Global ORS/zinc coverage and evolving strategies for addressing residual diarrheal mortality among children under-five in the SDG era

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DECLINES IN DIARRHEA-ATTRIBUTABLE DEATHS AMONG CHILDREN UNDER-FIVE, 1975-2015

- Globally, about half a million of 6 million total under-five deaths were attributable to diarrhea in 2015.

Sources: Snyder, Merson (1982); Bern et al. (1992); Kosek et al. (2003); Liu et al. (2016)
GLOBAL DIARRHEA TREATMENT POLICY


May 2004, WHO and UNICEF issued a joint policy for the treatment of diarrhea among children under five years of age. Treatment should include:

- Liberal use of low-osmolarity Oral Rehydration Salts (ORS) to correct and prevent dehydration
- Zinc supplementation for 10-14 days to shorten duration and severity of diarrhea (10/20 mg per day for ages <6 mos/ 6-59 mos)
- Continued feeding
- Increased fluids

In 2009, more than half of UNICEF priority countries did not have a policy for both low osmolarity ORS and therapeutic zinc supplementation.

Countdown 2015 indicates 69 countries have included both low osmolarity ORS and zinc in their national pediatric diarrhea treatment policies.

Sources: UNICEF Countdown 2015; CHAI. Progress over a decade of zinc and ORS scale-up: Best practices and lessons learned. 2016.
GLOBAL TREND IN ORS COVERAGE*, 1985-2015

- Promoted by WHO’s vertical Control of Diarrheal Disease (CDD) program, global ORS coverage increased from 0% in 1980 to 25.9% (95%CI: 22.0, 29.8%) in 1990.

- Progress over the subsequent 25 years has been slow, reaching only 33.2% (95%CI: 31.3, 35.1%) in the year 2000 and 44.2% (41.1, 47.2%) in 2015.

*DHS/MICS coverage definition: the % of children with diarrhea in last 2 weeks who were treated with ORS
REGIONAL TRENDS IN ORS COVERAGE, 1985-2015

Avg Rates of Coverage Increase

AFR: 0.7% / year (0.3, 1.1%)
AMR: 0.5% / year (0.1, 0.9%)
EMR: 0.4% / year (-0.2, 0.9%)
EUR: 1.4% / year (0.5, 2.2%)
SEAR: 1.3% / year (0.5, 2.1%)
WPR: 1.1% / year (0.2, 1.9%)

Source: Available DHS and MICS data
NATIONAL ORS COVERAGE AS PER MOST RECENT DHS/MICS
### Sustained ORS Coverage >50%

<table>
<thead>
<tr>
<th>Country</th>
<th>First year coverage &gt;50%</th>
<th>Most recent coverage level reported</th>
<th>Years Sustained*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>1994</td>
<td>77.0% (DHS 2014)</td>
<td>19</td>
</tr>
<tr>
<td>DPRK</td>
<td>2000</td>
<td>74.0% (MICS 2009)</td>
<td>9</td>
</tr>
<tr>
<td>Malawi</td>
<td>2001</td>
<td>63.5% (MICS 2014)</td>
<td>13</td>
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<tr>
<td>Sierra Leone</td>
<td>2003</td>
<td>85.1% (DHS 2013)</td>
<td>10</td>
</tr>
<tr>
<td>Thailand</td>
<td>1996</td>
<td>57.8% (MICS 2012)</td>
<td>16</td>
</tr>
</tbody>
</table>

### Unsustained ORS Coverage

<table>
<thead>
<tr>
<th>Country</th>
<th>Maximum ORS coverage reached</th>
<th>Most recent coverage level reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mongolia</td>
<td>55.9% (2000)</td>
<td>42.3% (2014)</td>
</tr>
<tr>
<td>Swaziland</td>
<td>85.7% (2007)</td>
<td>57.6% (2010)</td>
</tr>
<tr>
<td>Tanzania</td>
<td>57.6% (1992)</td>
<td>13.9% (2010)</td>
</tr>
<tr>
<td>Trinidad &amp; Tobago</td>
<td>52.3% (1987)</td>
<td>20.3% (2000)</td>
</tr>
</tbody>
</table>

### Non-starters: ORS coverage never >25%

Burkina Faso; Cameroon; Chad; Cote d’Ivoire; Madagascar; Mali; Mauritania; Morocco; Senegal; Togo; Turkey; Zimbabwe

*Note: India was a non-starter until 2006

**Source:** Used DHS and MICS to update data from Wilson, Shelby et al. Scaling up access to oral rehydration solution for diarrhea: Learning from historical experience in low- and high-performing countries. JoGH. 2013 June; 3(1)... *Based on most recently available data
GLOBAL TREND IN ZINC COVERAGE*, 2005-2015

- Zinc coverage has been extremely slow to increase since its introduction into global policy in 2004.

