



# PPT Program Science Strategy



# PPT Program Science Strategy Objective

- Enhance the quality and credibility of PPT Program contributions to NIOSH science by:

- **Identifying the Nation's PPE Needs**

- National Academies COPPE
- Standards Development Committee Involvement
- PPT Surveillance
- Feedback from Stakeholder Meetings

**THE NATIONAL ACADEMIES**  
*Advisers to the Nation on Science, Engineering, and Medicine*



- **Conducting Scientific Evaluations of Activities**

- National Academies Scientific Reviews
- Scientific Information Product Peer Review
- Scientific Proposal and Protocol Peer Reviews
- Action Planning Assessments

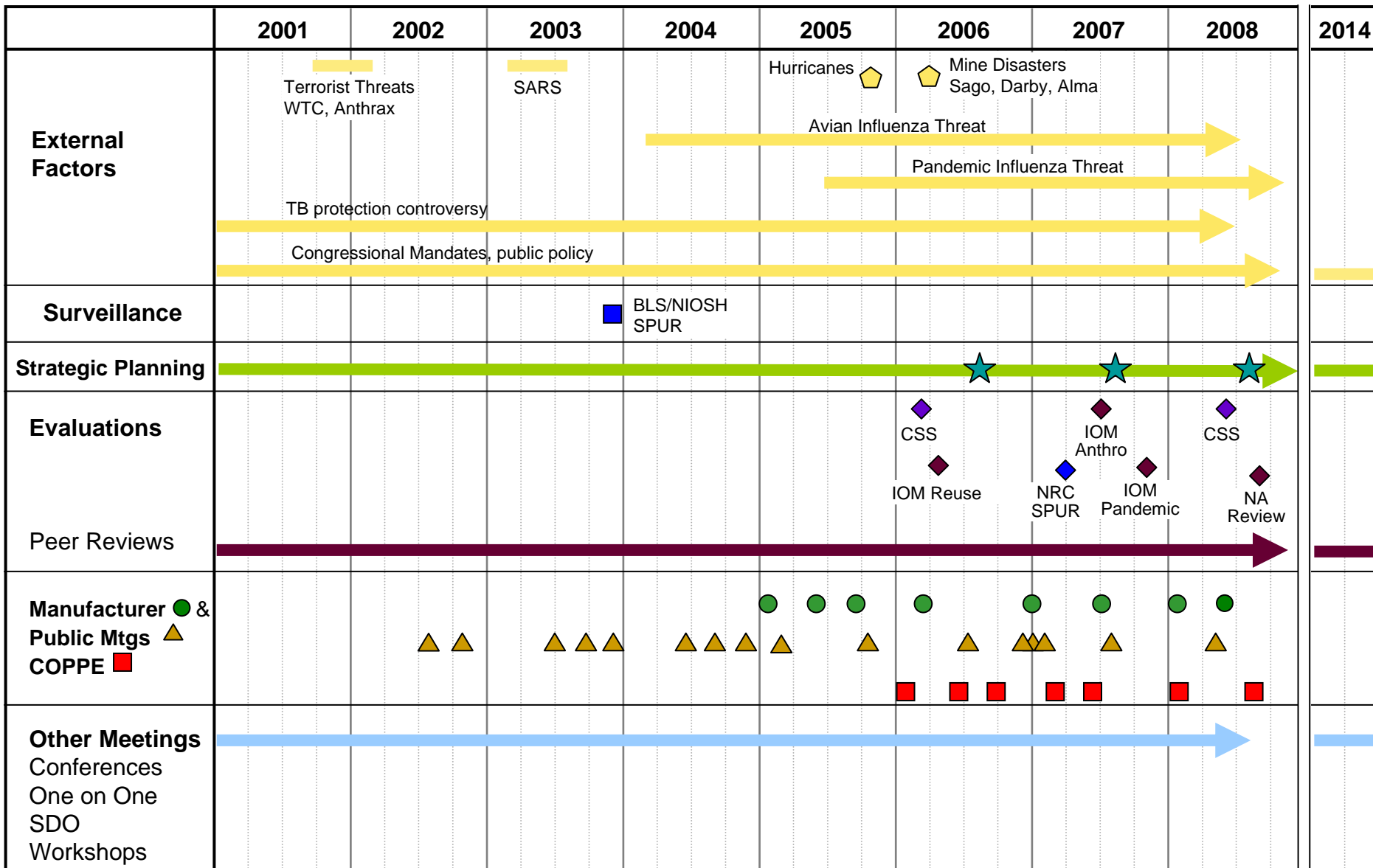


- **Assessing Customer Feedback**

- Customer Satisfaction Surveys (CSS)
- Customer Focus Groups
- Meeting Evaluations

