




COST–BENEFIT ANALYSIS OF INVESTMENTS IN

EARLY CHILDHOOD IN BURUNDI






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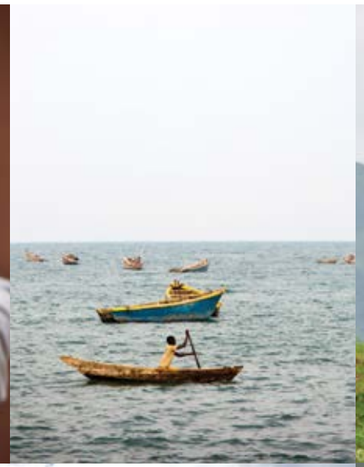








COST–BENEFIT ANALYSIS OF INVESTMENTS IN EARLY CHILDHOOD IN BURUNDI

FINAL REPORT DECEMBER 2021

G:ENESIS UNLOCKING VALUE FOR 20 YEARS

unicef for every child

ACKNOWLEDGEMENTS

This cost–benefit analysis of investments in early childhood development in Burundi is the result of a participatory process between the Government of Burundi and UNICEF in collaboration with UNDP and UNCDF within the framework of the Joint Strengthening the Sustainable Development Goals Financing Architecture and Ecosystem in Burundi.

This study is the result of a process led by the members of the Steering Committee as well as those of the Technical Committee responsible for supporting the implementation of the Joint Programme, under the direction of the Ministry of Finance, Budget and Economic Planning. This report could not have been completed without the continued commitment of all the members of the said committees, from the various institutions, including the Ministry of Public Health and the Fight Against AIDS, the Ministry of Interior, Community Development and Public Security, the Ministry of National Solidarity, Social Affairs, Human Rights and Gender, the Ministry of Environment, Agriculture and Livestock, the Institute of Economic Studies and Statistics of Burundi, the United Nations agencies involved and other parties involved in the issue of early childhood in Burundi.

Genesis-Analytics, an international research firm, was recruited to carry out this study. Our thanks go to the entire team of this firm.

This study also provided feedback from colleagues at UNICEF Burundi, UNICEF Eastern and Southern Africa Regional Office (ESARO) and UNICEF Innocenti Research Office.

Our thanks go to all those who have been involved, directly or indirectly, in the production of this document, which will serve to orient and guide investments in favour of early childhood in Burundi.

PREFACE

Early childhood is a stage in the life-course that covers birth up to eight years old. During this period, children undergo rapid development, acquiring the physical, cognitive, motor, psycho-emotional and social skills that will accompany them for the whole of their adult life. In fact, 90% of a child's brain development happens before the age of eight.[1] To achieve their full potential, young children need a range of diverse yet interconnected types of support, including quality health care, adequate nutrition, security, early learning opportunities and a stimulating environment.

In Burundi, children from birth up to age eight represent almost 25% of the population. This age group faces a number of challenges in the various domains that are essential to their well-being. However, adequate investments in the early years of these girls and boys, which will have long-term visible impacts, could catalyse the development that Burundi needs to realize its vision for the future.

The study "Cost–Benefit Analysis of Investments in Early Childhood Development in Burundi" confirms earlier conclusions in the literature on the cost-efficiency of investments in early childhood. The findings show that, for each US$1 invested in early childhood in Burundi, the returns for society could be up to US$18 by 2050. The study not only provides a detailed analysis of the importance of investments in early childhood but also proposes concrete interventions that are likely to lead to the achievement of the expected benefits. It also generates a cost–benefit ratio for each group of interventions.

The study also estimates the costs necessary to fund the various groups of interventions proposed, by means of an analysis of the fiscal space available as well as of the gaps in financing.

This study has made it possible to generate fundamental responses to important questions on early childhood in Burundi. As such, the United Nations System would like to thank the Government of Burundi, the Steering Committee and the Technical Committee, charged with supporting implementation of the Joint Programme on Strengthening the Sustainable Development Goals Financing Architecture and Ecosystem in Burundi, as well as the Ministry of Finance, Budget and Economic Planning, for its leadership and solid collaboration demonstrated all the way through the research period. Much gratitude is also owed to the international research firm Genesis Analytics for its valuable cooperation as well as the quality of the work carried out.

We would like to encourage all partners – the United Nations, the government, civil society, development partners – to use the elements found within this report to clarify decision-making and the design of programmes on early childhood, with a view to accompanying Burundi in its efforts to achieve the Sustainable Development Goals.

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FOREWORD

Burundi's National Development Plan 2018–2027 has the objective of transforming the country's economic, demographic and social structures. This chosen development trajectory should lead to strong, sustainable, resilient, inclusive development that generates decent jobs for all and facilitates improved social well-being. The NDP 2018–2027 is aligned with the Sustainable Development Goals as well as the African Union's Agenda 2063, and focuses on human capital development as one of the drivers of transformation of Burundi's economic, demographic and social structures.

Strengthening human capital in the country will require significant investments in the domain of early childhood, which represents the foundation on which the future of the country will be built, and the implementation of interventions and programmes in nutrition, health, stimulation and early childhood care. This will contribute to ending poverty and reducing inequality.

Burundi currently has a population of more than 12 million, and this number could increase to 20 million by 2050. Young children (aged under eight years) make up more than a quarter of this, numbering 2.4 million. This represents a huge portion of the Burundian people in favour of whom public policies, strategies and financing need to be mobilized.

This study therefore is of great importance, given that it enables the identification of packages of interventions, as well as the costs and benefits of these, to allow Burundi to make full use of the window of opportunity that this stage in the life-course of all human beings offers, and to reach milestones in realizing the country's vision for development.

It is thus with real pleasure that the Ministry of Finance, Budget and Economic Planning presents this study, "Cost–Benefit Analysis of Investments in Early Childhood Development in Burundi."

This study's implementation saw the establishment of a Steering Committee and a Technical Committee, made up of representatives of various agencies, including the Ministry of Public Health and the Fight Against AIDS, the Ministry of Interior, Community Development and Public Security, the Ministry of National Solidarity, Social Affairs, Human Rights and Gender and the Ministry of Environment, Agriculture and Livestock. The study was led by the Ministry of Finance, Budget and Economic Planning, with support from UNICEF.

The Ministry of Finance, Budget and Economic Planning owes a debt of gratitude to all those who contributed, directly or indirectly, to the realization and success of this study, in particular to members of the Steering and Technical Committees.

Dr Domitien NDIHOKUBWAYO
Minister of Finance, Budget
and Economic Planning

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AfDB	African Development Bank
AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral Therapy
BCG	Bacille Calmette-Guerin vaccine
BCR	Benefit-Cost Ratio
BIF	Burundian Francs
BRB	Bank of the Republic of Burundi
CBA	Cost-Benefit Analysis
CEA	Cost-Effectiveness Analysis
CHOICE	Choosing Interventions that are Cost-Effective
CT	Cash Transfer
DALY	Disability-Adjusted Life Year
DHS	Demographic Health Survey
DPT	Diphtheria, Pertussis and Tetanus vaccine
ECD	Early Childhood Development
ECDI	Early Childhood Development Index
ECE	Early Childhood Education
ESARO	Eastern and Southern Africa Regional Office
FP	Family Planning
GBD	Global Burden of Disease
GDP	Gross Domestic Product
GER	Gross Enrolment Rate
GNI	Gross National Income
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
IBCR	Incremental Benefit-Cost Ratio
ICER	Incremental Cost-Effectiveness Ratio
IMF	International Monetary Fund
ISTEEBU	Institut de Statistiques et d'Études Économiques du Burundi (Institute of Statistics and Economic Studies of Burundi)
ITN/IRS	Insecticide-Treated Nets/Indoor Residual Spraying
LiST	Lives Saved Tool
MAM	Moderate Acute Malnutrition
MDG	Millennium Development Goal
MFBEP	Ministry of Finance, Budget and Economic Planning
NDP	National Development Plan
NPV	Net Present Value
ODA	Official Development Assistance
OEC	Observatory of Economic Complexity
OECD	Organisation for Economic Co-operation and Development
OHT	OneHealth Tool
ORS	Oral Rehydration Salts
PMTCT	Prevention of Mother-to-Child Transmission (of HIV/AIDS)
PPP	Purchasing Power Parity
RBCD	Ratio of Benefit-Cost Differentials
RCED	Ratio of Cost-Effectiveness Differentials
RMNCH	Reproductive, Maternal, Neonatal and Child Health
RR	Relative Risk
SAM	Severe Acute Malnutrition
SDG	Sustainable Development Goal
SMART	Specific, Measurable, Achievable, Relevant, Time-Bound
STH	Soil-Transmitted Helminths
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
VAT	Value-Added Tax
WASH	Water, Sanitation and Hygiene
WEO	World Economic Outlook
WFP	World Food Programme
WHO	World Health Organization
WPP	World Population Prospects
YLD	Years of Life with Disability
YLL	Years of Life Lost

EXECUTIVE SUMMARY

OVERVIEW

Burundi has one of the youngest, and fastest-growing, populations of young people in the world. Based on international comparisons, Burundi ranks ninth globally in terms of the speed of its population growth (out of 235 countries).[2] If it manages this effectively, Burundi could reap a generous demographic dividend from this youth bulge. Currently, Burundi is a low-income country according to World Bank classifications.[3] Yet, in the midst of its challenges, a profound opportunity has emerged. Capitalizing on this opportunity will be critical to reversing the pervasive trends of stagnant economic growth, endemic poverty and poor socio-economic outcomes.

Early childhood is a phase in the life course that stretches from conception to the age of 8. During this period, a young child will undergo rapid development, acquiring physical, cognitive, motor, psycho-emotional and social skills. Extensive research indicates that it is the moment in the life course where opportunities for human development are greatest. Investing in early childhood makes sense, therefore, as it is critical to maximizing human capital and improving the futures of young people. However, early childhood development (ECD) has consistently been under-funded, including within Burundi. In 2019, the total funding gap for ECD health and education services reached a catastrophic 90% on average across Eastern and Southern Africa, and COVID-19 is only set to exacerbate this pre-existing resourcing crisis.[4] Clearly, there is a pressing need to reframe ECD as an investment rather than a cost.

This report, commissioned by the United Nations Children's Fund (UNICEF), provides an investment case for ECD in Burundi. It provides extensive empirical evidence that can be used to advocate for investing in young children within the country, as both a sound moral and a rational economic choice. It explores the results of a cost–benefit analysis study that examined the short- to long-term effects of ECD interventions. Further, it provides detailed recommendations on how to sustainably finance the costs of providing these interventions. This executive summary briefly outlines the central findings and recommendations of this research.

METHODS

This study used a combination of quantitative and qualitative data and analytical methods. Based on comprehensive research of international best practice and of the specific needs of, and challenges facing, young children in Burundi, the first step was to design two multisectoral ECD packages. The body of the report presents a full description of these packages. In brief, Package 1 contains health and nutrition interventions targeting children in the first 1,000 days of life whereas Package 2 is more holistic, containing the same health and nutrition interventions while additionally encompassing pre-primary education and water, sanitation and hygiene (WASH), as well as child protection and social protection programmes.

We modelled the scaling-up of interventions in Package 1 and Package 2 from their current coverage levels (baseline) to specified target levels. Data on current (baseline) coverage rates of the interventions within each package was sourced, with priority placed on utilizing recent national evidence. Normative target coverage rates were then developed based on evidence and international benchmarks, before being validated by study stakeholders. Based on these two data points for each intervention – the baseline and the target coverage – we designed three scale-up scenarios. These saw the target coverage for each intervention being hit over a different time horizon: a fast scale-up (target coverage hit by 2030), a medium scale-up (target coverage hit by 2040) and a slow scale-up (target coverage hit by 2050). The scenarios are presented below:

A **Scale-up Scenario A:** Increase baseline coverage until reaching normative target levels from 2022 to 2030, followed by a maintenance phase at 2030 target levels until 2050. This is aligned with the Agenda for Sustainable Development.

B **Scale-up Scenario B:** Increase baseline coverage until reaching normative target levels in 2040 to account for reduced fiscal space for interventions. Coverage will increase in linear increments from 2022 to 2040, followed by a maintenance phase until 2050.

C **Scale-up Scenario C:** Increase baseline coverage until reaching normative target levels from 2022 to 2050 to account for reduced fiscal space and difficulty in reverting the disruptions in the public system owing to COVID-19. Coverage will increase in linear increments.

We then used a number of modelling tools to project the costs and benefits of the packages over the three different scale-up scenarios. These tools included Avenir Health's One Health Tool, SimuEd and advanced Excel. A thorough validation process was conducted to ensure that the data obtained, approach taken and methodology used were empirically sound.

FINDINGS

Benefits

Increasing the coverage of these important interventions has many benefits, which include averting child deaths and cases of stunting, as well as disability-life years lost to illness and disease. We found that, regardless of the speed of the scale-up, increasing coverage of the interventions in Package 1 has significant benefits. These benefits will begin to be felt almost immediately and are expected to increase year on year. In the fastest scale-up scenario, in 2022 (the first year of the scale-up), it is projected that 1,604 additional child deaths and 9,632 additional stunting cases could be averted. By 2025, this would reach 20,346 additional child deaths and 249,287 additional stunting cases averted.

Across the entire time horizon of the study, the impacts on mortality and morbidity of scaling up Package 1 are impressive. In the slowest scale-up scenario, a total of 377,423 child deaths and over 13.3 million cases of child stunting could be averted up until the end of the study period (2050). In the fastest scale-up scenario, the impact of implementing this package is even greater. This is because populations are covered by, and benefiting from, these interventions at an earlier stage. By the end of the study period (2050), a total of 690,494 child deaths and 21.4 million cases of child stunting could be averted. As is intuitive, the faster the pace of the scale-up, the greater the potential benefits. Indeed, child deaths averted are 45% higher if target coverage levels are met by 2030 rather than 2050. Scaling up Package 1, therefore, would have important benefits for the population – leading to a decrease in preventable child deaths as well as an improvement in the health and development of young children. This would significantly improve the upholding of critical child rights in Burundi, as well as constituting a major human capital gain for the country.

Package 2 is more extensive than Package 1, covering all the same health, nutrition and WASH interventions, as well as interventions in early learning, child protection and social protection. For this reason, the positive impacts of implementing this package are far greater than those of Package 1. Meanwhile, as it is difficult to quantify or isolate the impacts of some of the interventions in Package 2 (as some of them are indirect), it is likely that our projections of benefit are an underestimate. Increasing the coverage of these important interventions has many benefits. Broadly, we found that, regardless of the speed of scale-up, the interventions had the potential to extensively improve child outcomes – including averting child deaths and stunting cases, as well as reducing disability-life years lost to illness and disease. In addition to these benefits, Package 2 also positively affects other areas of child development – namely, through improvements in educational outcomes, a reduction in poverty and an increased ability to access critical social services. These packages, and the process of forming them, were validated during the inception phase of this project.

We measured the impact of these outcomes by projecting the additional number of children completing high school and monetized this by estimating a productivity gain for each additional child who finishes high school. The main assumption for the monetization of benefits is that, in the labour market, children who finish high school will have access to better jobs, will be less likely to be poor and will have an income that, in general, averages the gross domestic product (GDP) per capita. Because of the relevance of preschool education in the Burundian context, we modelled the intervention as part of Package 2, as well as separately as a standalone intervention. The latter effort shows that, if the interventions are scaled up sufficiently fast (to reach targets in 2030), an estimated nearly 380,000 extra children will graduate high school by 2050. In all three scenarios, the number of eligible children not completing high school is projected to decline significantly year on year.

Improvements in educational access and outcomes constitute a major human capital resource to propel countries' economic development. Therefore, scaling up Package 2 would have important benefits for the population that go beyond nurturing from a physical perspective but also from a cognitive perspective. Not only would it lead to a reduction in preventable child deaths and improvements in the health and development of young children, as in Package 1, but also it would support their holistic development and future potential. If implemented, it is likely that Package 2 would generate the most wide-reaching and profound impacts on human capital formation in Burundi.

Implementing the packages of interventions analysed would prevent, by 2030, nearly 100,000 child deaths, 33,000 maternal deaths and 2,000,000 cases of stunting if they were scaled up sufficiently fast to reach the target in 2030. If scaled up at a slower pace, reaching targets in 2040 or 2050, the impact is lower, with the slowest scale-up scenario averting a third of the child deaths relative to the fast scale-up scenario in the same year (2030). The magnitude of the impact depends on what mechanisms are put in place to guarantee the fastest coverage increase in the shortest time possible in a sustainable way (fast vs. slow scale-up scenarios).

Costs

Scaling up the ECD interventions included within each of the packages comes at a cost. The annual cost of this scale-up is dependent on the package of interventions and the speed of scale-up. The real cost of scaling up Package 1 is significantly lower than for Package 2, in all scale-up scenarios. This is because Package 2 includes a higher number of multisectoral interventions. For example, scaling up Package 1 in a fast scale-up scenario costs a total of 1,500 billion BIF (average annual cost of 50 billion BIF); Package 2 costs four to ten times more, depending on the cash transfer programme chosen. A similar relation is observed in the other scale-up scenarios (Table E1).

Table E1: Total incremental costs (real) of scaling up the packages of multisectoral ECD interventions from 2022 to 2050 (BIF billion)

Total cost	Scenario A	Scenario B	Scenario C
Package 1	1,455,756	1,562,745	1,721,007
Package 2 (CT-1)	15,219,886	13,683,176	11,558,798
Package 2 (CT-2)	6,984,083	6,617,937	6,174,801

In real terms, implementing the packages would require different levels of investment at different stages in time depending on the speed of scale-up. For example, implementing Package 1 involves average annual real costs of 48 billion BIF (US$25 million) during the first nine years (up to 2030) of scale-up, and nearly 50 billion BIF (US$26 million) annually from 2031 to 2050. Meanwhile, the medium and slow scale-up plans involve lower real annual costs in the first decade of implementation (31 billion and 23 billion BIF, respectively) but higher real annual costs for the subsequent years. For example, implementing Package 1 implies an annual additional cost, in real terms, of 64 billion and 76 billion BIF under the medium and slow scale-up scenarios, respectively, from 2031 to 2050.



Table E2: Average incremental annual costs (real) of scaling-up the packages of multisectoral ECD interventions by decade, total (a) and per capita (b) average annual incremental costs (BIF and US$)

(a)	BIF million			USD million		
	2022–2030	2031–2040	2041–2050	2022–2030	2031–2040	2041–2050
Scenario A (fast)						
Package 1	47,741	52,781	49,828	25	28	26
Package 2 (CT-1)	243,358	571,506	679,099	127	298	355
Package 2 (CT-2)	165,493	248,448	301,017	86	130	157
Scenario B (medium)						
Package 1	30,547	62,651	66,132	16	35	33
Package 2 (CT-1)	117,651	728,632	498,652	61	260	380
Package 2 (CT-2)	96,711	320,497	254,257	51	133	167
Scenario C (slow)						
Package 1	22,509	60,689	91,154	12	32	48
Package 2 (CT-1)	77,576	359,298	700,436	41	188	366
Package 2 (CT-2)	68,451	206,234	349,641	36	108	183

(b)	BIF			US$		
	2022–2030	2031–2040	2041–2050	2022–2030	2031–2040	2041–2050
Scenario A (fast)						
Package 1	369	278	229	0.2	0.1	0.1
Package 2 (CT-1)	1,882	1,415	1,167	1.0	0.7	0.6
Package 2 (CT-2)	1,280	962	794	0.7	0.5	0.4
Scenario B (medium)						
Package 1	233	139	168	0.1	0.1	0.1
Package 2 (CT-1)	896	534	648	0.5	0.3	0.3
Package 2 (CT-2)	737	439	532	0.4	0.3	0.2
Scenario C (slow)						
Package 1	171	121	97	0.1	0.1	0.1
Package 2 (CT-1)	588	415	333	0.3	0.2	0.2
Package 2 (CT-2)	519	366	294	0.3	0.2	0.2

The faster the speed of the scale-up, the higher the present value of the investment needed to implement the package by the end of the study period (2050). This is intuitive, as increasing coverage rates faster means that more people will utilize services faster, thus costing money that needs to be spent earlier in time – that is, a higher investment upfront.

