

LIFE-COURSE IMMUNIZATION: BUILDING THE CONSENSUS FOR ADULT VACCINATION



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The International Vaccine Access Center (IVAC) applies rigorous science to build knowledge and support for the value of vaccines.

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By generating, synthesizing, and using evidence to inform decision-making and action, we accelerate equitable and sustainable access to vaccines globally.

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**“ THE BENEFIT OF
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Vaccines are credited with averting millions of child deaths in the last decade, with most countries offering infants the basic protection of immunization against more than 10 serious diseases. But the risk of infectious disease does not end with childhood: there are clear opportunities to prevent disease throughout life and into old age.

The benefits are myriad, not only in terms of healthier lives but also the reduced health costs for individuals and society. However, despite a commitment to the concept of prevention, most countries have not yet embraced life-course immunization. Barriers include concerns about financing, competing health priorities, the relative complexity of a heterogeneous population, the lack of a universal adult vaccine delivery platform and broad evidence base to support the value of vaccines beyond childhood.

However, with a rapidly aging population, it is imperative that the burgeoning conversation around life-course immunization now accelerates and broadens to encompass all countries. In the same way that a global movement coalesced around child vaccines, the time is now right for us to build a cohesive evidence base and call for policies and programs that extend throughout the life-course, especially for older adults.



MAIN VACCINES THAT COULD HELP ADULTS

CURRENT VACCINES	FUTURE VACCINES
PNEUMOCOCCAL	HIV
INFLUENZA	TUBERCULOSIS
HERPES ZOSTER	MALARIA
PERTUSSIS, TETANUS & DIPHTHERIA	EBOLA
OTHERS: HAEMOPHILUS INFLUENZAE TYPE B, HEPATITIS A AND B, MENINGOCOCCAL MENINGITIS	RSV
	CMV
	IMPROVED INFLUENZA, PNEUMOCOCCAL VACCINES
	NOSOCOMIAL INFECTIONS
	THERAPEUTIC CANCER

THE EVIDENCE BASE: A CONSIDERABLE BURDEN OF PREVENTABLE DISEASE

Non-communicable diseases such as heart disease and stroke are the leading causes of death globally, but in older age groups, lower-respiratory infections, including influenza and pneumococcal pneumonia, were amongst the top 10 causes of death in 2016. In adults over age 70, these infections were the fifth leading cause of death¹. Global surveillance to measure the extent of vaccine preventable diseases (VPDs) in adults, including pneumococcal disease, influenza and herpes zoster, is severely lacking. This creates data gaps, particularly in low-income countries. Burden of adult disease is often modeled based on the experience of high-income countries.

The University of Washington's [Institute of Health Metrics and Evaluation](#) (IHME) estimates that lower respiratory infections (including pneumonia and influenza) led to more than 1.5 million deaths in those aged 50 and over globally, most notably in low-income countries. The number of years of lives lost, a measure of premature death, shows more than 23 million years were lost to lower respiratory infections in 2017.

Pneumococcal disease and influenza are responsible for a substantial proportion of pneumonia cases. Among older adults hospitalized with pneumonia, mortality rates vary widely from less than 10 percent to over half of hospitalized cases dying from the disease^{3,4,5}. Herpes zoster, also known as shingles, causes a decline in older adults' ability to perform daily activities. Many face reduced quality of life and acute episodes can progress to postherpetic neuralgia, a painful and debilitating nerve condition persisting for prolonged periods⁶.

This wider societal impact of VPDs in adults includes significant economic consequences. In 2015, in the United States alone, these three diseases accounted for nearly US\$8.5 billion in economic burden - expenses for medical visit and treatment expenses, and productivity costs of lost wages when patients must seek treatment⁷.

Beyond these three main adult vaccines, others have important application. These include pertussis, tetanus and diphtheria for routine use, meningococcal meningitis, Haemophilus influenzae type b and hepatitis A and B vaccines in certain situations. Future vaccines against HIV, tuberculosis, malaria, Ebola, respiratory syncytial virus (RSV), cytomegalovirus (CMV), improved influenza and pneumococcal vaccines, nosocomial infections such as Clostridium difficile and Staphylococcus aureus have the potential to help adults in future, as do therapeutic vaccines that use immunotherapy to address some types of cancer.

THE COMPLEXITY TRAP: WHY POLICY LAGS BEHIND DEMOGRAPHIC SHIFTS

It is imperative that we act to reap the potential benefits of vaccines for adults. A huge demographic shift is coming – by 2050, 22 percent of the world’s population will be over 60 years of age, doubling from current levels to more than 2 billion people⁸. Although VPDs affect adults more as they age, most older adults are not immunized with recommended vaccines.