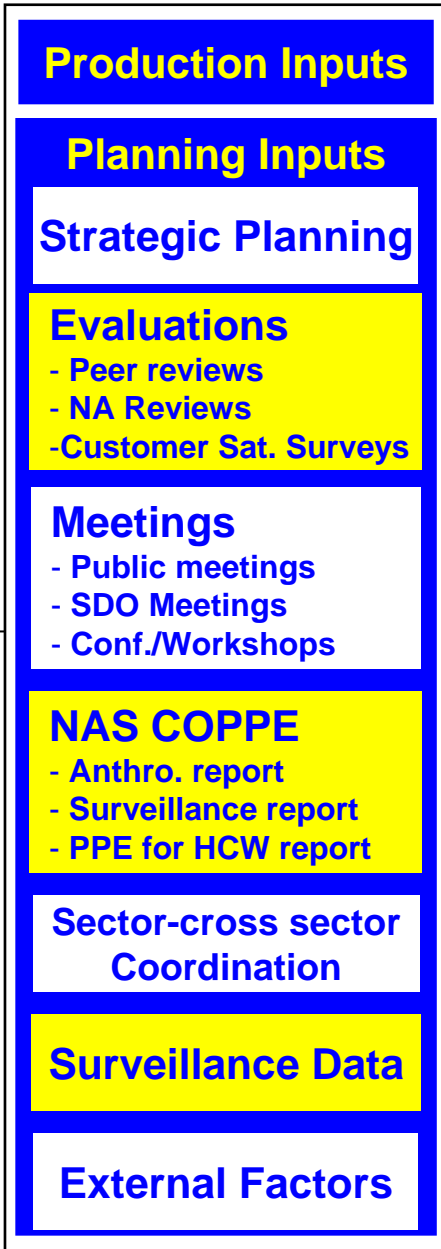


# PPT Program Planning Input Highlights

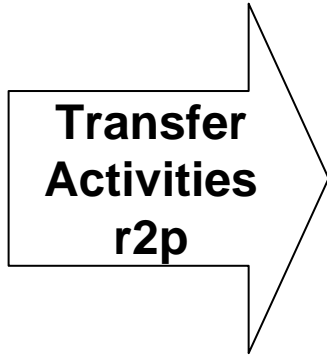


# PPT Program Logic Model

## Inputs



## Current Activities



# PPT Program Planning Input

## Customer Satisfaction Process

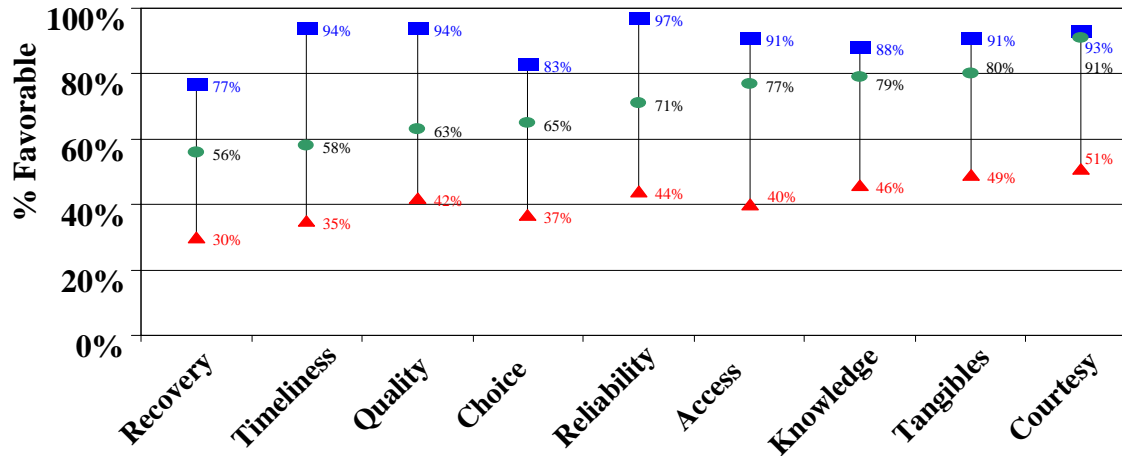
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- Conduct Customer Satisfaction Surveys (CSS) at OPM recommended frequency (every 18-24 months)
  - First survey Dec 2005
  - Second survey Mar 2008
- Conduct focus groups to better interpret responses
- Identify near, mid, and long term action items
- Address near term action items
- Develop strategies to address mid and long term action items
- Monitor and evaluate progress
- Develop PPT measures and metrics



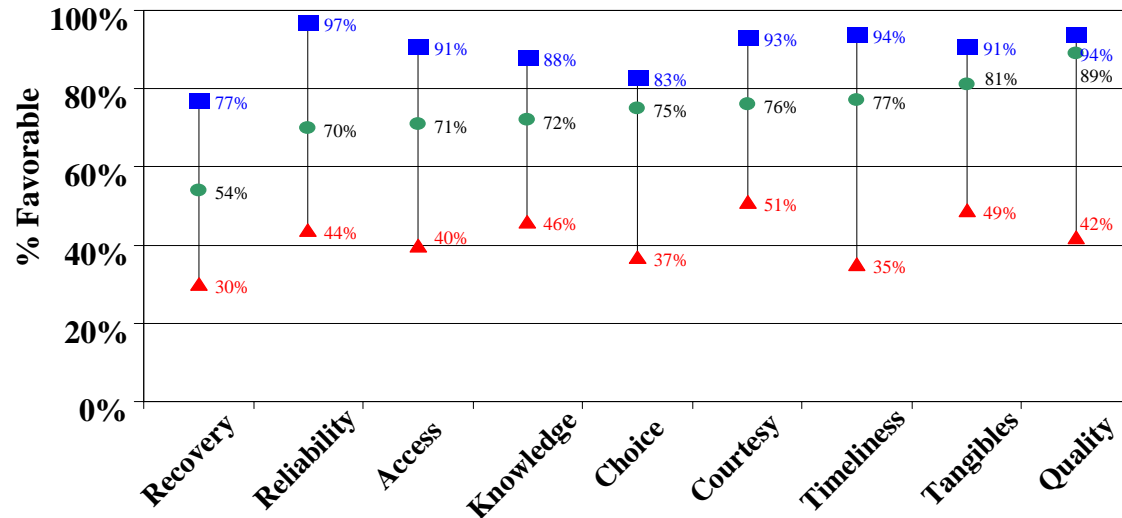
# PPT Program Planning Input Evaluations - Customer Satisfaction Survey

## Benchmarks: Manufacturers



- High Benchmark
- ▲ Low Benchmark
- PPT Manufacturers

## Benchmarks: Users



- High Benchmark
- ▲ Low Benchmark
- PPT Users

# PPT Planning Input

## COPPE Background

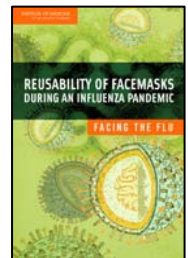
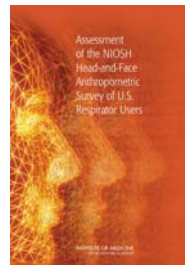
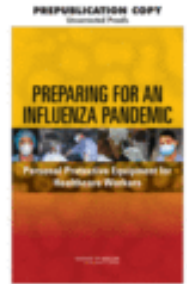
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- Established in 2005
  - First meeting Nov 2005
  - 2-3 open meetings conducted annually
    - NPPTL Listserv announcement posted to announce meetings
    - NPPTL Listserv announces availability of reports
- COPPE Charge
  - Forum for discussing scientific and technical PPE/PPT issues relevant to PPT Program mission
  - Liaison and oversight to ad hoc study committees requested by NIOSH and approved by the IOM and the NA
- COPPE Outputs
  - 2 Evaluations conducted
  - 1 HHS Study supported
  - 1 PPT Program study conducted

