Maternal, Newborn and Child Health

Healthy Women, Healthy Children, Healthy Communities

KEY FINDINGS

- Looking across the four study countries, findings suggest World Vision programmes are supporting and improving a continuum of care from the antenatal through the post-partum period.
- The results for exclusive breastfeeding and timely care-seeking for childhood illness are encouraging. Intervention sites outperformed comparison sites in three countries (Cambodia, Guatemala and Kenya) for both exclusive breastfeeding and caregiver's report of immediate care-seeking for a recent fever episode in a child under five.
- There was good news for children receiving their first dose of Vitamin A, with greater improvements in intervention versus comparison sites for Cambodia, Guatemala and Kenya.
- Zinc treatment for diarrhea persists as a gap in delivery of a proven and practical intervention across all countries.
- Results indicate that community health workers (CHWs) in all study sites can effectively encourage fundamental preventive and potentially life-saving behaviours by the families they serve. However, there is no conclusive evidence that the World Vision package of interventions performed better in intervention than in comparison sites.

Improving Health Status

World Vision's ongoing commitment to the UN's "Every Woman Every Child" initiative is a commitment to ensuring that every woman, newborn, child and adolescent lives in the healthiest environment possible.

This study was an exploration of the impact of World Vision's package of core approaches to strengthen community systems to improve the health status of women, newborns and young children, especially the most vulnerable. The approach aimed at helping to improve access to people-centred health services as well as boost household-based counselling to increase use of those health services. The study tracked key indicators that reflect good health outcomes from adequate prenatal care to care-seeking for ill children.

The study yielded encouraging findings along with lessons on potential improvements to maternal, newborn and child health programming.

Study Design

The Child Health and Nutrition Impact Study was a two-arm, quasi-experimental evaluation, with two intervention sites per country receiving a package of three approaches (see below) versus two matched comparison sites in each country receiving COMM[1] plus any pre-existing CHW[2] approach. In both intervention and comparison areas, World Vision's field operations were funded exclusively through private funds. The baseline was completed over a three-month period and the endline was completed five years later over the same timeframe to minimise seasonal effects. Household sample size varied across countries from 2,439 for baseline in Zambia to 4,561 for endline in Cambodia.[3]

> "In the past, a lot of women never came to ANC but now people are educated and they now know the value of ANC … [CHWs] have helped our community very much."
>
> Grandmother at Health Facility, Intervention Site, Zambia

A mixed-method approach was taken combining results from population-based surveys with qualitative interviews with implementing teams, community members, CHWs and health facility staff. The study used the difference-in-differences (DiD) statistic to quantify as a percentage point difference whether intervention sites outperformed comparison sites.

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The package of three approaches evaluated:

Timed and Targeted Counseling
ttC equips CHWs to counsel families through scenarios described in storybooks followed by dialogue and negotiation for better health practices. Home visits are timed during pregnancy and early childhood to target health messages when they are most relevant. Of the three approaches, ttC is the most directly linked to health and nutrition behavioural outcomes.

Citizen Voice and Action
CVA empowers community members to monitor health services and build relationships with local governments in order to hold duty bearers accountable for delivery and quality of health services. CVA groups facilitate a constructive dialogue between community members and decision-makers. CVA illuminates client-facing service quality elements, but only indirectly addresses clinical performance.

Community Health Committees
COMM empowers community groups to provide an enabling environment for health practice improvements. Committees diagnose and address barriers that families commonly face to reduce their daily risks or obtain needed health services. Committees link health facility staff to community representatives and can provide a support system for CHWs.

