

Improving Oxygen Access & Pneumonia Treatment



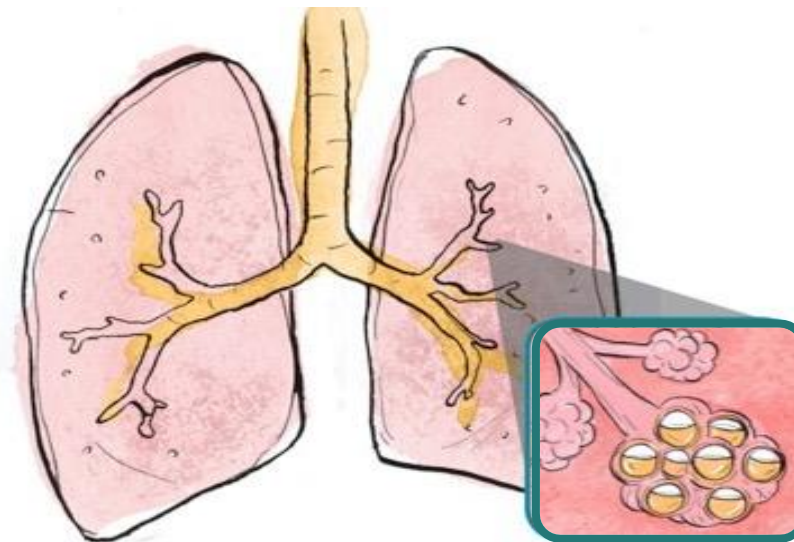
CHAI's program in three states:
Accelerating Policy Change, Translation and Implementation for Pneumonia and Diarrhea Commodities in Nigeria



February, 2019

CHAI is working in Nigeria to address pneumonia, which kills ~130,000 children each year^{1,2}

- Pneumonia is a respiratory infection in which the alveoli in the lungs fill with fluid and pus
 - Breathing becomes difficult; children have to breath faster and harder to ensure adequate oxygen uptake.
- Hypoxemia – low levels of oxygen in the blood – will develop in 13% of children with pneumonia.³
 - **Hypoxemia can be fatal.**
- If oxygen saturation is <90%, oxygen therapy must be provided quickly.
 - **Oxygen therapy can reduce the risk of death from pneumonia by ~35%.⁴**



1 out of **6** childhood deaths were due to **pneumonia** in 2015



1. Liu, L., et al. (2016). "Global, regional, and national causes of under-5 mortality in 2000–15: an updated systematic analysis with implications for the Sustainable Development Goals." *The Lancet* **388**(10063): 3027-3035.

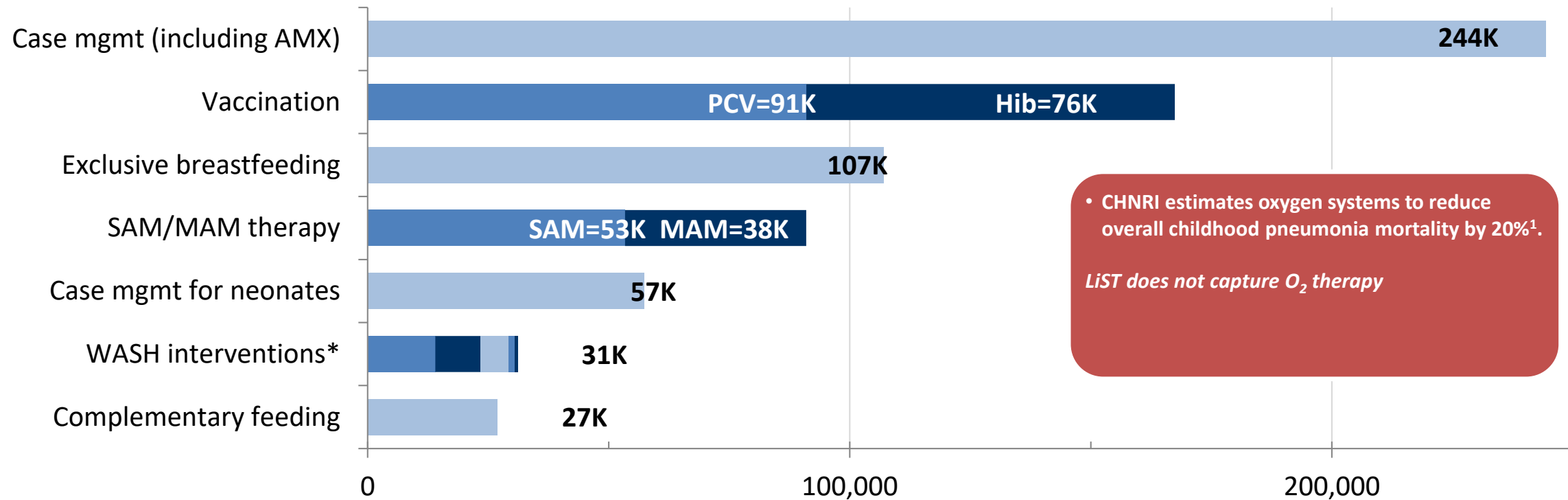
2. One is too many – Ending child deaths from pneumonia and diarrhoea - UNICEF – 2016

3. Subhiet al., (2009, April). The prevalence of hypoxaemia among ill children in developing countries: a systematic review. *The Lancet*.

4. Duke, T., et al. (2010, November). Oxygen is an essential medicine: a call for international action. *The international Journal of Tuberculosis and Lung Disease*.

Using the Lives Saved Tool¹, a Nigeria-specific analysis revealed that improved case management and vaccination have greatest potential impact

Estimated lives saved between 2018-2030 if interventions are scaled up to 80% coverage¹



In total, increasing coverage of pneumonia-related interventions to 80% could save 725,000 child lives -- or 60,000 per year. To achieve SDG 3.2, Nigeria needs to reduce child deaths by 70,000 per year.

1. LiST (Spectrum v5.63) using DHS 2013 as baseline coverage in 2018 and scales up all interventions to 80% by 2030

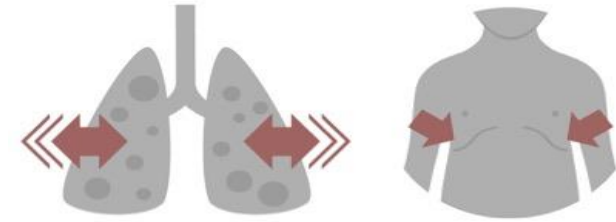
2. Catto et. al., 2011. An evaluation of oxygen systems for treatment of childhood pneumonia.