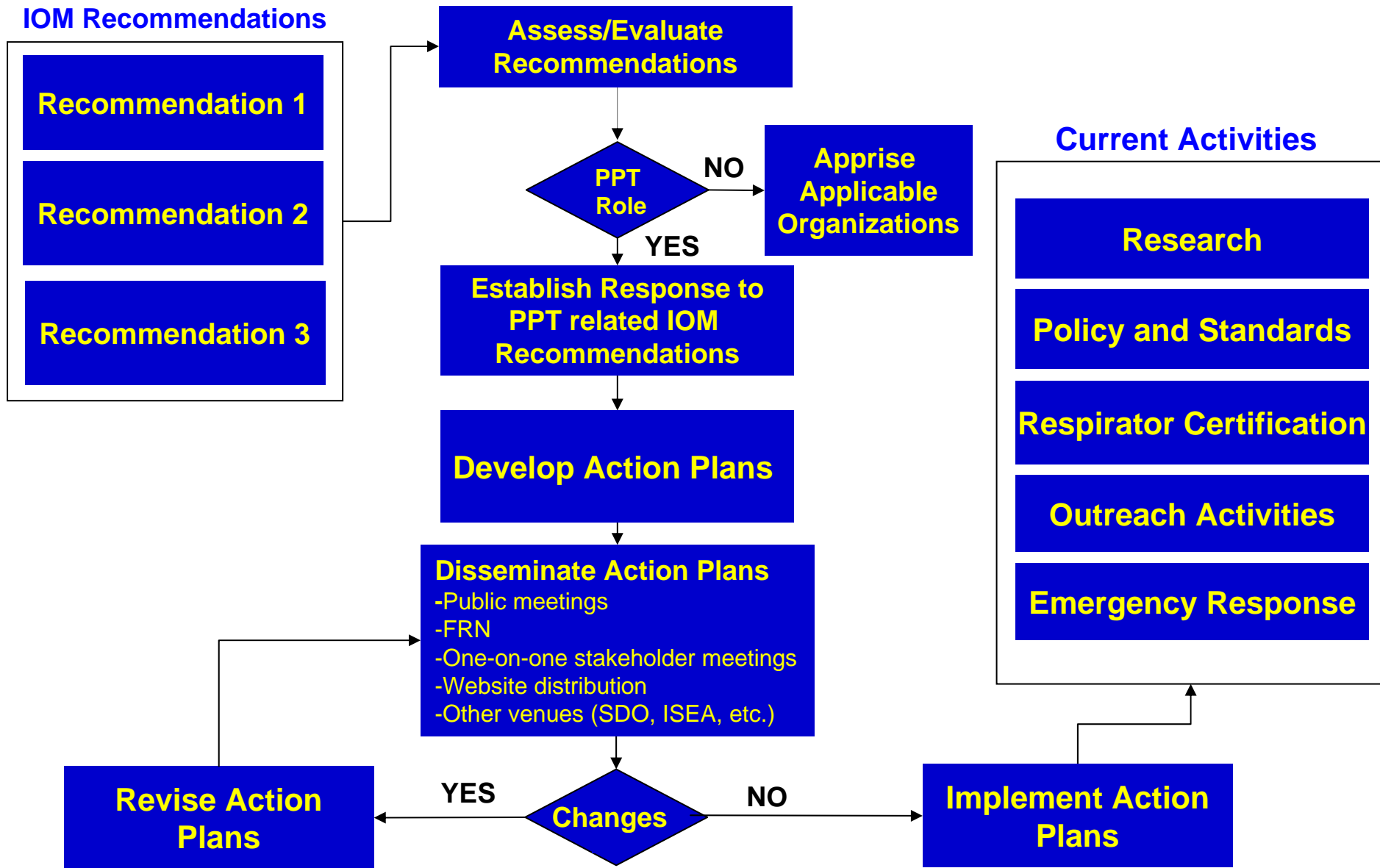
# PPT Program Planning Input

## Evaluations - National Academies Involvement in PPT

- *Committee on PPE for the Workforce (COPPE)*
  - Three open meetings in FY06 and two in FY07
  - Workshop: Feb 22, 2007 – PPE during an Influenza Pandemic: Research, Standards, Certification and Testing Directions
  - **Prepub report received Sep 2007, Briefing Sep 7, 2007**
  - FY08 Meetings: Oct 8-9, 2007, **May 5-6, 2008**
- *Review of Anthropometrics Survey and Respirator Panel Modifications*
  - Three open meetings in FY06
  - Jan – Mar 2006 - *Support to HHS for Committee on the Development of Reusable Facemasks for Use During an Influenza Pandemic*, **Prepub Apr 2006, Final Jun 2006**
  - **Prepub report received Jan 2007, Briefing Jan 2007, Final Mar 2007**
- *Review of BLS Survey of Respirator Use*
  - Three open meetings in FY06
  - **Prepub report received Dec 2006, Briefing Feb 2007, Final Apr 2007**
- *National Academies Evaluation of Personal Protective Technology (PPT) Cross Sector*
  - National Academies evaluation Sept 2007
  - Site visit Nov 8, 2007
  - Stakeholder meeting Dec 17, 2007
  - **Prepub report due Jul 2008**



# Process to Address PPT Program IOM Recommendations



# State of PPT Program Surveillance

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- PPE required in many settings
  - PPT is a NIOSH identified cross sector impacting all sectors
  - Workplace programs required
  - Lack of educational programs
- Systematic collection of PPT data needed to inform PPT Program
- Need to link exposure, PPE use, and outcome data in a meaningful way



# NAS Review of the NIOSH/ BLS Respirator Use Survey

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## Charge to Committee

- Assess informational underpinnings of the NPPTL program to promote effective use of respirator equipment in the workplace
- Focus on the Bureau of Labor Statistics (BLS) and NIOSH 2001 *Survey of Respirator Use and Practices* (SRUP)

# NAS Review of the NIOSH/ BLS Respirator Use Survey

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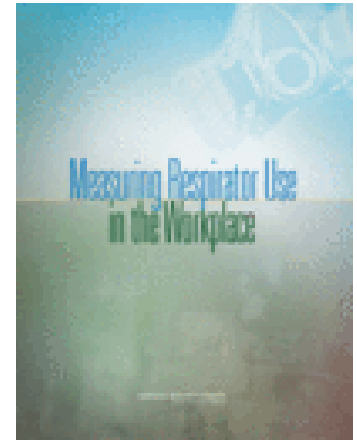
## Committee Findings

- Inadequate funding for its scope and size.
- Insufficient documentation to fully understand the survey design and implementation.
- Disagreements between survey objectives and final survey questions related to inadequacies in instrument design, pre-testing and compromises that had to be made between cost and quality.
- Sample design problems, including a lack of precision objectives for key estimates of population subgroups.
- Data collection procedures that did not use state-of-the-art techniques to improve response rates, improve non-response follow-ups and enhance data quality.
- Problems with the calculations of standard errors.
- Limited efforts to disseminate survey findings and data to key stakeholders.
- Failure to conduct sample matching to improve the quality and richness of data.

