

# Life-Course Immunization

A DRIVER OF HEALTHY AGING



Global Coalition on **Aging**





“A LIFE-COURSE APPROACH to vaccination is strategic economic policy, great health policy, and common sense. It’s also an ethical obligation. How can we continue to let preventable disease devastate our older population when cost-effective solutions exist? We need greater attention – and outcry – to expand this most sensible solution. Let us act with wisdom to prevent funerals and injury to people everywhere.”

STEPHEN MCMAHON, CEO, IRISH PATIENTS’ ASSOCIATION

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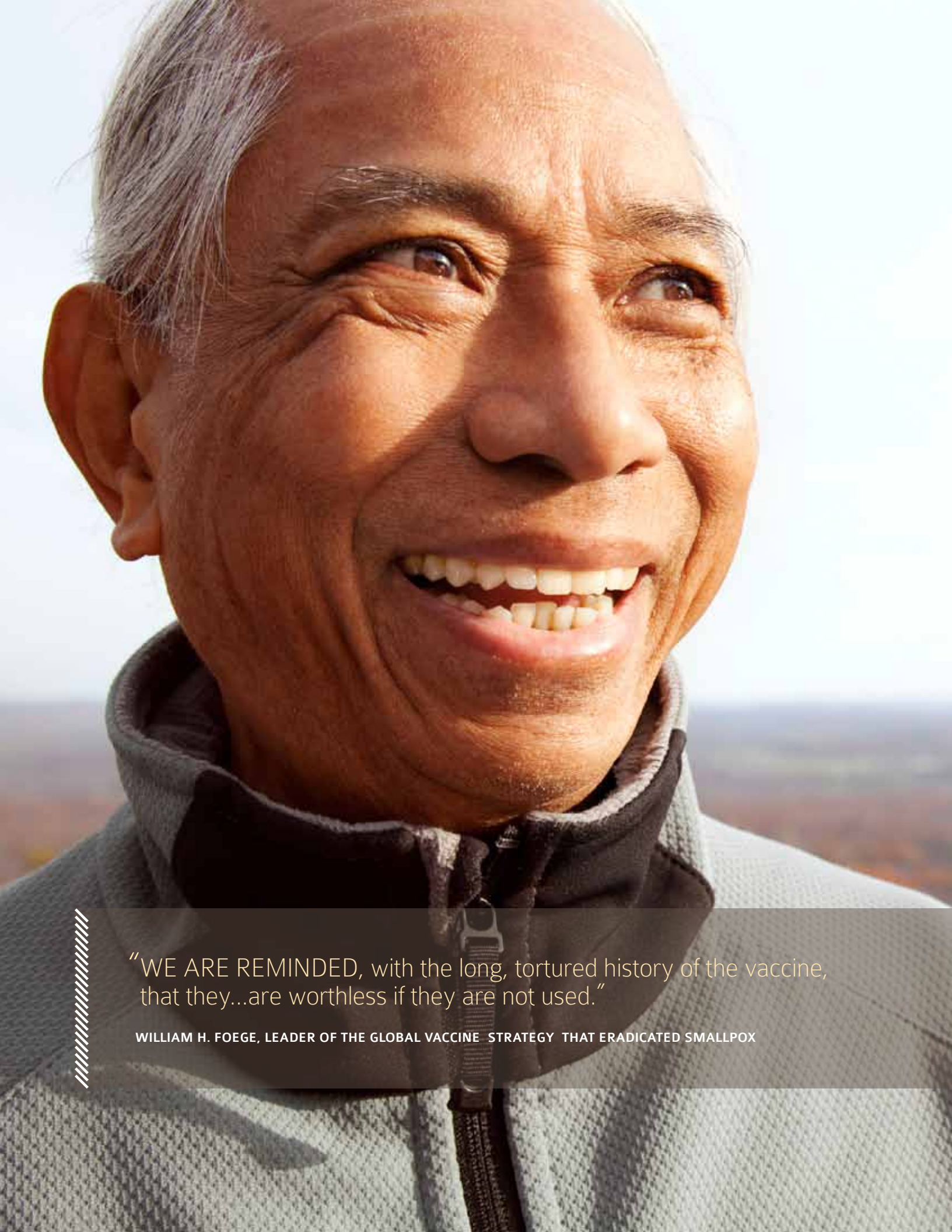
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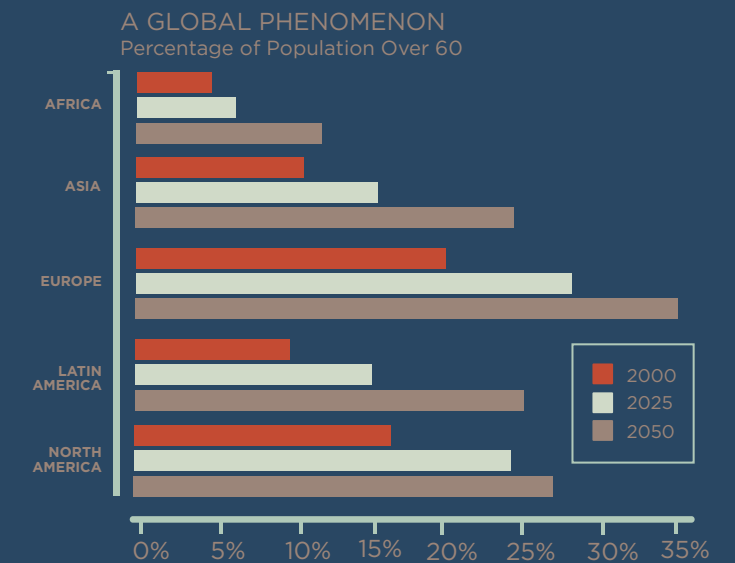


