National Vaccine Advisory Committee (NVAC)
February 2–3, 2016, Meeting Minutes

Committee Members in Attendance

Walter A. Orenstein, M.D., Chair
Richard H. Beigi, M.D., M.Sc.
Timothy Cooke, Ph.D.
Sarah Despres, J.D.
David Fleming, M.D., M.P.H.
Ann M. Ginsberg, M.D., Ph.D.
Philip Hosbach
Ruth Lynfield, M.D.
Yvonne Maldonado, M.D.
Charles Mouton, M.D., M.S.
Saad Omer, M.B.B.S., M.P.H., Ph.D.
Wayne Rawlins, M.D., M.B.A.
Mitchel C. Rothholz, R.Ph., M.B.A.
Nathaniel Smith, M.D., M.P.H.
Kimberly M. Thompson, Sc.D.
Vish Viswanath, Ph.D.

NVAC Ex Officio Members

Michael Bartholomew, M.D., Indian Health Service (IHS)
Marion Gruber, Ph.D., U.S. Food and Drug Administration (FDA)
Jeffrey A. Kelman, M.M.Sc., M.D., Centers for Medicaid and Medicare Services (CMS, day two only)
Rima Khabbaz, M.D., Centers for Disease Control and Prevention (CDC)
Iris Mabry-Hernandez, M.D., M.P.H., Agency for Healthcare Research and Quality (AHRQ)
Donna Malloy, D.V.M., M.P.H., Department of Agriculture (USDA)
Justin A. Mills, M.D., M.P.H., Bureau of Primary Health Care (BPHC), Health Resources and Services Administration (HRSA)
Barbara Mulach, Ph.D., National Institutes of Health (NIH)
Narayan Nair, M.D., Division of Injury Compensation Programs, HRSA
Robin Robinson, Ph.D., Biomedical Advanced Research and Development Authority (BARDA)
Margaret Yacovone, M.D., M.S.P.H., Department of Defense (DoD)

NVAC Liaison Representatives

Nancy M. Bennett, M.D., M.S., Advisory Committee on Immunization Practice (ACIP)
James S. Blumenstock, Association of State and Territorial Health Officials (ASTHO)
Scott Breidbart, M.D., M.B.A., America's Health Insurance Plans (AHIP)
Rebecca Coyle, M.S.Ed., American Immunization Registry Association (AIRA)
Robert S. Daum, M.D., C.M., Vaccines and Related Biological Products Advisory Committee (VRBPAC)
Charlene Douglas, Ph.D., M.P.H., R.N., Advisory Commission on Childhood Vaccines (ACCV)
Kristen Ehresmann, R.N., M.P.H., Association of Immunization Managers (AIM)
Hannah Kurtis (for Isabella Danel, M.D., M.S.), Pan American Health Organization (PAHO)
Rhonda Kropp, Public Health Agency of Canada (PHAC)
Tiffany Tate, M.S.H., National Association of County and City Health Officials (NACCHO)

Executive Secretary

Bruce G. Gellin, M.D., M.P.H., Deputy Assistant Secretary for Health and Director, National Vaccine Program Office (NVPO)

Day 1—February 2, 2016

Welcome—Karen B. DeSalvo, M.D., Acting Assistant Secretary for Health, U.S. Department of Health and Human Services (HHS)

Dr. DeSalvo welcomed the members and participants and introduced David Fleming, M.D., M.P.H., the newest NVAC member. She thanked departing NVAC members Charles Mouton, M.D., M.S., and Vish Viswanath, Ph.D., for their contributions in key areas, and then presented them with certificates honoring their service.

Dr. DeSalvo noted that Congress asked HHS to produce a better plan for protecting adult health through vaccines. The request coincides with the recent completion of the National Adult Immunization Plan (NAIP), which will be released this week. Dr. DeSalvo said the NAIP addresses concerns of stakeholders in and outside of government and tackles important opportunities. She appreciated that NVAC's expertise and work were translated into national priorities to improve access to care, promote the benefits of vaccines, increase community demand for adult vaccines, and foster innovation in vaccine development and technology to keep ahead of emerging needs.

To increase efficiency and effectiveness of tracking immunization, the Federal government encouraged investment in modernizing and digitizing health records, and the use of electronic health records (EHRs) has boomed. Continued efforts are needed to include retail pharmacies and public health providers to strengthen digital communication around immunization in particular. Dr. DeSalvo said she believes the adult immunization initiative is an opportunity to advance the integrated use of EHRs.

The National Vaccine Plan, published in 2010, included directions for a midcourse review in 2015. Dr. DeSalvo hoped the outcome of the review would identify specific, measurable indicators and benchmarks to assess progress toward the goals and priorities. She added that HHS counts on NVAC for expert advice on innovative technology and emerging issues—such as Zika virus—to help HHS protect people in the United States and globally.

Dr. DeSalvo thanked NVAC members for contributing their time and intellectual energy and for taking time away from their schedules to serve on the Committee. She praised NVAC for helping to ensure that science remains the foundation for public health policy, for staying ahead of demands in areas such as adult immunization, and for thinking through thorny issues such as maternal immunization. Dr. DeSalvo concluded that HHS looks forward to NVAC's output as it makes policy going forward.

Chair's Report—Walter A. Orenstein, M.D., NVAC Chair

Following introductions of Committee members, Dr. Orenstein gave an overview of the meeting process. He noted that the public comment period is not a question-and-answer session; rather, it is an opportunity for the public to give comments that will appear in the public record. Time for public comment is limited; written comments can be sent to the NVAC for consideration by e-mail (nvpo@hhs.gov). Dr. Orenstein said the minutes of past meetings are published online.

Dr. Orenstein called for review of the September 2015 NVAC meeting minutes. NVAC members unanimously approved the minutes with no changes.

Dr. Orenstein welcomed five new ex officio and liaison representatives to NVAC:

- James S. Blumenstock, ASTHO
- Rima Khabbaz, M.D., CDC
- Rhonda Kropp, PHAC
- Narayan Nair, M.D., Division of Injury Compensation Programs, HRSA
- Robin Robinson, Ph.D., BARDA

He thanked outgoing NVAC members Dr. Mouton and Dr. Viswanath for their major contributions, particularly the NVAC report on vaccine confidence. Dr. Orenstein welcomed Dr. Fleming to NVAC.

Recent accomplishments include three NVAC reports published in *Public Health Reports:*

- "Assessing the State of Vaccine Confidence in the United States" (December 2015)
- "A Call for Greater Consideration for the Role of Vaccines in National Strategies to Combat Antibiotic-Resistant Bacteria" (January/February 2016)
- "Overcoming Barriers to Low HPV Vaccine Uptake in the United States" (January/February 2016)

Dr. Orenstein summarized the meeting agenda. Most of the presentations can be found online at http://www.hhs.gov/nvpo/nvac/meetings/pastmeetings/index.html. The next two NVAC meetings are scheduled for June 7–8 and September 13–14, 2016.

Walter Reed Army Institute of Research's (WRAIR's) Contributions to the Vaccine Enterprise—COL Nelson Michael, M.D., Ph.D., WRAIR

COL Michael explained that the U.S. military has robust research and development (R&D) efforts around biodefense countermeasures but also addresses public health concerns to protect its force. The WRAIR has contributed to many licensed vaccines; it is playing a key role in vaccine development research for HIV, dengue fever, and malaria, and it is assisting with vaccines against Ebola virus and Middle East Respiratory Syndrome Coronavirus (MERS-CoV).

The U.S. military acquires vaccines in the same way it acquires tanks or any other product, said COL Michael, which can pose challenges. Products must go through numerous levels of decision-making that evaluate funding priorities and threats. The WRAIR does better than most vaccine developers in moving products across the so-called valley of death—that is, the gap between preclinical research and final licensing. Once a product is ready for phase-1 studies, a technology transfer agreement is created with another Army body that supports development and has input from stakeholders within and outside the military. As COL Michael put it, science dollars push the research process, while development dollars pull products across the valley of death and into clinical trials and production.

COL Michael described WRAIR's R&D capacity around the world, allowing research to take place where target diseases are prevalent. The WRAIR has a proven track record of effective vaccine development and capacity for human clinical trials, animal research, basic science, and product manufacturing. It has strong ties with other governments and militaries and collaborates with U.S. Government (USG) health and science agencies, pharmaceutical companies, foundations, and international health entities. COL Michael described several WRAIR successes in infectious disease research and promising efforts underway.

Discussion

COL Michael commented that the military R&D model is bureaucratic, highly structured, and difficult to accept at the outset, but it ensures that priorities are assessed, and processes are open and transparent. The process is designed to ensure that research efforts move forward toward development. Timothy Cooke, Ph.D., pointed out that WRAIR provides critical resources to independent biotechnology companies in the form of training personnel who then go on to work in the private sector and production facilities. COL Michael said the WRAIR just received funding to update production facilities. Such facilities are helpful to small biotechnology companies that may face bottlenecks with production at private pharmaceutical manufacturing plants. Dr. Robinson said BARDA also recognizes the difficulty of getting products through the valley of death, so it set up a network to facilitate manufacturing that benefits large and small pharmaceutical makers.

COL Michael noted that the Army and other branches budget according to 10-year R&D plans, but they also can ramp up quickly to address emerging threats, such as Ebola virus. Kimberly M. Thompson, Sc.D., asked what could be done to better anticipate such threats and mobilize resources. COL Michael said that before the Ebola outbreak, the biodefense and public health communities did not communicate well. An upcoming interagency meeting will address lessons learned from the collaboration around Ebola and how to apply them to emerging issues. The dialogue around Ebola broke down barriers, and more mechanisms are needed to support continued communication. Interoperability across agencies is very important, said COL Michael.

