Global Coalition on Aging

Vaccine-Preventable Respiratory Disease, Life Course Immunization, And Chronic Disease Management:

The Healthy Aging Difference

APRIL 2025

Executive Summary

On December 10th, 2024, the Global Coalition on Aging convened a small group of global experts from across noncommunicable disease areas (NCDs), life course immunization, healthy aging policy, economic and fiscal policy, and patient advocacy for an interactive discussion on the growing body of evidence connecting NCDs and vaccine-preventable respiratory diseases (VPRDs). The experts spoke to the urgency for health systems and governments to interrupt the rising trajectory of NCDs and support better NCD management and care amid the context of population aging, and of available levers for individuals, healthcare systems, and governments across the world to reduce the burden, impact, and economic costs of NCDs through measures including life course immunization.

The themes from the discussion have informed this report and the core set of priority actions to leverage immunization for adults as a key strategy for NCD management, making healthy aging more accessible and sustainable across Europe.

This roundtable and report were funded by Pfizer.

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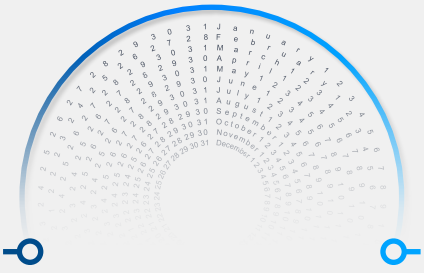
Overview

Each year, deaths due to noncommunicable diseases (NCDs) represent 74% of all deaths globally—more than 41 million—with expensive and devasting impacts on adults of all ages, and extending far beyond health alone.[1] As these impacts grow both in cost and burden amid global population aging, new and innovative solutions are required to help manage and prevent NCDs. Vaccine-preventable diseases, particularly respiratory infections (vaccine-preventable respiratory disease, or VPRD), are an underrecognized yet highly modifiable risk factor for both new and worsened NCDs, and the evidence is growing. This introduces a simple opportunity to intervene, which remains underutilized around the world: deploying immunization for adults as an integral part of NCD prevention and management.

NCDs—which include cardiovascular diseases (CVD), chronic respiratory diseases, cognitive impairment, diabetes, cancer, and other conditions, many associated with aging—are a huge drain on healthy aging. They are also very expensive globally, to healthcare systems and individuals directly, as well as indirectly to the economy, through decreased productivity. For the period spanning 2011 to 2030, NCDs are projected to cost the global economy in excess of USD $30 trillion and currently comprise the largest share of healthcare costs among OECD countries.[2,3] With the global population rapidly aging, this expense will grow, perhaps exponentially.[4]

74% GLOBAL DEATHS DUE TO NCDs

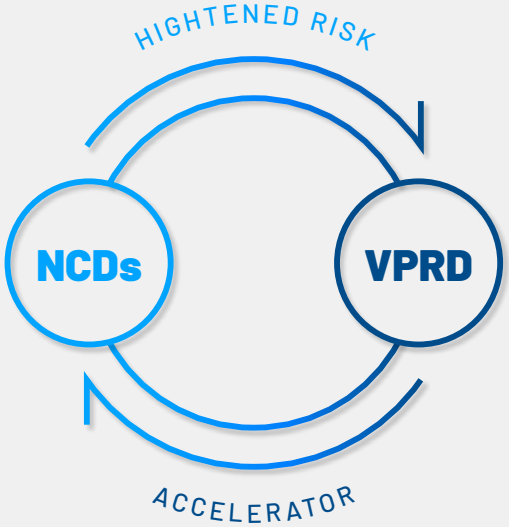


$30T NCDs COST TO GLOBAL ECONOMY

At their core, NCD and chronic care management have the goals of reducing the risk of and slowing disease progression, as well as lowering the likelihood of complications. To improve individuals' health outlook, as well as manage the demands on healthcare and economic systems, which include meeting the UN 2030 Sustainable Development Goals and the related Decade Of Healthy Ageing, strategies to successfully prevent and manage NCDs must be implemented.[5] This is becoming ever more urgent amid global demographic aging, as more than two-thirds of all older adults have multimorbidity, and this share increases with age.[6]

Success in the fight against NCDs is challenging and expensive for many reasons, not the least being the complexity of genetics, environmental, behavioral, and physiological factors that underly each and every NCD, making it difficult to pinpoint a targeted, yet broad public health lever. Further, many of the modifiable risk factors for NCDs, such as poverty and poor air quality, must be tackled at the population level to impact even a single individual's health, introducing further logistical challenges.