“THE MAGIC TOOL  
of health intervention  
is the vaccine.”

BILL GATES, SPONSOR OF THE GAVI  
ALLIANCE, WHICH HAS PREVENTED FIVE  
MILLION FUTURE DEATHS OF CHILDREN

“WE ARE REMINDED, with the long, tortured history of the vaccine,  
that they...are worthless if they are not used.”

WILLIAM H. FOEGE, LEADER OF THE GLOBAL VACCINE STRATEGY THAT ERADICATED SMALLPOX



DUE TO INCREASING LIFE-SPANS AND DECREASING BIRTH-RATES, the world’s population is aging. The over-60 demographic segment continues to expand while the under-14 population contracts, and by mid-century the “old” will officially outnumber the “young.” The implications for health and economic policy are significant.

According to population estimates by the United Nations, 10 percent of the world’s population was over 60 in 2000. This demographic segment will account for 15 percent of the overall population by 2025 and 21.8 percent by 2050, reaching a gross total of over two billion. There is no precedent for a society with this demographic structure, and there is a clear urgency to encourage health promotion and disease prevention.

As national governments, intergovernmental organizations, civil society organizations, and numerous thought leaders have noted, healthy aging is a complex, comprehensive issue. It reaches into a number of disciplines, from human rights to behavioral sciences, and it raises questions about medical access and strategies, as well as economic development and sustainability.<sup>1,2</sup> The years ahead will continue to be characterized by a committed pursuit of successful social, health, and economic

policies towards healthy aging and disease prevention in all stages of life.

One promising but overlooked prevention strategy is a “life-course” approach to immunizations that stresses vaccination through all stages of life. Just as systematic childhood immunization programs became a fixture of the healthy growth process in the 20th century – marked by motivated physicians, informed parents, and proactive policymakers – adult immunization programs should be consolidated and become a fixture to healthy aging initiatives this century. Adult vaccines, as a part of a life-course approach to immunization, are a cost-effective solution to promoting health and wellness in the adult population.

Given current demographic trends, systematic vaccination programs are “the low-hanging fruit” of preventive, cost-effective care.<sup>3</sup> As research has



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shown, older adults run increased risk of contracting vaccine-preventable diseases, like pneumococcal pneumonia, influenza, herpes zoster, tetanus, and hepatitis B, among others.<sup>4</sup> Immunization throughout the life-course enables adults to age with reduced risk to disease, thereby enabling healthier, more active, and more productive aging. Despite this significant potential, life-course immunization has not become a priority on national and global health agendas. Given the aging of the global population, continued neglect of late-adulthood immunization will result in more avoidable cases of diseases and preventable deaths among older people.

