Tackling pneumonia could avert almost 9 million child deaths this decade

Action on pneumonia would save 3.2 million children from pneumonia and 5.7 million from other diseases between 2020 and 2030

A forgotten killer

Pneumonia is the world's leading infectious killer of children under-five years of age, claiming 800,000 lives every year. These deaths are a reminder of the deep inequalities in access to health care. Pneumonia is overwhelmingly a disease of poverty. Almost all the global deaths occur in developing countries, with the most marginalised children facing the greatest risks. In 2015 governments around the world embraced a Sustainable Development Goal (SDG) commitment to 'end preventable child deaths'. Yet while most pneumonia deaths could be prevented through effective, low-cost interventions, deaths are falling slowly. Failure to change this picture in the 2020s will leave the world far short of the SDG targets.

The world's first Global Forum on Childhood Pneumonia, taking place from 29–31 January 2020 in Barcelona, is a critical opportunity to galvanise the action needed to save lives

A model for a better future

New modelling by Save the Children and Johns Hopkins University demonstrates what is possible.

The modelling looks at pneumonia mortality under two scenarios. The first is a "business as usual" scenario which assumes that all maternal, neonatal and child health interventions will continue to increase in line with historic rates since 2000. The second scenario assesses the impact of scaling up 19 interventions with proven benefits for pneumonia mortality to full coverage by 2030.[1] These include improvements in child nutrition and breastfeeding, vaccination and newborn case management, water and sanitation, malaria prevention and the use of antibiotics (see full list of interventions in Child nutrition interventions are the most effective ones from those chosen in the model, saving 1.3 million lives from pneumonia and 2.6 million from other diseases. Pneumonia deaths are also significantly reduced by improved care for newborns (1.8 million lives saved), age-appropriate breastfeeding practices (1.2 million lives saved) and the use of antibiotics (580,000 lives saved).). The effect of lives saved by full coverage is calculated as the difference between both scenarios.

Table 1: Interventions which reduce pneumonia mortality

Intervention categories	Maternal and child health intervention	Breastfeeding	Prevalence of early initiation of breastfeeding
Nutrition	Balanced energy supplementation		Age-appropriate breastfeeding practices
	Calcium supplementation	**Water and sanitation**	Hand washing with soap
	Change in stunting prevalence		Improved water source and improved sanitation
	Change in wasting prevalence		Water connection in the home
	Micronutrient supplementation (iron and multiple micronutrients)	**Malaria prevention**	IPTp - Intermittent preventive treatment of malaria during pregnancy
	Vitamin A supplementation		ITN/IRS - Households protected from malaria
	Zinc supplementation		
Vaccination	H. influenzae b vaccine	**Antibiotics**	Oral antibiotics for pneumonia
	Pneumococcal vaccine		
	Rotavirus vaccine		
Newborn	Case management of neonatal sepsis/pneumonia		

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[1] Projected coverage scale-up of interventions between 2019 to 2030 to coverage rates of 100%. Prevalence of stunting and wasting reduced to 2.275%.

