ISPPD-7

7th INTERNATIONAL SYMPOSIUM ON PNEUMOCOCCI AND PNEUMOCOCCAL DISEASES

SPECIAL REPORT

Tel Aviv, Israel
March 14-18, 2010

SABIN VACCINE INSTITUTE

PATH
A catalyst for global health

PACE
Pneumococcal Awareness Council *of* Experts
A project of the Sabin Vaccine Institute

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I. INTRODUCTION

Overview

Participants visit the exhibits from GSK Biologicals, Inverness Medical Innovations, Merck Sharp & Dohme Corp., Novartis Vaccines & Diagnostics, PATH, Pfizer Ltd., Statens Serum Institut, and World Pneumonia Day during their breaks.

From March 14 to 18, 2010, more than 1,200 experts in the field of pneumococci and pneumococcal disease came together in Tel Aviv, Israel, for the Seventh International Symposium on Pneumococci and Pneumococcal Diseases (ISPPD-7), making it the biggest ISPPD conference yet. Traveling from nearly 70 countries worldwide, participants gathered to discuss the latest scientific advances related to pneumococcus and to advance knowledge leading toward improved diagnosis, treatment, and prevention of pneumococcal disease worldwide.

Streptococcus pneumoniae, or pneumococcus, is the most common cause of severe pneumonia—the leading killer of young children due to infectious disease worldwide. It is a complex and deadly bacterium that results in the deaths of nearly one million children before their fifth birthdays annually, mostly in the developing world. Other particularly at-risk populations include the elderly and those with chronic health problems.

On the heels of the first annual World Pneumonia Day and a recent commitment by the Bill & Melinda Gates Foundation to make this the "decade of vaccines," ISPPD-7 participants were enthusiastic about sharing updates and recent findings in pneumococcal research and development. The symposium revealed new studies on the microbiology and epidemiology of the pneumococcus bacterium, reviewed developments for existing prevention and treatment solutions, introduced promising new vaccine technologies in the development pipeline, provided updates on advocacy efforts in the fight against pneumococcal disease, and expanded the debate on complex issues such as serotype dynamics.

PATH, GlaxoSmithKline, Pfizer, Novartis, and Merck Serono sponsored this year's symposium.

> "ISPPD-7 covered a huge amount of information and was very well organized. What I appreciated — having organized this conference last year — was the expanded poster presentations. ISPPD-7 gave more people more time than ever to discuss their work and there was more discussion in general than we had in the past."
>
> Dr. Ingileif Jónsdóttir
> Chair of ISPPD-6, Iceland

II. PROGRAM HIGHLIGHTS

Pneumococcal Evolution and Treatment Controversies

A series of sessions at ISPPD-7 covered dramatic changes in genome sequencing since the last ISPPD two years ago that enable a high-resolution view of bacterial genetics and evolution, which in turn allows researchers to better understand the evolution of *S. pneumoniae*. Participants discussed the rise of multi-drug-resistant pneumococcal serotypes—particularly serotype 19A—as well as regional differences in virulence of pneumococcal serotypes.

Speakers highlighted findings of their genome sequencing to better understand pneumococcal evolution. One study in Canada noted a complex genetic picture where high-level drug resistance, vaccine-selection pressure, and *S. pneumoniae* mutational events have created a "perfect storm" for the emergence of the multi-drug-resistant 19A serotype. Another study verified that phenotypic virulence differences between *S. pneumoniae* serotype 1 from developed and developing countries may be explained by the presence of genomic regions, which segregate between clonal complexes. Speakers noted that this emphasizes the need to analyze *S. pneumoniae* serotype 1 from developing countries to get a truer perspective on virulence and disease parthenogenesis for this serotype since this is where most of the burden lies. Overall, discussions acknowledged the complexity of pneumococcal disease as modern technologies continue to uncover new information about pneumococcus.

