

FOOD ASSISTANCE PROGRAMMING

Cost-Benefit Analysis



NOTE

This technical summary presents the Food Assistance Economic Analysis for projects funded by World Vision Canada in partnership with the UN's World Food Programme from 2019 to 2021, conducted by Limestone Analytics. Updates to this analysis will occur as additional projects are implemented and new evidence is continuously collected. As a result, figures may change to reflect a more accurate understanding of the pathways through which the approach achieves its effectiveness and efficiency. All dollar values are reported in 2023 USD with a discount rate of 9 per cent.

Introduction

One of World Vision's most vital partners is the World Food Programme (WFP). For more than 30 years, the World Vision Partnership has been one of WFP's largest international non-governmental partners, providing food assistance, particularly in fragile contexts, and working with communities to improve nutrition and build resilience.

Between fiscal years 2019 and 2021, World Vision Canada invested \$383,773,007 to implement 163 projects across 22 countries in partnership with WFP. Consulting firm Limestone Analytics was engaged to conduct an economic analysis of this portfolio. Using data from the WFP projects, Limestone applied a comprehensive cost-benefit model to estimate the entire portfolio's social, economic and nutritional benefits, along with each project's benefit-cost ratio and other measures of socio-economic viability.

The results show that overall, World Vision Canada's food assistance portfolio with WFP has been an effective use of funds, generating significant positive real impact™ and value.

Highlights (2019-2021)

- *\$383 million invested in our WFP food assistance portfolio*
- *8.5 million people helped through 163 projects in 22 countries*
- *10,841 lives saved among girls and boys under five—nearly 10 lives per day over three years*
- *\$1.97 in health and educational benefits produced for every \$1 invested*

World Food Programme Core Project Models

In partnership with WFP, World Vision Canada (WVC) operates a portfolio of programs designed to increase the food security and nutrition of those who need it most. The portfolio uses five programming types.

1. **Integrated school feeding** programs provide school meals for children.
2. **General food distribution** provides in-kind food assistance to the general population.
3. **Food or cash for assets** provide food or cash for job training or community projects.
4. **Cash or voucher transfers** provide unconditional cash assistance or vouchers redeemable for food items to the general population. (This is sometimes broken out as two separate programming types.)
5. **Targeted vulnerable group feeding** provides nutrient supplements or other ready-to-use supplementary foods to those at risk of moderate acute malnutrition.

Each project included in the analysis leveraged at least one of the five programming types, but often a combination of multiple.

Methodology

A cost-benefit analysis (CBA) framework was used to evaluate WVC's projects run in partnership with WFP. The model was developed to quantify the social, economic and health impacts of four programming types: general food distribution, cash or voucher transfers, integrated school feeding and targeted vulnerable group feeding.

The fifth programming type, food or cash for assets, was not distinctly modelled. As it operates through the same channels as general food distribution and cash or voucher transfers (distributing food or cash to increase food consumption), interventions from this programming type were included under those programming types according to the modality used.

The economic model estimated the present value of both the costs and benefits of 163 WVC projects implemented across 22 countries between 2019 and 2021. The model was populated using project-specific cost and participant data from WVC, supplemented with country-level secondary indicators. Outlier projects (e.g., those with mismatched or missing data) were excluded from the final analysis.

The CBA framework evaluated the benefits and costs across five key stakeholder groups, though these groups vary according to the programming type:

- Children reached through general population distributions, school feeding programs and targeted nutrition programs
- Adults reached through general population distributions
- Pregnant women reached through targeted nutrition programs
- Adults and children in targeted communities experiencing indirect spillover effects from the interventions
- WVC as the funder and implementer of the interventions

Benefits incorporated into the model include averted mortality, averted morbidity and increased income. Costs include the financial costs of implementation borne by WVC.