Despite Scenario A (fast scale-up) having a lower average annual real cost, the present value of the investment required for its implementation is significantly larger than that of the medium and slow scale-up scenarios. This is because costs that occur further in the future have a lower value in the present, and most costs to implement a fast scale-up take place in the nearer future (intensely in the first nine years). This contrasts with the other, slower, scale-up scenarios, for which most costs take place further in the future. As a result, the present value of the additional costs needed to implement any of the packages is higher for Scenario A. For example, the present value of Package 1 from 2022 to 2050 is 373 billion, 315 billion and 280 billion BIF under the fast, medium and slow scale-up scenarios, respectively. Meanwhile, depending on the cash transfer option selected, Package 2 is projected to cost 3,000 billion or 1,500 billion BIF by 2050 in the fast scale-up scenario and between 1,600 and 925 billion BIF in the slow scale-up scenario (Table E3).

Table E3: Present value of incremental investments needed to implement each of the packages under different scale-up scenarios and at different time horizons (BIF billion)

	Time horizon	Scenario A (fast scale-up)	Scenario B (medium scale-up)	Scenario C (slow scale-up)
Package 1	2022–2030 (short)	232,175	143,110	104,710
	2022–2040 (medium)	337,579	273,396	220,584
	2022–2050 (long)	372,577	315,206	279,731
Package 2 (CT-1)	2022–2030 (short)	1,373,753	708,244	481,918
	2022–2040 (medium)	2,518,287	1,651,391	1,156,650
	2022–2050 (long)	2,958,882	2,122,706	1,594,517
Package 2 (CT-2)	2022–2030 (short)	776,957	443,204	311,949
	2022–2040 (medium)	1,272,867	934,229	703,244
	2022–2050 (long)	1,469,707	1,142,120	925,616

Cost savings can be achieved by implementing these interventions together. A notable example is increasing contraceptive and family planning coverage, which significantly reduces the costs of increasing coverage of other interventions.

Cost-effectiveness

The cost-effectiveness of both packages was determined by comparing the effects or impact and costs explored earlier. The results of this analysis are clearly displayed in Tables E4 and E5 in US$. Packages are cost-effective, and therefore recommended, when the incremental cost for achieving an additional unit of a certain outcome (e.g. additional child death averted, additional disability-adjusted life year (DALY) averted, additional child finishing high school), which we called the incremental cost-effectiveness ratio (ICER), is below national or international thresholds. WHO-CHOICE (World Health Organization's Choosing Interventions that are Cost-Effective) suggests that an



intervention is considered cost-effective and highly recommended when its ICER (measured as incremental cost per DALY averted) is below one to three times the GDP per capita. In fact, those interventions for which the ICER is equal to or below one time of GDP per capita are defined as "very highly cost-effective" and are strongly recommended as they provide high value for money. In the case of Burundi, packages of interventions with an ICER below 822 are considered cost-effective, and those below 274 are "highly cost-effective."

For Package 1 (and the health and nutrition interventions of Package 2), this was calculated by dividing the total cost of providing the package by number of child deaths and DALYs years averted. This provided a figure for the cost per DALY and per child death for these health and nutrition interventions. Over all time horizons, the faster the scale-up of the intervention, the more cost-effective it appears. For the education intervention of Package 2, this was calculated by dividing the total cost of providing the intervention by the cost per additional child completing high school.

Scaling up Package 1 (health, nutrition and preventive interventions) is highly cost-effective, with incremental costs per additional DALY averted of less than US$274 in all scenarios. In the long term (i.e. to 2050), it requires between 10% and 15% of GDP per capita to gain a year lived in full health through investing in ECD interventions including health, nutrition, WASH and preventive interventions. These figures are very useful for advocacy purposes, as they position ECD multisectoral interventions as one of the "highly cost-effective ones," making the call for their prioritization.

Table E4: ICERs of scaling up health, nutrition and preventive interventions (Package 1) (US$)

Indicator	Scenario A (fast scale-up)			Scenario B (medium scale-up)			Scenario C (slow-scale up)		
	2022–2030	2022–2040	2022–2050	2022–2030	2022–2040	2022–2050	2022–2030	2022–2040	2022–2050
Incremental cost per additional child death averted	1,237	509	282	1,400	561	278	1,956	815	387
Incremental cost per additional DALY averted	127	53	29	144	58	29	152	64	31

Table E5: Cost-effectiveness of scaling up preschool education as a standalone intervention (US$)

Indicator	Scenario A (fast scale-up)		Scenario B (medium scale-up)		Scenario C (slow-scale up)	
	2022–2030	2022–2038	2022–2030	2022–2038	2022–2030	2022–2038
Incremental cost per additional child completing high school	189	89	307	141	366	185

Note: Only additional children completing high school from the cohorts from 2022 to 2038 were evaluated since these cohorts would produce children able to complete the whole education cycle until high school graduation (which is the relevant outcome analysed). Therefore, only costs for the same periods were considered to estimate the cost-effectiveness ratios.

The education intervention – that is, scaling up preschool education – is also highly cost-effective, with an incremental cost per additional child who achieves completion of high school of US$89 in the fast scale-up scenario and US$185 in the slow scale-up scenario, for the cohorts evaluated in this study.

Benefit–cost ratio

Benefits (child deaths or stunting cases averted, DALYs averted, additional children finishing high school) can all be monetized using quantitative techniques. Monetizing these benefits makes it possible to compare them with the total costs of implementing a package. Comparing the monetary benefits with costs of a package allows us to create a benefit–cost ratio (BCR). This ratio gives an indication of the magnitude of the return on investment of the package. This analysis was run for both of the packages under study, across the three scale-up scenarios. For both packages, and across all interventions, the rate of return on investment is impressive. Below we present the main results in US$.

Package 1 has higher average BCRs than does Package 2. For Package 1, the lowest BCR would occur under Scenario C (slow scale-up): for every US$1 invested in the package, US$54 would be returned by 2050. The highest BCR would be witnessed if the package was scaled up quickly. In Scenario A, by 2050, for every US$1 invested in the package, there would be a projected US$68 return.

Package 2 also has high BCRs in the fastest scale-up scenario. Analysis of Package 2 is disaggregated into two options, each with a different type of cash transfer. Depending on the transfer selected and the speed of scale-up, the overall package would see a return between US$9 and US$18 for every US$1 invested by 2050. This is a conservative estimation, as the true benefits of education, social protection and child protection interventions are harder to monetize than are the health and nutrition benefits of Package 1, given the multiple pathways through which they may exert an impact. This study considers the gains in productivity only for the education intervention. It does not monetize benefits from social and child protection – that is, cash transfers and birth registration – as they are understood as enablers that facilitate access to the interventions through which the real impact takes place. For example, birth registration *per se* does not impact *directly* the well-being and development of the child but does so indirectly by providing the child a necessary means to guarantee/facilitate the exercise of his/her rights to access basic services like health and education.

For both packages, the return on investment is greater the longer the time horizon it is viewed against. For example, for Package 1, for every scale-up scenario, the BCR is higher for 2022–2050 than it is for 2022–2030. Further, for both packages, the faster the scale-up, the greater the BCR. This is notable, as we found earlier that, the faster the scale-up, the greater the cost of implementing the package. This increasing BCR shows that, despite these increased costs, the benefits far outweigh them.

Table E6: Economic benefits derived from the impact of the interventions and benefit–cost ratio for Package 1

Indicator	Scenario A			Scenario B			Scenario C		
	2022–2030	2022–2040	2022–2050	2022–2030	2022–2040	2022–2050	2022–2030	2022–2040	2022–2050
Economic benefits (US$ million)									
DALYs averted in children	365	1,291	2,571	200	956	2,230	138	688	1,806
DALYs averted in mother	961	1,081	1,245	26	123	282	19	91	237
Stunting cases averted	910	4,386	9,331	449	2,884	7,684	298	1,946	5,806
Disability avoided from iodine deficiency	0.1	0.2	0.4	0.0	0.2	0.3	0.0	0.1	0.3
Total additional economic benefit	**2,237**	**6,758**	**13,148**	**675**	**3,963**	**10,197**	**455**	**2,725**	**7,849**
Benefit–cost ratio	**18**	**38**	**68**	**9**	**28**	**62**	**8**	**24**	**54**

Note: All costs and monetized benefits were adjusted for inflation at a constant annual rate of 7.9% for 2021 and 6% from 2022 onwards. The GDP per capita estimate used for the monetization of benefits is US$274.



Table E7: Economic benefits and benefit–cost ratio for the packages analysed (Package 2)

Indicator	Scenario A			Scenario B			Scenario C		
	2022–2030	2022–2040	2022–2050	2022–2030	2022–2040	2022–2050	2022–2030	2022–2040	2022–2050
Economic benefits (million US$)									
DALYs averted in children	365	1,291	2,571	200	956	2,230	138	688	1,806
DALYs averted in mother	961	1,081	1,245	26	123	282	19	91	237
Stunting cases averted	910	4,386	9,331	449	2,884	7,684	298	1,946	5,806
Disability avoided from iodine deficiency	0.1	0.2	0.4	0.0	0.2	0.3	0.0	0.1	0.3
Cash Transfer (Option 1) (CT-1)	1,088.0	2,102.9	2,496.6	524.6	1,299.8	1,717.2	345.6	867.2	1,228.6
Cash Transfer (Option 2) (CT-2)	492.7	860.7	1,011.4	260.2	584.5	739.2	176.1	414.9	561.4
Preschool education*	56.1	10.3	10.3	27.2	19.0	19.0	17.9	13.9	13.9
Total additional economic benefit (CT-1)	**3,381**	**8,871**	**15,655**	**1,227**	**5,282**	**11,933**	**819**	**3,606**	**9,091**
Total additional economic benefit (CT-2)	**2,786**	**7,629**	**14,170**	**963**	**4,567**	**10,955**	**649**	**3,154**	**8,424**
Benefit–cost ratio (CT-1)	**5**	**7**	**10**	**3**	**6**	**11**	**3**	**6**	**11**
Benefit–cost ratio (CT-2)	**7**	**11**	**18**	**4**	**9**	**18**	**4**	**9**	**17**

Note: *Only additional children completing high school from the cohorts starting preschool between 2022 to 2038 were evaluated since these cohorts would produce children able to complete the whole education cycle until high school graduation (which is the relevant outcome analysed) within the time horizon of the study. Therefore, only the benefits and costs accrued by these cohorts were considered to estimate the cost-effectiveness ratios. All costs and monetized benefits were estimated first in local currency, adjusted for local inflation at a rate of 7.9% for 2021 and 6% from 2022 onwards, and then converted to US$ using an exchange rate of 1 USD=1915 BIF (according to the World Bank in 2020). The GDP per capita estimate used for the monetization of benefits is US$274 (World Bank, 2020). These numbers were converted using the latest annual exchange rate available at the time of modelling. The annual exchange rate for 2021/22 is predicted to be 1,976.04 according to the Republic of Burundi. This is only a 3% difference, implying that these results could be 3% smaller in the 2021/22 period. This small change does not affect the directionality of findings and concluding remarks of this study.

It is worth remembering that the interventions included in Package 2 are those same ones as in Package 1 (nutrition, health and preventive interventions) and education, social and protection interventions. Therefore, DALYs averted in both cases are the same. The methods for the valuation of benefits are explained in the Methodology section of the report. The education intervention was modelled separately, outside of the packages evaluated, given its relevance in the Burundian context, where access to preschool education is not mandatory and far from universal. As Table E8 shows, the benefits of investing in early childhood education, specifically preschool education, at least double the costs, and can accrue as much as US$7 dollars for every US$1 dollar invested.

Table E8: Cost–benefit analysis of preschool education intervention as a standalone intervention

Indicator	Scenario A		Scenario B		Scenario C	
	2022–2030	2022–2038	2022–2030	2022–2038	2022–2030	2022–2038
Total economic benefit from education as a separate intervention (US$ million)	118	237	56	138	37	90
Total cost (US$ million)	26	34	20	34	15	29
Benefit–cost ratio	5	7	3	4	2	3

Note: All costs and monetized benefits were adjusted for inflation at a constant annual rate of 7.9% for 2021 and 6% from 2022 onwards.

Funding options

As the ability of the Government of Burundi to implement and finance an ECD initiative is inextricably linked to the broader macro-economic environment, a fiscal space analysis was conducted in order to assess the financial feasibility of the packages created. The fiscal space analysis incorporates the projected costs of the intervention packages with the existing macro-economic environment so as to show the fiscal space, or budgetary room, the government has to invest. Section 4.4 presents more details of funding challenges and options.

Four economic growth trajectories (referred to as "fiscal space scenarios") were considered for this analysis. These are presented below.

1. The NDP low growth path where economic growth averages 4%
2. The NDP medium growth path where economic growth averages 6%
3. The NDP high growth path here economic growth averages 10.7%
4. An additional post-COVID scenario that takes into account the macro-economic shocks imposed by the pandemic and revises projected growth paths

The scenarios were based on Burundi's Plan National de Développement 2018–2027 (NDP) (1 to 3), and an additional post-COVID scenario was created to account for the impact of COVID-19 on fiscal space. Additional fiscal space was calculated by computing the government revenue in a current year, less government revenue in the previous year, for each of the four growth or fiscal space scenarios.

The fiscal space scenarios should not be confused with the scenarios evaluated in the cost–benefit analysis. The latter are scale-up scenarios in which different assumptions on increase in coverage for each intervention are analysed, while the fiscal space scenarios present different economic and revenue growth situations in Burundi. While the scenarios presented in the cost–benefit analysis allow us to understand the different resources needed to implement each package according to how fast interventions are scaled up, the fiscal space scenarios shed light on whether there are, and there will be, enough resources to finance the increase in coverage presented in the scale-up scenarios, providing entry points for feasibility discussions.

Given Burundi's debt levels and substantial risk of debt distress, the Burundian government must be cautious when considering taking on additional levels of debt. Burundi's recent improvements in revenue collection, owing to the tax reforms introduced in the 2020/21 Finance Laws, are an important positive, but it is likely that these new, improved revenue collections will remain stable in the foreseeable future and they are unlikely to bring in further revenue. Since donor aid has largely been withdrawn since 2015, donor funding for interventions is



uncertain. Moreover, even with a reinstatement of donor funding, these will need to be channelled towards ECD. This, in itself, may be challenging, as donor funding of ECD is inadequate globally. Between 2015 and 2017, it is estimated that aid towards early childhood education fell by 27% from US$94.8 million to US$68.8 million: an equivalent of US$0.26 per child per year.[5] While reasons for the reductions in contributions are unclear, particularly given the widely acknowledged importance of ECD, lack of evidence-based advocacy on the importance and profitability of ECD in low-income countries is a very plausible scenario. As such, this study hopes to provide a vital advocacy piece for investing in ECD in Burundi.

The fiscal space analysis showed that scaling up Package 1 is more affordable than scaling up Package 2, in all scale-up scenarios considered. While the fiscal space analysis suggested the possibility that the interventions could be funded partially (in some cases entirely for Package 1) through government revenue, it is not recommended that the government seek to fund this important intervention through one source alone. Economic growth, and thus additional revenue from economic growth, is highly susceptible to shocks – as has been clearly experienced as the world deals with the shock of economic growth. Instead, we recommend diversifying funding resources so as to protect the sustainability of this important intervention. As a result, it is recommended that the government seek support from re-established connections with official development assistance donors to support financing ECD in the short term. Additionally, the potential to fund the ECD intervention through domestic revenue is greater in the slower scale-up scenario given that costs are distributed across a longer timeframe. However, we do not recommend choosing a package and scale-up scenario based on cost alone, as the faster scale-up scenario and more holistic intervention provide important gains, as this report shows.

Nevertheless, it is important that ECD be prioritised in the government budget and that ECD receive additional government spending. In the long term, the Burundian government should be decreasing its reliance on aid to finance the ECD strategy. With the decrease in costs and funding gaps over time, the team is confident that the Burundian government will be able to fund investment in ECD in the long term.

CONCLUSIONS

This study provides empirical evidence that resoundingly upholds previous findings in the literature on the cost-effectiveness and strong BCR of investing in early childhood. For Package 2, depending on the speed of scale-up (and the type of cash transfer), for every US$1 invested up to US$18 could be returned to society by the year 2050. For Package 1, BCRs are even higher – a reflection of their high level of cost-effectiveness and large impact on health and nutrition outcomes for young children. In the most pessimistic scale-up scenario, for every US$1 invested US$54 is projected to be returned in benefits by 2050, rising to US$68 in the most optimistic scenario.

This report argues, therefore, that investing in ECD is not only a good decision but actually a very good decision. The existing landscape in Burundi is ripe for such development and expansion into the early childhood sector. The government has already put in place strong policies in support of children, such as the provision of free primary education and under five health care schemes, and has recently adopted a new ECD strategy. Capitalizing on this political interest is key to ensure that ECD interventions are successfully implemented and scaled.

Ultimately, we conclude that scaling up investment in ECD is not only a strong moral and social proposition but also a sound financial and economic one, with real returns on investment. In Burundi, where coverage of interventions critical to early childhood are currently overwhelmingly very low and chronically underfunded, the potential gains to be made in scaling up investment are extensive. While this is true in economic terms – potentially leading to massive improvements in human capital and productivity – it also stands in the upholding of rights and equality within the country. According to the United Nations Convention on the Rights of the Child, every child has the right to survival, development, identify, education and safety. The results from our projections show that investments in ECD can be essential to the upholding and attainment of these rights. Indeed, in the most optimistic scenario, nearly 700,000 preventable child deaths could be averted by 2050 by implementing these interventions.

RECOMMENDATIONS

As a result of this study, we would like to propose the following recommendations for the Government of Burundi and its partners to consider:

PRIORITIZE

Scaling up the provision of multisectoral ECD interventions must be a top priority for the Government of Burundi.

For Burundi to catalyse economic development and ensure the realization of basic child rights, investment in early childhood is essential. Without the rapid mobilization of adequate financing for ECD services, these rights and development will be put at risk. Our study has confirmed that investments in early childhood are highly cost-effective and beneficial. Scaling up the ECD interventions will catalyse Burundi's progress towards the goals set out in the NDP and the Sustainable Development Goals. Based on our findings, it is not a case of whether the Government of Burundi and its partners should invest in ECD, but how. Our most important recommendation is that immediate political prioritization of ECD must be enacted. Below, we provide recommendations for how to realistically and feasibly scale up ECD in the country.

ALIGN

Our second recommendation is to align Burundi's current ECD programmes with those studied in this report.

There are a number of gaps in coverage of important areas of ECD; within our study and within the new Burundi ECD Strategy these gaps in coverage will be targeted. Overall, the recommended packages studied in this report align strongly with the priority areas identified in the national ECD Strategy – namely, education, health, nutrition child protection and WASH. Package 1 focuses on providing basic health care and WASH services, while Package 2 goes further to also incorporate child protection services (through the upscaling of cash transfers) and early childhood education.

SEQUENCE

In the short term, we recommend that efforts focus on scaling up Package 1 – The First 1,000 Days.

Burundi will face both fiscal and capacity constraints in scaling up a large package of multisectoral interventions. The Government of Burundi should start with rolling out Package 1. Evidence from this study suggests that, for these reasons, scaling up Package 1 will both be less expensive and have a greater return on investment than Package 2 in the short term. In the long term, Package 2 – Family Support and Strengthening – should be rolled out. ECD packages should be multisectoral and should holistically meet the needs of young children, including in health, nutrition, education, WASH, social protection and child protection We therefore recommend that the Government of Burundi have a long-term plan to integrate the additional interventions included in Package 2. The additional interventions in Package 2, including pre-primary education, child protection and social protection measures, are also highly cost-effective and are critical for a full and comprehensive early childhood programme.



