# Kit Yamoyo Transition to Scale (KYTS) – Summary report to Steering Group & Stakeholders

**Sept 2018**

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# 1. Executive Summary

Limited access to Oral Rehydration Salts (ORS) with Zinc (ORSZ) for diarrhoea treatment is a leading contributor to mortality and morbidity in children under 5 years old (U5), in Zambia and globally. Following a successful quasi-experimental trial (COTZ, 2011-2013) in Zambia, UK charity, ColaLife, convened a public-private partnership under the Ministry of Health (MoH) of the Government of the Republic of Zambia (GRZ), to achieve improved awareness, availability, access and use of a better-designed ORSZ kit for U5 children, based on WHO and UNICEF recommendations. Manufactured in Zambia, it is known as 'Kit Yamoyo', the kit of life.

Two funded projects, part of the Kit Yamoyo Transition to Scale (KYTS) initiative, subsequently improved access to ORSZ in both urban and rural settings, and provided extensive, robust evidence to build future good practice, both in Zambia and internationally. The projects were:

> **KYTS-ACE** (2015-2017), working mainly through public sector provision of a GRZ-branded ORSZ product in the 14 Scaling Up Nutrition (SUN) districts, with some complementary retail supply;
>
> **KYTS-LUSAKA** (2016-2018), delivering the Kit Yamoyo only through private sector shops, with Health Centre promotion, in 24 Lusaka compounds and 3 rural districts in Lusaka Province.

Collaboration through the formal market also supported KYTS ('KYTS-FORMAL'), most notably through the manufacturer, Pharmanova, and Shoprite supermarkets. These partnerships helped achieve project-area coverage, as well as some nation-wide coverage.

A key aim of KYTS was to leave a self-sustaining legacy:

i) providing a body of evidence to influence policy;
ii) to leave a commercially-viable, locally-owned and locally-made product available to the market for both private and public sector customers;
iii) to improve awareness of ORSZ combination therapy for the treatment of diarrhoea among all players (ranging from health professionals and manufacturers to community volunteers, small retailers and the general public);
iv) empowering local agencies across public, private and NGO sectors to take up future responsibility for improved ORSZ products, in strategic, tactical and operational terms.

Both funded projects shared similar outcomes frameworks (i.e. logic models or logframes), and both were evaluated through robust household surveys, stakeholder interviews and case studies as well as with commercial data on production, distribution and sales. Primary data was collected by each project, with the household surveys being led by Dr. Rohit Ramchandani in collaboration with RuralNet Associates. KYTS-ACE findings were independently verified by CARE under the SUN programme, and KYTS-LUSAKA was independently evaluated based on OECD Development Assistance Committee (DAC) criteria[1], using a multiple methods approach, by Ruralnet Associates and DfID UK AID Direct.[2] Key results included:

[1] Relevance, effectiveness, efficiency, impact, and sustainability
[2] See Independent Evaluation Report Executive Summary in Appendix 2

**KYTS-ACE SUMMARY RESULTS**

- Increase in ORSZ coverage in children under 5, up from an estimated baseline of between 1% (COTZ) and 5% (estimate) to 53%.
    - 41% of ORSZ users got their treatment from some form of Kit Yamoyo
    - Over three quarters (77%) of the ORS and Zinc used by endline respondents came from either Kit Yamoyo (~10%) or its public sector equivalent, the GRZ flexi-pack (67%).
- Public Sector: distribution through the public sector of over 466,650 GRZ-branded ORSZ co-packs to the 14 SUN districts and beyond, manufactured by Pharmanova in Zambia.
- Private Sector: Manufacture and sale of 40,000 commercially available 'Kit Yamoyo' branded kits, through the private sector, in 10 SUN districts, via 870 existing small retailers and supermarket chains.
- Capacity building: Over 2,000 HC staff, 600 CHW from 400 health facilities, 900 small retailers, and 20 wholesalers were trained in ORS and Zinc for diarrhoea and related issues.
    - 75% of small retailers trained remained active at the end of KYS-ACE
    - All HC staff interviewed indicated the importance of continuing to supply a similar kit, through the public and private sectors.

**KYTS-LUSAKA SUMMARY RESULTS**

- Increase in ORS and Zinc coverage in children under 5, up from a baseline of 13% to endline coverage of 33%.
    - Kit Yamoyo (private sector supply only) contributed nearly one third (~10% of the 33%) of the total coverage achieved;
    - the other 23% was made up of HC supply of separate ORS and Zinc product.
- Stimulated interest in Public Sector provision:
- At the end of the project, a 'bridging order' of 120,000 co-packed ORSZ kits, for the public sector, was paid for by ColaLife[3], to go nationwide according to GRZ priorities
- A GRZ Tender was published for the supply of 250,000 co-packed ORSZ kits, in May 2018
- Private Sector: Manufacture and sale of 47,875 Kit Yamoyo in Lusaka Province via 600 small trained retailers and supermarket chains.
- Capacity building: Over 900 small retailers and 200 HC staff and CHWs were trained in ORS and Zinc for diarrhoea and related issues.
- Over 600 (~66%) retailers remained active at the project end.

Evidence and lessons from the KYTS initiative include:[4]

- The importance of customer and stakeholder consultation, to inform product design and ease of use – equally valid for both commercial and free distribution from GRZ facilities
- How to operate during the funded phase of a development project to ensure that impacts are self-sustaining
- The creation of 'value chains' for private sector distribution, building on existing networks and infrastructure, and gap-filling where needed
    - developing private sector supply (including local manufacture) complementary to and supported by the public sector, to deliver public goods closer to home
- The importance of the public sector:
    - in serving remote/rural areas

[3] Funded by the Isenberg Family Charitable Trust
[4] See Sections 5 and 6

    - in serving the poorest
    - in experiencing and advocating for an improved ORSZ product, from primary carers to district, provincial and national level
- The importance of multi-sectoral partnership development and how best to deploy donor funding to stimulate the private sector and help shape the market.
- Insights into appropriate use of subsidy and vouchers
- Para-skilling of small retailers to deliver simple health messages and information on product benefits, to enable them to better support their community
- The role of co-packaging in improving coverage, prescribing practices, and utilization of the globally recommended combination therapy of ORS and zinc.

Evidence and lessons, based around the project logframes and ColaLife's 'eleven As' of access framework, have been shared with funders, with the MoH in Zambia and with WHO at the international level. Findings and lessons learned are expected to continue informing procurement and policy. Current efforts are focused on advocating for the inclusion of combined ORSZ on the Zambian national Essential Medicines List (EML) and WHO's model EML for children (EMLc).

Zambia's MoH and the National Formulary Committee (responsible for the EML) reviewed project evidence in spring 2018, and in May-18 issued a public tender, for the first time, for an ORSZ co-pack to be provided free via HCs. The NFC is understood to be in the process of formalising Zambia's EML, to include such a co-pack. Only four other African countries have done this so far. At international level, collaborators from the global Diarrhoea Innovations Group (DIG) - including PATH, CHAI, and UNICEF - are working with ColaLife and the MoH, to prepare a submission to WHO (due 7-Dec-18), proposing to include an ORSZ co-pack on the EMLc at global level, using the KYTS evidence from Zambia as well as evidence from other countries. The idea and impetus to submit this application came from Zambia's KYTS Programme.

**Figure 1: The products: COTZ trial 'AidPod', private and public sector flexi-packs and 'Screw-top'**


| Original - AidPod | Original – Flexi-pack | ESSENTIAL – Flexi-pack | Screw-top | GRZ ORS/Zinc co-pack |
|---|---|---|---|---|
| Discontinued from Oct-16 | Introduced from Oct-15 Replaced by the screw-top in May-17 | Introduced Oct-16 | Introduced May-17 | Supplied to MoH from Sep-15 to Dec-16 |

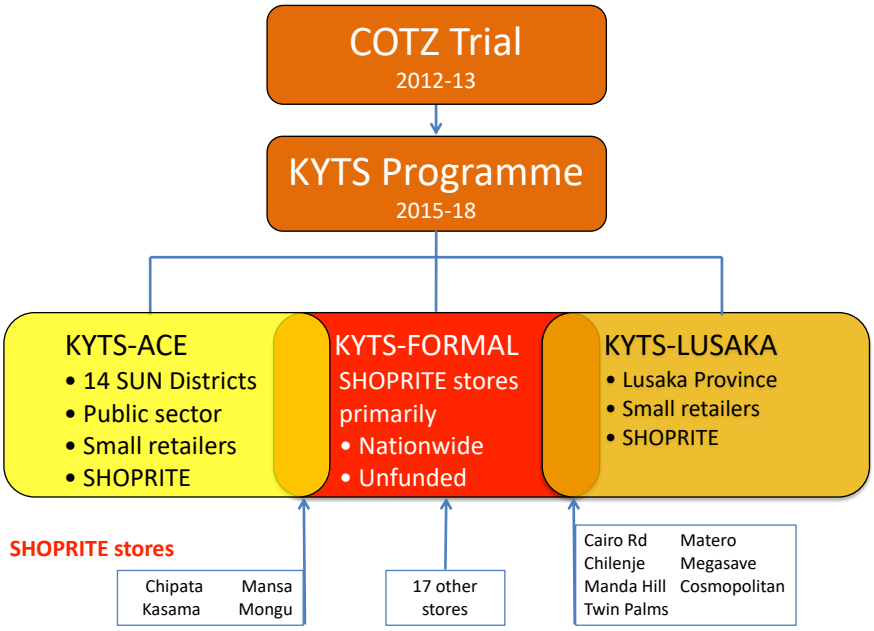
## 2. Background and purpose

In Zambia, diarrhoea is the third leading cause of death in U5s and in 2013 was causing 9% of childhood deaths (2013, CSO). Although treatment - combined ORS with Zinc (ORSZ) - is low cost, simple, general sales items, safe to administer and globally recommended, at baseline in Lusaka Province (2016) less than 13% of cases were receiving it, and in rural Zambia in 2012 and 2013 we found a coverage rate of <1%.

Kit Yamoyo ('kit of life') is an innovative product design, based on the 15-year-old WHO/UNICEF global recommendation. It was originally designed and trialled under the ColaLife Operational Trial Zambia (COTZ, 2011-13) with the aim of improving access, availability, awareness and rational use of ORS and Zinc in the home. Kit Yamoyo contains 4 200mL sachets of ORS (flavoured and coloured to appeal to children), 10 20mg dispersible, flavoured Zinc sulphate tablets and an instruction leaflet. Some formats contain soap for hand-washing (which currently makes those formats subject to VAT). Kit Yamoyo incorporates a high quality presentation and improved design features for ease of use (eg 200mL ORS sachets, a measuring function for 200mL of safe water and clear, graphical instructions).

The COTZ trial and subsequent KYTS projects worked with a local manufacturer (Pharmanova) to adopt, adapt and produce this award-winning[5,6] ORSZ product, with the aim of establishing it permanently in the Zambian market. The product, training materials (for retailers, Health Staff and Community Health Workers - CHWs) and promotional materials were fully approved and backed by MoH and its various regulatory bodies and departments including ZAMRA (previously PRA). The evidence and lessons from the COTZ trial led to two funded projects, outlined below. These emphasised different approaches (ie mainly public sector distribution vs mainly private sector) and different geographies (ie rural/remote vs mainly high density urban). However, the two projects shared similar logframes and activities, so that results and lessons from the two projects could be compared.

**Figure 2: The COTZ Trial and follow-on KYTS Programme**




[5] See http://www.colalife.org/category/awards/
[6] The Kit Yamoyo anti-diarrhoea kit is in the permanent collections of London's Design Museum and Victoria and Albert Museum (V&A)

**KYTS-LUSAKA** was a private sector market development project to improve access for U5 children to ORSZ for diarrhoea. This goal was pursued through the introduction of Kit Yamoyo via the private sector, in 24 high density population areas of Lusaka Province ('compounds'). There was also work in 3 peri-urban districts, including town markets and more rural areas: Chilanga, Chirundu and Kafue. KYTS-LUSAKA promoted the sale and distribution of Kit Yamoyo through private sector channels ('value chains') where commercial actors (mainly small retailers trained by the project) bought and sold the kit in free market conditions. This project did not offer a free kit through public sector Health Centres (HCs), but MoH, at various levels, supported and integrated community sensitisation about the kit into its usual activities, as did various NGOs. Vouchers, given out at HCs and by NGOs, helped to make Kit Yamoyo affordable and promoted first use among target beneficiaries – namely poorer communities such as those living in compounds (townships) and rural areas of Lusaka Province.

