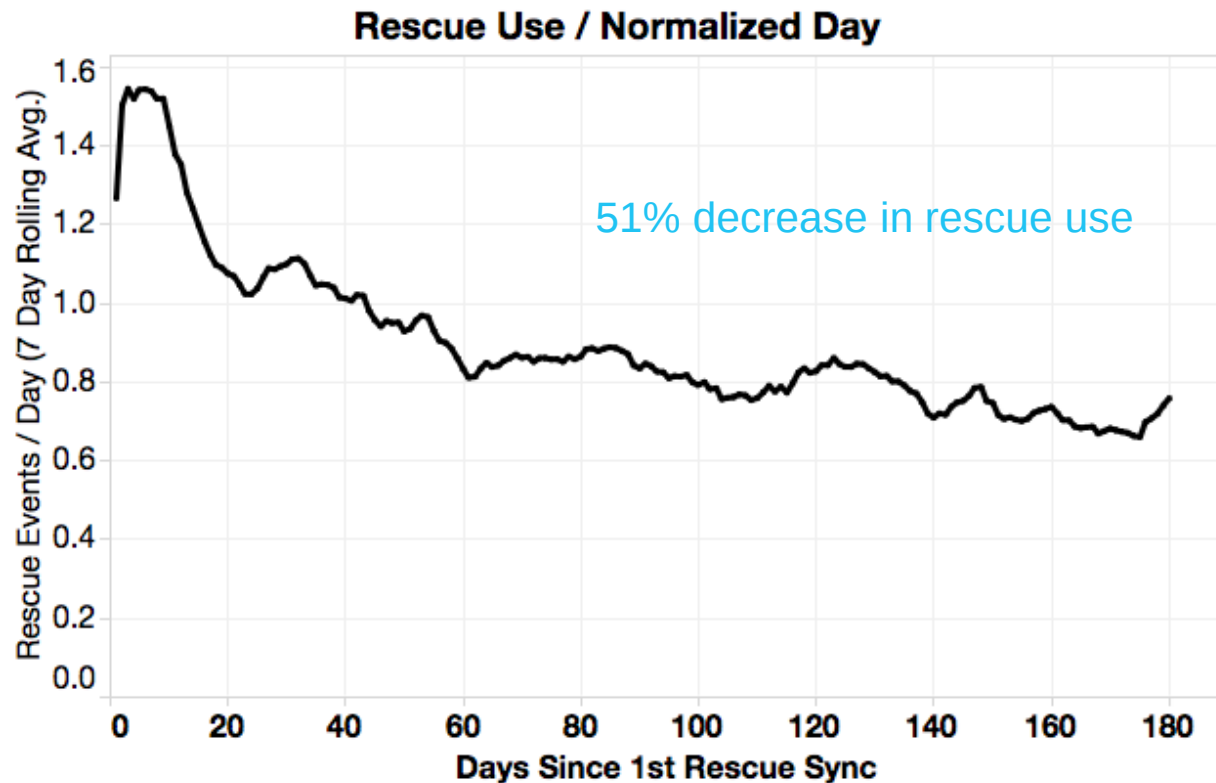
The frequency of rescue inhaler use represents one of the most valuable indicators of acute worsening.

> 2x increase in asthma-free days



Participants experienced more than double the number of healthier days - free from the burden of asthma symptoms

51% reduction in rescue inhaler use for COPD



Community learnings

Poll Question

Where does air quality fit in the list of population health priorities?