It is essential, therefore, to look at policies and practices—from national to local, for example, through WHO Age-Friendly Cities—that can be modulated at the individual level, where efforts to reduce the risk of new and worsening NCDs can then tally to a larger, collective effect. Adult immunization is one such strategy with potentially huge benefit; vaccines that help protect against severe respiratory infections can help prevent clinical onset of new NCDs, as well as ease management of existing ones, while, importantly reducing the severity and risk of VPRDs, which themselves can have devastating impact.



NCDs and VPRDs exist in a circular dynamic: Those living with NCDs are at a heightened risk of contracting a VPRD, and with more severe effects.[7,8] Conversely, NCDs can be worsened by a VPRD, particularly respiratory diseases, and may spur on the development of a new NCD—effectively, acting as an accelerator of aging.[9,10] Increasing uptake of immunization against respiratory infections could prevent both the emergence and worsening of NCDs, while reducing both the risk and severity of the initial infections themselves—collectively benefiting both individual health and healthcare systems.

Yet, country-level recommendations for life course immunization vary widely, and the guidance for adults is not comparable to immunization guidelines for children in their scope or clarity. In much of Europe, immunizations against respiratory infections for adults are recommended for those aged 65+, while in Italy and Germany, with rapidly aging populations, the guidelines are for those aged 60+. Clear guidance is important: in locales without age-based recommendations, uptake of immunization in adults is decidedly lower.[11] In areas where guidelines or recommendations are in place, funding is often lacking.[12]

Divergent immunization recommendations between those aged under 65 with and without NCDs create challenges for both individuals and healthcare providers to navigate what immunizations are actually needed.

Now is the time to update guidelines for life course immunization, in conjunction with investments in the necessary infrastructure to enable access. As we approach the midpoint of the United Nations Decade of Healthy Ageing and look to the United Nations General Assembly High-Level Meeting on Non-Communicable Diseases in 2025, routine adult immunization must be clearly delineated as a key lever within the NCD pathway and encouraged to healthcare providers, older adults, and their families, with the same gusto that is afforded to childhood vaccination programs. By supporting immunization across the life course, the burden of chronic disease associated with VPRDs can be lessened, as well as the burden of respiratory infections, which together will decrease economic and health system costs, and people living with NCDs can be better supported in their health management—maintaining their functional ability, intrinsic capacity, and independence—ultimately, allowing for healthier longevity.

The Case For Action

Adults are under-vaccinated and older adults disproportionately bear the burden of NCDs, highlighting the increased susceptibility to VPRDs and providing evidence of the underlying structural ageism built into our health systems and policies.

Ageism often means that the disproportionately high prevalence of NCDs in older adults is dismissed as simply a normal part of aging. It isn't and doesn't have to be—routine immunization against respiratory disease can challenge this belief by helping to manage and prevent NCDs.

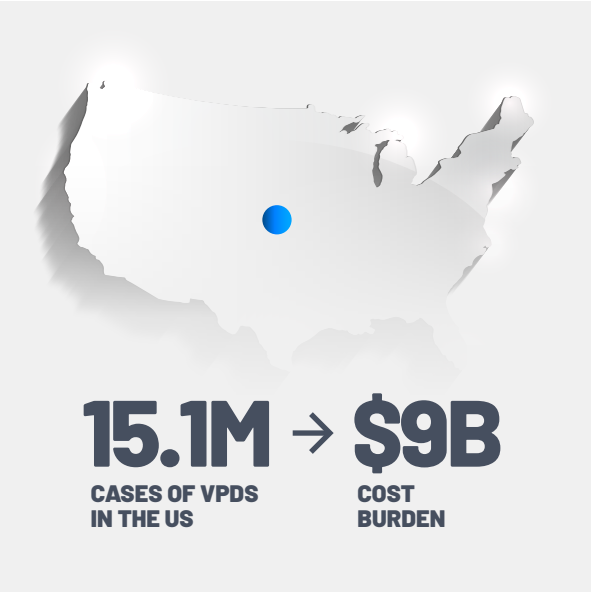
Effective management of NCDs is key to individual health, healthy aging, and reducing unnecessary healthcare costs. Many NCDs increase the risk of severe disease from infections, and infections can exacerbate chronic conditions like CVD, diabetes, asthma, and, emerging research suggests, cognitive impairment and decline.[13,14] In the Action Plan for the Prevention and Control of Noncommunicable Diseases in the WHO European Region (2016-2025), immunization and the implementation of national immunization schedules, particularly for older people, is highlighted as a specific pillar to prevent the development and exacerbation of NCDs, but this guidance has not yet led to the needed policy, infrastructure, and behavioral changes in the population.[15]