The analysis includes 81 "Countdown 2030" countries – those with the highest maternal and child mortality rates – which represent 90 percent of all child deaths in 2018. The model uses the Lives Saved Tool (LiST), a modelling software that estimates the impact on mortality rates that will come from changes in service coverage of maternal, neonatal, and child health, and nutrition interventions – which have been proven to reduce cause-specific mortality in low and middle income countries. LiST was developed by the Institute for International Programs at Johns Hopkins Bloomberg School of Public Health, and funded by the Bill & Melinda Gates Foundation.[2] More information about LiST can be found on livessavedtool.org and in academic publications.[3]
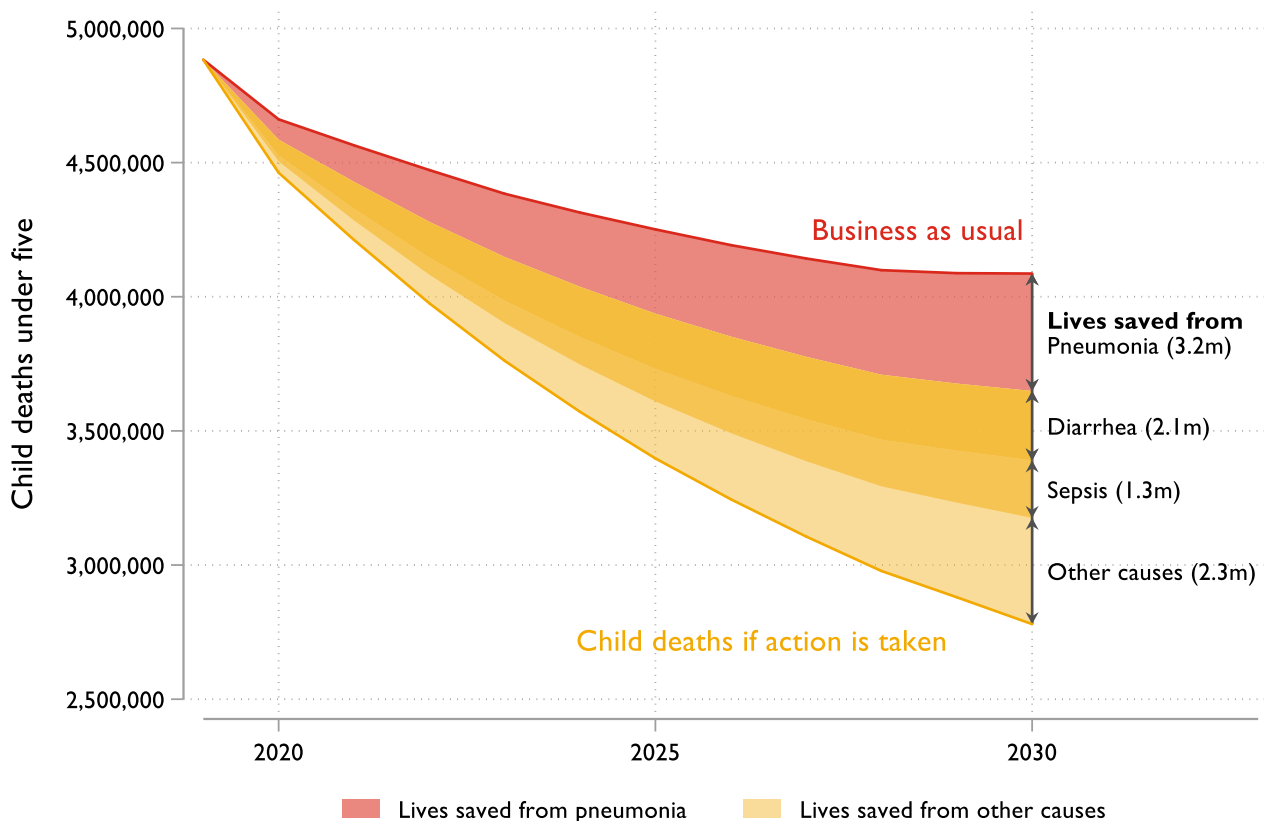
8.9 million lives saved

Baseline forecasts in the model project 6.3 million cumulative child deaths from pneumonia out of 47 million in total.

Introducing the full-coverage scenarios half of pneumonia deaths would be averted, saving 3.2 million lives. In addition, the modelling points to an additional 'ripple effect', preventing and additional 5.7 million child deaths from other major childhood disease. The majority of lives saved would be from diarrhoea (2.1 million), sepsis (1.3 million), prematurity (560,000) and measles (280,000).

By 2030, the effect would be so large that pneumonia interventions alone would avert almost 9 million of predicted under-five child deaths from all causes combined and set the world on a path to reach the SDG target in child survival (see Figure 1).[4]

Figure 1: Decisive action could prevent 3 million pneumonia deaths and 5.5 million deaths from other diseases in the next decade

Child nutrition interventions are the most effective ones from those chosen in the model, saving 1.3 million lives from pneumonia and 2.6 million from other diseases. Pneumonia deaths are also significantly reduced by improved care for newborns (1.8 million lives saved), age-appropriate breastfeeding practices (1.2 million lives saved) and the use of antibiotics (580,000 lives saved).

Limitations

Despite new insights in the effectiveness of a package of interventions to significantly reduce child mortality – with a specific focus on pneumonia – the model has several limitations. Despite air pollution being a major contributor to pneumonia deaths (responsible for more than half of all pneumonia deaths in some high-burden countries), it is currently not possible to analyse the impact of indoor or outdoor air pollution in LiST as input data is not available. Furthermore, as some interventions have a more indirect impact on pneumonia mortality, their effects might be limited in the modelling results.