BUDGET

In order to ensure the longevity of the ECD interventions, establishing a suitable financing plan is of paramount importance.

While different sectors and strategies are spending towards certain interventions that benefit ECD, there is as yet no established ECD budget. Creating an ECD budget is vitally important to consolidate political commitment and sustainability. Given the widely acknowledged benefits of ECD and the many gaps observed in current ECD care in Burundi, the team suggests that the selected package be scaled up as rapidly as possible (Scenario A). Even though this results in considerable upfront costs, the analysis shows that the benefits derived from implementation far outstrip the costs. Adequate resources will need to be committed through annual budgetary plans to achieve the required outcomes. Given the long-term and multisectoral nature of the interventions, it is recommended that any donor funding be integrated on-budget, to facilitate coordination efforts, reduce redundancy of spending and wastage, facilitate monitoring and boost transition towards domestic financing of ECD in the long run.

MOBILIZE FINANCIAL RESOURCES

The Government of Burundi and its partners must capitalize on all sources of financing available to mobilize sufficient resources for ECD.

As a result of Burundi's debt levels and the constraints already experienced in coping with recovery from the COVID-19 pandemic, we recommend seeking donor funding to support the short-term financing of ECD interventions. Donor collaboration and alliance will be important to pool resources and channel them towards the interventions. However, in the long term, it is important that domestic resources (both public and private) be used to fund the ECD strategies. Transitioning away from official development assistance is necessary to support the long-term sustainability of these interventions. It is advised that the government look into budget reprioritization. Additionally, private sector funding could be a key component of ECD financing. However, private sector support must be strategic and well planned so as to avoid potential equity concerns.

ASSESS CAPACITY

One of the potential challenges that Burundi will face in scaling up multisectoral interventions in ECD is the limited capacity of the workforce to deliver services efficiently and effectively in a coordinated way.

This capacity issue is an outstanding point to be addressed by Burundi, as fast mobilization of resources aimed at achieving a fast coverage increase can rapidly become a source of large waste and frustration if sectors do not possess enough human resources with the knowledge and tools to steer the process. Weak capacities of the system, organizations and workforce to plan, budget, deliver, monitor and cooperate on multisectoral ECD services could limit the large-scale implementation of the ECD packages analysed for decades. As a result, a capacity assessment should be conducted prior to implementation to pinpoint the gaps and opportunities for improvement.

MONITOR

We strongly suggest the development of a Multisectoral Monitoring and Evaluation Framework with SMART (specific, measurable, achievable, relevant, time-bound) indicators for performance measurement, monitoring and management of ECD investments and service delivery.

Furthermore, centralized and local sector authorities are recommended to set out three- or five-year programmes with commitments on progress on a range of mandatory and voluntary indicators linked to the key ECD outcomes pursued by the strategy and aligned to the Multisectoral Monitoring and Evaluation Framework. We recommend that the process of monitoring ECD investments and progress begin at an early stage of the budget cycle, where tagging specific budget lines as child-related expenditure, or specifically ECD-related, could facilitate the planning, tracking and monitoring of expenditure towards the ECD objectives outlined in the strategy and enhance policy review.

ENABLE

Our final recommendation is that further work be undertaken on the feasibility and implementation of these ECD packages.

While financing is an essential part of service delivery, funding alone is not enough. The enabling environment for high-quality and effective ECD services needs to be developed. This will include undertaking capacity development (of pre-primary teachers, for example), passing supportive national legislation and policies, setting out clear governance and institutional structures and considering the logistics and management of scaling up interventions. The Government of Burundi will need to work with its partners (both private sector and development partners) to design and fund structures with clear and empowered leadership of ECD within the country. There is a need for well-functioning, coherent implementation strategies to foster the broader ECD agenda. For the successful implementation of either of the ECD packages studied in this report, such actions will be critical.

1. INTRODUCTION

1.1. OVERVIEW

Burundi has one of the youngest, and fastest-growing, populations of young people in the world. Based on international comparisons, Burundi ranks ninth globally in terms of the speed of its population growth rate (out of 235 countries).[6] If it manages this effectively, Burundi could reap a generous demographic dividend from this youth bulge. Yet, today, Burundi is faced with a paradoxical situation. Burundi is currently a low-income country as per World Bank classifications.[7] Yet, faced with this challenge, a profound opportunity has emerged. Of a population of 11.53 million, 48% are under the age of 18.[8] As a country that is experiencing persistently high birth rates (38.37 births per 1,000 of the population in 2019) and falling death rates (7.766 deaths per 1,000 of the population in 2019), this high proportion of young people is only set to expand in coming years.[9] With a youth dependency ratio[10] of 86%, efforts to improve early childhood development (ECD) can help transform the demographic burden into a demographic dividend.[11] The demographic dividend refers to the accelerated economic growth that is initiated by a rapid decline in fertility and mortality that results in a shift in the age structure from one dominated by dependent children to one dominated by economically productive working adults. Capitalizing on this demographic dividend will be critical to reversing the pervasive trends of stagnant economic growth, endemic poverty and poor socio-economic outcomes.

In pursuit of these aims, achieving structural transformation of the economy is the core priority of the Burundian government. It seeks to promote strong, sustainable, resilient, inclusive growth that offers decent jobs for all and facilitates an improvement in social welfare. The government has charted a course to achieve these goals by adopting the Burundi National Development Plan 2018–2027 (NDP). The NDP defines an ambitious strategy, deeply rooted in the reduction of social inequalities and poverty, in both rural and urban areas.[12] These national efforts have been reinforced by broad international support. The vision outlined in the NDP echoes the Sustainable Development Goals (SDGs) and African Union Agenda 2063, setting ambitious targets for human development and the elimination of global inequalities.

Concurrently, the NDP, the SDGs and African Union Agenda 2063 promote human capital development as fundamental to the achievement of global development goals, including economic growth and structural transformation of the economy. Human capital refers to the knowledge, skills and health that people accumulate throughout their lives that enable them to reach their full potential and become productive members of society. The development of human begins in the earliest stages of life and continues throughout it. For this reason, tailored interventions to support human capital accumulation are often highly cost-effective, as well as being beneficial to the realization of basic human rights.

In line with the priority given to human capital development, the government and the United Nations Children's Fund (UNICEF) share concerns about the situation of young children in Burundi. Children aged under eight years represent almost 40% of the population, meaning that there are approximately 2.4 million children of this age group in Burundi.[13] Stimulating the development of these girls and boys in their early years through adequate investments in ECD can be the development catalyst Burundi needs to achieve its vision of becoming an emerging regional power by 2027 and beyond. In less than 20 years, these children will come to be critical in influencing, shaping and powering the future of the nation.

This report is a result of a detailed study into the potential costs and benefits of investments in early childhood. It seeks to support efforts to improve ECD in Burundi by the government, UNICEF and policy-makers, as well as other stakeholders, by providing an evidence-based model for investing in ECD packages as a way of improving the well-being of young children, as well as the long-term future of the nation more broadly.

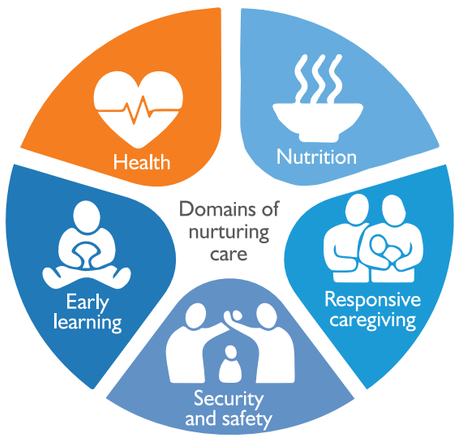
This report has been designed to contribute to the existing policy-making process being undertaken by the Government of Burundi with regard to the creation of an ECD package. Further, it seeks to complement a 2019 study commissioned by UNICEF Burundi, which highlighted the need to improve investments in multisectoral programmes aimed at adolescent development, to promote long-term national development. We argue that, to maximize the impact of these activities, it is necessary to develop a continuum of investments that occur throughout the life cycle and begin in early childhood.

1.2. EARLY CHILDHOOD DEVELOPMENT

1.2.1. What is early childhood development?

Early childhood is a phase in the life course that stretches from conception to the age of eight. During this period, a young child will undergo rapid development, acquiring physical, cognitive, motor, psycho-emotional and social skills. Indeed, 90% of a child's brain development will take place before the age of eight.[14] Within early childhood, there are three distinct phases: the first 1,000 days (up to the age of three); the preschool phase (typically from three to six years of age); and the early years of primary school (ages six to eight). For young children to reach their full potential, they need a range of interconnected and diverse supports. The Nurturing Care Framework is an internationally recognized framework conceptualizing the approach to helping children survive and thrive and to transform health and human potential in young children.[15] It posits that, to maximize ECD, young children need quality nurturing care interventions across five components: good health, adequate nutrition, safety and security, early learning opportunities and responsive caregiving.

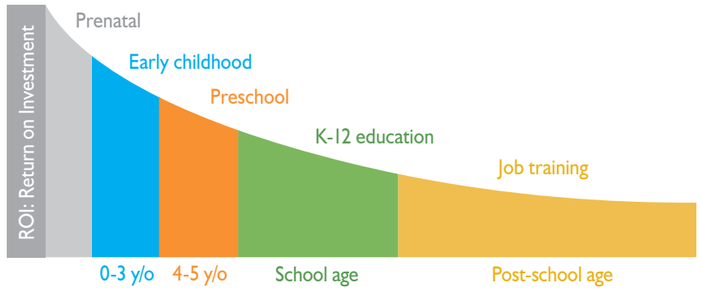
Figure 1: The Nurturing Care Framework



1.2.2. Why focus on early childhood development?

Investing in early childhood makes sense. This is the moment in the life course when opportunities for human development are greatest. A vast body of evidence has emerged in recent years pointing to investments in early childhood as having the greatest return of any human capital intervention (Figure 2).

Figure 2: The Heckman curve – return on investment: economic impact of investing in early childhood learning[16]



Critical interventions, including basic maternal and infant health care, nutritious feeding and parenting programmes, can protect children from life-threatening illnesses and support their long-term health. Initiatives to support maternal and child health and nutrition have been found to have a significant impact on lifelong physical and cognitive development. Maternal stress and nutritional deprivation during pregnancy can stimulate permanent changes in foetal tissues, which are associated with abnormal structure and function and disease in later life. Improving maternal health, therefore, improves delivery outcomes, thus avoiding premature birth and incidence of low-birth weight, and thus reducing maternal and infant mortality and lifelong health conditions.[17] Supporting mothers, as well as the family more broadly, therefore, can have significant impacts on young child outcomes. The optimal environment for neural development can be supported by positive parenting in the first 1,000 days. Recent research found that initiatives such as psychosocial stimulation programmes are effective in improving infant's cognitive development and socio-emotional outcomes.[18] Further, childhood health and nutrition interventions have also been found to have impressive benefits. Studies assessing interventions addressing acute undernutrition have found an association between the treatment and higher schooling grades of women, improved cognitive outcomes of men and women, and higher male wages.

Empirical evidence shows that interventions to support ECD can improve learning outcomes in later life. It has been found that, by 2012, child mortality had fallen to almost half its level in 1990 (from 90 to 48 deaths per live birth);[19] the next major frontier in early childhood is to improve early life support to ensure that children can maximize their potential in later life. During early childhood, more than a million new neural connections are formed every second. Early childhood education (ECE) programmes critically stimulate cognitive development, helping children acquire crucial foundational learning skills later in life. Evidence suggests that children who attend ECE programmes are twice as likely to show progress in early literacy and numeracy, compared with only 20% among children not attending any ECE programmes.[20] Quality ECE has also been found to be associated with starting primary school at the right age and progress through the educational system, making it one of the strongest predictors for a child's readiness for school.[21] This multitude of positive impacts of ECD is carried into later stages of the life course and can have a dramatic effect on lifelong outcomes in areas including, health, wealth and the formation of relationships. In recent years, studies from across the globe have tracked the impact that investments in aspects of early childhood can have in later life. One estimate suggests that increasing enrolment in pre-primary education to 50% coverage in low- and middle-income countries could result in lifetime earning gains of US$15–34 billion.[22]

Quality ECD has also been found to be essential to overcoming pre-existing inequalities (including income, gender, geographic, etc. inequalities). Disadvantaged children are less likely to have access to services critical for long-term development and human capital growth. They often face multiple risk factors, including lacking access to quality health services, basic water and sanitation supplies, adequate nutrition and good pre-primary education. Children living in poverty are also more likely to be exposed to toxic stress. Toxic stress in early childhood has been found to damage the brain architecture, contributing to lifelong challenges in learning, behaviour and health. For this reason, children who are disadvantaged or in poverty are more likely to demonstrate lower academic achievement

and exhibit poorer cognitive ability in later life, thus embedding a vicious cycle of poverty and disadvantage across generations.[23] However, high-quality ECD programmes have been found to reduce multidimensional poverty and inequality. A seminal study carried out in Jamaica found that children who were part of an ECD study programme (which worked with growth-stunted children aged 9–24 months in a two-year randomized controlled trial) earned 25% more as adults than disadvantaged children who received no treatment – and they earned as much as their more advantaged peers.[24]

Box 1: Toxic stress

Toxic stress refers to a child being exposed to strong, frequent and/or prolonged adversity. This includes physical or emotional abuse, neglect, caregiver illness, exposure to violence and/or the accumulated burdens of family economic hardship.

Importantly, investment in ECD can, therefore, drive progress within widespread development and the SDGs. Within the framework of the SDGs, achieving strong ECD is seen as a prerequisite, particularly in the fight against poverty, inequality and social exclusion and the promotion of peace and security. As the early years are the building blocks for later life, they dictate later academic success, economic productivity, responsible citizenship, lifelong health, strong communities and the success of the next generation of parents. An investment in early childhood thus lays a strong foundation for development, increases the effectiveness of the education and health systems, improves the chances of economic productivity and growth, and contributes to more equitable societies.

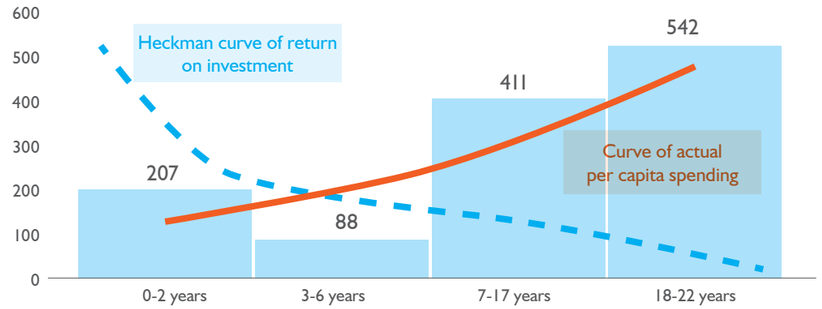
Figure 3: Contribution of ECD to the attainment of the SDGs

1.2.3. How much is being invested globally?

Yet, worldwide, there are 250 million children who survive but do not reach their full potential, owing to inadequate nutrition, care and opportunities to learn.[25] Of a global population of 575.6 million children in early childhood, 56% were at risk of stunting or moderate poverty, while 43% were at risk of stunting or extreme poverty.[26] In Sub-Saharan Africa, the total population of young children has been expanding consistently, growing from 124.9 million in 2004 to 143.3 million in 2010. Those at risk of suffering from stunting or moderate poverty, or stunting or extreme poverty, is far above global averages, sitting at 81% and 66%, respectively (2010).[27]

There is a pressing need to reframe ECD as an investment rather than a cost. According to recent research conducted by UNICEF in Eastern and Southern Africa, the total funding gap for ECD health and education services exceeded 90% in 2019, despite increasing investments since 2002. COVID-19 is set to only exacerbate this resourcing crisis, with preliminary research estimating that government spending on health and education for children aged below six years old will fall from US$138 per capita (constant 2017 prices) in 2019 to US$122 in 2020, before partially rebounding to US$126 in 2021. This research also found that young children in Eastern and Southern Africa were benefiting significantly less from spending than their older counterparts. In 2019, governments and development partners in this region spent progressively more on children the older they became. In constant 2017 prices, per person an estimated US$542 per person was spent on those in the 18–22 age category, US$411 on those 7–17, US$207 on those aged 0–2 and just US$88 on those 3–6.[28]

Figure 4: Average per capita government and donor spending on core human capital sectors by age group in Eastern and Southern Africa alongside the Heckman curve of return on investment, 2019 (US$, 2017 constant prices)[29]



Where they exist, attempts to improve early childhood outcomes are often siloed and spent on lifesaving health interventions. Programmes or policies for young children are often overseen by different government departments, administered by different sectoral actors, administered to divergent populations in different delivery settings and funded by disparate sources. This fractious and disjointed approach to ECD is undermining these interventions and limiting progress. Concerted effort needs to be made to unify national and regional ECD service offerings and expand the coverage of a multisectoral set of interventions, which support children to both survive *and* thrive. While unquestionably critical, health expenditures account for the bulk of ECD spending in Eastern and Southern Africa. In 2019, only around 2% of total education budgets were focused in pre-primary or early childhood education in Sub-Saharan Africa – a figure far below the 10% international benchmark. To overcome these deficits in resources, stakeholders from a multitude of sectors, including health, education, nutrition, child protection, social protection and water, sanitation and hygiene (WASH), must be brought together to support holistic ECD policies.

Such efforts and investments in early childhood must, therefore, be rapidly scaled up. This need is especially profound in countries, such as Burundi, which are currently marrying low economic development and poor human capital outcomes with large and growing populations of young children. According to a body of seminal research, human capital interventions focused on ECD are the most cost-effective form of human capital development.[30] Studies estimate that returns on investment for key childhood interventions can be up to 17 times the initial amount invested (depending on the focus, duration of exposure and quality of the programme).[31] Further, unlike other development investments that require constant upkeep or risk becoming obsolete as conditions change, investments in ECD endure throughout the life course and into the next generation. This generous return on investment stems from the lasting, cross-generational and multiplier effect of ECD investments, which result in sustainable progress and positive change and stimulate economic and social development.

1.3. OBJECTIVES

The objective of this report is to outline an investment case using findings from a cost–benefit analysis of the multisectoral ECD packages of interventions in Burundi. It seeks to serve as a tool to guide advocacy and decision-making with the ultimate goal of supporting and strengthening ECD in Burundi. The specific objectives guiding its development were to:

1. Identify population health, social and economic gains from investments in a combination of multisectoral ECD packages in Burundi. This will include examining the multifaceted effects on children and parents of engaging in ECD services in the short and long term.
2. Provide a comprehensive costing of the investment framework for the different ECD packages, and its impact on the national budget.
3. Develop a financing strategy to provide potential avenues for delivering various sets of ECD interventions. This strategy will be based on an analysis of possible financing options that could be used to maximize available financial resources.
4. Consult with key stakeholders to ensure the validity and reliability of the data used in this work and to build consensus and momentum around increasing investments in ECD.
5. Finally, provide evidence to facilitate adequate investment for multisectoral and integrated ECD programmes through the development of an investment case. This will be used to support policy-makers and partners in designing and/or expanding ECD programmes at the national level.

