

ADULT VACCINATIONS:

Opportunities for Action,
Barriers to Engagement,
Paths to Healthier Aging

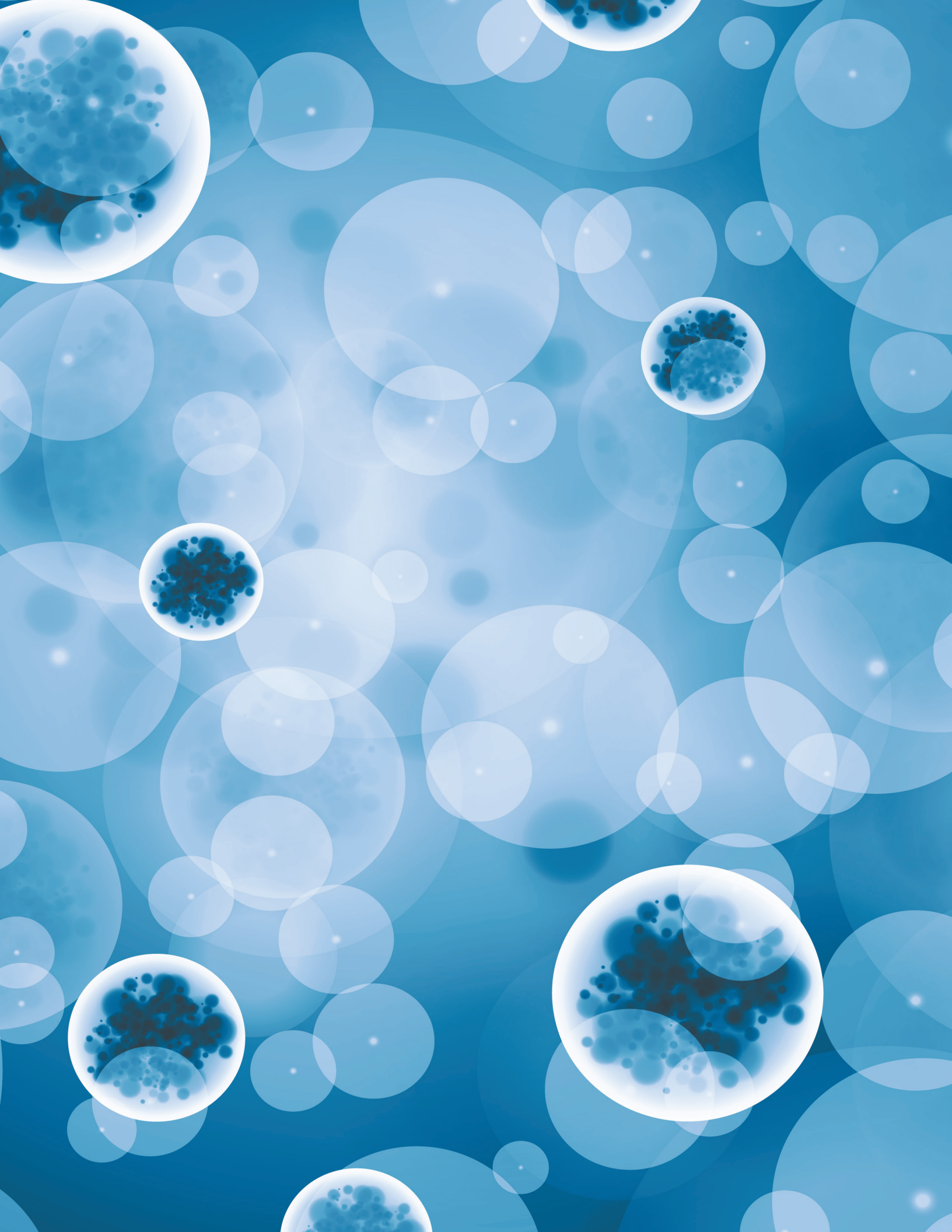
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for aging research



Global Coalition on **Aging**



Foreward | Vaccination in the Age of COVID-19

When leading experts gathered in New York City for a symposium on “Adult Vaccinations: Opportunities for Healthy Aging, Barriers to Engagement” in November 2019, the world was still more than a month away from the first reports out of China that a cluster of unexplained cases of viral pneumonia had occurred in the city of Wuhan.

By January 30, 2020, as the outbreak spread beyond China to other nations in Asia, the World Health Organization declared a Public Health Emergency of International Concern, and on February 11, the disease caused by the novel coronavirus was given a name: COVID-19. A month later, WHO characterized the outbreak as a pandemic.

As of June 30, 2020, more than 10.1 million confirmed cases of COVID-19 have been reported, along with at least 502,278 confirmed deaths in at least 216 countries, areas, or territories, according to the World Health Organization (WHO). In the United States, WHO has reported more than 2.5 million confirmed cases and 126,203 deaths.

The COVID-19 global pandemic touched off a frantic race to develop a vaccine that could protect against the novel coronavirus. And it targets the most vulnerable: adults age 65 and older, especially those living in nursing homes or long-term care facilities, and people of any age with underlying medical conditions, including: chronic lung disease or moderate to severe asthma; hypertension and serious heart conditions; compromised immune function; severe obesity (body mass index of 40 or higher); diabetes; chronic kidney disease undergoing dialysis; and liver disease.

While developing a vaccine that protects people against COVID-19 is a critical public health priority, it also dramatically underscores the absolutely critical need to concentrate more resources into developing effective vaccines that work across different strains of a virus. For example, different strains of the coronavirus led to previous outbreaks of SARS and MERS.

That is the approach now being pursued by the National Institute of Allergy and Infectious Diseases in seeking to develop a universal flu vaccine to replace the annual, seasonal flu vaccines that have a widely varying success rate—a topic discussed in this report.

Meanwhile, the need to create clear, consistent, and compelling communications regarding the benefits of vaccination, as discussed at length during the symposium and in this report, has grown more important than ever, as the COVID-19 pandemic has given rise to increased suspicion about vaccines and even bizarre conspiracy theories promoted by fringe groups. As noted during the symposium, even the most effective vaccine will not accomplish its goal unless those who currently resist vaccines for any number of reasons can be convinced to change their behavior—no easy task.

The fact that the overwhelming majority of people who have died as a result of COVID-19 are older adults also underscores the critical need to increase research efforts in immunosenescence—the decline in immune function as we age. As is discussed in this report, developing a vaccine that works will not necessarily help older adults whose immune systems are incapable of mounting a strong immune response.