* WASH interventions (and est. lives saved) include: water connection in the home (14K), handwashing with soap (9K), improved sanitation w/ latrines or toilets (6K), hygienic disposal of stools (1K), and improved water source (1K).

Unfortunately, caregivers often do not recognise symptoms and delay seeking care

Poor Knowledge of Symptoms

Only 13% of caregivers in Nigeria mentioned both fast breathing **and** chest in-drawing as symptoms of pneumonia¹



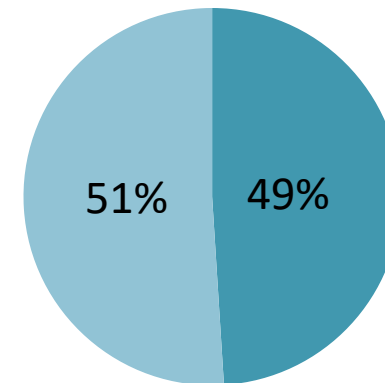
Care Seeking is generally high

However, **delays of 2-7 days** have been observed in Nigeria²



Source of care-seeking varies greatly

Almost half of Nigerian care seekers seek care in the private sector¹ indicating a need to focus interventions across both public and private facilities

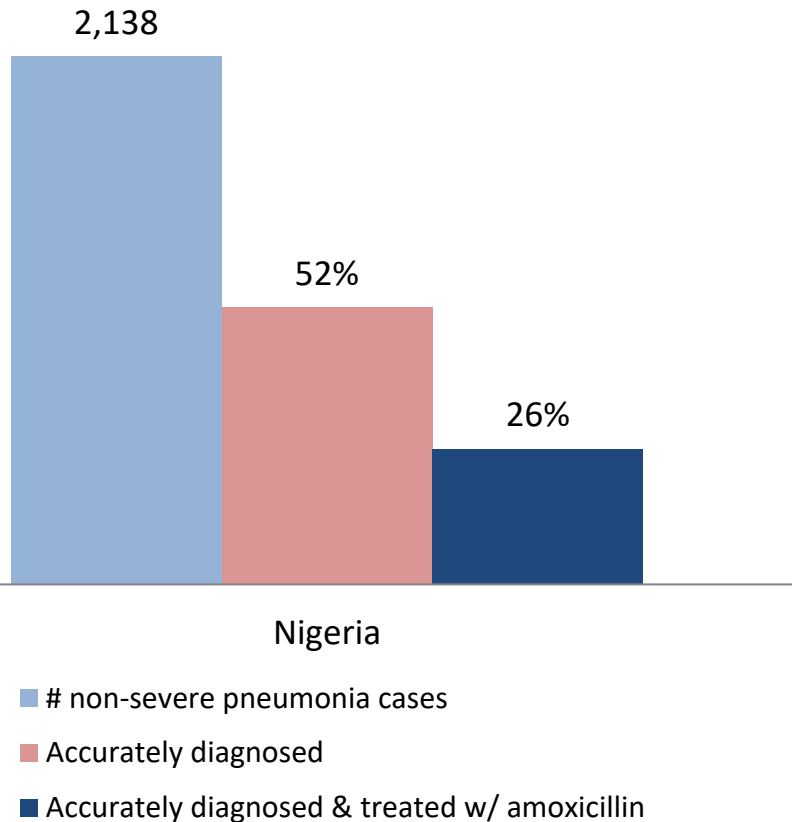


■ Private ■ Public

1. CHAI baseline 2016
2. Treatment of Pneumonia in Nigeria – PATH – 2013

Several barriers deter front-line healthcare workers from adequately diagnosing non-severe pneumonia.

Non-severe pneumonia diagnosis and treatment¹



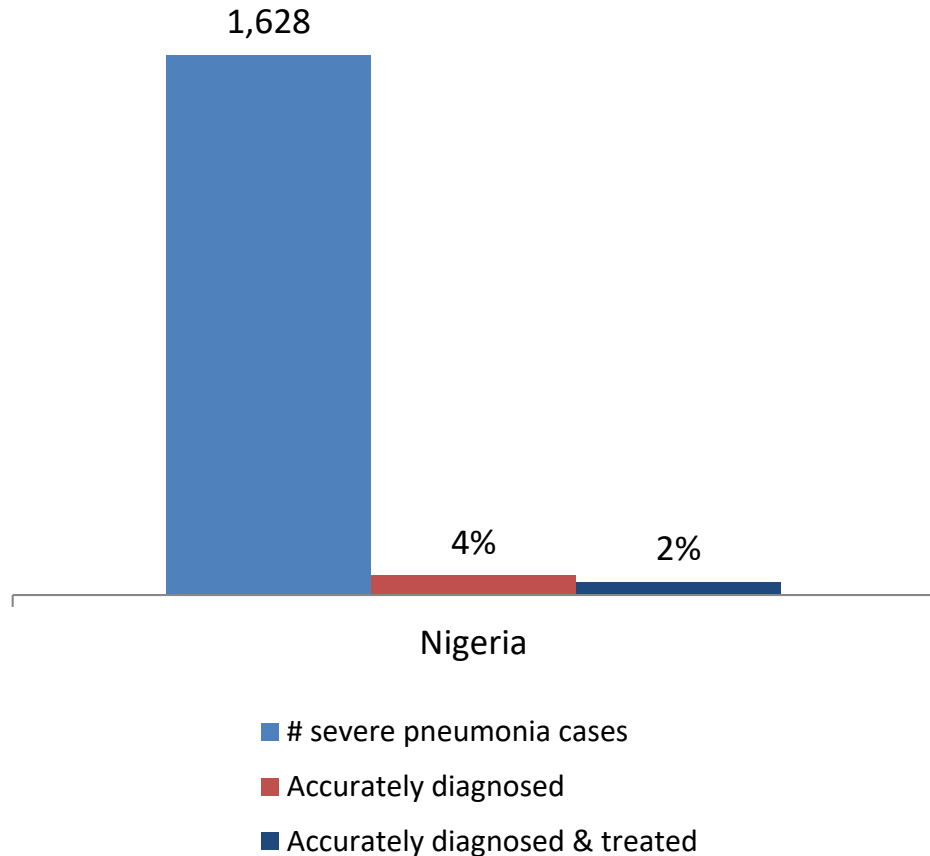
Barriers to correct diagnosis & treatment

- **Low clinical knowledge:** Up to 75% of frontline health workers do not recognize pneumonia symptoms (fast breathing & chest in-drawing)^{2, 3}
- **Limited diagnostic tools/skills**
 - Taking a respiratory rate (RR) on a child can be difficult – requires skill and practice
 - Up to 86% of cases did not receive an oxygen saturation (SpO₂) reading
- **Lack of standardized terms & metrics**
 - Over 60% of RI cases are not classified as non-severe/severe/no pneumonia⁴
 - 15+ terms used (ARI, LRTI, cough/cold, etc.)
 - No valid global indicator for tracking coverage
- **Lack of Availability of optimal treatment (Amox DT).** Use of dispersible tablet improves supply chain efficiency, increases dosing accuracy, simplifies training, reduces costs.