As a group, adults remain under-vaccinated, particularly for respiratory diseases perceived as routine, such as influenza, respiratory syncytial virus (RSV), pneumoccocal disease, and COVID-19. This has led to a higher incidence of VPRDs than would otherwise occur. Not only does this add excess burden on the healthcare system and the economy, it also negatively impacts an individual's health status and ability to achieve healthy aging—particularly those who are already managing, or at high risk for, an NCD.

According to a recent report from the Office of Health Economics, adult immunization programs are highly cost-effective, returning up to 19x their investment when accounting for societal benefits.

Source: Office of Health Economics, 2024

Under-vaccination in adults additionally has huge costs. In 2015 in the United States alone, 14.1 million cases of VPDs, largely VPRDs, were attributed to unvaccinated adults, which had an associated cost burden of USD $9 billion arising from both direct healthcare costs as well as productivity losses.[16] A staggering USD $1 trillion in lost productivity due to preventable conditions was estimated across G20 nations, in 2019, and this number has almost certainly grown since the COVID-19 pandemic.[17] On the individual level, a severe respiratory infection can be devastating and lead to a cascade of decline, even death. Despite this, uptake of respiratory infection vaccinations among adults, particularly older adults, is not improving.[18] Further, respiratory infections are often underdiagnosed, meaning that the true burden of disease is unknown, potentially contributing to the undervaluation of immunizations that can prevent or reduce the severity of respiratory infections in the first place.[19]



In addition to the higher risk of contracting a respiratory infection, those living with NCDs are at higher risk for more severe effects, including poorer health outcomes during the infection, as well as afterwards—both acute and chronic.

Individuals managing NCDs are at heightened risk of infection and are more likely to be older adults. Multimorbidity, referring to the coexistence of two or more chronic health conditions, increases with age, with over 80% of those 85 and older having multimorbid conditions. This further increases older adults' susceptibility to VPDs and adds urgency to the need to manage NCDs, as they can increase the severity of a respiratory infection.[20] In one study, nearly all adults who were hospitalized with COVID-19 had at least one underlying medical condition, demonstrating the importance of immunization as a preventative measure.[21] Other studies have shown that people living with diabetes disproportionately suffer from severe respiratory infections—with over half of the group affected, compared to only 10% of non-diabetic patients, with much higher mortality due to lung infections.[22,23]

Respiratory disease can alter the health status of an individual even after the infection has occurred. Both rates of death and other adverse health outcomes across multiple systems are high and severe following a hospital admission for COVID-19 or seasonal influenza.[24,25]

> One thing that we need to change is what we consider a vaccine failure. Traditionally, in our vaccinology approach, if I give you the influenza vaccine and you get influenza, the vaccine failed. But in reality, the vaccine is not just against the acute event of influenza. It's the acute sequela, the chronic sequela—and all these studies that prove that the influenza vaccine decreases incidence of myocardial infarction suddenly don't count if the patient during the same winter has [a mild case of flu]. If you have a mild case of influenza, versus influenza in the intensive care unit, the level of inflammation in the body is completely different. It is not a vaccine failure to prevent an acute myocardial infarction."
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> **Dr. Julio Ramirez,** Chief Scientific Officer, Norton Healthcare, Emeritus Professor of Medicine, Division of Infectious Disease, University of Louisville, Kentucky

Infection with a VPRD can permanently alter the health status of those previously managing NCDs successfully, as well as spur the development of multi-system comorbidities and conditions associated with the aging process.

Infections have been demonstrated to dysregulate an individual's microbiome, which in turn can affect bodily function and could lead to the emergence of new or worsened NCDs, particularly CVDs, cancer, chronic respiratory diseases, diabetes, and more.[26] Disruption to the lung microbiome caused by preventable respiratory disease can lead to pneumonia, which has its own set of acute and long-term consequences. The gut microbiome also plays a large role in systemic immunity, as 70-80% of immune cells are localized to the gut, further emphasizing the outsized effect of dysregulation caused by a VPRD.[27,28]

Infection with a VPRD, can have outsized and permanent effects on an individual's health status, across organ systems (neurological, renal, pulmonary, cardiovascular, musculoskeletal, metabolic). In turn, this has significant consequence to healthy aging and can create new or greater frailty, reduce functional ability and intrinsic capacity, and decrease life expectancy.[29] This process creates a "new normal" of decreased health status and higher dependence on the healthcare system, which has negative implications for both healthcare spending and healthy aging. This increased frailty then leads to elevated risk of respiratory infection, beginning the cycle anew.