Drivers of Vaccine Innovation

Vaccine Market Analysis: Update from McKinsey and Company—Tara Azimi and Michael Conway, McKinsey and Company

McKinsey and Company seeks to understand how vaccine innovations are evolving to meet unmet needs and to inform dialogues across sectors, said Ms. Azimi. The market analysis will describe challenges and solutions, primarily from a U.S. perspective but with attention to global concerns and broader implications. It will address the hierarchy and nature of the unmet need, the pipeline, key drivers, and potential solutions.

McKinsey and Company is mining the evidence base and planning interviews with stakeholders. It is evaluating published research and information; Ms. Azimi said she hopes to share early findings with NVAC in June on unmet needs and the vaccine development pipeline. Some insights have already emerged. For new vaccines in development with broad target populations, the biggest challenges come from technical hurdles. For those with narrower target populations, the challenge lies in the commercial model. Enhancing existing products involves a combination of technical challenges, regulatory complexities, and potential commercial uncertainty.

The findings to date corroborate early hypotheses about the pipeline. Attrition is higher in the vaccine development field than in related science fields. Vaccine trials require much larger populations than other products, which may have implications for innovation and the success rate of products to address unmet need.

DISCUSSION

Ms. Azimi clarified that interviews will involve stakeholders from across the spectrum; including industry, large manufacturing firms and small biotech companies, policy-makers, and academics. The report should be finalized this summer and presented at the Biotechnology Innovation Organization (BIO) International Convention.

Global Impact of Antimicrobial Resistance (AMR)—William Hall, AMR Review

In 2014, the United Kingdom organized the AMR Review to look at the global impact of AMR, primarily from an economic perspective. The group primarily consists of economists and policy-makers, along with some scientists, evaluating market issues around AMR. It will evaluate market problems and make recommendations for governments in its final report in May.

To date, the AMR Review has assessed the current and projected financial and human costs of AMR. Conservatively, it is estimated that 700,000 people die annually as a result of AMR. With continued resistance and no mitigation, it is projected that by 2050, the number will increase to 10 million people per year, resulting in a total gross domestic product loss of $110 trillion. Mr. Hall explained that the figures, while incredibly large, are still conservative. The secondary effects of AMR—for example, inability to perform surgical procedures—could double the projections.

Barriers to resolving AMR include the long timeline for product development (which hinders projections about need) and the current market incentives to focus on products that can be sold in large volumes. The solutions to finding new antibiotics include funding early stage research through a global innovation fund and creating rewards for entering the market (tying the money to access and availability of the new product).

In 2015, the AMR Review concluded that diagnostics are a public good that have the wide societal benefit of identifying AMR early, but they are not appreciated at the individual level. The group recommended creating a diagnostics market that would provide incentives for innovation and encourage public health uptake of successful products. In December, the AMR Review addressed agriculture and the environment. It recommended setting a global target for reducing agricultural antibiotic use and establishing both carrots and sticks to encourage alternatives to antibiotics. The possibility of reducing antibiotic use in animals through vaccines is an important option, said Mr. Hall.

The AMR Review will next assess vaccines and alternatives, then evaluate the health infrastructure. Mr. Hall said the NVAC paper on vaccines and their role in strategies to combat antibiotic resistance reflects much of the thinking by the AMR Review. He also said the wider benefits to society of vaccination are not always taken into account in determining private costs. During the week of June 6th, members of the AMR Review will be at the BIO International Convention and later in Washington, D.C. and are willing to continue the discussions with NVAC then.

DISCUSSION

In response to Ruth Lynfield, M.D., Mr. Hall said CDC is addressing the priorities for developing vaccines to combat AMR. The AMR Review's paper on vaccines, to be published in February, discusses whether incentives are needed for human vaccine development. In response to Robert S. Daum, M.D., C.M., Mr. Hall said that while antibiotics are used to promote animal growth, they are also used prophylactically, and it is difficult to distinguish the uses. Vaccines could play a larger role in prophylaxis in animals.

Shaping the Market: Gavi's Model—Seth Berkley, M.D., Gavi, The Vaccine Alliance

Dr. Berkley explained that Gavi is an innovative public-private partnership with a very large board that represents a wide range of stakeholders. Once all the stakeholders reach consensus, Gavi can move forward quickly on initiatives, such as reducing the time to launch new vaccines in poor countries. Gavi also supports the critical health infrastructure needed to deliver vaccines. Gavi prioritizes its vaccine investment strategy every 5 years, ranking available or anticipated

vaccines according to criteria such as the potential health impact. It raises money in advance to ensure that Gavi countries have vaccines available.

Gavi raises money from donors, such as the USG, and co-financing, which requires some contribution from even the poorest countries in an effort to ensure that vaccines are included in a country's budget. Eventually, countries graduate to a self-financed model. Gavi also created a stable market for vaccines in poorer countries, so that stakeholders could calculate their return on investment (ROI). Dr. Berkley explained that the growth of supply and demand for pentavalent vaccine demonstrates that a valuable market exists in low-income countries.

Another innovative financing mechanism—advance market commitment to accelerate vaccine development and production—is not supported by the USG because it involves multiyear financing. The approach provides some money to manufacturers who keep their prices low so they can show an ROI. Another is the International Finance Facility for Immunisation, through which manufacturers make long-term commitments that allow Gavi to raise money to pay for vaccine immediately, for example. Gavi recently made an advance purchase commitment with Merck to pursue Ebola vaccine licensure by the end of 2017.

Dr. Berkley summarized some other Gavi efforts, such as investing in measles and meningitis vaccination, stockpiling vaccines for emergency response, and understanding the ability of vaccines to reduce AMR.

DISCUSSION

In response to Yvonne Maldonado, M.D., Dr. Berkley said he could not project the number of countries expected to transition away from Gavi assistance but the outlook is good. Philip Hosbach noted that while there are more vaccine suppliers today, there are also more sole-source providers. Dr. Berkley replied that Gavi seeks not just to keep products cheap but to create healthy vaccine markets so that manufacturers and suppliers will remain.

Aligning Science, Policy, and Partners to Create an Enabling Environment for Vaccine Development—Mark Feinberg, M.D., Ph.D., International AIDS Vaccine Initiative

Dr. Feinberg said the strategies that led to vaccine development in the last century are unlikely to succeed in this century. More cooperation and alignment across sectors is needed. Currently, the development of a new vaccine takes 15–20 years and $1 billion. The vaccine enterprise should take into account from the outset questions of licensing, production, markets, and target populations. Stakeholders should work to ensure smooth handoffs across the spectrum from research to dissemination.

Dr. Feinberg described the disincentives to investment in vaccine development (e.g., high-risk, uncertain ROI) and growing tensions between the ACIP's call for cost-effectiveness and others' focus on price. He said HHS could address some problems by identifying narrower target populations and specifying acceptable endpoints so that vaccine developers could focus their efforts. For example, a workshop on cytomegalovirus (CMV) vaccine development concluded that resolving uncertainties about endpoints likely to be acceptable to regulators could increase interest in creating CMV vaccines. At the same time, the ACIP could provide greater clarity on the key drivers of value that inform its decisions.

Specifically, he outlined ways HHS agencies and their partners can work together to reduce uncertainty around development, licensure, and adoption pathways including prioritization of target vaccines, advance understanding of vaccine biology and epidemiology, establish target

product profiles, clearly identify the basis for licensure, provide expectations for ACIP recommendations, create novel development partnerships and align science, policy, reimbursement and regulatory stakeholders early in the development process for prioritized vaccines, before key program decisions are made. Science alone is not enough, he concluded; we must put all the pieces together in the name of public health.

Challenges for Global Vaccines Development—Adel Mahmoud, M.D., Ph.D., Princeton University

Like Dr. Feinberg, Dr. Mahmoud said the science of the 20th century will not be sufficient to drive vaccine discovery in the 21st century. Current advances are based on old technology and approaches, and new science is needed. Echoing COL Michael, Dr. Mahmoud described the valley of death: NIH and others support discovery, and the USG supports development, but there is a gap in the middle. Ebola vaccine development exemplifies the problem. Candidates were developed over the past 15 years, but the threat before 2014 was minimal and there was no market for vaccine. Cooperation among stakeholders to produce a vaccine was terrific, said Dr. Mahmoud, but 11,000 people died before the vaccine was moved into clinical development and efficacy trials.

Dr. Mahmoud reiterated the challenges to vaccine development—many of which revolve around funding. Global health and security depend on fixing the vaccine enterprise. Therefore, he and his colleagues proposed a new fund that would provide $2 billion per year to develop vaccines; specifically, the money would be used to bridge the gap between discovery and deployment. It would cover early clinical trials (including limited production of vaccine) and production of a small stockpile that could be expanded and used for phase-3 trials in case of an outbreak.

The funds would come from public and private entities around the world. Recipients would be organizations with demonstrated capacity to develop vaccines. A rigorous scientific review process would be established. The fund would have a streamlined governance structure.

The proposed fund should be global and independent, said Dr. Mahmoud, and it should facilitate cooperation. Other global funds support other aspects of vaccine research, purchase, and delivery, but none fill the strategic financial gap for vaccine development. The proposed fund fits within the framework of the Global Health Security Agenda and other global health recommendations and priorities. Dr. Mahmoud outlined the next steps toward the proposed fund, noting that international bodies are open to discussing it. He concluded that the vaccine development fund could be linked to proposals to address AMR or, at least, the two would have a common platform for thinking about infectious diseases for the rest of the 21st century.

Discussion

Dr. Orenstein suggested McKinsey and Company take Dr. Mahmoud's global fund proposal into account in its assessment and recommendations.

Dr. Thompson asked what Gavi is doing to improve equity in health care systems and performance. Dr. Berkley described some specific initiatives and noted that Gavi's goals feed each other. Improving health systems and access for isolated communities contributes to the Global Health Security Agenda; at the same time, bringing vaccines to new populations contributes to a high-volume market, allowing manufacturers to realize a profit.

Dr. Thompson asked who might be responsible for each part of the process from discovery to development. Dr. Feinberg responded that NVAC could play a role by bringing the stakeholders together to discuss how each could contribute to the solution.