- a. Top 10
- b. Top 20
- c. Top 50

Unprecedented data collection

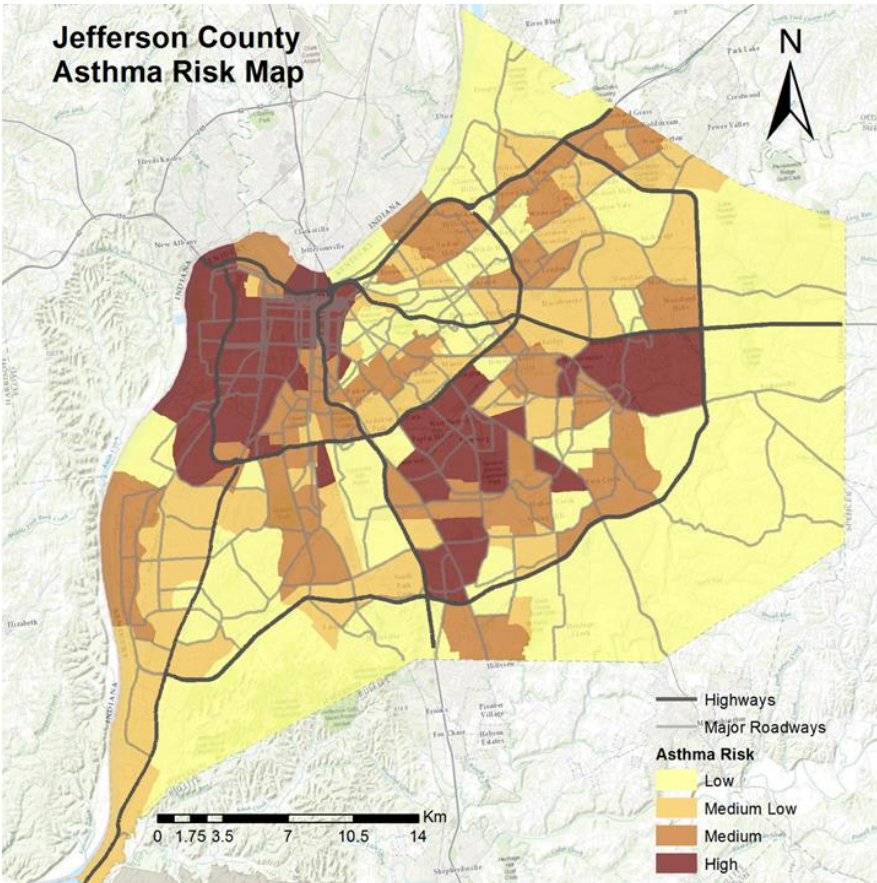
>905,000 data points collected,
representing signal of use and non-use

+198,000 medication use events
(rescue and control) including additional
data such as:

- Date and time
- Medication
- Number of doses
- Location
- NO₂
- PM_{2.5}
- Ozone
- Pollen Count
- Temperature
- Humidity



Risk assessment by neighborhood

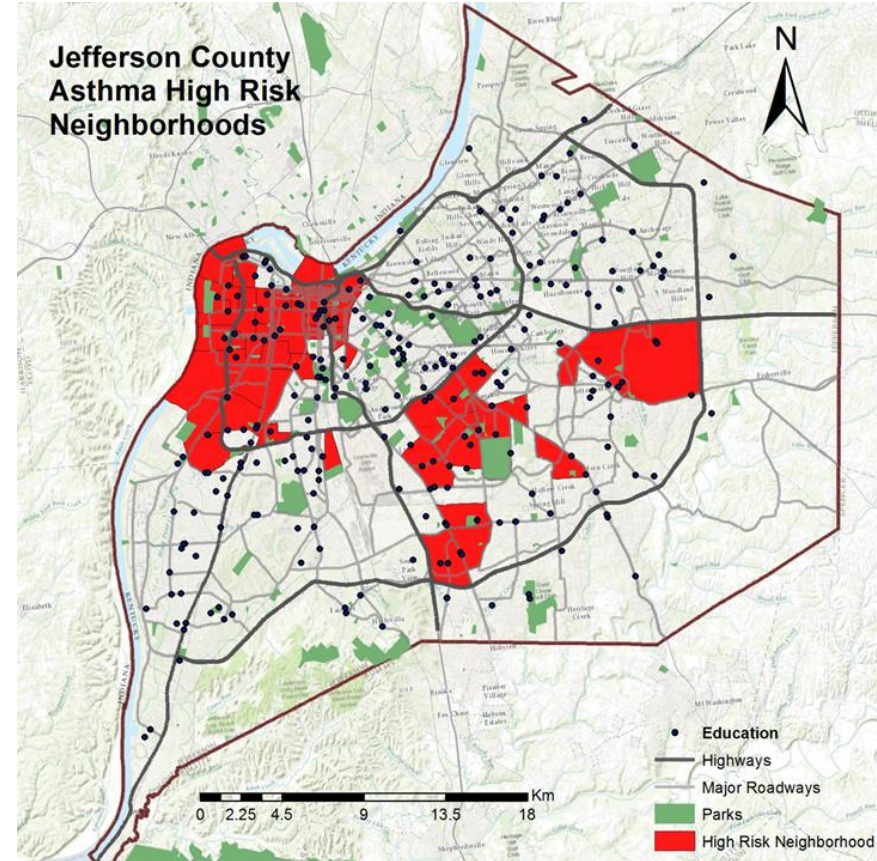


Represents asthma risk per census tract as a function of:

- Nitrogen Dioxide concentrations (annual mean)
- Particulate Matter $_{2.5}$ concentrations (annual mean)
- Smoking rate
- Temperature (annual mean)
- Underlying asthma prevalence
- Underlying race/ethnicity
- Pollen exposure due to grass & weeds

How many people could be at risk?

- 23% of the general population lives within high risk areas
- 27% of the asthma population lives within high risk areas
- 68 educational institutes/schools
- 47 parks (state, county and city)



What can we do?

Applying AIR lessons to help the broader community



2016 Community

Survey: “...people in all four areas **highly value clean air and clean water**, both of which have improved over recent decades but continue to be a struggle. 89% of survey participants say the environment is a **high or very high priority** in deciding where to live in the next five years.”

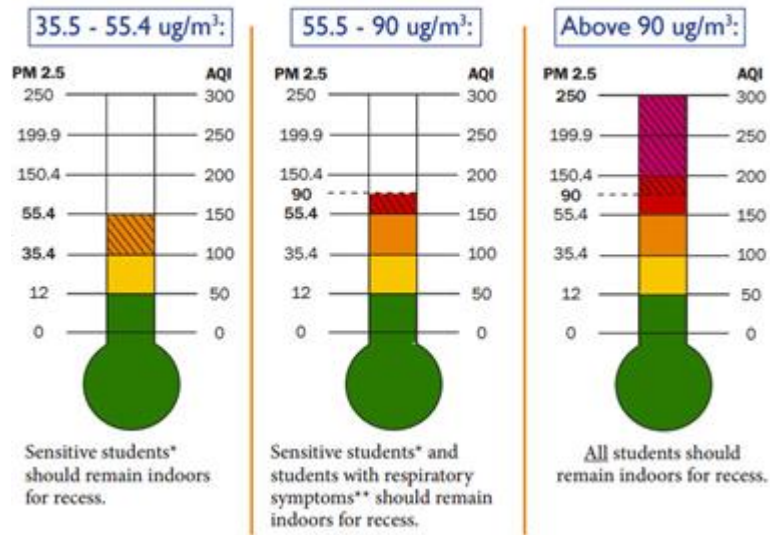


Asthma in Jefferson County: ~ 89,000 kids and adults

AIR Louisville participants ~1.3%

Building awareness

When the Particulate Matter (PM_{2.5}) is



1. Mom's Clean Air Force - Kentucky Chapter?
2. IFTTT air alerts
3. Public art - data art and smog eating cloth
4. Alerts for sensitive populations - daycares, retirement communities
5. Recess alerts for schools on bad air days

Interactive data art



Dominique Paul, PhD
Residency in Louisville in
2017



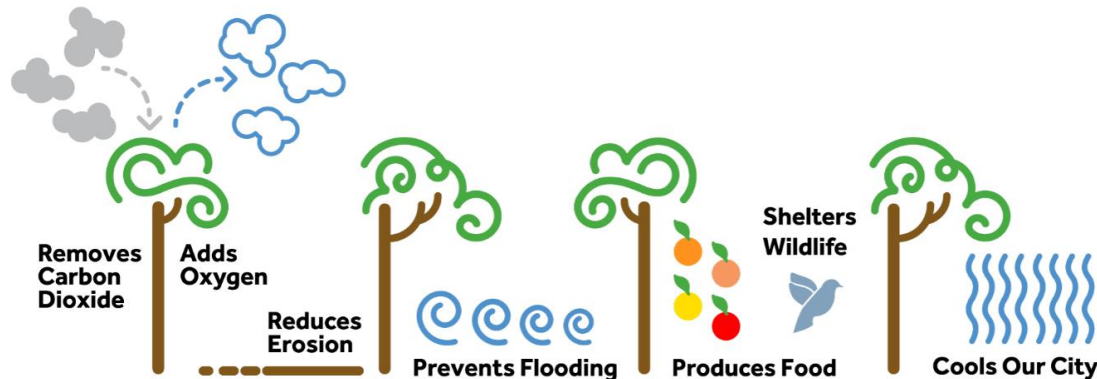
Connecting with ongoing work

100 Resilient Cities and Metro's Chief Resilience Officer

Air Quality Improvement - **Louisville Sustainability Council** and Kentuckians for the Commonwealth