Results

Safe Pregnancy

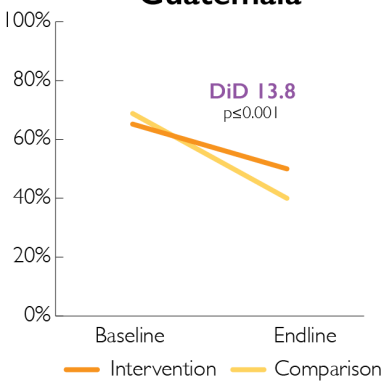
Iron folate supplementation in pregnant women is a key behaviour to minimise the risk of birth defects. As a home-based care behaviour, this measure also reflects adequate preparation for childbirth. The level of iron folate supplementation during pregnancy increased over time in both intervention and comparison sites in Kenya and Zambia although maternal anemia in Kenya did not improve over the study period (data not shown; see Nutrition brief). The DiD analysis showed intervention sites outperforming comparison sites for iron folate supplementation in Zambia (83.3% to 94.7% and 92.7% to 68.0% in intervention vs. comparison sites respectively, DiD=36.2, p≤0.001).

Receiving adequate tetanus toxoid immunisation is another key behaviour during pregnancy that prevents a life-threatening infection in the newborn. Levels of tetanus toxoid immunisation remained unchanged in all countries except Guatemala, where coverage actually decreased in both intervention and comparison sites. The decrease observed was significantly less so in intervention sites, suggesting that the World Vision programme may have helped stave off a general worsening trend for this indicator (Figure 1)[4].

Using an antenatal care (ANC) index[5], the study showed greater positive change in ANC in intervention sites relative to comparison sites in both Cambodia and Zambia (DID=0.3 index points, p≤0.001 and DID=0.6 index points p≤0.001 respectively).

Overall patterns for pregnancy-related preventive and care-seeking behaviours give some evidence of positive benefit from the World Vision programme in several countries, although consistency in these patterns is lacking.

Figure 1 Received at least two doses of tetnus toxoid, Guatemala[6]



The DiD value shown in purple indicates a worsening trend in both study areas but to a lesser degree in intervention sites.

> "If they [CHW] know that we are pregnant, [they will ask] how old is the pregnancy, if pregnancy in its 2 or 3 months, they [will ask] whether you go to have ANC. I told them that I have not had ANC yet. They encourage me to go to ANC, to get iron tablet to prevent anemia."
>
> Female Community Member
> Intervention Site, Cambodia

> "In the past, a lot of women never came to ANC but now people are educated and they now know the value of ANC … [CHWs] have helped our community very much, they visit pregnant women and encourage them to go for ANC. They even help to bring these women to the clinic using bicycles provided by World Vision to help do their work and they are really helping us and our children and our grandchildren."
>
> Grandmother at Health Facility
> Intervention Site, Zambia

Delivery and Newborn Care

When women give birth in a health facility by a skilled birth attendant, both mother and newborn are more likely to experience improved outcomes. The study showed general improvement in both facility-based birth and skilled birth attendance across intervention and comparison sites, except for Guatemala where improvement was only seen in comparison sites (data not shown).

In Cambodia, there was a dramatic increase in the prevalence of facility-based birth with intervention sites outperforming comparison sites by a substantial margin but the same was not true for skilled birth attendance showing an overall positive trend but greater improvement in comparison sites (Figure 2).

In Kenya, positive trends in both facility-based birth and skilled birth attendance also favoured comparison sites over intervention sites (DiD=-10.5, p≤0.001 and DiD=-4.4, p≤0.05 respectively). This pattern may reflect pregnant women's increased use of health facilities stimulated by CHW programming. Unfortunately, the evaluation did not assess change in quality of delivery services over time.

"Before [having CHWs], people in community follow the old practices – deliver a baby at home… and there were many incidences of the death of mother and child…after we have [CHW] & Health Center, [CHWs] educate women to stop the practice [of home delivery]"

Head of Village
Intervention Site, Cambodia

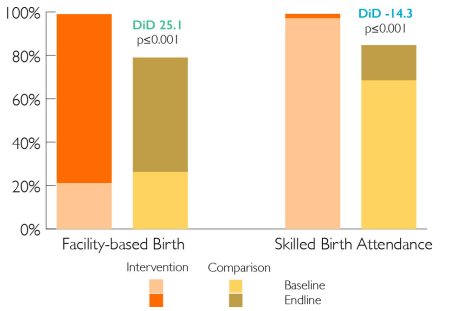
The study captured three basic newborn care patterns reported by mothers including adequate thermal care, clean cord practices and whether breastfeeding was initiated within one hour of birth. The study did not detect any differences in performance between intervention and comparison sites for any of these three indicators, with two exceptions. Zambia was the only country where we saw significantly greater improvement in World Vision intervention sites over comparison sites for breastfeeding within one-hour of birth (Figure 3).