Portfolio-Level Results

World Vision Canada's food assistance projects run in partnership with WFP between 2019 and 2021 were found to reach **8,546,606** individuals, creating socio-economic benefits equivalent to **\$756,991,897** at a cost of **\$383,773,007** with a benefit-cost ratio (BCR) of **1.97**. The portfolio's estimated net present value¹ (NPV) is **\$373,218,890**, suggesting the portfolio has effectively used the funds to generate social benefits. The model estimates that these projects

¹ Net present value is a way to determine how much money something will make or cost in the future by accounting for the time value of money. It is calculated by subtracting the present value of the costs from the present value of the benefits.

saved the lives of **10,841** children under age five and averted morbidity² equivalent to **169,276** disability-adjusted life years³ (DALYs) at a cost per DALY averted of **\$2,267**, which significantly surpasses the threshold for cost effectiveness set by the World Health Organization (WHO).

The majority of the portfolio's benefits (**92 per cent**) are attributed to reductions in mortality and morbidity among children under five, while the remaining **8 per cent** are from increased income. When considering the aggregate benefits of each programming type:

- Targeted vulnerable group feeding accounts for **50 per cent** (\$378,403,594)
- General food distribution accounts for **31 per cent** (\$235,619,877)
- Cash or voucher transfers account for **10 per cent** (\$78,906,945)
- Integrated school feeding accounts for **8 per cent** (\$64,061,480)

Table 1 presents the overall portfolio results.

Table 1. Headline results at the portfolio level

Present Value of Benefits	Present Value of Costs	Benefit-Cost Ratio	Beneficiaries	Cases of Mortality Averted	DALYs Averted
\$756,991,897	\$383,773,007	1.97	8,546,606	10,841	169,276

Figure 1 breaks down the total portfolio benefits by benefit stream. As shown, reductions in mortality among children under five account for roughly two-thirds of the total benefits. Averted morbidity among children under five due to reduced stunting, wasting and underweight account for the second largest share. An increase in income for adults and children participating in school feeding is the third highest, accounting for roughly 8 per cent of the total benefits.

² Morbidity is the condition of having a disease or illness.

³ Disability-adjusted life year (DALY) measures the total burden of disease. One DALY represents one year of healthy life lost due to illness, disability or early death. It combines years of life lost and years lived with disability to estimate the total impact on population health.

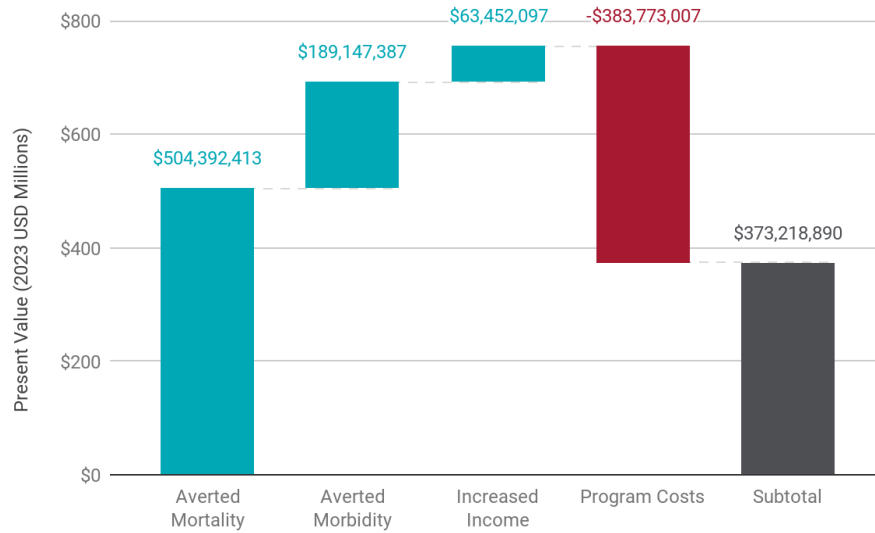


Figure 1. Breakdown of portfolio benefits and costs by type

At this time, WVC is not able to provide cost data broken down by programming type. Based on the way financial data is tracked, it is difficult to separate the costs associated with each programming type when multiple types are being used in the same geographical region, because of overlaps. This limits the ability to compare cost effectiveness between them. However, several projects in this portfolio implemented only one programming type. In those cases, it was possible to use the total project cost to analyze the cost effectiveness of the programming type used and glean some insights into their relative cost effectiveness.

