

aMAP: Asthma Management Assistance and Prediction Using Mobile-Sensor Application

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Asthma: Facts

- Chronic disease of the lungs
 - 2011: 20.3 millions people in the USA suffering from asthma (1 in 12 adult, 1 in 11 children)
 - on the rise: 15% in 2009 compared to 3% in 1980
 - cost: US \$56 billion each year
- Can be **deadly if asthma attacks are not dealt with in a timely manner**

ASTHMA - Triggers & Hot Spots

The common chronic inflammatory disease of the airways characterized by variable and recurring symptoms. Symptoms include wheezing, coughing, chest tightness, and shortness of breath.

300 Million suffer worldwide

20.3 Million Americans suffer

COMMON ASTHMA TRIGGERS



90%

Experience symptoms with the exertion from exercise



60%

Experience symptoms from second-hand smoke



55%

Experience symptoms from climate conditions; cold, wet/dry, sudden changes.



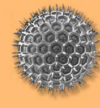
50%

Experience symptoms from exposure to dust mites



37%

Experience symptoms from Pet Dander, a combination of dead skin cells and hair



30%

Experience symptoms from Pollen, an airborne allergen that sets off numerous asthma symptoms

IN THE U.S.

2011 Worst Cities for Asthma

1. Richmond, VA
2. Knoxville, TN
3. Memphis, TN
4. Chattanooga, TN
5. Tulsa, OK
6. St. Louis, MO
7. Augusta, GA
8. Virginia Beach, VA
9. Philadelphia, PA
10. Nashville, TN

EVERYDAY

40,000

Miss school or work due to asthma

30,000

Asthma attacks



5,000

Visit the emergency room due to asthma



11

Deaths due to asthma



1,000

Admitted to hospitals due to asthma

Sources:
Asthma & Allergy Foundation of America
Center for Disease Control & Prevention
American Psychosomatic Medicine Society

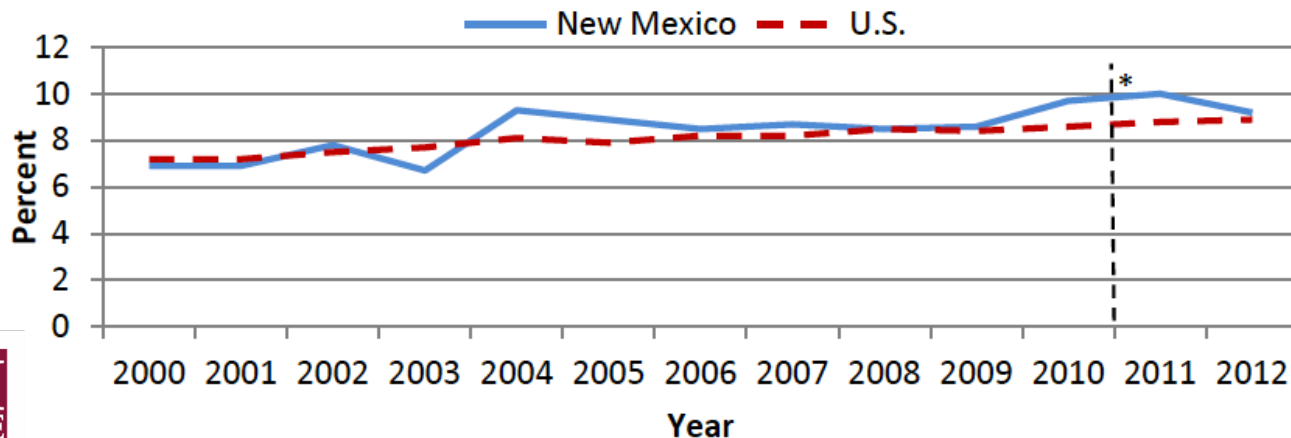
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Asthma in New Mexico (2011-2012)*

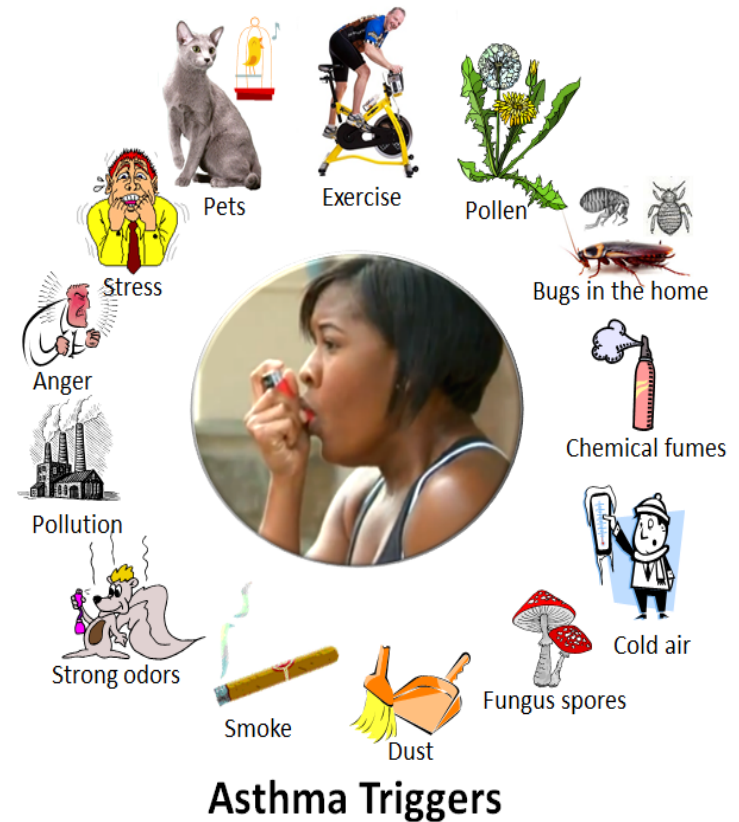
- A public health priority in New Mexico
 - 9.6% of adults
 - 9.0% of children
- In 2009 report: US **\$30 million** for hospitalizations with a primary diagnosis of asthma – which are **mostly preventable!**

