Improving access to and appropriate use of medicines for newborn and child health for primary health care:

Assuring appropriate use of pediatric amoxicillin and gentamicin injection

Child Health Task Force – May 24, 2022
Agenda

I. Introductions

II. Background & challenge

III. Consultative series on improving uptake of pediatric amoxicillin and gentamicin

IV. Bottleneck of inappropriate use: evidence, root causes, and interventions
Introduction

Child Health Task Force

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Child Health Task Force (CHTF)
Newborn and Child Health Commodities subgroup

- A subgroup on newborn and child health commodities was created in 2019 within the Child Health Taskforce. Co-chaired by UNICEF and USAID.

- Goal: raise awareness and promote collective efforts to improve the way commodities for newborn and child health are prioritized, financed, and managed.

- This meeting is in line with some of the CHTF objectives:
  - To develop evidence-based strategies to improve access to and appropriate use of newborn and child health commodities
  - To share resources on recognized and emerging best practices and innovations, as well as practical experiences from implementation in country programs for management of child and newborn health commodities.
Introducition
Participants

Government and organizational representation:

- Relevant government entities including Ministries of Health, Central Medical Stores, Regulatory authorities, Maternal & Reproductive Health units, and others
- Global health institutions, including World Health Organization, UNICEF, USAID, The Bill and Melinda Gates Foundation, and others
- Non-governmental organizations, national and international implementing partners
- Private sector
- Academic institutions
Global challenge
Children are still dying of preventable causes

- Almost half of under 5 deaths are in newborns due to infections, including sepsis/pneumonia, pre-term complications, and birth asphyxia
- Lower respiratory infections are the second leading cause of death among children under five years – 800,000 children a year
- Recent global changes in treatment of newborn and child health conditions still not widely adopted
  - Treatment with amoxicillin was recommended by WHO in 2014 for pneumonia and dispersible tablets were the preferred formulation
  - Oral amoxicillin with gentamicin injection recommended in 2015 for treatment of PSBI in newborns where referral is not feasible
  - In sick young infants with fast breathing as the only sign of illness:
    - under 7 days old refer and, if referral is not feasible, treat with oral amoxicillin
    - 7-59 days old treat with oral amoxicillin, referral not needed (IMCI 2019)
- 54 countries need accelerated action to meet the SDG target for under-five mortality
- Access to and appropriate use of amoxicillin and gentamicin for newborn and child health through primary heath care remains a challenge.
What is needed to further the advances already made and increase access to and appropriate use of pediatric amoxicillin and gentamicin?

**Prioritized bottlenecks:**

**Quantification & Financing**
- Inaccurate quantification at all levels and/or inadequate financing of pediatric amoxicillin and gentamicin formulations

**Quality**
- Quality of child health products not guaranteed

**Appropriate Use**
- Inappropriate use of medicines for treatment of pneumonia and PSBI by providers and caregivers
Challenges impacting commodity access & appropriate use

Quality not guaranteed

Inappropriate use

Lack of availability and appropriate use of quality pediatric amoxicillin and gentamicin
Improving uptake of amoxicillin and gentamicin

Evidence and solution building process to review experience and evidence related to selected bottlenecks

Consultative process:
- Review of recent literature
- Call for evidence, experience, and data
- Surveys to priority countries
- Consultative meetings
  - Convene country stakeholders, donors, and implementing partners
  - Share evidence on prioritized bottlenecks in uptake of medicines for newborn and child health
  - Discuss root causes
  - Develop consensus on actionable, prioritized solutions
- Call-to-action paper
  - with defined roles for both countries and global partners

Schedule of consultative meetings:
- Consultative Meeting #1: Quantification & Financing – May 10th
- Consultative Meeting #2: Quality – May 17th
- Consultative Meeting #3: Appropriate Use – May 24th
Consultative Series #3

**Bottleneck 3:** Inappropriate use of medicines for treatment of pneumonia and PSBI by providers and caregivers
Context of the bottleneck
Inappropriate use