KYTS-LUSAKA was co-funded by DfID UKAID Direct with match funding supplied by ColaLife. Significant additional value was leveraged from the market and from government: a local manufacturer, Pharmanova, collaborated closely and made its own investments in production and advertising. The funded partner which implemented day-to-day interventions was the Zambian NGO, Keepers Zambia Foundation (KZF).

As well as developing the private for-profit sector value chain (ie local manufacturer, wholesaler and supermarket linkages down to small retailers and, ultimately, end-users), the project also advocated with a range of relevant agents in this ecosystem. This included engaging government and non-profit actors, to influence better supply of ORSZ at district, provincial and central government level (eg all levels of government; international and local NGOs; intergovernmental organisations; Medical Stores Ltd, a state owned enterprise, responsible for performing key activities in the supply of medicines; as well as regulatory and professional associations). This advocacy work ran alongside a sister project, KYTS-ACE, and shared evidence and learning.

**KYTS-ACE** (Kit Yamoyo Transition to Scale - Adapting to Challenging Environments) was part of the First 1,000 Days Mother and Child Development Programme (MCDP) funded under Zambia's Scaling Up Nutrition (SUN) programme, managed by CARE Zambia. It contributed to SUN Priority Intervention 7: Zinc provision during diarrhoea. The overall objective of KYTS-ACE was to develop better availability, access, and use of ORSZ, for home treatment of diarrhoea, in U5 children, via public and private sector development and distribution, in the 14 SUN districts of Zambia. These included: Chipata, Lundazi, Mumbwa, Mongu, Kalabo, Shangombo, Mwinilunga, Zambezi, Mansa, Samfya, Kasama, Kaputa, Mbala and Chinsali. The aim was for even remote communities to have better awareness of and access to ORSZ, from Kit Yamoyo in the private sector and from a parallel product,[7] a GRZ-branded ORSZ co-pack, available free from Health Centres in the public sector.

For KYTS-ACE, the public sector supply was procured directly from the manufacturer, Pharmanova, by CARE, with SUN funding. Medical Stores Ltd (MSL) distributed it to the 14 SUN districts as part of their usual deliveries, at no additional charge. The project worked to influence and train public sector stakeholders (Government, PMOs, DMOs, HCs and CHWs) as well as collaborating with other NGOs to stimulate interest in child nutrition and/or combating diarrhoea.

[7] The GRZ ORSZ co-pack was identical to the commercial Kit Yamoyo except that the former had GRZ branding. However, the GRZ ORSZ co-pack is commonly referred to as "Kit Yamoyo" within the public sector even though it does not carry the Kit Yamoyo branding.

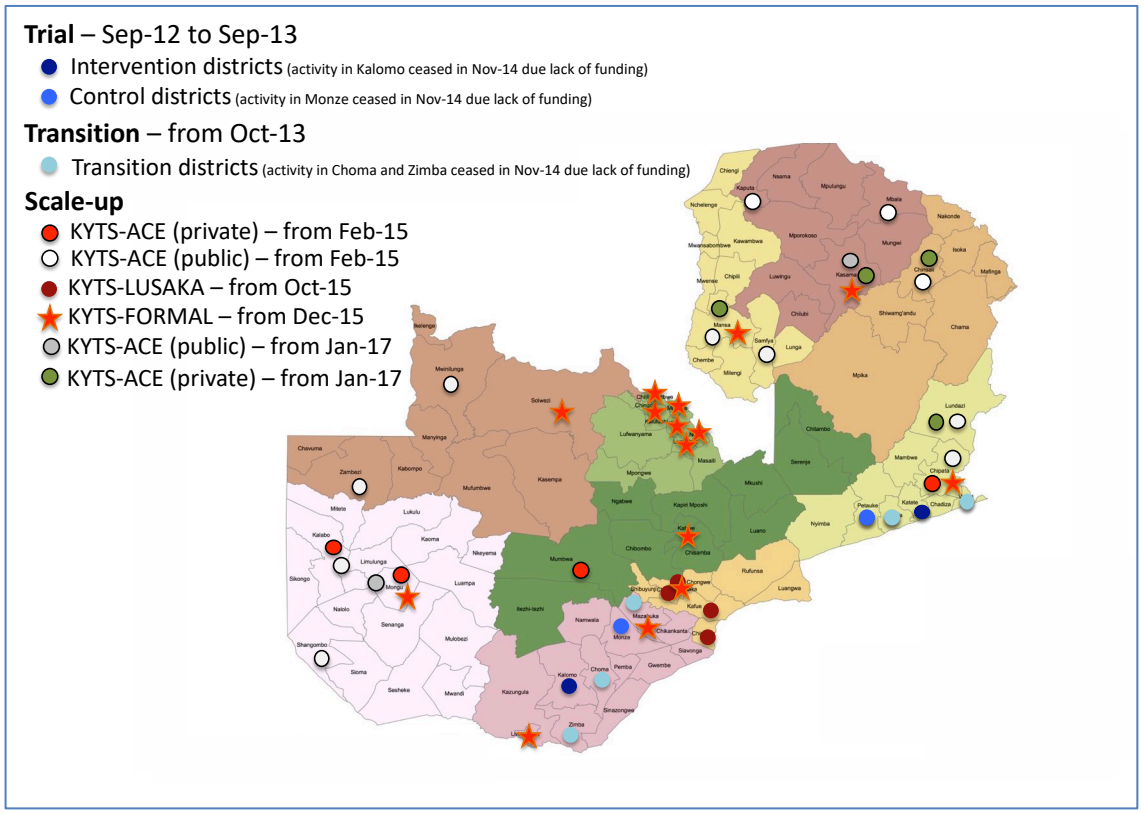
KYTS-ACE also used market-based approaches, including training of small retailers, and linking them to wholesale suppliers and Shoprite. It ensured that supply through the private sector was supported by and promoted by public sector health workers, so that beneficiaries have a choice of supply and to help overcome gaps in supply (for example, public sector stock-outs). There is also some anecdotal evidence that caregivers buy Kit Yamoyo in the private sector after experiencing the free GRZ ORSZ co-pack.

In KYTS-ACE, each district had a specific channel to market development and implementation based on practical considerations. The list of districts is shown below in Table 1. Only 4 SUN districts have a Shoprite store, so these were selected for a 'Catalytic' intervention. This meant ensuring Shoprite had stock, but other project retail activity was very limited. 10 districts were selected for 'Intensive' development (ie training micro-retailers and linking them to wholesalers) with promotion and market development carried out by KZF. The original bid was to supply GRZ ORSZ co-pack to 11 SUN districts through MSL, but later this was changed in the extension period to cover all 14 SUN districts. KZF undertook to introduce GRZ-branded ORSZ co-pack to stakeholders (PMOs/DMOs, selected health staff and Community volunteers) in all of the 11 districts which had public sector supply. Therefore some districts had up to three intervention models (channels to market) – see Table 1. This helped the project team to observe the way the market trends and sample coverage in selected districts.

**Table 1 – Implementation model, KYTS-ACE**

| Province | District | MoH | Shoprite | Retailers |
|---|---|---|---|---|
| Eastern | Chipata | Yes (Feb 16) | Yes (Nov 16) | Yes (Nov 15) |
| | Lundazi | Yes (Feb 16) | | Yes (Jan 17) |
| Western | Mongu | Yes (Mar 17) | Yes (Nov 15) | Yes (Nov 15) |
| | Kalabo | Yes (Nov 15) | | Yes (Nov 15) |
| | Shangombo | Yes (Nov 15) | | |
| Central | Mumbwa | Yes (Mar 17) | | Yes (Nov 15) |
| Luapula | Mansa | Yes (Mar 16) | Yes (Dec 15) | Yes (Mar 17) |
| | Samfya | Yes (Feb 16) | | Yes (April 17) |
| Northern | Kasama | Yes (Jan 17) | Yes (Dec 15) | Yes (Mar 17) |
| | Mbala | Yes (Dec 15) | | Yes (April 17) |
| | Kaputa | Yes (Dec 15) | | |
| Muchinga | Chinsali | Yes (Mar 16) | | Yes (Mar 17) |
| North Western | Mwinilunga | Yes (Mar 16) | | |
| | Zambezi | Yes (Mar 16) | | |

**Figure 3: Locations of the COTZ Trial and follow-on KYTS Programme**




The theory of change for both KYTS projects (see Appendix ) focused around increased use of ORSZ (by both carers of children and health stakeholders treating children) through improving a range of market elements simultaneously, primarily: access, availability and awareness. Learning throughout the project helped disaggregate influencing factors into 'eleven As' of access, explored in-depth in a separate study.[8]

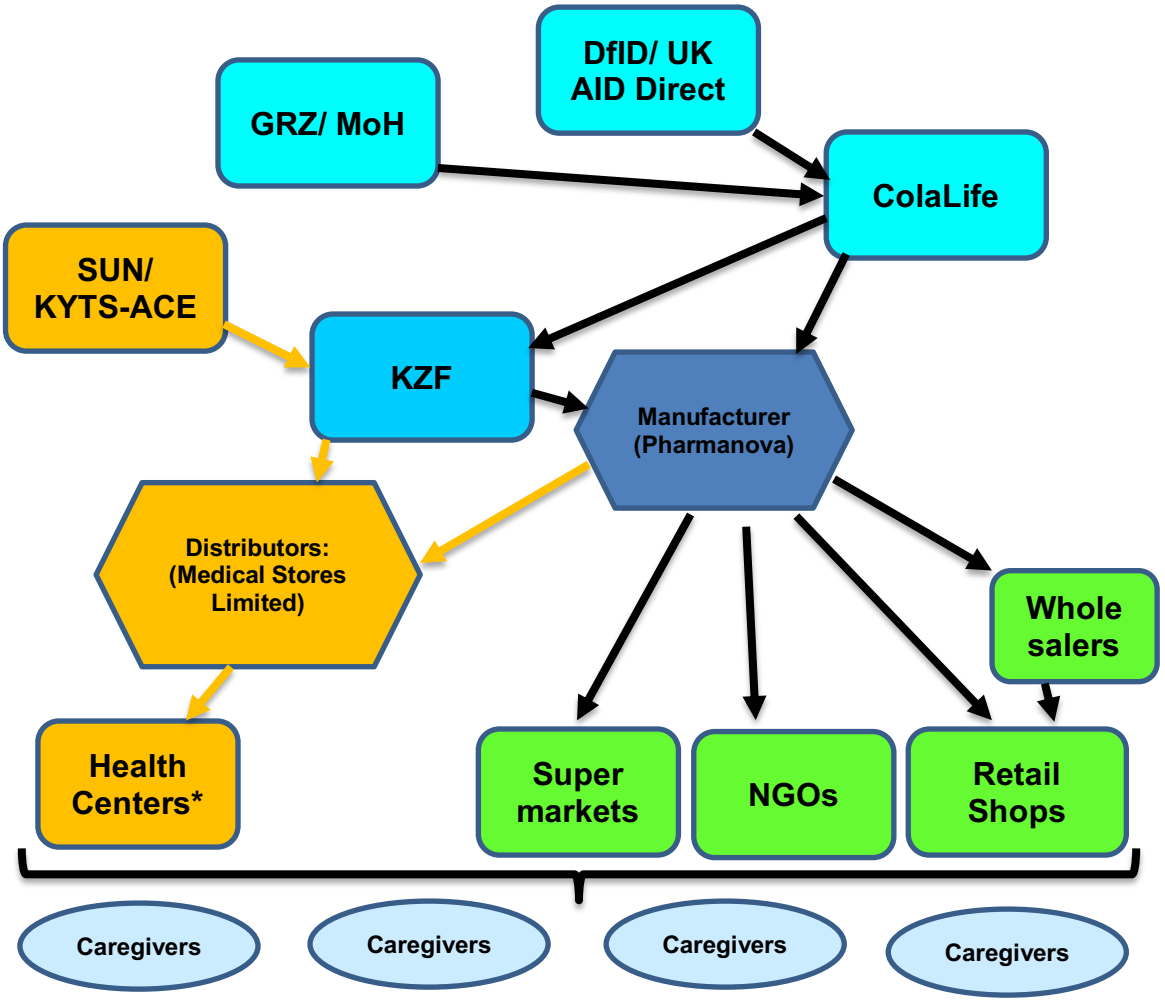
**Figure 4: Channels to market developed under KYTS - private sector, public sector and NGO sector**


[8] Forthcoming, Paulo Savaget, IBM innovation award, see http://www.colalife.org/2017/12/15/paulo-savaget-wins-ibm-center-for-business-of-government-award/ Also see Endline Stakeholder Survey Report, KYTS-LUSAKA, available on request.