At the time of the writing of this report, we don’t know how the COVID-19 pandemic will play out. We only know that the disease has exacted a terrible toll on lives and nations across our planet. Developing any vaccine that passes clinical trials for safety and efficacy is likely at least a year away. However, the broader issues surrounding vaccines discussed in this report remain relevant.

We trust that the discussions highlighted in this report are helpful in sparking future action on how we get more people to recognize the benefits of vaccination while developing new vaccines for the threats to public health that we face—now and in the future.



Stephanie Lederman, MEd
Executive Director, AFAR



Michael W. Hodin, PhD
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Introduction

On November 7, 2019, the American Federation for Aging Research (AFAR) and the Global Coalition on Aging (GCOA) hosted a symposium on “Adult Vaccinations: Opportunities for Healthy Aging, Barriers to Engagement” at the Lotte New York Palace in New York City. The symposium was held as the World Health Organization prepared to launch a Decade of Healthy Ageing at its scheduled World Health Assembly in Geneva, Switzerland in May 2020. As a result of the COVID-19 pandemic, the World Health Assembly was changed from a live to a virtual event.

Vaccines, and childhood immunization in particular, are one of the great success stories of public health in the 20th century. The progress of childhood vaccination has decreased mortality rates for vaccine-preventable diseases around the world, and immunization is recognized as one of the most effective prevention methods to sustain health and wellness. Despite these achievements, adult immunization rates remain low, and programs to increase uptake in adult vaccinations lag far behind those focused on children.

Vaccinations are especially vital across the lifespan to prevent a range of illnesses and viruses, such as influenza, pneumonia, shingles, measles, mumps, rubella, tetanus, diphtheria, pertussis, pneumococcal disease, and varicella, as well as hepatitis A and B. Additionally, advances in aging research show how targeting the biology of aging to extend health can also improve immunological responses to vaccinations.

The global increase in disease caused by drug-resistant bacteria, due to overuse and misuse of antibiotics, is a major public health concern. It is more difficult and costly to treat antibiotic-resistant infections and people do not always recover. Vaccinating humans and animals has shown to be an effective way to prevent infections—and thereby the need for antibiotics. Making better use of existing vaccines and developing new vaccines are important ways to tackle antibiotic resistance and reduce preventable illness and deaths.

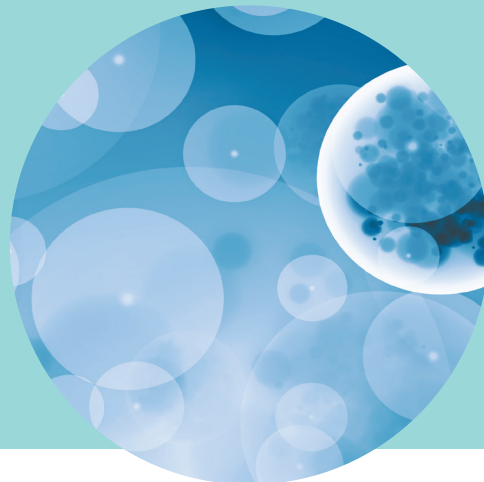
On the following pages, this report will highlight the main issues identified by the presenters and respondents in November. The first section, **Health Ahead: Opportunities for Driving Higher Rates of Adult Vaccination** (page 4), examines the critical role that vaccines play in saving lives and countering antibiotic resistance, as well as promising research that illustrates how geroscience may be able to make vaccines across the board more effective by slowing or reversing immune function decline.

The second section, **What Stands in Our Way: Barriers to Adult Vaccination** (page 8), explores the primary obstacles that keep adults from getting vaccinations, ranging from muddled messaging and clinician ambivalence, to Medicare payment and government regulatory hurdles. And the final section, **Where We Go From Here: The Path Forward** (page 12), identifies avenues worth pursuing to advance adult vaccination, from clear, consistent, and compelling communication to possible methods to make adult vaccination as common and accepted as childhood vaccination. And throughout the report, you’ll find The Vaccine Chronicles, four examples of the kinds of personal stories that can help engage people about the benefits of vaccines.

The November symposium intentionally brought together experts from different backgrounds with different perspectives to explore how to advance better use of existing vaccines and to chart a course to developing new, more effective vaccines. This report is intended to serve as a starting point for the future work that desperately needs to be done now more than ever to get more adults to use the vaccines we have, while making a concerted effort to develop the vaccines we need.

Meet the Experts

The symposium brought together leading researchers and experts from nonprofit organizations, academia, and the pharmaceutical and biotech worlds to discuss how to advance the twin goals of making better use of existing vaccines and developing new vaccines.



As symposium moderator **Michael W. Hodin, PhD**, Chief Executive Officer of GCOA, Managing Partner of High Lantern Group, and an AFAR Board Member, put it: “How do we move to the next stages of changing behavior and more effective usage vaccine among adults, while creating an environment more open to innovation and improved vaccines across the lifespan?”

In addition to Hodin, the symposium presenters and respondents included:

Presenters:

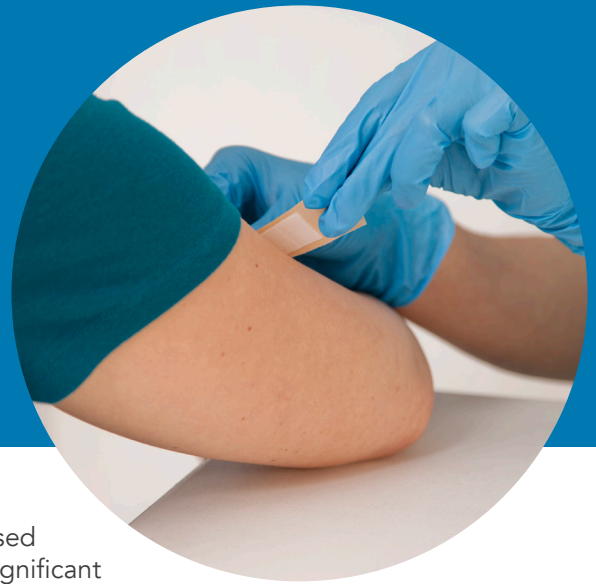
- **Todd A. Black, PhD**, Executive Director, Infectious Diseases/Vaccines - Basic Research, Merck Research Laboratories
- **Sean X. Leng, MD, PhD**, AFAR 2006 Beeson Scholar; President, Milstein Medical Asian American Partnership (MMAAP) Foundation; Professor of Medicine and board-certified Geriatrician in the Division of Geriatric Medicine and Gerontology, Department of Medicine, Johns Hopkins University School of Medicine
- **Sarah A. Chase**, Chief Operating Officer, Alda Communication Training Company
- **Pol Vandenbroucke, MD, MSc, MBA, FFPM**, AFAR Board Member; Chief Medical Officer, Pfizer Hospital Business Unit