Dr. Thompson suggested development of economic models to support the argument for funding efforts to cross the valley of death. Dr. Mahmoud agreed that studies need to look at the total economic impact, not just the costs of vaccines and the benefit to public health, and some such studies are underway. Dr. Orenstein added that policy-making must go beyond economics; the Strategic Multi-Attribute Ranking Tool (SMART) for vaccines allows decision-makers to consider factors other than cost-effectiveness.

Dr. Thompson noted that more should be done to communicate the value of vaccines to the overall health system. She pointed out that not only did 11,000 Africans die before serious efforts to develop the Ebola vaccine were advanced, but U.S. health systems spent tremendous resources to prepare for a potential outbreak. Dr. Thompson said there should be attention to preventing the next crisis. Dr. Orenstein agreed that the public health system needs mechanisms to anticipate emerging crises.

Mr. Hosbach observed that part of the lack of new technology and discoveries can be linked to the lack of new researchers entering the field. He raised concerns about the pipeline of talent in basic vaccine research and translation of basic research and the availability of jobs to support new researchers.

Zika Virus and Vaccine Development

Zika Virus: The Latest Emerging Arbovirus in the Americas—Lyle Petersen, M.D., M.P.H., CDC

Dr. Petersen gave an overview of the spread of Zika virus, pointing out that two types of mosquitoes are the primary vectors: *Aedes aegypti* and *Aedes albopictus*. Both also spread dengue virus and chikungunya virus, and both exist in parts of the United States. Dr. Petersen pointed out that the only local transmission of dengue and chikungunya occurred in areas where *Aedes aegypti* is present. Zika virus is also transmitted vertically from mother to fetus, and horizontally through sexual contact, blood transfusion, and laboratory exposure.

Questions surround the connection between microcephaly in newborns and Zika virus. So far, increased rates of microcephaly have only occurred in Brazil, and they seem to follow a large Zika outbreak 6 months ago. Dr. Petersen posited that microcephaly may be linked to exposure in the first trimester, so the effects of the more recent outbreak have yet to be seen.

Based on sero-surveys conducted during the 2007 Yap Island outbreak, the infection rate was estimated to be about 73 percent of people. The symptomatic attack rate among those infected was estimated to be 18 percent. During this outbreak, Zika virus was not associated with severe disease, hospitalization, or death. The clinical symptoms of Zika disease are similar to those of dengue and chikungunya (with the exception of conjunctivitis), which complicates surveillance. Diagnostic testing is available, but it cannot clearly distinguish Zika virus when other flavivirus infections, such as dengue, are present, which is relatively common.

Dr. Petersen noted that models created to track and project the spread of dengue and chikungunya should be helpful in projecting the spread of Zika virus. He predicted that travel-associated infections will increase in the contiguous United States. The number of U.S. infections could potentially be much higher than dengue or chikungunya.

Vaccine Development for Zika Virus—Robin Robinson, Ph.D., BARDA (for Rick Bright, Ph.D.)

Dr. Robinson described several reasons for creating a Zika vaccine, particularly to protect fetuses from microcephaly and also to keep the virus out of the donated blood supply. The high attack rate described by Dr. Petersen means Zika could attack suddenly.

Vaccines for other flaviviruses, such as Japanese encephalitis and yellow fever, have been available for many decades. Work to date on dengue and chikungunya may provide a platform on which to build. Two dengue vaccines have reached advanced development; one is already licensed for use in Mexico. Zika vaccine development is in the early discovery stage. Dr. Robinson stressed that vaccine development remains an expensive, risky, and lengthy process.

Dr. Robinson said many questions about Zika vaccine must be answered, such as whether infection with Zika or another Flavivirus predisposes an individual to an adverse reaction to a vaccine, how to conduct clinical studies to determine dosage and safety, and whether animal models exist to assess the immune response. Most notably, the key target population is women who are pregnant or of reproductive age, so development must take into consideration additional precautions.

The World Health Organization (WHO) declared Zika virus a public health emergency, so the response must be quick. Vaccine development is the highest priority, followed by vector control and diagnostic testing. Dr. Robinson concluded that NIH is supporting early discovery efforts and BARDA will produce one of the vaccine candidates in its manufacturing facility. BARDA is also funding a competition to develop a vaccine platform.

Discussion

Dr. Viswanath stressed the importance of public communication during emergencies. While the WHO has declared a public emergency of "explosive" proportions, individuals have no reliable guidance on how to protect themselves, and some of the current advice is not helpful.

Saad Omer, M.B.B.S., M.P.H., Ph.D., pointed out that the Zika outbreak marks the second major infectious outbreak that poses a particular threat to pregnant women. For the sake of preparedness, more research is needed related to pregnancy, such as development of robust models to understand toxicity and better understanding of the effects of sex hormones on immune response.

Dr. Orenstein said the morning's presentations revealed a number of issues NVAC should discuss further, with particular attention to the role of the USG:

- Prioritizing emerging infectious diseases that are candidates for vaccine (including tools that better anticipate emerging targets)
- Ensuring adequate support for discovery, domestically and globally
- Evaluating available platforms and potential new technology
- Bridging the gap between discovery and development (with funding but also by leveraging existing production capacity, identifying relevant endpoints for clinical trials, and tying discovery to the end use of the product)
- Maintaining the current manufacturing capacity and enhancing it as needed for security
- Ensuring equity of access

- Compressing the timeframe for development

Dr. Orenstein suggested a future NVAC working group be formed to address vaccine development in detail.

Maternal Immunization Working Group (MIWG) Update—Richard Beigi, M.D., and Saad Omer, M.B.B.S., M.P.H., Ph.D., NVAC Members

Dr. Beigi said numerous examples from the past few years indicate pregnant women and young infants are at higher risk for certain vaccine-preventable diseases. Provider recommendations are key to increasing vaccination coverage among pregnant women, and maternal immunization may foster greater vaccine acceptance among women and their children.

The MIWG was charged with identifying barriers and opportunities for developing vaccines for pregnant women and making recommendations to overcome the barriers. Over the course of deliberations and with perspectives from numerous guest speakers on a variety of topics, the MIWG has identified five domains to address in its recommendations:

- **Ethical issues** of research in pregnant women, with the goal of developing a framework and guidelines for use by multiple stakeholders
- **Regulatory issues** that limit the inclusion of pregnant women in research and the approval of vaccines for use in pregnancy
- **Safety monitoring issues**, with the goal of aligning current systems, clarifying definitions and guidance, raising awareness, and promoting data collection on the safety of individual antigens
- **Preclinical and clinical research**, with attention to funding and structures to address barriers and support postmarketing surveillance
- **Provider education and support**, noting the need to improve awareness and knowledge about vaccine research, safety, and indications

Dr. Omer added that the MIWG is seeking ideas to move the field forward, especially in the area of preclinical vaccine development.

Discussion

Dr. Thompson suggested that educating providers about maternal immunization should be linked to education about adult immunization in general. Obstetric providers should be thinking about vaccinations for all women of reproductive age in their care.

Dr. Thompson asked how research guidelines would be developed that define minimal risk. Dr. Beigi responded that local research review bodies have little or no guidance on how to interpret current requirements. Efforts should be made to distinguish risk to the mother from risk to the fetus or newborn and to provide guidance on how to evaluate risk in this context.

Dr. Omer added that defining minimal risk for pediatric populations took a while, but the effort may be a good starting point. The MIWG recommendations are likely to highlight the need to define minimal risk and provide a road map for doing so rather than propose a particular definition. Dr. Thompson felt the pediatric guidelines should apply to newborns and the adult guidelines to the mother; she suggested offering that as a framework to identify what is missing or needed. Dr. Omer noted that the biology of pregnancy is unique, and pregnancy is a dynamic state, not a constant one, making pregnant women a more complex population.

Regarding regulatory issues, Dr. Orenstein noted that NVAC has previously discussed the importance of including vaccines licensed for use among pregnant women in the Vaccine Injury Compensation Program (VICP). Sarah Despres, J.D., suggested requesting that HHS' Office of General Counsel again clarify its interpretation of the existing regulations for VICP; it may believe that maternal vaccines are already covered.

Dr. Mouton suggested addressing vaccine confidence and hesitancy in light of fetal concerns rather than maternal issues, and Dr. Beigi agreed the MIWG should look closer at the issue from that perspective. Dr. Omer said obstetricians and other providers are influenced by research. They want information not just about the safety of vaccines but also about how products were developed. Dr. Orenstein said the MIWG's recommendations should address vaccine hesitancy in light of clinical research participation. Dr. Maldonado said the MIWG could draw arguments from the vaccine confidence report. Bruce G. Gellin, M.D., M.P.H., added that NIH's efforts to evaluate the effects of approved vaccines in vulnerable groups led to a lot of confusion among the public about why such research would take place after vaccines were approved.

Refugee Enhanced Vaccination Program—CAPT Marty Cetron, M.D., and Michelle Weinberg, M.D., CDC

CAPT Cetron provided statistics on refugee arrivals by nationality and resettlement patterns. The NVAC recommendation that HHS coordinate with other USG agencies around overseas administration and documentation of vaccinations for all U.S.-bound refugees is important because refugees are not legally required to be vaccinated. The lack of coordination presents a significant missed opportunity, said CAPT Cetron. Notably, the cost of vaccinating refugees while they are overseas is substantially lower than vaccinating them in the United States and could prevent imported disease outbreaks.

A pilot vaccination program is modeled on a successful program for treating refugees for parasites before they depart for the United States. It represents a collaboration between CDC and the Department of State and is implemented by the International Organization for Migration. Plans are underway to expand the program.

Dr. Weinberg summarized the hepatitis B prevaccination testing program initiated by CDC in 2008. Its program manual includes instructions, safety guidance, checklists for contraindications and precautions, country-specific standard operating procedures, and an adverse effects reporting tool. Training addresses cold chain management, storage and handling, emergency power supply plans, and medical procurement guidance. Administration is logged into local systems that connect with CDC's systems, and refugees receive paper copies of their vaccination records.