The high resistance rates of *S. pneumoniae* to available antibiotics also prompted scientists at ISPPD-7 to acknowledge a debate in the pneumococcal field about whether introducing new antimicrobials can help or hurt treatment of pneumococcal disease today. Speakers underscored the importance of achieving a balance between treating pneumococcal disease with lifesaving medicines as soon as possible after onset and avoiding the unnecessary use of antibiotics, which could accelerate antimicrobial resistance and deplete resources. They noted that as antimicrobial resistance increases, the number of antimicrobial agents entering the market is actually declining, potentially limiting the availability of critical resources for treating pneumococcal disease. They further emphasized that immediate treatment was imperative to increasing a person's chance of survival from pneumonia, especially before day four of illness, after which the mortality rate can double without treatment.

Interactions of *S. pneumoniae* With Other Agents: The Influenza Virus Paradigm

A topic of marked interest at ISPPD-7 was the interaction between *S. pneumoniae* and other agents, particularly influenza viruses. Substantial discussion focused on the research showing that influenza predisposed individuals to developing bacterial, community-acquired pneumonia. During each of the influenza pandemics of the 20th century, epidemiological and pathological clinical evidence showed secondary bacterial pneumonia to be a frequent cause of illness and death. In these scenarios, the pneumococcus bacterium was reportedly the most common etiology, with similar findings also applying to seasonal influenza.

ISPPD-7 participants dialogued about a 2009 US Centers for Disease Control and Prevention study that found approximately one-third of the mortality cases in the 2009 influenza A (H1N1) pandemic to exhibit bacterial co-infection with pneumococcus. Research also showed that during seasonal influenza outbreaks, previous vaccination with 7-valent pneumococcal conjugate vaccine (PCV7) helped reduce the risk of hospitalization and death due to influenza. Evidence from other studies suggested the existence of a window of susceptibility to bacterial infections immediately following influenza infection in a number of mammalian models—including mice, ferrets, and monkeys—which led to enhanced susceptibility to death from the combined effects of the two pathogens.

Overall, speakers noted that the evidence underscored the need for pneumococcal vaccines to be a part of the larger strategy to prevent influenza-associated morbidity and mortality. Given the identification of pneumococcal infections as an important complication in many severe and fatal cases of 2009 pandemic influenza A (H1N1), researchers at ISPPD-7 emphasized that pneumococcal vaccines should be an essential part of pandemic planning.

Pneumococcal Vaccination: Today and Tomorrow

Participants rise early to attend a satellite symposium on new pneumococcal vaccines.

Ten years after the introduction of Pfizer's PCV7, Prevnar®, experts took advantage of the opportunity at ISPPD-7 to reflect on changes in the pneumococcal vaccine landscape since the last ISPPD, including the approval and introduction of the 10- and 13-valent PCVs. With expanded serotype coverage, these vaccines could have substantial impact in saving lives, especially in the developing world. They reviewed current research, which continued to evidence the general effectiveness of PCVs in reducing vaccine-type invasive pneumococcal disease (IPD) and nasopharyngeal carriage in children, as well as in indirectly decreasing the rate of invasive disease in adults, presumably through decreased transmission of pneumococcus from children to adults. Several plenary and poster sessions at the conference examined currently available PCVs, their roll-out in various countries, and the way forward for immunization practices using these technologies. Others shed light on the geographic diversity of serotype distributions, the approval process for PCVs, immunogenicity studies, and the potential impact of PCVs on mortality and morbidity due to pneumococcal disease.

Current pneumococcal conjugate vaccines

GlaxoSmithKline (GSK) updated conference participants on new research findings for its 10-valent PCV (PCV10), Synflorix™, which offers protection against the original PCV7 serotypes (4, 6B, 9V, 14, 18C, 19F, and 23F) plus serotypes 1, 5, and 7F. It is currently licensed in 55 countries and is the only pneumococcal vaccine prequalified by the World Health Organization (WHO), making it eligible for procurement by UNICEF and other UN agencies for use in national immunization programs. New data from studies conducted in Korea showed the vaccine to be non-inferior to PCV7. The data further demonstrated variability in immune responses within different populations and regions, as well as variability according to genetic, social, and environmental factors, including age of first immunization. Results from PCV10 carriage studies also strongly suggested a protective effect against carriage of vaccine serotypes before and after administration of a booster dose.