> The influenza virus can severely affect the cardiovascular system, firstly, by having a direct effect on the heart and on the vessels...and leading to heart failure or myocardial infarction. Influenza can also cause a pro-inflammatory response and a lot of changes that increase the incidence of myocardial infarction and heart failure. During the first two weeks after influenza infection, the risk of having a stroke is very high for young people, and this increased risk persists a long, long, time—60 days post-infection—for older adults."
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> **Dr. Jean-Pierre Michel,** Director, International Association of Gerontology and Geriatrics-World Federation of Geriatric Education

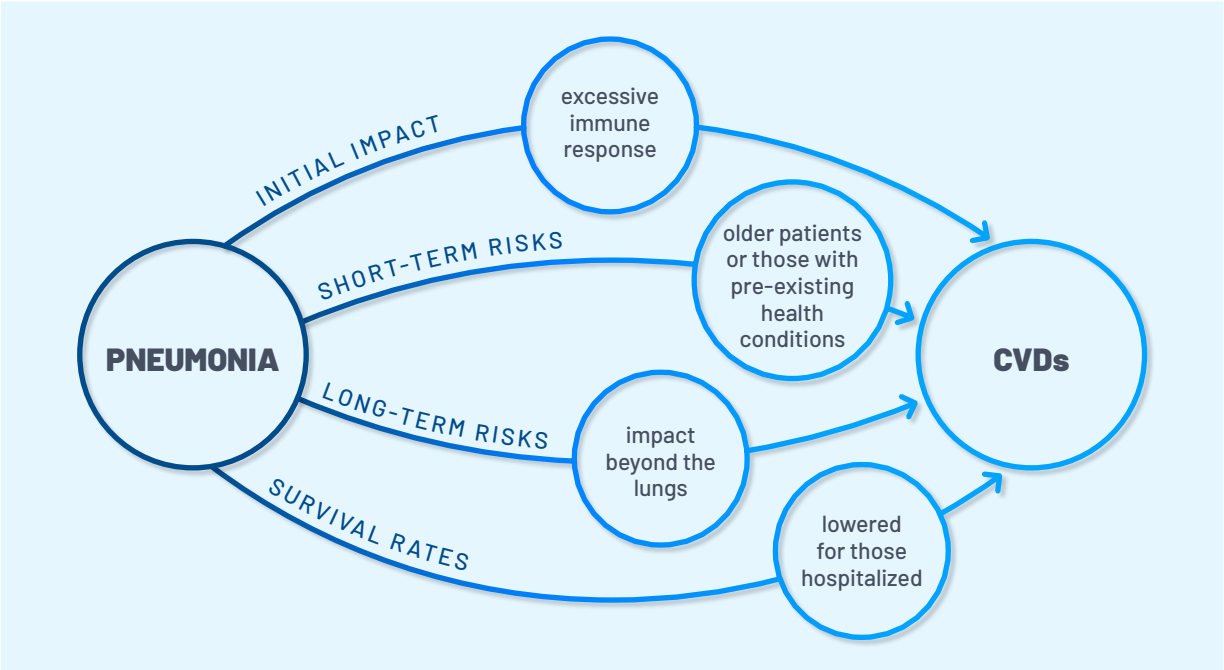
The pathway from pneumonia to cardiovascular disease

Vaccine-preventable respiratory diseases like pneumonia can have far-reaching effects, beyond just the lungs—developing into chronic NCDs and worsening both health and survival in the near-term and long-term following an infection.[30,31,32]

Initial Impact of Pneumonia	When someone contracts community-acquired pneumonia (CAP), their body responds with a strong immune reaction. This is usually a good thing, as the body tries to fight off the infection. However, in severe cases, the immune response can become excessive and harmful. This can lead to complications such as sepsis, septic shock, and even organ failure, including heart failure.[33]
Short-Term Risks	Studies have shown that pneumonia patients, especially those who are older or have pre-existing health conditions, are at a higher risk of experiencing cardiac complications shortly after their pneumonia diagnosis. These complications can increase the risk of death in the short term.
Long-Term Risks	Beyond the immediate dangers, pneumonia has been linked to an increased risk of cardiovascular diseases in the long run. This suggests that pneumonia may not only impact the lungs but also set the stage for future cardiovascular issues, developing into an NCD.[34]
Survival Rates	Long-term survival rates for individuals hospitalized with pneumonia are lower compared to those who haven't had pneumonia. This decreased survival is more pronounced in patients who are older or have other underlying conditions, like an NCD.[35]

