

FIGHTING FOR BREATH CALL TO ACTION

End childhood pneumonia deaths



Biggest killer, yet forgotten

Pneumonia is the world's leading infectious killer of children, claiming the lives of more than 800,000 children under the age of five every year, more than 2,000 every day.¹ It is a shocking demonstration of pervasive health inequities disproportionately affecting the most deprived and marginalised children in low- and middle-income countries. It represents a violation of children's right to survival and development, as enshrined in the UN Convention on the Rights of the Child.² Yet pneumonia has been largely forgotten on global and national health agendas. We can and must change this.

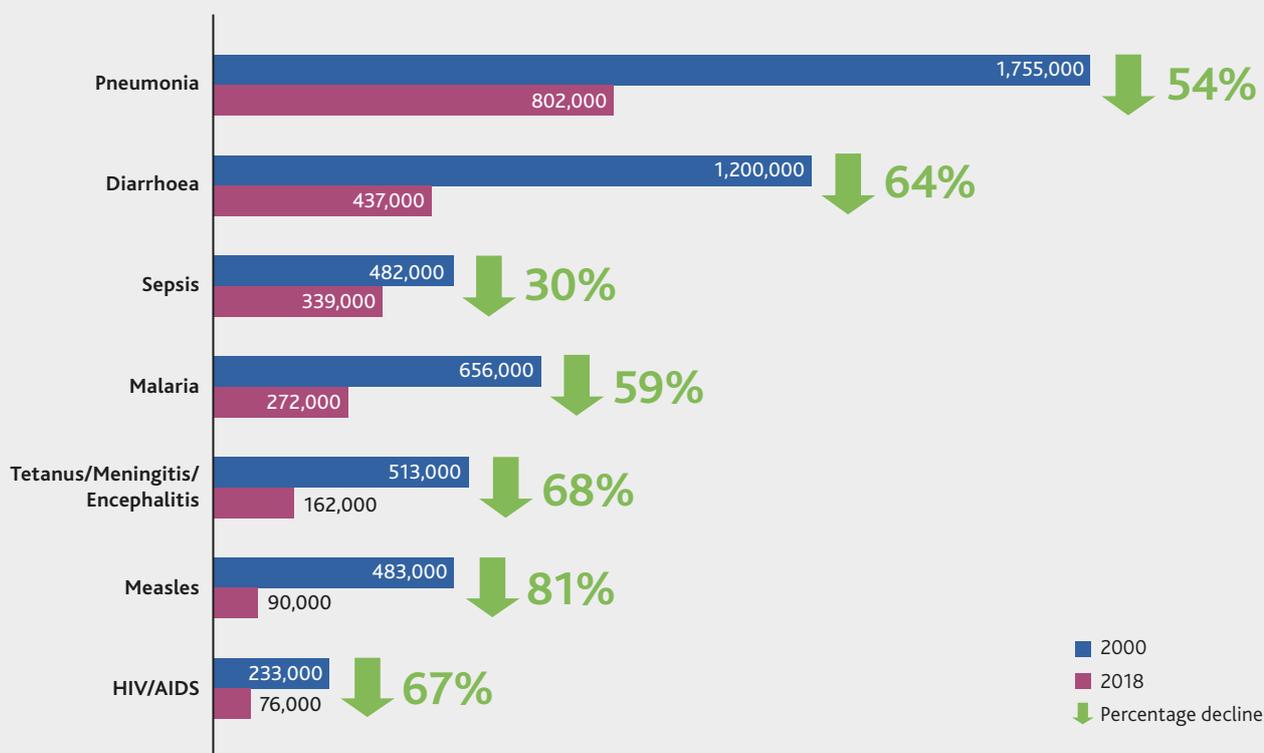
Almost all child pneumonia deaths are preventable. However, progress on reducing these deaths is slower than for most other major killers of children (Figure 1) – and too slow to achieve the Sustainable Development Goal (SDG) of ending preventable child deaths by 2030.³

Many countries are off track to reach globally agreed targets

In 2013, the World Health Organization (WHO) and UNICEF published a comprehensive global framework – the Integrated Global Action Plan for Pneumonia and Diarrhoea (GAPPD) – with the goal to end preventable pneumonia and diarrhoea deaths by 2025. It set a target of reducing pneumonia deaths in children to less than three per 1,000 live births by 2025. If current trends continue, the world will not meet this target⁴ and many countries will not reach the SDG3 child mortality target of 25 deaths per 1,000 live births.⁵

Nigeria had the largest number of child pneumonia deaths in 2018, followed by India, Pakistan, the Democratic Republic of Congo (DRC) and Ethiopia. Together, these five countries

Figure 1: Deaths of children under five by infectious disease, 2000 vs 2018



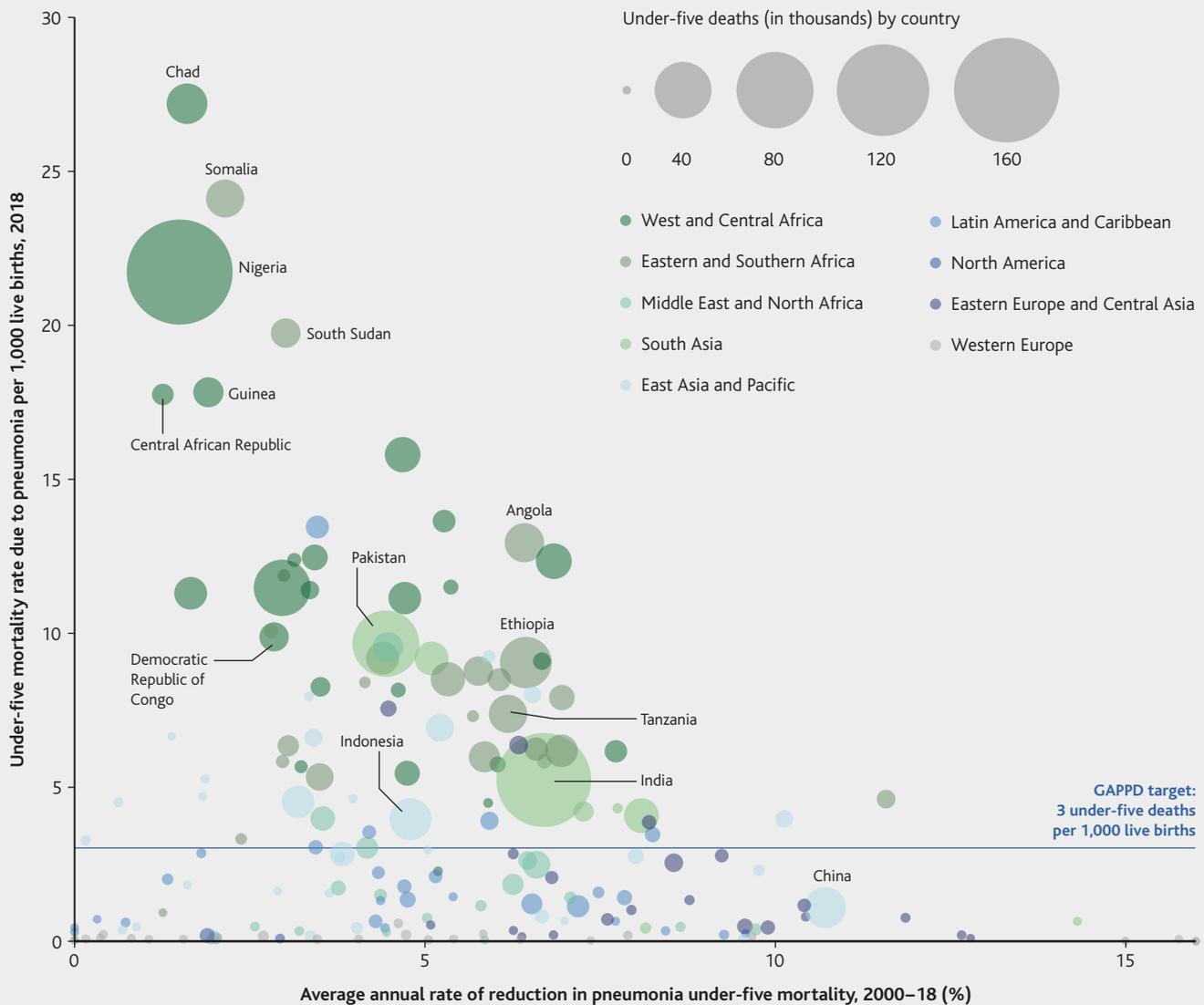
Source: UNICEF analysis based on WHO and Maternal and Child Epidemiology Estimation Group interim estimates produced in September 2019, applying cause of deaths for the year 2017 to United Nations Inter-agency Group for Child Mortality Estimation estimates for the year 2018

