Implications of Asthma
Genomics for Public Health

University of Washington
Center for Genomics & Public Health
Asthma

- Disease definition unclear
- Current pharmacotherapy not ideal for all
  - Non-responders
  - Adverse drug reactions
  - Difficult regimens
- Prediction of exacerbation imperfect
- Methods of prevention unclear.
- Public policies can be improved
Complex Causes of Asthma

Genetics
- Beta-adrenergic receptor
- IL-4, IL-4RA, IL-13
- TNF-alpha
- Other

Environment
- cigarette smoke, cockroaches,
- mites, animal allergen, molds,
- pollen, air pollution,
- food allergens

ASTHMA
Genomics in Healthcare

- No longer a distinct field of study
- Expected to play increasing role in health research & practice
- Definition – the study of the functions and interactions of all the genes in the genome, including their interactions with environmental factors.
From “Bench” to “Trench”

Genetic Contribution to Disease

Improved Health Outcomes
From “Bench” to “Trench”

Genetic Contribution to Disease

- Family history studies
- Gene discovery
- Gene function
- Gene-disease associations

Identification of Genetic Component

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Identification of Genetic Component

Characterization of Risk

- Gene-gene
- Gene environment
- Biologic pathways
- Multi-causal pathways

Improved Health Outcomes
From “Bench” to “Trench”

- Clinical trials
- Clinical management
- Environmental change
- Drug development

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Intervention Design

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Intervention Design
- Education
- Behavioral change
- Systems change

Implementation & Assessment
- Improved Health Outcomes
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Implementation & Assessment

- Assess health care delivery
- Evaluation of harms/benefits of genetic information

Public & Private Policy

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Genetic Contribution to Disease

Improved Health Outcomes
Objectives

- To seek information from a variety of perspectives concerning *current & potential* uses of genomic information in asthma research & health care that is:
  - Based on current evidence
  - Realistic
  - Comprehensive

- To assess whether or not this information will aid in reducing asthma related mortality & morbidity
# Framework

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Intervention Points

- **Population-Based Prevention**
  - Detection or intervention among defined group without disease

- **Risk-Based Prevention**
  - Targeted intervention for those with susceptibilities, but no disease

- **Diagnosis**
  - Identification of those with asthma.

- **Disease Management**
  - Guidance and assistance in reducing or reversing disease burden
We Welcome Your Feedback