Respondents:

- **James Appleby**, Chief Executive Officer, Gerontological Society of America (GSA)
- **Nir Barzilai, MD**, AFAR Deputy Scientific Director; Director, Institute for Aging Research at Albert Einstein College of Medicine
- **Richard Besdine, MD**, AFAR Medical Officer; Professor, Geriatric Medicine and Professor, Health Services, Policy and Practice, Brown University
- **Harvey Jay Cohen, MD**, AFAR Board Member; Professor of Medicine, Duke University School of Medicine
- **Pinchas Cohen, PhD**, AFAR grantee; Dean and Professor of Gerontology, Medicine, and Biological Sciences, USC Leonard Davis School of Gerontology
- **Ned David, PhD**, AFAR Board Member; Co-Founder and President, Unity Biotech
- **Donald Edmondson, PhD**, Director, Columbia University Science of Behavior Change Center
- **Mehmood Khan, MD**, AFAR Board Member, Chief Executive Officer and Board Member, Life Biosciences Inc.
- **George Kuchel, MD, FRCP, AGSF**, AFAR National Scientific Advisory Committee; Director and Chief of Geriatric Medicine, UConn Center on Aging
- **Nathan LeBrasseur, PhD**, AFAR grantee; Consultant, Professor, and Co-Chair of Research, Department of Physical Medicine and Rehabilitation, Mayo Clinic
- **Bruce R. Troen, MD, AGSF**, AFAR Grantee; Professor of Medicine and Chief, Division of Geriatrics and Palliative Medicine, and Director, Center for Successful Aging, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo and Veterans Affairs Western New York Healthcare System
- **Terrie Fox Wetle, PhD**, AFAR Board Member; Founding Dean, Brown University School of Public Health

Health Ahead:

Opportunities for Driving Higher Rates of Adult Vaccination



Over the course of the 20th century, life expectancy at birth increased by an astounding 30 years. And childhood vaccinations played a significant role in what is undoubtedly one of the great success stories of the past century.

Today, vaccines save an estimated 6 million lives a year worldwide. Polio and smallpox have been virtually eradicated from the planet, and the vaccine for measles is close to 100 percent effective when used.

The success of childhood vaccinations, however, has not carried over to adults. And for older adults in particular, influenza continues to pose a serious health risk—90 percent of people who die as a result of the flu each year are age 65 or older.

During his symposium presentation, Sean X. Leng, MD, PhD, noted that influenza remains the fourth leading cause of death for older Americans, claiming 36,000-50,000 lives annually. And the economic cost of caring for older Americans with the flu each year is estimated at \$87 billion.

Worldwide, the flu kills 250,000-500,000 older adults a year.

As the number of people over age 65 rises from about 600 million in 2000 to about 2 billion in 2050, “there is a tremendous impact on healthcare systems worldwide,” said Pol Vandenbroucke, MD. That impact necessitates a change in emphasis from treatment to prevention, he added.

“Vaccination is an important preventive measure, especially for older adults,” Vandenbroucke said. “As we get older, we are more susceptible to infection.”

However, “while we have a vaccine schedule for infants and children, we don’t yet have a vaccine schedule for older adults,” he said.

Countering Antibiotic Resistance

In addition to protecting against viral infections, vaccines also provide an effective counter to the growing threat of antibiotic resistance. That makes it more important than ever to emphasize prevention for influenza and other viral diseases—especially for older adults.

Overuse of antibiotics has accelerated the rise of new antimicrobial-resistant strains of pathogens, experts said. According to the World Health Organization, “Antibiotic resistance occurs when bacteria change in response to the use of antibiotics to treat bacterial infections (such as urinary tract infections, pneumonia, bloodstream infections) making them ineffective.”

The problem has been exacerbated by overuse and inappropriate use of antibiotics for viral infections like the cold or flu.

Too many people assume that if they get sick, “I need to go get an antibiotic and that’s going to cure me,” said Todd A. Black, PhD. “Well, that’s not always going to continue to be the case. And we also have to recognize that this often is not the right treatment choice.”

As Vandenbroucke noted, “vaccines for viral diseases reduce the inappropriate prescription of antibiotics as well as the need for antibiotics for secondary infections—and so have a tremendous impact on the rate of increase in antimicrobial resistance.”

Black said there also is a widespread misperception that new antibiotics are easy to identify and develop. They aren’t.

When exciting new technological advancements such as whole genome sequencing and new screening methodologies came online in the 1990s, Black said, “every major pharmaceutical company had a massive effort to try to find new classes of antibiotics. And we’ve essentially failed. We do have new antibiotics that are helping to address some of the drug resistance issues, but these continue to be incremental modifications or reactivation of old classes of antibiotics.

“Prevention is by far the best approach to take,” Black said.

Partial Protection Is Better than No Protection

The influenza vaccine may not always prevent older adults from getting sick, and the success rate does vary from year to year due to the fact that a new vaccine is developed annually to attempt to target the strains of the virus expected to be in widest circulation. (For more information, see “What Stands in Our Way: Barriers to Adult Vaccination” on page 8.)

“However, it’s important to note that older adults who do get sick after being immunized are much less likely to be hospitalized and much less likely to die even if they do get sick. For example, mortality is reduced even in 90-year-old nursing home residents who get the flu or a cold after receiving the high-dose vaccine,” said Richard W. Besdine, MD.

“That partial protection is enough not only to keep people alive, but to keep them out of hospitals,” Besdine said. “We tell our patients in our geriatrics practice, they still may get sick, but they’re much less likely to be hospitalized and much less likely to die. And most days, that’s a good thing.”

“In addition to reducing antimicrobial resistance, vaccination also offers other important community benefits,” Besdine added. “For example, the protections offered by vaccination can extend even to older adults living in nursing homes who do not get vaccinated themselves.”

“We have data emerging that there is herd immunity with flu vaccines,” said Pinchas Cohen, PhD. “In nursing home residents who refuse vaccine—and they always can—they still have lower rates of hospitalization and death if the large majority of their fellow residents get vaccinated.”