Figure 2 contains a breakdown of the benefits and costs per beneficiary by programming type. These results show that the three general distribution programs (general food distribution, cash or voucher transfers, and integrated school feeding) have significantly lower benefits and costs per beneficiary compared to the targeted program (targeted vulnerable group feeding).

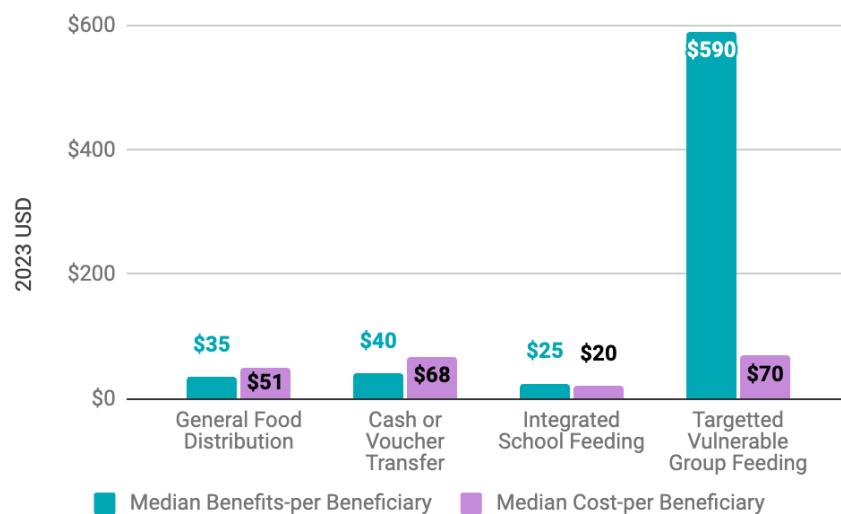


Figure 2. Median benefits and costs per beneficiary by programming type

Targeted vulnerable group feeding is the most cost-effective program, generating **\$8.44** in social benefits for every dollar invested, followed by integrated school feeding, producing **\$1.76** in benefits per dollar. General food distribution and cash or voucher transfers appear comparable in cost effectiveness, generating **\$0.70** and **\$0.71** in benefits per dollar, respectively. There are important considerations when interpreting these results, particularly regarding general food distribution and cash or voucher transfers, which may reach subgroups that the other types cannot feasibly reach. While the broader nature of these projects (targeting the general population) may lead to lower cost effectiveness, it may also allow WVC to support more difficult-to-reach subgroups.

Country-Level Results

Figure 3 presents the BCRs by implementing country, arranged in ascending order. The number above each bar represents the number of projects conducted in each country during the analysis period. The red line represents the BCR threshold—if the overall operations in each country had a BCR above 1.0, then the total benefits outweighed the total costs in that country. Sub-Saharan African countries tend to report higher BCRs than other regions (Latin America & Caribbean, Middle East & North Africa, and South Asia).