In this paper, we discuss why life-course immunization should be an important agenda item for policymakers, and we discuss why adult immunizations should be included in the repertoire of responses to the health and economic challenges arising from population aging. This paper, for the most part, aims to bring together the many, disparate strands of argument, research, and policy discussions regarding adult immunizations. This type of comprehensive synthesis does not exist in the literature, and we believe that the need for such an analysis is significant. Adult and life-course immunization can only become a top policy and health priority if better articulations exist about its health and economic advantages.

As national and global health, economic, and political circles explore connections between aging and economics, we believe it can be safely concluded that adult immunizations hold tremendous

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potential, and greater attention should be given to further understanding, funding and creating vaccination programs. The time is ripe to “move the needle” and trigger global health focus for adult immunizations.

## THE HEALTHY AGING POLICY LANDSCAPE

A survey of recent global events reveals that we have reached an opportune time to focus on the social, health, and economic benefits of a life-course approach to immunization. Below, we discuss four events that represent the evolution and current status of the global health and aging dialogue.

First, in September 2011, the United Nations convened an historic summit to discuss the rise of non-communicable diseases (NCDs) – like cancer, diabetes, and cardiovascular disease – and to outline ways to prevent NCDs from becoming a barrier to social and economic growth. The United Nations General Assembly passed an Outcomes Document that calls on all Member States to reform their national health plans to account for the growth in age-related NCDs. The UN’s attention and directives are welcome. While adult immuniza-

tions were absent from the Outcomes, the document does provide the basis for greater attention to adult immunization as a strategy for age-related health challenges.

Second, in May 2012, the World Health Organization’s 65th World Health Assembly endorsed the Global Vaccine Action Plan (GVAP) that calls for 2011-2020 to be the “Decade of Vaccines.” This plan, initiated by the World Health Organization and endorsed by Ministers of Health from 194 countries, supports life-course immunization and calls for more research that can help create better adult vaccination programs.<sup>5</sup>

Third, in June 2012, the International Federation on Ageing (IFA) Global Conference concluded with a “call out” for greater attention to be given to adult immunizations. Baroness Sally Greengross, Member of the House of Lords and President of the International Longevity Center Global Network, and IFA Secretary General, Jane Barratt, among others, declared that adult immunizations would be a major goal of IFA over the next two years. According to Barratt, “The whole adult immunization

program...enables us to be functional and to be contributors for many more years....[This] is one of those transformative conversations we must be having, not only in our community – that community of older people – but those communities, businesses and governments that stand beside us.”<sup>6</sup>

Fourth, in March of 2013, a group of researchers gathered in Sao Paulo, Brazil to suggest that the burden of pneumococcal disease may be shifting from children to adults in Latin America. The announcement follows a study conducted by the Sabin Vaccine Institute in partnership with the Pan American Health Organization, the International Vaccine Access Center at John Hopkins University, and the Centers for Disease Control and Prevention. The as-yet unreleased research will show that as Latin American countries “successfully immunize more infants with new vaccines,” especially against pneumococcal disease, the remaining disease burden is restricted to older demographics.<sup>7</sup>

All four of these representative events are rooted in the same premise: healthy aging is critical to social and economic success in the 21st century. And three







TODAY FEWER CHILDREN die each year from vaccine-preventable diseases than adults. This is the tremendous achievement of childhood immunization programs of past decades. A similar, concentrated effort is now required in order to achieve an equivalent success with adult morbidity and mortality.

of them (all but the UN Outcomes) recognize the untapped potential of a life-course approach to immunization. Yet, despite this prominence, a circular line of reasoning often governs the discussion of life-course immunization. It is commonly argued that we need more data and a better understanding of immunization efficacy in order to roll out national and global initiatives. Yet, it is exactly these initiatives that will yield such data and understanding. Therefore, the legitimate debates over the efficacy of and demand for adult vaccination should not deter but encourage national and global policymakers to launch results-driven implementations.