Dr. Weinberg described the experience of the joint CDC-State Department vaccination program in Thailand, where challenges included disease outbreaks, procurement challenges, the need for adverse event monitoring, the need for trained staff, and the lack of reliable Internet access to exchange information. Nonetheless, the program was very successful, and 98 percent of eligible refugees are covered. Dr. Weinberg noted that in the United States, clinician access to vaccine records and linkages with State registries are among several important next steps for the program as it expands overseas.

Discussion

In response to Dr. Orenstein, Dr. Weinberg explained that refugees' vaccine status is part of their overseas health assessment, and information is exchanged electronically or through State-level coordinators to the United States. In addition, refugees are supposed to keep their paper records.

CAPT Cetron noted that the USG is part of an international consortium that addresses refugee vaccinations. In refugee camps, said Dr. Weinberg, the International Organization for Migration works with local nongovernmental organizations to support immunization programs as part of basic health care. CAPT Cetron said the program is challenged by the absence of a clear funding stream, and it is difficult to coordinate all the moving parts. Long-term investment is needed to sustain programs and prevent importation challenges.

In response to Dr. Daum, CAPT Cetron provided the statutory definition of "refugees" that distinguishes them from immigrants. Dr. Gellin clarified that immigrants are required to receive at least the first dose of vaccines. Dr. Weinberg noted that cost of vaccines and access to care remain the biggest barriers to vaccinating refugees.

Progress Update: 2010 National Vaccine Plan Midcourse Review—Jennifer L. Gordon, Ph.D., NVPO

Dr. Gordon described the history of the National Vaccine Plan, noting that the 2010 version laid out a 10-year vision. The Plan included a directive for a midcourse review as an opportunity to reflect on the goals and objectives in light of new technology, new vaccines, and the changing landscape of health care. The midcourse review seeks to answer whether the Plan is meeting its goals and objectives, whether the priorities are appropriate in the current landscape and for the near future, and how progress can be measured and success defined.

The NVAC was charged with the providing recommendations on the midcourse review at the September 2014 meeting (http://www.hhs.gov/nvpo/nvac/subgroups/midcoursereview-wg.html). However the working group discontinued their deliberations to provide time for additional analyses. The working group will reconvene to discuss the analyses provided by NVPO and their final report will be completed by June 2016.

NVPO has contracted with Booz Allen Hamilton to collect and analyze included data from Federal and non-Federal stakeholders. These data revealed hundreds of relevant activities, which have been organized according to Plan goals, objectives, and strategies. A broad range of stakeholders representing every non-Federal stakeholder group responded to the request for information. In addition, the contractor has conducted interviews with non-Federal stakeholders and will do so with Federal subject matter experts from various agencies. More insights will come from small focus groups over the next few months that will address priorities for the next 5 years and metrics for success.

Once all the data are synthesized, the NVPO will work with the NVAC working group that will meet several times this spring to identify priorities, discuss indicators, and draft recommendations. The recommendations will be presented to NVAC in June and, once approved, will be part of the final analysis by the contractor and incorporated into the final report.

Discussion

Dr. Maldonado, who took part in a focus group that met on February 1, said she appreciated the efforts to gather information from a broad range of stakeholders who represent different

perspectives. She felt the Plan may need tweaks but not major changes. Nathaniel Smith, M.D., M.P.H., who took part in the same focus group, said he looked forward to input from other focus groups on priorities and key areas in need of tweaking.

Dr. Fleming proposed recasting the National Vaccine Plan as a rolling 10-year plan that goes beyond 2020. As such, it could be part of an action agenda for the next Administration. Dr. Fleming also asked whether the global goals of the Plan link to the Global Vaccine Action Plan. Dr. Maldonado said the contractor has gathered information on all the goals in the plan, and NVAC published an extensive report on global immunization. All of that information will be considered by the NVAC working group, which will take a strategic approach to determining what high-level changes are needed for the next 5 years. Dr. Gellin said the National Vaccine Plan is a rolling plan that will be updated each decade, and he appreciated the need for long-term planning.

Dr. Thompson said the midcourse review offers an opportunity to encourage more efforts in areas identified by the Global Vaccine Action Plan. It should also address the need for ongoing commitments to vaccine programs to sustain the benefits. Dr. Gellin pointed out the need to engage with the U.S. Agency for International Development, which was a key contributor to the global vaccination goal.

Mitchel C. Rothholz, R.Ph., M.B.A., said he also attended the focus group meeting, where participants acknowledged some progress over the past 5 years. However, challenges remain around infrastructure, vaccine development, and limited resources. He supported the concept of presenting the Plan as a framework for the next Administration.

NVAC Liaison and Ex Officio Updates

FDA—Marion Gruber, Ph.D.

In November 2015, FDA approved Fluad, the first seasonal influenza vaccine containing an adjuvant. It is a trivalent vaccine produced from three influenza strains (two subtype A and one type B) and is approved for individuals 65 years and older. In September 2015, FDA approved a supplement to the existing hepatitis B vaccine Engerix B. The package insert now includes safety and immunogenicity data for adults with type 2 diabetes. In November 2015, FDA approved the first vaccine under the Animal Rule by approving a supplement to the anthrax vaccine adsorbed (BioThrax) to include post-exposure prophylaxis of disease from suspected exposure, when combined with antimicrobial therapy. FDA also approved a supplement to Gardasil 9, the 9-valent human papillomavirus (HPV) vaccine to include indications for boys and young men ages 9–36 years. Recently, FDA approved a supplement for the *Haemophilus influenzae* type b conjugate vaccine Hiberix to include safety and effectiveness data on its use to prevent invasive disease caused by *Haemophilus influenzae* type b in children 6 weeks to 14 months of age for the primary series. Hiberix was previously licensed for use as a booster dose.

ACCV—Charlene Douglas, Ph.D., M.P.H., R.N.

Dr. Douglas said ACCV met in December 2015 and received a briefing on VICP claims. Claims have increased significantly since 2005, which increased the workload of the program. To accommodate the increase, HRSA can provide staff with credit or compensation for additional hours worked, use technology to improve efficiency of processing and payment, and hire more medical officers to review claims. The ACCV reviewed a petition to add food allergies to the Vaccine Injury Table. However, none of the literature reviewed discussed food allergies as a result of vaccination, and the petition was not approved.

The ACCV's Adult Immunization Workgroup was formed to explore whether vaccines recommended for routine administration to adults only should be covered by the VICP. The Workgroup decided not to recommend coverage because of data limitations, claims limits, and the potential unintended consequences of allowing amendments to the National Childhood Vaccine Injury Act. However, the Workgroup recommended that the ACCV consider revisiting the issue of adding new vaccines, especially vaccines routinely recommended for pregnant women solely for the benefit of a live-born child.

As part of its mandate, the ACCV reviewed revisions to CDC's vaccine information statements (VIS) for hepatitis A and B. It also heard updates from the NIH's National Institute of Allergy and Infectious Diseases (NIAID); the FDA's Center for Biologics Evaluation and Research; and NVPO.

ACIP—Nancy M. Bennett, M.D., M.S.

At its October 2015 meeting, the ACIP approved 2016 child, adolescent, and adult immunization schedules. Changes to the child and adolescent schedule included adding a line for meningococcal B vaccine with a note that beginning at age 16 years, non-high-risk groups may receive the meningococcal vaccine, subject to individual clinical decision-making, an unusual approach for the ACIP, said Dr. Bennett. The adult schedule reflects minor tweaks in the recommendations to the intervals between pneumococcal vaccines and the inclusion of a meningococcal B vaccine recommendation for young adults in a footnote.

Dr. Bennett said HPV vaccine coverage data from the 2014 National Immunization Survey indicate some progress, although slow. The ACIP considered two off-label recommendations for Japanese encephalitis vaccine but decided against proposing them for FDA approval. The pediatric hexavalent vaccine is under FDA review. Once it is licensed, it will not require ACIP recommendations, but the Vaccines for Children (VFC) program must vote on whether to include it in the program. The ACIP next meets on February 24. It will vote on the annual seasonal influenza vaccine recommendations for 2016–2017.

AHIP—Scott Breidbart, M.D., M.B.A.

Since the September 2015 NVAC meeting, the AHIP solicited feedback from members for the National Vaccine Plan midcourse review and provided comments to NVPO in December. The AHIP continues to serve as a resource on CDC and HHS immunization priorities as requested and disseminates vaccine updates to its committees, directors, and contacts.

AIM—Kristen Ehresmann, R.N., M.P.H.

Ms. Ehresmann said AIM worked with the American Academy of Pediatrics (AAP) on recommendations to encourage immunization programs to distribute VFC vaccines to providers as soon as possible, in response to perceptions that VFC providers received seasonal influenza vaccine later than private stock influenza vaccine. The recommendations focus on improving communication between immunization programs and VFC providers and other factors over which programs have control.

In September, AIM hosted an Immunization Information Systems (IIS) Programmatic Activity Meeting to discuss challenges program managers face around IIS and potential solutions. Also, AIM partnered with CDC to provide new program manager orientation. AIM will hold its first annual leadership conference in February. It is also hosting several webinars and online educational opportunities for managers.

AIRA—Rebecca Coyle, M.S.Ed.

Registration is now open for AIRA's national meeting, which will focus on the programmatic and technical aspects of IIS and registries. It recently updated its guidelines for AFIX quality improvement programs as part of a push to increase adoption of IIS. AIRA convened a group of subject matter experts to develop a road map for formally assessing IIS conformity with best practice guidance. It is hoped that the road map will be the first step toward a voluntary approach that could result in certification of aspects of IIS. AIRA is developing best practice documents, including one on how to assess IIS. It's Joint Development and Implementation Workgroup is developing governance for IIS joint development of products with an eye toward improving the consistency, quality, and cost-effectiveness of IIS implementation projects.