- Global coverage was 1.4% (95%CI: 2.9, 5.6%) in 2005 and reached only 6.4% (95%CI: 3.0, 9.9%) over the subsequent 10 years.

*DHS/MICS coverage definition: the % of children with diarrhea in last 2 weeks who were treated with zinc

Source: Available DHS and MICS data
Zinc coverage is not increasing at a statistically significant rate in any region

AFR: 0.4% / year (-0.1, 1.0%)

EMR: -0.9% / year (-2.8, 1.1%)

SEAR*: 2.8% / year (-2.1, 7.7%)

WPR: 1.4% / year (-0.8, 3.5%)

*Excluding Bangladesh, the SEAR rate of increase drops to 0.1% (-5.4, 5.6%) per year

Source: Available DHS and MICS data
NATIONAL ZINC COVERAGE AS PER MOST RECENT DHS/MICS
KEY TAKEAWAYS ON TRENDS IN DIARRHEA TREATMENT

• Global ORS coverage increased to 30% from 1980 to 1995.

• Analysis of national surveys shows an increase in ORS use from 26% in 1995 to 44% more recently.

• All world regions have had increases in use since 1995 but there is large variability within region and some countries have had large declines in ORS use.

• Nearly all low-income and lower middle-income countries have a policy to use zinc for diarrhea treatment.

• Unfortunately the global use of zinc for diarrhea is very low with the exception of a few countries.
ORS/ZINC SCALE-UP PROGRAMS: FOUR-PRONGED APPROACH TO DRIVING SCALE-UP

Progress over a Decade of Zinc and ORS Scale-up: Best Practices and Lessons Learned

ORS/ZINC SCALE-UP PROGRAMS: BANGLADESH SUCCESS

ENABLING ENVIRONMENT

- The Government strongly and consistently supported ORS scale-up. The National Pediatrics Association also endorsed the use of zinc for child diarrhea.
- As part of SUZY, two committees — involving the Government and NGO partners — were established to support scale up. Key outputs included revising national policies for zinc, including integrating zinc into national IMCI guidelines.
- Zinc and ORS are both included on Bangladesh’s EML and national standard treatment guidelines.
- Zinc OTC status was secured in 2007 and this allowed broad distribution through pharmacies and grocery stores and advertising on national TV.
- A change in Government policy was also required to allow work with providers in the informal sector (village doctors).

SUPPLY AVAILABILITY

- The Government now regularly allocates budget for zinc and ORS commodities in its operational plan. In the public sector, UNICEF supported government distribution of zinc in its project areas.
- Approximately 30-40 ORS brands are now available in the country. By the late 1990s, 80% of users were purchasing ORS from grocery stores or pharmacies. Social Marketing Company (SMC) established an effective distribution system and manufacturing facility in 2004; total ORS volumes sold increased from 52 million sachets in 1997 to 300 million sachets in 2011.
- Initially, dispersible zinc was only being produced by Nutriset (“ZincFanti”). SUZY facilitated a tech transfer from Nutriset to Acme Labs to produce zinc dispersible tablets locally (“Baby Zinc”). Zinc was distributed through Acme’s existing channels for bottled water and SMC also distributed product to chemist shops in 2008. In Year 1 of SUZY, US$ 5 million units of zinc were sold (exceeding initial forecast levels of 3 million). Several companies are now producing zinc in the country.
- SMC plans to introduce a zinc/ORS co-pack in 2016.
ORS/ZINC SCALE-UP PROGRAMS: BANGLADESH SUCCESS

提供商需求

- SMC 目标私有提供者—包括药剂师、
  药店售货员和农村未注册的实践者—
  为培训他们作为儿童腹泻的主要
  保健来源，Acme 实验室还设有
  专门的销售代表来推广锌在
  提供者之间。信息锌也提供了
  节省的销售商使用瓶装水
  分布系统。

- 锌和ORS 使用被整合
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来源: CHAI. 进展十年锌和ORS 规模
  操作: 最佳实践和教训。2016年
  腹泻和肺炎工作
  小组倡导
  简
  册，
  12月
  2015年。

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• Over the past 6 years, BMGF invested in programs in UP and Bihar focused on scaling-up ORS/zinc through the informal private sector where ~80% of careseeking occurs in rural regions.