account for more than half of all deaths due to pneumonia among children under five years. Only three of 30 pneumonia high-burden countries⁶ – Bangladesh, Indonesia and China – are on track to achieve the GAPPD target by 2025⁷ (see Annex 1 for progress across 30 high-burden countries). The 2019 Pneumonia and Diarrhoea Progress Report Card developed by International Vaccine Access Centre (IVAC)⁸ shows that countries are not making sufficient progress and calls for greater investment in the development of high-quality data that can be collected more regularly to improve our understanding of where countries are progressing or lagging on key indicators. Figure 2 looks at how child pneumonia death rates are changing over time. The vertical axis charts the death rate and the size of the bubble indicates the number of deaths caused by pneumonia in 2018 for each country, while the horizontal axis measures the rate of decline. It shows that in too many countries with a high burden of child pneumonia deaths the rate of decline is too slow.

Children left behind

Child deaths from pneumonia are concentrated in the world's poorest countries and within these countries it is the most deprived and marginalised children who suffer the most. Children from the poorest families living in low- and middle-income countries (LMICs) are nearly twice as likely to die before their fifth birthday as children from wealthier families,⁹ because of social and economic inequalities and poor access to basic, good-quality health services through poorer provision or out-of-pocket costs. They are further disadvantaged by high rates of malnutrition, co-infections with other diseases, exposure to polluted air, and limited access to safe water, sanitation and hygiene.

Figure 2: Child pneumonia mortality rate and average annual rate of reduction, 2000–18



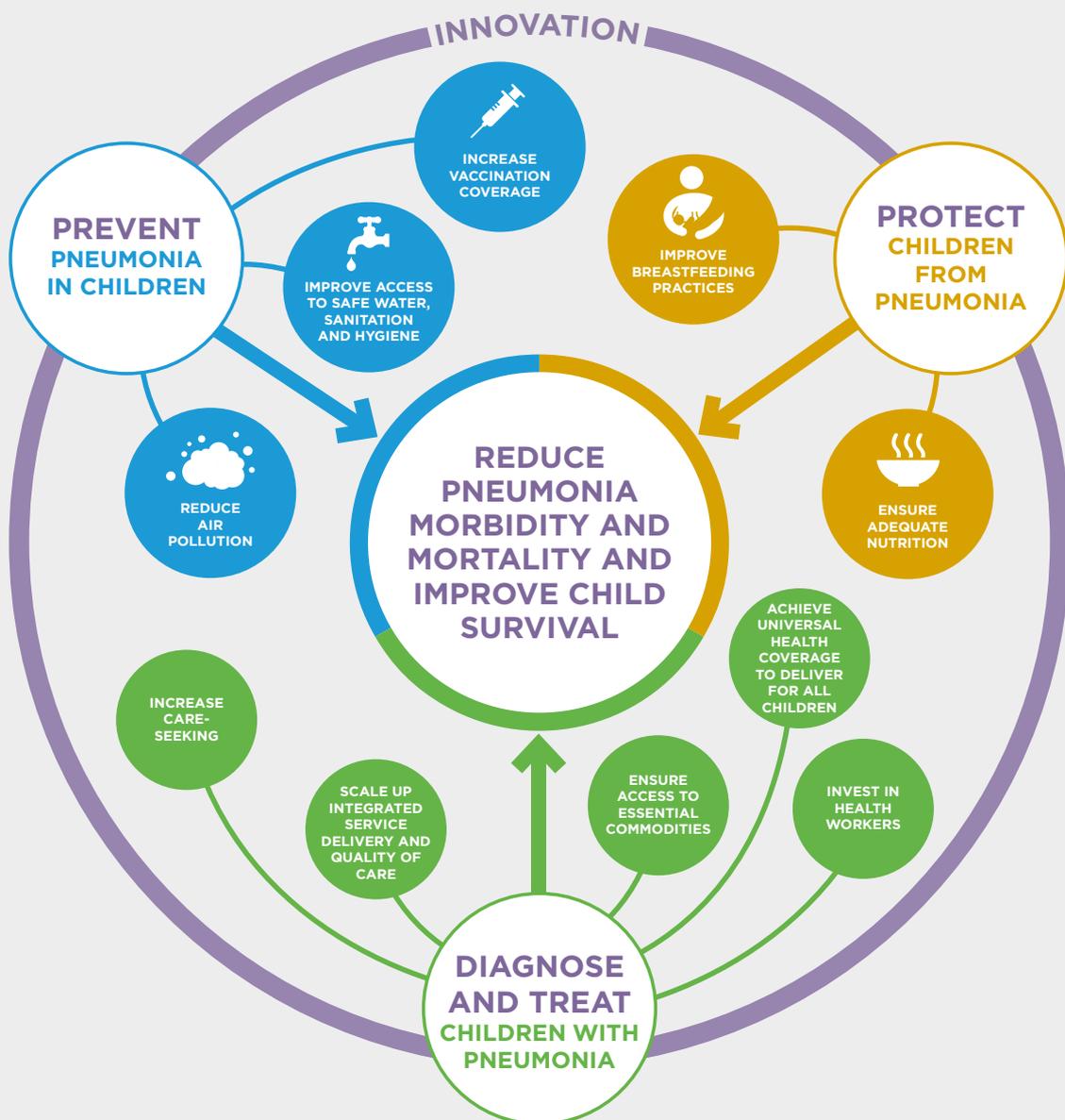
Source: UNICEF analysis based on WHO and Maternal and Child Epidemiology Estimation Group interim estimates produced in September 2019, applying cause fractions for the year 2017 to United Nations Inter-agency Group for Child Mortality Estimation estimates for the year 2018.

Tackling childhood pneumonia

Reducing the number of children getting sick and dying from pneumonia will require achieving universal access to primary health care, so that all children have access to vaccination and nutrition services, and to good-quality diagnosis and treatment. Multi-sectoral actions are

needed to ensure that all children have clean air to breathe, sufficient nutritious food to eat, and access to safe water, sanitation, and hygiene. Figure 3 illustrates the three pillars of the approach needed to put the GAPPD into operation.