1.4. RESEARCH QUESTIONS

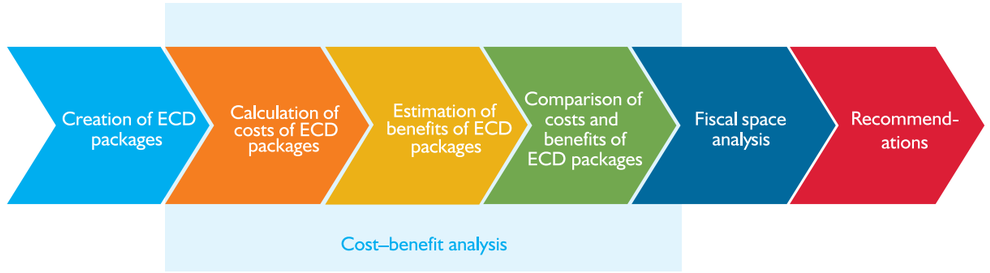
More specifically, this study aims to answer the following questions:

- What ECD intervention programmes exist in Burundi and what are the gaps in coverage? What is the current status of ECD in Burundi?
- What are the expected returns (benefit–cost ratio) of investments in the different integrated multisectoral packages for early childhood in general according to the mode of service delivery (e.g. community, health structures, school platforms, etc.) in Burundi?
- What is the cost (per child) of the different integrated multisectoral ECD interventions?
- Of the ECD service packages that exist (in Burundi or in the region), how many are needed to scale up to the national level, according to current policy documents?
- What is the impact on the national budget, and what are the financing options for providing the different intervention packages in Burundi?
- What are the long-term impact scenarios (2027, 2030, 2040, 2050) for young children based on the implementation of the investment framework and a greater focus on the intervention packages (i.e., the gains that can be achieved and, conversely, the opportunity costs and losses of not investing in ECD)? In addition, can greater investments contribute to lower rates of child poverty and deprivation in Burundi by 2030?
- Which early childhood intervention packages (up to eight years old) would provide the best return on investment (benefit–cost ratio) in terms of gross domestic product (GDP) growth, national income, human development index, human capital index, child poverty rate, reduction in social inequalities (Gini index and social cohesion index)?

1.5. STRUCTURE OF THE REPORT

The remainder of this report is structured as follows. Section 2 discusses the context for this investment case, including the current status of the economy and young children, as well as policies and investments in sectors relevant to ECD in Burundi. **Section 3** explores the methodology taken to construct the investment case. This includes the process of creating two relevant ECD packages; calculating the costs of scaling up these packages based on different scale-up scenarios; the approach to modelling the benefits of the scaled-up ECD packages; the comparison of these costs and benefits to produce benefit–cost ratios; and, finally, the process of conducting a fiscal space analysis. Figure 5 provides a schematic representation of the different sequential steps in this methodology that together culminate in an investment framework for ECD in Burundi. In **Section 4**, we present the results of this study – including the cost–benefit analysis for each of the ECD packages under study as well as a fiscal space analysis assessing the potential pathways to finance their implementation. **Section 5** concludes the report before recommendations are introduced in **Section 6**.

Figure 5: Phases of the investment case



2. CONTEXT

2.1. DEMOGRAPHY

Burundi is one of the most densely populated countries in Sub-Saharan Africa. It currently has a population of over 12.8 million, with projections suggesting this could reach 14.9 million by 2030.[32] The population is characterized by its extreme youth, with 65% under 25 years of age and 22% under 8 years of age. Within the age category eight and under, the population is fairly evenly split, both by age and by sex. When disaggregated by year of age within the under eight age category, those under the age of one make up the largest population group, representing 14.6%.

Figure 6: Population pyramid in Burundi, 2021[33]

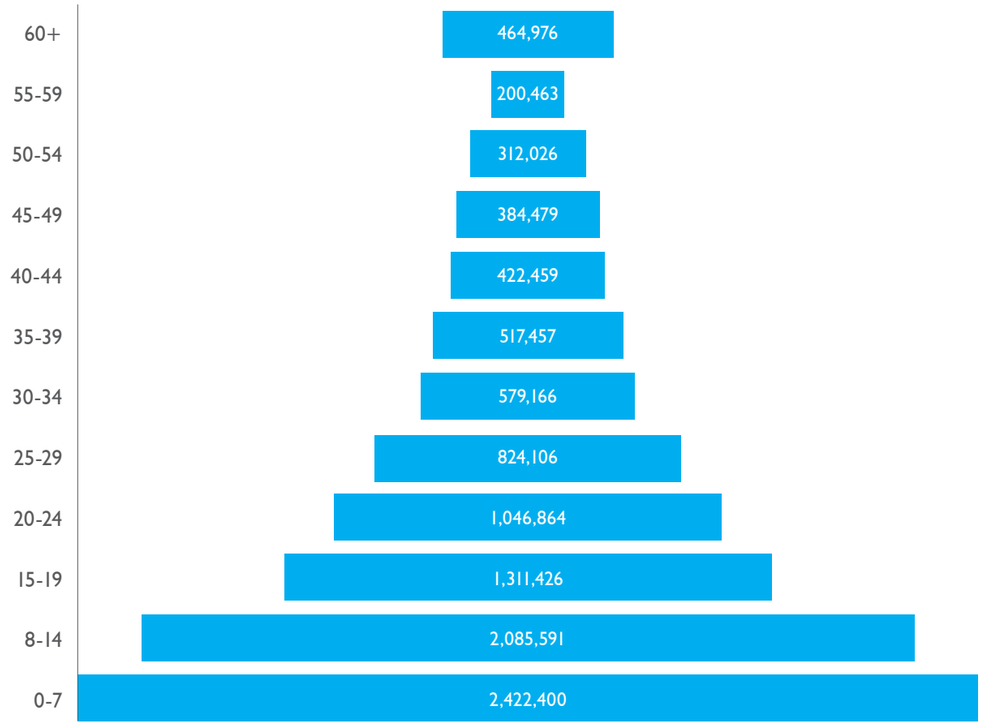
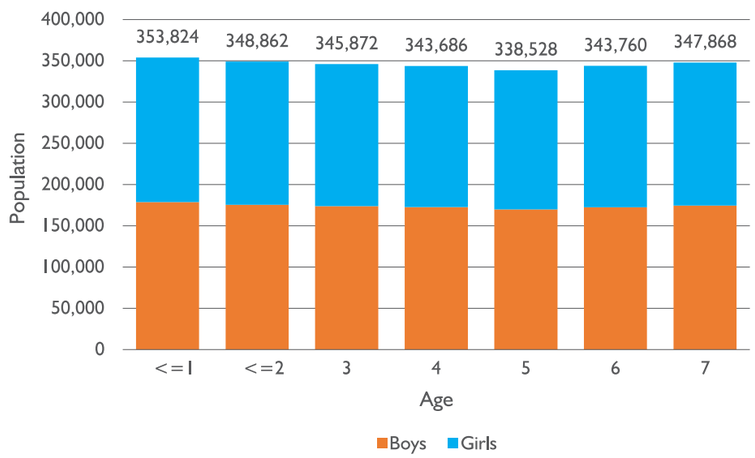


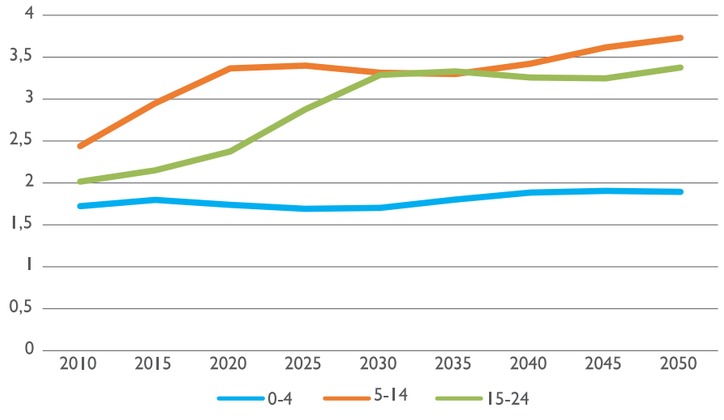


Figure 7: Proportion of children under eight years in Burundi, by age and sex[34]



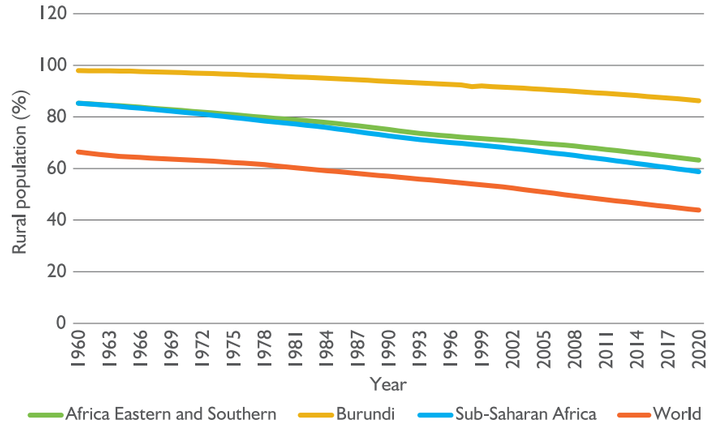
Demographic projections for Burundi show that the population will see an increasing number of individuals in their early productive years. As Figure 8 shows, the population of children aged zero to seven will remain at current levels, with a relatively low average annual growth rate of 1.5% through 2050.[35] This represents a large long-term window of opportunity to invest in their development.

Figure 8: Demographic projection for age groups 0–7, 8–14 and 15–24 in Burundi, 2010–2050[36]



Burundi's population is predominantly rural, although urbanization has been accelerating in recent years. In 2020, 86.3% of Burundi's population lived in rural areas, down from 89.4% in 2010 and 91.5% in 2000.[37] Notably, Burundi remains among the least urbanized countries in the world. For comparison, the average proportion of the population living in rural areas in 2020 was 63.2% in the Eastern and Southern Africa region, 58.7% in Sub-Saharan Africa and 43.9% worldwide (Figure 9).[38]

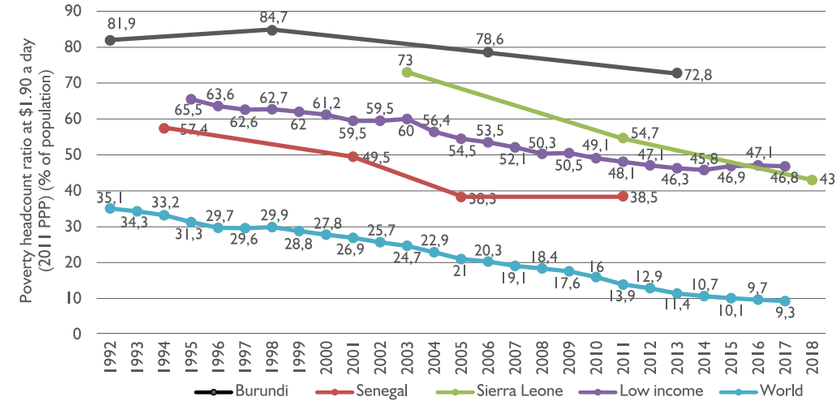
Figure 9: Rural population – world, Sub-Saharan Africa, Africa Eastern and Southern, Burundi



According to the Human Development Index (HDI), which is a summary measure of average achievement in key dimensions of human development (health, education and standard of living), Burundi is among the countries in the low HDI category.[39] Out of 189 countries, Burundi ranks in 185th position, with a total HDI value of just 0.433. This is below the Sub-Saharan Africa average value of 0.547 and the average for countries in the low HDI category, of 0.513. Life expectancy at birth is low, at 61.6 in 2020, and expected years of schooling is higher than the Sub-Saharan and low HDI average at 11.1.

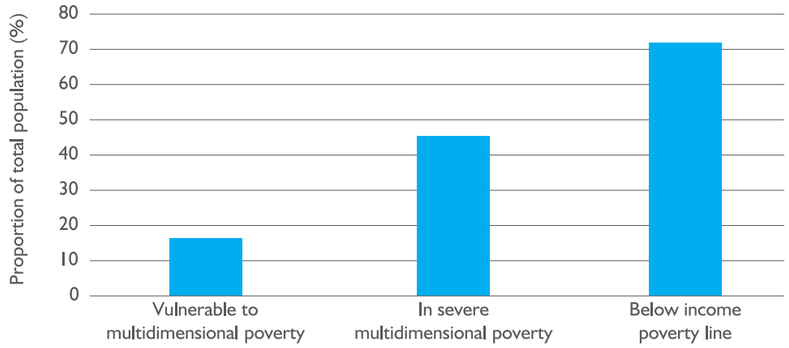
Deprivation in Burundi is very high and an important contributor to low levels of human development. The latest Multidimensional Poverty Index (carried out in 2016/17) found that Burundi had a national poverty headcount ratio of 74.3%.[40] According to World Food Programme (WFP) estimates, poverty rates remain at 65% in 2021.[41] As Figure 10 indicates, poverty in Burundi is far higher than the world average. However, it is also higher than the average poverty headcount ratio for low-income countries (as defined by the World Bank), as well as against the comparator countries of Senegal and Sierra Leone (which also have low levels of HDI).

Figure 10: Poverty headcount ratio at US$1.90 a day (2011 PPP) – Burundi, low-income countries, Senegal, Sierra Leone, world



When examining this poverty and deprivation in more detail, it is clear that a large proportion of the population is below the poverty line (71.8% in 2016/17) but is also either experiencing severe multidimensional poverty (45.3%) or at risk of suffering multidimensional poverty (16.3%) (Figure 11).[42] The intensity of deprivation, which ranks the share of deprivations faced by each poor person on average, is ranked very highly, at an average of 54.3%.

Figure 11: Proportion of the population in Burundi exposed to poverty and deprivation (vulnerability to multidimensional poverty, in severe multidimensional poverty and below the income poverty line), 2016/17



Interestingly, deconstructing the relative factors contributing to overall poverty and deprivation reveals that standard of living is the most significant. In comparison with low HDI country comparators (Senegal and Sierra Leone), as well as the Sub-Saharan African average, health and education tend to contribute relatively less to the poverty of deprivation felt in country.

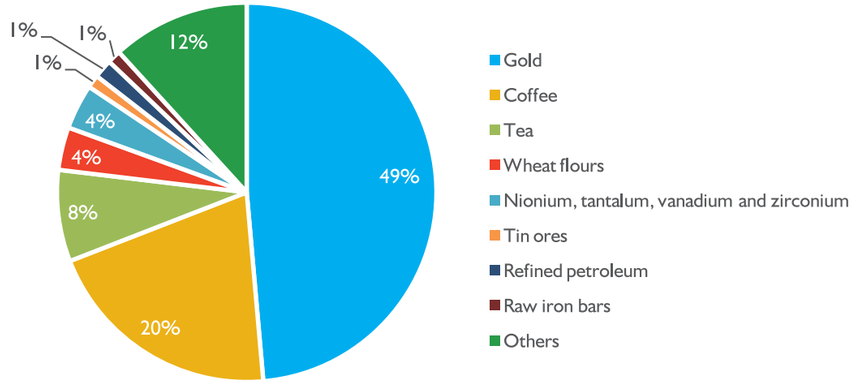
Table 1: Relative contribution to overall poverty of deprivation (as % of deprivations) – Burundi, Senegal, Sierra Leone, Sub-Saharan Africa[43]

	Health	Education	Standard of living
Burundi	22.3	27.5	49.2
Senegal	22.1	44.9	33.0
Sierra Leone	18.6	28.9	52.4
Sub-Saharan Africa	22.4	29.3	48.4

2.2. ECONOMY

According to the World Bank's classification, Burundi is a low-income economy, and is recorded as having GDP per capita of US$274 in 2020.[44] The economy is predominately agricultural; the sector provides 80% of total employment.[45] The country's exports have long been dominated by primary goods – in 2019, the main exports were gold, coffee and tea (Figure 12).

Figure 12: Breakdown of exports from Burundi by good, 2019 (% of total exports)[46]



Over the past few years, Burundi's tertiary sector has grown, and it has recently become the dominant sector in the economy. This is an important, positive, movement away from Burundi being a primary sector-based economy, which limits opportunities for sustainable growth and structural transformation of the economy, and has created low average income levels in the country. As Figure 14 demonstrates, GDP per capita in Burundi is far below that of neighbouring countries and the regional average. Further, economic expansion has been unable to keep up with population growth. This has led to stagnating levels of GDP per capita in comparison with other countries in the region, such as Kenya and Ethiopia, which have seen more rapid increases in rates of GDP per capita in recent years.

Figure 13: Contribution to GDP by economic sector in Burundi[47]

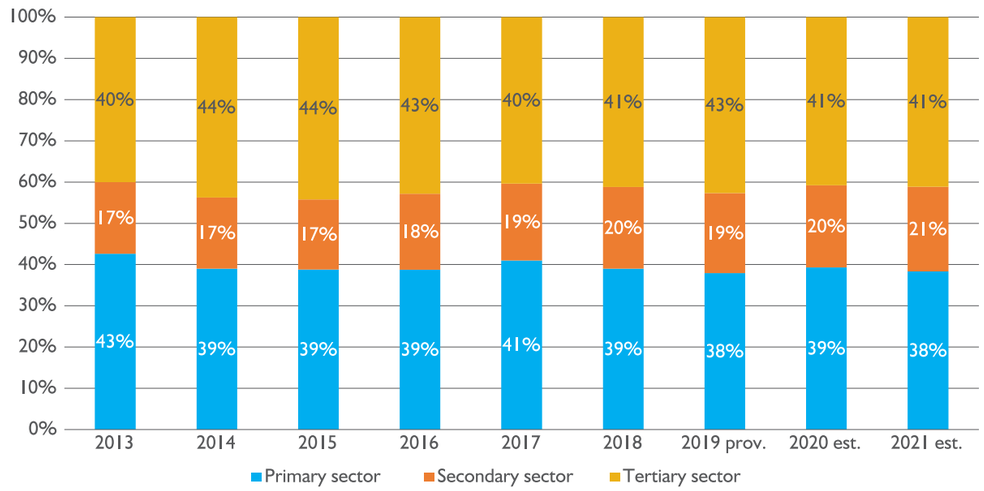
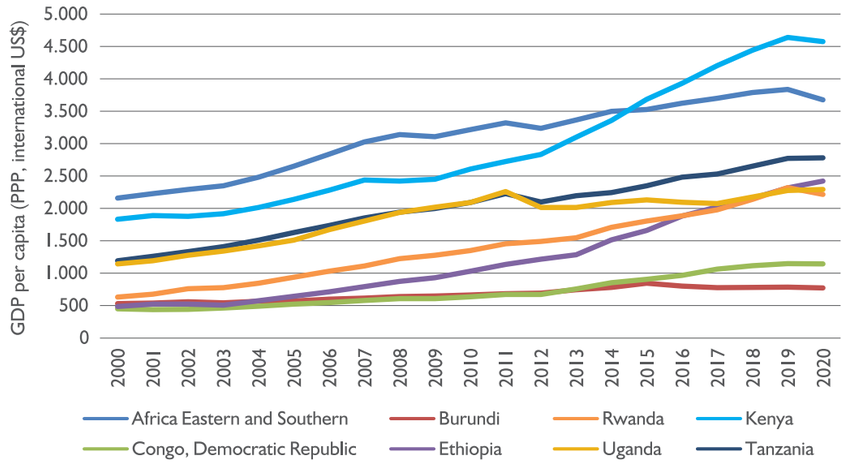


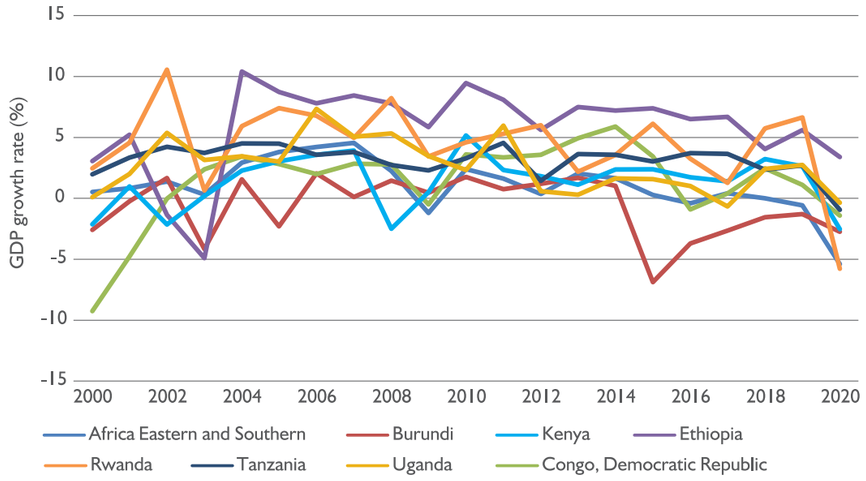


Figure 14: GDP per capita (PPP) – Africa Eastern and Southern, Burundi, Democratic Republic of Congo, Ethiopia, Kenya, Rwanda, Tanzania, Uganda (international US$)[48]



Accordingly, Burundi has also experienced low annual GDP growth rates over the past 20 years. Figure 15 demonstrates the oscillating rates of economic growth in the country (in orange), which peaked at 5.41% in 2006 and plummeted to a low of -3.9% in 2015. Economic growth has been almost exclusively below the average for that of the Eastern and Southern African region and also for that of neighbouring comparator countries, such as Tanzania, Rwanda and Uganda. Exposure to fluctuating prices for primary sector goods, alongside declines in foreign aid since 2015, have generated these economic challenges, which have in turn created both fiscal and balance of payment difficulties.