1. Data from 2017 CHAI patient record abstract surveys in 3 states in Nigeria (Kano, Kaduna, Niger)
2. Nigeria PPMV – 75% - Do not mention both fast breathing and chest in-drawing as symptoms of pneumonia – CHAI Data on File 2016
3. Treatment of Pneumonia in Nigeria – PATH – 2013. Most PPMVs are familiar with the term, but are not too sure about all of the symptoms
4. Data from 2017 CHAI patient record abstract: Nigeria 36%

Additionally, when children with severe pneumonia present at facilities, less than five percent are correctly diagnosed and treated

Severe pneumonia diagnosis and treatment¹



Barriers to correct diagnosis & treatment

- **Low clinical knowledge**
 - Up to 80% of health workers do not know severe pneumonia symptoms²
 - Up to 93% of health workers do not know first-line treatment for severe pneumonia³
- **Limited diagnostic tools/skills**
 - Less than 5% of secondary health facilities have pulse oximeters available.
 - Less than 5% of severe pneumonia cases in children are accurately diagnosed
- **Lack of availability and use of optimal treatment**
 - Up to 55% of health facilities do not have the recommended first-line injectable antibiotic available for severe pneumonia⁵
 - Less than 7% have oxygen available
 - Even where pulse oximeters and O₂ are available, usage is often low

1. Data from 2017 CHAI patient record abstract surveys in 3 states in Nigeria (Kano, Kaduna, Niger)
2. Nigeria – 80% - do not know 3+ symptoms of severe pneumonia – CHAI Data on file 2016
3. Nigeria – 93% - Do not know the 1st line ABX treatment for severe pneumonia – CHAI Data on File 2016
4. Nigeria – 96% of suspected severe pneumonia lack a diagnosis of severe pneumonia in health facility records – CHAI Data on file 2016
5. Nigeria 55% - do not have 1st line injectable antibiotic available for severe pneumonia – CHAI Data on File 2016

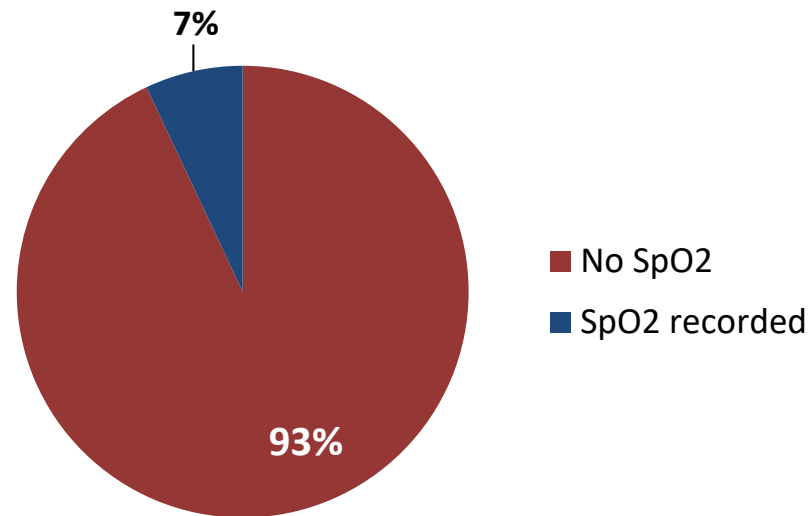
For a large proportion of children admitted with severe pneumonia, diagnosis of hypoxemia is largely based on clinical signs, which are often inaccurate.

Pulse oximetry measures the percentage of oxygenated haemoglobin in arterial blood (SpO₂)

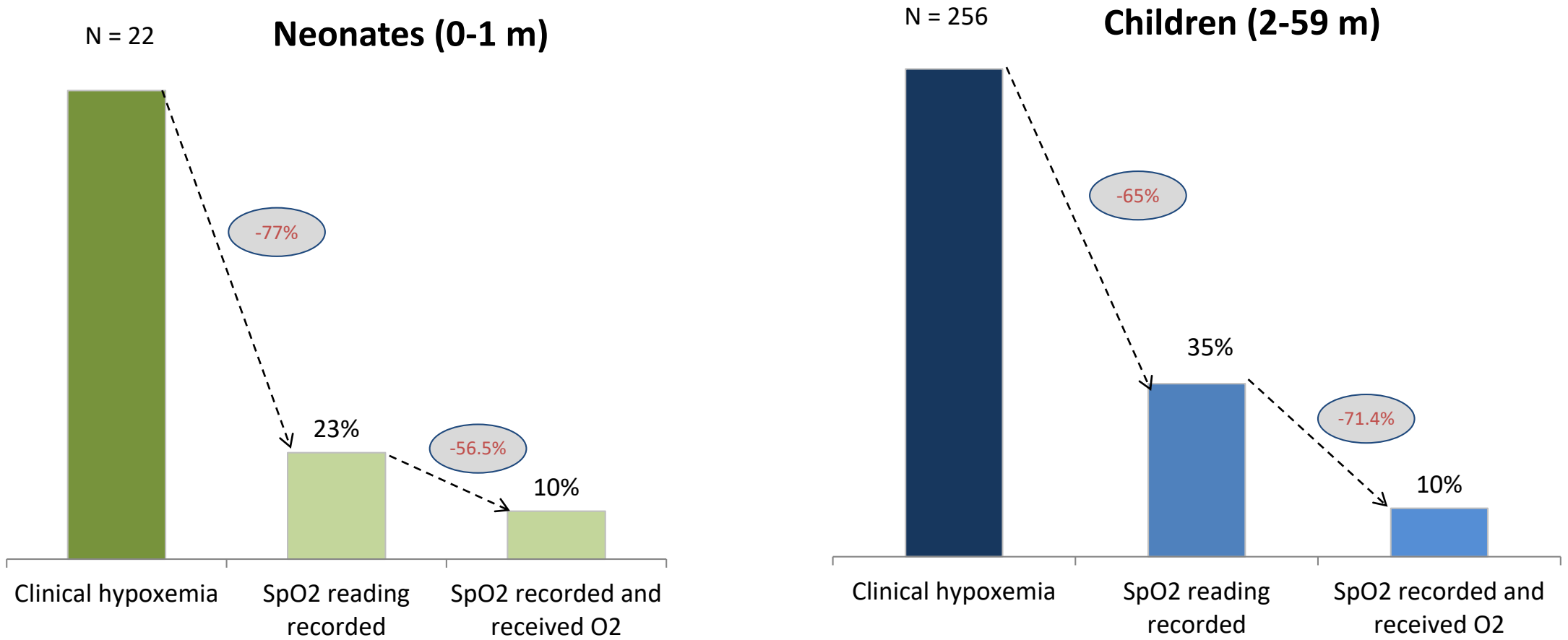
→ It is non invasive, accurate and cost effective.