Figure 3: Critical areas for tackling pneumonia



Source: Adapted from WHO/UNICEF, 2013. *Ending Preventable Child Deaths from Pneumonia and Diarrhoea by 2025: The Integrated Global Action Plan for Pneumonia and Diarrhoea (GAPPD)*

PREVENT pneumonia in children

Increase vaccination coverage

Improved vaccination coverage has contributed to significant reductions in child deaths, saving two to three million lives a year and protecting millions more children from disease and disability.¹⁰ Immunisation also creates contact points between families and health services for the provision of health services. Each dollar invested in immunisation in 91 LMICs from 2021–30 provides a return of \$20 in benefits; this increases to \$51 when considering broader societal benefits of people leading longer and healthier lives.¹¹

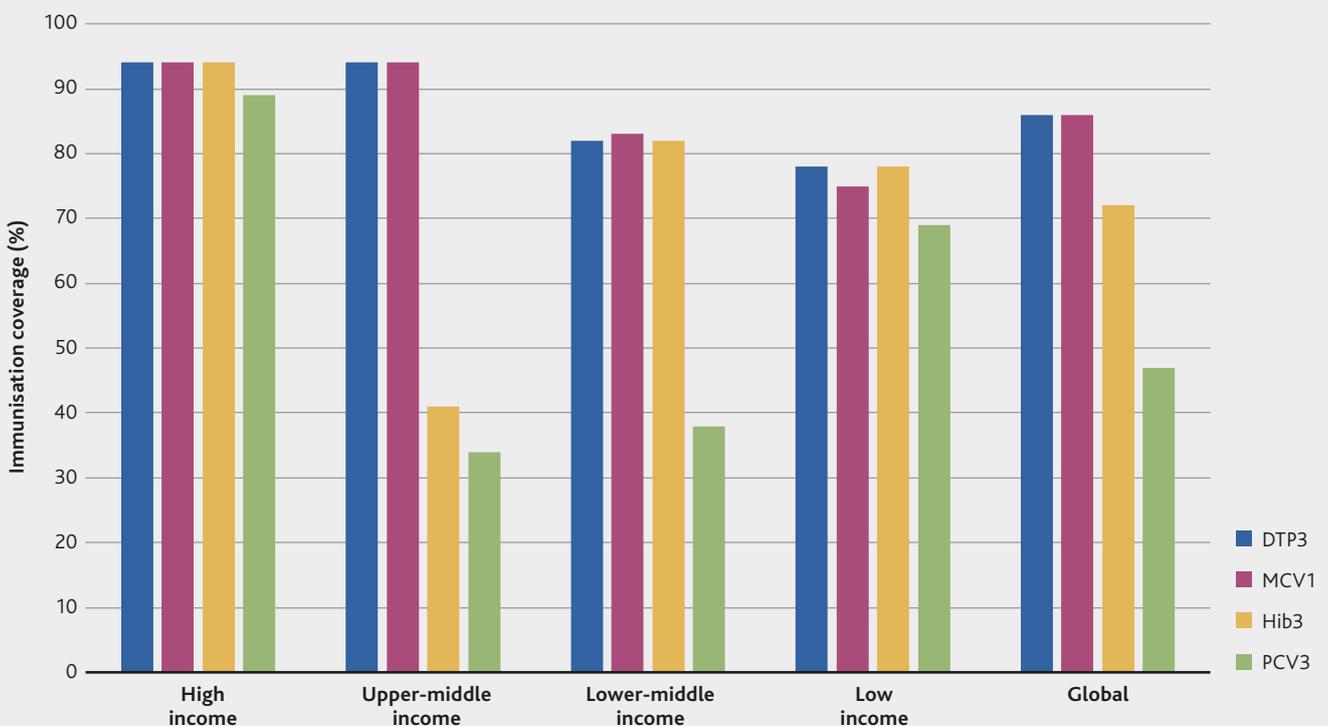
Several vaccines protect against pneumonia: Haemophilus influenzae type b (Hib), pneumococcal conjugate vaccines (PCV), measles vaccine (MCV), and diphtheria, tetanus and pertussis (DTP). However, nearly 20 million children still miss out on basic vaccinations, with global coverage of three doses of DTP and one dose of the measles vaccine continuing to stall at 86% in 2018.¹² In 2018, approximately 39 million children globally did not receive the recommended three doses of the Hib vaccine and 71 million did not receive the recommended three doses of PCV, putting them at higher risk of pneumonia (Figure 4).¹³ Many countries still have not introduced PCV because of a variety of factors, including high vaccine prices, underfunded health budgets, and conflict

situations.¹⁴ Gavi, the Vaccine Alliance, has supported the introduction and scale-up of PCV in many low-income countries,¹⁵ yet lower-middle and middle-income countries not eligible for Gavi support are lagging behind.¹⁶ In the three countries with the highest number of pneumonia deaths, PCV coverage is only 57% in Nigeria, 6% in India and 79% in Pakistan.

Children from the poorest families, the most remote areas and marginalised groups are left behind in immunisation. Survey data across 72 low- and middle-income countries from 2012–17, for example, indicate a gap of 25 percentage points for DTP3 coverage between children in the poorest and richest households.¹⁷

Governments must improve immunisation delivery through increasing domestic investment, strengthening primary health care, creating a reliable supply chain system, and focusing on children missing out. Donors and the global health community should support countries to achieve these steps, particularly poorer countries and those experiencing humanitarian crises. Gavi’s third replenishment, in June 2020, must raise at least \$7.4 billion to support the delivery of its 2021–25 strategy to immunise 300 million people and save up to eight million lives.¹⁸ Donors should make significant

Figure 4: Estimated coverage of pneumonia-fighting vaccines in 2018, by World Bank income group



Source: WHO/UNICEF estimates of national immunisation coverage, 2018 revision

Note: World Bank income groups, 2018

pledges to Gavi, while ensuring this investment drives a strong policy agenda on equity and strengthening primary health care systems. In its next strategic period, Gavi aims to accelerate improved access to immunisation for the world's poorest children, while leaving a stronger health system in the countries it supports. Gavi remains committed to prioritise a market-shaping role to improve vaccine affordability and access, including accelerating new entrants to the vaccine market to ensure genuine competition, which could drive down prices and improve quality.

Reduce air pollution

Air pollution (both indoor and outdoor) is a significant risk factor for pneumonia deaths among children.¹⁹ The percentage of child pneumonia deaths attributable to air pollution varies widely across high-burden countries, ranging from 27% in Indonesia to 56% in Niger;²⁰ however, the impact might be under- or over-estimated.²¹ Increasing urbanisation and urban population growth in many high-burden pneumonia countries may increase the number of children exposed to air pollution.