- Amoxicillin has been adopted by most countries as 1st line treatment for treatment of pneumonia in under 5s and with gentamicin for treatment of PSBI where referral is not feasible\(^a\)
- But even if policies are in place, there is no guarantee that children receive appropriate treatment
- Inappropriate and ineffective use of medicines is 3rd in the top 10 inefficiencies in health systems (WHR, 2010)
- WHO estimates that more than half of all medicines are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take them correctly
- Antimicrobial resistance – newborns particularly vulnerable. Children under five years old made up over half of the 255,000 deaths due to AMR in Sub-Saharan Africa in 2019\(^b\)

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Photo credit: J Briggs MSH
Evidence of bottleneck:

Inappropriate use of medicines for treatment of pneumonia and PSBI
Poor quality care for pneumonia - highlighted by Lancet Global Health Commission on High-quality health systems in the Sustainable Development Goals era

40-75% of children seeking care for pneumonia received appropriate treatment

Investments in integrated case management have improved coverage of pneumonia treatment from about 3% in 2016* to 57% in 2019.

However significant variation exist between regions.

Evidence of poor prescribing or dispensing practices

In Ethiopia, STG adherence for amoxicillin to treat pneumonia was 13% in selected facilities\(^4\)

In Nigeria, baseline data showed that for cases with symptoms of pneumonia, treatment with amoxicillin by community providers was 29%\(^1\)

In Uganda, 57% of health workers surveyed from 32 public facilities reported using amoxicillin DT to treat pneumonia\(^8\)

Sick young infants with PSBI not treated at lower-level facilities due to lack of confidence but referred to higher-level facilities (India)\(^3\)

In India, 4% of pneumonia cases prescribed amoxicillin by AHSAs\(^2\)

In Uganda, 0% of providers in selected drug shops were treating children with pneumonia with amoxicillin DT and 68% treated with cotrimoxazole\(^7\)

In Nepal, 73% of sellers in medicine shops and 82% providers of physician run clinics for sick young infants providers mentioned amoxicillin (+/- clavulanate) as their usual first line oral antibiotic but fewer mentioned gentamicin as the usual first line injectable antibiotic (53% of medicine shops and 21% of physician run clinics).\(^5\)

In a recent study in Ghana, 8% of private health facilities and 1% of private pharmacies had amoxicillin DT in stock and 0/15 wholesalers managed amoxicillin DT\(^6\)
Observational study in Tanzania highlighted severe challenges around appropriate use related to misdiagnosis and mis-prescription – likely similar patterns in other high-burden countries (R4D)⁹

100 children under five with ultrasound-confirmed pneumonia seeking care across 83 public health facilities with *peds amox in stock*

- **Correctly** diagnosed as pneumonia positive by provider
  - Provider prescribed *peds amox* 72%
  - Provider prescribed *non-peds amox* 28%
- **Incorrectly** diagnosed as pneumonia negative by provider¹
  - Provider prescribed *peds amox* 46%
  - Provider prescribed *non-peds amox* 54%

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1. R4D conducted observational study in 2017 to assess rates of misdiagnosis and quality of care for children presenting non-severe pneumonia in Tanzanian public health facilities. N = 100 children U5. After enumerator observed provider following IMCI guidelines to diagnose and prescribe medicine for children presenting signs of pneumonia, lung ultrasound was used to confirm diagnosis.
2. Provider diagnoses in these instances: 42% ARI, 27% URTI, 10% cough/cold, 3% other.
Most providers *know* the steps of an IMCI examination…

- 67% *know* to count breaths for 1 min.
- 77% *know* to look for chest indrawing
- 47% *know* to listen to breathing for sounds of stridor or wheezing

…but those steps do not get carried out most of the time

Only 33% of children with respiratory symptoms received any IMCI examination step