In Kenya, for all three newborn care indicators, comparison sites showed a modest but significantly greater improvement relative to intervention sites (for thermal care DiD=-3.1, p≤0.01, clean cord practice DiD=-4.8, p≤0.001, and breastfed within one hour DiD= -5.6, p≤0.001). It is important to note that there were very high levels for both thermal care and clean cord practice at baseline in every site across the four countries, which is very good news. This however means there was likely little room for improvement in these patterns. The levels for breastfeeding within one hour were high, but not ideal.

"In the past, mothers used to shun away under five children's and pregnant women's health prevention and promotion services but from the time the [CHWs] were introduced, we are now able to disseminate information from the center to the community and everyone is well informed, a lot of mothers are now seeking these services."

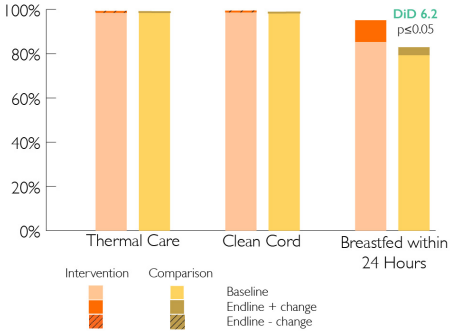
Male Nurse in Charge
Intervention Site, Zambia

Figure 2 Facility-based birth and skilled birth attendance, Cambodia[6]



DiD values in green and blue indicate improvement in both study areas but green highlights significantly better performance in intervention sites and blue indicates significantly better performance in comparison sites.

Figure 3 Newborn Care, Zambia[6]

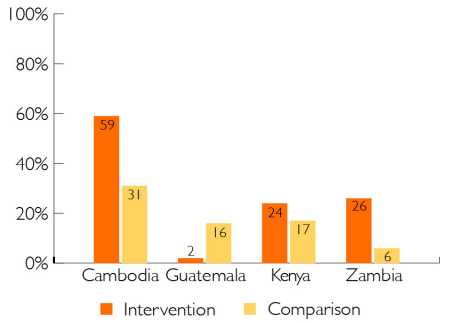


DiD value in green indicates improvement in both study areas but significantly better performance in intervention sites. For other comparisons, no significant difference in performance was found.

Continuum of Care from Pregnancy through Delivery

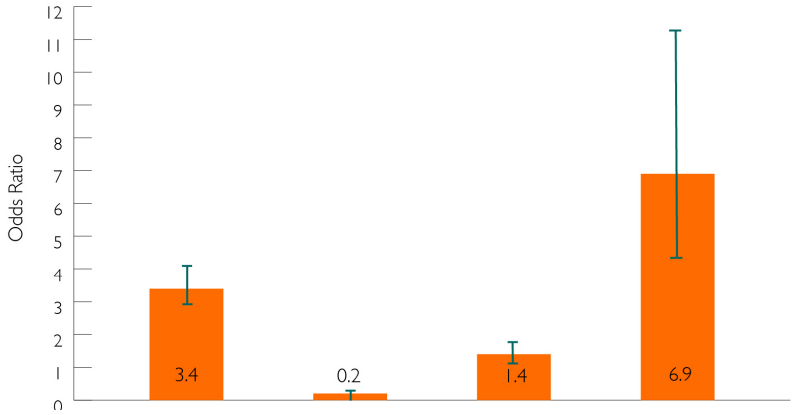
Supplemental analyses using endline data[7] was prepared by the Johns Hopkins team and focused on the continuum of care for women during pregnancy and childbirth. The analysis used a widely-accepted

Figure 4a Levels of complete continuum of care, CHNIS Endline



For all countries, differences between intervention and comparison site values are significant at the p≤0.001 level.

