**Supplementary Table 1a.** Comparison of neutrophil and epithelial cell quantity in induced sputum samples from children aged 1-59 months with WHO-defined severe or very severe pneumonia, CXR+ Cases

<table>
<thead>
<tr>
<th>Number epithelial cells per low power field</th>
<th>Number of neutrophils per low power field</th>
<th>&gt;25</th>
<th>10-25</th>
<th>&lt;10</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>&lt;10</td>
<td>694</td>
<td>39.9</td>
<td>233</td>
<td>13.4</td>
<td>235</td>
</tr>
<tr>
<td>10-25</td>
<td>232</td>
<td>13.3</td>
<td>65</td>
<td>3.7</td>
<td>64</td>
</tr>
<tr>
<td>&gt;25</td>
<td>165</td>
<td>9.5</td>
<td>20</td>
<td>1.2</td>
<td>31</td>
</tr>
<tr>
<td>All</td>
<td>1091</td>
<td>62.7</td>
<td>318</td>
<td>18.3</td>
<td>330</td>
</tr>
</tbody>
</table>

Percentages represent percent of total specimens among subset of cases (N=1739). Abbreviations: WHO, World Health Organization. CXR+ defined as radiographic evidence of pneumonia (consolidation and/or other infiltrates).
Supplementary Figure 1a. Prevalence of organisms by induced sputum culture interpretive criteria and induced sputum quality variables in children aged 1-59 months with WHO-defined severe or very severe pneumonia, CXR+ Cases (N=1739)
Abbreviations: HINF, H. influenzae; LPF, low power field; MCAT, M. catarrhalis; OGNR, Other non-fermentative gram-negative rods; PMNs, polymorphonuclear cells; PNEU, S. pneumoniae; SAUR, S. aureus; SECs, squamous epithelial cells; WHO, World Health Organization.

CXR+ defined as radiographic evidence of pneumonia (consolidation and/or other infiltrates) (N=1739).

Other non-fermentative gram-negative rods include: Acinetobacter species and Pseudomonas species.

*Sputum interpretative criteria: 1 = organism present in any amount; 2 = present in any amount with compatible Gram stain morphotype; 3 = present as the predominant organism; 4 = present as the predominant organism with compatible Gram stain morphotype; 5 = present in quantities ≥2+; 6 = present in quantities ≥2+ with compatible Gram stain morphotype.

Other non-fermentative gram-negative rods includes: Acinetobacter species and Pseudomonas species.
Supplementary Figure 1b. Prevalence of organisms by induced sputum culture interpretive criteria and induced sputum quality variables in children aged 1-59 months with WHO-defined severe or very severe pneumonia, Cases with no prior antibiotics (N=842)
Abbreviations: HINF, *H. influenzae*; LPF, low power field; MCAT, *M. catarrhalis*; OGNR, Other non-fermentative Gram-negative rods; PMNs, polymorphonuclear cells; PNEU, *S. pneumoniae*; SAUR, *S. aureus*; SECs, squamous epithelial cells; WHO, World Health Organization.

Other non-fermentative gram-negative rods includes: *Acinetobacter* species and *Pseudomonas* species.

*Sputum interpretative criteria:* 1 = organism present in any amount; 2 = present in any amount with compatible Gram stain morphotype; 3 = present as the predominant organism; 4 = present as the predominant organism with compatible Gram stain morphotype; 5 = present in quantities ≥=2+; 6 = present in quantities ≥=2+ with compatible Gram stain morphotype.
Supplementary Figure 1c. Prevalence of organisms by induced sputum culture interpretable criteria and induced sputum quality variables\(^\text{b}\) in children aged 1-59 months with WHO-defined severe or very severe pneumonia, Cases with prior antibiotics (N=2833)

\(^\text{b}\) Other non-fermentative gram-negative rods includes: *Acinetobacter* species and *Pseudomonas* species.
Abbreviations: HINF, *H. influenzae*; LPF, low power field; MCAT, *M. catarrhalis*; OGNR, Other non-fermentative Gram-negative rods; PMNs, polymorphonuclear cells; PNEU, *S. pneumoniae*; SAUR, *S. aureus*; SECs, squamous epithelial cells.

Other non-fermentative gram-negative rods includes: *Acinetobacter* species and *Pseudomonas* species.

Sputum interpretative criteria: 1 = organism present in any amount; 2 = present in any amount with compatible Gram stain morphotype; 3 = present as the predominant organism; 4 = present as the predominant organism with compatible Gram stain morphotype; 5 = present in quantities ≥=2+; 6 = present in quantities ≥=2+ with compatible Gram stain morphotype.