Notes

1. Clinical examination refers to the completion of one or more of the three assessment steps providers should be undertaking when diagnosing a child under five according to the IMCI guidelines: 1) counting breaths, 2) looking for chest in-drawing, and/or 3) listen to breathing for sounds of stridor or wheezing.
2. Survey question: How do you assess whether a child has pneumonia? N = 92 providers
3. Provider directly observed by survey interviewer, who recorded whether provider conducted each IMCI step, N = 957 children under 5 with respiratory symptoms
# Root causes of inappropriate use of amoxicillin & gentamicin

<table>
<thead>
<tr>
<th>Knowledge &amp; perceptions</th>
<th>Habits</th>
<th>Information provision/counseling</th>
<th>Policy/guidelines</th>
<th>Supply</th>
</tr>
</thead>
</table>

**CHILD HEALTH TASK FORCE**
# Root causes of inappropriate use

## Knowledge & Perceptions

### Providers
- Inadequate knowledge of clinical examination protocols for pneumonia diagnosis
- Lack of knowledge of or access to treatment guidelines
- Unaware of/unfamiliar with amoxicillin DT
- Lack of instructions and training on use of amoxicillin DT
- Lack of job aids and other reference material
- Staff rotation
- Limited awareness of benefits of amoxicillin DT versus suspension (lower cost/ease of management and administration)
- Negative perceptions of efficacy or suitability of amoxicillin
- Lack of perceived benefit of amoxicillin
- Lack of trust in amoxicillin compared to other antibiotics
- Providers not trained or hesitant/fearful to give gentamicin injection
- Difficulty to measure the dose of gentamicin injection

### Caregivers
- Unsure of dosing and how to administer
- Don’t know how to dissolve tablets
- Community resistance to using antibiotics
- Lack of demand (from community)
- Lack of trust in amoxicillin compared to other antibiotics
- Preference for specific medicine or formulation
- Perception that fee-based drugs are more effective than free drugs
## Root causes of inappropriate use

### Habits
**Providers**
- Have experience and familiarity with other antibiotics
- Used to amoxicillin dosing 3 times per day
- Preference for other antibiotics
- Profit motivation
- Fear that caregiver will not accept DT

**Caregivers**
- Forget to give doses

### Policy/guidelines
- Not included in guidelines or EML
- Not designated as preferred treatment in guidelines
- WHO guidelines did not align with local guidelines
- Limited clinical monitoring on treatment adherence

### Information provision/counseling
**Providers**
- Did not give instructions on how to administer

**Caregivers**
- Caregivers do not find amoxicillin DT easy to administer
- Amoxicillin package not very clear on preparation and dosage

### Supply
- Stockouts or insufficient supply of medicines
- Cotrimoxazole has been reported as being used in some countries as it can be financed through GF
- Lack of 1ml or 2ml syringes for gentamicin
Subnational facility availability of Amoxicillin DT, 2021

Data collected via facility inventory spot checks in each subnational geography.
Subnational facility availability of gentamicin, 2021

Data collected via facility inventory spot checks in each subnational geography

- **Burkina Faso**
  - Centre-Ouest: 80% (8 of 10)
  - Sud-Ouest: 100% (6 of 6)

- **Ethiopia**
  - Oromia: 69% (9 of 13)
  - 85% (23 of 27)

- **India**
  - Bihar: 58% (29 of 50)
  - Uttar Pradesh: 78% (7 of 9)

- **Kenya**
  - Kakamega: 70% (7 of 10)
  - Kisumu: 83% (10 of 12)

- **Nigeria**
  - Sokoto: 40% (8 of 20)

- **Source:** PATH Asset tracker
Inappropriate use of medicines

In your experience, what are the most critical root causes contributing to inappropriate use of pediatric amoxicillin and gentamicin by healthcare providers?
Inappropriate use of medicines

In your experience, what are the most critical root causes contributing to inappropriate use of pediatric amoxicillin and gentamicin by caregivers?
Examples of interventions to improve use of pediatric amoxicillin and gentamicin
Policy - adoption of WHO recommendation

Amoxicillin DT on nEML

61/74 countries include Amoxicillin DT on their National Essential Medicines List (WHO SRMNCAH Policy Survey)