Figure 3. Current asthma prevalence among adults by year, New Mexico and U.S., 2000-2012



Facts

- Incurable, symptoms can be controlled through
 - quality health care
 - appropriate medications
 - **good self-management**



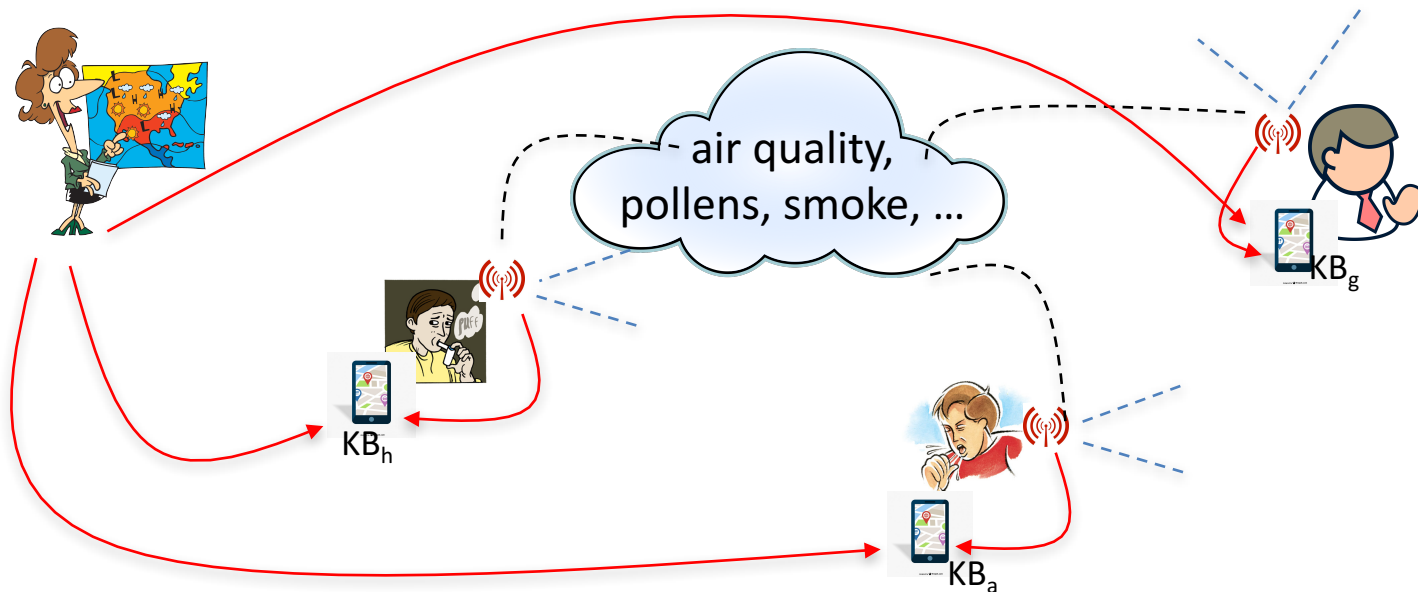
- **being aware of possible triggers helps managing asthma effectively!**
 - **problem: it is personal**

Current Practice

- Guidelines focus on providing healthcare providers (e.g., nurses, doctors) with steps for identifying asthma and controlling asthma
- Patients
 - rely on experience and self-awareness to predict asthma attacks
 - use diary for self-management of asthma symptoms
- There exists some mobile apps for “asthma diary” but **NO** system for asthma attack prediction is available

Goal: Asthma management through an integrated mobile-sensor platform

- Predict asthma attacks
- Assist in asthma self-management
- Iterative self-learning



Benefits of aMAP

- Accurate prediction of asthma attacks and timely alerting patients will
 - reduce number of emergency visits by asthma patients (cost saving, potentially life saving)
 - improve health and ultimately quality of life of patients
- Self-management tool will
 - help patients follow guidelines set forth by their doctors
 - improve communications with health care providers (cost saving)
 - help improve prediction capability

Summary: **aMAP**

- Integrated software-hardware solution for asthma control
 - uses environmental information and asthma triggers to predict asthma attack
 - alerts patient about potential attacks
 - keeps track of asthma attacks and asthma triggers for self-improvement
 - keeps track of medications and communicates with doctor
- Budget: requested 350K