Both projects developed the private for-profit sector value chain (ie local manufacturer, wholesaler and supermarket linkages down to small retailers and, ultimately, end-users). Examples of value-chain building and 'gap-filling' include: Wholesalers were recruited and trained and introduced to Pharmanova; Shoprite became a 'quasi-wholesaler' nation-wide, due to free distribution it provided and the low-mark-up negotiated; trained retailers were introduced to wholesalers and the option of buying at their local Shoprite; NGOs were introduced to Pharmanova and supported to sell Kit Yamoyo. See Figure 3. Both projects worked with a range of relevant agents in the ecosystem, to influence better supply of ORSZ at district, provincial and central government level (government and non-profit actors, MSL, regulatory and professional associations).

The project aimed, from inception, to leave a self-sustaining market for the new product, ensuring its local adoption by all parties (including passing of the Kit Yamoyo trademark to Pharmanova); its profitability throughout the value chain; and creation of sufficient general public awareness for sustainability, as well as buy-in and ownership from key actors. ColaLife itself was therefore not involved directly in any market processes in either project. ColaLife played a purely catalytic role.

**Figure 5: Organisational arrangements and funding, KYTS-ACE and KYTS-LUSAKA**




Source: Ruralnet Associates Final Evaluation Report, KYTS-LUSAKA

# 3. Methodology

## 3.1. Evaluation design and data collection

KYTS-LUSAKA and KYTS-ACE used similar logframes and intervention design. The endline evaluation processes are summarised on the ColaLife blog.[9,10,11]

Both projects deployed multiple methods and data sources to demonstrate the causative effect of the scale-up of ORSZ awareness, availability, access and use in each project's geographical target areas. These relied on a combination of methods and data sources which included household surveys, small-scale surveys, case studies, interviews with a wide range of stakeholders, and administrative, operational records generated by ColaLife and by project staff at KZF. Ex-factory sales data were also provided by Pharmanova and Shoprite also shared its sales data.

Both projects used some purposive selection of survey areas to ensure that targeted communities were captured, but achieved some randomisation within survey sites selected by using the 'random walk technique'.[12]

Both projects used the Lives Saved Tool (LiST), a model to calculate deaths averted or lives saved by past interventions and for the purposes of programme planning when costly and time consuming impact studies are not possible. LiST is an effective tool for modelling diarrhoea mortality and can be a useful alternative to large and expensive mortality impact studies. An outline of LiST and how it was used in KYTS-LUSAKA is in Appendix 3. Results trees summarising a breakdown of findings are in Appendix 5 and Appendix 6.

### 3.1.1 KYTS-LUSAKA

KYTS-LUSAKA included household surveys (baseline, midline and endline), case studies conducted at midline and at project completion, interviews with a wide range of stakeholders, and monitoring of retailer activity, knowledge and reported sales throughout the project.[13] Ex-factory sales data were also provided by Pharmanova, and Shoprite also assisted with some sales datasets. This helped to triangulate reported sales data from retailers.

**Household surveys**

Household surveys were conducted by Ruralnet Associates Ltd, an independent research firm, in collaboration with Dr Rohit Ramchandani who was the principal investigator (PI). A multi-stage sampling methodology was used, first for site selection, then for household selection, and then for caregiver/interviewee and reference child selection. The random selection of sites was done from a list of all known low cost residential areas in Lusaka ('Compounds'). The number of households to be sampled from each of the selected sites was proportional to the population size (i.e. PPS) of that compound (based on the most recent Central Statistics Office (CSO) census data).

Table 2 shows the sample sizes for the three surveys. The sample sizes were not meant to be statistically significant, but based on the time and resources available they allowed

[9] http://www.colalife.org/2018/06/28/endline-findings-from-the-lusaka-scale-up-kyts-lusaka/
[10] http://www.colalife.org/2017/11/25/kyts-ace-endline-part-1-chipata/
[11] http://www.colalife.org/2018/03/31/weve-got-designs-on-change-1-findings-from-our-endline-household-survey-kyts-ace/
[12] This involves dropping enumerators off at randomly selected points in the survey area from where they walk to every third household and request an interview with the household's caregivers of under 5 children.
[13] See www.colalife/dashboards

the evaluation team to draw some key insights, track progress, and assess the project's contribution to ORSZ access in Lusaka.

**Table 2: KYTS-LUSAKA survey sample sizes**

| Survey | Sample Size |
|---|---|
| Baseline | 1527 |
| Midline | 424 |
| Endline | 1652 |

Source: Ruralnet Associates Final Evaluation Report, KYTS-LUSAKA

Data collection was done by experienced and well-trained research assistants contracted by Ruralnet Associates, in face-to-face interviews using electronic data collection (EDC). Data was cleaned and tabulated using SPSS and was analysed using STATA in readiness for reporting.

### Small scale surveys and case studies

The KYTS-LUSAKA methodology also included special small-scale surveys undertaken by project staff to understand specific aspects of the project. Some of these included:

- Small Scale Survey on awareness of Kit Yamoyo among caregivers (Nov 2017)
- Midline Survey on user (caregiver) feedback (Mar 2017)
- Small Scale Survey on reported stocking rates of ORS and Zinc at selected health centres in Lusaka Province (for context – not a direct project outcome).
- Small Scale Survey on knowledge among trained retailers and CHWs on diarrhoea and Kit Yamoyo use
- Small survey of other Zinc products, ORS products and other ORSZ co-packs sold by trained Kit Yamoyo retailers
- Several case studies were done during the course of project implementation
- Ex-factory sales into Lusaka Province

The findings guided project implementation and mid-term adjustments, and were also reviewed to form part of the final evaluation.

### Endline stakeholder Interviews

Two distinct questionnaires were used, to guide a structured conversation among a range of respondents. The two questionnaires were:

A. For 'strategic level' stakeholders, the questionnaire focused around ColaLife's model of the '11 As of Access'; a model which evolved during the KYTS-LUSAKA project. The main aim of this interview was to gain insights into what stakeholders thought of the project's strategic approach, and to gain their insights into the different aspects of access we had tried to develop and implement, within their particular purview.

B. Questionnaire B targeted those on the frontline delivering activities. The interview focused around their knowledge of the product and the capacity building they had experienced, their experience of how the project influenced their own work and learning, how it influenced their organisation, and how it impacted on the people they are seeking to serve.

Findings are discussed in an extensive "KYTS-LUSAKA Stakeholder Survey Report".[14]

[14] Full Stakeholder Survey Report available on request from jane@colalife.org

### 3.1.2 KYTS-ACE

KYTS-ACE followed similar methodologies to KYTS-LUSAKA, including the endline questionnaire, LiST tool and the monitoring dashboards. This enabled some interesting comparisons of the two projects. However, its M&E budget was limited, its geographical reach extensive and challenging and its integration with and reliance on the overall SUN baseline was not as well co-ordinated as originally expected (see below and Limitations).

**Household surveys**

For KYTS-ACE, a household survey was conducted only at endline, as the baseline was expected to be constructed on assumptions underpinning the original SUN design and with data from the public sector facilities. Due to staff changes and other factors, a formal baseline down to district level was not achieved; therefore, generally available typical rural indicators were assumed.

At endline, Chipata and Mongu were purposively selected as sample endline districts, because they were reasonably accessible (therefore within budget) and both deployed all the 3 channels of distribution (Public Sector only, 'Catalytic' - ie Shoprite - and Intensive – ie para-skilling small retailers). They are also both the 'capital' district for their respective provinces: Eastern and Western provinces.

Endline data was collected from a total of 638 households, by enumerators from Ruralnet Associates under technical guidance from Dr Rohit Ramchandani, principal investigator (PI). A similar multi-stage sampling methodology was used to KYTS-LUSAKA (ie site selection, household selection, and caregiver/interviewee and reference child selection), with similar enumerator training and deployment and tablet-based tools (EDC). As for KYTS-LUSAKA, data was cleaned and tabulated using SPSS and analysed using STATA.

**Small scale survey and case studies**

The following small scale surveys were done:

- A supply chain and distribution analysis of GRZ co-packs from MSL to health facilities in all 14 SUN districts.
- A stocking rate survey, of ORS and Zinc separately and the GRZ co-pack, at selected HCs in Chipata and Mongu districts, consulting HC records from the facilities collaborating in the project, and covering Jan-15 to Oct-17.
- A survey comparing dispensing practice for diarrhoea with and without the GRZ co-pack (Oct-16 vs Oct-17) among HC staff at collaborating facilities which had all treatments under review available, in Mongu district.
- Knowledge among trained retailers and CHWs on diarrhoea and Kit Yamoyo and GRZ co-pack use
- Ex-factory sales into KYTS-ACE districts
- Several case studies were collected by field staff throughout the project

Case studies and retailer/CHW knowledge informed project implementation and all surveys formed part of the final reporting.

**Endline stakeholder Interviews**

At KYTS-ACE endline, interviews were conducted with staff at 65 health facilities (38 in Chipata and 27 in Mongu). Respondents included 66 health workers, 2 PMOs, 2 DMOs, 2 MCH Coordinators, 2 District Pharmacists, 2 Nutritionists, 2 Clinical Care Officers and 2 SUN Coordinators. In addition, 20 retailers in both districts were interviewed as part of the data collection and fact finding analysis. KZF Staff collected the data from the

facilities and health stakeholders, and responses were recorded and transcribed. All interviews - including retailer responses and data - were guided using a tablet-based questionnaire.
The views from 9 Health Stakeholders were published online[15].

## 3.2. Challenges & Limitations

KYTS-LUSAKA endline survey was affected by flash floods and a cholera outbreak in Lusaka. The flash floods made it difficult to reach some households in the selected compounds using the random walk method. Data collection was also affected by heavy downpours that slowed down the pace of data collection. While the flash floods affected survey implementation, the cholera outbreak mostly impacted on the survey results. This was due to measures the government put in place to try and contain the outbreak. Street vending and almost all small and micro shops were closed in most compounds, and movements of people were restricted in the worst hit compounds. These measures affected access and availability of ORSZ in Lusaka.

Residents were encouraged to immediately take anyone with diarrhoea to the nearest health facility and this may have led to a reduction in home treatment of diarrhoea, which is what KYTS was encouraging (ie home treatment of ordinary diarrhoea with ORSZ). The stigma associated with cholera may have affected the reported incidence of diarrhoea in the two weeks before the survey as any form of diarrhoea during this period was associated with cholera. Household members or even neighbours made sure anyone who had diarrhoea and/or vomiting, whether simple diarrhoea or cholera, was rushed to a cholera centre. Once a household member was taken to a cholera centre, health authorities rushed back to his/her place of residence to disinfect it in full view of neighbours. That household then wore the tag of a “cholera home”, even if later it was proved the case was not cholera but simple diarrhoea. Thus, in some cases, people were secretive about diarrhoea during the cholera outbreak. Unfortunately where the case was that of cholera, and not simple diarrhoea, and the household chose to hide it, it led to people dying at home. Because of these challenges during the endline survey, some of the key findings from the endline eg diarrhoea incidence may be considered as conservative estimates.