Figure 15: GDP growth rate – African Eastern and Southern, Burundi, Democratic Republic of Congo, Ethiopia, Kenya, Rwanda, Tanzania, Uganda[49]



In addition to the fluctuating and low economic growth over the past six years, Burundi has experienced financing constraints leading to low growth, rising public debt and external imbalances. Prior to 2015, donor aid contributed around half of total government revenue. Between 2014 and 2016, aid decreased from 8.5% to 2.3% of GDP.[50] Some donors have since reinstated some support, albeit slowly. Between 2015 and 2019, fiscal deficits increased rapidly, averaging 7% of GDP per year – in spite of reductions in investment and social spending – driving increases in public debt. With reduced domestic funding available, the fiscal deficits have been financed from borrowing from the central bank and domestic banks.[51] In 2019, public debt was estimated at 57.4% of GDP,[52] a statistic that is expected to rise further as a result of COVID-19. Burundi is at great risk of debt distress and filed for debt relief from the International Monetary Fund (IMF) in 2020.[53] While fiscal consolidation efforts were made by reducing government expenditure down from 42% of GDP in 2011 to 22% in 2016, government expenditure has since been on the rise. Before 2015, capital spending was high, since donors funded a substantial portion of capital spending.[54] With the withdrawal of donor support, capital spending has averaged between 9% and 14% of GDP.[55] Even with limited donor support, most capital spending remains funded by donors. Over the 2020/21 fiscal year, 55% of capital spending was financed by donors.[56]

Since 2015, the Burundian economy has recovered only slowly. With population growth averaging 3%[57] per year, slow economic growth has been unable to improve the living standards of Burundians – with per capita GDP remaining rather stagnant over 2017–2020. Inflation initially rose sharply after the crisis in 2015, and after a period of falling has begun rising again. According to national estimates, Burundi is again experiencing a high inflation environment, with inflation reaching 7.9% in 2021.[58] The inflation fluctuations broadly follow food prices, which have been driven by the varying impact of climate change on harvests. Large external imbalances have emerged, consistent with an overvaluation of the exchange rate. The real effective exchange rate has appreciated by 18% since 2014.[59] In spite of some reductions in imports, the current account deficit has remained high with the withdrawal of donor budget support and subsequent reductions in current transfers. Financial and capital accounts have similarly deteriorated, with extremely low FDI inflows.[60]

Table 2: Extract of macro-economic indicators[61]

Macro-economic indicator	2017	2018	2019	2020	2021
Real GDP growth		6.5%	4.5%	-0.5%	3.1%
GDP per capita (BIF)	496,032	502,400	516,176	540,683	575,056
GDP per capita (US$)	287	282	280	282	303
Tax: GDP	13.1%	13.8%	13.1%	14.1%	14.8%
Non-tax: GDP	1.0%	1.1%	1.1%	1.5%	1.4%
External grants as % of GDP	2.5%	3.6%	3.4%	3.8%	3.1%
General government expenditure as % of GDP	20.1%	22.2%	21.1%	22.8%	23.4%
Current expenditure	15.1%	15.4%	14.7%	14.0%	18.1%
Capital expenditure: GDP	4.9%	6.7%	6.4%	8.8%	5.3%
Public debt as % of GDP	**44.7%**	**46.2%**	**57.4%**	**65.1%**	**68.8%**
Fiscal balance as % of GDP	**-3.5%**	**-3.7%**	**-3.5%**	**-3.3%**	**-4.7%**
Inflation	16%	-3%	-1%	8%	7.9%

However, Burundi has made significant progress in mobilizing domestic resources through tax policy reforms. Tax reforms introduced in the 2020/21 Finance Law are expected to generate an important increase in tax revenue. Additionally, non-tax reforms are similarly expected to grow as a result of increased property income, dividends and additional administrative laws (including fees for visas, passports, permits, fines and penalties).[62]

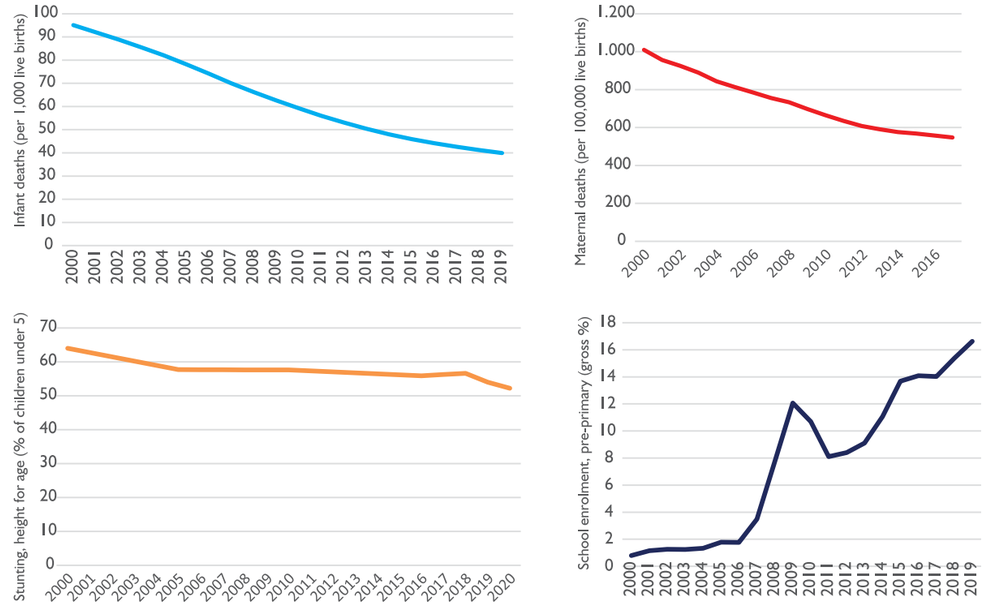
Nevertheless, the COVID-19 pandemic has further complicated this already challenging macro-economic situation. The economic shock linked to the pandemic has jarred the fragile economic recovery taking place since the 2015 recession. Although efforts have been made to improve domestic revenue collection, with limited donor support debt levels have also risen, from 57.4% of GDP in 2019 to 65.1% and 68.8% in 2020 and 2021, respectively.[63] Real GDP growth has been downgraded, with national sources estimating -0.5% in 2020, compared with 4.5% witnessed in 2019.[64] However, the Ministry of Finance, Budget and Economic Planning (MFBEP) predicts a rebound in economic growth in 2021 – projecting real GDP to increase to 3.1%.[65] Further, after two years of deflation, inflation in 2020 reached 7.5%, owing to rising food prices and limited availability of consumer products, which are largely imported.[66] Weak economic growth coupled with rising inflation has deflated per capita income growth, which in 2020 was estimated at just US$282 US($5 below the level recorded in 2017).[67] However, this is expected to improve in 2021.[68]

Burundi's economic recovery is contingent on a number of uncertain factors, including both domestic and global recovery following the COVID-19 pandemic and the impacts of climate change on crops, since Burundi's economy is predominantly agricultural. As the ability of the Burundian government to implement and finance an ECD initiative is inextricably linked to the broader macro-economic environment, a fiscal space analysis is conducted in Section 4.4 in order to be able to promote the financial sustainability of the intervention.

2.3. STATUS OF YOUNG CHILDREN (ZERO TO EIGHT YEARS)

Child outcomes have improved over the past 20 years in Burundi but this progress has been inconsistent and faltering. On core indicators of maternal, infant and child health, such as the infant and maternal mortality rates, clear progress has been made (Figure 16). Higher proportions of expectant mothers and young children are gaining access to critical lifesaving interventions. This includes 84% of children being fully immunized in 2020, 90% of pregnant women attending antenatal care visits and delivering in appropriate health facilities with skilled staff for maternal and newborn health care, and a declining trend in the prevalence of stunting. Meanwhile, school enrolment at both primary and pre-primary levels has increased. However, a child born in Burundi today will be only 39% as productive when she grows up as she could be if she enjoyed complete education and full health.[69] This figure is below both the Sub-Saharan African and world averages.

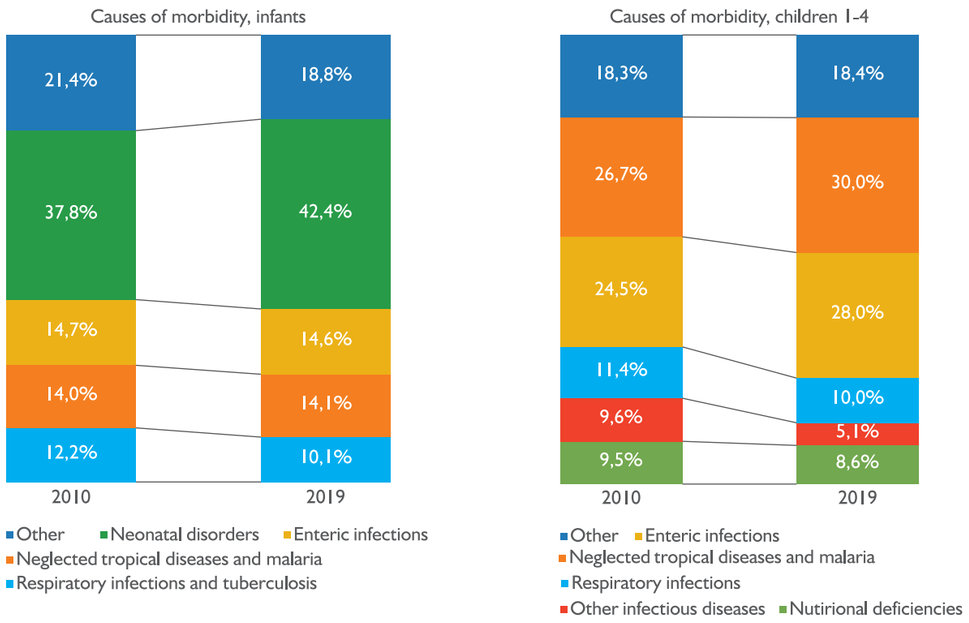
Figure 16: Selected indicators of early childhood development outcomes – infant mortality rate, maternal mortality rate, prevalence of stunting, school enrolment rate[70]

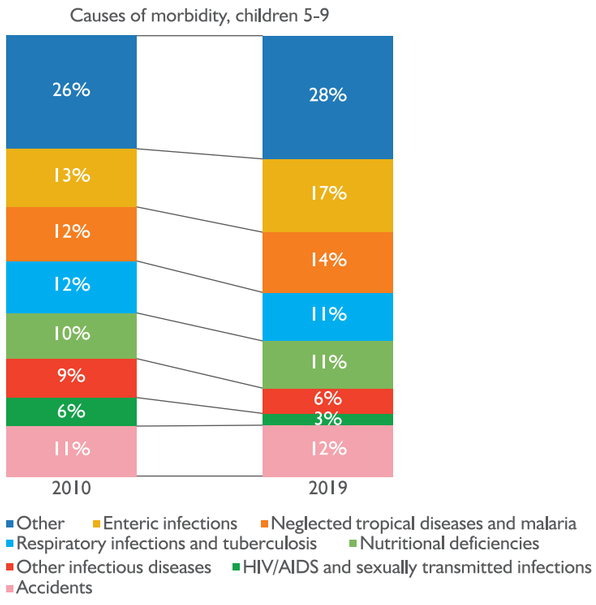


2.3.1. Health and nutrition

Given Burundi's low levels of social and economic development, mortality and morbidity continue to pose a significant threat to childhood development in the country. Probability of survival to the age of five is 94%, whereas 52.2% of children are stunted, which puts them at great risk of cognitive and physical limitations that can last a lifetime.[71] Figure 17 includes graphs that show the evolution of the causes of the burden of disease over the past 10 years in Burundi. Together, these graphs show that the relative contribution of each cause of DALYs varies considerably between the different age categories of the early childhood life cycle.

Figure 17: Causes of morbidity for children in Burundi by age group – under 1, 1–4 years, 5–9 years





While neonatal conditions, such as preterm birth and neonatal sepsis, accounted for 42% of the burden in 2019, the majority of DALYs after infancy (one to four years) are the result of infectious diseases, most of which are vaccine-preventable. Among children aged five to nine years in 2019, the leading causes of morbidity and mortality were related to enteric infections (17%), neglected tropical diseases and malaria (14%), accidents (12%), nutritional deficiencies (11%) and respiratory infections (11%). Strikingly, while most of these causes of disease are preventable through highly cost-effective interventions, their contribution to the burden of disease remains high or has increased over the past 10 years.

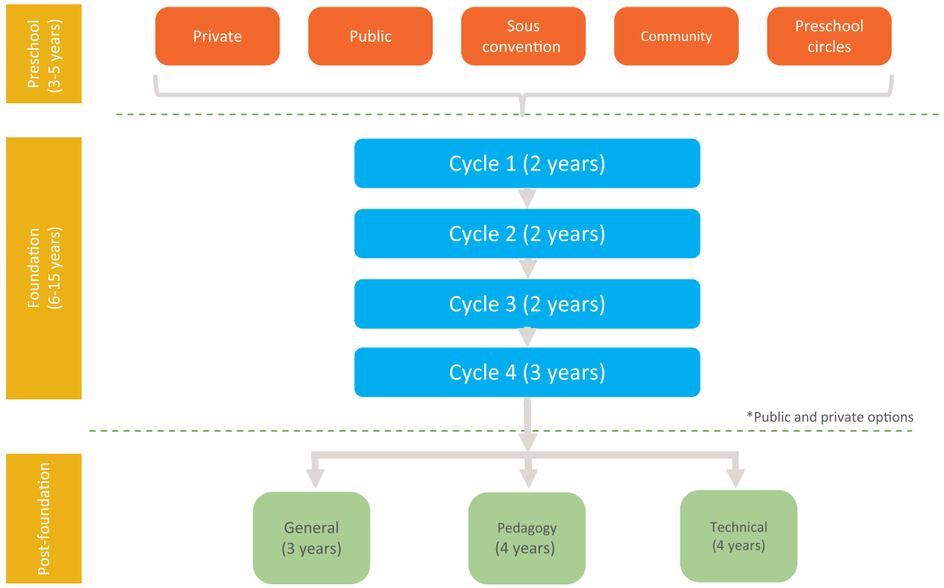
The burden of disease for young children in Burundi is dynamic: just as it varies between different stages of the life cycle, it also changes over time, owing to the changing environment and systems in which people live. The increase in the relative burden of neonatal disorders among infants between 2010 and 2019 is likely a result of challenges in scaling up and ensuring access to quality antenatal and perinatal health services, such as maternal nutrition, antenatal care and immediate postnatal care. The increase in enteric infections over the past decade may be associated with factors such as inadequate access to WASH services, poor hygiene education and practices, insufficient knowledge of meal preparation, poor knowledge of agricultural production techniques adapted to overpopulation, among others. The increases in neglected tropical diseases and malaria may reflect inadequate access to highly cost-effective interventions such as intermittent preventive therapy and insecticide-treated nets. Finally, accidents continue to represent a concerted threat to young children, constituting 12% of total morbidity for children aged five to nine years, demonstrating the insecure environment facing many children.

Significant socio-economic and gender inequalities also exist in nutrition and health for young children. For example, according to the latest 2020 Burundi National Nutritional Situation and Food Security Survey, the national prevalence of stunting among children under five was 52.2%. Yet disaggregated data shows that this number differs greatly by wealth quintile. For example, prevalence of stunting among the poorest children is twice as high as among those in the richest quintile (70% versus 30%, respectively). Similar disparities exist between rural and urban settings. In addition, only 5% of the poorest children receive a sufficiently frequent and diversified diet.

2.3.2. Education

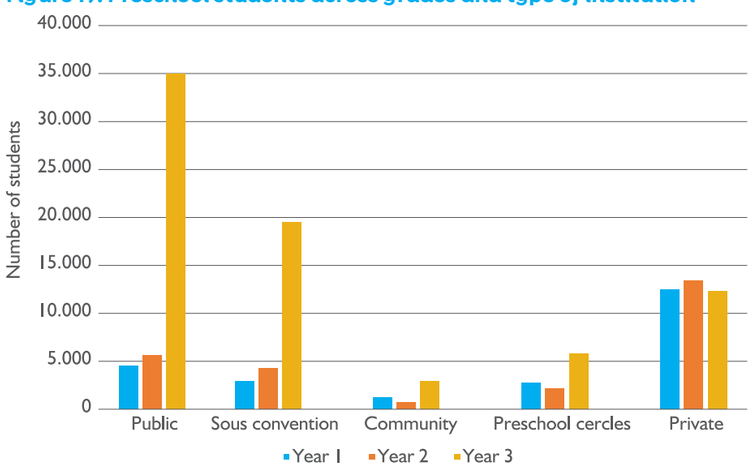
The education system in Burundi is composed of five stages: preschool, foundation, post-foundation, vocational training and tertiary education.[72] At the preschool level, there are four options available to children. In addition to public and private preschools, there are the community *garderies communautaires and cercles prescolaires*. Additionally, there are religious preschools *sous convention*. Children are typically between the ages of three and five and the duration of preschool is between one and three years. The foundational phase of schooling is composed of three cycles and usually welcomes children aged six for a duration of nine years, whether or not these children have completed preschool.[73] Thereafter, children (typically aged 16 and above) are able to choose between three broad streams of post-foundational schooling – namely, general, pedagogical and technical, which are between three and four years of duration.[74] Figure 18 provides an outline of the education system in Burundi.

Figure 18: Education system in Burundi[75]



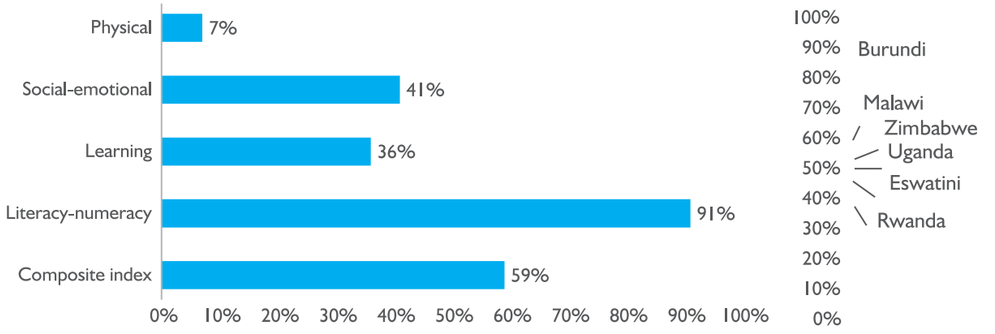
Children enrolled in private preschools typically have three years of preschool before enrolling in foundational schooling, while those attending public schools are most likely to only enrol in one year of preschool. As Figure 19 shows, all three years of private preschools have similar numbers of children enrolled. However, preschool attendance is low until the third year of preschool. Specifically, 78% of total enrolments at public preschools are in their third year, of which 83% are between the ages of five and six.[76,77] This suggests that a large number of three- and four-year-old children are not attending preschool.