Countries are slow to recommend and fund vaccines as part of national programs; even when policy recommendations exist, seniors don’t necessarily have access to the vaccines or see their value. Seasonal influenza vaccines are recommended in more than 50 countries but their use in adults over 65 in high income countries ranges from under 3 percent to over 80 percent⁹, and is even more limited in middle- and low- income countries. Pneumococcal vaccines are recommended in many high-income countries and some middle-income countries but coverage has been sub-optimal. Herpes zoster (shingles) vaccines are recommended but use at only low coverage rates in high-income countries.

One important reason for a lack of global and national adult vaccine policy recommendations is the complexity of the issues. Older adults are a heterogeneous group and data on disease or contributory risk factors are often difficult to interpret. Vaccines are less effective as immune response declines with age, but age is a poor indicator of individual immune response since other factors also influence vaccines’ immunogenicity. Further, most studies measure vaccine preventable deaths by age as a means to assess the potential value of a vaccine, but to make better decisions, “vaccine preventable disability” or measures of how disease can impact daily function are also needed^{10,11}. This complexity results in a challenge for generalizable guidance for countries, providers and patients.



**INFLUENZA VACCINE USE IN ADULTS OVER 65 IS VARIABLE.
COVERAGE RATES IN HIGH INCOME
COUNTRIES RANGE FROM
UNDER 3% TO OVER 80%**

THE BROADER BENEFITS OF ADULT IMMUNIZATION EXTEND TO MULTIPLE GENERATIONS

Although adult vaccines are not viewed as a priority in many countries, policymakers should consider the wider benefits and the close links between health and economic development. This is especially important in lower-income settings where VPDs may peak when adults are still working^{12,13}.

We need more studies that capture the full value of vaccines in all settings^{14,15}, including their impact on work, volunteering or caregiving, contributions to slowing the impact of antimicrobial resistance, impact on concomitant conditions, protections offered to the community and promotion of social equity. As people live longer and work to a higher retirement age, the contribution of vaccines to sustaining productivity increases. Even those not in the formal workforce contribute to productivity by caring for their grandchildren, enabling working-age parents to continue to work. Preventing disease among older adults through immunization also helps working-age adults avoid missing work to care for an ill parent.

Immunization programs also provide a healthcare platform to diagnose problems or provide advice on healthy lifestyles. Just as some polio vaccination campaigns created enhanced infrastructure for routine child vaccination programs in affected countries, life-course immunization could help drive the move towards a more holistic, patient-centered approach to health care with a stronger emphasis on prevention that would ultimately improve health outcomes and cut expenditures. Well established platforms for immunization are also important in emergencies, pandemics or outbreaks when efficiently reaching the population of older adults to provide immunization services is critical to disease control.



CURRENT PROGRESS TOWARD POLICY CONSENSUS

At the World Health Assembly in 2016, countries committed to a global strategy and plan on aging and health. [The Global Vaccine Action Plan](#) reaffirmed this aim, stating that countries should strive “to make the benefits of immunization to all those at risk in every age group.” The World Health Organization also recognized the value of an integrated life-course approach in Africa in their recently published [business case for immunization activities](#).

“EVEN WHEN COUNTRIES RECOMMEND VACCINES FOR ADULTS, COVERAGE RATES DO NOT APPROACH WHAT THEY WOULD IN INFANT POPULATIONS”

Many high-income and some middle-income countries have sufficient data to consider the case for individual vaccines, yet recommendations have been slow to develop. The preliminary results of an IVAC analysis of 34 high- and middle-income countries show most of the former had made recommendations for influenza vaccines and more than 20 had made recommendations for pneumococcal vaccines in adults 60 or 65 years of age and over. A smaller number had made recommendations for herpes zoster vaccines. A separate analysis of low- and middle-income countries showed that few countries had influenza vaccine programs¹⁶ or pneumococcal vaccine programs for adults¹⁷.

Even when countries recommend vaccines for adults, coverage rates do not approach what are achieved in infant populations. Reasons for this can include lack of awareness or clear narrative on the benefits of immunization that resonate with older adults, particularly those that are relatively healthy. Providers may not recommend vaccines, perhaps due to a lack of incentives, concerns about cost, effectiveness or safety. Furthermore, a holistic perspective on the needs of older adults is still missing.

BUILDING A GLOBAL CONSENSUS

For adult immunization to be adopted and implemented, it is important that policy makers and the public view healthy aging as a priority, understanding the value of protecting older adults from infectious disease. Drawing on Schiffman and Smith's framework for building global priority for health initiatives¹⁸, it is clear there is important work to bring movement on the issue.

First, technical consensus must be achieved. On this front, IVAC is convening experts across diverse disciplines concerned with adult immunization and its impact on the well-being of individuals and communities. IVAC's International Council on Adult Immunization (ICAI), chaired by Dr. Gregory Poland at Mayo Clinic, will call for global guidance from the norm-setting institutions, such WHO or healthy aging organizations. Bringing perspectives on such topics as epidemiology, infectious disease, health systems, social sciences, economics and healthy aging, these experts will synthesize the data and offer a holistic approach for patients and communities, helping to galvanize other champions and institutions to action and uniting the policy community.