ASTHO—James S. Blumenstock

Since 2012, ASTHO and CDC have been assessing best practices for coordinating public health preparedness activities between public health programs and pharmacies. Some successful strategies have been identified and incorporated into a template memorandum of understanding (MOU) to formalize responsibilities between State programs and pharmacies. A couple of States have agreed to test the MOU and offer suggestions for revision.

ASTHO is working to identify best practices in adult immunization programs that serve uninsured adults. The project will describe how States identify uninsured adults and the providers that serve them. Results will be disseminated to State health agencies. Mr. Blumenstock said the effort offers great opportunity for cooperation with NVAC's adult immunization initiatives.

The AAP approached ASTHO and AIM about the pervasive, perennial issue of vaccine maldistribution between VFC and private purchasers. ASTHO and AIM are evaluating issues around distribution, quantity, and timing. Suggestions and feedback are welcome, said Mr. Blumenstock.

NACCHO—Tiffany Tate, M.S.H.

Ms. Tate said CDC funded NACCHO efforts to increase the capacity of local health departments around HPV vaccination. In the first phase of the project, which ended in June 2015, NACHHO helped local departments develop action plans for working with local health care providers and prepare to implement their plans. Implementation began in November 2015. Recently, NACCHO received additional funding to add 10 more local health departments to the project. The NACCHO website features resources from the local departments.

NACCHO's General Immunization Workgroup includes local health officials and staff and other immunization coalition members; it will meet in person in June in Washington, DC, so some of the Workgroup members will attend the NVAC meeting. NACCHO combined five policy statements into one entitled "Comprehensive Immunization Programs." It is updating its policy statements on third-party billing and school vaccine requirements and exemptions. Finally, NACCHO collaborated with CDC to survey health departments about their programmatic and clinical use of IIS in October 2015; the data are being analyzed.

PHAC—Rhonda Kropp

Ms. Kropp reported that PHAC just approved an Action Plan on human and animal vaccines jointly written by 13 government departments. It is an effort to lay the foundation for interoperability across departments and to use resources collectively to move products across the valley of death. The Action Plan was approved by all 13 assistant deputy ministers and will

now go to the deputy ministers for review. Once published, an accompanying implementation plan will be developed for vaccines and medical countermeasures. While the Action Plan focuses on vaccines, there were so many common issues with medical countermeasures that the mandate was expanded to include them.

Ms. Kropp explained that a group of experts was convened to review vaccine acceptance and uptake. It reviewed current studies and gave concrete recommendations on how to improve acceptance and uptake. Ms. Kropp said the resulting document is large and very academic; PHAC will create an action plan to disseminate the findings.

PAHO—Hannah Kurtis

At the recent PAHO Directing Council meeting, countries approved the Regional Immunization Action Plan as the guiding policy document for 2016–2020, said Ms. Kurtis. It provides member states with the rationale, guiding principles, objectives, and indicators to align the region with the Global Vaccine Action Plan. It is available online.

PAHO's Immunization and Neglected Diseases Units have together developed a toolkit for monitoring coverage of integrated public health interventions. Over 2015, PAHO held four training workshops on the toolkit at national and regional levels. In November 2015, the annual meeting of managers of the Caribbean Expanded Programme on Immunization took place in Guyana. In December 2015, the International Expert Committee accepted evidence that the measles and rubella outbreak had been interrupted. The Committee expects to declare the elimination of endemic measles in the entire Region of the Americas in 2016.

In keeping with the Polio Eradication and Endgame Strategic Plan, 2013–2018, countries using the oral poliovirus (OPV) will switch from bivalent to trivalent preparations at the end of April 2016. The 14th annual Vaccination Week in the Americas will take place April 23–30. The regional slogan, "Go for the gold! Get vaccinated!" capitalizes on momentum leading up to the summer Olympic games in Brazil.

VRBPAC—Robert S. Daum, M.D.

Dr. Daum said VRBPAC met twice since the last NVAC meeting. In September, the group reviewed the Fluad vaccine application. A strong majority of VRBPAC members concluded that the data were adequate for licensure and safety. As a result of FDA approval, MF-59 is now a licensed component of an American vaccine for the first time.

In November, VRBPAC noted that each maternal immunization program has a different purpose, whether it is protecting the fetus or the mother against disease. When vaccine is used to benefit the infant, it was not clear what serologic endpoints should be used, what the duration of follow-up should be, or what developmental outcomes should be evaluated. Also, there are serious liability issues around maternal immunization programs. Dr. Daum said such issues were barely discussed by FDA, and there are few data to support current or planned programs. Dr. Daum said the ACIP has recommended several immunizations in pregnancy, usually without data. VRBPAC discussed how to measure the effectiveness in pregnant women and their infants but, again, there are no data to support strong conclusions. Members did note that mothers and infants are seen by different providers, which complicates the situation. Furthermore, products intended to prevent influenza and other diseases may be given to pregnant women and influence the immune responses of the mother to the disease and also the infant's response to subsequent vaccine antigens. VRBPAC concluded that there are many

components to maternal immunization, almost none have been studied, and liability remains the biggest roadblock to getting more data.

AHRQ—Iris Mabry-Hernandez, M.D., M.P.H.

Dr. Mabry-Hernandez said AHRQ has no new initiatives to report since the last NVAC meeting. AHRQ provides knowledge about vaccine- and immunization-related topics for stakeholders by producing technical reports, such as reports on vaccine safety; by funding investigator-initiated research grants and conferences on topics such as improving immunization rates in young children; and by reporting on immunization-related measures in the National Healthcare Quality and Disparities Report.

BARDA—Robin Robinson, Ph.D.

BARDA filed an investigational new drug application with the FDA in November 2015 for clinical trials to compare the potency of stockpiled vaccines that were made 8–9 years ago with new vaccines. That study will start in March.

The H5N1 vaccine stockpiles were checked to see if they would provide protection against avian influenza in poultry. Serum from individuals who had been vaccinated with H5N1 vaccine without adjuvant did not provide any cross-reactivity. Individuals who received vaccine with adjuvant through a heterologous prime boost approach showed some cross-reactivity. A third study is looking at the relationship between the stockpiled vaccine and the current virus.

BARDA supported Fluad, which was licensed last November. Along with CDC, FDA, NIH, NVPO, and others, BARDA has been leading an effort to look at seasonal influenza vaccine mismatch and antigen drift. An exercise with stakeholders posed the question “What would we do if we had a vaccine mismatch for seasonal influenza, and how quickly would we be able to adapt to that?” The partners came up with numerous action items for the HHS Secretary and have moved forward to put them into an action plan that covers everything from surveillance to vaccine design and manufacturing to distribution.

The Assistant Secretary for Preparedness and Response has been leading an effort for a new HHS pandemic influenza plan. A workshop with CDC was held last December to discuss action items and provide guidance. A milestone was reached with the WHO program on providing vaccine manufacturing infrastructure in developing countries for pandemic influenza. As of 2015, four countries had licensed influenza vaccines that had none before. At the outset of the program in 2006, there was zero capacity, and now there is manufacturing capacity to produce 500 million doses throughout many countries around the world.

BARDA supported the development of the BioThrax vaccine for anthrax prophylaxis, which was licensed following an 8-year effort. BARDA is moving forward with acquisition of a smallpox vaccine for immunocompromised individuals that may be formulated as a longer-life lyophilized product. With CDC, BARDA is conducting studies on Ebola vaccines. BARDA has supported four vaccine candidates within manufacturing clinical lots. It is hoped that studies on the vaccine candidates in West Africa will continue this year.

For MERS-CoV, BARDA is finalizing an MOU with Saudi Arabia to create a clinical infrastructure there to study vaccines and therapeutic candidates. Lastly, with NIH as a lead, BARDA will support development and discovery of new Zika vaccine candidates and development of vaccine platform technologies that could be used not only for Zika but also for

other emerging infectious diseases. As part of that process, a killed vaccine will be made by BARDA.

CDC—Rima Khabbaz, M.D.

The ACIP 2016 immunization schedules were approved and released. Dr. Khabbaz said the 2015 National Influenza Vaccination Week was a success, as there were a lot of activities to encourage vaccination and a lot of social media activity by partners. The influenza season has been slow, with little activity until recently. In the second week of January, CDC began seeing a slight increase. The predominant types seen so far are those associated with severe disease in younger people, so CDC has been encouraging antiviral use for influenza.

With support from BARDA and partners in Sierra Leone, CDC is conducting the STRIVE Ebola vaccine study. It has enrolled over 8,000 health care and frontline workers, all immunized—some earlier and some later. An immunogenicity and safety monitoring study is following a subset of participants at 6 months and 12 months.

Dr. Khabbaz said CDC is seeking nominations for its Childhood Immunization Champion Award. It is given jointly by the CDC foundation and CDC to individuals who contribute to improving public health through their work in childhood immunization, with up to one childhood champion per State and U.S. Territory. Finally, planning is underway for the National Immunization Conference on September 14, 2016, in Atlanta.

DoD—Margaret Yacovone, M.D., M.S.P.H.

Dr. Yacovone said seasonal influenza vaccination is mandatory for uniformed personnel, and DoD achieved its 90 percent vaccination compliance goal by December 15. Vaccination is also mandatory for health care personnel who provide direct care in military facilities and recommended for all other health care personnel. As of January 15, 2016, the vaccination rate was 93 percent.

All DoD military and civilian health care providers are required to complete influenza training before administering the vaccine. An online educational training program was developed that consists of five modules and a quiz. An online influenza cold-chain management was developed for medical logistic and pharmacy personnel. As of January 25, more than 23,000 health care providers had taken the influenza training and more than 6,000 medical logistic and pharmacy personnel had completed the cold chain management training.