Pfizer (formerly Wyeth) presented data on its new 13-valent PCV (PCV13), Prevnar 13™, which the US Food and Drug Administration (FDA) approved for use in children in the United States just weeks prior to ISPPD-7. In addition to the original PCV7 serotypes, the vaccine includes serotypes 1, 3, 5, 6A, 7F, and 19A, some of which are prevalent in the developing world. Pfizer revealed results from a Phase 3 study of the vaccine showing it to be immunogenic and generally well-tolerated in healthy young children vaccinated with at least three prior doses of PCV7. Comparative data also suggested that PCV13's immunogenicity and functional antibody responses for serotypes 6A and 19A were greater than the responses elicited by PCV7. Due to these findings and others, presenters expressed the expectation that the transition from PCV7 to PCV13 would be relatively easy, particularly as it related to vaccination schedules. They also reported that additional studies were underway to evaluate possible administration of PCV13 to adults, with results expected to be available next year.

In a late-breaking announcement, Merck Research Laboratories revealed its new 15-valent PCV (PCV15) candidate now in the early stages of testing, which adds 1, 3, 5, 6A, 7F, 19A, 22F, and 33F to the original PCV7 serotypes. Preclinical testing reportedly showed antibody response in infant rhesus monkeys and indicated comparable antibody responses for the seven serotypes common to both PCV15 and PCV7. Further, the post-vaccination responses to PCV15 were higher than baseline for the added eight serotypes.

Vaccine schedules

Along with the presentation of data supporting the safety, immunogenicity, and effectiveness of current vaccines, much discussion at ISPPD-7 focused on new studies evaluating appropriate dosing, immunization schedules, and vaccination combinations as the roll-out of these vaccines expands, including to low-resource countries. Presenters identified the need to optimize the schedule of pneumococcal vaccines in routine vaccine programs and outlined efforts to do so. Study results from countries that introduced PCVs in their national immunization programs showed a variety of schedules to provide protection, though not necessarily of equal effectiveness. Findings also indicated that differences between the schedules were subtle and could be insignificant taking into consideration herd immunity effects, but there was not enough evidence to support a recommendation for the use of fewer than two doses in infants.

Delivering vaccines to developing countries

Global movements and organizations, including WHO, PneumoADIP, the International Vaccine Access Center (IVAC), the Pneumococcal Awareness Council of Experts (PACE), the Sabin Vaccine Institute, the Global Action Plan for Prevention and Control of Pneumonia (GAPP) initiative, World Pneumonia Day, and UNICE F have been working with the GAVI Alliance over the past decade to accelerate the uptake of new pneumococcal vaccines in the developing world, where most pneumococcal deaths occur. ISPPD-7 participants celebrated progress over the past few years on this front, with more than 40 countries adopting PCV7 in their national immunization programs, including two African countries—Rwanda and The Gambia. Of special note was the huge demand for these vaccines in low-resource countries, as 34 countries had formally expressed interest in obtaining pneumococcal vaccine through the GAVI Alliance and 11 countries already received approval to introduce pneumococcal vaccines this year and into 2011.

Another mention at ISPPD-7 was the Advance Market Commitment (AMC) for pneumococcal vaccines, a financing mechanism designed to create incentives for manufacturers to supply vaccines at long-term lower prices. Under the AMC, donors commit funds to guarantee the price of vaccines, provided the vaccines meet stringent, pre-agreed criteria on effectiveness, cost, and availability to enable access to these prevention tools in low-income countries. ISPPD-7 participants acknowledged the importance of this mechanism in facilitating improved access to vaccines in the short- to medium-terms and affirmed that vaccines in the AMC pipeline included PCV10 and PCV13. They also noted that Kenya was the first country in line to introduce PCV10 through the AMC mechanism.

Serotype Dynamics of Pneumococcal Disease

Mounting concerns about the emergence of non-vaccine serotypes, or serotype replacement following the introduction of PCVs, stemmed a highly anticipated dialogue at ISPPD-7 on serotype dynamics of pneumococcal disease. Participants emphasized the need for further research to understand the degree and types of serotype replacement that may be occurring. They also noted that given the increased number of serotypes covered by newer PCVs, it was important to continue to monitor and evaluate pneumococcal serotypes and colonization to further the scientific community's understanding of the impacts different serotypes have in causing disease.