According to Global Burden of Disease estimates, household air pollution from using solid and unclean fuels for cooking and heating contributes to 62% of air pollution-related child pneumonia deaths, while outdoor pollution, especially

particulate matter, is a contributory factor in an additional 38%.²² One of the reasons that air pollution is such a major factor is the low level of access to clean fuels and technologies for cooking, especially in sub-Saharan Africa. In Nigeria, DRC, Ethiopia, Tanzania, Niger, Chad, Burkina Faso, Madagascar, South Sudan and Mali, less than 10% of the population has access to clean fuels and technologies for cooking. This needs to be addressed by governments.²³

Improve access to safe water, sanitation and hygiene

Good hygiene practices help prevent pneumonia and other illnesses, including diarrhoea. Studies have shown that improved handwashing with soap reduces pneumonia risk by up to 50%²⁴ by reducing exposure to bacteria and other microbial agents.²⁵ But in least developed countries (LDCs)²⁶ in 2017, nearly three-quarters of the population lacked handwashing facilities with soap and water, and two-thirds lacked basic sanitation services at home.²⁷ Lack of water, sanitation, and hygiene services in health care facilities places newborns and young children at great risk. In LDCs one in five health care facilities has no water, sanitation or health care waste management services.²⁸



Jamillah, age six months, is being treated for pneumonia at a hospital in Turkana, Kenya. Photo: Nina Raingold/Save the Children

PROTECT children from pneumonia

Ensure adequate nutrition

Malnutrition is a risk factor in nearly half of all deaths among children under five.²⁹ In 2018, 49 million children suffered from wasting and 149 million from stunting.³⁰ A severely undernourished child is nine times more likely to die from common infections, including pneumonia, compared with a well-nourished child.³¹ Children from the poorest 20% of households are more than twice as likely to be stunted and have a 40% higher risk of being wasted as those from the richest 20%.³² And while around 80% of children who complete treatment for severe undernutrition are cured,³³ currently less than 20% of those who need treatment have access to it.³⁴

Countries with high burdens of both childhood pneumonia deaths and malnutrition, especially acute malnutrition, should scale up nutrition-related programmes within primary health care, including improving infant and young child feeding, nutrition counselling, growth monitoring, and work to promote behaviour change around feeding and care seeking. Integrated service delivery approaches, such as integrated management of child illness (IMCI) and integrated community case management (ICCM) are key strategies to address pneumonia at the primary health care level and to integrate the community-based management of acute malnutrition. Financing for nutrition also urgently needs to increase. The Tokyo Nutrition for Growth Summit in 2020 is a critical opportunity to galvanise world leaders to address the current

funding deficit.³⁵ This will require significantly increased domestic and innovative financing, supported by international development assistance. Nutrition financing also needs to be better aligned with investments in primary health care to achieve universal health coverage.

Improve breastfeeding practices

Newborns are particularly susceptible to infections, and pneumonia claimed 153,000 newborn lives in 2018 (6% of newborn deaths).³⁶ Babies born to mothers who enter pregnancy well-nourished, who receive nutrition services during and after pregnancy, and who exclusively breastfeed over the first six months of life are less likely to contract or die from pneumonia and other infections.³⁷ Immediate breastfeeding in the first hours and days of a baby's life provides protection against pneumococcal bacteria and other pathogens, and strengthens a baby's natural defences, yet rates of colostrum feeding in many high pneumonia risk areas remain too low.³⁸ Breastfeeding exclusively until six months of age, and continued breastfeeding with the gradual introduction of complementary foods up until two years of age or beyond, can similarly reduce the risk of babies contracting and dying from pneumonia.³⁹ Despite the protective properties of breast milk, less than half of infants in low-income countries, and only one third in lower-middle-income countries, are exclusively breastfed for the first six months of life.⁴⁰



Nakwan, just seven days old, has pneumonia. She is being treated at a health clinic in northern Kenya. Photo: Fredrik Lerneryd/Save the Children

DIAGNOSE AND TREAT children with pneumonia

Increase care seeking

Improved care seeking is critical to ensure sick children are taken to and seen by a health worker who can effectively diagnose and treat them or refer them for special care. Globally, only 68% of children with suspected pneumonia are taken to a health facility.⁴¹ This is far lower in most high-burden pneumonia countries – for example, in Somalia and Benin, only 46% of children with suspected pneumonia are taken for care.⁴² Just 60% of children with pneumonia symptoms from the poorest households and 65% in rural areas are taken to a health facility compared with 78% and 74% of children from the wealthiest and urban households.⁴³ Improving care seeking requires improved engagement and communication with families and communities.

Scale up integrated service delivery and quality of care

Increased demand for services must be matched by improved availability and accessibility of comprehensive, high-quality health services, especially for the most deprived and marginalised children. It has been shown that a package of key interventions delivered at community level, including

vaccines and treatment for pneumonia, has the largest effect on averting deaths among children under the age of five.⁴⁴ Expanded access to primary health care at community level also requires functioning referral and transport pathways, data collection and monitoring.

IMCI delivered at primary care facilities and ICCM delivered by community health workers are critical strategies to address pneumonia and other key causes of child illness and death. While there has been progress, the coverage of these services remains patchy, and only a handful of countries have recognised ICCM as a core child survival strategy and rolled it out at scale. Over the past years, the Global Fund has provided substantial support to the scale-up of ICCM, including community health worker training and malaria commodities. Yet, the financing of treatments for pneumonia and diarrhoea, not supported by the Global Fund, has been a major challenge. Very few countries finance community case management through their national health budgets. The recent successful replenishment effort of the Global Fund and upcoming country allocations provide an opportunity to again strongly promote ICCM and leverage country commitments for child health commodities and services, while at the same time clearly defining the overall budget needs and resources gaps.

Box 1: 13-day-old Emran recovers from severe pneumonia

While community health volunteer Honufa was making her regular house-to-house visits in a remote village in the Barisal Division of Bangladesh, she found Sharmin worrying about her 13-day-old son, Emran. Sharmin complained that Emran couldn't breastfeed, was breathing rapidly, and that his chest was drawing in. Honufa immediately recognised the danger signs of pneumonia and advised Sharmin to go to the nearest community clinic.

Within 15 minutes of being seen by Naznine, a community health care provider at the clinic, Emran was diagnosed with pneumonia and treated with his first dose of dispersible Amoxicillin. Naznine showed Sharmin how to give the tablet at home for the next seven days, and explained how to care for Emran at home. Thanks to the quick referral, diagnosis and treatment, Emran made a full recovery.

Like all community health care providers in Bangladesh, Naznine had received training on the diagnosis and management of pneumonia. The Government's investment in strengthening health services at the community level, with the support of organisations like Save the Children, means that communities now have access to health services and a trained health worker closer to home. They no longer have to travel to sub-district facilities and bear the huge financial burden of hospital treatment. It also means that treatment can be started much more quickly.



Emran, seen here with his mother, Sharmin, was treated for pneumonia at a community clinic in Bangladesh. He was referred for treatment by a trained community health volunteer.

Photo: Md. Touqir Islam/Save the Children

Ensure access to essential commodities

Detecting and managing child pneumonia is challenging as no simple diagnostic test exists, so health workers rely on assessing and interpreting signs and symptoms. This carries the risk of both under- as well as over-diagnosis and results in some children failing to get access to treatment while others receive treatments they don't need, contributing to antibiotic resistance and wastage of medicines. Affordable and highly effective amoxicillin in dispersible tablet form is the recommended first-line treatment for childhood pneumonia but coverage remains low in many settings. Of great concern is the almost complete lack of access to pulse oximetry, a non-invasive mechanism for measuring oxygen levels in blood, and the availability of medical oxygen at all levels of the healthcare system in high-burden countries, meaning that many children die from pneumonia for lack of oxygen. Unitaid has recently invested more than \$40 million to increase access to pulse oximeters in several high-burden countries, which could improve the identification and referral of very sick children and save many lives.