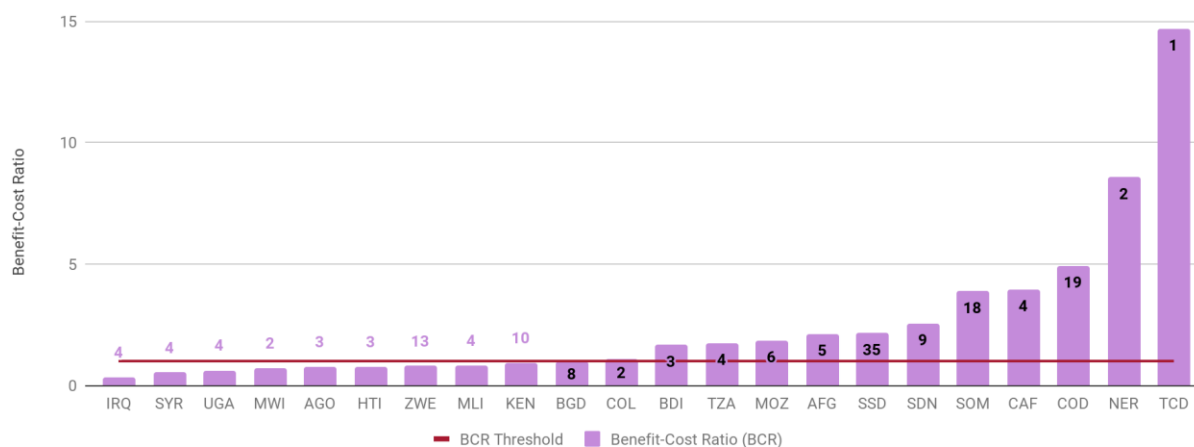


Figure 3. Benefit-cost ratio by implementing country

Figure 4 graphs each country's BCR against its under-five mortality rate. As anticipated, there is a noticeable positive correlation between the under-five mortality rate and the BCR. This finding suggests that programs are more cost effective in areas where children under five are dying at higher rates, even if their implementation costs might be higher.

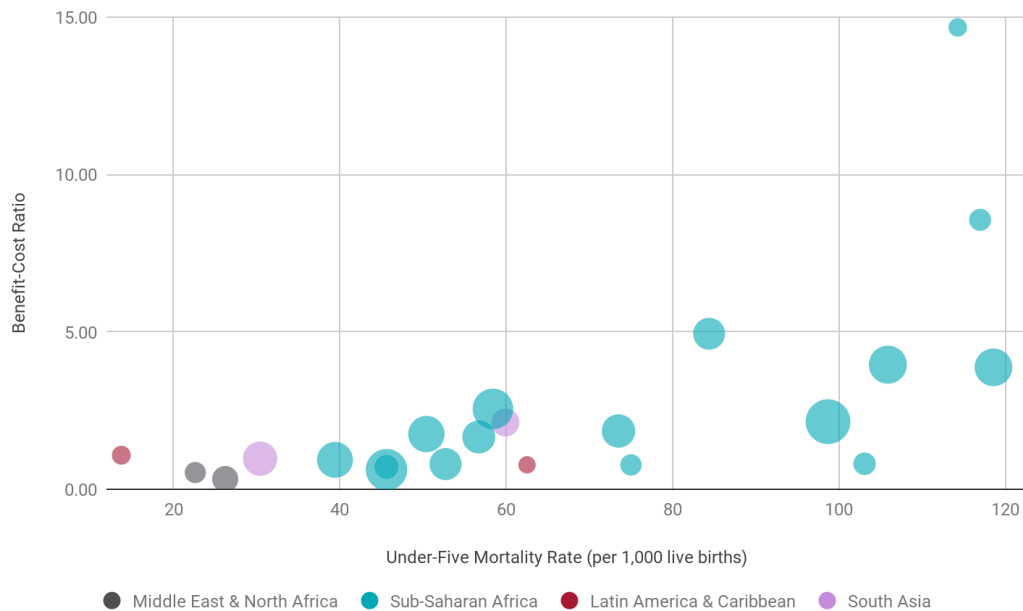


Figure 4. Benefit-cost ratio and under-five mortality rate by country (size indicating the population reached)

Figure 5 shows how cost effective each country's intervention is using a standard measure: the cost per DALY averted. Converting reductions in both non-fatal and fatal health outcomes into this common measure allows the total health impact to be assessed in a consistent way. The cost per DALY averted was compared to a benchmark—three times the average gross national income (GNI) across the countries studied. (This is the threshold recommended by the WHO for determining cost effectiveness.) Based on this definition, most of the interventions across countries are considered cost effective, except for Colombia and Iraq.