# NAS Review of the NIOSH/ BLS Respirator Use Survey

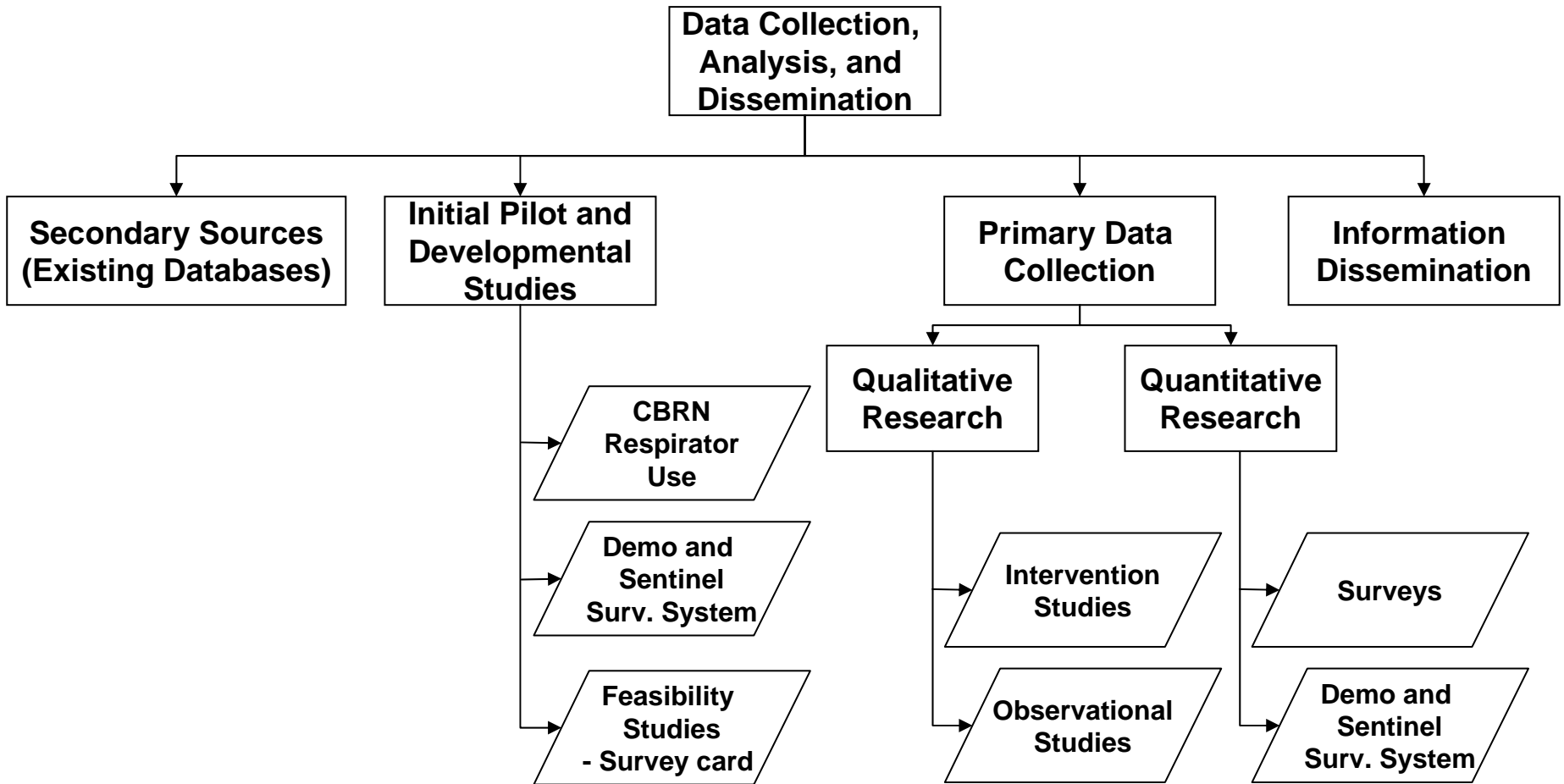
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- FY06
  - National Academies Evaluation - Three open meetings
- FY07
  - Prepub report received Dec 2006
  - Briefing Feb 2007, Final Apr 2007
- FY08
  - PPT Draft Action Plan completed Nov 2007
  - Discussions with NIOSH Surveillance Coordination Group
  - Next Steps
    - APR 2008: Action Plan posted for public comment
    - MAY 5-6, 2008: Action Plan presented to COPPE
- FY 09 and beyond
  - Action Plan implementation