Invest in health workers

A health worker with the right training, skills, medicines and supplies, based in a functional health centre or his/her community, is needed to prevent and treat pneumonia. However, countries are facing severe health workforce shortages, with the quantity and quality of health workers under threat. Globally, an estimated 18 million more health workers are needed by 2030 to reach the SDG targets on universal health coverage.⁴⁵ WHO standards call for a

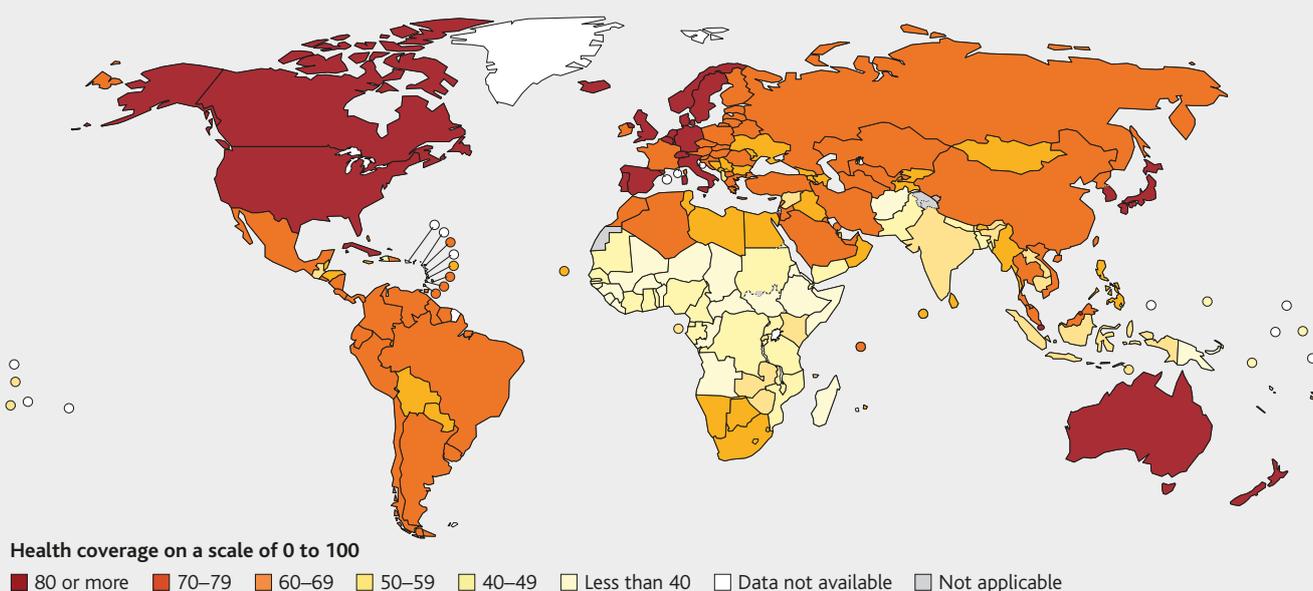
minimum of 44.5 doctors, nurses or midwives for every 10,000 people. Health worker shortages are most widespread in low- and middle-income countries.⁴⁶ Community health workers are recognised as a crucial workforce to deliver life-saving interventions, yet support for community health workers and their integration into health systems and communities remain uneven across and within countries.⁴⁷

Achieve universal health coverage to deliver for all children

Ending preventable child deaths from pneumonia can only be achieved if countries make faster progress in achieving universal health coverage, and pneumonia will be the litmus test of whether universal health coverage can truly deliver for all children. Governments have the core responsibility to fulfil this right, ensuring children have access to an essential package of good-quality health care, free at the point of use, prioritising those furthest behind. Health systems must deliver good-quality care for children at all levels.⁴⁸

While there has been global progress on delivering universal health coverage,⁴⁹ a third of the world's population (34%) is still missing out.⁵⁰ There are huge variations across countries with low-income countries and those affected by conflict having the lowest coverage (see Map 1).⁵¹ Care-seeking for a child showing symptoms of pneumonia is the indicator used to monitor 'child treatment' in the UHC Service Coverage Index. Yet, currently most high-burden pneumonia countries fall far below the target of 90% of children with pneumonia symptoms being taken for healthcare.⁵²

Map 1: Universal health coverage across countries



Source: WHO, 2019. Primary health care on the road to universal health coverage: 2019 monitoring report. WHO: Geneva.

Note: This map has been produced by the WHO. The boundaries, colours or other designations or denominations used in this map and the publication do not imply, on the part of the World Bank or WHO, any opinion or judgement on the legal status of any country, territory, city or area or of its authorities, or any endorsement or acceptance of such boundaries or frontiers.

Government spending on health care is far too low in many parts of the world, resulting in patients picking up the bill for their treatment. Governments should increase domestic public health expenditure towards a target of 5% of GDP, prioritising spending at the primary healthcare level and raising revenue in an equitable way. The Global Financing Facility for Women's Children's and Adolescents' Health has a key role to play in helping countries to grow domestic resources and structure health services to reach those left furthest behind.

The first-ever UN High-Level Meeting on Universal Health Coverage in September 2019 saw the endorsement of a Political Declaration⁵³ with commitments on strengthening primary healthcare, health financing and leaving no one behind. This followed the Astana Declaration in October 2018, which refocused efforts on primary health care. Governments must be held to account to deliver on these promises, both at national level and through global reporting and accountability mechanisms, such as at the World Health Assembly, SDG reporting and UHC2030.⁵⁴

Box 2: Addressing pneumonia in humanitarian contexts

Common causes of illness and death are often intensified in humanitarian contexts, as are many pneumonia risk factors, such as malnutrition, missed vaccination opportunities, air pollution, and overcrowding, while health systems are at risk of breaking down. Pneumonia is one of the top causes of morbidity in crisis contexts, accounting for 20–35% of deaths among children under five.⁵⁵ Four out of five countries identified as having exceptionally high humanitarian need in 2019⁵⁶ – DRC, Ethiopia, Nigeria and South Sudan – are also among the ten countries with the highest number of child pneumonia deaths or the highest child pneumonia mortality rate.

Preventing children from becoming sick

Unvaccinated children are disproportionately found in fragile or conflict-affected states. Almost half are in just 16 countries – Afghanistan, Central African Republic, Chad, DRC, Ethiopia, Haiti, Iraq, Mali, Niger, Nigeria, Pakistan, Somalia, South Sudan, Sudan, Syria and Yemen. Immunisation programmes often come to a halt in humanitarian contexts, and when they are reinstated the only vaccines reliably and consistently introduced are to protect against measles, polio, and tetanus. This is despite the Vaccination in Acute Humanitarian Emergencies WHO Framework listing other routine vaccines for consideration in crises, including PCV.⁵⁷

A long-standing barrier to PCV use in the humanitarian context has been price. After sustained advocacy on this front, in 2016 GSK and Pfizer committed to offer their PCV vaccines at the lowest global price in humanitarian settings. Save the Children, Médecins Sans Frontières, WHO and UNICEF set up the Humanitarian Mechanism⁵⁸ to operationalise these commitments. Two years in, the mechanism has contributed to the immunisation of around 647,000 children and has the potential to increase immunisation access significantly in the future.

Diagnosing and treating children

While health systems may break down or become inaccessible to large parts of the population during humanitarian crises, it has been shown that community health workers have the potential to provide continued services, including ICCM, creating a lifeline of health care provision to affected populations. ICCM is a critical approach to helping reach the most deprived and marginalised children and it should be prioritised and strengthened in humanitarian responses. Concerted effort is needed to overcome challenges to delivering ICCM in these situations, such as obstacles to accessing referral centres, medicine and supply shortages, disrupted supervision, increased demand on community health workers and security threats for patients and health workers.⁵⁹



One-year-old Luc is treated for severe pneumonia at a hospital in the DRC; his mother, Makenda, waits at his side. Photo: Jonathan Hyams/Save the Children

INNOVATE to improve access to affordable and cost-effective pneumonia technologies and services

Only 3% of global infectious disease research spending is currently allocated to pneumonia,⁶⁰ despite pneumonia causing 15% of deaths in children under the age of five. Innovations can catalyse and accelerate progress, but there must be an emphasis on innovations that will meet the needs of high-burden countries and improve equity.