Figure 4b Odds of Complete Continuum of Care for Intervention vs Comparision sites – CHNIS Endline



index that combines information on completion of four or more antenatal care visits, delivery by a skilled provider and prompt medical care within 24 hours of delivery.

Considering a set of potentially confounding variables, the likelihood of women located in an intervention site having experienced a complete continuum of care compared to women in comparison areas was significantly greater for three countries – Cambodia, Kenya and Zambia (Figure 4a). The magnitude of this difference varied with women in Kenya having a 38% greater chance, women in Cambodia having more than a three-fold greater chance and in Zambia women had a greater than six-fold increased chance of having received a complete continuum of care (Figure 4b).

"…they mobilise [CHWs] to keep working hard and ensure that all pregnant mothers attend ANC; they have called community members and asked them to provide labor in construction at the health facility and this does really work; in short the [COMM] people are very crucial in this community. I was forgetting that they refer pregnant mothers to deliver at the hospital for their own safety."

Village Elder
Comparison Site, Kenya

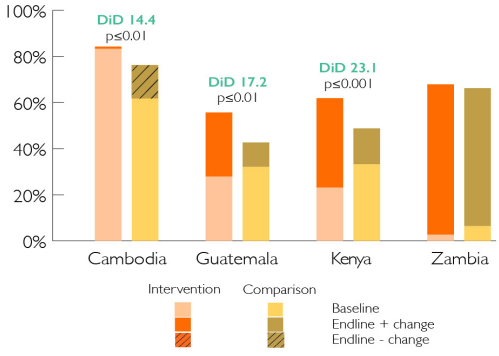
Preventive and Care-seeking Behaviours for Children under Five

In all four countries, the study evidenced an improvement in exclusive breastfeeding of children under six months. In two of those countries, the improvement was significantly greater in intervention sites than comparison sites and in a third, an unusual pattern was seen (Figure 5). In Guatemala and Kenya there were impressive gains in intervention relative to comparison, sites and in Cambodia, a slight and non-significant improvement in intervention sites compared favorably with a worsening of this indicator in comparison sites. In Zambia, improvements in exclusive breastfeeding were substantial for both intervention and comparison sites despite the fact that the gain in intervention sites was not significantly greater than in comparison sites.

"Improvements in exclusive breastfeeding across all countries is one of the most convincing pieces of evidence that the World Vision programme is capable of having impact across varied programme contexts."

Johns Hopkins Impact Analysis Report

Figure 5 Exclusive breastfeeding in children less than six months of age [6]

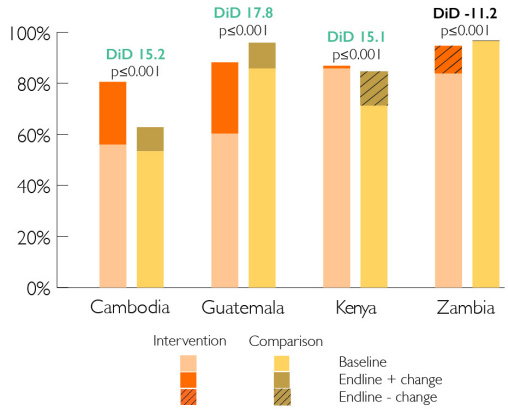


DiD value in green indicates better performance in intervention than comparison sites (note that prevalence decreased in comparison site in Cambodia). For Zambia, no significant difference in performance was found.

Completing recommended child immunisations is a cornerstone of preventing childhood illness and death in children under five. The study showed less than optimal baseline levels of complete immunisation coverage (high of 70% in Guatemala and low of 41% in Kenya) with improvements across the board at endline, without differences between intervention and comparison site performance except in Kenya. In Kenya, the intervention sites showed improvement while in comparison sites coverage worsened (DiD=34.7; p ≤ 0.001).