In 2013, DoD released a standardized process for reporting compromises of temperature-sensitive products, including vaccines. The reporting requirements were consolidated into an extensive worksheet. The ongoing data collection allows DoD to target areas of high risk and mitigate vaccine loss due to improper storage and handling.

The Vaccine Hesitancy Subcommittee Working Group has developed a 4- to 6-hour curriculum on the immune system and benefits of immunization that will be piloted in DoD schools at the Fort Bragg, NC, Army base. The regional office has also worked with Army Community Services at Fort Bragg to establish a referral system for vaccine-hesitant parents to receive counseling on immunizations. The office is also providing briefings and answering questions about childhood vaccinations at the new Army Community Services parenting classes.

HRSA BPHC—Justin Mills, M.D., M.P.H.

Dr. Mills said HRSA recently announced $63 million in Affordable Care Act (ACA) funding to 1,100 health centers in all 50 States, the District of Columbia, and seven U.S. Territories to recognize health center achievements in providing high-quality comprehensive care. Health centers will use the
funds to expand current quality improvement systems and infrastructure and improve primary care service delivery in the communities they serve.

Awards were given in three categories. In the first group, 243 health centers were deemed Clinical Quality Improvers for improvement in clinical quality measures from 2013 to 2014 on childhood immunization rates. Another 310 health centers received Health Center Quality Leader awards for improvement in childhood immunization rates. Finally, 61 health centers were named National Quality Leaders for meeting or exceeding national benchmarks for chronic diseases management, preventative care (including immunization rates), and perinatal and prenatal care. These health centers are using the funds to develop and improve quality systems in infrastructure and care delivery systems.

Dr. Mills said BPHC is proposing to revise the clinical quality measures (CQMs) in HRSA's Uniform Data System (UDS), including the childhood immunization measure, to align with CMS' electronic specifications. Changes to the current measures include expanding the age range from 2 years to 3 years and adding hepatitis A, rotavirus, and seasonal influenza vaccines. The rationale for revising the CQMs is that 98 percent of community health centers used electronic medical record (EMR) systems, but only half use them to collect CQM data reported through UDS. The change should reduce the reporting burden, making it easier for health centers to extract data from their EMRs. Also, HRSA hopes the changes will improve the data integrity. To limit errors caused by transcribing information across systems, HRSA is phasing out chart samplings. Health centers will be strongly encouraged to report using the entire universe of claims from their EMR systems. To ease that transition, HRSA is working with an outside vendor to develop a UDS ePortal to facilitate data transmission to UDS.

VICP and the Countermeasures Injury Compensation Program (CICP)—Narayan Nair, M.D.

As of January, over 375 VICP claims had been filed for fiscal year (FY) 2016, said Dr. Nair. So far, 127 were adjudicated, of which 125 were compensable and two were dismissed. In FY 2016, the program has paid approximately $75.5 million to petitioners and $6.2 million to attorneys. The program is currently accepting public comments through July on proposed regulations to change the Vaccine Injury Table. The Countermeasures Injury Compensation Program (CICP) is a program specific for the compensation for serious adverse events caused by the administration or use of pandemic, epidemic, or security countermeasures identified in declarations issued by the Secretary. In FY 2016, the CICP has compensated two claims totaling just over $125,000. Outreach efforts for the VICP continue to focus on making providers and the public aware of this safety net program.

IHS—Michael Bartholomew, M.D.

Dr. Bartholomew said IHS-funded facilities have administered over 308,000 doses of seasonal influenza vaccine. Coverage for active IHS patients in the 2015-2016 influenza season is estimated at about 31 percent; for the 2014–2015 season, it was about 37 percent. IHS successfully implemented a mandatory influenza vaccination policy for all non-union health care employees and is negotiating with employee unions on the matter. Last year, approximately 71 percent of health care personnel were vaccinated; data are not yet available for this influenza season.

IHS partnered with HHS Region 7 and the Great Plains Tribal Epidemiology Center to develop influenza-related materials and a public service announcement distributed to GoodHealthTV, a subscription health education channel that targets American Indians and Alaska Natives and that is broadcast through many IHS and Tribal health care facility settings.

IHS performance measures for influenza vaccine coverage now incorporate all age groups, not just those over 65, and it is collecting baseline data this year. For adult and maternal immunizations, IHS is engaging in a project funded by the NVPO to assess the utility of a composite immunization measure looking at age-appropriate routine vaccine coverage for adults 19 years and older, in lieu of separate measures for individual vaccines. Other performance measure changes are allowing IHS to collect baseline data on influenza and Tdap vaccine coverage among pregnant women.

NIH—Barbara Mulach, Ph.D.

Dr. Mulach said NIAID has initiated work on several fronts to address Zika virus, including development of animal models, in vitro assays, and improved diagnostics. Several NIAID-supported Zika vaccine development efforts are underway, and the platform strategy is being used to accelerate progress. NIAID recently put out a guide notice encouraging grant applications on Zika virus and it hopes the community will rally around the cause, bringing together Flavivirus and vector biology experts.

In January, the journal *Pediatrics* published online a paper on the safety and immunogenicity of sequential rotavirus vaccine schedules. It concluded that it is safe to "mix and match" rotavirus vaccines from different companies. Dr. Mulach commended the Vaccine Treatment Evaluation Units for their contributions to this study.

NIAID is beginning a phase-3 trial in Brazil of an investigational dengue vaccine and a phase-2 trial in various Caribbean countries of a chikungunya vaccine. Dr. Mulach reminded the participants that the Global Vaccination and Immunization Research Forum will take place in March in South Africa as part of the 10-year Global Vaccine Action Plan.

USDA—Donna Malloy, D.V.M., M.P.H.

Dr. Malloy said that in January, the USDA's Animal and Plant Health Inspection Service (APHIS) confirmed an outbreak in Indiana of highly pathogenic avian influenza (HPAI) H7N8, which is different from the strain that caused the 2015 outbreak. She noted that there are no known cases of new H7N8 infections in humans. The samples came from a turkey flock that was experiencing increased mortality rates. APHIS is working with the Indiana State Board of Animal Health on a joint response. State officials quarantined and depopulated the affected flocks to avoid disease spread, and none of the affected animals entered the food system. As part of an existing avian influenza response plan, Federal and State partners are working jointly on additional surveillance and testing in nearby areas. Since the previous detections in 2015, APHIS and State and industry partners have learned many valuable lessons that will strengthen preparedness and response. They are captured in an HPAI preparedness and response plan that is available online.

No representatives from CMS or the Department of Veterans Affairs were available to provide updates.

Public Comment

Theresa Wrangham, executive director for the National Vaccine Information Center (NVIC), said vaccines, like all pharmaceutical products, carry the risk for injury and death. She appreciated the acknowledgement of the vaccine safety research highlighted by the Institute of Medicine (IOM) report. During today's presentations on vaccine innovation, said Ms. Wrangham, there was no discussion about research on injuries and deaths resulting from the introduction of new vaccines or the urgent need for research to ensure that vaccine safety research gaps do not continue to grow. This issue is particularly important, because vaccine safety research deficits already highlighted by the IOM continue to be a concern.

Also absent from the presentations today was information on how informed consent is obtained, especially in poor countries, and how vaccine injuries and deaths are tracked and compensated for in these countries. Future presentations would benefit from a more balanced approach in providing not only information on vaccine coverage progress, but additional information on what resources are available to care for poor families in these countries for whom vaccinations have negative outcomes, what research is being done to prevent those outcomes, and what policies and laws are being put into place to protect informed consent.

The NVIC appreciates efforts being made with refugee programs and encourages the use of existing vaccine manufacture product inserts in that process due to the limited information available in the VIS. During the Zika presentations there was no mention of other hypotheses being put forward to explain the occurrence of microcephaly. The NIH notes that babies may be born with microcephaly if during pregnancy their mother abused drugs or alcohol, were exposed to certain toxic chemicals, or had untreated phenylketonuria. Given that the vaccine development has been characterized today as risky and expensive, it is worth noting that an investigative report by Rutgers in 2015 noted that Brazil was the leading country in its use of pesticides. There is also research suggesting that pesticides may have a role in the development of microcephaly. It is hoped that these and other environmental toxins and their possible role in the development of microcephaly are also under investigation, given that the WHO has noted that the link between Zika and microcephaly has not been scientifically proven.

Relating to vaccine safety needs, the IOM has stated consistently for over 20 years that it has been prevented from making vaccine safety statements due to an absence or lack of quality science. As demonstrated by IOM reports, vaccine development, licensure, and usage outpaces what we know about which vaccines cause what injuries and who is at risk for vaccine injury and death. Yet, the ability of professionals and parents and individuals to exercise their human and informed consent rights to voluntarily accept, delay, or decline vaccination without sanction is eroding.

As NVAC undertakes the midcourse review of the National Vaccine Plan, there is an urgent need to address the existing vaccine safety research deficits highlighted by the IOM reports as well as place the same priority for this data for vaccines under development as part of the Federal mandate for ongoing vaccine safety research. There is also an equal and urgent need for NVAC to support the applicable human and informed consent rights of the individual as they relate to vaccination. The IOM has acknowledged that not all individuals respond the same way to vaccines and that there are individuals who are at increased risk for vaccine injury. Because there is risk there must be choice, and those at risk should not be treated as acceptable collateral damage in the discharge of public health policies and laws relating to vaccination. Ms. Wrangham concluded.

Conclusion

Dr. Orenstein gave a preview of the agenda for the next day and adjourned the meeting for the day at 5:17 p.m.

Day 2—February 3, 2016

Welcome—Walter A. Orenstein, M.D.

Dr. Orenstein called the meeting to order at 9 a.m. He said most of the day would be devoted to adult immunization.

Dr. Gellin said that in response to NVAC recommendations on vaccine confidence, NVPO announced a competitive cooperative agreement, Understanding and Addressing Vaccine Confidence and Hesitancy to Inform Vaccine Decision Making. It will provide up to $250,000 for research related to fostering informed vaccine decision-making by assessing or addressing vaccine confidence or hesitancy, particularly via vaccine education and communication. The closing date for proposals is March 1, 2016.