Hot topic:

Reports of surveillance data showing possible regional differences in non-vaccine serotype emergence patterns was a subject of marked debate within the scientific community leading up to ISPPD-7. At the symposium, a presentation comparing surveillance data from the United Kingdom with data from the United States and Australia garnered discussion on possible explanations for the alleged regional discrepancies, including differences in data sampling and definitions between countries. Overall, the data presented at ISPPD-7 showed PCVs in all three countries to have large effects on reducing vaccine-type disease, while non-vaccine serotypes increased. The scientific community continues efforts to answer outstanding questions about how these patterns affect the degree of change in overall disease burden post-PCV introduction.

In addition, researchers at ISPPD-7 expressed the need to leverage lessons learned to optimize the cost-effectiveness of vaccines for populations most in need. They agreed on the need to establish surveillance early in developing countries and to undertake careful monitoring of potential non-vaccine serotype emergence in order to tailor vaccines and vaccination schedules to their appropriate context.

Predicting serotype incidence

ISPPD-7 brought to light several studies taking place in the field to better understand serotype behavior and dynamics. One such study in Africa aimed to predict serotype dynamics by evaluating the factors influencing serotype trends and changes—time, space, and context. In another study, findings showed the pneumococcal population to follow a stable pattern that serotype-associated correlates could help predict, which could ultimately help evaluate the impacts and patterns of serotype replacement. Along the Thai-Burmese border, other researchers discovered that conventional techniques for detecting nasopharyngeal pneumococcal carriage has significantly underestimated the prevalence of multiple serotype carriages, warranting reevaluation of these techniques.

Novel Vaccine Technologies and Their Way Forward

In addition to the exciting new developments in conjugate vaccines, researchers at ISPPD-7 described parallel efforts to develop novel and alternative vaccine strategies, which could provide broad, cost-effective protection for the global population. Speakers noted that the development of vaccines against pneumococcus was complicated, as scientists continue to confront the bacterium's more than 90 pneumococcal serotypes, which vary by region and continually evolve. Thus, ISPPD-7 presenters emphasized the importance of developing new vaccines that broaden serotype coverage, increase efficacy at the mucosal level, bolster efficacy in at-risk groups such as children and the elderly, and entail simpler and more cost-effective production methods to make vaccines more affordable for low-income populations. Scientists brought to light several new technologies currently under development on this front.

Protein vaccines

Intercell AG of Austria presented preliminary data from a Phase 1 clinical trial of its novel pneumococcal common protein vaccine candidate, IC47, recently completed in partnership with PATH. The first in-man study conducted in Germany showed the vaccine candidate to be immunogenic and well-tolerated with or without adjuvant among healthy adults in two-dose groups. Although questions remained about how the vaccine would perform in further clinical evaluations, if successful, the vaccine candidate could provide affordable, serotype-independent coverage against *S. pneumoniae* for both children and the elderly.

> "Twelve years after the start of clinical studies on pneumococcal vaccines, so much has been learned in the last decade about pneumococcus, and in fact, we realize there is so much more to learn. There is a lot of new information, and what we understand now is that nothing is simple with this bug."
>
> Dr. Ron Dagan
> Chair of ISPPD-7, Israel

Genocea Biosciences Inc. provided an overview of its collaboration with Children's Hospital Boston (CHB) and PATH to determine whether a protein subunit vaccine designed to elicit IL-17 producing effector T helper cell (Th17) immunity was a viable alternative for combating pneumococcal disease. To this end, the partners used Genocea's proprietary antigen discovery platform to identify T-cell antigens most commonly recognized by Th17 cells in humans naturally exposed to pneumococci and in mice immunized with CHB's whole cell vaccine (WCV) candidate. They reported completing preclinical proof-of-concept studies on a pneumococcal vaccine developed using *S. pneumoniae* antigens identified by the proprietary Genocea technology.