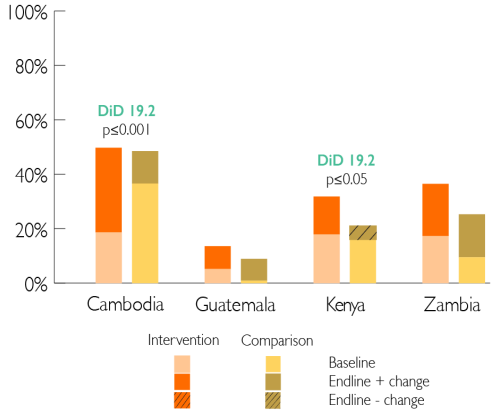
The changes in levels of Vitamin A supplementation trended differently. There was an overall improvement in the percentage of children receiving their first dose of Vitamin A, with greater improvements in intervention versus comparison sites for Cambodia, Guatemala and Kenya (Figure 6). In Zambia, the comparison site held steady while in the intervention sites, coverage worsened yielding significantly worse performance.

Figure 6 First dose of Vitamin A[6]



DiD value in green indicates better performance in intervention than comparison sites (note that prevalence decreased in comparison site in Kenya). For Zambia comparision sites outperformed intervention sites.

Figure 7 Caregiver sought immediate facility-based care (within one day) for a fever episode within last two weeks in a child under five [6]



DiD value in green indicates better performance in intevention than in comparison sites (note that there was a small decrease in prevalence in comparison site in Kenya).

Once a child falls ill, caregivers who seek and receive immediate and high-quality care at a health facility can minimise the negative impact of the illness, be it contributing to the child's overall poorer health and nutrition status or averting death. In all four countries, there was a general improvement over time across three relevant indicators of immediate care-seeking: for acute respiratory infection, for fever and for diarrhea.

There was considerable evidence of greater improvement in intervention sites in several countries. For one of these measures, immediate care-seeking within one day for a recent fever episode, the evaluation showed intervention sites outperforming comparison sites in Cambodia and Kenya (Figure 7)[8].

This consistency across programming contexts is another encouraging sign of the utility of World Vision's package of approaches. Furthermore, intervention sites outperformed comparison sites for two of the three care-seeking practices in both Cambodia and Kenya. For Cambodia, this was true for immediate facility-based care-seeking for both acute respiratory infection and fever (DiD=26.4, p≤0.05 and DiD=19.2 p≤0.001 respectively).

For Kenya it was true for care-seeking for both fever and diarrhea (DiD=19.2, p≤0.001 and DiD=18.1, p≤0.05 respectively). In most cases, the magnitude of these percentage point difference-in-differences were large.

"For example, [COMM] is mobilising villagers to [bring their children] to receive vaccine and use health services. As result, the number of clients at the health center reached the target."

Head of Health Center
Comparison Site, Cambodia

Supplemental analyses using endline data was prepared by the Johns Hopkins team[9] and focused on caregiver's report of treatment for diarrhea, acute respiratory infection and fever. Treatment for acute respiratory infection with antibiotics and for fever with an antimalarial for suspected or confirmed malaria infection would presumably require seeing a provider at a health facility.

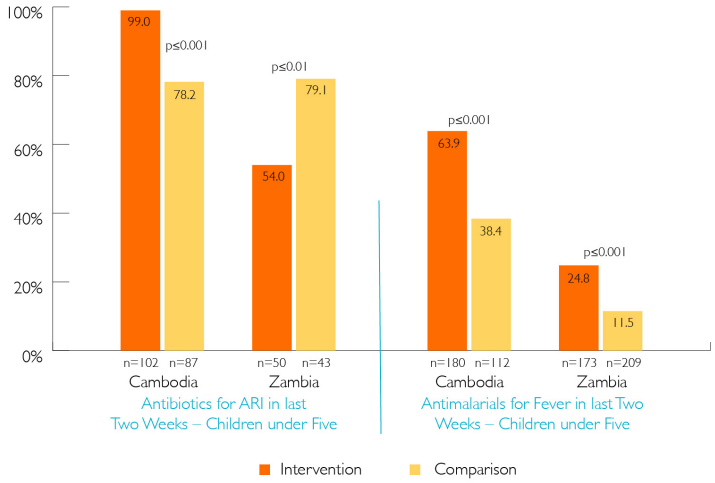
Results showed higher levels of treatment of fever with antimalarials in the intervention versus comparison sites in Guatemala, Kenya and Zambia, and higher frequency of treatment of acute respiratory infections with antibiotics in the intervention versus comparison sites in Cambodia (Figure 8 showing all significant differences between intervention and comparison sites).