This mobilizing force can help position life-course immunization as essential to reducing premature death and disability and support reduced healthcare costs while enabling older adults to live longer and more productive lives. In addition, such efforts will work towards improving equity and highlight the need for stronger platforms to reach older adults with immunizations to address global health security needs.

To see success, we must frame the value proposition more powerfully. Discussions around adult vaccines are often confusing and the technical community has not presented consistent or comprehensive advice. A lack of global recommendations sends the message that these vaccines do not rise to a sufficient level of importance and action.

Now is the time to address the immunization measures that form a platform for universal healthcare. Access to vaccines throughout the lifespan is essential – not only for ensuring the health of the individual but also for addressing the indirect impact disease can have on families and societies. Ensuring the health and productivity of the aging adult population makes sense for everyone. Work must begin to build the investment case now – with this fast-growing demographic, we can no longer delay efforts to build a global roadmap for integration of adult immunization into the [post-2020 immunization strategy](#) and the [decade of healthy aging](#).

**“NOW IS THE TIME
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REFERENCES

1. World Health Organization 'Global Health Observatory Data Top 10 Causes of Death', accessed June 27, 2018
http://www.who.int/gho/mortality_burden_disease/causes_death/top_10/en/
2. Institute for Health Metrics and Evaluation 'Global Health Data Exchange, Burden of Disease Tool', accessed June 2018
<http://ghdx.healthdata.org/gbd-results-tool>
3. Buzzo et al. 'Morbidity and mortality of pneumonia in adults in six Latin American countries', 2013
<https://www.ncbi.nlm.nih.gov/pubmed/23558317>
4. File & Marrie 'Burden of Community-Acquired Pneumonia in North American Adults', 2015
<https://www.ncbi.nlm.nih.gov/pubmed/20203464>
5. Welte, Torres, Nathwani 'Clinical and economic burden of community-acquired pneumonia among adults in Europe', 2012
<https://www.ncbi.nlm.nih.gov/pubmed/20729232>
6. Herpes Zoster and Functional Decline Consortium 'Functional decline and herpes zoster in older people: an interplay of multiple factors', 2015
<https://www.ncbi.nlm.nih.gov/pubmed/26440662>
7. Ozawa et al., 'Modeling of the Economic Burden of Vaccine-Preventable Diseases in the United States', 2016,
<https://www.ncbi.nlm.nih.gov/pubmed/27733424>
8. United Nations, 'World Population Prospects: The 2017 Revision, Key Findings and Advance Tables', 2017
https://esa.un.org/unpd/wpp/publications/Files/WPP2017_KeyFindings.pdf
9. Organization for Economic Co-operation and Development 'Influenza vaccination rates', accessed June 2018
<https://data.oecd.org/healthcare/influenza-vaccination-rates.htm>
10. McElhaney et al. 'T-Cell Immunity to Influenza in Older Adults: A Pathophysiological Framework for Development of More Effective Vaccines'
<https://www.ncbi.nlm.nih.gov/pubmed/26941738>
11. Thomas-Crusells, McElhaney, Aguado 'Report of the ad-hoc consultation on aging and immunization for a future WHO research agenda on life-course immunization', 2012
<https://www.ncbi.nlm.nih.gov/pubmed/22835737/>
12. Moisi et al. 'Burden of Pneumococcal Disease in Northern Togo before the Introduction of Pneumococcal Conjugate Vaccine', 2017
<https://www.ncbi.nlm.nih.gov/pubmed/28114427>
13. Tornheim et al. 'The epidemiology of hospitalized pneumonia in rural Kenya: the potential of surveillance data in setting public health Priorities' 2007
<https://www.ncbi.nlm.nih.gov/pubmed/17537660>
14. Cafiero-Fonseca et al. 'The full benefits of, adult pneumococcal vaccination: A systematic review', 2017
<https://www.ncbi.nlm.nih.gov/pubmed/29088258>
15. Bloom et al. 'Moving beyond traditional valuation of vaccination: Needs and opportunities', 2017
<https://www.ncbi.nlm.nih.gov/pubmed/28017436>
16. Ortiz et al. 'A global review of national influenza immunization policies: Analysis of the 2014 WHO/UNICEF Joint Reporting Form on immunization', 2016
<https://www.ncbi.nlm.nih.gov/pubmed/27646030>
17. Sauer et al. 'Assessing the adult immunization policy landscape: challenges and opportunities for adult vaccination globally and in low- and middle-income countries', presented at the International Symposium on pneumococci & pneumococcal diseases, April 2018
18. Shiffman et al. 'Generation of political priority for global health initiatives: a framework and case study of maternal mortality', 2007
[https://www.thelancet.com/article/S0140-6736\(07\)61579-7/abstract?code=lanct-site](https://www.thelancet.com/article/S0140-6736(07)61579-7/abstract?code=lanct-site)

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