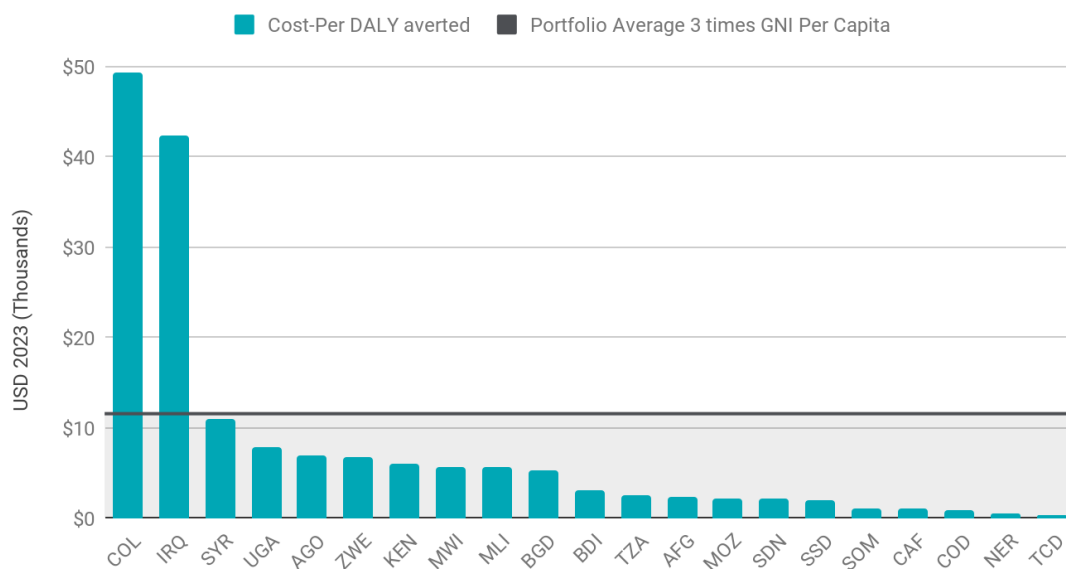


Figure 5. Cost per disability-adjusted life year averted by country

Project-Level Results

Analysis of the project-level implementations were reported in two measures: the mean and the median. The median is the preferred metric as it puts less weight on very high or very low values within the dataset.

Figure 6 shows the median BCRs for projects implemented in each country compared to the aggregate BCR (the total benefits of all projects divided by the total costs of all projects) per country. It is sorted by the aggregate BCR. The median and aggregate BCRs are similar for most countries.

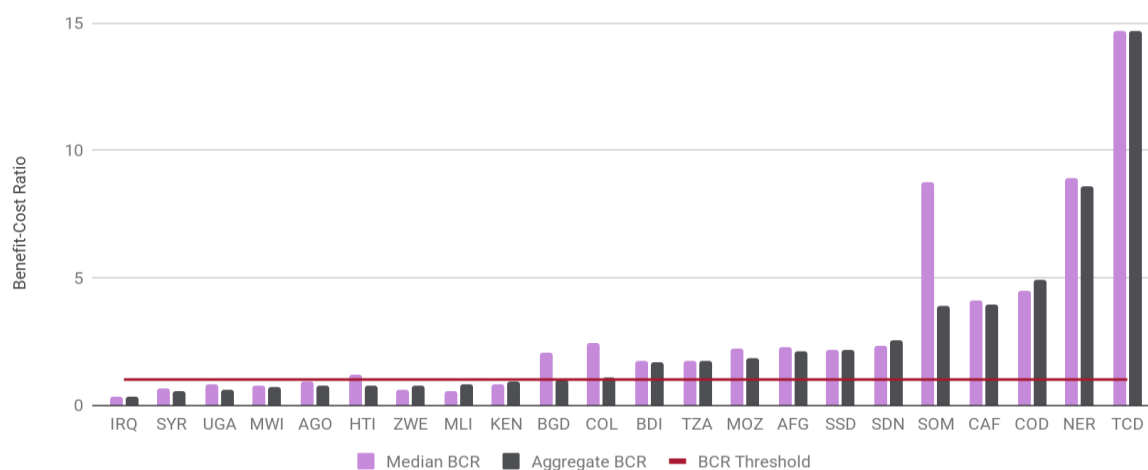


Figure 6. Median and aggregate BCR by country

Overall, the median project in the portfolio has a BCR of **1.72**, which is slightly below the portfolio aggregate of **1.97**. This suggests that some extreme values skew the portfolio-aggregate BCR to the right (upward).

According to the WHO definition, **116** projects are considered cost effective, with **60** being classified as very cost effective.⁴

Learnings

The CBA findings highlighted four areas for further investigation and follow up.