Caregiver report of antibiotic treatment for diarrhea, demonstrating use of the health system in some way, was significantly higher in intervention than comparison sites in Cambodia and Zambia (55.6% vs. 23.1%, p≤0.001 and 12.6% vs. 22.9%, p≤0.05 respectively).

"Lack of knowledge is one of the reasons why some parents do not take their children for immunisations or seek care for them when they are sick … but now people are informed they are very few cases where you would find that people are going to traditional doctors, most of them go to health institutions."

Female Programme Coordinator,
Intervention Site Zambia

Figure 8 Caregiver reported treatment patterns for recent ARI and fever episodes, CHNIS endline [10]



P-values indicate significant differences between intervention and comparison sites for each country.

Generally, there were no differences between intervention and comparison sites with respect to caregiver report of the primary interventions for diarrhea in children including continued feeding, increased fluid intake and use of any form of oral rehydration therapy. The exceptions showed higher levels in intervention versus comparison sites for continued feeding in Kenya (40.0% vs. 21.0%, p≤0.01); and for increased fluid intake in Zambia (40.0% vs. 25.1%, p≤0.01).

Levels of reported oral rehydration therapy varied considerably, from a low of 58.3% in intervention sites in Cambodia to a high of 80.7% for intervention sites in Zambia. However, across all but two of 16 research sites, less than five percent of the caregivers reported that their ill child received zinc treatment for reducing the duration and severity of diarrhea (exceptions: Kenya intervention site 16.9% and Zambia comparison site 11.9%). Suboptimal levels of recommended oral rehydration therapy including zinc appear to persist across most of the study areas.

Conclusion

Although there was inconsistent evidence that World Vision's package of health approaches did better than routine programming in comparison sites overall, there were specific improvements in some key health behaviours linked to the intervention package, and many instances of improvements in both intervention and comparison sites.

Iron folate supplementation during pregnancy – seen as an important

proxy for birth preparedness – saw substantial improvement in three of the four countries over the course of the study, and in Zambia was significantly higher in intervention versus comparison sites.

These improvements may be attributable to the fact that the first module of ttC, which covers ANC, was deployed and active in the field for the greatest amount of time, thus potentially influencing ANC trends more strongly. This also suggests that as CHWs continue to deliver ttC beyond the end of the research period, improvements in other target health behaviours may be realised.

Improvements in the prevalence of exclusive breastfeeding was the most noteworthy success observed through this study. Taken together with the largely positive findings around breast milk and complimentary feeding, this suggests that CHWs are reliably delivering appropriate messaging and changing child nutrition related behaviour at the household level.

Taking a wide view of the pregnancy through newborn continuum of care, the study confirmed a positive impact on delivery of a complete continuum of care to improve newborn survival. In three of four countries the chance of mothers receiving adequate continuum of care was substantially and significantly higher in intervention compared with comparison sites at endline. However, there was only sporadic evidence (single country among the four) showing greater improvement of antenatal, delivery and newborn care related indicators in intervention versus comparison sites.

Although immunisation of children was included in the intervention package, improvements were only seen in Kenya. It's possible that the intervention package delivered was inadequate to move the needle for completing national immunisation schemes due to their dependency on having regular contact with a well-provisioned health system, a dependency the intervention package did not seek to address comprehensively. However, levels of Vitamin A supplementation, an outcome requiring similar individual and structural changes, increased significantly in intervention versus comparison sites in three of four countries. This pattern suggests that it may simply require more time for the programme to take effect on complete immunisation.

The study did see overall improvements to care-seeking and treatment for children for ARI, fever and diarrhea, although results varied by illness and across countries. A major gap was identified, however, in relation to zinc treatment as a component of diarrhea management. It's unclear why this deficiency persisted so widely across research sites and warrants urgent attention and further investigation.