# PPT Program Surveillance

## Data Collection and Analysis Structure

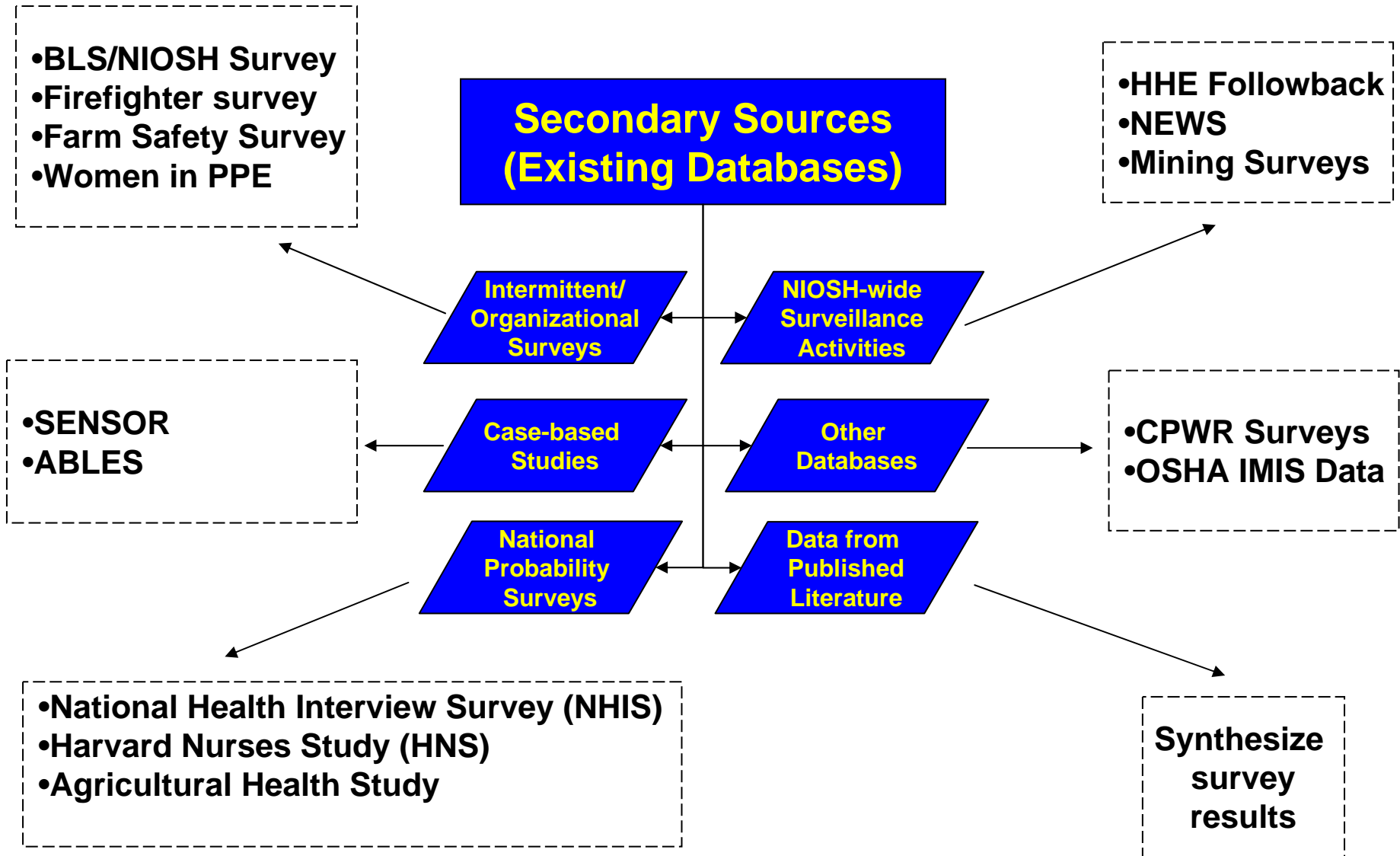


# PPT Surveillance – Near Term Plan

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- **Secondary sources serve as primary data collection**
  - Goal 1: Monitor Use and misuse of PPE
  - Goal 2: Assess potential impact of PPE use
  - Goal 3: Evaluate effectiveness of PPE use
- **Continue Qualitative Surveillance in Construction Industry**
  - Assess respirator use
  - Establish interventions to address findings
  - Assess success of interventions
  - Translate findings to other industries
- **Categorize PPT/PPE Knowledge gaps**
  - Develop survey content
  - Work with sectors to establish PPT component of surveys
- **Assess Feasibility of Demonstration and Sentinel Surveillance System**
  - Applicability to other NIOSH surveillance activities
  - Pilot/Demo Program

# Assessment of Secondary Data Sources



# PPT Surveillance

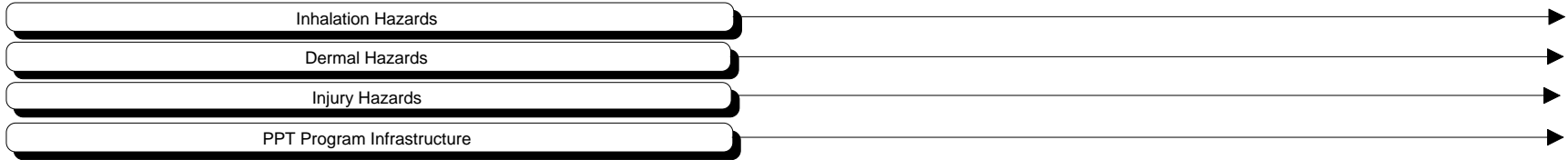
## COPPE Meeting May 5-6, 2008

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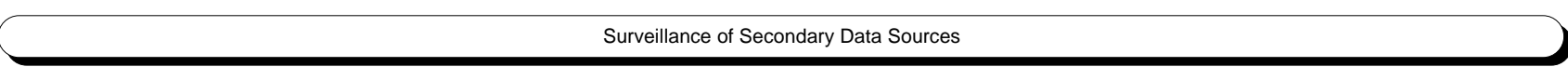
- **NIOSH SCG/Surveillance Participation**
  - Overview of NIOSH Surveillance Strategy and how PPT fits in overall strategy
- **Secondary Data Source Discussion**
- **Surveillance in Construction Industry**
  - Interventions
- **Outside Participation**
  - RAND – Discussion regarding IMIS and Respiratory Protection Standards
  - State based program
  - Other Recommended Participants
  - CDC Early Aberration Reporting System (EARS)