GlaxoSmithKline Biologicals SA of Belgium presented data from its preclinical study of the pneumococcal histidine triad (Pht) protein family to evaluate the protective potential of these proteins as vaccine candidates in two mouse models. In a preclinical evaluation, the team found that designate members of the Pht protein family were valid candidate antigens to be incorporated in pneumococcal vaccines either as a stand-alone vaccine or together with a polysaccharide conjugate vaccine.

Whole cell vaccines

CHB revealed details from its efforts to develop a novel, inactivated WCV candidate in collaboration with PATH and Butantan Institute of Brazil. The candidate, if successful, could be a cost-effective way of providing broad serotype coverage to children against pneumococcus. Findings from preclinical studies showed the WCV candidate to be protective in several murine models after subcutaneous injection. CHB reported that a pilot toxicology study for the

"The work underway in the scientific community to develop novel, broadly protective vaccines against pneumococcal disease could save millions of lives if successful. Efforts to maximize the cost-effectiveness of these technologies could also enable low-income countries to access lifesaving vaccines not otherwise affordable wtihout assistance."

Dr. Mark Alderson
USA

vaccine candidate was underway and that the study partners were seeking advice from the FDA on moving the vaccine candidate into early-stage clinical trials.

Live attenuated vaccines

As another approach, researchers at ISPPD-7 presented on the use of live attenuated vaccines (LAVs) for preventing pneumococcal disease. The data revealed a detailed evaluation of the humoral response of a live attenuated *S. pneumoniae* vaccine to determine which pneumococcal surface antigens generated cross-reactive and cross-protective antibodies. Researchers confirmed the effects of LAV in protection from colonization and also highlighted the need for a component vaccine with multiple targets to ensure broad protection.

Regulatory pathways

In light of the exciting new developments in novel and innovative vaccines, significant discussion at ISPPD-7 took place surrounding the uncertain regulatory pathway for bringing new technologies such as protein-based pneumococcal vaccines to market. The comparative nature of first to second generation PCVs helped speed their progression through the clinical trial process to licensure. In contrast, novel pneumococcal vaccines face a difficult and undefined regulatory path, entailing higher development costs due to challenges associated with demonstrating immunogenic non-inferiority without correlates for comparison. Many experts at ISPPD-7 agreed that there was no one way to go and that the scientific community would need to find alternative strategies for predicting effectiveness in order to accelerate time to market for novel pneumococcal vaccines.

Pneumococcal Disease Control Efforts on the World Stage

Three special lectures at ISPPD-7 explored ways in which the scientific and advocacy communities are generating momentum in the fight against pneumococcal disease by promoting and facilitating global access to lifesaving treatment and prevention tools.

World Pneumonia Day

The International Vaccine Access Center (IVAC) sponsored a luncheon event, "World Pneumonia Day 2010: Time for Action," which highlighted successes from the first-ever World Pneumonia Day on November 2, 2009, and explored opportunities for the upcoming World Pneumonia Day on November 12, 2010. The event highlighted the central role that grassroots efforts played in the success of World Pneumonia Day 2009 and encouraged ISPPD-7 participants to join and promote a call to action to combat pneumonia. Session organizers led an interactive discussion during which participants shared innovative ideas to garner global attention for World Pneumonia Day and invited participants to continue to share their ideas going forward, beyond ISPPD-7.

Possible pathways forward:

1. Demonstrate clinical effectiveness of novel versus conjugate technologies
2. Pursue licensure paths with adult vaccines first and then license in children based upon a defined correlate of protection
3. Combined conjugate and protein antigen vaccine
   - Advantage: High predictability, relatively fast because it leverages existing conjugate correlates
   - Disadvantage: Does not highlight proteins as backbone and requires vaccine developer to have both conjugate and protein programs
4. Establish reduction of pneumococcal colonization
   - Leverage PneumoCARR project and other efforts

Global Action Plan for the Prevention and Control of Pneumonia

In response to the overwhelming burden of pneumonia, WHO and UNICEF launched the Global Action Plan for the Prevention and Control of Pneumonia (GAPP) in 2009 with the aim of increasing awareness of pneumonia as the world's leading cause of childhood death and spurring the global health community to action. A dedicated session at ISPPD-7 updated participants on the GAPP initiative's progress, including several inspirational examples from countries in Asia. Speakers identified opportunities to synergize GAPP activities with efforts to combat the world's second-leading killer of kids—diarrhea—stressing the need to reduce duplication of structures and effort, and to eliminate conflicting messages going out to countries and communities.