Figure 19: Preschool students across grades and type of institution[78]



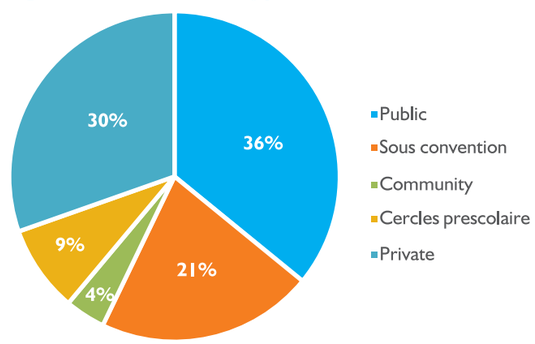
Challenges facing young children in health and nutrition are also mirrored in measures of education and cognition. ECE is a vital component of ECD. ECE programmes critically stimulate cognitive development, helping children acquire crucial foundational learning skills later in life. In recent years, studies from across the globe have tracked the impact that investments in aspects of early childhood can have in later life. The Early Childhood Development Index (ECDI), an indicator capturing developmental delays in several domains (physical; socio-emotional; literacy-numeracy; learning) found that the proportion of children in Burundi with suspected developmental delays was over 50% (Figure 20). Further, only 40% of all children under five years of age are on track and only 10% are on track in the literacy and numeracy dimension, despite the introduction of free primary education in 2005.[79]

Figure 20: Proportion of children in Burundi with presumed general developmental delay on ECDI, measured on the composite index and its dimensions (left) and compared with countries in Eastern and Southern Africa (right)[80]



While Burundi has achieved near universal enrolment in primary school *(école fondamentale)***, with a gross enrolment rate (GER) reaching 118% in 2018,[81,82] only 11% of children were enrolled in preschool in 2019/20.**[83] There has been a slight upward trend since 2015, when the GER in preschool was only 5%, but Burundi remains below the regional average for Sub-Saharan Africa of 20%.[84] Of those children who attend preschool, 30% attend private preschools.[85] At primary level, only 2% of children are enrolled in private schools,[86,87] suggesting that pre-primary expansion needs to happen in the public school system to increase access for children who cannot afford private school fees.

Figure 21: Distribution of preschool children across types of institutions[88]



2.3.3. Social protection and child protection

Poverty is a major determinant of these poor outcomes for young children in Burundi. As aforementioned, the experience of poverty and deprivation is widespread in the country. However, the distribution of the population living in poverty is not uniform, and more children than adults live in poor households, as revealed by a study on child income poverty, which found a rate of 69%.[89] In addition, 78% of children in Burundi are multidimensionally poor, meaning they suffer deprivation in at least three of the seven dimensions of child well-being.[90]

Growing up in poverty typically exposes children to many risk factors that hinder their development. According to the Integrated Household Living Conditions Survey 2013–2014, 33.9% of Burundian households do not send their children to school for financial reasons, and poverty itself was identified in the Voluntary National Review on the Implementation of the SDGs in Burundi (2020) as a major constraint to achieving the SDGs. This is further compounded by the high prevalence of child labour: 25.9% of children aged 5–11 are used in some form of economic activity; 88% of the same age group are involved in a domestic activity.[91] Although poverty is recognized as a major constraint, nearly one in five children (19.7%) living in non-poor households suffer deprivation in at least three of the seven dimensions of child well-being. This demonstrates that living in a household with a minimum income does not guarantee the satisfaction of all children's rights and, therefore, there are causes other than financial that explain children's lack of access to essential services and coverage of their basic needs.

In terms of child protection, possession of a valid birth certificate is central to securing rights and access to services for Burundian children. Birth registration is a dedicated target (16.9) under SDG 16 and the Goal aims to provide legal identity for all, including birth registration, by 2030. In Burundi, birth certificates are the only documents that guarantee access to free health care for children under five years of age, or free access to basic education (Grades 1–9).[92] Further, lacking a birth certificate can have lifelong implications, as without one children will be unable to prove their age or identity.[93] Currently, only 66.2% of children under five in Burundi have a birth certificate, according to the latest Demographic and Health Survey (DHS) data (from 2016).[94] Notably, this is an increase from 2010, when only 56% of children under five had a birth certificate.[95]

2.4. ECD POLICY AND SPENDING

2.4.1. 2021 strategy document

Early childhood has increasingly become a focus of attention for reform in Burundi. Numerous policies have been implemented to support ECD, including free access to elementary school, as well as health care for pregnant women and children under the age of five.

In 2021, Burundi has launched its first national ECD Strategy (2021–2027). This is firmly grounded in the principles of the NDP and is vital to achieve the SDGs. In particular, the NDP outlines national health plans, education policies and child protection policies – which are all key components of an ECD intervention. In Burundi, there are six ministries, departments and agencies involved in child protection services. This shows strong political commitment to enhance ECD in the country. While there are a number of players and policies with an impact on ECD (Box 2), with a number of sectors directly targeting key areas of ECD (such as interventions for maternal and child health in the health sector), Burundi has until now lacked a single, overarching approach to ECD. The Strategy aims to reinforce and complete existing strategies supporting ECD.

Box 2: Overview of ECD landscape in Burundi

- National Health Policy of Burundi 2016–2025
- National Health Development Plan 2019–2023
- National Plan for the Elimination of Mother-to-Child Transmission of HIV and Universal Access to Paediatric HIV Care in Burundi 2019–2022
- National Plan for Maternal, Neonatal, Child and Adolescent Reproductive Health 2019–2023
- National Plan for Nutrition 2019–2023
- Multi-Sectoral Food Safety and Nutrition Plan 2019–2023
- National Child Protection Policy in Burundi 2020–2024
- National Strategy for Preschool Education in Burundi 2018–2022
- National Social Protection Policy 2011
- National Strategy for Social Protection 20115
- National Gender Policy 2012–2025
- National School Feeding Policy
- National Decentralization Policy

Acknowledging the multitude and diversity of challenges facing young Burundian children, the ECD Strategy embodies a holistic approach to child development: an approach that creates synergies among the multidimensional components of ECD, **focusing on education, health, nutrition, child protection and WASH**. Specifically, the objective of the ECD Strategy is as follows:

«By 2027, ensure that all young children in Burundi, especially the most vulnerable, from conception to 8 years of age, reach their full potential through equitable access to quality, holistic and continuous *health, nutrition, education, protection* and *WASH* services in supportive family, community and work environments, within a common, harmonised and operational framework.»

The Strategy aims to meet its objective by prioritizing action according to five strategic pillars: (i) leadership and governance, (ii) families and community, (iii) integrated health-nutrition, education, protection and WASH interventions directed at mothers and young children, (iv) communications and advocacy and (v) monitoring and evaluation. Included in the multitude of arguments supporting funding ECD interventions, such as the importance of ECD as a human right and the expansive, population-wide health benefits, the Strategy also outlines both the rationality and the importance of ECD as an investment case.

As such, this report and the investment case provided are in strong alignment with the principles of the national ECD Strategy. First, our recommended packages encompass the four priority components of the strategy – namely, education, health, nutrition child protection and WASH. As will be described in sections to come, Package 1 focuses primarily on providing basic health care and WASH services, while Package 2 goes further to also incorporate child protection services (through the upscaling of cash transfers) and ECE. Moreover, the principles and core arguments advocating for the fundamental importance of investing in ECD are strongly aligned. Beyond the moral argument of ECD as a basic human right and the society-wide benefits that are likely to be derived – including a lower disease burden and enabling citizens to reach their full potential as happy, healthy, productive individuals – ECD

interventions make sense as investments. There is a growing body of global evidence documenting how investments in ECD offer the highest return of any human capital interventions. This study supports this argument by offering a context-specific analysis in Burundi.

2.4.2. Public spending on ECD sub-sectors[96]

Public spending on ECD in Burundi is split across different sub-sectors. Public expenditure in these areas is broadly too low to take advantage of critical returns on investment, despite a limited but growing trend in recent years in budget allocations to ECD sub-sectors. Below, we outline briefly the current levels of public expenditure on the sub-sectors relevant to ECD.

2.4.2.1. Health and nutrition

Public spending on the health (and nutrition) sector has increased in recent years. According to the 2021/22 Government of Burundi state budget, the allocation to health represents 13.6% of the total government budget. This is an increase from the 10.8% of the total budget allocated to health in 2019/20. This is a promising trend, denoting increased political prioritization of health and nutrition issues (especially within the context of the COVID-19 pandemic).

While this allocation is above the proportionate allocations of many of Burundi's neighbours, it remains below the Abuja Declaration target of 15%. The health budget is also heavily reliant on external donor resources – with 89.1% of the budget in 2020/21 coming from investments from this source. This brings concerns regarding the long-term sustainability of public health expenditure in Burundi. Further, given that Burundi's population now stands at 12.6 million, the absolute public spend on health remains worryingly low. In absolute terms, US$116.3 million is in the state budget 2020/21 for spending on health; per capita, this is just US$9.09, far below the amount needed to provide even the most basic benefit packages.[97]

2.4.2.2. Education

Burundi continues to allocate around 20% of its budget towards education, which is in line with the United Nations Educational, Scientific and Cultural Organization (UNESCO) guidelines of allocating at least 15–20% of government spending towards education.[98] Over the past four years, government allocations towards education have varied only slightly, from 20.6% in 2018/19 to 19.5% in 2020/21[99,100] and a budgeted 19.8% in 2021/21.[101] On average, budget execution bears close resemblance to forecasts. Between 2016 and 2020, the budget execution rate consistently exceeded 90%.[102,103]

Spending on preschool makes up only a small portion of the education budget. Over the 2010–2016 period (Figure 22), spending on primary education made up on average 45% of the total budget on education, which is broadly in line with the Global Partnership for Education best practice recommendation of 50%. Over the 2020–2021 period, primary and pre-primary education received 49% of the budget (Figure 23), or 176,000,946,030 BIF out of the 176,000,946,030 BIF allocated to education[104] In 2016, basic education, which welcomes 83% of total enrolments, received 47% of public resources. On the other hand, tertiary education received around 20% of the education budget – with only 2% of students enrolled. Budget allocations towards pre-primary education remain low throughout the period.[105] In 2020/21, preschool was allocated only 0.03% of the total education budget.[106] While the Burundian government is making commendable efforts in other domains of education, such as free primary schooling since 2005,[107] this does not change the fact that spending towards pre-primary education is low. In fact, it is significantly lower than UNICEF's recommendation that 10% of the education budget should go towards pre-primary education.[108]

Figure 22: Decomposition of Burundi's education budget[109]

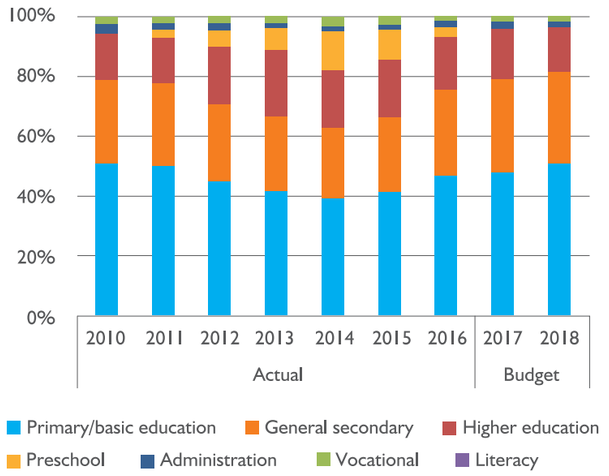
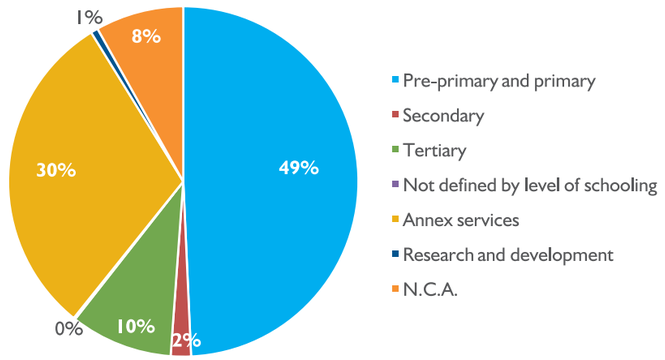
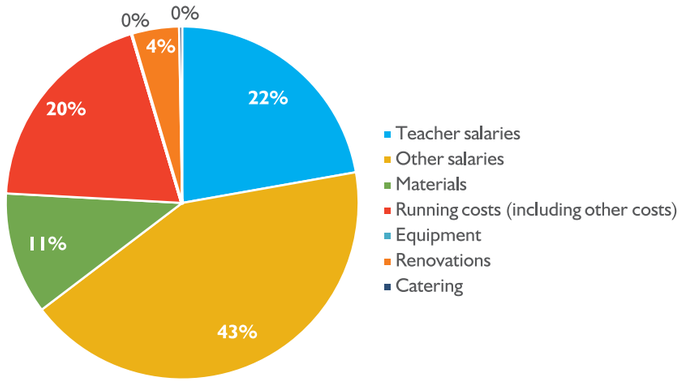


Figure 23: Education expenditure by category, 2020/21[110]



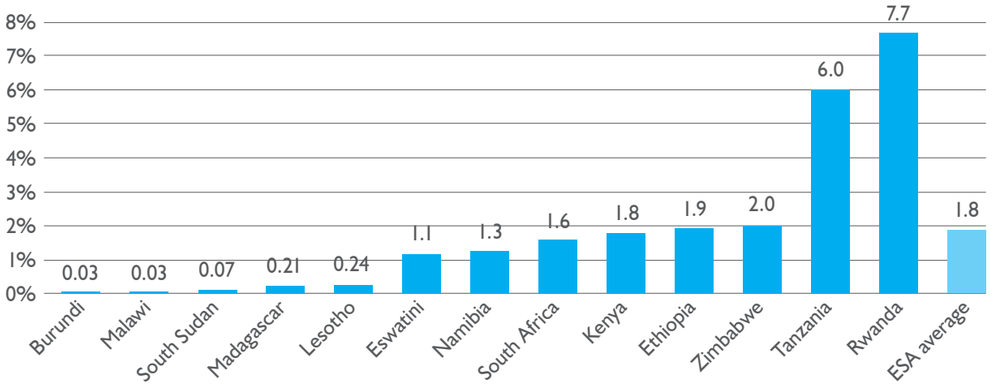
Most of the spending in the education sector is in the form of current expenditures, with low levels of investment. Between 2010 and 2018, 79% of basic education spending was on salaries, and 95% of basic education expending was on current, recurring expenditures.[111,112] Similarly, at preschool level, 65% of costs are towards salaries (Figure 24). Public investment in basic education is low, with high reliance on external aid and investment. Investment in basic education (as a portion of total basic education expenditures) increased slightly from 7% in 2010 to 25% in 2014, but has since fallen to below 5% (Figure 24).[113] In 2019/20, 2020/21 and 2021/22, investments and capital expenditure on education made up approximately 1% of the total education budget.[114,115,116] Importantly, external financing for capital expenditure in education rose substantially between 2020/21 and 2021/22, from 2,607,149,800 BIF to 27,274,090,230 BIF.[117] This is an optimistic sign, as external financing can support increases in capital spending.

Figure 24: Costs of public preschool, 2019/20[118]



Budget allocations to preschool sit at around just 0.03%.[119] This share is low compared with the average of low-income countries, which, in 2017, allocated 1.95% of the education budget to pre-primary education.[120] It also compares poorly with the Eastern and Southern African average levels of 1.8% (Figure 25).

Figure 25: Spending on preschool in selected countries, 2017 or latest available (as % of public education spending)[121]



2.4.2.3. Water, sanitation and hygiene

Public expenditure on WASH facilities is exceptionally low in Burundi and, since 2000, progress in the sector has been poor. In 2020/21, the government expects to spend just US$8.1 million on the WASH sector, which translates to just US$0.67 per capita. There has also been a proportional reduction in budgetary allocations to the sector, from 1% in 2019/20 to 0.94% in 2020/21. Given the high rates of communicable disease spread through poor WASH in the country (which particularly affects young children), this low relative and absolute spend is a real challenge for the ECD sector. Owing to underinvestment, service expansion has struggled to keep pace with population growth since the adoption of the Millennium Development Goals (MDGs), which has led to stagnant outcomes.

2.4.2.4. Social protection

Over the 2011–2020/21 period, budget allocations to social protection in real terms have increased by an average of 0.2% per year. Sawtooth allocations during this period have been witnessed. In 2020/21, the state budget is allocating US$103.8 million to social protection, representing 12.1% of the total budget. This is a marked increase from 2018/19 (equivalent to 50%), largely as a response to the need to scale up social protection measures (including cash transfers) related to the COVID-19 pandemic.

However, importantly, when looking at public social protection spending as a proportion of GDP per capita, expenditure has actually declined. In 2015, it sat at 3.87% versus just 2.93% in 2020/21. Budget allocations to the sector decreased between 2015 and 2017 and have only recently been reprioritized (although they have clearly not met earlier levels).

2.4.2.5. Child protection

Expenditure on child protection programmes is split across six different ministries, departments and agencies. This makes monitoring and coordination of child protection expenditure particularly difficult. According to Burundi's 2021 draft ECD Strategy, in 2020/21, child protection will receive US$19.4 million, representing 2.3% of the total budget. This is an increase from 2.1% in the 2019/20 budget but remains very low considering the very youthful demographics in the country, meaning that these resources are spread thinly across Burundi's large population of young children.

2.4.3. Contribution of this study

In this context, the Government of Burundi and its partners must prioritize investments in ECD if the goals of the new Strategy are to be met and the returns on investing in ECD are to be realized. Together, they will have an important role to play in advocating for the Strategy's effective implementation and ensuring it is sustainable and equitably financed. The Government of Burundi and partners face difficult decisions over where to allocate budgetary resources. Tight fiscal constraints, the COVID-19 pandemic and declining official development assistance (ODA) mean that ensuring sufficient revenues for ECD are raised will be a challenge.

This study aims to contribute to efforts to face this challenge by providing empirical evidence on the cost-effectiveness of investing in ECD. This evidence will be vital for advocacy and decision-making purposes. It will help decision-makers, in and outside of government, to appreciate the value of investments in ECD. It will clearly lay out the expected costs of implementing certain, highly effective ECD interventions that will guide stakeholders to estimate the scale of resource mobilization needed. Further, it will calculate the long-term economic and societal benefits arising from these investments. By stating these benefits in simple, quantifiable terms, it will help decision-makers understand the high levels of cost-effectiveness of ECD interventions, and their centrality to Burundi's long-term development. It will also contribute by providing tangible suggestions for locating sources of financing, which can guide decision-makers in determining how to make the new ECD Strategy a reality in Burundi.