# PPT Program Surveillance Draft Timeline

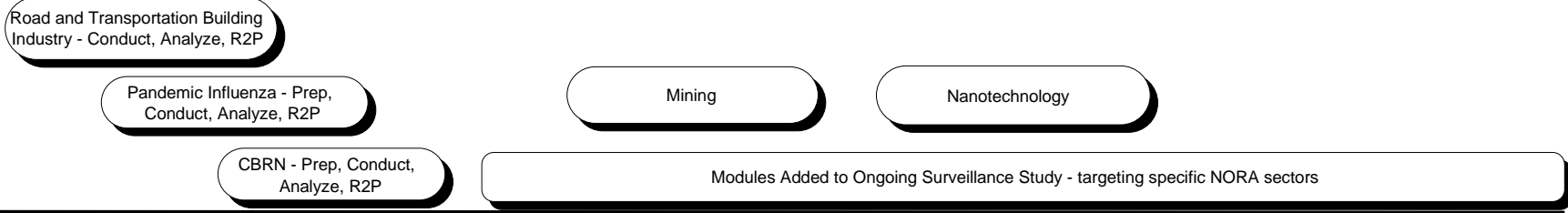
Projects and Activities



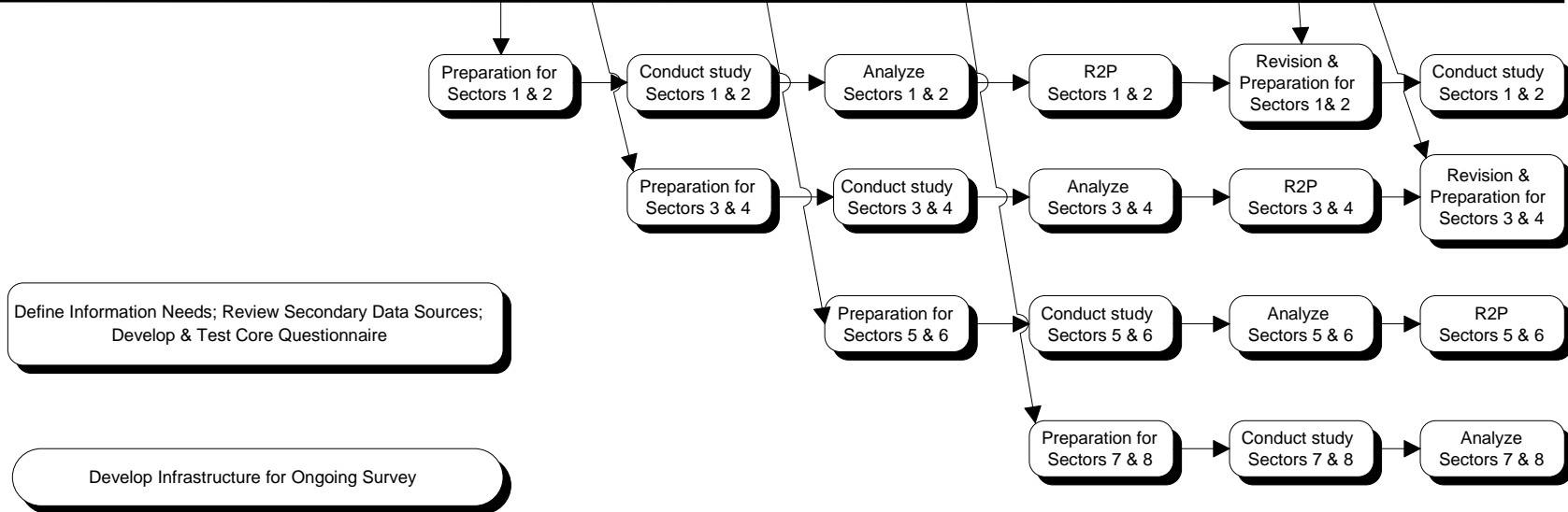
2ndary Data Sources



Special Studies



Ongoing Surveillance



FY08      FY09      FY10      FY11      FY12      FY13      FY14      FY15



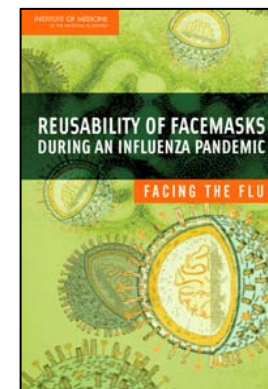
# PPT Program Planning Input

## NPPTL Contract Vehicle used for HHS Study

Development of Reusable Facemasks for use During an Influenza Pandemic

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- Dec 2005
  - PPT Program worked with HHS to develop scope of work
- Jun 2006
  - Final report
- PPT Program Actions
  - No PPT Action Plan developed
  - Report served as input to validate several PPT Program research activities



# Charge to the Committee on the Development of Reusable Facemasks for use During an Influenza Pandemic

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## Charge to Committee

- Multiple measures necessary to reduce impact of pandemic influenza.
  - Respirators and medical masks could help prevent or slow influenza transmission in absence of antivirals and vaccines
- Sufficient supplies of disposable masks and/or respirators may fall short in the event of a pandemic
  - HHS requested IOM examine reuse of medical masks and N95 respirators in the event of an influenza pandemic.

# Charge to the Committee on the Development of Reusable Facemasks for use During an Influenza Pandemic

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## Committee Findings and Recommendations

- Very little is currently known regarding the potential to disinfect and reuse either medical masks or respirators.
- Fundamental research both in the epidemiology of influenza and in the material properties of medical masks and respirators is needed before methods of disinfection and reuse can be developed.
- In spite of that lack of research, the committee, in its expert opinion, was able to develop a method of use that may allow for extended use of an N95 respirator.

# State of PPT Program

## Anthropometrics Research

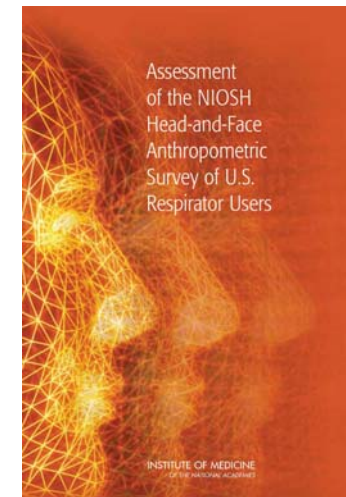
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- Respirator panel recommendations from anthropometric research serve as foundation to new respirator test panel for Total Inward Leakage and PPE sizing for today's workforce
- Research findings to be used in:
  - Total Inward Leakage Program
  - Future certification activities
  - Human subject selections for research (workforce representation)
- National Academies review of Program provides highest level review to assess findings

# PPT Program Planning Input COPPE Studies Requested by NPPTL IOM Review of Anthropometrics Survey

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- FY06
  - Three open meetings
- FY07
  - Prepub report received Jan 2007
  - Final report received Mar 2007
  - Research Action Plan posted Aug 2007
- Action Plan comment period end Apr 2008
- Action Plan implementation – FY 08 and beyond



# IOM Committee for the Assessment of the NIOSH Head-and-Face Anthropometric Survey of U.S. Respirator Users

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## Charge to Committee

- Review the NIOSH sponsored Anthrotech report entitled, “Assessment of the NIOSH Head-and-Face Anthropometric Survey of U.S. Respirator Users.”
- Examine the adequacy and validity of the NIOSH study, the data collected, and the recommended revisions to the set of facial characteristics that are to be used in testing the fit of respirators.
- Examine both the content and the form of the study, the appropriateness of its sample and its sample methodology, and the adequacy of the resultant data.
- Assess representativeness of diverse U.S. workforce and the adequacy of the anthropometric features and parameters considered in the revised panel

# IOM Committee for the Assessment of the NIOSH Head-and-Face Anthropometric Survey of U.S. Respirator Users

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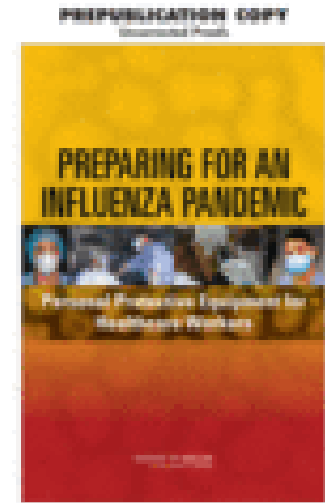
## Committee Findings and Recommendations

- The results are clear improvement over the anthropometric data and corresponding LANL fit-test face panels that have been used since the 1970s;
- NIOSH-sponsored Anthrotech study has a number of weaknesses that limit its effectiveness and reliability;
- Certain steps should be taken to address the weaknesses, in order to move toward more effective testing and certification of respirators in the future.