Adult Immunization

Introduction to the NAIP and Implementation Plan—CAPT Angela Shen, Sc.D., M.P.H., NVPO

CAPT Shen summarized the creation of the NAIP as a mechanism for promoting public health by vaccinating all adults. It is national in scope, not just Federal, and addresses the NVAC 2012 recommendations on adult immunization. It was developed following a review of the literature of the past 10 years and several stakeholder engagement efforts. The NAIP describes four goals:

- Strengthen the adult immunization infrastructure.
- Improve access to adult vaccines.
- Increase community demand for adult immunizations.
- Foster innovation in adult vaccine development and vaccination-related technologies.

The goals encompass 16 objectives and numerous strategies to promote action through 2020. CAPT Shen presented the objectives for each goal. She also summarized some of the target indicators for select adult vaccinations. The NAIP will roll out this week, and an accompanying implementation plan is in development.

DISCUSSION

Dr. Orenstein said that for measles, CDC defined cases as either preventable or nonpreventable. Preventable cases were those in which the individual should have been vaccinated but was not, as opposed to cases in which the vaccine failed. The distinction is useful in determining whether the failure to prevent disease stems from failure of implementation of the vaccination strategy or the vaccination strategy itself, he said. Carolyn Bridges, M.D., FACP, of CDC, said there are few data on adults at present, although more national quality measures on vaccination may be implemented. She pointed out that the seasonal influenza vaccine, for example, is not as effective as the measles-mumps-rubella vaccine, which complicates the assessment.

In response to Dr. Viswanath, CAPT Shen said most of the targets are aligned with Healthy People 2020. Others are characterized as “developmental,” and were crafted on the basis of survey data and input from partners. CAPT Shen agreed with Dr. Viswanath that it will be

helpful to drill down into the data on unvaccinated adults for each target to better understand the populations affected and their characteristics.

Selecting Implementation Priorities for the NAIP: Stakeholder Survey Results—Lori Uscher-Pines, RAND Corporation

Ms. Uscher-Pines acknowledged that progress takes time and resources are limited, so the implementation plan aims to help stakeholders determine priorities and how to pursue them. A stakeholder survey identified preliminary priorities; those findings will be vetted by focus groups. Among the criteria suggested for setting priorities were urgency, ease of implementing a solution, availability of a window of opportunity, and foundational need (i.e., a step needed before other steps can be taken). RAND will conduct an inventory of current activities around each priority and share them with stakeholders and focus groups, who will be asked to point out critical gaps and propose next steps.

The survey revealed 19 priorities, which will be further winnowed to a manageable set of about 10–15. Many of the priorities relate to research and evaluation, for example, the call to build the evidence base to make the case for intervention or policy changes. The priorities so far vary in scope and specificity: some are lofty, others are prescriptive and translate easily to action.

Once the priorities are finalized, RAND will identify actions. The levers for action include guidance, incentives, services, and capacity building. All activities should be specific, measurable, assignable, realistic, and time-related, following the example of the National Vaccine Plan Implementation Plan. Ms. Uscher-Pines said RAND hopes to finalize the implementation plan by summer 2016.

DISCUSSION

Dr. Fleming said that projecting the impact of achieving certain goals would likely affect the prioritization. CAPT Shen agreed that approach is worth considering. Ms. Uscher-Pines said that, ideally, the implementation plan will capitalize on what is happening now and push the field forward with some aspirational goals. CAPT Shen said she and her colleagues are evaluating whether it would be better to focus on the low-hanging fruit or higher-value outcomes.

Dr. Mouton suggested that stakeholder engagement include not only vaccine advocacy groups but other community-based organizations in underserved areas that may not deliver vaccines but understand local barriers to vaccination. Dr. Thompson cautioned that stakeholders tend to focus on issues from their own perspectives and values, not necessarily the big picture. She recommended evaluating the implementation plan to ensure that the steps suggested all move toward achieving the overall goals and objectives.

Communicating the NAIP and Implementation Plan With National Stakeholders—Ann Aikin, NVPO

Ms. Aikin described the planned rollout of the NAIP. It includes a stakeholder-driven communication strategy. NVPO will provide messages and content that can be incorporated into social media, presentations, and talking points. Ms. Aikin said she and her colleagues tried to make it easy for people to find and download the NAIP. She called on NVAC members to promote the NAIP by using the NVPO materials in their own communication, outreach efforts, and presentations. Ms. Aikin hoped NVAC members and other partners would let NVPO know what they are doing to support and promote the NAIP.

DISCUSSION

Dr. Orenstein expressed concern about how the progress of immunization coverage is measured. He again encouraged data collection that allows users to identify system failures in vaccination. Dr. Khabbaz agreed in principle with the approach but noted that the effectiveness of different vaccines varies. Dr. Thompson agreed that there is significant need for surveillance to understand missed opportunities for vaccination, which could fuel engagement.

Dr. Viswanath encouraged NVPO to think about ways to reach underserved communities by relying more on horizontal than vertical communication platforms and not thinking about vaccination as an issue separate from other concerns of the underserved. Groups that address topics such as immigration status and education, for example, may be well positioned to help communicate through horizontal platforms. Dr. Viswanath applauded the inclusion of the goal of increasing community demand, but he said a completely different approach to community mobilization may be needed to address vaccination from the consumer's side. He said community leaders can provide a road map to tackle such topics. CAPT Shen said she appreciated the comments and hoped more suggestions would be forthcoming, because it is harder to reach adult populations than pediatric populations. Dr. Mouton pointed to breast cancer screening as an example of how building patient demand has helped address disparities in health care screening.

Dr. Lynfield highlighted the importance of overcoming barriers to increased use of EHRs and IIS to assess and target populations in need and evaluate outbreaks if necessary. CAPT Shen said questions about IIS and registries come up in many contexts with many partners, and NVPO is gathering information about gaps and inputs. Dr. Khabbaz later added that improving the capabilities and functionalities of IIS will improve standardization, which will decrease variability across providers and empower consumers to understand what vaccines they need.

Dr. Omer stressed that the implementation plan should pay attention to the need to communicate with providers about the benefits of vaccination. Adult immunization is a prime target for the White House Executive Order that requires policies to incorporate insights from behavioral science, he noted. He recommended going beyond large professional medical societies to reach providers by seeking other channels of communication.

In response to Mr. Rothholz, CAPT Shen said she believes the National Adult Immunization and Influenza Summit (NAIIS) Standards for Adult Vaccination Practice are the backbone of the NAIP. Mr. Rothholz suggested that communication with providers about the NAIP mention the Standards so it is clear that the two are not separate and support each other.

Dr. Bennett said the NAIP can make an impact by encouraging providers to have structures in place for vaccine administration and quality improvement initiatives to foster good practices. The pediatric vaccination system works because offices are set up for it. Dr. Bennett noted that health care disparities are the primary issue, not a secondary one, and addressing disparities in adult immunization can provide rapid benefits.

Mr. Hosbach suggested more outreach about adult immunizations around seasonal influenza vaccinations. Dr. Gellin said the current NAIP is a distillation of all the issues discussed, and the indicators look at a subset of the goals and are necessarily imperfect. He added that disparities are not seen as a secondary or separate concern but rather are interwoven into every issue around adult immunization.

Adult Immunization Coverage—Carolyn Bridges, M.D., FACP, and Walter W. Williams, M.D., M.P.H., CDC

Dr. Bridges presented results about adult vaccination coverage from the 2014 National Health Interview Survey (NHIS) of the general population and health care personnel. For influenza vaccination, the NHIS found no significant differences from the previous influenza season, and vaccination rates remain well below Healthy People 2020 goals. No significant increases were seen for most other common vaccines, except HPV vaccine. Since 2011, however, there has been a steady increase in adults receiving herpes zoster, HPV, and Tdap vaccines.

Compared with 2013, racial and ethnic differences in vaccination persisted for most vaccines and widened for Tdap and herpes zoster. Non-Hispanic Black health care personnel had lower coverage than White health care personnel for several diseases, including influenza. Hispanic health care personnel had lower coverage than White health care personnel for Tdap and hepatitis B. Most of the survey respondents had health insurance, and having health insurance and a usual place of care were both associated with higher immunization rates. Depending on the vaccine, missed opportunities for vaccination occurred among 24–89 percent of respondents.

An Internet panel survey found that influenza vaccination among pregnant women has been stagnant for the past 4 years, although Tdap vaccination during pregnancy has increased substantially. Dr. Bridges concluded that much remains to be done to increase vaccine rates in adults and to eliminate disparities.

Evaluation of Adult Composite Immunization Measures, IHS, 2015–2016—CAPT Thomas Weiser, M.D., M.P.H., IHS

CAPT Weiser explained that from the perspective of planning and coordinating immunization, composite measures are more useful than measures on individual vaccines. He described the results so far of a phase-2 study to evaluate the feasibility and utility of a composite performance measure for routine adult immunizations. The phase-1 study demonstrated that 1) coverage rates were higher among patients in primary care settings as compared with all other patients and 2) coverage decreased as the number of recommended routine vaccinations increased.

The phase-2 study showed little increase in vaccination rates, with the exception of small rises in herpes zoster vaccine among those age 60 years and older. The composite measure identified the settings where changes were occurring, allowing researchers to drill down. All of the sites in the study reported that taking part in the study and monitoring vaccination rates led to systematic improvement. The sites did some work in advance of the study, such as configuring EHRs to gather data for the measure and activating vaccination reminder messages. Personnel at the sites worked as a team: nurses and assistants were responsible for reviewing reminders, initiating discussions, and administering vaccines while providers acted as a backup by counseling hesitant patients, educating the staff, and ensuring that nurses could work with autonomy.