Given the rapid aging of the global population, this kind of urgent action is required. Research shows that age-related chronic conditions such as diabetes and cancer increase an older person's risk of becoming seriously or fatally ill from vaccine-preventable diseases like influenza or pneumococcal pneumonia.<sup>8,9</sup> With the global health community's new focus on healthy aging, strategies could and should be built around vaccine-preventable diseases. Adult immunizations are a driver of healthy aging, and they should become a public health priority.

#### THE UNDER-UTILIZATION OF LIFE-COURSE IMMUNIZATIONS

There is a growing chorus of public and private organizations calling for greater usage of adult immunizations. Yet, adult vaccination rates remain well below target levels.<sup>10,11,12</sup> Today, fewer children die each year from vaccine-preventable diseases than adults.<sup>13</sup> This is the tremendous achievement of childhood immunization programs of past decades. A similar, concentrated effort is now required in order to achieve an equivalent success with adult morbidity and mortality.

The CDC reports that immunization for pneumococcal disease and other common vaccine-preventable diseases is below target levels, and "little progress" has been made and there is much "need for continuing efforts to increase adult vaccination coverage."<sup>14</sup> Research has shown that adult immunization can help drive healthy aging initiatives.<sup>15</sup> In the U.S., progress is being made. The Patient Protection and Affordable Care Act (PPACA) increases the role of prevention and integrates it into healthcare systems and the community. Beginning in 2014, adults in the U.S. will have greater access

to recommended vaccines. Yet, as we discuss below, obstacles still remain to successful implementation, and policymakers must recognize these challenges as well as potential solutions.

We note, for example, that the Infectious Disease Society of America (IDSA) suggests that life-course immunization in the U.S. must overcome systemic flaws within medical systems. IDSA contends that, in the U.S., there "is no strong mechanism in place for vaccinating adults." The U.S.'s "medical system is not set up to ensure adults receive regular preventive healthcare."<sup>16</sup> The Alliance for Health and the Future at the U.S.-International Longevity Center's research shows that, globally, the causes of the lack of uptake of life-course vaccination programs are more varied, ranging from prohibitive costs, to complex vaccination schedules, to inadequate physician knowledge, and more.<sup>17</sup>

Patients themselves, too, lack awareness of the benefits of vaccines and importance of receiving necessary revaccination boosters. One study in the United States found that while adults knew of the tetanus vaccine, just over one in three (36



percent) were aware that they should receive a booster shot every 10 years.<sup>18</sup> Another study shows that while the hepatitis B vaccine has been on the market since 1981, roughly 600,000 adults around the world died from the disease in 2002 (the latest available data).<sup>19</sup> Part of the problem is ideological. In the United States and throughout the industrialized world, it is common for people get vaccines before they travel abroad in order to prevent disease, but they do not consider the disease risks they face while at home.

The National Immunization Survey released by the CDC in 2007 reveals additional discouraging figures. It reports that 2.1 percent of eligible American adults had tetanus, diphtheria, and



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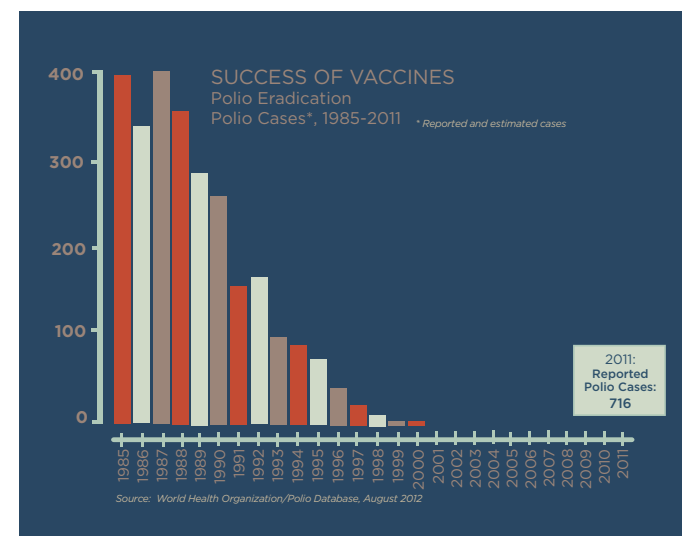
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whooping cough vaccine in the previous two years; under 2 percent of older patients had shingles vaccine; 10 percent of eligible women had the human papillomavirus vaccine; only 36 percent of adults receive vaccines for the seasonal flu; and the CDC's vaccination target for the pneumococcal vaccine fell short by 23 percent.<sup>20</sup> These numbers persist despite the CDC's recommendation for adults over 65 to include seasonal influenza vaccine and pneumococcal vaccine as a part of their preventive care.