Amoxicillin DT clinical guidelines

58/74 countries have clinical guidelines for Amoxicillin DT as the first line treatment for pneumonia chest in-drawing (WHO SRMNCAH Policy Survey)
Case study: Drug Use Evaluation, GHSC-PSM Ethiopia

Background
• Ethiopia added amoxicillin DT on EML in 2015 and updated IMNCI protocol in 2016 as first-line treatment for pneumonia.
• By the end of 2018, Amox DT was integrated into the national supply management system.
• Rational prescribing and use of Amoxicillin is critical for better treatment outcome of childhood pneumonia

Challenge
• Through routine supportive supervision, GHSC-PSM identified:
  • Limited awareness and use among prescribers & dispensers
  • Non-adherence to the national protocols
  • Facilities unaware of product availability despite its free availability from the supply hubs
  • Preference for high-cost second line medicines where less expensive alternatives exists for clients

Intervention:
Drug Use Evaluation (DUE): The evaluation of medical records of children treated for pneumonia by DTCs to assess adherence to standard treatment guidelines, analysis and implementation of corrective actions.

• Baseline DUEs conducted to assess adherence to standard treatment guidelines
• Root cause analysis for the problems identified
• Designed and implemented facility specific interventions
• Post-intervention DUEs conducted
• The baseline DUEs conducted at four facilities revealed:
  • Adherence to STGs in the management of pneumonia at correct dose & duration was low
  • Amoxicillin DT was not prescribed despite its availability at no cost
Root causes analysis

Identified reasons for low adherence for STG and low amoxicillin use:

- Limited availability and inconsistent use of IMNCI chart booklet/STGs
- Knowledge gap due to lack of updated training and skill transfer practice
- Rotation of trained prescribers within the facility
- Lack of awareness on the availability of amoxicillin DT in the facility
- Misperceptions on amoxicillin DT efficacy and preference by care givers
- Weak drug information services
Interventions implemented to address root causes

GHSC-PSM supported DTCs to disseminate the DUE findings and supported facilities to implement intervention plans:

- Distributed treatment guidelines
- Posted amoxicillin dosing charts in treatment areas
- Conducted supportive supervision at facilities on
  - Proper prescribing practice and utilization of amoxicillin DT
  - Correct requisition by the facility to supplying hubs for stock
  - Monitoring availability of amoxicillin DT as a tracer drug
- Implemented a pre-printed order sheets for pneumonia management
  - A two pager -checklist in medical charts that assists clinicians to select the right and cost-effective antibiotic and minimize errors

Key result
- Enabled better monitoring by health facility management and DTC to follow correct prescribing practices through feedback provision
Comparison of result on pre and post intervention DUEs

% of adherence to STG in the management of childhood pneumonia in correct dose and duration at baseline DUE and post intervention DUE

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Baseline DUE</th>
<th>Post intervention DUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adama hospital</td>
<td>13%</td>
<td>86%</td>
</tr>
<tr>
<td>Mekaneselam Hospital</td>
<td>0%</td>
<td>81%</td>
</tr>
<tr>
<td>Assela health Center</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Mojo health center</td>
<td>0%</td>
<td>83%</td>
</tr>
</tbody>
</table>

% increase in prescriptions of amoxicillin DT for childhood pneumonia in baseline DUE and post intervention DUEs

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Baseline DUE</th>
<th>Post intervention DUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adama hospital</td>
<td>0%</td>
<td>12%</td>
</tr>
<tr>
<td>Mekaneselam Hospital</td>
<td>0%</td>
<td>14%</td>
</tr>
<tr>
<td>Assela health Center</td>
<td>0%</td>
<td>41%</td>
</tr>
<tr>
<td>Mojo health center</td>
<td>0%</td>
<td>45%</td>
</tr>
</tbody>
</table>
# Interventions to address inappropriate use of treatments

## Facility-level providers

### Kenya

**Treatment/level:** Oral amoxicillin for pneumonia in hospitals

**Package components:**
- **Training** on WHO clinical guidelines for management of childhood pneumonia
- **Standard feedback:** data collection and quality support, mentorship/team management training for pediatricians, peer-to-peer networking, electronic bimonthly hospital-specific feedback reports on guideline adherence indicators