THE FACTS ABOUT VACCINES

- Vaccines save 6 million lives worldwide every year. ^{1,2}
- Vaccines can help to prevent other diseases common among adults. ³
- Vaccinations in aging individuals improve quality of life. ⁴
- Vaccines are integral to ongoing health and wellness. ⁵
- Vaccines help to mitigate the effects and severity of other diseases. ⁶
- Vaccinations both benefit individuals and help to prevent the spread of epidemics. ⁷
- Vaccines are also cost-effective, calculated to save tens of billions of dollars annually. ⁸
- For every \$1 USD governments around the world spend on immunization, they receive a \$44 USD return on investment. ⁹
- The cost saved for four vaccine-preventable diseases (influenza, pneumococcal diseases, shingles, and whooping cough) in adults 50+ is estimated to be \$26.5 billion. ¹⁰

See page 17 for citations

The Promise of Geroscience

One of the most promising vaccine-related developments to emerge in recent years comes from the field of geroscience, which focuses on targeting the underlying biology of aging as a main driver of chronic diseases in older adults.

One of the main reasons older adults are often hardest hit by viral infections, as dramatically seen in the COVID-19 pandemic, is immunosenescence—the decline in immune function as we age. Leng mentioned research he conducted that was funded through his AFAR Beeson Award that looked at data for frail, older adults from the 2007-08 flu season. The study, published in 2011, found that older adults with frailty were not able to mount antibody responses to the standard dose trivalent inactivated influenza vaccine (SD IIV3)—the only vaccine that was available for older adults at the time.

More recently, research suggests that drug interventions that target the biology of aging, known as “gerotherapeutics,” may help boost the effectiveness of vaccines in older adults.

Nir Barzilai, MD, said the reason immune function declines as we age is “because there is a biology for aging.” The question for researchers and the pharmaceutical industry is not only how to convince more older adults to get vaccinated for the flu and other infections, such as shingles and pneumococcal disease. It’s how to improve the effectiveness of vaccines for older adults and to help them avoid the diseases of aging in the first place by targeting that underlying biology.

George Kuchel, MD, Barzilai, and Besdine each pointed to recent clinical trials conducted by Novartis Institutes for Biomedical Research and led by Joan Mannick, MD, co-founder and Chief Medical Officer of resTORbio, involving resTORbio’s lead product candidate, RTB101.

The promising gerotherapeutic inhibits the activity of a protein complex called “target of rapamycin complex 1,” or TORC1, an evolutionarily conserved pathway that contributes to the decline in function of multiple aging organ systems. TORC1 and TORC2 are both multiprotein complexes formed by mTOR (mechanistic target of rapamycin).

An initial study found that inhibiting levels of mTOR in older adults boosted the effectiveness of the flu vaccine by 20 percent. And a follow-up study found that inhibiting mTOR decreased the incidence of all infections, improved flu vaccination responses, and boosted immune function.

Besdine said the research not only improved the effectiveness of the flu vaccine, “but now they are actually showing it prevents a variety of upper respiratory infections across large populations.”

Barzilai added, “And also they prevented the hospitalization, the cardiovascular events, and [other diseases] because they were targeting aging. So they got other benefits.”

“They not only prevented the flu, but they prevented all other infections,” Barzilai said. “And also they prevented the hospitalization, the cardiovascular events, and [other diseases] because they were targeting aging. So they got other benefits.”

Kuchel, who is on the advisory board for resTORbio, said: “It’s not pie in the sky. That’s happening right now. And because it targets the biology of aging, it is not dependent on one virus. It’s cross-cutting, real impact that is meaningful.”



THE VACCINE CHRONICLES: WHEN FATHER DOESN'T KNOW BEST

As chief medical officer at Pfizer's Hospital Business Unit and an AFAR board member, Pol Vandembroucke, MD, clearly qualifies as a trustworthy source when it comes to the flu vaccine.

So it had to be tough not to take it personally when his own father told him he didn't want to get vaccinated. His reason? "Because he took it once and he had the worst flu in the history of humanity," Vandembroucke recalled.

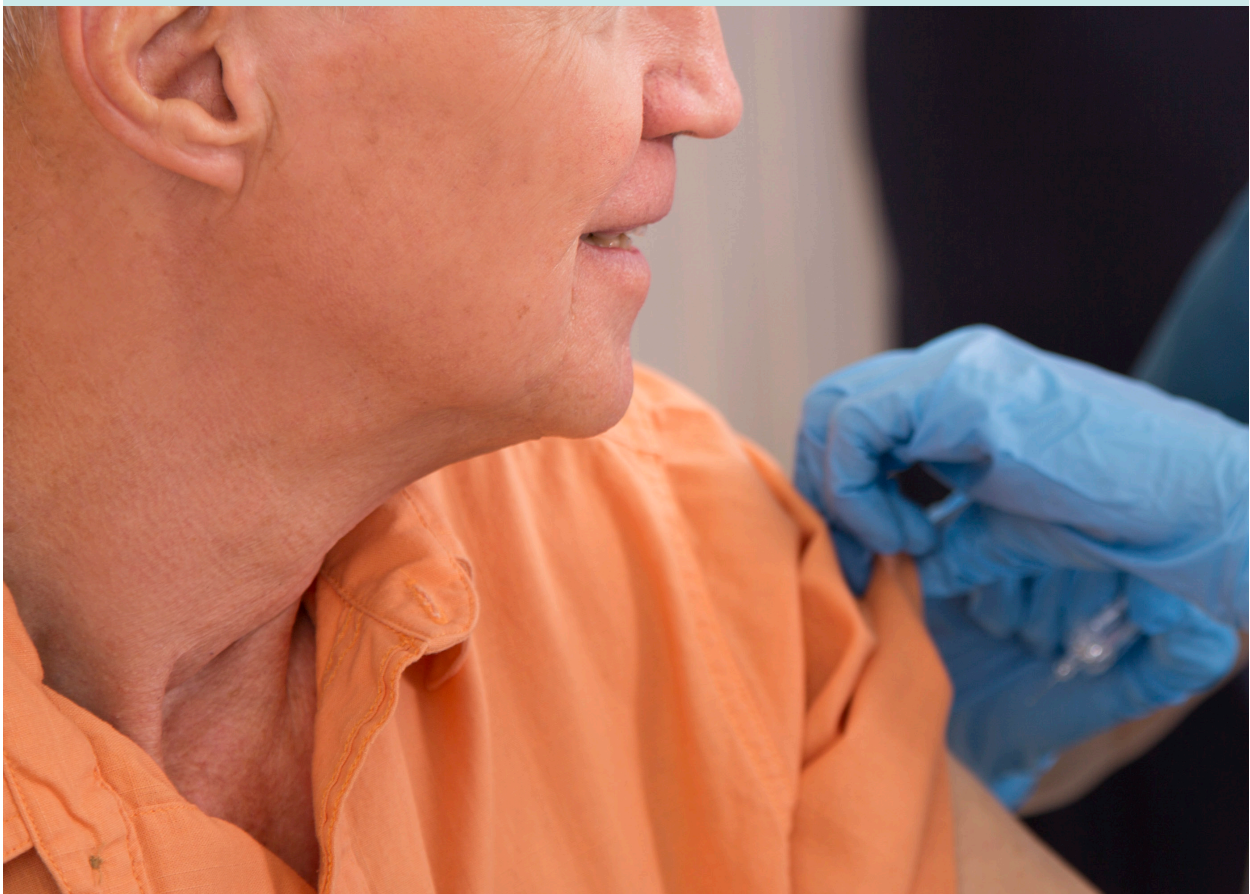
"So I said, 'Okay, how do I do this?' And I thought, well, maybe I'll just explain to him why it would work."