Pulse Oximetry detects 20-30% more children with hypoxemia than clinical signs¹.

Oxygen saturation readings for all RI cases presenting²



Likewise, among children with hypoxemia, few are being screened appropriately and only 1 in 10 actually receive requisite oxygen therapy

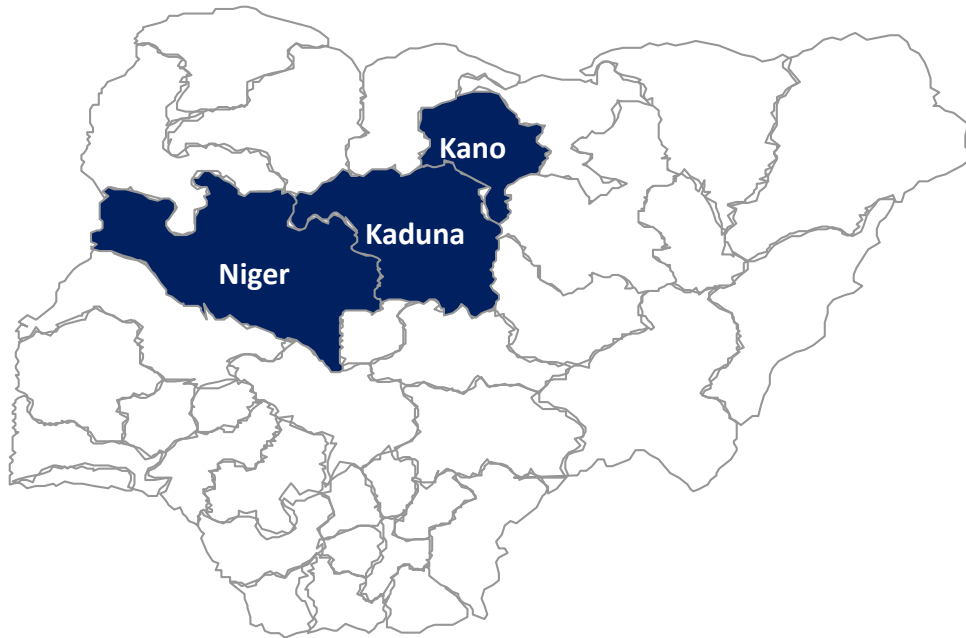


1. Data from 2017 CHAI patient record abstract surveys in 3 states in Nigeria (Kano, Kaduna, Niger)

Using a three-pronged approach CHAI aims to ensure improved diagnosis and treatment of diarrhea and pneumonia in three focal states

1 Ensure an **enabling policy environment**

- Oxygen, pulse oximetry, amoxicillin DT, zinc/ORS are in STG, EML, EEL and NSO



*These three states account for **17%** of the country's under-5 population¹ and **22%** of pneumonia burden².*

2 Galvanize **domestic resource mobilization**

- Support state governments to invest in oxygen equipment through a Joint Investment Plan
- Procurements and donations of AMX DT
- AOPs and budgets revised to include funding for key commodities and related activities