Recommendations

1. In the context of World Vision community programmes, there was a lack of support and resources to fully operationalise the three approaches simultaneously and with sufficient speed following completion of the study baseline. This suggests that more options for timing, resourcing, streamlining, sequencing, staffing configurations and linking approaches for synergy are needed. For rigorous studies, it is critical to ensure adequate funding to facilitate rapid and quality deployment.

2. Positive results showed progress against some measures tied to preventive household behaviour (e.g., exclusive breastfeeding) but weak or mixed results for others which also rely on availability of strengthened and people-friendly health services (e.g., antenatal, delivery and newborn care). This suggests that expectations of effectiveness of community health system strengthening, core to World Vision's work and that of others, must be realistically adjusted depending on the investments being made to strengthen the formal primary health care delivery system.

3. Findings highlighted key areas where both health and community systems require an assessment of programmatic need – be they focused on specific behaviour change messaging or on barriers to access high quality primary health care services. Low levels of reported zinc use and less than ideal levels of treatment with oral rehydration therapy are an example of weak adoption of a simple and effective means to break the cycle of infection-linked child undernutrition and prevent child deaths due to diarrhea.

4. Additionally, positive findings regarding Vitamin A supplementation and the use of some but not all recommended childhood immunisations suggests that more work is needed to support the implementation of established national guidelines. These are clear examples of the need for enhanced behaviour change and advocacy work.

Endnotes

1 The term Community Health Committee or COMM is used to describe groups with this function. In Cambodia, COMMs involved are called Health Centre Management Committees; in Guatemala – COMM; in Kenya – Community Health Committees; in Zambia – Neighbourhood Health Committees. For ease of understanding, we use COMM throughout this report.

2 Community Health Workers (CHWs) is the term widely used to refer to community-based health extension workers. In Cambodia, CHWs are called Village Health Support Group Volunteers; in Guatemala – Madres Guías, in Kenya – Community Health Volunteers, and in Zambia – Safe Motherhood Action Groups. For ease of understanding, we use CHW throughout this report.

3 For a complete picture of household sample sizes as well a sub-sample sizes for eligible women, children and for anemia testing, please see *Impact Analysis Report: World Vision Child Health and Nutrition Impact Study*, Table 2.2 on page 9.

4 When the quality of services available at the health facility plays into the coverage level, we acknowledge that a change could be unrelated to the World Vision intervention package but rather to health system factors. For example, availability of tetanus toxoid vaccine could be intermittent and not amenable to change using solely a local level advocacy approach.

5 This index combined information on iron folate supplementation, tetanus toxoid immunisation, blood pressure measured, blood sample taken (unavailable for Zambia) and whether pregnant women reported they were told of pregnancy complications.

6 The exact values for percentages represented in this graph can be found in *Impact Analysis Report: World Vision Child Health and Nutrition Impact Study* in the following tables: Cambodia -- Table 7.2 on p 117; Guatemala -- Table 5.2 on p 55; Kenya – Table 6.2 on p 87; and Zambia – Table 4.2 on p 21. Difference-in-differences values appear in Table 3.1 on p 14 of this same report.

7 Edward A, Jung Y, Ettyang G, Chege J, Ghee AE. *Applying an Equity Lens to Maternal Health Care Continuum in Rural Communities of Cambodia, Guatemala, Kenya and Zambia. Internal Medicine Review.* 2018. http://internalmedicinereview.org/index.php/imr/article/view/666/pdf.

8 Edward A, Sanchez J, Chhorvann C, Bowles C, Malama S, Chege J. *Impact of Community Oriented Interventions on Pediatric Care-seeking Practices- A Multi-country Study in Cambodia, Guatemala, Kenya and Zambia. Preventive Medicine and Community Health.* 2018. Values reported in Figure 7 were prepared using data included in Table 4 of this manuscript.

9 Op. cit.

10 Op. cit. Values reported in Figure 8 were extracted from Table 5 of this manuscript.

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