For KYTS-ACE, a full baseline through a household survey was not established, due to a limited budget, M&E staff changes at both CARE and KZF, and lack of Health Centre data available directly from SUN districts. This was somewhat ameliorated by using typical estimates based on, for example, historic COTZ data (2012/13), from sampling historic HC records at endline and by comparing available datasets to similar datasets from the beginning of the project, where these could be reliably obtained.

There were budgetary constraints in KYTS-ACE, particularly in the M&E budget. The original design and budget for full project implementation, submitted by KZF, was meant for activities in only 8 districts. However this changed to 14 at the time of project approval by SUN/CARE. This meant increased coverage for scarce resource and extensive travel and distances to cover. Only 2 intervention districts could be covered at endline, to judge impact (Chipata and Mongu).

For both KYTS-ACE and KYTS-LUSAKA, although the endline household surveys were carried out by independent teams, the smaller surveys mentioned above were

[15] http://www.colalife.org/2018/04/29/more-designs-on-change-what-do-health-and-nutrition-staff-think/

conducted by project staff themselves, due to value for money considerations. This could have led to bias, although all personnel were trained to use tablet based questionnaire tools and be strict in following the supplied script and prescribed prompts. A few of these interviews offered poor audibility in parts; in those cases, the interviewers were asked to check the transcription or fill in gaps subsequent to the interview by emailing additional answers.

# 4. Demographic Information

The demographic information offered below refers to the endline HH surveys, unless otherwise stated.

## 4.1 KYTS-LUSAKA

For KYTS-LUSAKA, the project aim was to reach beneficiaries (U5 children) whose carers come from poorer segments of the community, mainly in compounds in and around Lusaka.

The endline survey targeted communities in 11 compounds (selected randomly from the 24 targeted), with the breakdown by compound presented in Table 3 below.

**Table 3 Compounds sampled at KYTS-LUSAKA endline**

| Site | Compound name | #HH | % sample |
|---|---|---|---|
| Site 1: | Bauleni | 149 | 9.02 |
| Site 2: | Chainda | 108 | 6.54 |
| Site 3/4: | Chipata | 251 | 15.19 |
| Site 4: | Kabanana | 12 | 0.73 |
| Site 5: | Garden | 196 | 11.86 |
| Site 6: | George | 135 | 8.17 |
| Site 7: | Lilanda/George | 82 | 4.96 |
| Site 8: | Kalingalinga | 99 | 5.99 |
| Site 9: | Kanyama | 215 | 13.01 |
| Site 10: | Mtendere | 188 | 11.38 |
| Site 11: | Chawama | 217 | 13.14 |
| **Total HH** | | **1,652** | |

The segments reached in the endline survey are shown in Tables 4 and 5.

**Table 4 Caregivers/respondents and children reached at KYTS-LUSAKA endline**

| **Respondent breakdown** | |
|---|---|
| Mean Age | 29 years |
| Sex | 3% male; 97% female |
| Relationship to Child | 84% mothers; 7% grandmothers; 5% aunts; 4% other |
| Completed Education | Grade: 1 to 4 (5%); 5 to 7 (28%); 8 to 9 (38%); 10 to 12 (22%); higher learning (4%); None (3%) |
| **Children Under 5 reached** | |
| Mean Age | 29 months |
| Sex | 50% male; 50% female |

**Table 5 Type of Households reached at KYTS-LUSAKA endline (N=1652)**

| Target Category for the project | Proportion of HH's interviewed with an Individual in Category | Proportion of HH's Reached with Kit Yamoyo and with an Individual in Category |
|---|---|---|
| Female Headed Household | 27% | 48% in last 2 weeks |
| Persons with Disability in Household | 4% | 4% in last 2 weeks |
| Caregiver Reporting Person Living with HIV/AIDS in Household | 5% | 8% in last 2 weeks |
| Orphan in Household | 20% | 32% in last 2 weeks |
| Households with > 6 People | 26% | 24% of ever kit users |
| Primary Caregiver with no Primary Education | 3% | 8% in last 2 weeks |
| Households Meeting Definition for Extreme Poor | | Of those that ever used the Kit Yamoyo, ~8% would be considered extremely poor |

## 4.2 KYTS-ACE

For KYTS-ACE, the project aimed to reach those children under 5 living in the SUN districts, therefore more likely to suffer from lack of access to Zinc. The endline survey sample reached is in Table 6:

**Table 6 Caregivers/respondents and children reached at KYTS-ACE endline**

| **Respondent breakdown** | |
|---|---|
| Mean Age | 31 years |
| Sex | 7% male; 93% female |
| Relationship to Child | 80% mothers; 12% grandmothers; 5% fathers |
| Main activity | Farmer 48% Informal SME (small retailer) 15%; unemployed (13%); Piece Worker (7%) |
| **Children Under 5 reached** | |
| Mean Age | 31 months |
| Sex | 49% male; 51% female |

**Table 7 Type of Households reached at KYTS-ACE endline (N=638)**

| Target Category for the project | Proportion of HH's interviewed with an Individual in Category | Proportion of HH's Reached with Kit Yamoyo/GRX co-pack and with an Individual in Category |
|---|---|---|
| Female Headed Household | 35% | 40% |
| Persons with Disability in Household | 10% | 40% |
| Caregiver Reporting Person Living with HIV/AIDS in Household | 7% | 39% |
| Orphan in Household | 25% | 38% |
| Households with > 6 People | 33% | 40% |
| Primary Caregiver with no Primary Education | 7% | 22% |

# 5. Findings

## 5.1 Overall findings

Table 8 below presents key findings from the scale-up, providing a comparison of KYTS-ACE and KYTS-LUSAKA.

**Table 8 Comparison of findings: KYTS-ACE and KYTS-LUSAKA**

| Indicator | KYTS-ACE | | KYTS-LUSAKA | | Notes |
|---|---|---|---|---|---|
| **Impact level:** Estimated number of under-5 lives saved | Not available | | 104 lives over the 30 month period. | | Modelled using the Lives Saved Tool (LiST). |
| | **Baseline** | **Endline** | **Baseline** | **Endline** | |
| 2-week household prevalence of U5 diarrhoea | 25%[16] | 32% | 29% | 16% | We were not expecting to see a reduction in prevalence in such a short time. The low incidence at the KYTS-LUSAKA endline may be due to under reporting caused by the cholera outbreak (See Limitations). |
| % children U5 receiving both ORS and Zinc (all sources) | Estimated to be between 1% to 5% | 53% (KY - 41% - public and private formats, Other - 12%) | 13% | 33% (KY-10%, Other-23%) | 'Other' includes ORS and Zinc prescribed separately at HCs. |
| % children U5 treated with Kit Yamoyo and who used ORS & zinc (public & private sources) | negligible | 41% of which: Private sector Kit Yamoyo - 13% GRZ flexi-pack - 87%) | negligible | 10% Kit Yamoyo (from the private sector) | Both projects achieved similar coverage from the private sector kit (ie in the 10% - 13% range) . For KYTS-LUSAKA, Lusaka Province had no public sector ORSZ co-pack |
| Proportion of caregivers administering zinc to U5 children with diarrhoea for:<br><br>a) the entire 10-day course (Kit Yamoyo vs. Non-KY); and<br><br>b) in the correct dosage (1 tablet for >6mnths, ½ tablet for <6 mnths) (Kit Yamoyo vs. Non-KY) | a) NA<br><br>a) Not known; negligible<br><br>b) NA<br><br>b) Not known; negligible | a) 39% (Kit Yamoyo)<br><br>a) 25% (small sample)<br><br>b) 74% (Kit Yamoyo)<br><br>b) 70% (small sample) | a) NA<br><br>a) 16% (Non-Kit Yamoyo Zinc)<br><br>b) NA<br><br>b) 76% Non-Kit Yamoyo Zinc | a) 49% Kit Yamoyo Zinc<br><br>a) 0% Non-Kit Yamoyo Zinc<br><br>b) 77% Kit Yamoyo Zinc<br><br>b) 66% Non Kit Yamoyo Zinc | a) Kit Yamoyo appears to have influenced an improvement in adherence to the 10 day regimen. The 33% baseline for KYTS-ACE only refers to 2 COTZ districts; elsewhere, the 10 day regimen was likely to be poor. For KYTS-LUSAKA, 49% adherence is an improvement.<br><br>b) for KYTS-LUSAKA, adherence at baseline to correct dosage <u>all dispensed by HCs</u> was matched and slightly improved at endline by Kit Yamoyo Zinc, which was all dispensed by small retailers. Correct use of Zinc <u>in the absence</u> of a professional dispenser is a key product benefit. |

… continued

[16] Average across four rural districts – Katete, Kalomo, Monze, Petauke – at COTZ Endline. National average was 16% in 2014 DHS. This figure will vary based on seasonality, timing of data collection, urban vs. rural, etc.

| Indicator | KYTS-ACE | | KYTS-LUSAKA | | Notes |
|---|---|---|---|---|---|
| | Baseline | Endline | Baseline | Endline | |
| Average treatment time delay | 1.24 days[17] | 1.04 days (Kit Yamoyo users)[18]<br><br>1.05 days (Non- KY users) | 0.9 days | Kit Yamoyo Users: 0.6 days.<br><br>Non-Kit Users: 1.07 days | In KYTS-LUSAKA, availability in local shops appears to have contributed to a shortened treatment delay; 68% of users treated their child the same day, compared to 49% who used a health centre |
| Proportion of beneficiaries (by target group) who paid cash and reported they found Kit Yamoyo affordable or not expensive | N/A | 50% of Kit users who paid for Kit Yamoyo found it affordable or inexpensive | N/A | 59% | For KYTS-LUSAKA, 59% of those that paid only cash (no voucher) said it was either affordable or inexpensive. The perceived affordability by format in those that paid cash only was:<br>Flexi with Soap: 64%<br>KY Essential: 53%<br>Screw-top: 70% |
| Proportion of caregivers who prepared ORS solution correctly (rational use based on preparing ORS in the correct concentration)<br>a) Using 1L sachet<br>b) Kit Yamoyo users | a) 60% (COTZ data)<br><br>b) 93% - Kit Yamoyo users | a) 75%<br><br>b) 54% | a) 64% (Non Kit Yamoyo users-1L users)<br><br>b) not known – Kit Yamoyo not commonly available | a) 62% (Non-Kit Yamoyo users; 1L sachet);<br><br>b) 63% (Kit Yamoyo users, 200ml) | We did not see the improvement expected in these projects, compared to COTZ, where 93% of kit users mixed ORS correctly, using the pack to measure. The rigid 'Screwtop' (like the rigid 'AidPod' pack used in COTZ) may be easier to use as a measure. Use of the flexi-pack to measure 200mL water needs more sensitisation.<br><br>55-59% of those that used the private sector Kit Yamoyo flexi-pack prepared the solution correctly, vs 69% who used the GRZ version. All using the Screw-top version prepared the ORS solution in the correct concentration. |

## 5.2 Changes in dispensing behaviour

A small scale survey across 7 health centres in Mongu showed an apparent significant change in dispensing behaviour for the treatment of diarrhoea. All 7 centres had all possible non-antibiotic treatments for diarrhoea in stock in Oct-16 and Oct-17 (ie ORS and Zinc). The GRZ co-pack was introduced in Jan-17 and this was also in stock at all centres surveyed in Oct-17.

The diarrhoea treatment dispensed are shown in Figure 6. Before the introduction of the co-pack, 44% of diarrhoea cases received ORS and Zinc. This is high when compared with the global average of 7%. However, this increased to 87% after the introduction of the co-pack with 87% of the combined ORS and Zinc treatments provided by the co-pack. This change was also associated with decreased antibiotic use.

[17] Average across COTZ control districts at endline (2013)

[18] Note: the difference between Kit users and non-users may not reflect the same difference as was seen in COTZ because much of the Kit use in KYTS-ACE was from health centres. The reduction in treatment delay seen in COTZ was partly associated with the reduction in distance and greater convenience of accessing at local private shops.