This lack of immunizations has significant economic consequence. As one of the authors of this paper has argued, a systematic vaccine program “lowers the number of clinic visits, the rate of hospitalization and the incidence of long-term disability...saving money spent in health care, increasing workforce productivity and building a healthier society.”<sup>21</sup> A 2010 US study found that, annually in US adults, among adults 50 and over, there are roughly 500,000 cases of pneumococcal pneumonia which led to 200,000 hospitalizations, 19,200 deaths, and \$5.5 billion in costs due to healthcare expenses and lost productivity.<sup>22</sup>

The growing over-60 population will also increase costs related to pneumococcal disease if vaccinations cannot control rising incidences. Research shows that costs associated with the disease in the U.S. and Western Europe are high and preventable, but that vaccines have a low level of priority among general



practitioners because of insufficient awareness of the disease and the concern about the vaccine's efficacy.<sup>23</sup> As we outline below, there are specific public policy initiatives that can help increase awareness.

## THE POTENTIAL OF LIFE-COURSE IMMUNIZATION

The prevailing belief that there is a fixed connection between advancing age and increasing medical costs is a 20th-century assumption that does not hold in the 21st century. As the World Health Organization has shown, a large body of medical and scientific data reveals that older adults only have substantially higher medical costs if their aging process is marked by poor health and disability.<sup>24</sup> While it is true that these conditions often increase as one ages, this correlation is often avoidable. With the right medi-

RESEARCH SHOWS THAT COSTS associated with pneumococcal disease in the U.S. and Western Europe are high and preventable. Vaccines have a low level of priority among general practitioners due to insufficient awareness of both the risk of disease and its potential impact on individuals' health, the healthcare system, and society at large.

cal interventions and wellness programs – including life-course immunization – individuals have greater opportunity to age in good health.

Immunizations have greater health benefits than is commonly believed. The CDC's definition of immunization captures (and perpetuates) the standard line of thinking: an immunization is the “process by which a person or animal becomes protected against a disease,” and a vaccine is a “product that produces immunity therefore protecting the body from the disease.”<sup>25</sup> In other words, immunizations stimulate the body's immune system to prevent infectious disease. In older populations, this is especially valuable, as the elderly often suffer from immunosenescence, or the gradual deterioration of the immune system. This element of “protection”

and “immunity” is highly valuable, but there are also other, lesser-known health benefits.

First, some vaccines do more than prevent infection; they can also prevent more severe conditions that can arise long after the initial infection (e.g., liver cancer associated with hepatitis B infection).<sup>26</sup> Second, there is evidence to suggest that vaccines can provide a tool for reducing disease caused by drug-resistant strains by reducing antibiotics that people must take throughout their lives.<sup>27,28</sup> Third, vaccinations can lead to a “herd effect” – a phenomenon in which even people who are not immunized are protected against infectious diseases because large numbers of people around them have been vaccinated. High-coverage leads to a “herd” or “indirect” effect for communities and groups of people.<sup>29,30,31</sup>

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From a historical perspective, the success of large-scale immunization programs is unequivocal. Immunizations are responsible for eradicating or significantly reducing the prevalence of many serious diseases, such as smallpox and polio.<sup>32</sup> More currently, a number of studies have shown how organized immunization programs produce superior health outcomes. One recent study examined influenza vaccination over a 10-year period and found a 27 percent reduction in the risk of pneumonia or influenza as well as a 48 percent reduction in the risk of death.<sup>33</sup> It is also becoming standard practice to recommend vaccines for those attending “global gatherings,” like the Olympic Games or the World Cup.<sup>34</sup>