And he did.

Vandembroucke explained how each flu season, scientists take three or four influenza strains that they think will be prevalent during the coming flu season to make the vaccine for that year.

"Does it work 100 percent? Absolutely not, because obviously nobody has a clue what that actually will be. But what I can tell you is that if you take it, there's a good chance you will stay out of the hospital and the hospital at your age is the last place in the world you want to go to."

What did his father decide? "I'm happy to report that he got the flu vaccine."



What Stands in Our Way:

Barriers to Adult Vaccination



Muddled messaging. Clinician ambivalence. Behavior modification. Medicare payment issues. Government regulatory hurdles.

There is no single reason why a majority of adults in the United States do not get the flu vaccine. During the 2018-19 flu season, 45.3 percent of adults 18 years old and older got the flu vaccine, according to the Centers for Disease Control and Prevention (CDC). And that was actually a good year—up 8.2 percentage points from the previous year, and 2 percent higher than two years prior.

It's interesting to note that, among health care personnel, 81.1 percent got the flu shot, and among health care personnel who work in a setting where vaccination is required, 97.7 percent were vaccinated.

Symposium presenters and respondents spent considerable time discussing why most of the adult population is not getting the message about the need to get an annual flu vaccine, as well as other indicated vaccines.

Clearing Up Muddled Messaging and Clinician Ambivalence

Part of the problem, the experts agreed, stems from the fact that the flu vaccine is different from other vaccines—especially from the childhood vaccines like polio and measles that most people know. The success rate for the flu vaccine varies widely from year to year because the vaccine itself changes each year in an attempt to anticipate which particular strains of influenza will be most prevalent during that particular flu season.

That can lead to a misperception that all adult vaccines, even those with extremely high success rates such as the shingles and pneumococcal vaccines, are not that effective. Which in turn leads many adults to say: Why bother?

"I think our message about vaccines is muddled even for people who are scientifically sophisticated," Besdine said. "There's some element of intellectual gymnastics there and it's not easy to convey."

Several experts agreed that the lack of a clear, consistent, compelling message from clinicians advocating for adult vaccination is a large part of the problem.

"One thing that's been shown from the research is that a strong recommendation from the clinician is a big predictor as to whether or not someone will get their vaccine," said Pinchas Cohen, PhD.

Many clinicians today are ambivalent about vaccines. There is no clear and consistent message people receive when they see a doctor, nurse, physician's assistant, or other health professional. Some strongly recommend the flu vaccine, others do not. And when patients question issues such as effectiveness, they don't adequately or clearly explain how the vaccine works and how it benefits people, several participants agreed.

As Kuchel put it: “Physicians and health professionals and scientists are horrible communicators because we’re experts in nuance. And our patients just want the bottom line.”

That bottom line, said James Appleby, is: “Yes, vaccines are good and older adults should get all their age-appropriate vaccines throughout the life course. But too often, and the research shows this, clinicians equivocate.”

Appleby suggested that clinicians should think about vaccination like seat belts.

“We recommend seat belts even though they don’t work all the time,” he said. “All right, seat belts don’t guarantee you’re not going to die in a crash, but you’re going to be a hell of a lot better off having worn one in case you get into an accident. Right? We’ve got to get clinicians over this ambivalence around recommending vaccines and make it part of what they do day in and day out. And it has to be everybody, not just physicians. Nurses, nurse practitioners, physician assistants, pharmacists, even social workers need to be talking about the value of vaccines.”

It also was noted by some participants that there has been a rise in efforts by anti-vaccination activists to spread debunked misinformation through various internet and media outlets.

Bruce Troen, MD, brought up *The Death of Expertise: The Campaign against Established Knowledge and Why it Matters*, a book by Tom Nichols. “We live in a society where people have access to information and that access makes them think that they know what they really need to know,” Troen said. “This is really rampant.”

While this makes it more difficult to cut through the noise and deliver a clear and consistent message based on scientific evidence, it also makes it even more imperative for clinicians and other experts to work together to make the case for vaccinations.

“We’re not going to solve this today,” Troen said, “but I think it’s important to be aware of it as we go out and try to spread our message and try to get support for these appropriate efforts.”

Promoting Behavior Modification

Convincing people to get a flu shot or other vaccines when they have balked in the past requires them to change their behavior, which is a major barrier across the spectrum when it comes to healthy living.

“The behavioral sciences is where I think our biggest bang for the buck is right now,” said Terrie Fox Wetle, PhD. “We need to really understand how to change behaviors and that is reducing barriers. It’s finding incentives—incentives that work for the individual that we’re targeting.”

After all, most people generally know what’s good for them. Getting them to actually do it is the issue. For example, people know that diet and exercise are good for their health, but most just don’t do it.

“Prevention is really an issue of behavioral modification,” Pinchas Cohen said.

Developing vaccines that work is the first step. But finding the best approach to get people to change their behavior “is going to be difficult,” Cohen said. “We could develop all the vaccines we want, but if we don’t put some effort into behavior modification, they won’t accomplish the goal we hope.”