The Bill & Melinda Gates Foundation

The Bill & Melinda Gates Foundation's $10 billion commitment in February 2010 to make this the "decade of vaccines" set the stage for its special lecture session at ISPPD-7. The event reiterated the high priority that the foundation is giving to the fight against pneumonia and pneumococcal disease, and afforded conference participants the opportunity to learn about the foundation's collaborative work with partners to understand pneumonia, reduce its risks, and develop new, affordable, and accessible pneumococcal vaccines to eliminate the inequity of the burden of pneumonia.

Speakers stressed the importance of partnerships in the strategy to eliminate this inequity. Projects featured were PERCH, a research project that aims to improve the evidence-base for pneumonia prevention and treatment in low-resource countries; the PneumoCarr consortium, which investigates the epidemiology of colonization by *S. pneumoniae*; the pneumococcal vaccine project at PATH, which aims to accelerate development of safe, effective and affordable pneumococcal vaccines for children in the developing world; and The Mother's Gift Trial, which evaluates the effect of maternal immunization on infants' response to pneumococcal vaccine.

> "The annoucement serves as a leverage for other stakeholders and national governments to follow the Foundation's footsteps despite the current economic downturn. That purpose is already being served based on recent announcements from UK's Department for International Development and the WHO."
>
> Dr. Richard Adegbola
> USA

The Robert Austrian Lecturer Committee stands with the recipients of the prestigious research award in pneumococcal vaccinology.

Awards, Recognition, and Travel Grants

The ISPPD-7 board recognized the next generation of innovators with the Robert Austrian Research Awards in Pneumococcal Vaccinology. The recipients, who were from five different geographical regions, included Ole Schmeitz Sogaard, Denmark; Maria Leonor Sarno de Oliveira, Brazil; Aoife Roche, United States; Nicole Wolter, South Africa; and Odilia Wijburg, Australia. Each recipient received $25,000 through an educational grant from Pfizer to support their various research projects. The awards were established in honor of the late Robert Austrian, whose pioneering research resulted in essential advancements and contributions in the areas of pneumococci and pneumococcal disease prevention and vaccinology.

The ISPPD-7 secretariat also awarded travel grants sponsored by PATH, IVAC, Pfizer, Novartis, and Merck to more than 50 recipients from around the world to enable the participation of leading researchers from a diverse group of countries, particularly in the developing world. A full list of grantees is available on the ISPPD-7 Web site.

Next Steps: Continuing the Dialogue

The symposium adjourned after five days of stimulating lectures and dynamic scientific exchange. Participants left looking toward an invigorated global commitment to invest in new and current technologies for the prevention and treatment of pneumococcal disease, confirmation of the efficacy of current PCVs, hope on the horizon for novel vaccine solutions that are affordable and sustainable, and the promise of increased access to lifesaving pneumococcal vaccines throughout the developing world.

The dialogue that commenced at ISPPD-7 confirmed a promising yet complex road ahead. Current vaccines against pneumococcal disease are effectively saving lives today, yet are complicated and relatively expensive to produce, making it difficult for developing nations to afford them without donor assistance. Leaders in the pneumococcal community at ISPPD-7 agreed that keeping an eye on new technologies may lead us to even more sustainable solutions for preventing pneumococcal disease, particularly in the developing world where need is greatest.

With renewed energy and a reinvigorated network, the dialogue continues beyond the walls of the symposium—building on the strides made in pneumococcal disease research—until the next ISPPD. The community will reconvene for ISPPD-8 from April 1 to 5, 2012, in Iguaçu Falls, Brazil.

III. GENERAL INFORMATION

About ISPPD

In 1998, a core group of researchers founded ISPPD as a means for experts to hold interdisciplinary meetings and discuss all aspects of pneumococcus, including molecules, biology, evolution, immunity, clinical uses, treatments, and prevention. Since the successful inaugural meeting of 200 researchers in Elsinore, Denmark, ISPPD has made important progress over the years.