Further evidence has also been found to support the health and economic benefits of vaccination in adults. One study measured the value of preventive services by two criteria – health impact and cost effectiveness – and found that influenza immunization and pneumococcal immunization rank among the best preventive health services, as highly as smoking cessation and cancer screening.<sup>35</sup> While the study only accounts for immunizations against influenza and pneumococcal disease, other evidence suggests the efficacy of immunizations against herpes zoster, pertussis, and hepatitis B.<sup>36,37,38</sup> It is unfortunate that the results of these studies

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have not had much impact on policymakers and other decision-makers. The main reason, we believe, is that their findings remain relatively hidden in specialized academic journals, and much of the conversation about them is esoteric and inaccessible to non-scientific readers. It is the goal of this paper to bring greater attention and awareness to these studies, and to open their implications to exoteric audiences so that they can be brought to bear on policy dialogues and decision-making processes. This type of analysis, we hope, can spark new, politically endorsed momentum in this line of research, and open a new conversation about adult immunization that recognizes not only the health and social benefits, but also the economic benefits.

## POLICY PRIORITIES FOR LIFE-COURSE IMMUNIZATION

Throughout this paper, we have suggested the strengths and shortcomings of the current policy landscape as it applies to adult immunizations. Below, we discuss six policy goals that can help bring adult immunizations into healthy aging initiatives and create mechanisms that will increase our understanding of the potentials and usages of adult immunizations.



### Policy Goal 1: Increase awareness regarding the health benefits of life-course immunization.

While all stakeholders should be made aware of the health benefits of adult immunization, the first targets should be healthcare professionals and employers, employee groups, and unions.

#### Healthcare professionals

The recommendation for adult vaccines from physicians and other healthcare professionals is integral to increasing the rates at which adults are immunized. Research has shown that physician recommendations have been critical to the success of childhood immunization, and similar influence is needed to improve adult immunization rates.<sup>39</sup> Currently, physicians and other healthcare providers do not have adequate knowledge of the health and economic benefits of adult immunizations; they lack awareness of both the vaccines and their key roles and responsibilities in implementing vaccination policies.<sup>40</sup>

Education and training programs for physicians and other healthcare professionals could increase the understanding of the health outcomes of immunizations and their cost-effectiveness. Incentives should be provided to physicians and targets

should be established so that immunizations become a routine part of wellness visits for all older adults, and especially at-risk adults. Payers, too, can incentivize physicians and physician groups to meet target levels by providing both financial rewards and administrative assistance through performance measures. Certain U.S. healthcare companies are currently piloting such wellness incentives, and adult immunizations should become a component of these programs.

#### Employers, Employee Groups, and Unions

Employers, both public and private, have a significant and often under-appreciated role in offering and promoting preventive services, such as vaccination. Employee groups and unions, too, have a vital role to play. Recent studies have shown the value in employers and other labor organizations promoting wellness, and life-course vaccination should become part of these initiatives. Currently, however, there is a lack of data to make the case for the impact of vaccine-preventable diseases. The value-proposition could be made more persuasively with data about both absenteeism and presenteeism (attending work while sick) as a consequence of vaccine preventable diseases. As we have seen





VACCINE SCHEDULES are complex and often contradictory.



with Alzheimer's and other chronic diseases, workers are often pulled from the workforce as they act as caregivers for loved-ones, and their productivity suffers when they continue to work while sick or unwell. Better data on lost productivity through absenteeism and presenteeism would give a more accurate sense of the total costs of influenza, pneumococcal disease, and other vaccine preventable diseases.

**Policy Goal 2: Establish or enhance existing surveillance systems to determine and monitor the burden of vaccine-preventable diseases in adults.** National and global bodies should work together to create surveillance systems and frameworks to objectively assess immunization needs among adult populations in general and high-risk adult populations in particular. As a first step, these systems could focus on high-risk subpopulations, such as those with chronic diseases who face increased risk of contracting a vaccine-preventable disease. In the U.S. and throughout the west, minority and under-privileged populations have disproportionately high rates of co-morbid conditions. Assessing the disease burden among these

populations could make immediate impact on health spending due to the uneven amount of overall healthcare spending that goes to the co-morbid elderly population.

