Pertussis Meeting Update

Ruth Lynfield, M.D.
March 6 Pertussis Working Group Meeting

- IDSA, NFID, PIDS and NVPO co-sponsored a meeting to convene experts from government, industry, and academia
- Discussed epidemiology, pathogenesis, immune response, vaccines, vaccines in development, regulatory issues, potential short and long-term solutions, gaps in scientific knowledge
- 64 in-person participants, 66 joined via webinar
- Discussions used to create strategies to address resurgence of pertussis
Working Group Meeting on Pertussis

March 6th, 2013
7:30 am – 5:30 pm

7:30-7:50 am: *Introductions and Plans for the Day* (Ruth Lynfield)

7:50 -8:55 am: *Session 1 - Overview of Pertussis* (Bruce Gellin, Moderator)

**Epidemiology** (20 minutes) (Tom Clark)

**Pathogenesis** (20 minutes) (Erik Hewlett)

**Pertussis Toxins** (10 minutes) (Jim Cherry)

**Questions and Group Discussion** (15 minutes)

8:55-10:35 am: *Session 2 – Vaccines and Immune Response* (Linda Lambert, Moderator)
Short Term Solutions

• Discussed more frequent boosters
  – Understand positive and negative impact of more frequent boosters

• Discussed challenges (regulatory, economic) of licensure of monovalent acellular pertussis vaccine
  – Need cost-effectiveness data

• Better diagnostic and antibiotic strategies, particularly for newborns

• Caution that have not yet fully implemented new Tdap recommendations for adults, adolescents, pregnant women
Long-Term Solutions

- More basic research needed
- Better understanding of natural infection to apply to vaccine development
- Better understanding of correlates of protection and duration of protection
- Potential approaches: novel vaccines, novel adjuvants, novel delivery systems
- Understand vaccine effectiveness in different genetic backgrounds
- Maternal vaccination promising strategy
Working Group Meeting Next Steps

• Develop multidisciplinary working group to continue to discuss re-emergence of pertussis and priorities in research and response

• Describe global epidemiology and burden of pertussis
  – Take into account different vaccines, different vaccination schedules, vaccine coverage and different surveillance methods
  – Determine public health impact of pertussis
  – Increase understanding of the molecular epidemiology of pertussis strains
  – Determine types of additional vaccine effectiveness studies needed (e.g. strain-specific VE)
Next Steps (cont.)

- Determine variables that could be used to populate mathematical modeling studies to evaluate transmission, prevention and control

- Develop a systems biology approach for pertussis infection, disease, and protection from infection

  - Refine understanding of:
    - *B. pertussis* pathogenesis
    - Microbial products and toxins

  - Investigate impact of other microbial flora on infection and transmission

  - Enhance understanding of effective/ineffective host responses
Next Steps (cont.)

• Describe gaps in understanding of immune responses to pertussis and to different formulations of vaccines at different ages (including neonates)
  – Immune responses that protect against infection vs. disease
  – Use of animal and human data to address gaps
• Apply information from other infectious diseases that may lend insight
• Consider meta-analysis of animal and human data to approach question of correlates of protection
Next Steps (cont.)

- Increase understanding of impact of vaccination of pregnant women on protection from infection in infants
  - Investigate possible blunting of immune response in infant to vaccine
- Refine best time in pregnancy to immunize
- Develop better understanding of transmission of organism in vaccinated, previously infected and naive populations
- Determine whether and at what site(s) (e.g. tonsils) there may be carriage
Next Steps (cont.)

• Develop data and specimen repositories
  – Existing data and samples for repository for use by pertussis researchers
    • Ideally with date of sample, age of person, geographic location, vaccine history
    • Determine if sera from earlier vaccine trial studies or other pertussis studies are available
    • Determine if isolates are available
    • Determine if de-identified individual level data are available from earlier studies
Next Steps (cont.)

• New specimens for repository, with accompanying de-identified demographic data
  
  – Frozen specimens that are PCR positive for *B. pertussis*

  • May be able to culture these specimens and characterize organisms

  – Sera/whole blood, etc. from cases and from participants in pertussis studies
Pertussis Working Group

- Summary of meeting available
- Supplement underway to be published in *Journal of Infectious Disease* based on talks at the meeting
# Acknowledgements

*Great appreciation to many, but especially*

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