Today, ISPPD convenes more than 1,000 experts to participate in a program highlighting the latest scientific achievements in the field of pneumococci and pneumococcal disease. The symposium brings together researchers and clinicians from all over the world to share advancements in pneumococcal disease diagnosis, prevention, and treatment. Topics cover epidemiology, bacteriology, pathogenic mechanisms, clinical aspects, vaccinology, and advocacy. The program includes state-of-the-art plenary lectures, selected presentations from submitted abstracts, and ample opportunity for interactive discussions.

Profile of ISPPD-7 Chair

Dr. Ron Dagan presents his Robert Austrian Lecture at the symposium.

Professor Ron Dagan, Chair of ISPPD-7 and the Robert Austrian Lecturer of ISPPD-7

Dr. Ron Dagan, professor of pediatrics and infectious diseases at the Ben-Gurion University of the Negev, Israel, has made immense contributions to the pneumococcal field over the past 25 years. He is a pioneering researcher on pneumococcal vaccines, an active mentor, and an effective advocate for pneumococcal disease prevention.

His work has been instrumental in persuading policymakers in Israel to include pneumococcal vaccines in the country's national immunization program, a decision that took effect in July 2009. Among his other accomplishments, Dr. Dagan has been a leader in the clinical development of many PCV candidates, and his pioneering research has led to the discovery of several immune mechanisms not previously known in humans. Further, Dr. Dagan is one of the first to describe the importance of carriage in herd immunity and the potential for serotype replacement as a result of pneumococcal vaccination. For his contributions to the field, he was unanimously selected as the Robert Austrian Lecturer at ISPPD-7.

About Sabin

Sabin Vaccine Institute is a nonprofit organization dedicated to preventing and curing infectious and neglected tropical diseases worldwide and eliminating the tremendous human suffering they cause. The Sabin Vaccine Institute works tirelessly to develop treatments and vaccines for the world's poor and establish networks to ensure these treatments are effectively and efficiently delivered. Sabin is helping to end the suffering of billions of people by fighting infectious and neglected tropical diseases worldwide through major research, development, and advocacy programs. For more information, **visit www.sabin.org**.

About PATH

PATH is an international nonprofit organization that creates sustainable, culturally relevant solutions, enabling communities worldwide to break longstanding cycles of poor health. By collaborating with diverse public- and private-sector partners, PATH helps provide appropriate health technologies and vital strategies that change the way people think and act. Its work improves global health and well-being. To learn more about PATH, visit **www.path.org**.

About PACE

A project of the Sabin Vaccine Institute, the Pneumococcal Awareness Council of Experts (PACE) is comprised of leading global experts in infectious diseases and vaccines. The Council raises awareness among policymakers and aims to secure global commitments to prevent pneumococcal disease—a leading infectious killer of children and adults worldwide—working through collaboration and partnership with countries, NGOs, academia, and industry to achieve its goals. For more information about PACE and the Global Call to Action, please visit **www.sabin.org/PACE**.

IV. ISPPD-7 BOARD AND COMMITTEE

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Ron Dagan, Israel

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Put together by: Jeff Weiser (Chair), David Briles, Peter Andrew, Marc Lipsitch, Elaine Tuomanen, Peter Hermans

Session 3: Interaction of S. pneumoniae With Other Agents - The Influenza Virus Paradigm

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Session 6: Treatment Controversies

Put together by: Donald Low (Chair), Michael Jacobs, Javier Garau, Steve Pelton, Adriano Arguedas

Session 7: Serotype Dynamics of Disease and Colonization Before and After Vaccine

Put together by: Kate O'Brien (Chair), Leslie McGee, Helen Makela, Herminia de Lencastre, Samir Saha, Hanna Nohynek, Steve Black

Session 8: The Way Forward for Global Pneumococcal Vaccination

Put together by: Orin Levine (Chair), Kim Mulholland, Thomas Cherian, Cynthia Whitney, Kari Auranen, Steve Black

Session 9: Novel Pneumococcal Vaccines and Alternative Vaccination Strategies – Promises & Challenges

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