**Policy Goal 3: Create alignment on adult vaccination schedules.** There are a number of different bodies that issue recommendations for adult and life-course vaccination, including the Department of Health and Human Services, the Advisory Committee on Immunization Practices, the Strategic Advisory Group of Experts (SAGE) on Immunization, and more. These recommendations fail to align on adult immunization recommendations, and they create confusion for both patients and healthcare providers. Vaccine schedules, consequently, are complex and often contradictory, and many patients are unaware of what vaccinations they need and the schedules upon which they should receive them. Physicians and other healthcare providers are often just as confused. Alignment could lead to clearer vaccine schedules, thus enabling physicians, payers, and other stakeholders to more easily adhere to immunization recommendations.

**Policy Goal 4: Integrate adult immunizations into Electronic Medical Records (EMRs) and create an adult immunization registry.** As EMRs become more common, they should include records of immunizations and provide healthcare professionals with immunization prompts. This would allow healthcare providers to see whether patients are up-to-date on their vaccinations, and it would prevent patients from being "double vaccinated."

Additionally, registries for adult immunizations should be formed. Over the past few years, registries for cancer and chronic diseases like diabetes and hypertension have been created. Similar registries should be made for high-risk adults. There is reason to believe in the efficacy of adult immunization registries. Research has found a high pick-up rate of disease registries among Physician Organizations (POs), with over 40% of POs reporting using diabetes disease registries.<sup>41</sup>

As mobile digital devices are further integrated into healthcare, EMRs and disease registries will give healthcare professionals in many different institu-

tions real-time information about a patient's immunization record, risks, needs, etc. Additionally, we may also expect that as medical records are used to support adult vaccination tracking, this usage will, in turn, prompt greater use of medical records.

**Policy Goal 5: Integrate adult vaccination in public and private payer access programs.** For adult vaccinations to become common practice, they must be reimbursed through basic insurance and payment packages. Such reimbursement will not only promote their usage, but it will also incentivize further innovation in the field. To get vaccinations as a part of reimbursement schemes, the value proposition of adult immunizations needs to be more clearly articulated. As this paper has shown, there is a good amount of evidence available, but it has yet to be collected and synthesized in a single, definitive report. Far more explicit work is also needed, and this is a major recommendation of our paper.

Research has shown that when vaccines are reimbursed, usage increases. One study in Australia found that uptake of pneumococcal vaccines, when

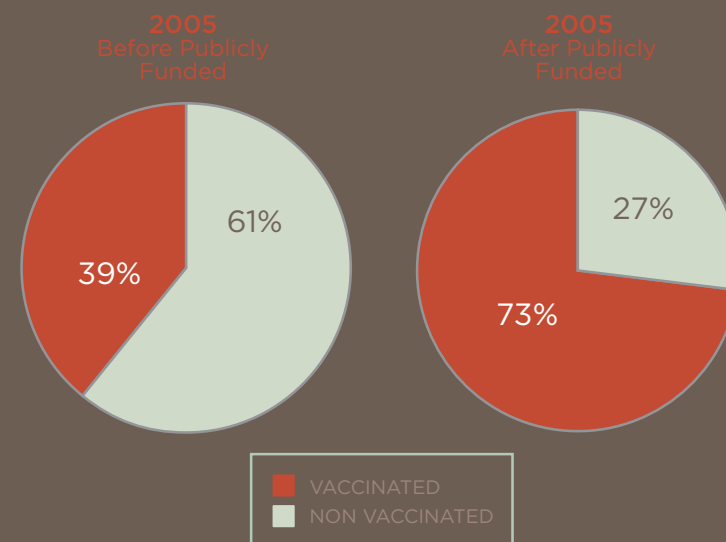


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## UPTAKE OF PNEUMOCOCCAL VACCINES Australia Example



Source: Motbey C. 2008. "Pneumococcal polysaccharide vaccination in Australia: An examination of barriers and arguments in support of the hospital based approach." Human Vaccines

publicly funded, nearly doubled within a single year (from 39% to 73%).<sup>42</sup> In a cost-conscious environment, the long-term economic benefits of adult vaccination would justify upfront costs for both public and private payers so long as the value proposition was clearly and persuasively articulated.

**Policy Goal 6: Embed adult vaccination in core preventive services for adults.** Adult immunization should become standard practice within wellness and preventive service. Research shows its efficacy ranks among cancer screenings and smoking cessation, and adult immunizations should become a mainstream wellness practice.