Table 2: Country-specific effects

Country	Pneumonia deaths 2020-2030, business as usual	All lives saved due to pneumonia interventions 2020-2030	Pneumonia deaths averted 2020-2030	Deaths from all other diseases averted 2020-2030	Deaths averted from meningitis	Deaths averted from measles	Deaths averted from malaria	Deaths averted from diarrhoea	Deaths averted from sepsis
Afghanistan	109,968	160,202	58,185	102,017	4,692	6,085	17	27,303	26,319
Algeria	24,039	24,505	9,701	14,805	574	172	-	3,005	8,203
Angola	143,782	160,577	67,777	92,800	3,760	1,926	337	40,533	23,862
Azerbaijan	3,086	3,028	1,267	1,761	35	-	-	539	647
Bangladesh	101,796	139,726	47,920	91,806	1,886	3,053	3	25,043	32,630
Benin	48,402	67,023	23,959	43,064	1,763	608	57	15,951	12,419
Bhutan	376	370	139	232	- 0	3	-	40	115
Bolivia	7,349	7,822	3,292	4,531	108	-	3	1,509	1,897
Botswana	1,475	2,346	786	1,560	21	-	-	204	795
Burkina Faso	81,998	140,726	50,493	90,233	5,931	1,521	156	29,041	18,475
Burundi	36,843	49,203	20,418	28,786	2,587	110	49	9,185	6,635
Cambodia	11,654	12,639	4,945	7,694	346	35	- 0	1,868	2,897
Cameroon	88,099	107,868	45,686	62,182	3,015	540	234	28,707	14,039
Central African Republic	25,755	36,319	13,632	22,686	1,847	1,509	90	8,212	4,944
Chad	154,236	225,516	77,336	148,180	8,208	226	150	65,633	36,987
Comoros	2,123	2,801	937	1,864	27	-	-	602	523
Congo	8,769	12,340	4,006	8,334	205	1,363	12	2,052	2,318
Côte d'Ivoire	72,041	116,021	37,639	78,382	3,783	10,386	388	28,047	20,648
Dem. People's Republic of Korea	8,446	11,887	4,135	7,752	294	-	-	2,559	1,634
Democratic Republic of the Congo	347,726	610,154	178,951	431,203	14,749	55,344	727	152,106	67,051
Djibouti	1,283	2,138	692	1,446	57	8	-	437	315
Dominican Republic	6,188	7,277	3,002	4,275	188	-	-	873	2,155
Equatorial Guinea	7,428	11,308	4,932	6,375	374	458	1,421	1,882	646
Eritrea	5,893	12,091	3,649	8,442	312	2,509	10	1,972	1,733
Ethiopia	278,278	349,647	132,589	217,059	9,276	8,131	8	74,041	63,806
Gabon	3,712	4,698	1,989	2,709	163	570	2	644	835
Gambia	7,328	9,404	3,676	5,729	464	2	2	1,580	2,111
Ghana	46,719	54,421	19,346	35,075	650	177	28	12,481	13,686
Guatemala	14,123	15,026	6,401	8,625	366	-	3	2,636	3,426
Guinea	65,627	94,400	37,944	56,456	3,678	4,748	216	19,341	14,282
Guinea-Bissau	6,562	9,325	3,085	6,240	213	151	3	2,384	1,818
Guyana	407	529	153	376	9	-	0	80	205
Haiti	31,866	35,143	16,491	18,652	2,162	-	-	8,244	3,811
Honduras	4,050	3,835	1,618	2,217	94	-	-	595	933