1. Having the change in food consumption scores at the project level would increase the accuracy of the analysis and provide additional insights to the WFP portfolio.

The [food consumption score](#) (FCS) is an index developed by WFP—it aggregates a household's food group diversity and frequency, weighted according to nutritional value, and helps to

⁴ The WHO defines "very cost effective" as having a cost per loss of DALY averted that is less than the GNI per capita.

classify households according to their caloric intake. It is one of the main metrics used in the analysis to estimate the portfolio's impact.

Since WVC does not currently have FCS at the project level, the analysis relied on assumptions grounded in country-level data and applied a standardized 10-point FCS increase per participant for the general food distribution and cash or voucher transfer programs. These FCS changes were then linked to reductions in child malnutrition and mortality, with the health impacts valued in economic terms.

Even when changing the model's already-conservative assumptions to be more conservative, the broad conclusions from the CBA results do not change—the benefits are still greater than the costs. However, using an assumption does limit the accuracy of the analysis. In addition, project-level FCS data would enable WVC to assess the relative effectiveness between the programming types, such as comparing cash transfers to general food distributions. It could also provide more information about regional or country variations, allow for more knowledge about WVC's implementation strengths, and inform shifts of the portfolio where applicable.

2. WVC needs cost data that is disaggregated by programming type.

Having cost data per programming type is needed for more in-depth analyses of the cost-effectiveness trend as well as the efficiency of the specific interventions. For example, targeted vulnerable group feeding accounts for a significant portion of benefits; however, having the accurate cost of the targeted vulnerable group feeding projects will help to determine if they are more cost effective at reducing malnutrition compared to other interventions, such as general food distribution.

3. Pipeline breakages may be a cause of outliers in the dataset.

Within the WFP portfolio, WVC is aware of instances of pipeline breakages—disruptions and challenges that prevent the delivery of food assistance as planned. The analysis investigated whether these breakages would lead to outliers in the dataset. Early results indicate that this *is* happening, but further analysis is needed to understand the scope of the issue, and to what degree it is affecting the quality of WVC's interventions.

Conclusions and Recommendations

The cost-benefit analysis reveals that, overall, the investments in World Vision Canada's WFP portfolio have been a cost-effective use of Canadian funds. The projects have generated over \$756 million in benefits for participants with a positive benefit-cost ratio of 1.97. This means that for every dollar invested, participants receive \$1.97 in benefits. The portfolio has saved the lives of an estimated 10,841 children—nearly 10 lives per day over a three-year period.

The analysis highlights several considerations and recommendations for WVC regarding future research and investments in the WFP programming types.

- **Remove bias introduced by using national-average levels for health outcomes in the CBA.** The use of national-level statistics on health outcomes in the CBA model (as

opposed to statistics specific to the targeted regions or sub-groups) underestimates the impact of programs that target regions facing food insecurity at more severe levels than the national average. To address this, collecting proxy data on the target population's characteristics could provide an efficient path to approximating the health outcomes more accurately and enhance the estimate for the portfolio's cost effectiveness.

- **Obtain a more accurate measure of attributable impact.** The model assumes a uniform increase in the food consumption score (FCS) across all interventions and populations. This may not reflect the true impact in different regions and contexts. Collecting data on the mean FCS for participants, even in the absence of an experimental design, would offer valuable insights into the programming type's effectiveness.
- **Incorporate other health benefits.** While the model links FCS increases to improvements in specific health indicators for children under five, future research should explore the relationship between FCS and other health indicators, such as improvements with respect to weight-for-height Z scores (WHZ), anemia and micronutrient deficiencies. Examining the association between FCS and adult health indicators could significantly enhance the programming types' cost effectiveness.
- **Compare different methods to address emergency food needs.** Breaking down the WVC cost data by programming types would allow for a better understanding of each programming types' relative cost effectiveness and improve the power of this portfolio analysis.
- **Prioritize areas with high child mortality.** Examining the results by country showed countries with higher under-five mortality rates tend to have higher BCRs on average. This suggests that WVC should prioritize future WFP projects in countries or regions where mortality rates are higher among children under five to improve the cost effectiveness of WVC's food assistance portfolio.