Air Pollution Control District and ozone compliance status

Trees Louisville - Tree planting campaign



Policy ideas - actions for each stakeholder

	Civic leaders	Employers	Individuals
Emissions (NO₂ and PM_{2.5})	Reduce auto emissions: Ban or toll on diesel trucks Low emission zones (traffic rerouting) Low emission city fleets Bus Rapid Transit system Universal mowing ban on bad air days	Idle-free fleet commitment (KAIRE) Low mow (KAIRE)	Take advantage of Grow More, Mow Less program (APCD) Advocate for reducing auto emissions
Emissions & urban heat	Tree planting in specific high-risk neighborhoods	Tree planting on large campuses	Tree planting on private property
Smoking	Promote smoking cessation via LMPHW programs (FFS, GIFTS)	Smoking cessation as a wellness benefit Support public smoking ban at work	Enroll in smoking cessation program Avoid smoke exposure
Self-management	Further support LMPHW asthma programming	Support disease self-management by offering AIR Louisville as a wellness benefit	Improved self-management via AIR Louisville Avoid/mitigate triggers identified in AIR Louisville program

Poll Question

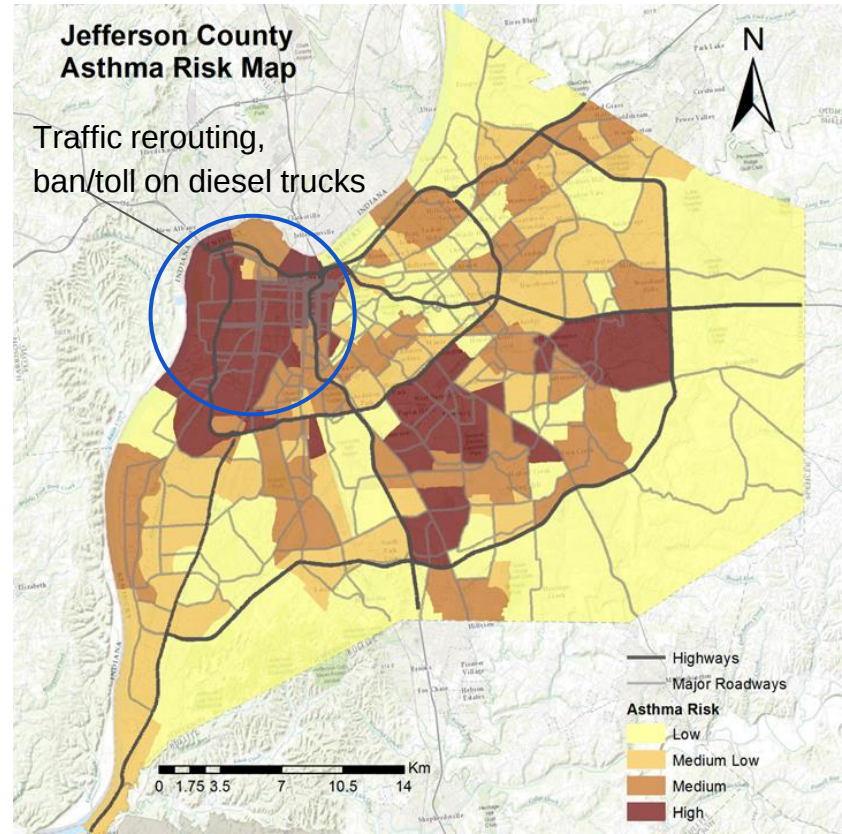
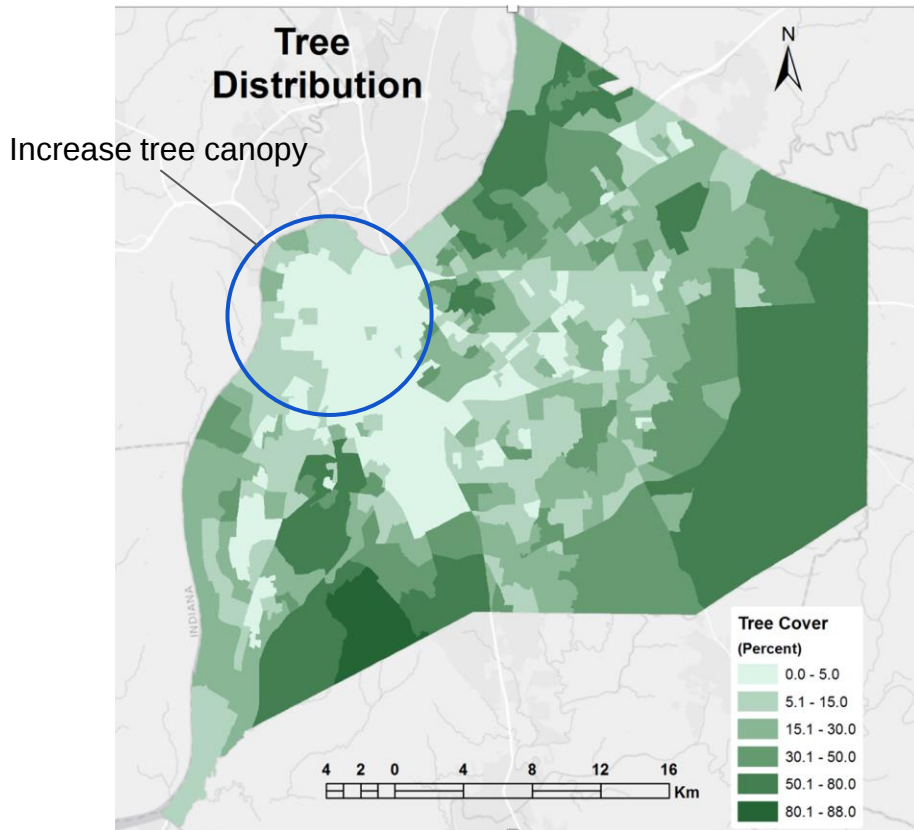
Should planting trees be part of a population health strategy?