CAPT Weiser described some of the data collection challenges. Once the analysis of data and site-specific reports is complete, CAPT Weiser and his colleagues will determine whether to recommend to IHS to replace an existing measure with the new, composite vaccination measure and discuss how to advocate for additional financial support for herpes zoster vaccine.

DISCUSSION

Dr. Viswanath suggested that the NHIS data could be mined to identify intersections that could contribute to strategic outreach, and Dr. Bridges agreed. Wayne Rawlins, M.D., M.B.A.,

cautioned against jumping to conclusions about the causes behind, for example, low influenza vaccination rates among Black health care personnel, without considering multifaceted etiologies.

Regarding the composite measure, Dr. Thompson posited that data could be collected by decade of life to determine which patients are receiving which vaccinations. The variations in vaccine schedules contribute to the difficulty of a composite measure, she said. CAPT Weiser responded that there was a lot of debate about which measures would be meaningful to the field, but a major goal was to keep the composite measure simple.

Dr. Bennett asked how quickly States are moving to include adults in their IIS. Dr. Bridges said CDC sees bolstering IIS as a preparedness issue; they could provide valuable, verified information in the face of an unexpected disease outbreak. CDC has invested in IIS in six sites, and various national associations are working with providers, coaching them on implementing new standards.

Vaccine Financing for Adult Immunizations—CAPT Angela Shen, Sc.D., M.P.H., NVPO

The NAIP calls for studies to fill in data gaps around financing. The NAIIS Provider Working Group frequently discusses vaccine financing. NVPO is convening a meeting in the spring with partners to explore the business case for adult immunization. NVAC has addressed financing in various contexts over the past several years. Patients, providers, and payers have different perspectives about the key financing barriers to address.

CAPT Shen listed a number of studies underway to identify the costs of vaccination and the utility of decision-making tools. She presented embargoed results (with permission) from a study of physicians and office practice billing experts that demonstrated that the barriers differed depending on the respondent. For example, physicians' perceptions about payment for adult vaccines did not always correlate with actual coverage or reimbursement. Billing experts reported denials and insufficient reimbursement that reflect a need for better guidance on how to bill for vaccines. Another study found that vaccine purchasing groups may assist providers in increasing the availability of adult vaccines. Financing issues such as inventory management and reimbursement may be topics for future study.

CAPT Shen pointed out that pediatric vaccination providers face the same financing issues. The AAP's "Business Case for Pricing Vaccines" made a solid argument for financing that laid out the indirect costs. Provider education is also key and should center on helping providers understand costs and operate efficiently.

DISCUSSION

Dr. Orenstein asked whether there have been any analyses of the long-term cost savings to public programs that would result from increased vaccination. Jeffrey A. Kelman, M.M.Sc., M.D., of CMS, expressed interest in any data on real cost savings. He pointed out that CMS pays for many services that are good for public health even if they do not save money.

Dr. Thompson suspected that providers are frustrated because Medicaid vaccine coverage policies differ by State. She added that although the ACA covers vaccines, many ACA plans include large deductibles, so perceptions about high costs are worth evaluating. Dr. Thompson asked whether NVAC could recommend that vaccine payment rates for Medicaid match those of Medicare; CAPT Shen said NVAC has made that recommendation. She also said NVPO is compiling a list of vaccine payment rates by State.

Dr. Rawlins noted that vaccine financing is a controversial topic, and most data come from research in pediatric populations before the ACA became law. He hoped a better evidence base would allow for a more informed discussion. CAPT Shen said NVPO is crafting a policy paper on what the ACA covers and where more research is needed.

Dr. Orenstein said it would be useful to assess for a correlation between Medicaid reimbursement rates and uptake of adult vaccinations. If data demonstrated that better reimbursement is associated with higher uptake that would inform the vaccine financing case.

Overview of the 2016 NAIIS—Carolyn Bridges, M.D., FACP, CDC

Dr. Bridges described the origin of the NAIIS and how it operates. The Summit has more than 700 participants, representing about 130 private and public organizations, who participate in calls and working groups year-round. Through the working groups, stakeholders identify actions they can take to improve uptake of recommended vaccines. Dr. Bridges described several accomplishments, including:

- development with NVAC of updated Standards for Adult Immunization Practice,
- annual awards and a website to showcase best practices,
- development and dissemination of key messages and tools for providers,
- creation of a Current Procedural Terminology (CPT) code for vaccine counseling, and
- promulgation of educational materials to overcome barriers to IIS use.

The NAIIS assists with communication and implementation of standards, policies, and quality measures. The 2016 annual meeting will focus on best practices for effective vaccination programs in a changing health care environment. Other topics include improving IIS, the role of nontraditional vaccine providers in pandemic response preparedness, and influenza communications planning for 2016–2017.

DISCUSSION

Dr. Orenstein outlined the key takeaways from the adult immunization session:

- Adult immunization has a long way to go but progress is underway.
- More surveillance data are needed to understand vaccine status of persons who contract adult vaccine preventable diseases.
- Better understanding is needed of the reasons for racial and ethnic disparities in adult immunization.
- More attention should be paid to building on existing systems, such as IIS and use of retail pharmacies.

Update on U.S. Polio Containment Efforts—Olen Kew, Ph.D., National Poliovirus Containment Coordinator

Dr. Kew described the status of poliovirus strains, noting that polio persists in small pockets around the world, such as Pakistan, Afghanistan, Madagascar, Nigeria, Guinea, and Ukraine. The WHO established a Global Action Plan (GAP III) to minimize facility-associated risk of poliovirus after the eradication of wild-type strains and the cessation of OPV use. The goal is to reduce the number of facilities handling poliovirus to a minimum and to ensure that by 2021, all

wild and vaccine-derived poliovirus strains are effectively contained in "essential" laboratory facilities (i.e., the equivalent of a U.S. biosafety level 3 [BSL-3] laboratory).

The plan addresses infectious material and the more controversial category of "potentially" infectious material. Potentially infectious materials are those of unknown status that were collected in areas where poliovirus was circulating or OPV was in use and were stored in a manner consistent with maintaining infectivity. Such materials may include fecal specimens, sewage samples, respiratory samples, or extracted nucleic acid. Dr. Kew said the United States has asked WHO to exclude respiratory samples and extracted nucleic acid from the definition because it would have a detrimental effect on research.

Dr. Kew explained that changes to polio immunization practices around the world contributed to a marked increase of polio cases due to type 2 circulating vaccine-derived polioviruses. In April 2016, there will be a synchronized global change in practice that will end the use of trivalent OPV containing all 3 serotypes and replace it with bivalent OPV which will contain only types 1 and 3. To maintain immunity to type 2, use of inactivated polio vaccine containing all three polio serotypes will become part of all routine childhood immunization schedules.to.

The USG will play a critical role in containment. CDC has the largest collection of polioviruses on earth, and many leading poliovirus research laboratories are in the United States. The risk of the virus spreading from U.S. laboratories is low (but not zero), and the risk of virus release in developing countries is higher. The USG established the National Poliovirus Containment Coordinator at CDC to oversee containment. Several surveys are underway to assess which laboratories have infectious or potentially infectious materials, with a short-term goal of ensuring type 2 poliovirus (including wild, vaccine derived and parent Sabin viruses in OPV are contained in 2016.

Dr. Kew explained that facilities are deemed essential or nonessential on the basis of their need to have live poliovirus materials. He noted that diagnostic laboratories are not essential in that sense and usually do not have BSL-3 capacity, but if poliovirus is detected in the community, its use in a diagnostic laboratory would not pose significant additional risk.

Dr. Kew noted that because the USG lacks statutory authority around poliovirus containment, compliance may be limited outside of Federal facilities. Legitimate concerns about the impact of the containment approach on non-polio laboratories must be addressed. Many such laboratories are not aware of GAP III. Poor specimen records impede survey completion. Dr. Kew outlines a number of other challenges around GAP III related to interpretation and feasibility of the guidelines. He hoped to work with U.S. laboratories to figure out the best way to contain poliovirus samples.

Discussion

In response to Dr. Maldonado, Dr. Kew said frozen RNA specimens can last a long time, but they present a low risk, so he and others hope to exclude RNA from the definition of potentially infectious materials. Dr. Orenstein said any stool sample collected in the United States before 2000 could be potentially infectious. He suggested mechanisms be enacted to ensure that valuable specimens can be maintained and guidance promulgated on how to minimize risks. Dr. Kew said the current surveys aim to define the scope of the problem so that he and his colleagues can ask WHO for reconsideration. Dr. Orenstein said GAP III could have substantial implications for ACIP; he wondered how reliable containment efforts must be following polio eradication (of all types) in order for the United States to stop polio vaccination.

Public Comment

Ms. Wrangham of the NVIC focused on the overall lack of discussion about precautionary and informed consent principles. There continues to be a lack of informed consent protections within many aspects of the NVAC's work and more specifically with the ability of consumers to retain privacy with respect to their health care decisions, particularly with respect to IIS and electronic medical records, she said. The use of IIS and EMRs is being leveraged as a way to track consumers' health status, target them for behavior change, and "assist" with identifying individuals during an outbreak.

The strategy does not acknowledge that people are not all the same, nor do they respond the same way to any medical treatment or pharmaceutical product. NVIC requests that the NVAC uphold these principles of informed consent and precaution in decisions about medical risk-taking in all of its work. The NVIC also asks NVAC to state the need for the immediate discontinuation of OPV in global polio eradication efforts, due to the ongoing vaccine injuries occurring, as demonstrated in today's presentation. The risks for these injuries are widely known, and OPV should never have been an option in eradication efforts. Because OPV was permitted, people were injured. These people represent preventable vaccine injuries that could have been avoided. These lives are forever changed. These lives matter, and they are more than numbers in a presentation, said Ms. Wrangham.

Closing Remarks and Adjournment—Walter A. Orenstein, M.D.

Dr. Orenstein thanked the NVPO staff, NVAC members, liaisons, ex officio members, and all those who help make NVAC meetings successful. He adjourned the meeting at 12:54 p.m.