3 Ensure **policy translation and implementation**

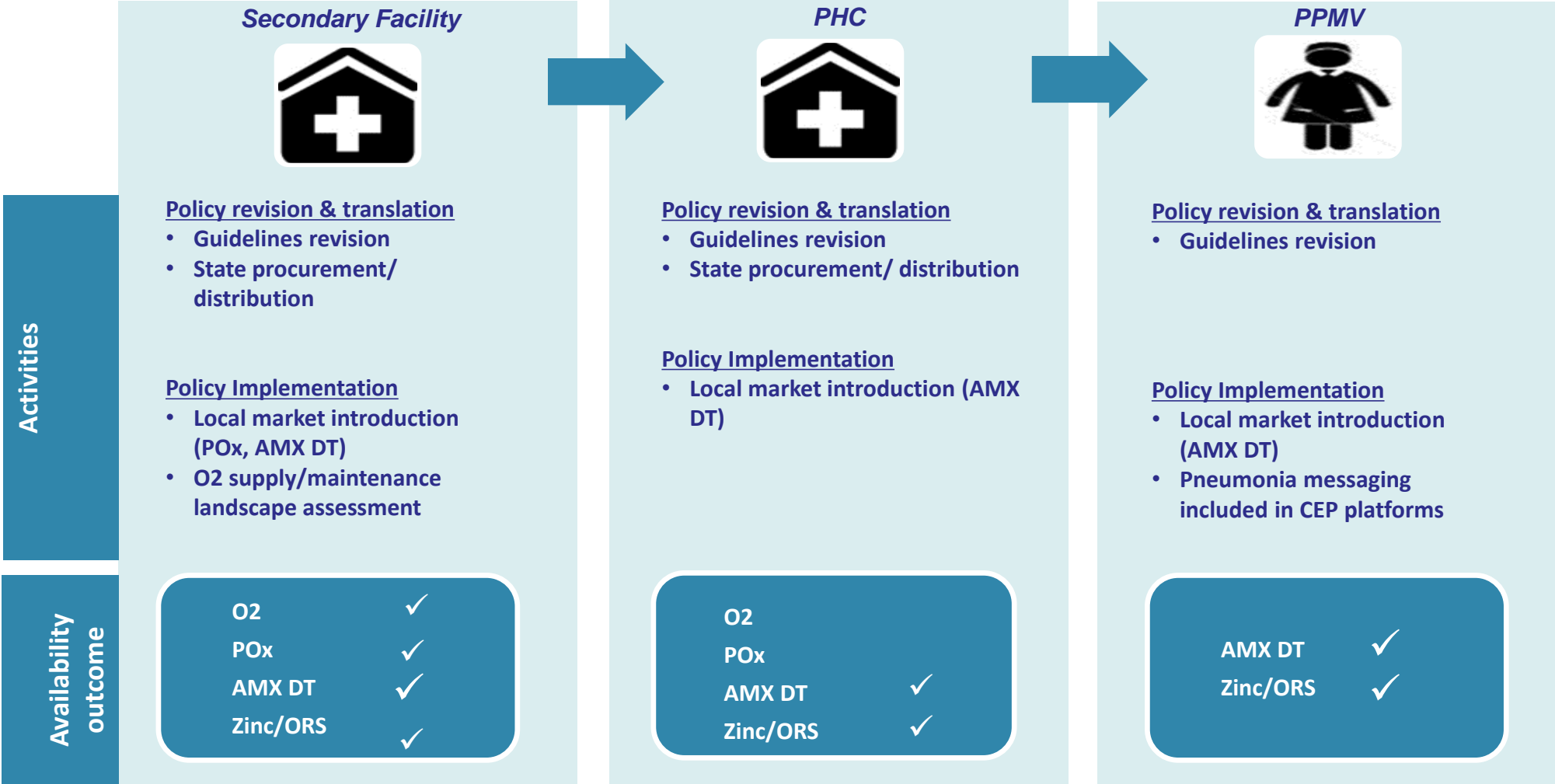
- Technical support for job aides/SOPs
- Training of clinicians on hypoxemia diagnosis and treatment
- Training BME/Ts on equipment maintenance & repair
- Establishing/leveraging existing QITs



1. Estimate projections based on Nigeria 2006 Census
2. CHAI morbidity analysis based on NDHS 2008 pneumonia prevalence rates.

The program focuses on 30 secondary facilities and has indirect impact at PHCs and PPMVs through policy reform

CHAI aims to **enable widespread availability** of key commodities: oxygen, pulse oximeters, AMX DT, and zinc and ORS—at appropriate levels of care **through policy change, translation, and implementation.**



CHAI supported SMOHs to quantify, procure, and install 110 concentrators & 207 pulse oximeters to meet IPD needs across 40 facilities in the 3 focal states

Number of O₂ concentrators and POx quantified & procured for focal facilities

State (# IPDs supported)	Equipment	Equipment quantified to meet need in IPDs	Existing supply found in IPDs during pre-installation assessment	Number of equipment jointly procured by CHAI and SMOH
Kaduna (10)	O ₂ concentrators	31	7	28
	POx	43	2	41
Kano (10)	O ₂ concentrators	36	20	24
	POx	73	4	69
Kano expansion	O ₂ concentrators	31	5	30
	POx	54	0	53
Niger (10)	O ₂ concentrators	31	0	28
	POx	44	0	44

The end line assessment focused on facility assessments and chart reviews in the three program states (Kano, Kaduna, and Niger)

1

Health Facility Assessments

Objectives

- To determine whether essential treatments (e.g. amoxicillin, gentamycin, ORS, zinc, oxygen supply, etc.) and diagnostic tools (e.g. pulse oximeters) were available at the facility
- To understand the impact of the intervention on availability of requisite commodities at facilities

Methodology

- Structured questionnaires applied at 254 PHCs & 85 SHFs by trained LGA M&E officers
- Assessed availability of key commodities
- Assessed HCW knowledge towards identifying severe/non severe pneumonia
- Assessed HCW prescription practices

2

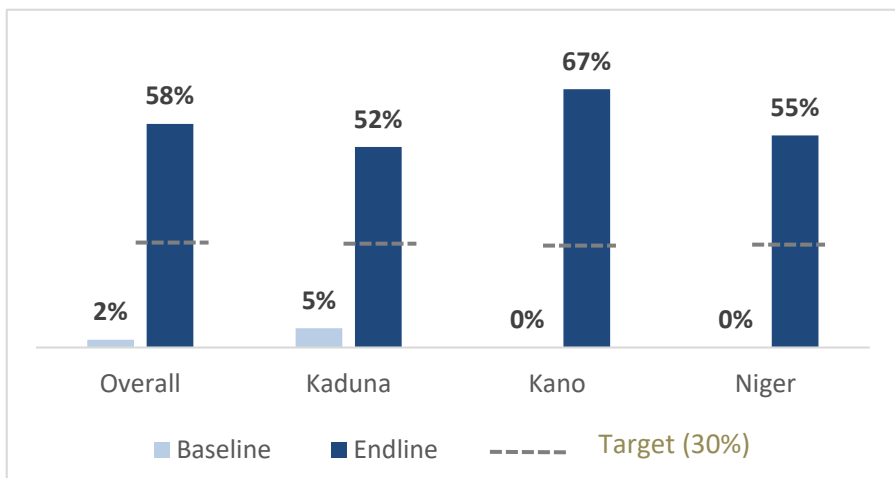
Patient Chart Reviews

- To review case files of children admitted with pneumonia in PIPDs in focal facilities
- Understand the case management and treatment practices for children with mild and severe pneumonia
- To evaluate if case management practices and patient outcomes improved after equipment installation and training of providers