  - **Enhanced audit feedback:** standard feedback components + monthly hospital-specific feedback sheet targeting pneumonia indicators and email follow-up from a supervisor

**Results:**
No significant difference in proportion of children correctly classified and treated in the first 24 hours during the 9-month period (38.2% in enhanced feedback group vs. 38.4% in standard feedback group)

### Bangladesh

**Treatment/level:** Injectable gentamicin and oral amoxicillin drops by primary care facility providers

**Package components:**
- **Supportive supervision** with monthly meetings for providers and government managers and on-site visits by government managers
  - Highly sensitive **clinical algorithm** for classification and treatment of infection
  - 5-day **cascade training and refresher training** for providers on infection management guidelines using a **revised register and job aids: algorithm and dosage chart**
  - Community sensitization on care-seeking

**Results:**
- 63% of young infants were correctly classified and treated (83% of fast breathing, 44% of clinical severe infections (CSI), 24% of critical illness (CI))
- Dosage errors for treatment for 23% of infants receiving antibiotic treatment, including 24% of gentamicin injections but decreased over a year to under 10%

**Note:** new strategies for measuring the infant’s weight and measuring body temperature. Confusion over classification – need case scenarios in training
## Interventions to address inappropriate use

### Facility-level providers (PSBI)

<table>
<thead>
<tr>
<th>Interventions</th>
<th>India (Haryana)(^{12})</th>
<th>India (Uttar Pradesh)(^{13})</th>
<th>India (Maharashtra)(^{3})</th>
<th>Nigeria(^{14})</th>
<th>Ethiopia (Jimma Zone)(^{15})</th>
<th>Ethiopia (Southern Tigray)(^{16})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical support unit</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Training</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Job aids/booklets/tools</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>WhatsApp</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Community sensitization</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Supply monitoring/management</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Supervision</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Policy dialogue</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Interventions to address inappropriate use
Facility-level providers (PSBI)

PSBI Treatment Completion

- Full treatment of gentamicin
- Full treatment of amoxicillin
SPRINT
utilisation de l’amoxicilline DT
dans la PEC de la pneumonie

Dr Alpha Seydi Ndiaye
Spécialiste Santé / UNICEF
SENÉGAL
Contexte

Situation initiale

• Amoxicilline sirop était utilisé comme traitement de la pneumonie en première intention

• Adoption Amoxicilline DT comme traitement contre la pneumonie en 2013

• Amoxicilline DT inscrit sur la liste des médicaments essentiel en 2014

• Première dotation en 2014-2015

• Engagement du gouvernement
  – Absence de fournisseur pour la continuité de la disponibilité

• Projet SPRINT début en 2020
  – 5 districts de 80 de Sénégal
Activités de mise en œuvre de SPRINT

• Planification conjointe avec les régions et districts
• Atelier de quantification de l’amoxicilline DT au niveau national avec la Pharmacie Nationale d’approvisionnement et les autres parties prenantes
• Dotation initiale en Amoxicilline et intégration dans la chaîne d’approvisionnement et de distribution nationale
• Adaptation des documents de références : Politiques Normes et Protocole, Protocoles des PEC de la Pneumonie, documents de formation et outils de gestion
• Coordination régionale et nationale
• Formation des prestataires et des acteurs communautaires sur la prise en charge
• Formation des dépositaires sur la gestion et la dispensation de l’amoxicilline
• Coaching et supervision
• Renforcement gratuité chez les moins de 5 ans (intégration de amoxicilline)
• Elaboration et mise en œuvre d’un plan de communication :
  o Affiches et aides mémoire pour les prestataires, affiches pour la population, spots et émissions radios
  o Visites à domicile, causeries, des dialogues communautaires dans les districts
  o Implication des leaders religieux, les influenceurs des réseaux sociaux
**Résultats**

