Session 1 Panel Discussion

• Questions:
  – What lessons and success stories have we learned from 20th century cancer epidemiology?
  – What are the gaps and provocative questions that epidemiologic research can fill in the next 12 years?

• Moderator: Robert T. Croyle, Ph.D., DCCPS, NCI

• Panelists:
  – David Hunter, Sc.D., M.P.H.  
    *Harvard University*
  – Timothy Rebbeck, Ph.D.  
    *University of Pennsylvania*
  – Margaret R. Spitz, M.D.  
    *Baylor College of Medicine*
David Hunter, Sc.D., M.P.H.

Harvard University
Where is the US NATIONAL COHORT? – FOR CANCER IT EXISTS!

<table>
<thead>
<tr>
<th>Cohort Size</th>
<th>Minorities</th>
<th>Blood</th>
<th>Cohort Size</th>
<th>Minorities</th>
<th>Blood</th>
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<tbody>
<tr>
<td>Male</td>
<td>Female</td>
<td>Total</td>
<td>Base</td>
<td>Last</td>
<td>F/U</td>
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<td>US Initial Cancer Cohort</td>
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<td>US Enlarged Cohort</td>
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NCI Funded (Infrastructure)  EXPOSURE DATA  DIVERSITY

COHORT CONSORTIUM, 2012 Hartge
Timothy Rebbeck, Ph.D.

University of Pennsylvania
Multilevel Model from: Warnecke 2005

Social Conditions and Policies
- Culture, Racism, Sexism, Poverty
- Discrimination, Public Policies

Institutions
- Health Care System, Families, Community-based organizations
- Legal System, Media, Political System

Neighborhoods
- Collective Efficacy, Access, Social Cohesion, Segregation,
- Neighborhood Disadvantage, Neighborhood Stability

Social Relationships
- Social Networks, Social Support
- Social Influences, Social Engagement

Individual Risk Factors
- Age, SES, Education, Obesity,
- Tobacco Use, Acculturation,
- Diet, Race

Biologic/Genetic Pathways
- Metabolic Processes,
- Genetic Mechanisms

Fundamental Causes

Social Epidemiology

Environmental Epidemiology

Molecular/Genetic Epidemiology

Epidemiology in the:
- 20th Century
- 21st Century

Multilevel Epidemiology

Cancer
Integrative Epidemiology - The time for “big science”
cohesive; apply new technologies; interdisciplinary collaborative studies

**Lung Ca Genetic Susceptibility**
- Replication studies
- Fine-mapping, resequencing
- WES, WGS
- Functional genomics
- Intermediate phenotypes - COPD
- Extreme phenotypes
- Risk assessment models

**Mechanisms of Obesity/Cancer link**
- Advanced phenotype measurements
- Novel imaging
- Extreme phenotypes
- Bariatric surgery - metabolomics
- Regulators of BAT determination
- Pre-clinical models
- Gut microbiome

**Smoking**
- How to uncover heritability of lung cancer?
- What are functional consequences of variants?
- G-E interactions? Role of nicotine dependence?
- Can we refine risk prediction?

**Obesity**
- What have we learned about obesity genetics?
- Is association reversible if obesity is treated?
- What is role of brown adipose tissue?
- How does colon microbiome affect body fat?

**Discovery**
- Who to screen?

**Translation**
- Obesity prevention/Rx

What are the “big”, “understudied”, “neglected” or “provocative” questions?