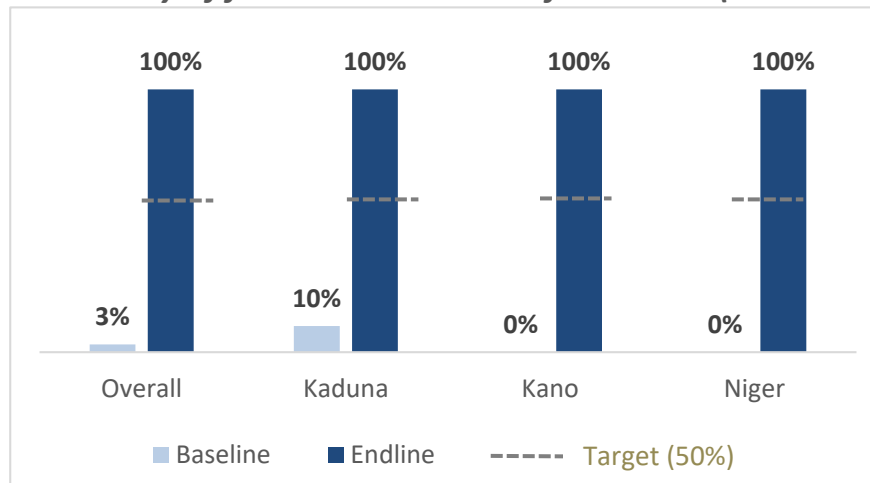
- Chart reviews conducted in all focal facilities in three states
- Reviewed charts of children presenting at facilities with pneumonia
- Compared data between baseline conducted in 2016 and at endline in 2018 (Jan – Aug) after installation of equipment at facilities
- 4, 650 patient case files were reviewed at endline

In all three states, POx and O₂ availability increased from baseline following installation of equipment

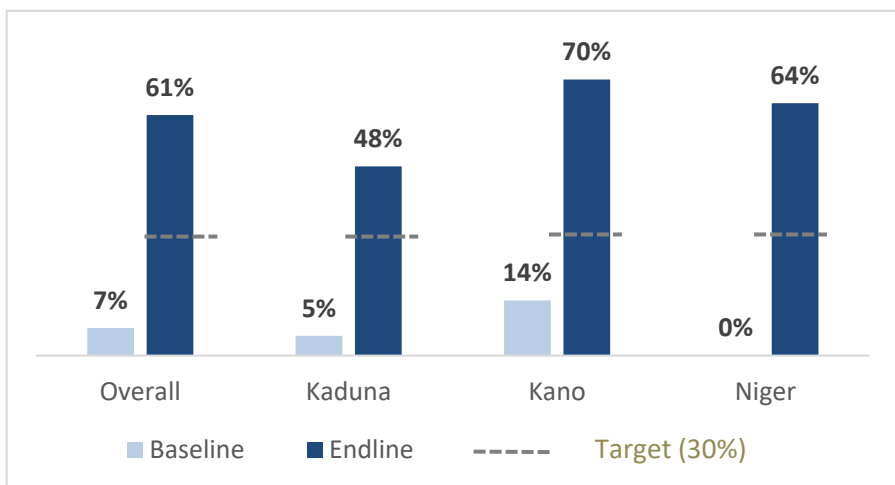
Availability of functional POx in all SHFs (N=85)



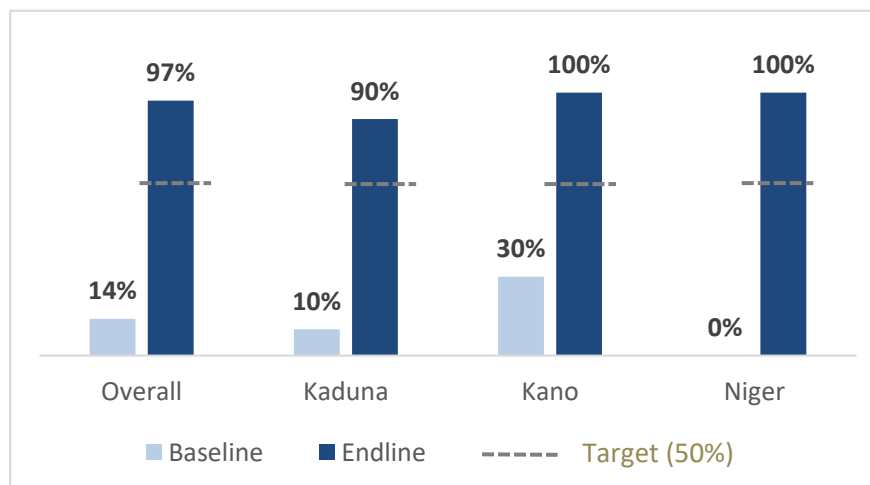
Availability of functional POx in all focal SHFs (N=30)



Proportion of all SHFs with functional O₂ (N=85)



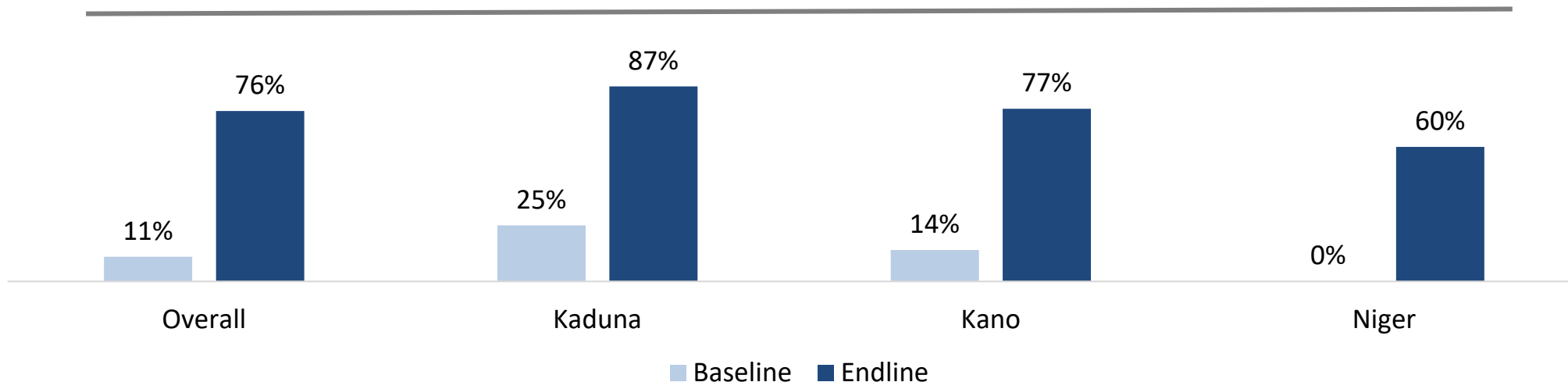
Proportion of focal SHFs with functional O₂ (N=30)