**Figure 6: Non-bloody diarrhoea treatments with ORS and Zinc in Mongu health centres in Oct-16 and Oct-17 after the introduction of the GRZ ORS/Zinc co-pack in Jan-17**


# 6 Discussion of findings – KYTS-ACE and KYTS-LUSAKA

This section presents a brief discussion of endline household survey results. Comments and insights from the stakeholder interviews from both projects are in Section 7 and will be discussed further in the final Steering and Learning Group session.[19,20]

## 6.1 Overall comments

Whilst the overall 'Lives Saved' impact was relatively small, these were short-term projects and the longer term impact will follow from the self-sustaining potential of the improved ORSZ design and on-going private and public supply, given continued awareness-raising efforts focussing on the general public and primary care workers. Stakeholder and evaluator comments underpin these reflections and highlight the sustainability potential.

We do not expect such short-term projects to impact prevalence, and the reduction seen in KYTS-LUSAKA is likely to be under-reporting due to cholera. Prevalence is influenced by many factors, although ORS and Zinc provision play a part. This could be an area of future work.

KYTS-LUSAKA achieved a coverage level of 33% for ORS and Zinc, of which around one third was contributed by Kit Yamoyo purchased from the private sector. While this is a significant improvement over baseline (13%) and is far better than the global average of 6%[21], KYTS-LUSAKA did not manage to hit the coverage rates seen in KYTS-ACE, where coverage of 53% of U5 children with both ORS and Zinc was achieved, and 41% was contributed by the new kit (Kit Yamoyo private sector format and GRZ-flexi-pack format combined). This was up from an assumed baseline in KYTS-ACE areas of under 5%. We might extrapolate from this that the combination approach of having ORSZ kits available in both the public and private sectors leads to higher coverage rates. KYTS-ACE also shows

[19] See http://www.colalife.org/2018/04/29/more-designs-on-change-what-do-health-and-nutrition-staff-think/
[20] Stakeholder Survey, KYTS-LUSAKA – full report available on request from jane@colalife.org
[21] The latest Countdown to 2030 report found that of 43 countries with available data, median coverage of both ORS and zinc was 6% (range: 0% to 60%). https://data.unicef.org/wp-content/uploads/2018/01/Countdown-2030.pdf.

that having a free public sector kit still leaves room in the market for private sector supply: in KYTS-ACE, Kit Yamoyo private supply provided 13% of coverage, while the GRZ flexi-pack provided the bulk at 87%). In both projects, the private sector contributed around 10% of supply. Whilst a relatively small contribution, stakeholders (see Stakeholder Survey Report) considered this essential for gap-filling, stock-outs and choice of access. Availability in small shops does appear to have contributed to reduced treatment delay, and this is borne out by stakeholder insights[20].

Changes in dispensing behaviour of ORS and Zinc by health workers, observed in the small scale study in Mongu, seemingly influenced by having a co-pack in stock, would benefit from further study, to see if the wide public supply of an improved ORSZ co-pack can replicate similar improvements in dispensing and ultimately use. The feedback from primary care workers gathered in the Stakeholder Survey (see Section 7) certainly provides some evidence for such an improvement.

The good adherence to Zinc usage, even when mainly supported by trained micro-retailers, is encouraging, and may inform the planned Health Shops initiative.

In both KYTS-ACE and KYTS-LUSAKA endline findings, correct preparation of ORS was no better in Kit Yamoyo/GRZ co-pack users than in non-Kit Yamoyo users (i.e. 1L sachet users). This was disappointing. However, further investigation of the data sets showed that:

- 51% of Kit Yamoyo users used the Kit Yamoyo “ESSENTIAL” flexi-pack without soap, 25% used the flexi-pack with soap, 9% used the screw-top, and 9% used the GRZ version (which was not available in Lusaka).
- 55-59% of those that used the private sector flexi-pack models prepared the solution correctly;
- 69% of those that used the GRZ Flexi-pack prepared the ORS in the correct concentration (perhaps because of more direction from health centres).
- 100% of those who used the screw-top version prepared the ORS solution in the correct concentration.

This seems to indicate that direction from HC staff on how to use the flexi-pack bag to measure water was more impactful than guidance given by retailers (even though trained retailers scored similarly to HC worker on this and other points of key product knowledge Only 51% of Kit Yamoyo users (KYTS-LUSAKA sample) said they were aware that they could use the packaging/container as a measure for the water used to prepare the ORS, despite it being clearly articulated/diagrammed in the instructions and on the packaging itself. The use of the flexi-pack as a measure seems not to be as intuitive as the formats with rigid containers (for example, the original ‘Aidpod’ trial format and the screw-top format, presented in a jar). ). This points to the potential of the screw-top jar format, for example as a one-off initial purchase to be encouraged, retained in the home, with the flexi-pack as a ‘refill’; this was mentioned by stakeholders.

Only 65% of the 1L sachet users consumed the full amount of solution prepared. In 88% of cases, residual solution was thrown out. The quantity of discarded solution ranged from 250mL (37%), to 500mL (42%), to more than 500mL (21%). This data provides additional support for smaller, 200ml, sachet sizes as per those designed for the Kit Yamoyo.

Affordability is key and a complex area. The projects illustrate that responsible but profitable pricing by the manufacturer, informed by the market and by willingness to pay studies, market research and market development provided by the projects, can result in acceptable affordability. A key price reduction mechanism was economies of scale from some large public procurements. Some views are captured in the next section.

# 7 OECD/DAC Criteria

The OECD/DAC criteria are used to evaluate development projects, and include measures of relevance, effectiveness, efficiency, sustainability and impact. KYTS-LUSAKA reviewed these through an independent evaluation by Ruralnet Associates (May-Jun-18) and was subsequently reviewed by DfID.[22] Both KYTS-LUSAKA and KYTS-ACE also captured stakeholder opinion on these criteria. We also included a review of affordability, as this is key.

For the KYTS-LUSAKA project the methodology, results and findings were found to be robust, with the independent evaluation concluding:

> *"There is evidence in the project having resulted in notable impact including: strengthening networking; accelerating implementation of strategies by government and other stakeholders related to child health; improving the economic well-being/ livelihoods of retailers through market development and saving life by helping deal with childhood diarrhoea. The value for money of UK Aid Direct in funding the project is clearly notable through the realization of these positive results."*

In the endline Stakeholder Survey Report respondents commented on the product as well as the projects as a whole. The report has sections on affordability of the product and capacity building of partners, HC staff and retailers.[23]

Some of the key comments and findings from the independent review and the Stakeholder Survey Report are summarised below:

**Relevance**

Relevance includes whether the approach was valid and adapted to the local context and needs and whether activities were consistent with the goal, objectives and intended impact.

Both projects were widely considered to be well-targeted and appropriate to the needs of the stakeholder organisations and their workers, to the prevailing context, to the communities targeted and to the beneficiaries themselves. This includes both the project as a whole and the Kit Yamoyo product. This is attributed to a number of factors, including:

- the pre-project consultation with beneficiaries and stakeholders (ie COTZ);
- the design of the product around 'human centred design' principles including consulting with customers and proceeding on the basis of what you know they *want*, not on the basis of what you think they *need*;
- collaborative working of the partnerships for implementation – from decision-making to grass-roots levels;
- monitoring and on-going responsiveness to feedback throughout KYTS-ACE and KYTS-LUSAKA
- insights from the Learning and Steering Group, chaired by MoH, that has supported the projects since the COTZ trial (2012).

The use of the private sector alongside and collaborating with the private sector is also seen as relevant to people's needs and to the workings of the public sector itself. Stakeholders commented favourably on:

- giving people choice of where to access medicines
- alleviating the realities of public sector supply bottlenecks on the ground
- aligning to GRZ policy to work with the private sector and bring medicines as close as possible to the people who need them

[22] Summary in Appendix 2. Full Final Evaluation Report available on request from ColaLife.
[23] Full Stakeholder Survey Report available on request from ColaLife jane@colalife.org.

*"..we didn't have ORS at the facility, but I referred her to a shop where these kits are found." Frontline Health Worker 1*

*"When they [at the HC] ran out of ORS, it was easy for the facility to go to buy, so there is no shortage at the facility." Frontline Health Worker 1*

*"say the child becomes sick in the night, instead of coming to the facility, they just go nearby. They buy the Kit Yamoyo. They use it and then they maybe come to the facility in the morning. So, for us as a facility, it reduced the burden." Frontline Health Worker 3*

*"When you have it in retail shops, it is readily available. It is as close to the family as possible. As opposed to just in health facilities. Because some of them are quite very far away to be accessible to some members of the community." MOH1*

**Effectiveness**

The projects are generally considered to have been well-planned and implemented to achieve the desired results, with good attention to value for money.

*"This [the evidence produced] is very critical and it has the highest weight as it also hinges on the quality of the product, putting beneficiaries at the centre. The research was very good and helpful." MOH2*

- Key aspects of the kit design highlighted in reports and by stakeholders include:
    - Ease of use of the kit (co-packaging, measuring);
    - Reported acceptability among children of flavoured ORS;
    - Ease of dispensing even by untrained staff;
    - the required medicines being in one product/package
    - the high quality of the kit
    - it worked to stop the child's diarrhoea.

It seems that the experience of the primary care workers in facilities, seeing the effectiveness of the product, was key in supporting complementary retail supply, in influencing care-givers and in advocating for the improved product to their superiors and decision makers.

*"Kit Yamoyo content is superior…The game changer with this product is that is contains Zinc which is adding high value as informed by evidence compared to ordinary ORS as a product… The look is excellent." MOH2*

*"It is important to have this kit. The combination… is very easy for a prescriber to give because they won't forget the other component when giving it out. We always have a tendency to rush to ORS and forgetting the zinc, which is a very important component. In the pack that they are, it is easy for someone to administer and for someone to prescribe as well." Senior Health Worker 2*

*"..it is easy for someone to use in the home… the way that the package has been done, the instructions, so it is easy for people to follow, to know the amount of water that they need." Senior Health Worker 1*

- Value for money aspects mentioned in reports and by stakeholders include:

- Building on what exists (eg avoiding creating a parallel supply chain system, but rather leveraging existing distribution channels for other fast-moving consumer goods, like Coca-Cola)
- Leveraging the private sector (Pharmanova, Shoprite)
- Leveraging the public sector – eg distribution by MSL; sensitizing and training trusted public providers of health information, to share information about Kit Yamoyo and provide vouchers; engaging Community Health Workers (CHWs); thereby helping to reduce marketing costs, project costs and providing foundations for self-sustainability.
- Mobilising community-level retailers to heighten availability and access of the kit by caregivers thereby enhancing effectiveness, economy and efficiency. This strategy facilitated a wider coverage of caregivers than the public sector can provide, given the many outlets used.
- Synthesis between SUN-funded KYTS-ACE and DfID-funded KYTS-LUSAKA (both with match funding from ColaLife).

*"… the fact that a local entrepreneur can explain something that is typically considered to be highly medical jargon. They are able to explain the benefits of Zinc for instance. It does not need someone to go to the University Teaching Hospital to be able to explain all those. But we now have retailers doing that. That already increases awareness because those retailers are now servicing a wide range of households in their communities." KZF Staff 2*

*"It was interesting, to see this project, which was providing the solutions for oral rehydration [in shops] so that by the time the mother came to the clinic, the child was not severely dehydrated. So, having this being used at the community level, was going to lessen the severity of dehydration in children with diarrhoea." Senior Health Worker 1*

*"In terms of procurement of medical supplies, it is an area that must become cost effective, and effective in terms of addressing the health delivery issues. … Planning for the newly designed formulation of ORS – to minimise waste and costs – that is what I will plan for. When I am asked what type of ORS… I will go for the one which has been modified to 200 mls. It's better; and the one which is co-packaged, as opposed to separately we have zinc, separately we have ORS – no, that gives room for stock outs…." MOH1*

**Efficiency**

There is a general consensus that the project activities and the product had translated well into lasting health impacts, when considering aspects such as cost-efficiency of activities, timeliness and consideration of alternative approaches. Both projects delivered within the planned timescales and to budget, although KYTS-ACE was extended in both aspects, to enable more to be done across the full 14 SUN districts.