Overall, pneumonia doesn't just pose a risk to the lungs; it can lead to serious and prolonged complications affecting the heart and overall health. Preventing pneumonia, and other respiratory infections, through routine adult immunization can help to better prevent and manage these risks of developing or worsening CVD.

THE PATHWAY FROM PNEUMONIA TO CARDIOVASCULAR DISEASE



Diabetes as a complicating risk factor in chronic respiratory conditions

Diabetes is another key example of the circular NCD and VPRD pathway, as well as the importance of managing these risks. One in ten adults are currently living with Type 2 diabetes, with three-quarters in low- and middle-income countries and associated health expenditures of nearly USD $1 trillion per year. Both prevalence and expense are expected to increase sharply in coming decades, along with the aging of the global population.[36] As an immune-related condition, individuals living with diabetes are at sharply increased risk of severe respiratory infections that can have devastating effects.[37,38]

Diabetes as a Risk Factor for Infection

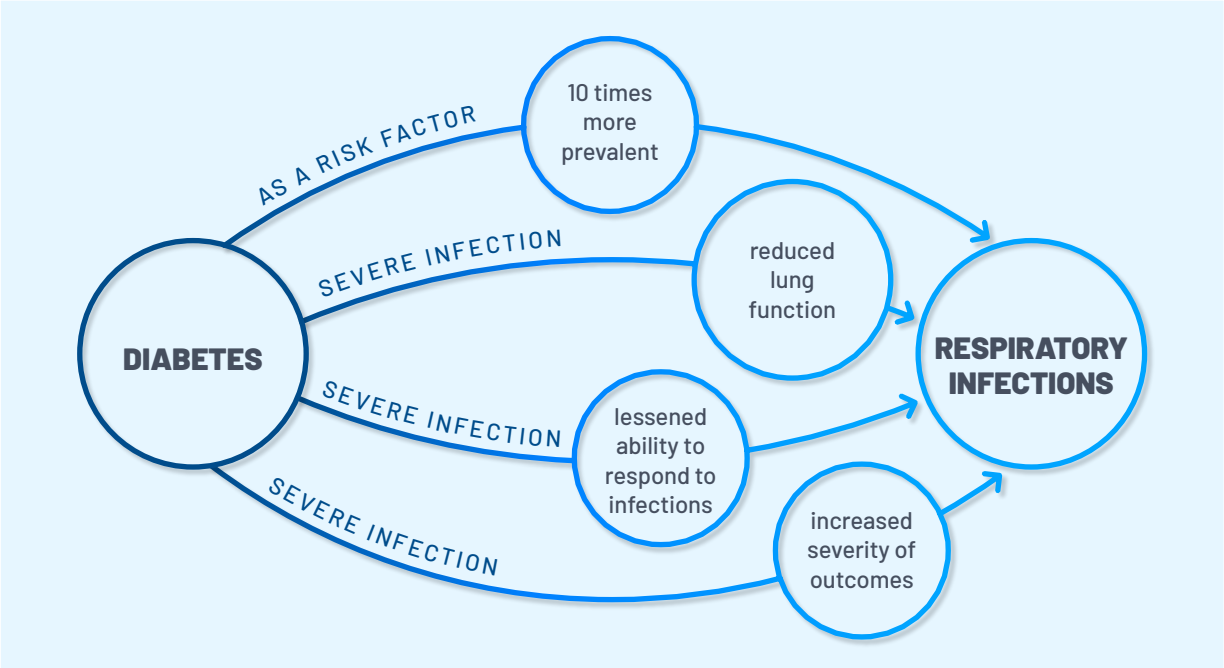
Diabetes is an NCD that is characterized not only by high glucose in the blood due to insufficient insulin but also by chronic low-grade inflammation.[39] Along with genetics and behavioral factors, aging is one of the key risk factors for Type 2 diabetes, the most prevalent form of the condition.[40] In a longitudinal study, respiratory tract infections and asthma were found to be 10 times more prevalent in those with Type 2 diabetes compared to those without.[41]