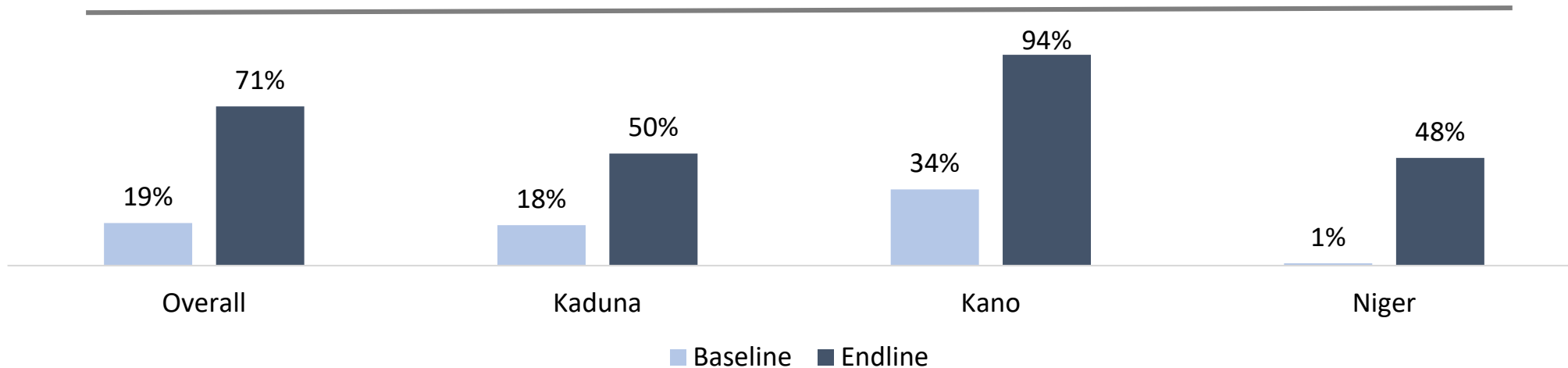
Sources: Patient chart abstraction at 30 focal facilities. Baseline data collected in January 2016; Endline data collected in August 2018.

In all three states, POx and O₂ coverage increased from baseline following installation of equipment

% of U5 inpatient pediatric pneumonia admissions with O₂ saturation measurement



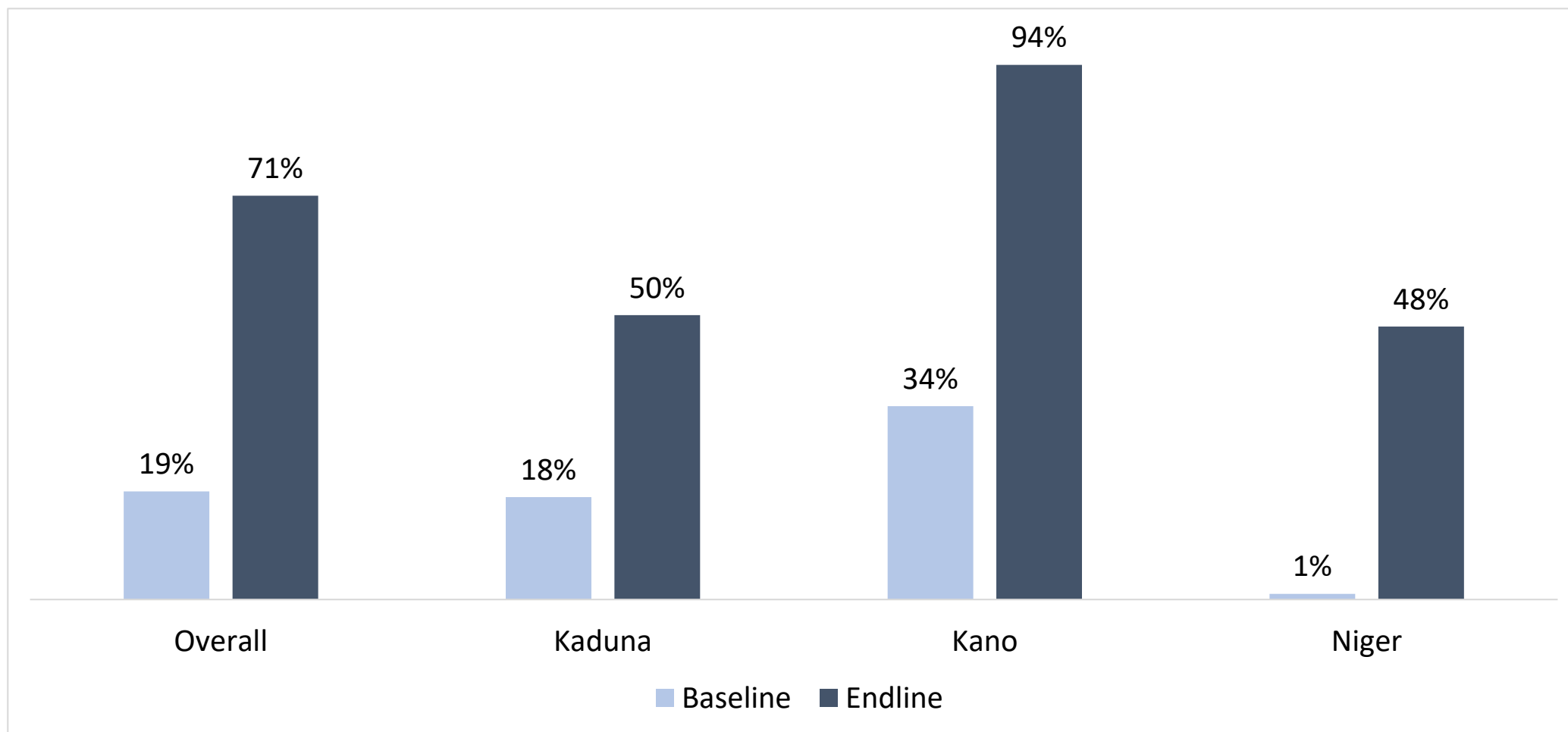
% of U5 severe pneumonia admissions with clinical signs of hypoxemia or SPO₂ < 90% treated with O₂ *



Sources: Patient chart abstraction at 30 focal facilities. Baseline data collected in January 2016; Endline data collected in August 2018.

Treatment of non-severe pneumonia cases with amoxicillin has improved in all 3 focal states

% of U5 non-severe pneumonia cases receiving amoxicillin*



Sources: Patient chart abstraction at 30 focal facilities. Baseline data collected in January 2016; Endline data collected in August 2018.