This was in spite of difficult circumstances faced by both projects including:

- Vast distances to cover (especially KYTS-ACE)
- Change of health staff, at strategic level and frontline, particularly after the election
- Unfavourable economic situation, including inflation over 20% in 2015-16
- Cholera outbreak in Lusaka in 2017 (KYTS-LUSAKA), including disruption of the local market places, a need to change messaging, and burden on health centres

Aspects of efficiency mentioned for the projects include:

- Close monitoring of project budgets, costs and performance (including KPIs – Key Performance Indicators)
- Local sourcing of the Kit Yamoyo/GRZ flex-pack product
- Local sourcing of the small hand-soap (in some formats) eg from Trade Kings
- Working with other NGOs for distribution or awareness, such as Live Well (Lusaka and Eastern), USAID DISCOVER-HEALTH, PPHZ (Lusaka) and Toilet Yanga, as well as with SUN nutrition co-ordinators in KYTS-ACE districts.

**Affordability**

Affordability is key to an essential health product available through the private sector, so 'willingness to pay' studies were conducted by ID Insight, with consumers in remote rural and urban areas[24] in 2013 and 2014. The key target retail price was found to be the kwacha equivalent of 1USD at that time. Since then Zambia has experienced a period of high inflation (over 20%). However all actors in the value chain, from the manufacturer to retailers, have been conscious of the importance of keeping the product at an affordable price.

Options to subsidise were recognised as problematic, and an area for future discussion:

> "*When a product is subsidised, that only happens when there is a donor, or a government that has committed funds to bring down prices. Then the donor or government is unable to continue financing the initiative then everything crumbles. So for me if I am to seek a balance in the pricing for a health commodity then I think if anything then we shouldn't allow subsidies." KZF Staff 3*
>
> *"What subsidies do, actually, is provide an opportunity, to reduce the price, but also increase the access … We understand also that the problem with diarrhoea, diarrhoea also affects the poor, the people who can't afford, then your thinking has to change." Senior Stakeholder 2*
>
> *"at least if you can charge just a little bit… it is a sign of ownership. It means that someone is committed to using it effectively. If someone gets it just like that, free of charge, they tend to misuse. If they make something, if they contribute something to that thing, they will be able to really use it for the intended purpose." Frontline Health Worker 3*

Neither KYTS-LUSAKA nor KYTS-ACE attempted to control the retail price at small retail outlets, but prices were rigorously monitored. The ex-factory price was kept as keen as possible by the manufacturer, Pharmanova. Shoprite agreed to sell at a very low mark-up – at 6.99 for the Flexi-pack and 8.59 for the Screw-top. Small retailers near Shoprite stores across the country were therefore able to buy at cheaper than most wholesalers. Retail prices varied between K10 and up to K15, with the lower range fitting the projects' ideal of close to 1USD equivalent.

Midline research (KYTS-LUSAKA) established that 64% respondents in compounds found the price they had paid was affordable. At the endline household survey, this had dropped to 59% perhaps reflecting the worsening economic situation and closure of market trading. 69% of stakeholders interviewed for KYTS-LUSAKA judged the retail pricing to be affordable.

[24] Willingness to pay studies were conducted independently by ID Insight in 2013 (rural) and 2014 (urban). These are available on request from ColaLife.

However, experience from KYTS-ACE tells us that in rural/remote areas, in non-monetised economies, a larger proportion of caregivers struggle to afford a kit – although the cost of transport to a health centre for a free kit, or a day's lost work, can also be barriers to access.

> *"When you look at the rural economy it [the price] is on the higher side. But when you look at the [urban] economy where it is monetized – a monetized economy – then I think it is affordable." KZF Staff 1*

> *"..someone goes to the clinic in the morning, they will only be attended to in the afternoon. So the time spending at the clinic, it's an issue. There are hidden costs, for instance, when you are treating a child. You get out to a clinic, expecting that you will be able to get drugs for free.. For instance, if you are using public transport. You are paying. Which will come almost to the same amount that you would pay if you just got it in your shopping bag." KZF Staff 3*

Affordability for a general sale essential medicine is key consideration, but must sit alongside good design, high quality and ease of use. A reliable public sector supply of a well-designed ORSZ kit, complemented by an affordable choice at a shop near to home, would seem to be the best option to ensure maximum coverage. Localised manufacture in Zambia of an affordable, high-quality, easy-to-use ORSZ kit would ensure this for the future.

**Sustainability**

Both KYTS-ACE and KYTS-LUSAKA are considered to offer good potential for sustainable and lasting improvement. The independent final evaluation for KYTS-LUSAKA notes:

> *"Though the recent outbreak of cholera has slowed down the pace at which the project benefits would be sustainable, there is a high likelihood that the benefits will continue beyond the life of the project." Ruralnet Associates*

Reasons for optimism in this regard include:

- a clear appreciation of the usefulness of the Kit by caregivers
- confidence in the product among stakeholders (see endline Stakeholder Surveys for each project)
- the manufacturer committed to continuing production of a profitable product
- retailers continuing to stock, since the product is profitable and demand among customers has begun to be established
- capacity building of key players in the value chain, including the manufacturer, retailers, MoH staff (especially at district level) and CHWs as well as NGO partner staff
- buy-in from MoH at various levels, including a public tender placed on 8th May for ORS kits to a similar design
- Support from the National Formulary Committee, and from many MoH staff at all levels, for listing an ORSZ co-pack on the Zambian Essential Medicines List.

> *"The research that was undertaken on this project gave the Kit a strong starting point and credibility for dialogue with the MOH and other stakeholders, as well as for use by mothers / caregivers. Without that, there would most likely been difficulty to get acceptance of the Kit.*

*Research on other aspects of the Kit must continue, and the outcome must be published particularly to the MOH, WHO and others... This approach provides also the data that will lead to placing and maintaining the Kit on the Zambia National Essential Medicines List, and also on the WHO Essential Medicines List (Children's List)." Senior Stakeholder 1*

However it is recognised by many players, including MoH at strategic level, that there is still more to do:

*"Innovative communication and advocacy strategies of promoting health and preventing disease would be a game changer. Social behaviour change multi-pronged strategies will be the way to go… There is need for more advocacy supported by evidence as the role of zinc in diarrhoea management is new and for many Zambians this is novel…Knowledge, attitudes and behaviours have not significantly changed [yet]." MOH2*

## Impact

Impact includes health impacts on beneficiaries and capacity building, but should also consider unintended consequences.

### Health Impacts

Lasting health impacts were the main aim of both projects. These are discussed in sections 6 and 7, and will hopefully support a long-term reduction in childhood morbidity and mortality from diarrhoea.

### Capacity building

Although neither project aimed mainly at capacity built, the endline stakeholder surveys and final evaluations show that capacity was built in a number of areas and these supported the successful implementation of the projects as well as its potential for sustainability. Many stakeholders interviewed said that the skills developed would last – particularly the knowledge gained on ORS and Zinc.

Stakeholders mentioned that skills had developed in:

- Health knowledge (particularly diarrhoea and rational use of ORSZ) among:
    - Health staff – particularly on the frontline and at district level
    - CHWs
    - Retailers
    - Caregivers of under-5 children in target areas
    - Staff in partner organisations

- Market development knowledge and skills, particularly among:
    - Partner staff
    - Health staff (appreciation of the role of community retailers)

- Project management, M&E, financial and IT skills, particularly among:
    - Partner staff

Other areas mentioned include product design, the importance of community consultation, partnership working, the use of vouchers and organisational strengthening.

*"… I didn't have knowledge of market development, but with the coming in of this project, the capacity that was built in us – this was increasing in knowledge, skills in market development. …the project was focussing on market development so*

*right from the beginning I got involved in market development for Kit Yamoyo. That has benefitted me and many others involved in the project." KZF staff member*

*"I feel in future, involving the community and we work hand- in-hand with the facility it is very, very helpful.. So, the facility and the CHWs, when we worked together with them, it helped us to achieve what we wanted to achieve." Front Line Health Worker 1*

**Unintended consequences**

The independent evaluation of KYTS-LUSAKA identified that the Kit Yamoyo will be bought by the middle and high income segments of the market. However, this is a positive contribution to its commercial sustainability in the market. There is also some anecdotal evidence that these customers give the kit to the people they employ (maids and gardeners).

# 8 Conclusions and recommendations

The project is seen as something of a breakthrough among those with first-hand experience of the intervention, as well as some wider stakeholders. It is widely recognised that there are now opportunities for government and other key players to translate evidence into policy and action on the ground. The KYTS initiatives have given impetus towards the fight against stunting and malnutrition among children.

*"It has been a very good project, and we of course expect to see the key findings, of which some of things we know: it has been a breakthrough, a breakthrough in terms of the introduction of the kit, the co-packaged ORS and Zinc, to the private sector in Lusaka and may be other districts, so … we believe a lot of children have been reached. And their lives have been saved, and we hope to see that trend continue and a lot of lives will be saved… There are partners who are also interested: government is interested, others are interested, so we expect to see a lot of players coming on board." KZF Staff 3*

Key lessons and recommendations from KYTS-ACE and KYTS-LUSAKA include:

i) co-packaging ORS and Zinc helps increase coverage. This is also borne out by work in other countries[25] These lessons should be widely shared, through publication internationally and across Zambia's public health system.
ii) Zambia is currently leading the field with its lessons on smaller sachet size (200mL) of ORS for home use, as per those designed for the Kit Yamoyo. However WHO's model EML lists both 500mL sachets and 200mL sachets as standard, so there is a strong policy platform to continue further research and lobbying in this area.
iii) In terms of Kit Yamoyo packaging design innovation, more needs to be done in Zambia to promote the functionality of the flexi-pack as a measure for the water needed to mix the ORS correctly; a rigid pack (eg the new screw-top version) may be more intuitive to use as a measure, but both production and transport costs for this would be more expensive. Encouraging one purchase of a screw-

[25] United Nations Children's Fund (UNICEF), World Health Organization (WHO). Tracking Progress Towards Universal Coverage for Women's, Children's and Adolescents' Health: The 2017 Report. Washington DC, USA: UNICEF and WHO; 2017. https://data.unicef.org/wp-content/uploads/2018/01/Countdown-2030.pdf.

top format and then a 'refill', provided from either a public or private source may be considered a way forward.

iv) The work sensitising and co-operating with all levels of health personnel in Zambia in the use of ORS and Zinc co-therapy, and the use of co-packs in particular, has been vital and should be continued, and ideally should be embedded in public health training (eg ICCM) and in ordering and dispensing practice across the country. Key audiences include: MoH staff at all levels including district and provincial staff and front-line workers; CHWs; pharmacists, retailers, wholesalers, other manufacturers, NGOs, academics. There is a need to bridge the gaps in knowledge and practice among different players, for example, providing co-ordinated support and messages in the districts under future SUN interventions.

v) Policy actions could include formal listing of ORS/Zinc co-packs on the next Zambia EML and inclusion of co-packaged ORSZ in health centre kits, as the new standard

vi) Encouraging Health Facilities in proper record-keeping on all medicines received and dispensed, to provide better service to patients, better ordering, and potential for further gathering of evidence.

vii) Private sector participation in the supply chain remains a key element in ensuring that the public sector supply is supplemented and complemented. The private sector approach is a profit-driven supply chain which has promise to be self-sustaining, in terms of availability and accessibility.

*"I like this component of local manufacturing. That initiative that the product is locally manufactured is a boost to the local economy. Sustainability would also mean that us, as a public system, we adopt that innovation: we get it and make it as widely as possible. All projects must come an end – I take it there is a proper agenda on how it can be absorbed into the public sector. We can say that we have a good approach. We are able to sustain the idea" Senior Stakeholder 2.*

viii) There is potential to incorporate lessons into the new Health Shops initiative. This may need co-ordinated and funded work among the various players: MoH, ZAMRA and NGOs

*"That Health Shop initiative, in my view, now extends your role, as KZF, moving this kit, from purely being available in, say, just retail outlets, to these new identified health outlets which are called Health Shops under the Retail and Allied Substances Act. The Zambian Medical Regulatory Authority is now spearheading that the initiative. The idea is to translate the many thousands of the previously known 'drug stores', into regulated outlets. And those outlets become naturally another outlet for the kit." Senior Stakeholder 1*

*"It has been a good journey, throughout. Your team [KZF], the ColaLife team, it's not the end. There is a long way to go. We will still be working very close together to ensure that this product becomes the next Panado."[26] Private Sector 1*

# 9 Note on future actions and next steps

Future actions will be discussed and captured at the Steering and Learning Group meeting on 6th Sept 2018. Notes from the meeting will be available on request from ColaLife.

