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What Does Severe Acute Respiratory Syndrome Coronavirus 2 Mean for Global Pneumonia Prevention, Diagnosis, and Treatment?



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This year, for the first time, World Pneumonia Day will be held during a global pneumonia pandemic. By November 12, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is expected to cause 1.3

million deaths and by December 31, 1.9 million deaths.¹ If these deaths are counted as lower respiratory infection (pneumonia) by the Global Burden of Disease, SARS-CoV-2 could increase pneumonia mortality rates by >70% in 2020, bringing the annual death toll to 4.5 million. No other infection causes this burden of death.

The pandemic has alerted the world to the dangers of pneumonia and the threat to population health, economic progress and the achievement of the sustainable development goals set by the United Nations.² It has strained national health systems severely, exacerbated poverty and existing inequities, and threatened broader social assets, which includes peace and security.

Pneumonia deaths, unlike deaths from other leading infectious killers, generally follow a “U” shape across the life course and are highest in children <5 years old and adults over >70 years old. Although SARS-CoV-2 has not affected children severely, the indirect effects on child health from reduced access to basic health services, diversion of resources, poverty, and lock-downs have been substantial. Recent models estimate up to 2.3 million additional children could die this year due to COVID-19-related health service disruptions, 35% from pneumonia and newborn sepsis alone.³

SARS-CoV-2 already has caused a significant increase in adult deaths from pneumonia, especially the elderly. Further, the role of SARS-CoV-2 infection as an additional future cause of chronic lung diseases is unknown. Together, the direct and indirect effects of the pandemic will increase pneumonia deaths with pneumonia substantially and remain the leading cause of infectious death for many years to come.

The pandemic has revealed just how unprepared most countries have been to deal with wide-scale, rapidly increasing outbreaks of viral pneumonia. Decades of underinvestment in preventing, diagnosing, and treating pneumonia has left most countries with health systems that are not equipped or trained to diagnose and treat respiratory infections effectively. To date, no national government has implemented a specific strategy to control respiratory infections, and global support for pneumonia is limited. Pneumonia attracts just 6% of

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international development assistance for infectious diseases, of which >90% is for vaccines⁴; pneumonia research accounts for just 3% of infectious disease research spending, despite causing >25% of all infectious disease deaths.⁵

This sustained lack of investment has left huge deficiencies in community awareness, prevention, diagnosis, and management of pneumonia. Communities largely are unaware of the dangers of pneumonia, how to recognize the signs, and when and where to seek appropriate treatment.⁶ Globally, almost one in three children with suspected pneumonia are not receiving care. Many more experience pneumonia due to low vaccination coverage, high rates of malnutrition, and exposure to air pollution. More than one-half of children <5 years old are not protected with the pneumococcal conjugate vaccine; 47 million children are nutritionally wasted, and almost all are exposed to unsafe levels of air pollution. There is no rapid diagnostic test for pneumonia, and the most effective tool to identify patients with severe pneumonia (pulse oximetry) is absent in most low resource facilities.⁷ Studies have shown that access to pulse oximetry, oxygen, and antibiotics is alarmingly low.^{8,9}

However, SARS-CoV-2 has created the conditions to address some of these glaring gaps. National governments have developed plans to control the virus and are identifying at-risk populations, educating communities, equipping health facilities, and training staff. International health agencies, including the World Health Organization, United Nations International Children's Emergency Fund, the World Bank, the European Commission, and others are providing personal protective equipment, diagnostic tests, and respiratory care equipment and training. If done properly, this massive effort to control the pandemic should contribute to improved case findings and diagnoses of all-cause respiratory infections, reducing deaths among children and adults over the long term.

But governments will need to make sure that COVID-19 technologies, including diagnostic tools and therapies for respiratory care, are integrated fully into health systems and an item in national health budgets, along with vaccines, HIV/AIDS, malaria, and other national health priorities. Global health donors will need to support national governments by financing multilateral health agencies (eg, Global Fund, Gavi, Unitaid) to help fill the gaps in pneumonia control, with a special focus

on vulnerable populations: the very young and the very old and those with underlying conditions.

The next decade is critical. Countries should emerge from the pandemic with specific national strategies to control pneumonia that improve vaccination and child nutrition, reduce smoking and exposure to second-hand smoke, and indoor and outdoor air pollution. Closing the gaps in diagnosis and treatment with pulse oximetry, oxygen, and antibiotics must become health priorities. Other priorities include the development of rapid diagnostic tests for pneumonia, which include point-of-care tests and innovative financing to ensure an affordable, energy-efficient supply of medical oxygen to health facilities everywhere.

Sustained roll-out of affordable new conjugate vaccines is needed, especially pneumococcal conjugate vaccine, new vaccines against the common viral causes of childhood pneumonia such as Respiratory Syncytial Virus, which are under development. Several candidate vaccines against SARS-CoV-2 are under evaluation, and it is crucial that an affordable, effective vaccine be available and equitably distributed to all populations. Such strategies will not only reduce pneumonia deaths but also prevent the development of chronic respiratory disease, because pneumonia early in childhood leads to reduced lung function that sets the path to development of chronic illnesses.

With these approaches, every country will be in a stronger position to reduce vulnerability to another respiratory pandemic and to make rapid progress to achieve most of the sustainable development goals for health that they promised to achieve by 2030. Investment in pneumonia control is effectively an investment in pandemic preparedness against future emerging respiratory viral threats.

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