Fixing Medicare Payment Issues

While Medicare Part B covers flu shots, there are other payment issues with both Part B and Medicare Part D that need to be addressed. Bipartisan legislation has already been introduced in Congress to accomplish that, Appleby said.

Medicare beneficiaries, many of whom are on fixed incomes, are required to make copayments on vaccines covered under Medicare Part D—tetanus-diphtheria-acellular pertussis (Tdap) and varicella zoster (shingles)—but not vaccines under Part B (flu, pneumococcal), which are available with no out-of-pocket cost.

“We’ve got a really large barrier when you look at older adults getting vaccines as a result of Medicare Part B and Medicare Part D,” Appleby said. “And it causes confusion when providers are trying to provide vaccinations to their patients.”

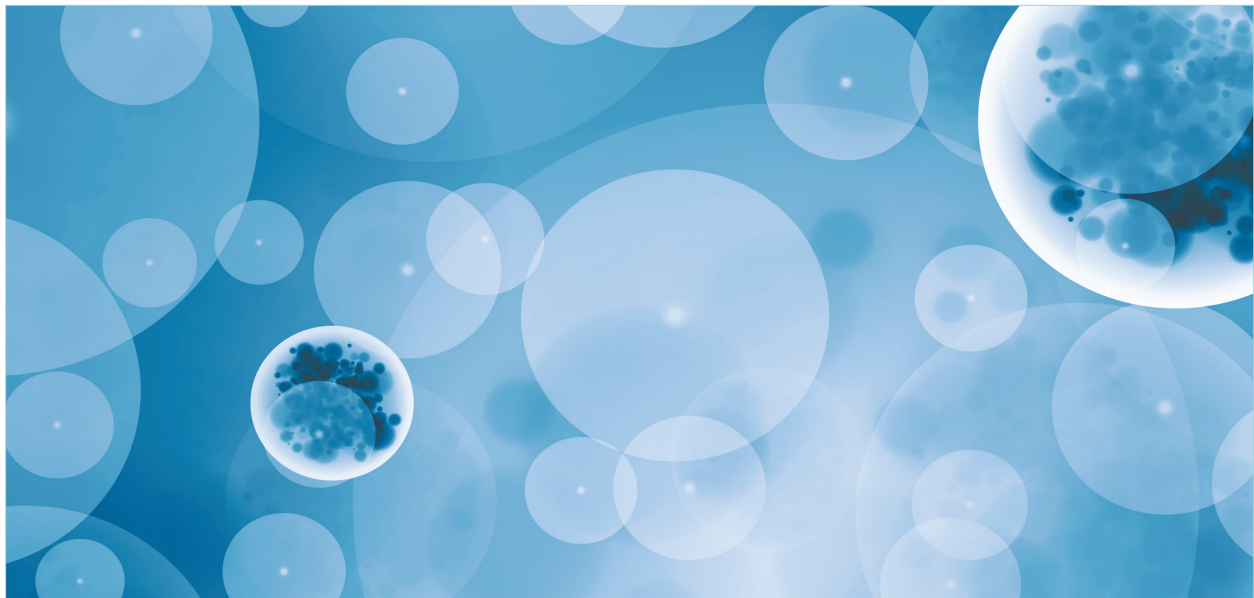
The Protecting Seniors Through Immunization Act would eliminate out-of-pocket costs for vaccines covered under Medicare Part D, while also seeking to improve vaccination rates through improved education and access to recommended vaccines.

“We need to fix this so that patients don’t have that barrier that prevents them and requires them to put a fair amount of money out of pocket just to get a vaccine. It seems to me that there’s a health system issue that we can solve. Right? That’s solvable.”

Clearing Regulatory Hurdles

Regulatory agencies have so far not been receptive to efforts by pharmaceutical companies seeking to establish a direct connection between vaccination and preventing potential progression to antibiotic resistance, Black said.

“When we talk to regulatory agencies, there’s still a complete hesitation to say, ‘Well, you’ve definitively proven that vaccination is going to prevent potential progression to resistance,’” he said. “So it’s very difficult to meet some of the regulatory hurdles to really be able to make a strong argument.”





THE VACCINE CHRONICLES: A SON'S ANGUISH

For several years, Sean X. Leng, MD, PhD, had tried to get the flu vaccine for his centenarian mother, who still lived independently in a small town in the south of China.

But his repeated requests were ignored in a country where only 3 to 4 percent of adults are covered for influenza. Pediatric vaccines, however, are another matter. They are fully covered by the government.

"Then, last winter, she actually came down with the flu," Leng said during the November AFAR/GCOA symposium. "The whole townspeople came down with this flu."

Leng visited her in China to help care for her over the Chinese New Year. She was on her way to recovery when Leng left for the US via Beijing. But she took a turn to the worse and passed away next day. Leng rushed back from Beijing to attend her funeral. She was 104 years old.

Leng is president of the Milstein Medical Asian-American Partnership Foundation, which works to improve world health by developing mutually beneficial partnerships between the U.S. and China, as well as greater Asia. He's also a leading researcher at Johns Hopkins University in immunosenescence—the decline in immune function as we age—and its relationship to the basic biological and physiological changes in aging and frailty.

None of that mattered when it came to getting the flu vaccine approved for a woman who had lived for more than a century.

The United States certainly needs to improve the effectiveness of its influenza vaccine and do a better job of getting more older adults immunized. "But when you look at other countries like China, it's really miserable," Leng said. "I mean, look, I cannot get the vaccine for my own mother there."

Where We Go From Here:

The Path Forward



With participants from varied backgrounds offering many different perspectives, the symposium provided a forum for a lively and wide-ranging discussion. But four main areas emerged as particularly fertile ground to advance the goal of removing barriers to adult vaccination and increasing opportunities for healthy aging.

They are:

- Creating clear, consistent, and compelling messaging for clinicians and others in the field about the benefits of adult immunizations.
- Finding more effective ways to persuade or incentivize adults to change their behavior and get vaccinated.
- Developing vaccines that work optimally in adults.
- Advancing the geroscience approach so that vaccines that do work will work in older adults who are in their 80s, 90s, and 100s.

Nathan LeBrasseur, PhD, said moving forward “requires a multifaceted, multidisciplinary team to tackle” the issues identified during the symposium.

He added that leading organizations in the health and aging field, such as AFAR and GSA, need to be involved “to attract talent to realize these are major problems that can be addressed. And it also highlights the importance of shared decision-making. I think that’s one thing that we undervalue sometimes in older adults is that they do have a say in this and we do need to respect their opinions.”