Leadership will be required, and the World Health Organization's Age-friendly Cities network can be an ideal leadership platform. The WHO checklist has wellness, prevention, care, and social services as part of an Age-friendly City standard, a standard to which hundreds of cities worldwide are making efforts to meet. Adult immunization should become a central and explicit part of all Age-friendly Cities. With such high-profile adoption, both the awareness of the demand for vaccinations would rise, and researchers would gain new access to data about efficacy and need.

## LEARNING FROM THE GAVI ALLIANCE

As a guide, advocates of life-course immunization can learn from and utilize the successes of childhood vaccination programs. One such program is the GAVI Alliance (formerly the Global Alliance for Vaccines and Immunization), "a unique public-private global health partnership committed to saving children's lives and protecting people's health by increasing access to immunization in developing countries." In the first decade of its existence, GAVI "has reached 257 million additional children with new and under-used vaccines, and prevented five million future deaths."<sup>43</sup> Policymakers could learn lessons from the success of GAVI as a guide for implementing mechanisms to promote a life-course approach to immunization.

Aside from the remarkable achievement of the GAVI Alliance, its methods of intervention hold particular interest for life-course immunization advocates and policymakers. One example is the "Hib Initiative," which introduced *Haemophilus influenza* type b vaccines into low-income countries. GAVI offered these vaccines after it was set up in 2000, but, according to GAVI, "uptake was slow due in part to lack of understanding of the full burden to the problem." Despite availability, people were not using the vaccines because they had limited awareness and understanding of the Hib disease burden.<sup>44</sup>

In response, GAVI set up the Hib Initiative, a program that "catalyzed the vaccine's uptake" by "collecting and disseminating existing data, [and undertaking] research and advocacy." Importantly, the Hib Initiative was built from the collective cooperation of the Johns Hopkins Bloomberg School of Public Health, the London School of Hygiene & Tropical Medicine, and the Centers for Disease Control and Prevention. Additionally, it aligned with the World Health Organization, and in 2006 the WHO recommended that Hib vaccines should be a part of all national immunization programs.

The GAVI Alliance's Hib Initiative was a success because it did more than simply increase funding for immunization. Critically, it created a robust communications campaign that both raised awareness and showed the benefits of immunization. And this campaign built from the cooperation and alignment of key influential institutions. As policymakers and advocates discuss ways to further life-course immunization programs and policies, the Hib Initiative can provide a model of success. More broadly, GAVI is a spectacular example of cooperation between national governments, highly visible thought leaders from public and private sectors, the global health community, and the media. A similar coalition is now needed for life-course immunization.



CONCLUSION

Over the last couple of years, health and aging experts have made significant strides in rolling out plans for healthy aging initiatives. From President Obama’s pledge to end Alzheimer’s by 2025 to the United Nations historic summit on NCDs, national and global health leaders have pioneered new paths for healthy aging.

Conspicuously missing from these efforts is a campaign for life-course immunization. As this paper has detailed, this is a major oversight. With 21.8 percent of the global population over 60 by mid-century, it will be imperative to forge new paths for healthy aging so that younger generations are not forced to carry the burden of poor health policies. Adult vaccinations are a health- and cost-effective method for achieving better outcomes across the life course.

In the introduction of this paper, we acknowledge the relative paucity of data about adult immunizations, and we note the regrettable absence of adult immunizations from global policy dialogues. We firmly believe that now is the time for this to change. In this paper, we have attempted to bring together the many, separate strands of the argument and insight for adult immunizations to start a new conversation that brings esoteric knowledge about adult immunizations to exoteric audiences. It is time for policymakers around the world to put life-course immunization at the top of their agendas. Adult immunizations can drive healthy aging and support social and economic success in the 21st century.

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### ABOUT THE GLOBAL COALITION ON AGING

The Global Coalition on Aging (GCOA) 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 communication, GCOA is advancing innovative solutions and working to ensure global aging is a path for fiscally sustainable economic growth, social value creation and wealth enhancement. For more information, visit [www.globalcoalitiononaging.com](http://www.globalcoalitiononaging.com).

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