a. Yes

b. No

c. Maybe

Possible interventions



Green For Good – Studying the Power of Trees



OFFICE OF
SUSTAINABILITY
A Division of Develop Louisville



INSTITUTE FOR HEALTHY
AIR WATER & SOIL



UNIVERSITY OF
LOUISVILLE
SCHOOL OF MEDICINE

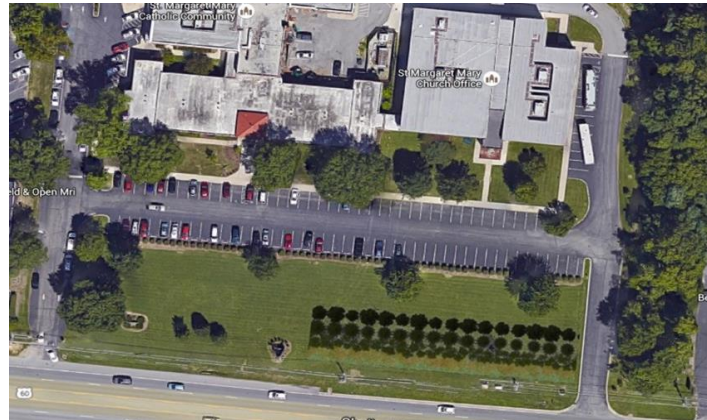


Green For Good – A three-part study

HEALTH



SCREENING



Air Monitoring

- Nitrogen oxides
- Fine particles (PM_{2.5})
- Ultrafine particles

HEALTH



SCREENING



Air Monitoring

- Nitrogen oxides
- Fine particles (PM_{2.5})
- Ultrafine particles

Green for Good – What did we learn?

Mean
concentration of
ultrafine particles
is 60% lower
behind the buffer
compared to
control side.



Questions