Creating Clear, Consistent, and Compelling Messaging

As noted earlier (see page 9), research shows that whether adults get the influenza vaccine is largely dependent on a strong recommendation from their clinician. As a result, much of the discussion centered on how to get clinicians on the same page, speaking with one voice about the benefits of adult immunization.

“I don’t think there’s a silver bullet answer, a one-off answer to this,” said Sarah A. Chase.

Storytelling is one strategy that has proven effective in the work of the Alda Communication Training Company, which is structured as a one-of-its kind public-private partnership with the Alan Alda Center for Communicating Science® at Stony Brook University, Chase said.

“Sharing stories about success, about science, about what’s going on are some of the most important things that you can do as communicators,” she said. “And your personal stories—the way in which you are relating to people at their level.”

It’s important to keep two things in mind, she said: “Know your audience and relate to your audience.”

When talking about adult immunizations, she said, “you’re dealing with very specific age groups here at times in their lives when they need specific vaccinations. And if you’re a millennial or a Gen Y, you might understand why this is important for your microbiome and you may already have this information in your head that’s been brought in from society about what antibiotics may be doing to that. But if you’re 65-plus, the idea of a microbiome may be completely bizarre to you because this is something that’s just coming into your life for the first time. So you don’t have that background information that helps you connect the dots as to why this is important.”

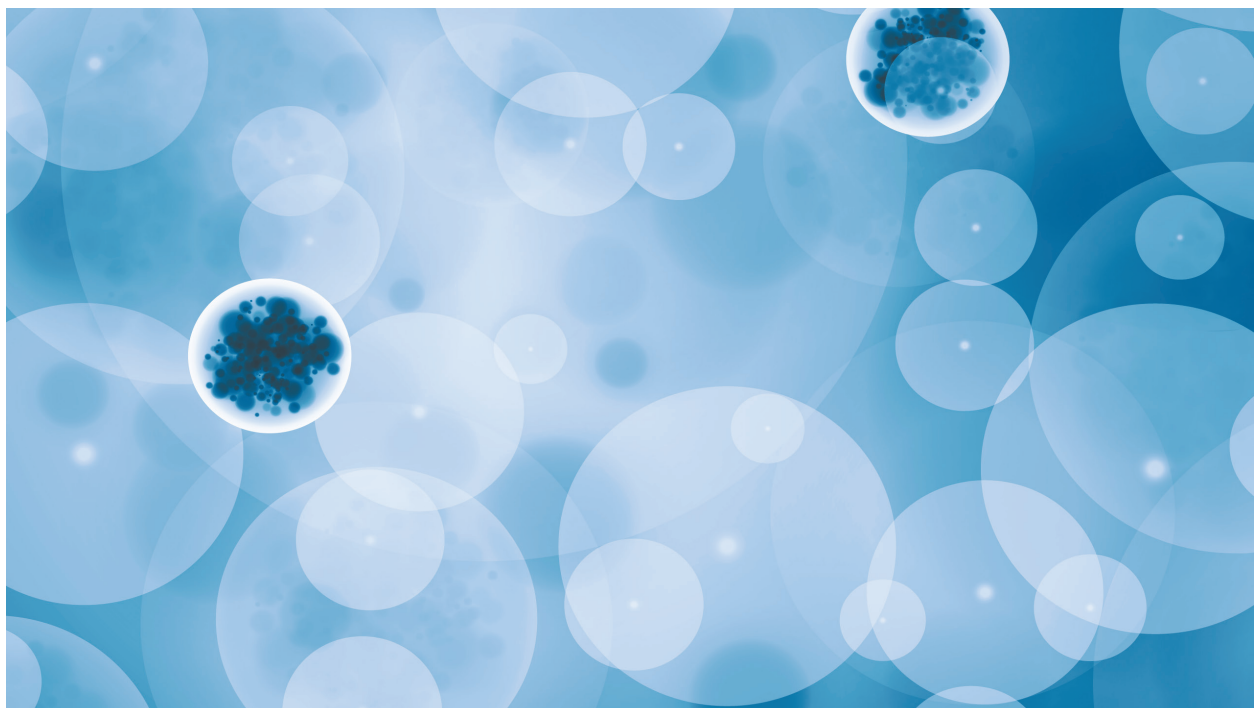
Chase said developing messaging will require market research to determine how to target those specific age groups.

Mehmood Khan, who was vice chairman of PepsiCo before becoming CEO of the biotech firm Life Biosciences, agreed, and strongly recommended that the group look to consumer-facing companies to understand how to do effective communications and marketing that leads people to change behaviors.

“We in life sciences think we know how to brand, communicate, and market. We don’t,” Khan said. “We have a lot to learn from the consumer industry. If you don’t believe that, next time you go shopping online and you start to see things that you never thought you needed, but suddenly you [think] you really need, it’s a perfect example. It’s not an art, it’s a science. It’s done very, very carefully.”

In addition to developing messaging for adults of different ages, it’s important to keep health disparities for underserved minorities in mind as well, Harvey Jay Cohen said.

“There are some huge issues when it comes to preventive care and especially vaccines that need to be addressed there,” he said. “The Black community, by and large, as I think we all know for many good reasons, is very suspicious of things like shots for preventive care. Tuskegee (the 40-year, Public Health Service Syphilis Study that misled African-American males to participate without providing adequate treatment for their disease) comes up all the time. And we have to think about that really seriously if we’re going to be messaging things as to how we communicate with those communities, as well as the majority community.”



Changing Behaviors

One of the reasons childhood vaccination is an overwhelming success is because a great deal of pressure is brought on parents to ensure their children get their shots. Pediatricians have vaccinations on their “checklist” of things every child needs when they see them, and clinicians strongly recommend that children get their shots. Plus, state laws establish vaccination requirements for school children.

“I trained as a pediatrician and I can tell you, from the day you walk in to your first rotation, immunization is like drinking water or coffee in the morning or bread and butter,” Pinchas Cohen said. “There’s no discussion. Every test quizzes the residents on exactly what is the schedule of immunization. If a kid doesn’t have immunizations, they can’t go to school. So there’s a whole, completely different frame of mind that maybe we can introduce into the geriatric or internal medicine community.”

Most adults routinely have their blood pressure measured and cholesterol levels checked, among other tests, when they see their doctor for a checkup. Adding an adult vaccination schedule to that “checklist” is one step worth considering, he added.