New vaccines targeting the leading viral cause of pneumonia (Respiratory Syncytial virus, RSV) are in the final stages of development, and new technologies that would reduce reliance on cold chain vaccine storage are showing great promise. Research is also under way to help identify optimal PCV mass immunisation strategies for crisis-affected populations, as well as looking at the potential of one-off PCV campaigns amongst displaced populations.

There is an urgent need for cost-effective diagnosis of illnesses such as pneumonia. Devices that measure respiratory rate, plus pulse-oximetry and other vital signs,

such as temperature and pulse rate, are advancing rapidly and need to be incorporated within health services. Lung ultrasound – more portable and less dangerous and costly than x-ray imaging – has been shown to be feasible in low-resource settings.⁶¹

Promising treatment innovations include ways to produce, store, deliver and transport medical oxygen, more robust ventilation support systems and simplified antibiotic treatment schedules with child-friendly formulations. However, there is an alarming lack of an antibiotic drug pipeline in an age of antimicrobial resistance; this problem must be addressed. There is also a need for innovations that can reduce two of the leading risk factors for child pneumonia death – wasting and poor air quality. All of these areas should be the focus of increased research and development in the years ahead. Public–private partnerships have a role to play in supporting this.



Sohai, age two, being treated for acute pneumonia at a primary health centre in Cox's Bazar, Bangladesh. Photo: Jonathan Hyams/Save the Children

The time to act is now – The Fighting for Breath Global Forum

With ten years left to deliver on the SDGs – and five on the GAPPD targets – now is the time to act to reduce pneumonia deaths and improve child survival. Failure to do so could leave 11 million children robbed of their futures.⁶² The Fighting for Breath Global Forum on Childhood Pneumonia, taking place from 29–31 January 2020 in Spain, is a critical opportunity to galvanise urgently needed national action and mobilise country governments, development partners and the donor community. The Forum will also demonstrate the power of partnerships, such as the Every Breath Counts coalition.⁶³

The Global Forum continues the work of the Global Conference on Primary Health Care and the UN High-Level

Meeting on Universal Health Coverage, where governments made commitments that must now be translated into action and monitored. The Global Forum will also take place in the run-up to the Gavi replenishment in June 2020 and the Tokyo Nutrition for Growth Summit later in 2020 and will encourage donors to support governments by strengthening immunisation, nutrition, primary health care and universal health coverage. The Forum is a real opportunity to galvanise action on combatting child pneumonia. We encourage governments and partners to drive progress towards a world in which no child dies needlessly of pneumonia.

A global call to action on childhood pneumonia

1. **Develop pneumonia control strategies** as part of wider plans for universal health coverage and commit to reducing child pneumonia deaths to fewer than three per 1,000 live births, the target set by the Integrated Global Action Plan for Pneumonia and Diarrhoea (GAPPD).
2. **Strengthen quality primary health care and action on pneumonia** as part of national multi-sectoral plans and through integrated strategies (including nutrition, water, sanitation and hygiene, and air pollution), including at community level, focusing on the most deprived and marginalised children.
3. **Increase domestic government investment in health and nutrition** (to at least 5% of GDP on health) and ensure that increased spending improves access to child health and nutrition services, including by removing user fees, addressing non-financial barriers to accessing care, and prioritising primary health services.
4. **Improve health governance** by ensuring accountability, transparency and inclusiveness in planning, budgeting and expenditure monitoring, including for pneumonia control strategies.
5. **Accelerate vaccination coverage** by supporting Gavi's 2020 replenishment and ensuring the investment drives more equitable vaccination coverage and improves vaccine affordability.
6. **Enhance official development assistance** by increasing allocations to child health services and advancing the achievement of universal health coverage (aligned with national priorities and plans), including through pledges as part of Gavi replenishment and Nutrition for Growth.
7. **Engage the private sector to improve access** to affordable, quality vaccines, diagnostic tools, new antibiotics, medicines and medical oxygen, especially for the most deprived and marginalised children.
8. **Measure and report progress in achieving universal health coverage** to promote accountability for the development of stronger health systems that deliver quality primary health care and reduce child deaths, including from pneumonia, as well as against SDG child survival and GAPPD targets.
9. **Prioritise research, development and innovation** to improve access to the most affordable and cost-effective pneumonia prevention, diagnosis, referral and treatment technologies and services.
10. **Champion multi-sectoral partnerships** between the child health and nutrition communities and the broader infection control, clean air, water, sanitation and hygiene, and development financing communities.

Annex 1 – Pneumonia high-burden countries⁶⁴

Country	Number of under-five deaths from pneumonia (2018)	Under-five mortality rate due to pneumonia per 1,000 live births (2018)	Percentage of under-five deaths due to pneumonia (2017)	Average annual rate of reduction in pneumonia deaths 2000–18 (%)	Year country is expected to reach the 2025 GAPPD target at current rate of progress
Nigeria	161,515	21.7	18.6	1.5	Later than 2050
India	126,535	5.2	14.3	6.7	2026
Pakistan	57,970	9.7	14.2	4.4	2044
DRC	39,796	11.5	13.4	3.0	Later than 2050
Ethiopia	32,006	9.0	16.8	6.4	2035
Indonesia	19,152	4.0	15.8	4.8	2024
China	18,382	1.1	12.6	10.7	2009
Chad	17,783	27.2	23.7	1.6	Later than 2050
Angola	16,270	12.9	17.3	6.4	2040
Tanzania	15,288	7.4	14.3	6.2	2032
Somalia	15,165	24.1	20.7	2.1	Later than 2050
Niger	12,803	12.3	15.5	6.8	2038
Mali	12,557	15.8	16.7	4.7	Later than 2050
Bangladesh	11,967	4.1	13.5	8.1	2022
Sudan	11,463	8.5	14.4	5.3	2037
Afghanistan	11,086	9.2	14.9	5.1	2039
Mozambique	10,206	9.2	12.9	4.4	2043
Côte d'Ivoire	10,142	11.3	14.4	1.7	Later than 2050
Uganda	10,065	6.2	13.6	6.9	2028
Cameroon	9,955	11.1	15.0	4.7	2045
Philippines	9,919	4.5	15.8	3.2	2031
Kenya	8,856	6.0	14.7	5.8	2029
Guinea	8,072	17.8	18.2	1.9	Later than 2050
South Sudan	7,641	19.7	20.3	3.0	Later than 2050
Benin	5,193	12.5	13.8	3.4	Later than 2050
Haiti	3,643	13.5	20.9	3.5	Later than 2050
Sierra Leone	3,491	13.6	13.2	5.3	2046
Central African Republic	2,949	17.8	15.5	1.3	Later than 2050
Equatorial Guinea	539	12.4	15.0	3.1	Later than 2050
Comoros	315	11.9	17.9	3.0	Later than 2050