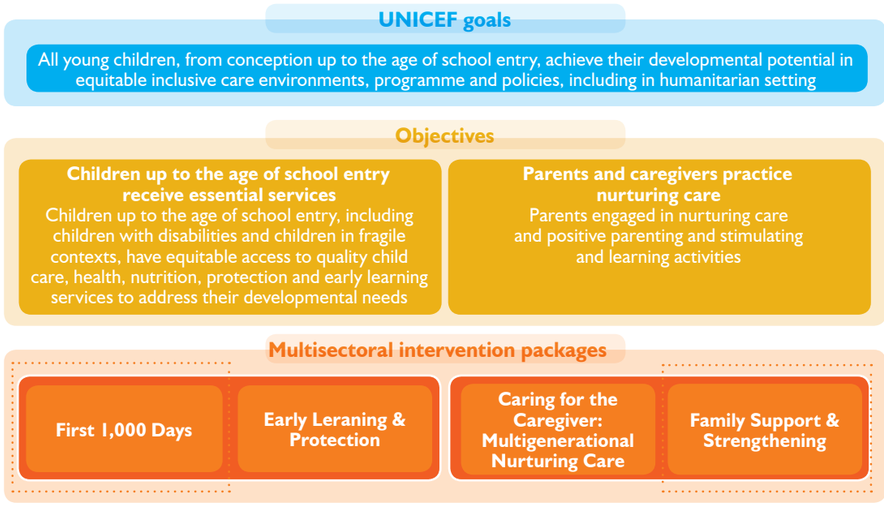
3. METHODOLOGY

This section describes the approach and methodology adopted in the cost–benefit analysis and subsequently in the construction of this investment case. It begins by discussing the creation of ECD packages (including the identification of interventions and creation of selection criteria), in Section 3.1. This is followed by an explanation of the approach taken to modelling the costs and benefits of ECD interventions (this includes describing the modelling tools used for different types of intervention), in Section 3.2. Section 3.3 details the packages selected, alongside the methodology and results of the scale-up scenarios for both of them. Finally, Section 3.4 describes the approach for undertaking the fiscal space analysis.

3.1. CREATION OF ECD PACKAGES

The multisectoral and life cycle approach packages described in the UNICEF (2017) programme guide were used as the basis for the two packages to be studied in this report.[122] To achieve the twin goals of providing essential services to young children and ensuring that their caregivers offer nurturing care, UNICEF advises that quality multisectoral interventions should be conditioned on identified gaps in the three aspects of stimulation, nutrition and protection; and included either as part of the first 1,000 days, early learning and protection, caregiver care, or family support and strengthening.

Figure 26: UNICEF'S ECD Framework (with selected packages highlighted)[123]





Two of UNICEF's package frameworks were selected – one age-specific and one non-age-specific. Based on the assessment of the four recommended packages (the four packages are shown in Figure 26), two were selected for their relevance, applicability and feasibility in the Burundian context: The First 1,000 Days and Family Support and Strengthening. Table 3 presents a summary of each of the four packages, along with the rationale for selecting The First 1,000 Days and Family Support and Strengthening.

Table 3: Description and justification of UNICEF package selection

Package	Description	Justification
The First 1,000 Days	Addresses the first 1,000 days of a child's life. Focuses on the pregnant mother, newborn and infant. Is delivered primarily within the health system by community health workers, physicians, nurses, nutrition counsellors and other professionals. Its main component is "care for child development" because it incorporates the nurturing component, the essential element for promoting child development – providing parents and primary caregivers with skills and information on early stimulation, positive interactions and emotional attachment. The package has been endorsed by UNICEF and WHO.	Selected: The first 1,000 days are the most important part of a child's life. In resource-limited settings, such as Burundi, it is strongly advised to focus on these early interventions (especially those that can build on existing infrastructure – i.e., health systems). This package will provide a more limited, but very effective, option for the study.
Early Learning and Stimulation	Addresses the next 1,000 days of a child's life. It focuses on providing services to the child. It is delivered primarily through the education system, by social workers and preschool and early childhood teachers. Helps teachers and social workers develop the skills needed to create safe, stimulating and nurturing learning environments; helps parents support the growth, development and learning of their young children.	Not selected: Interventions of this nature already included in Package 4. Not as holistic as other packages – that is, more focused on education than social protection, health, nutrition, etc.
Caring for the Caregiver: Multigenerational Support	Is not tied to a specific age of the child. Focuses on caring for and protecting the mental health and well-being of the mother and father, while building their capacity to provide nurturing care to their child. Can be implemented through community-based child care and/or social protection mechanisms. Many of the interventions are similar to the other modules. The main differences are that this package focuses on the adult, is not age-specific and is relevant to humanitarian crises.	Not selected: The interventions in this package are more focused on adults than on children, whom we wish to place at the centre of our work. They are adapted to a humanitarian context, which we consider less relevant to the Burundian context. It also shares a large number of interventions with Package 4, which was selected instead.
Family Support and Strengthening	Not tied to a specific age of the child, aims to support and strengthen the whole family as a unit. Can be implemented through community-based child protection and/or social welfare mechanisms. Involves providing essential services, skills-building and social support. These combined interventions increase the likelihood that families, especially the most vulnerable, will be better able to provide quality care for their children.	Selected. One of the two more comprehensive, non-age-specific packages. Considered to be more holistic and child- and environment-focused than Package 3. Is more extensive than Package 1 and, more importantly, covers the educational elements of Package 2.

The UNICEF package frameworks are broad and foundational and relate specifically to the Nurturing Care Framework. They include high-level prescriptions for multisectoral interventions that each cover different audiences (e.g. the child or caregiver), age groups and delivery mechanisms.

3.1.1. Identification of interventions

The second step in the creation of these packages was to identify the specific multisectoral ECD interventions, which should sit within each of these packages. A rapid literature review was conducted to provide evidence and guidance in creating selection criteria for interventions. The results of this literature were primarily intended to:

Identify potential ECD interventions and programme design:

a. Assess global best practices and UNICEF guidance on ECD package design.

b. Determine the strength and quality of evidence supporting the intervention or package.

The literature review drew on a wide range of sources. This included recently published articles, papers and studies in academic journals, government ECD strategies and policies (in developing countries, especially in East, Central and Southern Africa) and grey literature, such as UNICEF reports and guidelines. A complete list of the literature used in this review can be found in the database. Each ECD intervention identified within this literature was systematically recorded in an Excel document, categorized by sector, age group and impact. The relevance of these interventions and packages to the Burundian context was then assessed, considering the level of development of ECD service delivery platforms, as well as the burden of disease, and key challenges facing young children's growth and development.

Next, empirical evidence related to the effectiveness of interventions was explored. The assessment of the effectiveness of these interventions was based primarily on systematic literature reviews, including that published in a special edition on ECD in *The Lancet* in 2016.[124] This series of papers provides a comprehensive and up-to-date analysis of ECD interventions in six sectors – health, nutrition, education, child protection, social protection and WASH. Their review highlighted evidence-based interventions, which they recommended be implemented as multisectoral packages, targeting multiple risks, building on existing delivery platforms and applied at developmentally appropriate points in the life course.

Finally, the availability of local data related to these interventions was assessed. This included reviewing the availability of locally sourced secondary cost data that can best replace or complement the cost data from the literature review, as well as considering the feasibility of collecting primary data to fill emerging data gaps.

3.1.2. Selection criteria for interventions

Following the collection and analysis of evidence generated throughout the literature review, a selection criterion was created to justify the inclusion of different multisectoral packages of ECD interventions. Interventions were included if:

1. They aligned with UNICEF programmatic guidelines for that intervention and the Nurturing Care Framework.
2. There is evidence within the literature on the effectiveness of this intervention.
3. If it was relevant to the Burundian context based on our preliminary research on challenges facing young children, current and baseline target coverage for interventions, and discussions with stakeholders.
4. It was included or linked to Burundi's ECD Strategy 2021–2027.
5. There was sufficient data to reliably model the costs/benefits of the intervention.
6. Modelling tools were available to generate results on the costs/benefits of the intervention.

To ensure the quality of the packages and interventions, the packages were cross-checked with other similar studies and a validation process was undertaken. This included comparisons with research undertaken in Eastern or Southern Africa (e.g. Namibia 2019) and with the 2019 Adolescent Investment Package conducted in Burundi, to encourage overlap and ensure that a life cycle approach to interventions was advocated by UNICEF and its partners.

3.2. MODELLING METHODS

This section provides a detailed description of the modelling methods adopted for the investment case.

3.2.1. Overview of investment case approach

An investment case provides the evidence to evaluate the value for money of an investment to inform decision-making. In an economic evaluation framework, evidence is presented by comparing relative costs (in monetary units) to relative effects (in a quantifiable outcome measure) or benefits (in monetary units) of different projected investments. In resource-constrained systems such as in Burundi, this evidence becomes highly relevant to understanding the value of an investment in multisectoral ECD intervention packages and allows policy-makers to (i) understand the value of each package of interventions and (ii) efficiently allocate limited resources between competing interventions.

This assessment investigates both the cost-effectiveness and the cost–benefit of scaling up multisectoral ECD packages compared with a baseline scenario. The output of both the cost-effectiveness analysis (CEA) and the cost–benefit analysis (CBA) was expressed as an incremental ratio (e.g. the additional cost per extra DALY averted). Those ratios evaluate the difference (or increment) in costs and the difference in outcomes (or benefits) between the intervention scenarios and the comparator (the baseline scenario).

The baseline scenario is where the current level of investment and service provision is maintained. This means that the level of coverage in 2021 for each intervention in the packages analysed was assumed to remain unchanged over the study timeframe. Scale-up Scenario A is where the coverage increased from the 2021 baseline until reaching normative target levels in 2030, the year to meet the targets of the SDGs, followed by a maintenance phase at these target levels until 2050. Scale-up Scenario B increases baseline coverage until reaching normative target levels in 2040 to account for reduced fiscal space for interventions, followed by a maintenance phase at these target levels until 2050. Finally, Scale-up Scenario C increases coverage until reaching normative targets in 2050 to reflect reduced prioritization, constrained fiscal space and difficulty in reverting after the disruptions in revenue generation as a result of COVID-19. These scenarios are further explained in Section 3.3.2.

3.2.2. Cost-effectiveness and cost–benefit analysis

CEA and CBA are classed as full economic evaluations (as opposed to partial evaluations, which evaluate only costs or benefits). CBA and CEA allow decision-makers to compare sets of interventions in terms of value for money, so as to achieve maximum gains for the population within limited resources.

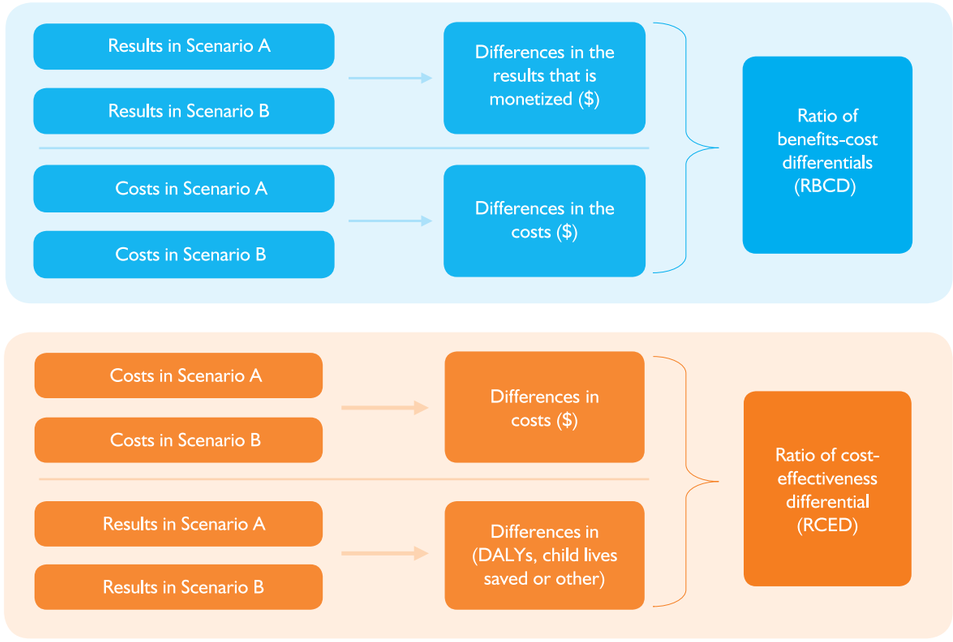
CEA is a method of economic evaluation that compares the difference in costs (in monetary units) and the difference in effects (in a quantifiable measure) between a scenario and a comparator. In the present case, the comparator of interest is the baseline scenario in which there is no increase of coverage of any of the interventions included in the packages analysed. Because many of the interventions included in the packages have direct impacts on health, we draw attention to the most frequently used health outcome: DALYs. DALYs are commonly used in the context of developing countries. A DALY is a measure of the mortality and morbidity associated with a particular condition. It is calculated as the sum of years of life lost (YLLs) owing to premature mortality and years of life with disabilities (YLDs) owing to living in a suboptimal health state as a result of a health condition or its consequences. Other effects or outcomes are used for education, like "child with high school completed." The output of a CEA is an incremental cost-effectiveness ratio (ICER) – in this case the incremental cost per DALYs averted/child with high school completed owing to increased coverage of ECD multi-sectoral packages of interventions.

CBA is similar to CEA as both identify and quantify positive and negative impacts, measured in costs and outcomes/benefits. Also, both CEA and CBA are incremental analyses – that is, they evaluate the difference (or increment) in costs and difference in outcomes between the intervention and the comparator. While CBA focuses on the dollar value of the return on investments, CEA focuses on the incremental cost to obtain an additional unit of outcome or effect.

The main difference between CEA and CBA is that, in the latter, the effects are also expressed in monetary terms. CBA monetizes the health benefits, based on the expected productivity return of children with higher levels of education and DALYs averted. Typically, the output of a CBA is expressed as a benefit–cost ratio (BCR) – that is, a ratio of the incremental monetary benefits relative to the incremental costs. Thus, a set of interventions with a BCR greater than 1 has positive net benefits. The methodology used to convert benefit into monetary terms is discussed later in Section 3.2.4.

A schematic representation of how cost-effectiveness ratios were reached for each scale-up scenario is illustrated below. The ICER shows the additional cost for every extra unit of health effect or outcome obtained. Interventions with an ICER between zero and the national threshold are usually recommended.

Figure 27: Schematic representation of the CBA (a) and CEA (b) approaches[125]



The Incremental Benefit–Cost Ratio (IBCR) highlights the additional benefit obtained in monetary value for every extra dollar (or monetary unit) spent. The ICER shows the additional cost for every extra unit of (health) effect obtained. Interventions with an IBCR >1, and/or a positive ICER (>0) that is below the agreed threshold, are usually recommended. The next section describes the CEA thresholds and methodological approach in detail.

The estimation of costs and benefits in evaluations looking at future costs and future impact requires the use of techniques that allow the researcher to project and predict the variables of costs and impact in the future in order to, then, estimate the cost-effectiveness and benefit-to-cost ratios. These involves the design of different modelling approaches, which make use of various tools and assumptions. The modelling methods for the estimation of costs and effects/benefits are presented below.

3.2.3. Components of modelling

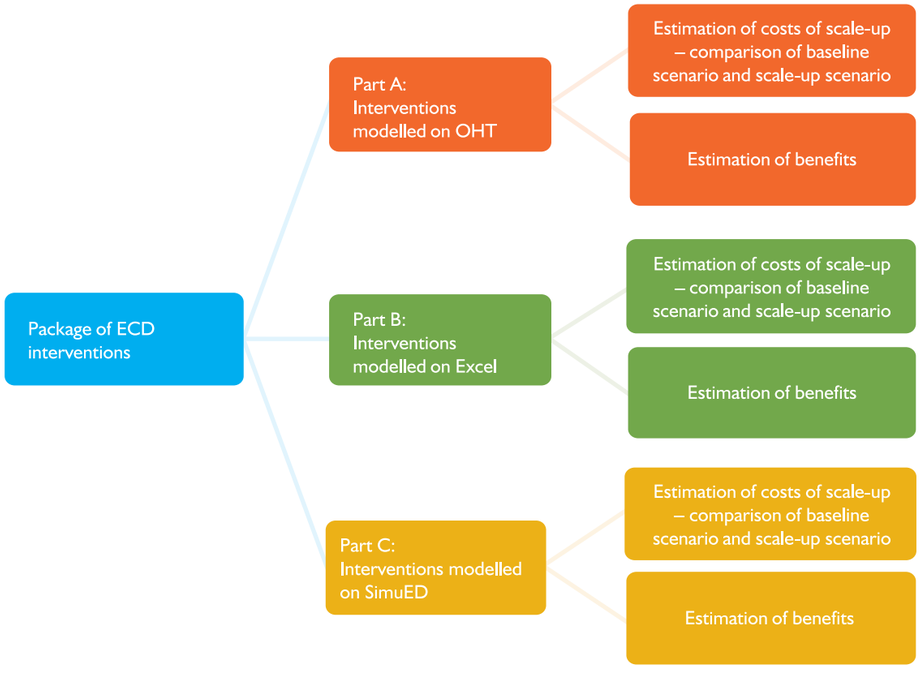
The approach used in this study employs two now well-established and internationally tested models. The models make use of the best data currently available from Burundi and, where relevant, international sources.

In brief, the modelling for the investment case is made up of three components:

1. **Modelling based on OneHealth Tool** (OHT): The model for health-related interventions is OHT, developed by the United Nations Inter-Agency Working Group on Costing.
2. **Modelling based on SimuED:** The model used for education is SimuED, which was developed by UNESCO and has been recently enhanced to include a preschool education module.
3. **Excel-based modelling:** Specific health interventions (deworming and salt iodization), as well as interventions that serve as enablers for the implementation of and access to the health and education interventions being modelled (birth registration and cash transfers), were modelled using Excel-based models developed by the authors.

This is illustrated below; the methods for each part are discussed in turn.

Figure 28: Components of the impact modelling[126]



3.2.3.2. OHT-based modelling

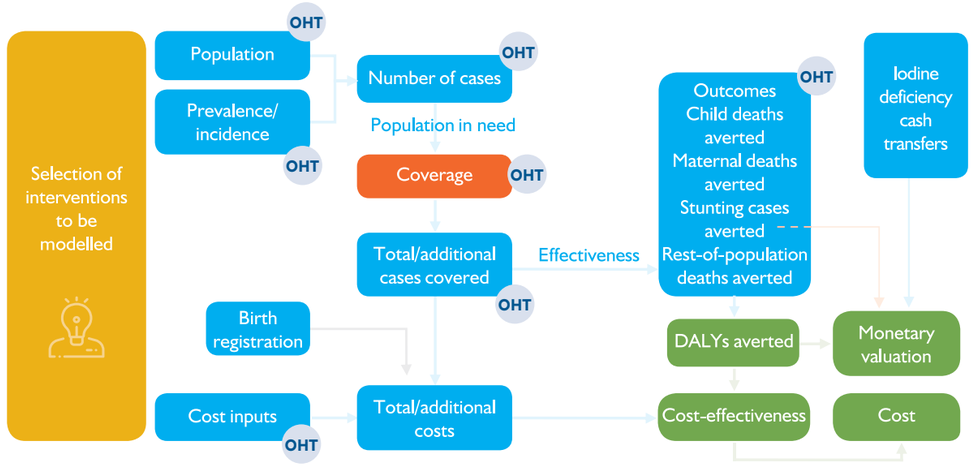
The main health model for this study is OHT (Avenir Health 2021). The development of this tool is overseen by the United Nations Inter-Agency Working Group on Costing, and it is provided as a product by Avenir Health (2019). The tool allows for modelling and estimation of health impacts and costs of a programme of interventions to improve child survival and well-being. A companion economic model estimates the economic and social benefits arising from the interventions.

OHT was configurated to model costs and benefits based on intervention targets set up by vertical programmes. These programmes were configurated in the respective modules available in OHT and included Reproductive, Maternal, Neonatal and Child Health (RMNCH); Family Planning (FP), Immunization; Nutrition; Water and Sanitation (WASH); HIV; Malaria; and Mental Health (non-communicable diseases). Each module contains a set of related interventions for which country-specific data is obtained from different validated sources. Only the interventions of interest for this assignment and for which cost and impact data was available on OHT were modelled in the tool. The version of OHT used in this study is version 6,08.