“Are you up to date on immunization? Now I go to a doctor, I have to remind them that I want the new shingles vaccine instead of them telling me that I have to do it,” Pinchas Cohen said.

Another option worth exploring is having health systems and other health care settings require their employees to get the influenza vaccine.

“The Duke University Health System has made it mandatory,” Harvey Jay Cohen added. “Everybody who works at Duke has to have the flu vaccine or you don’t work.”

According to the CDC, requiring employees to get the flu shot makes a huge difference in the number of people who are immunized. In 2018-19, 97.7 percent of health care personnel who worked in a setting where vaccination was required got the flu shot. Among those working in settings where vaccination was not required, promoted, or offered on-site, the number dropped to just 42.1 percent.

Developing Vaccines that Work Optimally in Adults

In 2018, the National Institute of Allergy and Infectious Diseases launched a research program to develop a universal influenza vaccine, one that would work against multiple strains of the flu at once. The current model requires trying to predict which strains will emerge for the coming flu season and then developing a vaccine to prevent widespread infection.

If successful, the universal flu vaccine program would address one of the main excuses offered by those who don’t get immunized: the widely varying success rate of the seasonal flu vaccine.

But the need for new, effective vaccines is hardly limited to the flu. As Harvey Jay Cohen noted during the November 2019 symposium, “when you look at the global scene, we haven’t talked yet about the biggies like malaria, like tuberculosis. We need vaccines for those things as well. Not to mention HIV, for which we’ve been trying to develop a vaccine for almost forty years and still haven’t gotten there yet. So there are a whole bunch of big entities out there that could be vaccine-targeted.”



Most recently, the race to develop a vaccine to protect against the novel coronavirus behind the COVID-19 global pandemic further underscores Cohen's point.

Developing vaccines that work optimally in adults, including the flu vaccine for older adults in particular, has to be part of the equation, he notes.

"I think there are several compartments here and they're not mutually exclusive. They all have to be addressed ultimately," Cohen said. "Yes, we have to adjust the psychobiology of figuring out how to get people to do things and we have to address the biology of aging. But we also have to adjust getting vaccines that work optimally. If a vaccine doesn't work, it's not going to matter whether we address the biology of aging or not. If it just doesn't work, it doesn't work, so we need to work on that issue while these other issues are there, too."

Targeting the Biology of Aging

Advancing the geroscience approach to target the biology of aging—which has shown potential to boost the effectiveness of vaccines and prevent infections in older adults—is an important piece of the puzzle.

"By understanding the biology of aging, we not only have the potential to improve vaccine responses, but we have the potential to impact the biology of aging and age-related diseases as a group," said LeBrasseur. "And that's something that we should all be incredibly excited about."

Pinchas Cohen called for increased research emphasis on immunosenescence, the decline in immune function that occurs as we age and adversely impacts on the effectiveness of vaccines.

"Clearly, we have a good, but imperfect, opportunity to advance public health," Cohen said. "And there is some emphasis already on optimizing clinical trials with available and emerging drugs like rapamycin analogs to improve the efficacy of vaccines. But when you look at the domains of aging or the hallmarks of aging and all the great laboratories around the country that AFAR is supporting on every aspect of aging, immunosenescence is probably the most understudied area."

"I think we need an initiative to understand the biology of immunosenescence to develop new mechanisms, new targets that will improve both vaccine efficacy, and maybe prevent infections in other ways. ... I think the ultimate public good from that is going to be enormous."

Harvey Jay Cohen noted that moving forward in the areas discussed during the symposium will require considerable resources.

"I'm really surprised nobody's mentioned the 'M' word yet today—that is, money. These approaches, all of them, are going to take substantial investment. I'm interested in this because just last week, the NIH announced the award of a \$400 million contract to the Duke Human Vaccine Institute in the search for the universal flu vaccine."

"That's probably just a spit in the bucket for what's going to be needed broadly to attack this issue at the vaccine level. And that's not to mention once you get into behavioral research and the like. This is a huge price tag and I think we have to be prepared to think about advocating for that if that's what we want to happen."



THE VACCINE CHRONICLES: ENGAGING THE UNUSUAL SUSPECTS

The weekend before the symposium, James Appleby, the CEO of GSA, who has a background in pharmacy, was in New York City with his brother and sister to see some plays.

When they stopped in a bar for a drink, Appleby recalled, “I overheard the one bartender say to someone else, ‘Oh, Joe is not in today. He got the flu shot yesterday and now he’s got the flu.’”

Appleby wasn’t working. He was on vacation. “But I couldn’t help myself. When the waiter served my beer, I said, ‘It’s scientifically impossible to actually get the flu from the flu vaccine.’ And we had a 10-minute conversation.”

Challenging misinformation is important, regardless of where you are. “The point is that maybe we’ve got to engage some unusual suspects to help us,” Appleby said.

Perhaps a communications campaign that educates people who regularly relate to people in areas outside medicine and health—like bartenders—might be something to explore. “A little bit about geroscience, but maybe a lot about vaccines and just some simple messages,” he said.

The suggestion got a thumbs up from communications expert Sarah A. Chase: “Vodka and vaccine ‘conversation’ nights could be fun, and do some good.”





The American Federation for Aging Research (AFAR) is a national non-profit organization that supports and advances pioneering biomedical research that is revolutionizing how we live healthier and longer. For nearly four decades, AFAR has served as the field's talent incubator, providing more than \$181 million to more than 4,200 investigators at premier research institutions nationwide. A trusted leader and strategist, AFAR also works with public and private funders to steer high quality grant programs and interdisciplinary research networks. AFAR-funded researchers are finding that modifying basic cellular processes can delay—or even prevent—many chronic diseases, often at the same time. They are discovering that it is never too late—or too early—to improve health. This groundbreaking science is paving the way for innovative new therapies that promise to improve and extend our quality of life—at any age. Learn more at www.afar.org or follow AFARorg on Twitter and Facebook.



The Global Coalition on Aging aims to reshape how global leaders approach and prepare for the 21st century's profound shift in population aging. GCOA uniquely brings together global corporations across industry sectors with common strategic interests in aging populations, a comprehensive and systemic understanding of aging, and an optimistic view of its impact. Through research, public policy analysis, advocacy, and strategic communications, GCOA is advancing innovative solutions and working to ensure global aging is a path to health, productivity, and economic growth. For more information, visit www.globalcoalitiononaging.com.

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