Endnotes

- 1 UNICEF analysis based on WHO and Maternal and Child Epidemiology Estimation Group interim estimates produced in September 2019, applying cause fractions for the year 2017 to United Nations Inter-agency Group for Child Mortality Estimation estimates for the year 2018.
- 2 Convention on the Rights of the Child: <https://www.unicef.org/child-rights-convention/convention-text>
- 3 Between 2000 and 2018, child pneumonia deaths fell by 54% compared with 81% for measles, 68% for tetanus, 67% for HIV/AIDS, 64% for diarrhoea, and 59% for malaria. WHO and Maternal and Child Epidemiology Estimation Group (MCEE) estimates 2017.
- 4 Calculation of progress towards GAPPD target based on average annual percentage change 2000 to 2017; WHO and UNICEF (2013). Ending Preventable Child Deaths from Pneumonia and Diarrhoea by 2025: The integrated Global Action Plan for Pneumonia and Diarrhoea (GAPPD).
- 5 Goal 3.2 of the Sustainable Development Goals.
- 6 High pneumonia burden refers to both numbers of pneumonia deaths and mortality rates due to pneumonia (see list of countries in Annex 1).
- 7 Calculation of progress towards GAPPD target based on average annual percentage change 2000 to 2017.
- 8 The Report Card includes a total of 23 countries – the top 15 by number of under-five pneumonia and diarrhoea (combined) deaths, and the top 15 by under-five pneumonia and diarrhoea (combined) mortality rate, with seven countries appearing on both lists. It scores countries based on the latest available data for ten GAPPD indicators – Protection: exclusive breastfeeding; Prevention: DTP3, MCV1, Hib3, PCV3, and RotaC coverage; and Treatment: oral rehydration salts and zinc for diarrhoea, and antibiotics and visiting an appropriate health care provider for pneumonia/ARI. The Report Card is available here: <https://www.jhsph.edu/ivac/resources/pdpr/>.
- 9 Comparison of under-five mortality rates in richest and poorest quintile for 74 countries with last data point 2012 or later. Source of data is DHS or MICS, accessed via GRID, Save the Children's Child Inequality Tracker. Data is weighted by number of births per country.
- 10 WHO Immunization. <https://www.who.int/news-room/facts-in-pictures/detail/immunization>, last access 22 October 2019.
- 11 Johns Hopkins University / International Vaccine Access Centre (2019). Methodology Report: Decade of Vaccines Economics – Return on Investment Analysis. Available at: <http://immunizationeconomics.org/dove-roi>
- 12 WHO (2019). 20 million children miss out on lifesaving measles, diphtheria and tetanus vaccines in 2018 (News release). <https://www.who.int/news-room/detail/15-07-2019-20-million-children-miss-out-on-lifesaving-measles-diphtheria-and-tetanus-vaccines-in-2018>, last access 29 October 2019.
- 13 WHO (2019). Global and regional immunisation profile. https://www.who.int/immunization/monitoring_surveillance/data/g_s_gloprofile.pdf?ua=1
- 14 The challenge of high vaccine prices continues to be raised as a problem by governments and development partners. At the 72nd World Health Assembly in 2019 countries endorsed a resolution to improve the transparency of markets for medicines, vaccines, and other health products (https://apps.who.int/gb/ebwha/pdf_files/WHA72/A72_ACONF2Rev1-en.pdf). Previously, at the 67th World Health Assembly (WHA) in 2014, many countries requested greater price transparency, information on cost of production, support for improving negotiation capacity and access to lower prices. Vaccine affordability has also been raised by ministers of health at subsequent WHAs and at the Ministerial Conference on Immunisation in Africa in 2016. This was also a key finding from consultations conducted by the WHO MIC Task Force (see http://who.int/immunization/programmes_systems/procurement/v3p/platform/database/en/).
- 15 Some Gavi-eligible countries still have not introduced PCV (Chad, Somalia, South Sudan, Vietnam, Ukraine) or have low coverage (India, Nigeria, Central African Republic, Indonesia, Laos, Mongolia, Papua New Guinea), based on International Vaccine Access Center (<https://view-hub.org/>).
- 16 International Vaccine Access Center. <https://view-hub.org/>, last access 29 October 2019.
- 17 UNICEF analysis of DHS and MICS survey reports via WHO Health Equity Monitor for the period 2012–2017.
- 18 Gavi – The Vaccine Alliance (2019). Gavi sets ambitious goal to immunise 300 million people by 2025, leaving no one behind (Press release). <https://www.gavi.org/library/news/press-releases/2019/gavi-sets-ambitious-goal-to-immunise-300-million-people-by-2025-leaving-no-one-behind/>, last access 29 October 2019.
- 19 IHME (2017). Global Burden of Disease. Available at: <https://vizhub.healthdata.org/gbd-compare/>
- 20 IHME (2017). Global Burden of Disease. Available at: <https://vizhub.healthdata.org/gbd-compare/>
- 21 UNICEF (2019). Silent suffocation in Africa: Air pollution is a growing menace. Available at <https://www.unicef.org/reports/silent-suffocation-in-africa-air-pollution-2019>
- 22 IHME (2017). Global Burden of Disease. Available at: <https://vizhub.healthdata.org/gbd-compare/>
- 23 IHME (2017). Global Burden of Disease. Available at: <https://vizhub.healthdata.org/gbd-compare/>
- 24 Luby, SP, Agboatwalla, M, Feikin, DR, Painter, J, Billhimer, W, Altaf, A, & Hoekstra, RM (2005). Effect of handwashing on child health: a randomised controlled trial. *The Lancet*, 366(9481), 225–233.
- 25 Kumar, S et al. "Handwashing in 51 countries: Analysis of proxy measures of handwashing behavior in multiple indicator cluster surveys and demographic and health surveys, 2010–2013." *The American journal of tropical medicine and hygiene* 97.2 (2017): 447–459.
- 26 Least developed countries are low-income countries confronting severe structural impediments to sustainable development, highly vulnerable to economic and environmental shocks and with low levels of human assets. <https://www.un.org/development/desa/dpad/least-developed-country-category.html>
- 27 UNICEF and WHO (2019). Progress on household drinking water, sanitation and hygiene 2000–2017: special focus on inequalities.
- 28 WHO and UNICEF (2019), WASH in health care facilities: global baseline report. Available at: <https://data.unicef.org/resources/wash-in-health-care-facilities/>
- 29 Black RE, Victoria CG, Walker SP, Bhutta ZA, Christian P, de Onis M et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet Series: Maternal and Child Nutrition*. 2013; 382:427–451.
- 30 UNICEF/WHO/World Bank. Joint child malnutrition estimates 2019.
- 31 UNICEF. Severe acute malnutrition. https://www.unicef.org/nutrition/index_sam.html, last access 29 October 2019.
- 32 Comparison of stunting and wasting rates in richest and poorest quintile for 81 countries with last data point 2012 or later. Source of data is DHS or MICS, accessed via GRID, Save the Children's Child Inequality Tracker. Data is weighted by population under age 5 per country.
- 33 Shekar, Meera; Kakietek, Jakub; Dayton Eberwein, Julia; Walters, Dylan. 2017. An Investment Framework for Nutrition: Reaching the Global Targets for Stunting, Anemia, Breastfeeding, and Wasting. World Bank, Washington D.C. Available at: <https://openknowledge.worldbank.org/handle/10986/26069>

