



Short Commentary

Adult Respiratory Pathogens Vaccination: A Neglected Public Health Intervention in Africa

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Abstract

For several decades, vaccination of vulnerable persons against respiratory pathogens such as Influenza and pneumococcus has been implemented in most developed countries. In Africa vaccination against these pathogens is almost nonexistent yet there are persons eligible for these vaccines. In this perspective I review the current state of Influenza and pneumococcal vaccination in Africa and identify key barriers to these vaccinations. I conclude with recommendations and a call to action for prioritizing vaccination of eligible persons against Influenza and pneumococcus in Africa.

Keywords: Africa; Influenza; Pneumococcus; Vaccines

Introduction

The respiratory system is highly prone to colonization and infection with various pathogens due to its anatomy and direct contact with the environment. An average adult human breathes about 10 liters of ambient air per minute. Common respiratory pathogens include influenza virus and its zoonotic sub-types, respiratory syncytial virus [RSV], coronaviruses [SARS-CoV-2], Streptococcus pneumoniae, Haemophilus influenzae, Pneumocystis jirovecii and Aspergillus species.

Burden of Respiratory Infections

Respiratory infections are among the leading causes of acute illness and mortality worldwide, being responsible for nearly 4 million deaths annually, the majority of which occur in infants and children and other vulnerable groups such as the elderly, people with chronic cardiopulmonary diseases and those who are immunosuppressed. According to a study published in 2015, the mean annual influenza-associated respiratory Excess Mortality Rate (EMR) ranged from 0.1 to 6.4 per 100 000 individuals for people younger than 65 years, 2.9 to 44.0 per 100 000 individuals for people aged between 65 and 74 years, and 17.9 to 223.5 per

100 000 for people older than 75 years. [1] The highest overall mortality rates were estimated in Sub-Saharan Africa (SSA) (2.8-16.5 per 100 000 individuals), South-East Asia (3.5-9.2 per 100 000 individuals), and among people aged 75 years or older (51.3-99.4 per 100 000 individuals) [1].

Interventions to Reduce The Burden of Respiratory Infections

One of the interventions to reduce the burden of respiratory infections is vaccination. Vaccines are available for influenza viruses, strep pneumoniae, Haemophilus influenzae and SARS-CoV2. Whereas effective childhood vaccines for pneumococcal, influenza and COVID-19, are also essential for elderly adults with specific conditions, such vulnerable population are rarely targeted in LMICs. The US Centers for Disease Control and Prevention (US CDC) recommends routine pneumococcal vaccination for adults 65 years or Older and adults 19 through 64 years old with certain chronic medical conditions or risk factors [e.g. alcoholism, chronic lung, liver, renal and heart disease, cigarette smoking, diabetes mellitus, HIV infection and other immunosuppressive disorders]. [2] For influenza, US CDC recommends influenza vaccination for nearly all individuals 6 months and older in the United States. [3] WHO also recommends influenza and pneumococcal vaccination

for adults. In its 2003 World Health Assembly resolution (resolution WHA56.19), WHO called on all United Nations Member States to immunize $\geq 75\%$ of all elderly persons and persons with chronic disease annually with influenza vaccines by 2010 [4].

Uptake of Adult Respiratory Vaccination (Influenza and Pneumococcal)

WHO reports that Pneumococcal vaccine had been introduced in 154 Member States by the end of 2021 [5]. CDC estimated that 67.5% of US adults aged 65 years and older are vaccinated against pneumococcal disease in 2020 while 54.0% of all adults received influenza vaccination as May 2022. [6] Among adults, the landscape of vaccine coverage for respiratory pathogens in Africa is largely unknown. A WHO/UNICEF review found that only 32% of LMIC had influenza vaccine programmes. [7] A recent analysis of global influenza vaccine rates (IVR) that included 522 studies from 68 countries/regions found IVR in the general population was 24.96%, for individuals with chronic diseases was 41.65%, for healthcare workers 36.57% and for pregnant women was 25.92%. [8] Notably, data on vaccination rates for African countries were absent from this analysis due to absence of primary data, unshaded sections in, NA. The same data gap applies to the recent respiratory pathogen (COVID-19) for which rates for Africa has lower vaccination rates than other parts of the world (49.9% vs. 67.9%). [9,10] There are several reasons why these vaccines have been poorly adopted in Africa. These include uncertainty among healthcare professionals regarding the efficacy, indications, and use of the different pneumococcal vaccines and lack of resources and lack of experiential evidence since very few of the trials introducing these vaccines have been conducted in Africa. [11] The poor access to adult vaccines is against the WHO's immunization agenda 2030 (IA2030) which envisions a world where everyone, everywhere, at every age, fully benefits from vaccines to improve health and well-being. [12] IA2030 targets to achieve 500 introductions of new or under-utilized vaccines in low- and middle-income countries, only 22 were realized in the year 2020 [12].

Population Sizes of Respiratory Pathogen Vaccination Eligible Population in Africa (Influenza and Pneumococcal)

Despite low rates of respiratory pathogen vaccine coverage in Africa, the number of persons eligible based on international recommendations above is substantial. Considering persons older than 65 years, Africa is experiencing increasing life expectancy. In the year 2020, the proportions of persons 65 years and older was 5.6%. [13] Although this is lower than the North America 23.4% it translates into 74M people. It is estimated that by 2050 Africa will have 235M older people, a growth that will surpass most other regions. It is well known that African has the highest number of

people living with HIV (PLWH) one of the conditions at high risk of respiratory infection in who vaccination is recommended irrespective of age. Another special population for vaccination irrespective of age is people with Chronic Respiratory Diseases (CRD). The burden of CRD is highest in Africa and is increasing driven by risk respiratory exposures such urban air pollution and indoor air pollution and persisting malnutrition and poverty in rural areas. In one study in Uganda in which we conducted a population survey of chronic respiratory diseases (asthma, COPD, bronchitis and restrictive lung disease incorporating quality assured spirometry) we found that 20% of the population surveyed had one these diseases [14].

Conclusions

The burden of adult respiratory infections in Africa is high. According to current international recommendations millions of persons are eligible for vaccination but vaccination is almost nonexistent in most countries. The lack of uptake of vaccination is driven by lack of belief in the efficacy of these vaccines, unavailability of data on the true burden of these diseases, resource limitations and health systems not tailored to adult vaccination.

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