[26] Panado is paracetamol produced by the same manufacturer (Pharmanova), which is widely available across the country and accounts for the highest share of their revenue.

## Appendix 1 – Executive Summary – KYTS-LUSAKA Stakeholder Survey

Twenty respondents, purposively selected to offer a range of stakeholder opinions and insights, were interviewed at the end of the KYTS-LUSAKA project, which undertook market development for an innovative ORS/Zinc (ORSZ) co-packaged kit, in Lusaka Province, for 30 months, between October 2015 and March 2018.[27]

Two questionnaires were used, to enable the project to gather both strategic level, qualitative insights – particularly on the project's approach to developing 'access' to over-the-counter diarrhoea treatment – and to gather qualitative and quantitative data on product knowledge, opinions, perceived impact and capacity built, among implementation staff, both those directly employed by the project and those collaborating. The responses also enabled some insights into OECD/DAC criteria.[28]

Overall, respondents were very supportive of the project's approach, its positive impact, the experience of working as part of the partnership, the use of resources and the learning opportunities. Learning and organisational improvements were generally judged to be significant and potentially long lasting. In particular, there was overwhelming support for the Kit Yamoyo product itself and its impact, both on the work of health staff and on beneficiaries. Interviewees were well aware of the benefits provided by the kit, how it should be used, by whom and in what circumstances. Among those who had experience of personal use, all said they would likely or very likely use the kit again. All respondents thought the kit should be distributed by government Health Centres and be included on the government's Essential Medicines List.[29]

There were no reported significant concerns about the product itself, nor negative effects of the project on organisations or on beneficiaries. The most often mentioned concerns were about whether the project would leave a self-sustaining legacy and on affordability for the poorest after the end of the project's voucher scheme – should the government not intervene with a public sector supply.[5] Nearly all respondents highlighted these concerns, although the kit was felt to be generally affordable by 60% of respondents who answered Questionnaire B and 69% overall.

A recurring issue was whether the Ministry of Health would adopt procurement and distribution of this kit (or a similar design) in the public sector in future.[30] Ministry decision-makers interviewed said they expected this to happen and would support it. The manufacturer also stated they would continue serving all sectors and were expecting the announcement of the first government order for an ORSZ co-pack.[31] This is a very encouraging indication that the government have taken on board the benefits of a better-designed ORSZ co-pack.

A key aim of ColaLife's approach is to leave a self-sustaining legacy by supressing its brand and empowering local agents to take up strategic, tactical and operational responsibilities for an improved ORSZ product; it was striking that very little mention was made of ColaLife or its staff. Ownership of and pride in the project partnership and the product seems already well-embedded locally.

[27] This report should be read in conjunction with the results of the endline household survey of beneficiaries, on impact, and other project outputs, including the Independent Evaluation Report by Ruralnet Associates.
[28] See sections 5.1 to 5.5 of the full Stakeholder Survey Report – available on request
[29] In Apr-18, the Zambia National Formulary Committee met to consider the Zambia Essential Medicines List and the inclusion of co-packaged ORS and Zinc. A sub-committee decision, based on KYTS evidence, was made in May-18.
[30] KYTS-LUSAKA offered no funds for this, but advocated for it through evidence and example from the private sector. The sister project, KYTS-ACE, working in remote rural areas, offered funds via SUN. After the close of both projects, in Apr-18, a 6-month gap-filling fund to buy 20,000 public sector kits a month, via ColaLife, continued supply of GRZ ORS/Zinc co-packs, to KYTS-ACE districts but one or two understocked HCs in KYTS-LUSAKA districts seemed to be benefitting (eg Airport HC was mentioned).
[31] In fact, the call to tender for an ORS/Zinc co-pack was published on 7-May-18 – the first tender for an ORSZ co-pack in Zambia. See http://www.colalife.org/2018/05/17/zambian-government-tender-for-250000-ors-zinc-co-packs/

## Appendix 2 – Independent Evaluation Report - Executive Summary

This is an independent evaluation report of the Kit Yamoyo Transition to Scale (KYTS) – Lusaka project. KYTS-LUSAKA's purpose was to develop the urban and peri-urban market of Kit Yamoyo in order to achieve the goal of "better availability, access and use of ORS/Zinc therapy for home treatment of diarrhoea in children under 5 via private and public sector development in Lusaka Province, Zambia".

The purpose of the independent evaluation of the KYTS-LUSAKA was to assess the performance of the project. The two-fold objectives of the evaluation were: (i) To independently verify (and supplement through a previously contracted end-line survey), grantees' record of achievement as reported through its Annual Reports and defined in the project log-frame; and (ii) to assess the extent to which the project was good value for money.
The evaluation used multiple methods approach. It relied on a combination of methods and data sources which included evaluation surveys (baseline, midline and endline), case studies conducted at project completion, interviews of a wide range of stakeholders at endline, and administrative and operational records generated by the grantee (ColaLife) and by project implementation staff (KZF).

### Key Findings

*1. Assessment of Accuracy of Reported Results*
The independent evaluator's general view is that the reported results were accurate and were a fair reflection of the project's achievements. The reported results were based on evidence most of which was generated through internationally accepted practices. For instance, the survey methodologies were clearly defined and conformed to scientifically accepted standards and norms and where there were challenges, these were acknowledged and clearly highlighted.

*2. Relevance*
KYTS-LUSAKA Project has been found to have been relevant to global aspirations by directly supporting the Millennium Development Goal number 4: "*to reduce child mortality*" (or Agenda 2030 (SDG) goal 3: "*Ensure healthy lives and promote well-being for all at all ages".*) Two other MDGs that were indirectly supported were goal number 1: e*radicate extreme poverty and hunger* (goal 1 in Agenda 2030) through promotion of community retail of ORS and Zinc (ORSZ), and goal 3: *Promote gender equality and empower women*. The project was also relevant to the needs of the poor and marginalized by offering a solution to a problem that predominantly affects the poor. Other SDGs supported included SDG 8 – *Decent work and economic growth* (given the private sector business model, which has generated jobs at Pharmanova and contributed to livelihoods of community retailers), and SDG 17 – *Partnerships for the Goals* (given the multi-sectoral partnerships that have been established to deliver the model).

*3. Effectiveness*
The results achieved by KYTS-LUSAKA Project have been tracked and reported through various mechanisms which include household surveys, key informant interviews, retailer surveys, and project documentation review. The data collection for all the three evaluation surveys (baseline, midline and endline) were contracted out to RuralNet Associates Ltd, an independent research firm. The independent evaluator is of the view that the reported results are a true reflection of what was achieved by the Project. Funds were put to good use, and there is no evidence of inefficiency. Some results were achieved which would not have been achieved had the Project not been implemented. These include increased

coverage of ORSZ from approximately 15% at baseline to 33% at endline, saving of lives through the use of Kit (104 child deaths averted), and influencing government policy on ORSZ.

*4. Efficiency*
Efficiency as "a measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results"1. Overall, the Project delivered results in an efficient manner. Areas of concern include the late start of the Project and the negative budgetary impact of macroeconomic factors (sudden rise in local inflation and the effect of Brexit on the sterling).

*5. Sustainability*
The independent evaluation team is of the view that intervention put in place by the grantee is poised to succeed beyond donor funds. This is because it has been enthusiastically taken over by the private sector and there is buy-in by the public sector (government), evidenced by government purchases of Kit Yamoyo.

*6. Impact*
The project has had some demonstrable impact already: the capacity of civil society has been built, and about 104 lives have been saved which would not have been saved had the project not been implemented. It is, however, hard to say in what ways the project produced unintended effects, whether positive or negative.

*7. Some Lessons Learnt*
Some of the lessons learned through the KYTS-LUSAKA include:

(a) Built-in transition mechanism from an aid-funded solution to a private-sector owned solution has helped to assure sustainability**.**
(b) Research and consultation to inform product design and adaptation helps to assure product success.
(c) Early engagement with regulators and policy makers helps to forestall bottlenecks.

**Ruralnet Associates, June 2018,**
**Stephen Tembo and Fison Mujenja**

1 OECD. (2002). *Glossary of Key Terms In Evaluation and Results Based Management*. OECD.

## Appendix 3 – LiST tool and how it was used in KYTS-LUSAKA

### KYTS-Lusaka Lives Saved Analysis, June 1, 2018

The Lives Saved Tool (*LiST*) is a model used to calculate deaths averted or lives saved by past interventions and for the purposes of program planning when costly and time consuming impact studies are not possible. *LiST* is an effective tool for modelling diarrhoea mortality and can be a useful alternative to large and expensive mortality impact studies[32].

> *LiST models the relationship between coverage of interventions and outputs, such as stunting, diarrhea incidence and diarrhea mortality. Each intervention directly prevents a proportion of diarrhea deaths such that the effect size of the intervention is multiplied by coverage to calculate lives saved. That is, the maximum effect size could be achieved at 100% coverage, but at 50% coverage only 50% of possible deaths are prevented. Diarrhea mortality is one of the most complex causes of death to be modeled. The complexity is driven by the combination of direct prevention and treatment interventions as well as interventions that operate indirectly via the reduction in risk factors, such as stunting and wasting. Published evidence is used to quantify the effect sizes for each direct and indirect relationship. Several studies have compared measured changes in mortality to LiST estimates of mortality change looking at different sets of interventions in different countries. Comparison work has generally found good agreement between the LiST estimates and measured mortality reduction.*
>
> *LiST is characterized as a linear, mathematical model that is deterministic [14]. It describes fixed relationships between inputs and outputs that will produce the same outputs each time one runs the model. In LiST the primary inputs are coverage of interventions and the outputs are changes in population level of risk factors (such as wasting or stunting rates, birth outcomes, such as prematurity or size at birth) and cause-specific mortality (neonatal, child mortality 1 to 59 months, maternal mortality and stillbirths). The relationship between an input (change in intervention coverage) with one or more outputs is specified in terms of the effectiveness of the intervention in reducing the probability of that outcome. The outcome can be cause-specific mortality or a risk factor. The primary underlying assumption in LiST is that mortality rates and cause of death structure will not change except in response to changes in coverage of interventions. The assumption is that changes in distal variables, such as increase in per capita income or mothers' education, will decrease cause-specific mortality, such as diarrhea mortality, by increasing coverage of interventions or reducing risk factors, such as increased rates of exclusive breastfeeding.*