# PPT Program Planning Input

## IOM PPE for HCW Report and Update

- Workshop evolved from discussions between IOM COPPE and PPT personnel
- Workshop: Feb 22, 2007 – PPE during an Influenza Pandemic: Research, Standards, Certification and Testing Directions
  - Prepub report received Sep 2007
  - First meeting FY08, Oct 8-9, 2007
- Action Plan Development
  - Draft disseminated to NIOSH Divisions, Jan 2008
  - NIOSH NPPTL Response posted for comment Feb 2008
- IOM COPPE Meeting May 5-6, 2008



<http://www.cdc.gov/niosh/review/public/129/>

# IOM Committee for Preparing for an Influenza Pandemic: PPE for HCW Workshop

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- Charge to Committee
  - Urgent need to address the lack of preparedness regarding effective PPE for use in an influenza pandemic.
  - In 2006, NIOSH NPPTL funded the IOM to conduct a study on the PPE needed by healthcare workers in the event of an influenza pandemic.

# IOM Committee for Preparing for an Influenza Pandemic: PPE for HCW Report

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- Committee Findings and Recommendations
  - Three critical areas were identified that require expeditious research and policy action:
    - Understand influenza transmission
    - Commit to worker safety and appropriate use of PPE
    - Innovate and strengthen PPE design, testing, and certification

# Overview of IOM PPE for HCW Report Recommendations

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## Understand Influenza Transmission

- [1] Initiate and support a global influenza research network

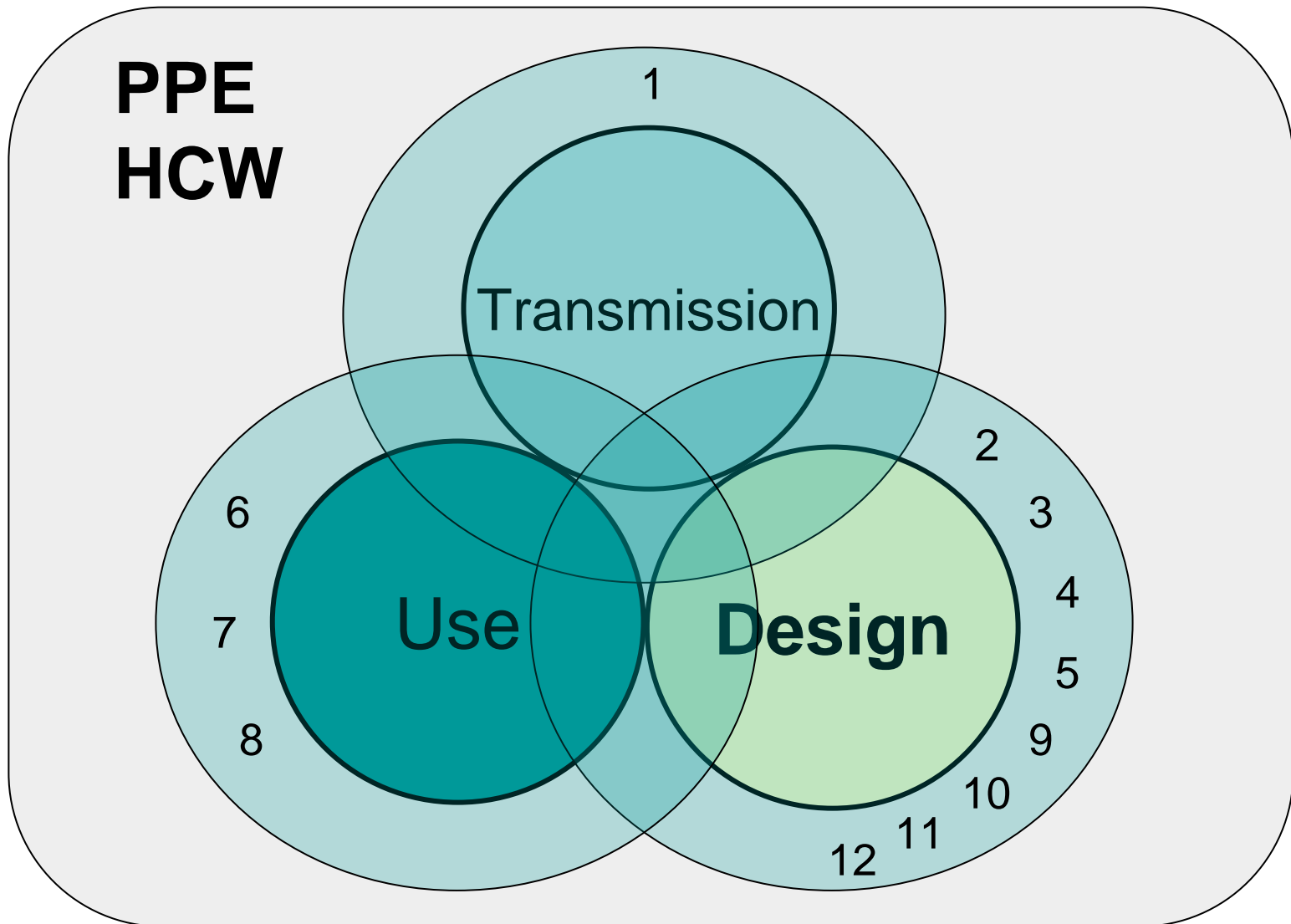
## Commit to Worker Safety and Appropriate Use of PPE

- [6] Emphasize appropriate PPE use in patient care and in healthcare management, accreditation, and training
- [7] Identify and disseminate best practices for improving PPE compliance and use
- [8] Increase research and research translation efforts relevant to PPE compliance

## Innovate and Strengthen PPE Design, Testing, and Certification

- [2] Define evidence-based performance requirements (prescriptive standards) for PPE
- [3] Adopt a systems approach to the design and development of PPE
- [4] Increase research on the design and engineering of the next generation of PPE
- [5] Establish measures to assess and compare the effectiveness of PPE
- [9] Ensure balance and transparency of standards-setting processes
- [10] Strengthen pre-market testing of PPE for healthcare workers
- [11] Strengthen post-market evaluation of PPE for healthcare workers
- [12] Coordinate efforts and expand resources for research and approval of PPE