Diabetes and Severe Infection

Because of the metabolic stress and effects on the immune system, as well as the increased prevalence of asthma, people living with diabetes may have a lessened ability to respond to infections, increasing the risk of contracting a severe respiratory infection as well as severity of outcomes.[42,43] These severe outcomes that are exacerbated by the underlying diabetes have the potential to further weaken a person's baseline health status—Type 2 diabetes has been shown to causally reduce lung function—putting them at higher risk of contracting an infection again in the future.[44]

Diabetes is not localized to the pancreas—it is a whole-body condition that elevates the risk of severe respiratory infection and raises the risk of chronic respiratory conditions like COPD and asthma. Integrating routine adult immunization as part of one's diabetes management is essential to cutting off this cycle of severe health risks and healthcare system strain.[45]

DIABETES AS A COMPLICATING RISK FACTOR IN CHRONIC RESPIRATORY CONDITIONS



> “Vaccines are part of a whole life course approach, and we need to think of that in a much more integrated way. And so, we shouldn’t be just developing solutions which target one single risk factor and think that’s solving the problem. We actually should be developing a much more integrated, community-based approach to promoting health across the life course.”

Dr. John Beard, Irene Diamond Professor of Epidemiology and Health Policy and Management, Columbia University; Director, International Longevity Center-USA

Routine immunization is a key but underrecognized input to infectious disease prevention and NCD management. Routine immunization, particularly against respiratory infections, should be emphasized in clinical guidance and care pathways for NCD management and prevention.

Life course immunization guidelines vary significantly and are not on par with those offered for children. The lack of attention paid to adult immunization constitutes a health equity issue that ultimately affects uptake.[46] To address this issue, immunization guidelines must be updated, clearly establishing routine adult vaccination against respiratory infections as a fundamental component of the NCD management pathway.

Further, these updated guidelines should be made readily accessible to healthcare providers, older adults, and their families to promote higher uptake of immunization. Supporting lifelong routine immunization against VPRDs as part of a broader NCD prevention strategy can decrease economic and health system costs and improve the management of NCDs, ultimately helping individuals maintain their functional ability, intrinsic capacity, and independence, fostering healthier longevity.

> It is very important to have campaigns targeting healthcare professionals, but it's also necessary to go to the root of that and trying to improve medical curricula."
>
> **Jaber Oufkir**, Liaison Officer for Public Health Issues, International Federation of Medical Students' Association

> A lot of the decision-making at a consumer level around vaccines, unfortunately, is not based on data, and we need to consider that. There is a lot of emotion involved here, and all the data in the world may not overcome that. So, in addition to health literacy and simple language, I think we need to do a lot of work around trying to figure out what those touchpoints are, so we meet people where they are and help them make an informed decision that benefits their health."
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> **Candace DeMatteis,** Director of Policy, Partnership to Fight Chronic Disease

A Call To Action

As governments look towards the United Nations General Assembly High-Level Meeting on Noncommunicable Diseases in 2025, it is imperative that stakeholders call for actions that will leverage the value of adult immunization for the prevention and better management of NCDs. Decision-makers across governments, health systems, and society should set the following priorities for action:

1. Update 21st century health policies to invest in prevention, and ensure parity in investment, infrastructure, and targets for vaccines for adults as with for children.

2. Embrace a shift from the traditional mindset to reframe vaccinology—success in immunization should not be measured only by complete prevention infection, but also by reducing severe outcomes and their impact on chronic conditions.

3. Reflect in national vaccination policies the added urgency to vaccinate adults, especially older adults, to help protect against VPRDs, as well as prevent the negative impact on NCDs.

4. Embed adult vaccination literacy and education across the healthcare provider and patient advocacy ecosystems and at the community level, for example through the WHO's Global Network of Age-friendly Cities and Communities, to establish uptake of vaccines against respiratory infections as a key strategy to reduce the impact and cost of NCDs for individuals and communities.

5. Undertake additional research and analysis investigating and further validating the relationship between respiratory infection impact on NCDs and the aging process.

6. Organize across multiple disciplines to form a society-wide consensus on the importance of adult vaccine uptake for the workplace and the overall value to the economy.

Integrating routine adult immunization against respiratory infections into NCD management and prevention offers a promising opportunity to reduce the burden of these diseases and improve overall health outcomes to support healthy aging, while decreasing economic and health system costs, imperatives for governments and societies everywhere as they experience rapid population aging.

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