- Note du Ministère de la Santé que l’amoxicilline DT est le médicament de 1ère intention pour la pneumonie pour les autres régions
- % des cas de pneumonie traité par antibiotique approprié = 94% en 2021 (source: DHIS2)
- Capacité de prestataires et dépositaires en PEC de pneumonie renforcée
- Demande de la communauté augmentée « amoxicilline en comprimés dispersibles guérit nos enfants »

**Défis**

- Lenteur dans le processus de formation des autres acteurs en dehors du pilote
- Faible complétude des données de gestion de stock d’amoxicilline
- Absence d’un indicateur spécifique sur les cas pris en charge avec l’amoxicilline DT
- Amoxicilline DT donnée au niveau communautaire non remboursée – besoins de plaidoyer
- La quantification n’a pas pris en compte l’utilisation de l’amoxicilline pour les autres pathologies infectieuses (otite, angine bactérienne, malnutrition, etc.)
Ongoing research on electronic clinical decision support

**TIMCI project** – tools for IMCI (implemented by PATH):
India, Kenya, Senegal, and Tanzania
- Tablet-based application of IMCI chart booklet
- Electronic Clinical Decision Support Algorithms promote adherence to guidelines, strengthen their implementation, and help enhance health care workers’ ability to accurately manage sick children.
- Study underway

**Noviguide**
- Decision support platform, mobile point of care application
- Algorithms and clinical pathways
- Insights dashboard linking stock-out data, equipment needs and epidemiological anomalies
- Used at hospital level in Uganda with 14 providers**
  - it improved newborn care delivery
  - reduced mistakes in newborn care
  - they felt more confident taking care of newborns
  - 83% of 1705 newborn assessments were completed

*Photo credit Noviguide*
Focus on gentamicin technologies\textsuperscript{18,19}

- Ensure availability and use of 1 ml syringe at all levels
- Premeasured, single-dose vials or ampoules or prefilled injection devices (although unlikely to be cost–effective)
- Pediatric gentamicin injection not best for IM administration as volumes over the recommended 1 ml
- Syringes with custom dose markings
  - Back in 2016, a syringe manufacturer stated that 3-5 customized markings on the syringe would be free of charge for orders of 100,000 syringes or higher
  - Example of Ethiopia chart booklet for health workers with instructions for using an insulin syringe for gentamicin delivery

<table>
<thead>
<tr>
<th>Weight</th>
<th>Dose: 80 mg per 2 ml vial</th>
<th>How much to take in insulin syringe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upto 2.5 kg</td>
<td>10 mg OD for 7 days</td>
<td>10 line</td>
</tr>
<tr>
<td>More than 2.5 kg</td>
<td>15 mg OD for 7 days</td>
<td>15 line</td>
</tr>
</tbody>
</table>
## Interventions to address appropriate use

### Community-level providers

<table>
<thead>
<tr>
<th>Country</th>
<th>Treatment/level</th>
<th>Package components</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uganda</td>
<td>Antibiotics, including amoxicillin DT, for pneumonia by CHWs</td>
<td>Pneumonia added to existing home-based malaria care management program&lt;br&gt;Training of district health team in community management of malaria and pneumonia&lt;br&gt;Training for all community health workers (CHWs) on malaria case management and on pneumonia case management for CHWs (only intervention areas)&lt;br&gt;Training of health facility workers on iCCM for malaria and pneumonia, investigating and documenting adverse effects, and supervision/training of CHWs</td>
<td>Children receiving prompt and appropriate antibiotics, including amoxicillin DT: 45% in intervention group vs. 11% in control group</td>
</tr>
<tr>
<td>India</td>
<td>Amoxicillin for fast breathing pneumonia by community providers</td>
<td>Supervision of ASHAs, including calls to discuss treatment by phone&lt;br&gt;Training in iCCM, with materials translated into local language&lt;br&gt;Retraining for ASHAs under certain score on evaluation&lt;br&gt;Post-training, ASHAs were given a medicine kit that included amoxicillin DT and medicine for malaria and diarrhea&lt;br&gt;Awareness activities to generate demand for iCCM services</td>
<td>Prescription of amoxicillin for cases of pneumonia by ASHAs increased significantly, from 4% of cases prescribed amoxicillin at baseline to 32% at midline to 41% at endline</td>
</tr>
<tr>
<td>Nigeria</td>
<td>Amoxicillin for pneumonia by community providers</td>
<td>Training of community-oriented resource persons (CORPs) and CHWs on iCCM; trainees provided with kit including amoxicillin DT after training&lt;br&gt;Regular supervision of CORPs by CHWs</td>
<td>For cases with symptoms of pneumonia, treatment with amoxicillin by any provider increased significantly from 29% at baseline to 61% at endline</td>
</tr>
</tbody>
</table>
## Interventions to address bottlenecks