• These strategies failed to improve diarrhea and pneumonia treatment of children under-five in UP and Bihar due to inadequate public sector and caregiver engagement, as well as the complexities of influencing informal provider behaviors:
  - Profit motives contribute to an inherent know-do gap leading to inadequate treatment provision and diversion of drug volumes to non-target groups (e.g. adults). Hence, increased sales do not translate into higher coverage
  - Government restrictions and heterogeneity of the RMP population complicate program design, targeting and sustainability

Our revised strategy focuses on improving diarrhea/pneumo treatment for severe cases among vulnerable children at increased risk of death.

Public sector facilities
- Increase pediatric admissions at facilities with high outpatient footfall.
- Improve facility readiness to treat diarrhea and pneumonia.
- Ensure adequate staffing and beds/equipment/drugs to support improved pediatric inpatient treatment.

Public sector FLWs
- Transition ASHAs to targeted community engagement focused on identification, referral and follow-up of vulnerable children at increased risk of severe illness/death
- Assess differential pathways to treatment or poor health outcome by geography, caste, wealth, nutritional status etc. to better inform ASHA targeting.

Informal Private sector
- Halt engagement with RMPs as baseline data indicate similar challenges as earlier investments.
- Assess pathways to formal private provider care - a current programmatic blind spot in rural areas.
Focus on ORS/zinc coverage alone distracts from the true goal of accelerating mortality declines.

Diarrheal deaths in children <5 continue to decline, but the rate of decline is decelerating.

The annual rate of reduction (ARR) in diarrheal deaths decreased from 6.9% in 2000-2005 to 5.8% in 2005-2015.

The decelerating rate of reduction is concerning as it indicates the need to refine our strategies to better target the residual mortality.

Sources: GBD 2015 (Lancet 2016); MCEE 2015 (Lancet 2016)
1) Introducing and delivering interventions in the highest burden countries
   • The 10 highest burden countries accounted for ~66% of all U5 diarrheal deaths in 2015

2) Addressing co-morbidities, complex disease and the link to malnutrition
   • ~50% of U5 diarrheal deaths are attributable to stunting and 34% are attributable to wasting. On average 22% of diarrheal deaths in high mortality countries are attributable to persistent diarrhea.

3) Reaching vulnerable populations
   • As U5MR declines, residual deaths are increasingly concentrated among the marginalized and ultra-poor. Bangladesh succeeded in accelerating diarrheal mortality declines by eliminating ORS inequities with only incremental gains in national coverage.
BMGF’S EDD/PNEUMO TREATMENT INNOVATIONS & DELIVERY INITIATIVE

Our Treatment goals were recently updated to reflect:

- Our refined focus on targeting vulnerable populations (the unreached and the high risk);
- Successes achieved on policy change in high burden countries;
- A focus on high quality monitoring and evaluation data.

Generate evidence to improve and optimize care guidelines for the most vulnerable children with diarrhea and pneumonia in limited resource settings

Interventions and delivery strategies including definitions and indicators need to be revised to appropriately impact the residual mortality

Ensure resources - funding, leadership, strategy - are prioritized for child health globally and in countries with the highest burden of mortality

SDG U5MR target of 25/1,000 live births will not be reached without sustained leadership and focus within more complex RMNCAH environment

Integrate pneumonia and diarrhea treatment into health programming of priority countries

In India, we are leveraging increased use of lower level facilities for maternal/newborn care to ensure targeting and care for vulnerable, high risk children

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THANK YOU
OUR GOALS

• End diarrheal disease deaths in children under age 5 by 2030

• Eliminate typhoid as a public health problem globally by 2035

• Prevent and reverse stunting mediated by enteric environmental dysfunction (EED) in children by 2025