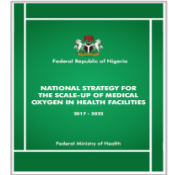
* Amoxicillin use includes any format and formulation (i.e. syrups, suspensions, or tablets)

Key program achievements

1

Policy Change

- ❑ Supported PCN with the inclusion of AMX DT in the APML
- ❑ Supported development of the national oxygen strategy and guidelines
- ❑ Printing and dissemination of National EMLs, EEG and STGs and relevant policies and guidelines



2

Domestic Resource Mobilization

- ❑ Secured commitment (NGN 69million or ~\$193K collectively) of the state governments in all three implementation states (Kano, Kaduna and Niger) under the pneumonia EDD/P program towards the procurement of oxygen equipment.
- ❑ Completed installation of oxygen treatment and diagnostic equipment in 30 SHFs

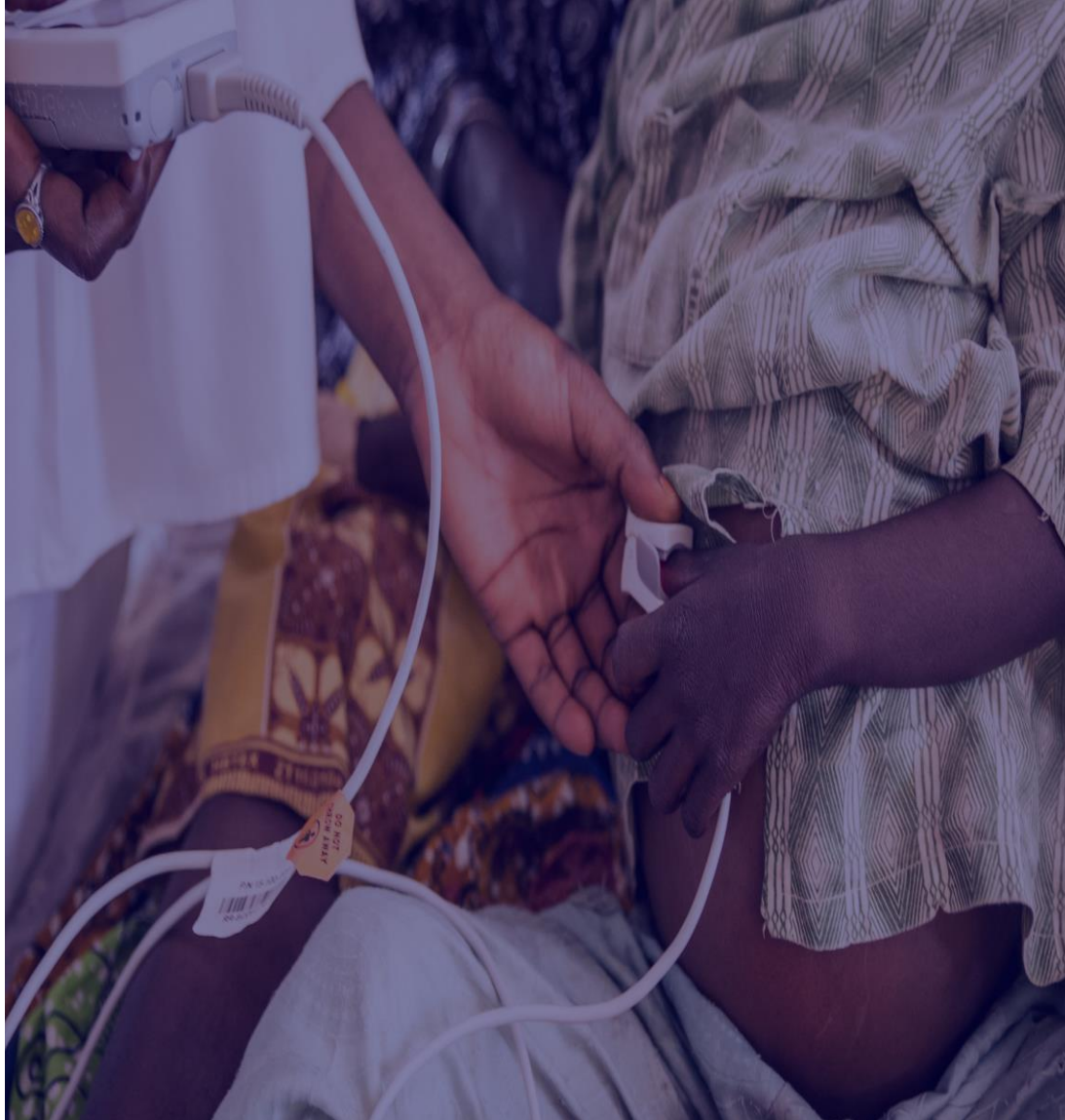


3

Policy Translation & Implementation

- ❑ Training of all BME/Ts in Kano, Kaduna and Niger.
- ❑ Training of frontline health care workers
- ❑ Increased availability of oxygen equipment coupled with trained personnel has led to:
 - ✓ Improved overall management of childhood pneumonia - both diagnosis and treatment.
 - ✓ Increased use of POx
 - ✓ Increased and appropriate use of oxygen
- ❑ Supported the inauguration/optimization of Quality Improvement Teams in supported facilities.
- ❑ Supported the training of Medical Records Officers and optimized data tools to ensure improved management of patient records in a bid to provide data for improved patient care.





In addition, based on estimations from the LiST tool between 400-500 lives were saved from this intervention between Jan – Aug 2018.

To avert the 390+ daily pneumonia deaths in the country, more is needed to..

Educate mothers	Improve diagnosis	Increase treatment rates
<ul style="list-style-type: none">✓ Recognize the signs and symptoms of pneumonia✓ Seek care immediately when a child has difficulty breathing✓ Partner with churches, schools and community groups to share the message	<ul style="list-style-type: none">✓ Equip health workers with better tools (combined pulse oximeter + respiratory rate)✓ Support workers to use the tools effectively✓ Strengthen triage and referral practices	<ul style="list-style-type: none">✓ Expand oxygen access and use✓ Improve access and use of AMX DT✓ Strengthen systems to be able to routinely measure pneumonia treatment rates

Improving reporting and indicators for pneumonia success

- **Champion the use** of the standardized global indicators
- Engagement to **incorporate in routine reporting systems (DHIS2) and standardized surveys** where relevant & feasible
- Identify and **prioritize short and longer-term opportunities to strengthen reporting** for pneumonia and hypoxemia treatment