# Overarching Recommendations



# IOM PPE for HCW

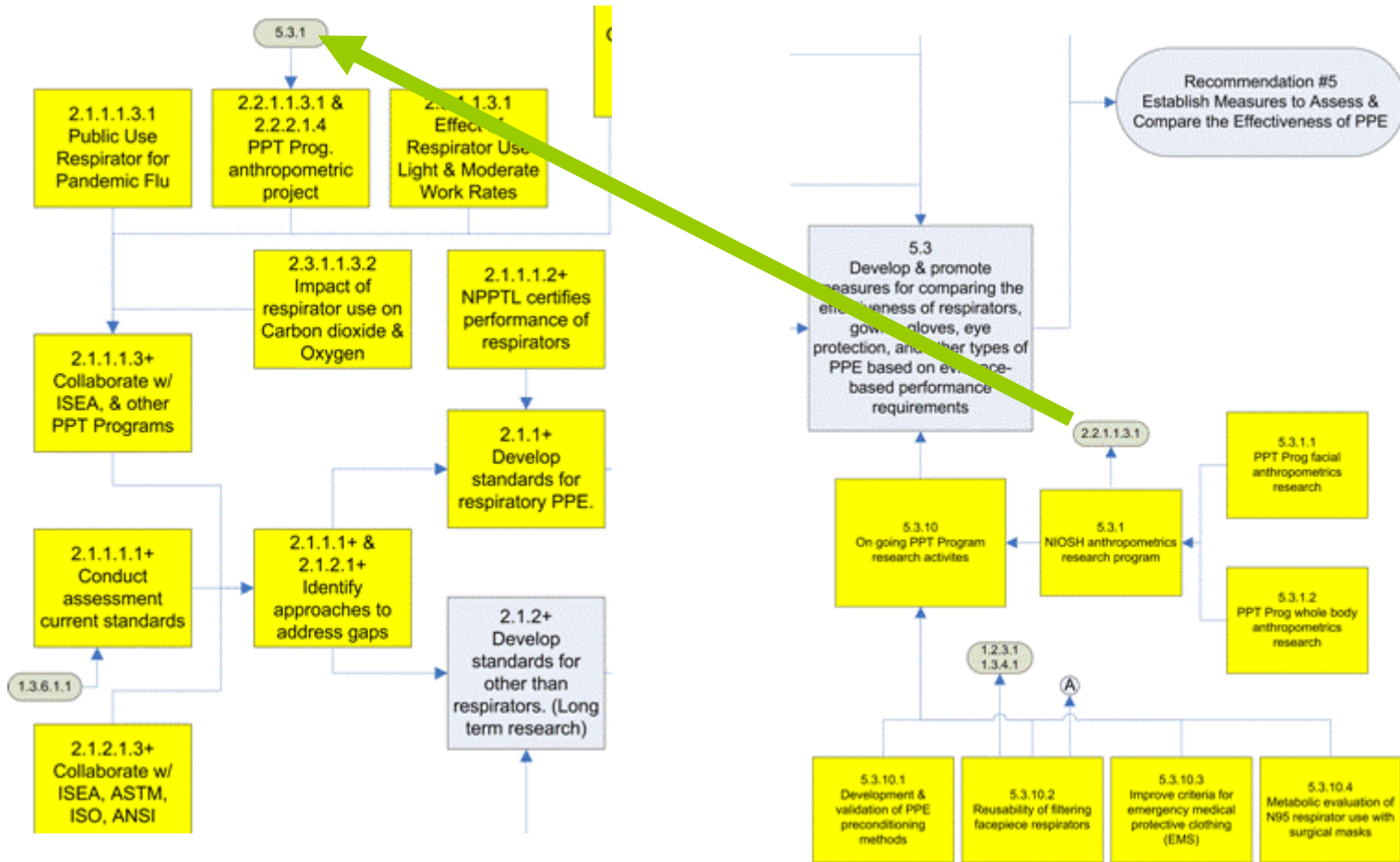
## Action Plan Structure

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- **IOM Recommendations**
  - Text Description
  - Flow Chart
  - Gantt Charts
  - Related PPT Activities Identified
  - Related NIOSH Activities Identified
- **URL links to IOM Report and PPT Action Plan**
  - <http://www.cdc.gov/niosh/review/public/129/>

# PPE HCW Report

## Recommendation Interactions



# NPPTL Program Related Activities for IOM PPE for Healthcare Workers

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- Reusability of Filtering Facepiece Respirators
- Metabolic Evaluation of N95 Respirator Use with Surgical Masks
- Aerosol Generation by Cough (HELD/NPPTL)
- PAPR/N95 FFR Combination
- N95/P100 TIL Testing
- Project BREATHE
- Frequency of Fit Testing
- Development of Computer-Aided Face-Fit Evaluation Methods
- Penetration of Nanoparticles through NIOSH-approved Respirator Filters
- Commerce Business Daily – No Fit Test Respirator Workshop Nov 8, 2007
- Certified Product Investigation Process (CPIP)
- Industrial PAPR Module
- Total Inward Leakage (TIL)
  
- Improved Criteria for Emergency Medical Protective Clothing

# Other NIOSH and CDC Related Activities for IOM PPE for Healthcare Workers

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- Elastic Textile Solution Pilot for Prototype Masks (CDC)
- Personal Protective Equipment (PPE) Effectiveness Study (CDC)
- Expedient Patient Isolation for Bioterrorism and Epidemic Response (DART)
- Expedient Airborne Isolation for Emergency Response Exercises (DART)
- Provide worker guidance in addressing pandemic influenza and aerobiological workplace hazards through HHS pandemic influenza Response plan (DSHEFS)
- Working in collaboration with researchers at West Virginia University on a project to examine the potential for airborne transmission of influenza virus in a hospital emergency department (HELD/DRDS)

# PPT Program Science Strategy Summary

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- **Continue to Identify the Nation's PPE Needs**
  - Implement Action Plans from COPPE Activities
  - Develop a Surveillance System for PPT
  - Identify Appropriate SDO Involvement
  - Assess Feedback from Stakeholder Meetings
- **Conduct Scientific Evaluations of Activities**
  - PPT Evaluation Report anticipated Jun '08
  - On-going Project Reviews
  - Scientific Peer Reviews of new Projects, Protocols, Proposals
- **Assess Customer Feedback of Our Performance**
  - Integrate Customer Satisfaction Survey Results in future action planning

# Quality Partnerships Enhance Worker Safety & Health



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## Thank you