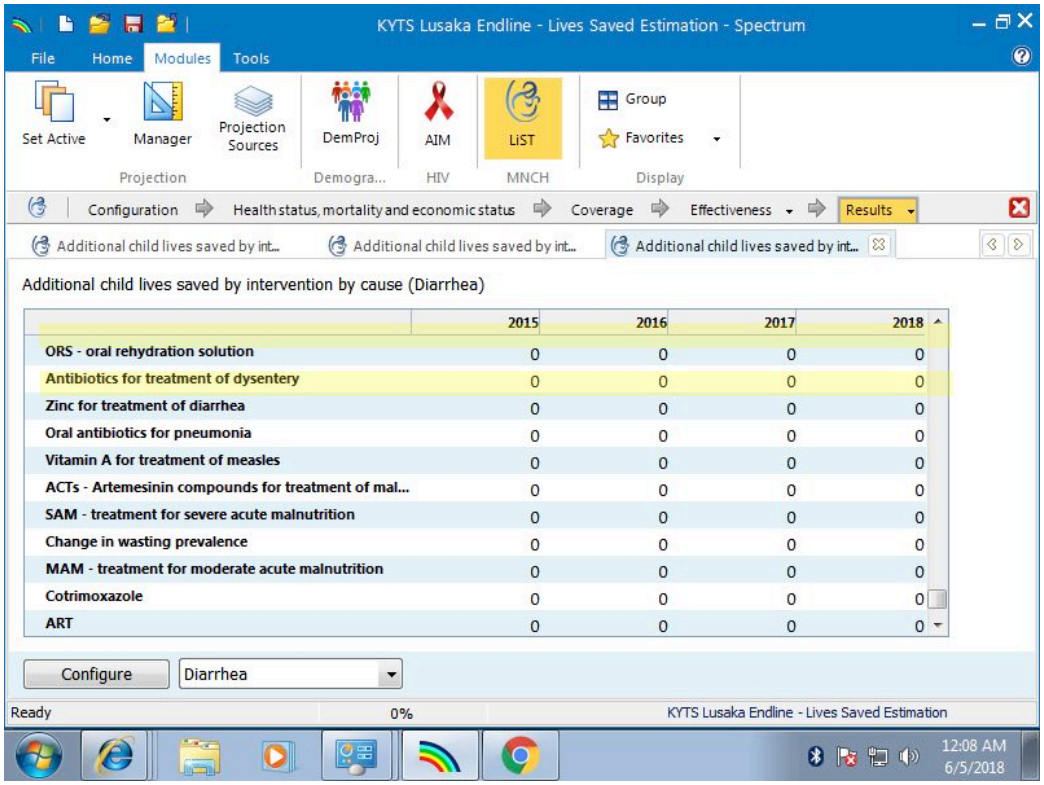
Each diarrhea -specific intervention modeled in LiST directly prevents a proportion of diarrhea deaths. For example, the effectiveness estimate for zinc for the treatment of diarrhea is 23%. In *LiST* to achieve a reduction in mortality, the effect size is multiplied by the coverage and assumes that all other interventions are kept constant. Thus, at 100% coverage, zinc treatment could prevent 23% of current diarrhea deaths among children 1 to 59 months of age. If coverage were halved to 50%, the deaths prevented would also be reduced by 50%. In the case of zinc, the 23% reduction in hospitalizations can be argued to be a very conservative effect size estimate as it is based on community-based intervention studies and measured reductions in hospitalizations in the community.

[32] Fischer-Walker C and Walker N. The Lives Saved Tool (*LiST*) as a model for diarrhea mortality reduction. BMC Med. 2014; 12: 70.

ORS, as an intervention in *LiST,* is a community-based intervention for the prevention of diarrhea mortality in the community and in clinical settings. For the purposes of calculating the potential reduction in diarrhea mortality, a linear trend between the relative reduction in mortality and achieved coverage is assumed, such that if ORS reduces diarrhea mortality by 69% at 74% coverage, then ORS would reduce mortality by 93% at 100% coverage[33]. It is important to note that community-based studies have some level of coverage of ORS in control communities, which is not taken into account, and thus this estimate is a conservative estimate and may overestimate the true coverage needed to reach the estimated mortality reduction.

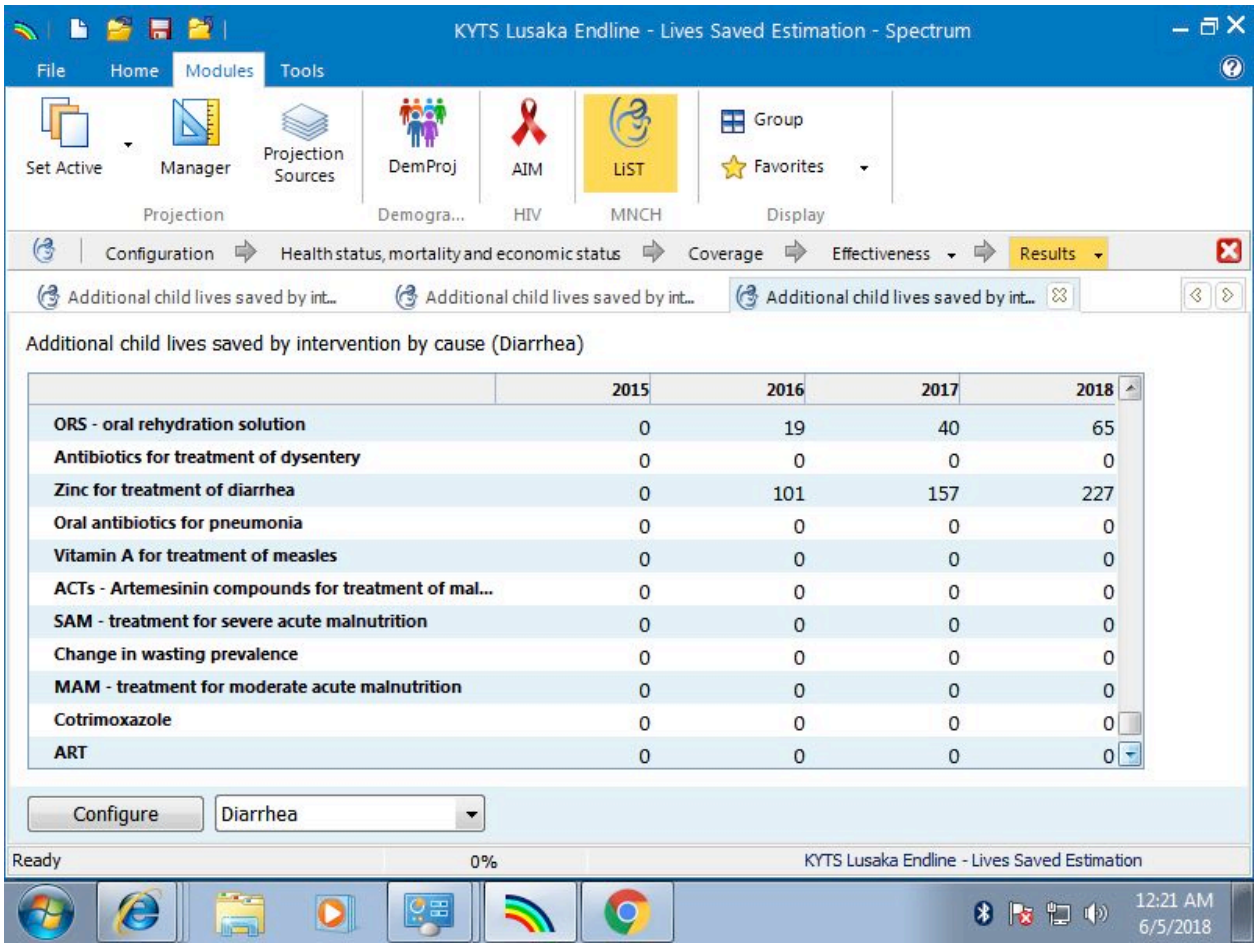
### KYTS-Lusaka Analysis

The image below shows the number of additional lives that would have been saved in the absence of the KYTS-Lusaka intervention. As our counterfactual, it appropriately shows that no additional lives would have been saved from ORS and Zinc.




Based on the ORS and Zinc coverage achieved through KYTS-Lusaka, and measured via the endline household survey, we are able to model the estimated number of additional lives saved of children under 5 who would have otherwise died from diarrhoea.

[33] Munos MK, Walker CL, Black RE. The effect of oral rehydration solution and recommended home fluids on diarrhoea mortality. Int J Epidemiol. 2010;39:i75–i87.




Based on our analysis using the Lives Saved Tool, KYTS-Lusaka is likely to have saved:

**<u>Calculations:</u>**

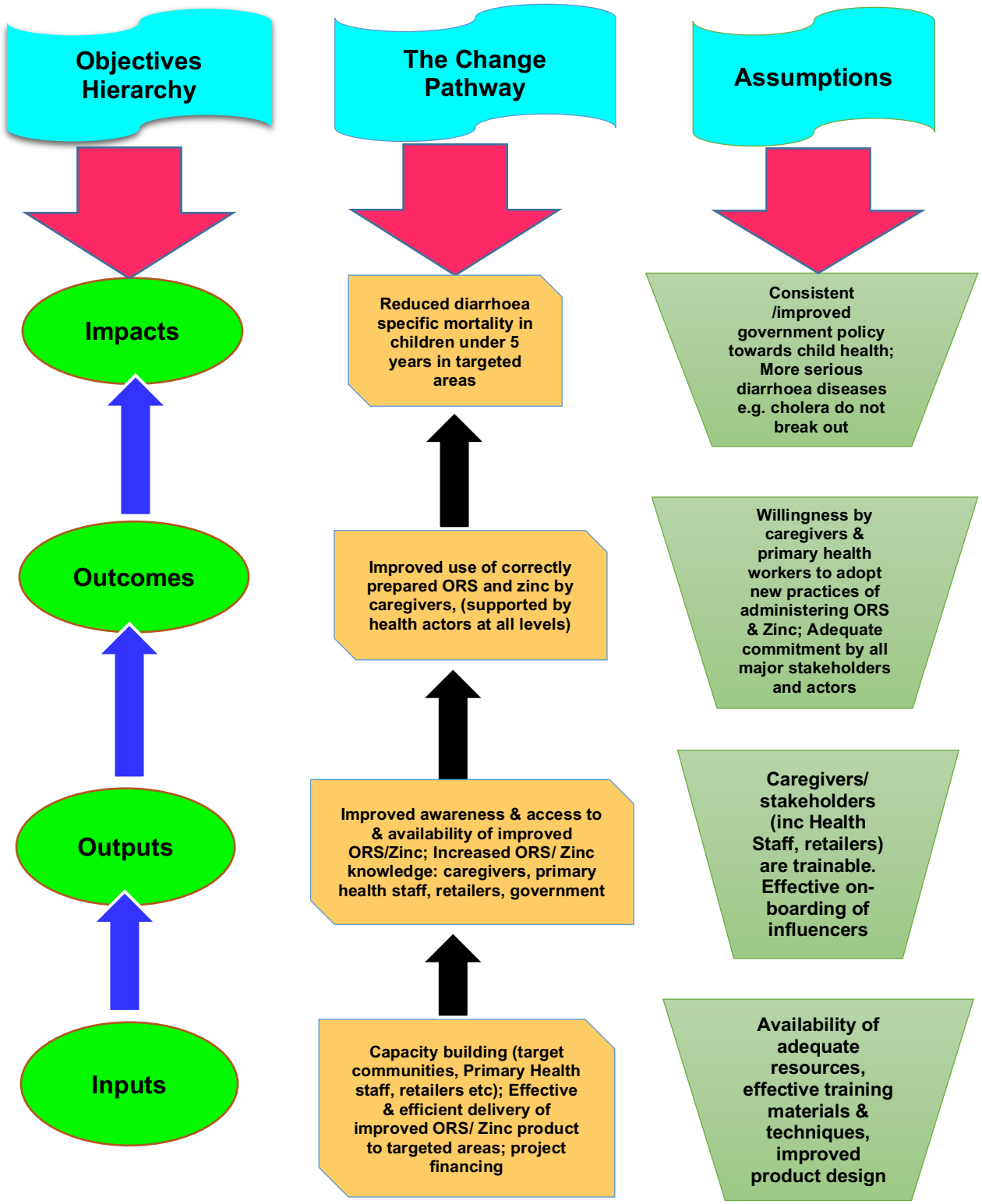
**Country wide estimation based on coverage achieved in KYTS-Lusaka:** 125 (lives saved from additional ORS coverage) + 485 (lives saved from additional Zinc coverage) = **610**

**Lusaka accounts for 17% of the total population: 0.17*610 = 103.7**

**If we assume 100% coverage of Lusaka: 104 lives saved**
**If we assume 80% coverage of Lusaka: 83 lives saved**
**If we assume 70% coverage of Lusaka: 73 lives saved**

## Appendix 4 – Simplified theory of change: KYTS projects

Source: Ruralnet Associates
(edited to encompass the importance of experience and bottom-up influence of primary health care workers)




In a total market development approach, addressing multiple areas of 'access', improved awareness (among caregivers and health actors) and better availability of an improved ORSZ product via multiple channels improves access to and ultimately use of ORS and Zinc for childhood diarrhoea.