Other non-fermentative gram-negative rods includes: *Acinetobacter* species and *Pseudomonas* species.
**Supplementary Figure 2a.** Quantity of oropharyngeal flora in induced sputum in children aged 1-59 months with WHO-defined severe or very severe pneumonia by induced sputum quality variables, CXR+ cases (N=1739)

A. Epithelial cells per LPF

B. Neutrophils per LPF

C. Traditional IS Quality Measures

Abbreviations: LPF, low power field; PMNs, polymorphonuclear cells; SECs, squamous epithelial cells; WHO, World Health Organization.

CXR+ defined as radiographic evidence of pneumonia (consolidation and/or other infiltrates).
**Supplementary Figure 2b.** Quantity of oropharyngeal flora in induced sputum in children aged 1-59 months with WHO-defined severe or very severe pneumonia by induced sputum quality variables, Cases with no prior antibiotics (N=842)

A. Epithelial cells per LPF

B. Neutrophils per LPF

C. Traditional IS Quality Measures

Abbreviations: LPF, low power field; PMNs, polymorphonuclear cells; SECs, squamous epithelial cells; WHO, World Health Organization.
**Supplementary Figure 2c.** Quantity of oropharyngeal flora in induced sputum in children aged 1-59 months with WHO-defined severe or very severe pneumonia by induced sputum quality variables, Cases with prior antibiotics (N=2833)

A. Epithelial cells per LPF

B. Neutrophils per LPF

C. Traditional IS Quality Measures

Abbreviations: LPF, low power field; PMNs, polymorphonuclear cells; SECs, squamous epithelial cells; WHO, World Health Organization.
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PERCH Chest Radiograph Reading Panel

Readers: Dr. Kamrun Nahar, Dr. Fariha Bushra Matin, Dr. Claire Oluwalana, Dr. Bernard Ebruke, Dr. Joyce Sande, Dr. Micah Silaba, Dr. Mahamadou Diallo, Dr. Breanna Barger-Kamate, Dr. Nasreen Mahomed, Dr. David Moore, Dr. Anchalee Kruatrachue, Dr. Piyarat Suntarattiwong, Dr. Musaku Mwenechanya, Dr. Rasa Izadnegahdar, Arbitrators: Dr. Vera Manduku, Dr. John DeCampo, Dr. Marg DeCampo, Dr. Fergus Gleeson.

PERCH Contributors:

Vaughan, Sakina Loonat, Martin Hale, Sugeshnee Pather, Mariëtte Middel, Siobhan Trenor, Palesa Morailane, Ntombi Maya, Rene Sterley, Charné Combrinck, Given Malete, Lerato Qoza, Grizelda Liebenberg, Hendrik van Jaarsveld, Zunaid Kraft, Lisa-Marie Mollentze, Lourens Combrinck, Tsholofelo Mosome; **Thailand:** Sununta Henchaichon, Dr. Tussanee Amornintapichet, Dr. Somchai Chuananont, Toni Whistler, Juraiporn Ratanodom, Patranuch Sapchookul, Ornma Sangwichian, Sirirat Makprasert, Manoon Hirunsalee, Possawat Jorakate, Anek Kaewpan, Duangkamol Siludjai, Apiwat Lapamnouysup, Dr. Wantana Paveenkittiporn, Waraporn Ubonphen, Dr. Peera Areerat, Ms. Yupapan Wannachaiwong, Ms Tewa Faipet, Ms Punnat Natnarakorn, Ms Ahchanan Sacharone, Mr. Winai Makmool, Ms. Kanlaya Sornwong, Ms. Promporn Sansuriwong, Ms. Ratchanida Potiya, Ms. Wasana Hongsawong, Ms. Wipa Matchaikhen, Ms. Thatsanawan Chaiyabil, Ms. Piyapai Wannarach, Ms. Chamaiporn Wadeesirisak, Mr. Yuttapong Norapet, Mattana Bangkung, Mr. Barameht Piralam, Sathapana Naorat, Anchalee Jatapai, Prasong Srisaengchai, Dr. Leonard Peruski, Ms. Dawan Phaensoongnoen, Ms. Tussaorn Klangprapan, Ms. Narawadee Dumrongdee, Ms. Atchara Sritrongkhiam, Mr. Piyawut Noinont, Ms. Pornthip Kamlee, Ms. Siyapa Mongkornsuk; **Zambia:** Justin Mulindwa, Musaku Mwenechanya, John Mwaba, Magdalene Mwale, Julie Duncan, Kazungu Siazele, Muntanga Mapeni, Emily Hammond; **Canterbury Health Laboratory, Christchurch, New Zealand:** Rose Watt, Shalika Jayawardena; **The Emmes Corporation, Rockville, Maryland:** Mark Wolff, Megan Sanza, Omid Neyzari.