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India	882,266	1,378,565	408,478	970,087	16,942	41,127	3,730	293,132	247,307
Indonesia	133,115	180,342	60,753	119,588	1,269	17,610	11	37,545	23,105
Iraq	36,950	41,002	15,566	25,437	280	230	-	6,843	9,241
Jamaica	247	486	94	392	3	-	-	29	226
Kenya	81,521	91,377	37,494	53,882	3,579	3	32	18,305	17,718
Kyrgyzstan	5,076	3,593	2,246	1,347	149	2	-	113	588
Lao People's Democratic Republic	10,560	11,619	5,322	6,297	305	87	0	1,993	1,917
Lesotho	3,762	4,542	1,655	2,887	94	38	-	770	983
Liberia	11,216	17,352	4,600	12,752	706	2,723	9	3,741	3,087
Madagascar	65,925	81,070	31,565	49,505	3,238	564	-	17,361	10,682
Malawi	35,998	48,923	17,184	31,739	1,758	539	10	9,053	9,870
Mali	113,849	147,515	59,904	87,611	5,072	1,045	35	28,131	23,429
Mauritania	14,398	20,897	7,250	13,647	461	505	12	4,198	3,745
Morocco	14,724	16,245	6,714	9,531	182	1	-	1,934	5,026
Mozambique	77,178	102,671	34,549	68,122	2,629	613	214	17,888	24,341
Myanmar	47,509	50,896	18,684	32,212	716	674	0	11,706	9,970
Namibia	3,211	3,360	1,506	1,854	91	-	-	538	610
Nepal	18,715	23,139	8,752	14,387	555	50	3	3,309	5,412
Nicaragua	4,127	3,427	1,862	1,565	90	-	13	316	866
Niger	115,921	202,481	69,349	133,131	6,487	2,388	209	49,150	28,180
Nigeria	1,363,945	2,055,116	808,533	1,246,583	68,676	55,522	4,275	579,508	152,818
Pakistan	507,845	705,536	238,647	466,890	12,504	20,004	522	150,303	145,080
Panama	1,647	1,710	826	885	65	-	-	305	382
Papua New Guinea	18,757	27,302	10,466	16,837	792	387	371	6,298	3,527
Paraguay	2,775	2,426	872	1,554	86	-	-	276	699
Philippines	83,356	110,907	41,104	69,803	1,624	2,710	-	27,845	14,823
Rwanda	18,248	19,323	7,347	11,976	228	36	5	3,464	4,114
Senegal	45,107	49,693	24,218	25,474	3,325	223	18	6,310	9,963
Sierra Leone	33,455	47,823	17,801	30,022	1,448	242	129	12,836	6,122
Solomon Islands	581	979	352	628	26	-	69	203	122
Somalia	113,006	151,295	58,718	92,577	5,739	30,664	-	24,167	11,355
South Africa	34,921	38,659	17,130	21,529	799	726	122	6,018	8,109
South Sudan	54,875	70,389	27,049	43,340	1,878	992	61	18,639	7,719
Sudan	99,642	161,657	50,093	111,564	3,135	2,995	3,060	37,357	28,221
Suriname	133	217	76	141	23	-	-	16	68
Swaziland	1,556	2,114	808	1,305	29	-	-	517	381

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Tajikistan	15,611	16,936	7,055	9,881	566	-	-	3,226	2,059
Timor-Leste	2,763	3,630	1,503	2,126	96	-	-	694	516
Togo	18,790	23,279	8,970	14,309	1,278	230	33	4,751	4,374
Turkmenistan	7,630	6,554	2,266	4,288	89	-	-	1,461	1,387
Uganda	78,078	90,909	29,557	61,353	1,562	272	127	19,988	21,784
United Republic of Tanzania	149,131	153,612	61,302	92,310	2,188	137	33	31,989	31,682
Uzbekistan	13,915	12,503	4,521	7,982	133	-	-	1,644	3,384
Venezuela	12,839	17,917	6,471	11,446	413	-	382	3,027	5,688
Yemen	76,082	104,719	42,781	61,937	3,379	276	10	19,734	13,836
Zambia	41,926	54,404	18,484	35,921	955	158	24	12,781	10,198
Zimbabwe	20,625	26,343	10,140	16,203	751	28	-	5,763	5,407
World*	6,250,934	8,885,771	3,177,388	5,708,383	228,232	283,438	17,434	2,054,506	1,312,916
East Asia and Pacific**	316,741	410,201	147,264	262,937	5,469	21,503	451	90,712	58,511
Middle East and North Africa***	151,795	186,472	74,762	111,710	4,416	679	10	31,515	36,305
South Asia****	1,620,966	2,407,539	762,120	1,645,419	36,579	70,322	4,275	499,130	456,862
Sub-Saharan Africa*****	4,030,363	5,743,128	2,134,728	3,608,401	177,189	190,932	12,298	1,408,260	732,818

* Global average based on 81 countries, representing 91% of child deaths.   ** Regional average based on 9 countries, representing 57% of child deaths.   *** Regional average based on 4 countries, representing 53% of child deaths.   **** Regional average based on 6 countries, representing 100% of child deaths.   ***** Regional average based on 45 countries, representing 100% of child deaths.