- 34 Calculation for severe acute malnutrition is based on UNICEF Nutridash, 2016 Edition, and for moderate acute malnutrition on WFP data for 2016. <https://www.nowastedlives.org/the-facts>
- 35 Government of Japan (2019), Tokyo Nutrition for Growth Summit 2020: vision and Roadmap – August 2019 version.
- 36 UNICEF analysis based on WHO and Maternal and Child Epidemiology Estimation Group interim estimates produced in September 2019, applying cause fractions for the year 2017 to United Nations Inter-agency Group for Child Mortality Estimation estimates for the year 2018.
- 37 Lamberti, L et al. (2013). Breastfeeding for reducing the risk of pneumonia morbidity and mortality in children under two: a systematic literature review and meta-analysis. *BMC Public Health* 13(Suppl 3): S18. <https://bmcpublihealth.biomedcentral.com/articles/10.1186/1471-2458-13-S3-S18>
- 38 Khan J, Vesel L, Bahl R, Martines JC. Timing of breastfeeding initiation and exclusivity of breastfeeding during the first month of life: effects on neonatal mortality and morbidity – a systematic review and meta-analysis. *Matern Child Health J.* 2015;19(3):468–79; UNICEF. Infant and young child feeding, available at <https://data.unicef.org/topic/nutrition/infant-and-young-child-feeding/>.
- 39 Lamberti, L.M. et al. (2013). Breastfeeding for reducing the risk of pneumonia morbidity and mortality in children under two: a systematic literature review and meta-analysis. *BMC Public Health* 13(Suppl 3): S18. <https://bmcpublihealth.biomedcentral.com/articles/10.1186/1471-2458-13-S3-S18>
- 40 UNICEF Data. Monitoring the Situation of Children and Women – Infant and young children. Available at: <https://data.unicef.org/topic/nutrition/infant-and-young-child-feeding/>, last accessed 20 August 2018
- 41 UNICEF Global databases based on DHS, MICS and other national household surveys, updated August 2019.
- 42 UNICEF Global databases based on DHS, MICS and other national household surveys, updated August 2019.
- 43 UNICEF Global databases based on DHS, MICS and other national household surveys, updated August 2019.
- 44 Black RB, Levin C, Walker N, Chou D, Liu L, Temmerman M for the DCP3 RMNCAH Author’s Group. Reproductive, Maternal, Newborn and Child Health: key messages from disease control priorities 3rd Edition. *Lancet* 2016
- 45 WHO (2016). Health Workforce Requirements for Universal Health Coverage and the Sustainable Development Goals, Geneva.
- 46 UNICEF (2019). Healthy Mothers, Healthy Babies: Taking Stock of Maternal Health, UNICEF, New York.
- 47 WHO (2019). WHO guideline on health policy and system support to optimize community health worker programmes. Available at: <https://apps.who.int/iris/bitstream/handle/10665/275474/9789241550369-eng.pdf?ua=1>
- 48 The Lancet Commission on High-Quality Health Systems in the SDG Era argues that “High-quality health systems should be informed by four values: they are for people, and they are equitable, resilient, and efficient.” A global movement is underway to improve the quality of care for maternal, newborn, and child health services. WHO issued in 2018 the Standards for Improving the Quality of Care for Children and Young Adolescents in Health Facilities. The quality of care standards encompass the delivery of evidence-based clinical services, an elevated experience of care for children and their families, an equipped, motivated, supervised, and supported health workforce, and health facilities replete with essential child health commodities, technologies, and physical resources and infrastructure. Based on these and similar standards for improving the quality of maternal and newborn care, WHO and UNICEF launched The Network for Improving Quality of Care for Maternal Newborn and Child Health (the QoC Network).
- 49 Measured by an index of 16 tracer indicators
- 50 The UHC service coverage index based on 16 tracer indicators, measuring progress on SDG indicator 3.8.1; WHO (2019). Primary Health Care on the Road to Universal Health Coverage – 2019 Monitoring Report. Available at: https://www.who.int/healthinfo/universal_health_coverage/report/uhc_report_2019.pdf?ua=1
- 51 WHO. Global Health Observatory. UHC service coverage index.
- 52 Stop Pneumonia (2019). Pneumonia Careseeking Scorecard 2019. <https://stoppneumonia.org/pneumonia-careseeking-scorecard-2019/>
- 53 UN General Assembly (2019). Political Declaration of the High-Level Meeting on Universal Health Coverage. Available at: <https://www.un.org/pga/73/wp-content/uploads/sites/53/2019/09/UHC-HLM-silence-procedure.pdf>
- 54 UHC2030 is a provides a multi-stakeholder platform to promote collaborative working in countries and globally on health systems strengthening. See www.uhc2030.org.
- 55 Bellos, A, Mulholland, K, O’Brien, KL, Qazi, SA, Gayer, M, Checchi, F. The burden of acute respiratory infections in crisis-affected populations: a systematic review. *Confl Health*, 4 (2010), p. 3
- 56 Syria, the Democratic Republic of the Congo, Ethiopia, Nigeria and South Sudan are identified as having exceptionally high levels of humanitarian need in 2019. United Nations Office for the Coordination of Humanitarian Affairs (2018). Global Humanitarian Overview 2019. <https://www.unocha.org/sites/unocha/files/GHO2019.pdf>
- 57 WHO (2017). Vaccination in Acute Humanitarian Emergencies: A Framework for Decision Making. Geneva: WHO.
- 58 WHO (2017). Accessing Affordable and Timely Supply of Vaccines for use in Humanitarian Emergencies: the Humanitarian Mechanism (WHO Working Document). Available at: https://www.who.int/immunization/programmes_systems/sustainability/The_Humanitarian_Mechanism_ToRs.pdf?ua=1
- 59 Save the Children (2019). Community case management in humanitarian settings – Guidelines for humanitarian workers. Available at: https://resourcecentre.savethechildren.net/node/15870/pdf/iccm-guide_formatted-online.pdf
- 60 Brown, R and Head, M (2018). Research Investments in Global Health Study (ResIn). Sizing up Pneumonia Research: Assessing Global Investments in Pneumonia Research 2000–2015. Southampton, UK: ResIn.
- 61 Nadimpalli, A et al. (2019). Feasibility of Training Clinical Officers in Point-of-Care Ultrasound for Pediatric Respiratory Diseases in Aweil, South Sudan. *Am J Trop Med Hyg*, Sep 2019;101(3):689–695;
- lorio, G et al. (2015). Lung ultrasound in the diagnosis of pneumonia in children: proposal for a new diagnostic algorithm. *PeerJ.* 2015; 3: e1374; Ellington, LE et al. (2017). Lung ultrasound as a diagnostic tool for radiographically-confirmed pneumonia in low resource settings. *Respir Med.* 2017 Jul; 128: 57–64; Zar, HJ, Andronikou, S., Nicol MP (2017). Advances in the diagnosis of pneumonia in children. *BMJ* 2017;358:j2739; Prina, E, Ranzani, OT, Torres, A (2015). Community-acquired pneumonia. *Lancet* 286(9998); Lenahan, JL et al. (2018). Multicentre pilot study evaluation of lung ultrasound for the management of paediatric pneumonia in low-resource settings: a study protocol. *BMJ Open Res* 2018;5:e000340
- 62 UN Interagency Group for Child Mortality Estimation. Levels and Trends in Child Mortality. Report 2019. p.15
- 63 Every Breath Counts is the world’s first public–private partnership to support national governments to end preventable child pneumonia deaths by 2030. This global coalition has 40 members from governments, UN and multilateral health agencies, companies, foundations, and NGOs working together to close the most critical gaps in pneumonia prevention, diagnosis and treatment. See: <https://stoppneumonia.org/>
- 64 The 30 high-burden countries include 22 countries with the highest absolute number of pneumonia deaths and the top 14 countries in terms of pneumonia-specific mortality rates. UNICEF analysis based on WHO and Maternal and Child Epidemiology Estimation Group interim estimates produced in September 2019, applying cause fractions for the year 2017 to UN Inter-Agency Group for Child Mortality Estimation estimates for the year 2018; WHO Global Health Observatory – Causes of deaths 2017.

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Cover: Abraham, age seven months, after recovering from pneumonia at a hospital in Turkana, Kenya. *Photo: Nina Raingold/Save the Children*

Some names in this report have been changed to protect identities.

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