### Caregivers

<table>
<thead>
<tr>
<th>Country</th>
<th>Treatment/level</th>
<th>Package components</th>
<th>Results</th>
</tr>
</thead>
</table>
| Bangladesh | amoxicillin DT for pneumonia by health facility providers | • Printed instructions (envelopes) and calendar for caregivers  
• Training on treatment of childhood pneumonia with amoxicillin DT  
• Job aids for facility providers | Intervention group: 32% of caregivers maintained full adherence to the recommended amoxicillin DT treatment regimen vs. 3% in the comparison group  
96% of children in the intervention group given appropriate dose twice per day vs. 66% in the comparison group |
| Kenya     | amoxicillin DT and oral suspension for pneumonia by CHWs | • Counseling for caregivers on treatment preparation and administration  
• Training for CHWs and nurses on classification of ARIs and at home case management of pneumonia with oral amoxicillin  
• Reporting of suspected pneumonia by CHWs to hotline; nurse sent to confirm case  
• Intervention incorporated into already existing iCCM structure | Adherence on day 4 was 89% for amoxicillin DT vs. 42% for oral suspension |
| DRC       | amoxicillin DT for pneumonia by CHWs and facility providers | • Dispensing envelopes for caregivers  
• Job aids for providers | After the intervention, 76% of mothers provided treatment with amoxicillin correctly |

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*Bangladesh21*  
*Kenya22*  
*DRC23*
## Summary of interventions to improve use of amoxicillin and gentamicin

### General
- Tracking and monitoring of use of medicines for pneumonia and PSBI
- Policies – treatment guidelines and EML aligned and in place
- Dissemination of guidelines
- Package interventions

### For providers
- Training & refresher training (link with IMNCI)
- Algorithms, treatment protocols
- Electronic clinical decision support
- Support material – job aids, posters, wall charts
- Supervision, mentorship
- Use of WhatsApp video to troubleshoot and communicate mass messages to groups
- Role of Medicines and Therapeutics Committees & Medicine Use Evaluation
- Ensure availability of 1ml Syringes with markers for gentamicin

### For caregivers
- Printed instructions/ Leaflets
- Dispensing aids such as envelopes
- Community sensitization and education

### Research agenda
- Cost effectiveness of dispensing aids for caregivers
- Electronic clinical decision support
- Technologies to facilitate administration of gentamicin injection
Evidence-based approaches to improving use of medicines

Systematic review of strategies to improve health care provider practices

- Training or supervision alone had moderate effects, but had larger effect when combined
- Multifaceted strategies had large effects
- Strategies with community support plus provider training had larger effect

Four broad approaches to improve use of medicines
Inappropriate use

What are the priority interventions and solutions to address inappropriate use of pediatric amoxicillin and gentamicin by providers and caregivers?

Breakout group discussions
Reporting Back

What interventions did your group discuss?

Which interventions should be prioritized?

Breakout group discussions
Summary of the session on inappropriate use
Thank you & next steps

High-level summary of three sessions

Next Steps

– Dissemination of meeting recording and materials

– Report out of all 3 consultative meetings and the priority actionable solutions in CHTF Commodities sub-group meeting: June 2022

– Develop call to action paper: June 2022
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See also:
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- PATH asset tracker