OHT software package was used to model the large majority of interventions for various reasons:

1. This is standard epidemiologic modelling software that is widely used by leading development organizations and decision-makers.
2. It uses up-to-date and robust evidence on the effectiveness of interventions on health outcomes.
3. It allows researchers to model the health impacts of increasing coverage of interventions over time, consistent with scale-up plans that are relevant to decision-makers.
4. Most of the interventions recommended for ECD with robust evidence of effectiveness are included. In addition, OHT provides a consistent framework to jointly assess the impact of altering the coverage levels of multiple interventions at the same time.
5. Finally, by using OHT, results will be methodologically and empirically comparable to the investment frameworks in child's health and well-being in other Sub-Saharan African countries (Uganda 2013; Namibia 2019; South Africa 2016).[127]

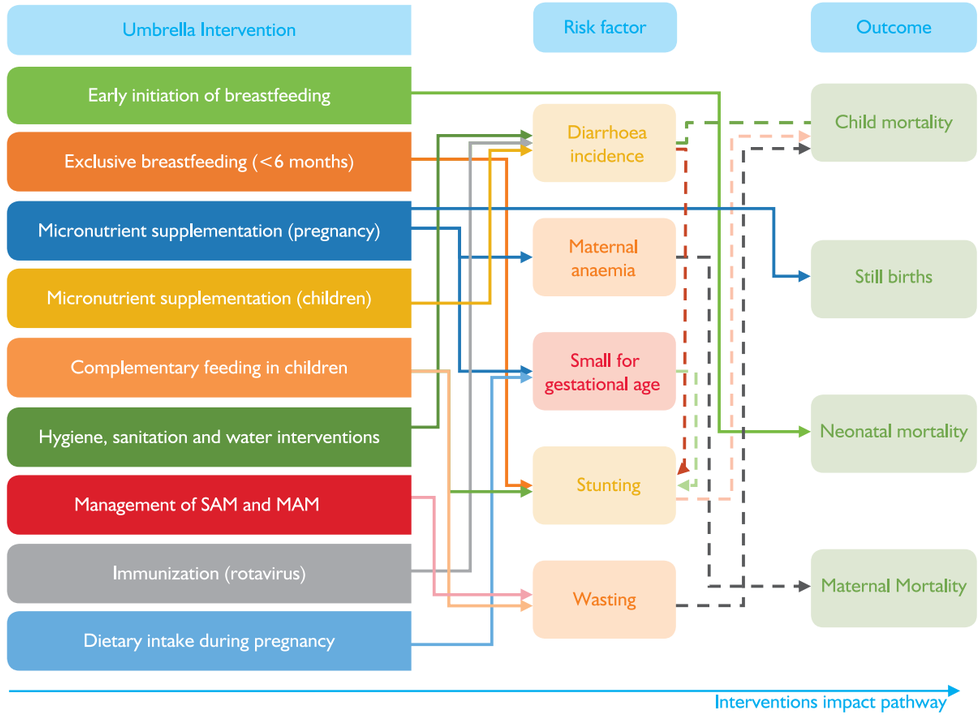
Figure 29: Summary of the approach used for the economic evaluation (CEA and CBA) in the current study for health interventions[128]



Several steps were followed to conduct the modelling on OHT. These are presented graphically and described below.

1. The interventions contained in the packages identified as relevant for Burundi were compared with interventions available in OHT. This informed the identification of the interventions that could be modelled with the software. Some interventions matched those in the modules available, but for others we identified appropriate proxy indicators. The specific interventions are detailed in Section 3.3.
2. Data was then updated in OHT. This involved checking the data available in OHT for health status, mortality and economic status in Burundi. This was confirmed or edited according to trusted external sources. Second, baseline data available in OHT was compared against the baseline data collected for each of the interventions in earlier phases of the study and validated with national stakeholders. Data sources utilized included Institute of Statistics and Economic Studies of Burundi (ISTEEBU) data on population, the World Population Prospects database (WPP 2019), Burundi Demographic Health Survey (DHS 2017) and UNICEF's Nutridash 2.0., complemented with key informant interviews in Burundi.
3. Next, the software was provided with specific scenarios in which the coverage of the interventions of interest gradually increases or is maintained over a given timeframe. These coverage levels are the key input parameters in OHT. When coverage levels of the interventions change, incidence and prevalence of the associated diseases/conditions will also change over time as a result.
4. Country-specific incidence and prevalence rates of the related conditions/diseases are available in the OHT software. These incidence/prevalence rates are combined with the projected population of Burundi in OHT to estimate the number of cases of health conditions (e.g. child stunting, maternal anaemia) at baseline. Therefore, interventions affecting the population growth and demographic projections, like family planning to reduce the contraceptive prevalence rate, have an impact on the number of cases that will result from other interventions.
5. Based on the effectiveness[129] of the interventions modelled, the health impact of increased coverage was estimated using the relevant module in OHT. RMNCH was modelled in Lives Saved Tool (LiST), Family Planning in FamPlan, HIV/AIDS in AIM, Malaria in the Malaria Module and perinatal depression in the NCD Module. The health impact was calculated for each of the packages of interventions analysed. Interventions were assumed to be implemented simultaneously. This is to avoid double-counting of the health benefits of interventions with the same impact pathway (e.g. breastfeeding promotion and complementary feeding supplementation). An example of the interlink between these pathways and the risk factors the interventions attenuate, and through which they exert their effect, is depicted below. The health impact was captured in terms of the following: child deaths averted, maternal deaths averted, stunting cases averted, HIV/AIDS-attributable deaths averted and malaria-attributable deaths averted.
6. We used these outputs (health impacts) derived from OHT to estimate DALYs averted. DALYs is a frequently used outcome in health economic evaluations that measures YLLs owing to premature death and YLDs owing to a health condition or its consequences. Additional assumptions to calculate DALYs consisted of standard life expectancy at age of death, the cause of death- and age-specific YLD/YLL ratio derived from the latest Global Burden of Disease 2019 database and application of a 12% discount rate. (See Annex for an explanation of the calculation of DALYs.)
7. The promotion of salt iodization is not included in the LiST software. Hence, health impacts and DALYs are not calculated for this intervention. Some investment case studies focusing on child nutrition (Eberwein et al., 2016a; Eberwein et al., 2016b) include only the cost of this intervention and ignore the benefit aspect. This study went further and estimated the productivity gains via increased future earnings for the cases of iodine deficiency avoided in children under five (Aburto et al., 2014).
8. Next, an incremental analysis was conducted – that is, additional DALYs averted owing to an increase in coverage of interventions in each scale-up scenario were calculated in comparison with the business-as-usual (baseline) scenario.
9. For the cost side, we used a combination of existing unit costs, mainly from the LiST Costing Tool and OHT costing, as well as costs derived from the international literature for Sub-Saharan Africa (for salt iodization and the cost of deworming) and from Burundi (cost of birth registration). Costs obtained from the LiST Costing Tool were transferred to an Excel file and shared with country stakeholders for validation. No adjustments were required. Next, incremental costs were estimated – that is, the difference in intervention-related costs between the scale-up scenario under investigation and the business-as-usual scenario.
10. Next, cost-effectiveness results were reported as incremental cost per DALY averted for the scenarios under investigation compared with business-as-usual. Additional cost-effectiveness results included incremental cost per child life saved and cost per stunting case averted.
11. Next, DALYs and cases averted were converted into monetary values using the approach discussed. Monetary gains were also estimated for the increase in coverage of salt iodization promotion.
12. Finally, IBCRs were estimated as part of a CBA to report the incremental dollar value gained per incremental dollar cost of each scenario under investigation.

Figure 30: Interlinks between the impact pathways of a set of interventions available in LiST[130]



Using the methods above, health, mortality and economic data, baseline data and coverage levels were updated, also taking into account the scale-up scenarios. Inputs and results from the baseline scenario and the scale-up scenarios were kept on file, allowing comparison of the impact results across the three. Results were generated according to the outputs of interest from OHT and were transferred to Excel for additional analysis.

3.2.3.3. Education modelling in SimuED

The modelling of ECE was conducted on SimuEd. Originally launched in 2019 by UNESCO, SimuEd is an Excel-based simulation model providing users with built-in modules to guide data-driven decision-making in education planning. The version used in this study is SimuEd3.0.[131] SimuEd was configured to estimate the costs and benefits of the three scale-up scenarios considered to increase GERs over time. Specifically, these are to scale up GER to 90% in 2030, 2040 or 2050.[132] These are also compared with a base scenario, where enrolment remains constant over the timeframe considered.

SimuEd was chosen to model the preschool component of Package 2 for many reasons, including:

1. SimuEd contains over 100 built-in modules that facilitate computing costs and running projections.
2. These modules allow users to input population data, learner data (including pupils per year, repeaters and drop-outs), distributions across private or public school systems, teacher data, costs information and financing data.
3. The interface enables users to select modules and input data without having to modify the built-in formulas.
4. SimuEd allows for projections across the entire education system – from preschool up to tertiary education.
5. Users are able to describe the country-specific education system, allowing for detailed mapping of possible education paths throughout the schooling career.

The steps that were taken to model the education data follow the layout of the SimuEd interface:

1. As a first step, SimuEd allows users to describe the structure of the education system and specify the transitions between each level of schooling. The structure of the Burundian education system was described and illustrated diagrammatically, sourced from the *Annuaire statistique scolaire 2019–2020*.[133]
2. Next, yearly population estimates are inserted for the relevant timeframe. These are decomposed by gender with yearly age brackets (i.e., age 0, age 1, age 2, etc.). Five-year age brackets were sourced from the WPP 2019[134,135] and decomposed into yearly brackets using the Spragues multiplier.[136] Separate models were run for the different populations that are predicted in accordance with the contraception interventions in OHT.
3. Base year education data was included using the *Annuaire statistique scolaire 2019–2020*. This data is decomposed across phases in the education system (preschool, foundational and post-foundational schooling), gender and institution type (public or private). Additionally, number of teachers and class sizes were included.
4. SimuEd's modules S21 and S24 were used to calculate the GERs for each level of schooling and the distribution of children across the institutions. As illustrated, almost a third of children who are in preschool are in the private sector. It is expected that the majority of the preschool sector expansion will be provided by the public sector. The distribution across institutions is important as it influences total costs of providing universal access to schooling.
5. Personnel were included in the form of the number of teachers per institution.[137]
6. SimuEd's module C50 was used to incorporate unit costs per student for the different cost types (including salaries, renovations, equipment and running costs, among others), according to types of institution.[138] The baseline data was provided by the *Annuaire statistique scolaire* 2019–2020.
7. SimuEd's financing sheet allowed for the inclusion of macro-economic data (such as GDP and GDP growth rate) and state budget for education. In this sheet, the total costs are projected.[139]
8. Finally, scenarios were run according to the different GERT targets (achieving 90% GER in 2030, 2040 and 2050 – as well as a baseline scenario) and the different economic growth paths provided by the NDP.

3.2.3.4. Excel-based modelling

The majority of interventions for which robust evidence of treatment effects on health outcomes is available can be modelled directly in OHT or have appropriate proxy indicators available. However, there were two groups of interventions that were not included in OHT or SimuED but were included in the packages selected for Burundi. These groups of interventions were:

Health-related interventions for which robust evidence of directly improving child early development exists. These included mass deworming and promotion of salt iodization.

Enabling interventions – that is, interventions that improve child health and education outcomes by facilitating or enabling access to them. These included cash transfers and birth registration.

For these interventions, an Excel-based model was used to estimate the impact of increasing coverage. A standard approach used in previous investment case studies was followed for salt iodization and deworming, focused on modelling the impact pathway of the intervention in terms of economic benefits derived from the improved outcomes in children resulting from the intervention. The methodology that is followed is to build an Excel-based model that relates population, coverage, impact and effectiveness or monetized benefits.

Regarding enabling interventions, the modelling approach varied by intervention. In the case of birth registration, only costs were modelled and included in the analysis. The rationale for this is that birth registration increases access to public basic services for children, the impact of which was already modelled when scaling up coverage of the related interventions. Regarding cash transfers, no direct impact of cash transfer on nutritional status and health was modelled. The rationale for this is that cash transfers exert their effect by increasing household consumption of goods and services related to the health and education interventions already scaled up and estimated through OHT-, SimuED- or Excel-based modelling. Therefore, the impact of cash transfers included in this analysis considers only the multiplier effect on consumption resulting from increased household income, which in turn increases demand of goods and services, increasing finally overall economic output as described by Cummins et al. (2021). Two types of cash transfer programmes were modelled: (i) expansion of the current unconditional cash transfer available in Burundi (Merankabandi), in which households living under the national poverty line and with children below 12 years old are eligible (current coverage estimated at 3.3%, annual transfer value of 240,000 BIF); and (ii) unconditional cash transfer proposed by Cummins et al. (2021) in which all children under five are granted a transfer (estimated current coverage of 3%, annual transfer value of 20% of gross national income (GNI)).

There is no standard way of carrying out these calculations in practice, thus the model was constructed on a case-by-case basis. To model these interventions, we defined the following aspects:

- **Target group reached by the intervention –** that is, the eligible population of interest expected to get the intervention, in this case, all households are expected to get the intervention, but children under five are expected to obtain the benefits derived from it.
- **Prevalence/incidence** of the health condition associated with the intervention – that is, iodine deficiency. This was estimated from the Global Burden of Disease (GBD) database (2019), which reports the number of children under five years with iodine deficiency in 2019. Incidence of cases was estimated by dividing the GBD estimate by the population of children under five in the same year (estimated incidence of 0.06%).
- **Treatment effectiveness –** that is, the relative change in the prevalence or incidence of the condition associated with the intervention (i.e., percentage increase in cognitive development associated with the micronutrient deficiency). The effectiveness estimate was obtained from the international literature; specifically, it was based on the relative risk (RR) of low intelligence for children under five exposed to iodine deficiency as reported by Aburto et al . (2014) (1-RR = 0,72).
- **The total cost of the intervention.** The total cost of the interventions was drawn from the LiST Costing Tool and OHT. The costs components were shared before running the analysis with relevant stakeholders for validation purposes. Also, costs for education were derived from Burundi budget information and budget briefs released by local institutions and development partners (UNICEF and ISTEEBU).

All benefits and costs derived from the Excel-based calculation were also expressed in the form of additional terms – that is, they were compared with a baseline (business-as-usual scenario). Thus, the cost-effectiveness and benefit-cost metric was evaluated in ICERS and IBCRs, respectively, as shown below.

$$\text{Incremental cost – effectiveness ratio} = \frac{\text{(Additional costs of the intervention)}}{\text{(Additional \#of cases prevented with the intervention)}}$$

$$\text{Incremental benefit – cost ratio} = \frac{\text{(Additional benefits associated to the \# of cases prevented)}}{\text{(Additional costs of the intervention)}}$$

The impact of the heath-related interventions was estimated from evidence collected through a desk-based search to obtain an effectiveness estimate. For example, salt iodization reduces iodine deficiency, and iodine deficiency is associated with causing cognitive impairment, which is then associated with a reduction in lifetime earnings. Monetized benefits were calculated using a discount factor of 12%. Details of the specific methodology for the modelling of these interventions using Excel can be found in the Annex.

3.2.4. Monetization of benefits

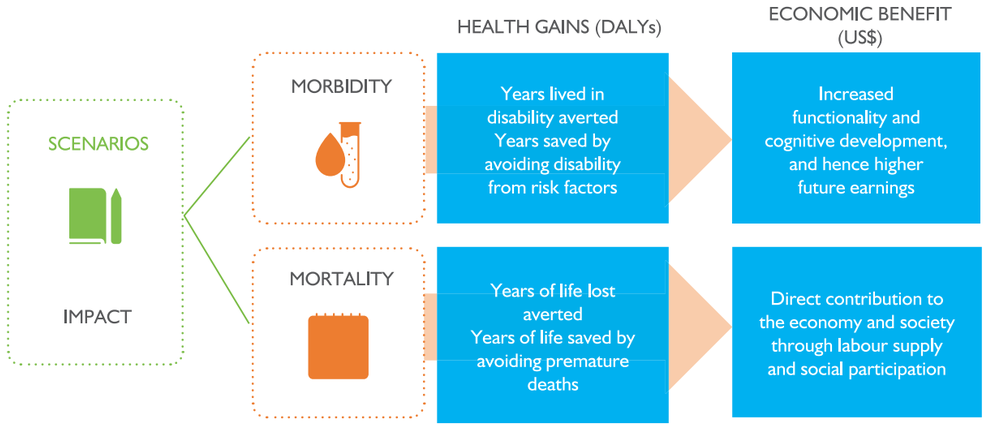
A CBA is based on the principle that outcomes have a monetary value that is based on what society is willing to pay for improvements in life expectancy and quality of life. In this sense, we make use of the approaches and assumptions in the literature to estimate a monetary value of the outcomes derived from the model – that is, DALYs, maternal deaths and child lives saved. Figure 31 shows the different mortality and morbidity sub-components for which health (in the form of DALYs averted) and economic gains (in monetary values) are calculated.

For the mortality side, mortalities averted were expressed in monetary benefits by converting lives saved into a productivity contribution to society. To estimate this, a monetary value of 1.5 times GDP per capita is assigned to each life-year saved (e.g. DALY averted) in the period 2022–2050, based on the results of a recent return investment study of maternal and child health interventions (Stenberg et al., 2014). The value of 1.5 times GDP per capita corresponds to an average benefit of 1 time GDP per capita for the direct contribution to the economy through increased labour supply and productivity, while the value of 0.5 times GDP per capita corresponds to the social contribution made by the person whose life was saved (Stenberg, 2014).

For the morbidity side, child stunting, iodine deficiency cases prevented and increased years of education and completion rates for high school resulting from preschool education were similarly translated into benefits in terms of increased future earnings via gains in productivity and improvements in cognitive development. In the case of child stunting, this was done based on Hoddinnott et al. (2013), Hoddinott et al. (2011), and Horton and Ross (2003) . In the case of education, this was estimated from the increased in earning reported by Heckman et al. (2006) . In addition, the morbidity-related gain from improving child and maternal health is also translated into monetary benefits by giving a social value of 0.5 times GDP per capita (Stenberg, 2014) to each life-year saved.

Lastly, this study also estimates the productivity gains from avoiding iodine deficiency in under-five children owing to the promotion of salt iodization and deworming. For the former, productivity gain estimation is based on a study (FSANZ, 2006) that estimates an association between iodine deficiency case and cognitive impairment (based on Santiago-Fernandez et al., 2004 and Aburto et al., 2014), leading to reduced lifetime earnings. For deworming, treatment effectiveness was derived from Moser et al. (2017),[141] a meta-analysis on the efficacy of recommended drugs against soil-transmitted helminths, and DALYs were converted into monetary benefits following the "value of a statistical life" described by Stenberg et al. (2014) and explained in the previous paragraph. The formulas used for all the components of the economic valuation are explained in the Annex.

Figure 31: Approach to the valuation of DALYs in terms of economic gains



3.3. PACKAGES AND SCENARIOS MODELLED FOR THE INVESTMENT CASE

The investment case evaluates the difference in costs and benefits (or outcomes) between a scale-up scenario(s) and the baseline situation for two packages of interventions. In line with other investment cases, the baseline (business-as-usual) scenario is a situation in which the current level of investment and service provision is maintained – that is, the current level of coverage (the last year with available data) for each intervention will remain unchanged over the study timeframe.

The following section discuses the selected multisectoral packages in detail. The methods for selecting the two packages, and the interventions within them, were described in detail in Section 3.1. Each package is briefly covered, alongside a justification of its relevance in the Burundian context. This is followed by a table containing all the specific interventions not covered that were deemed relevant to ECD in Burundi, along with those selected for each individual package.

It is important to note that some interventions have been changed since the inception report. These changes were mainly motivated by the existence of overlaps between interventions (e.g. two very similar interventions modelled may lead to double-counting of costs and benefits) or a lack of data or relevance in the Burundian context (e.g. if an intervention was too vague and is not currently an ECD priority in the country, which would lead to a reduction in the usefulness of the study), or may have arisen if additional evidence emerged regarding the relevance of a certain intervention in Burundi. When changes to the packages were necessary, we communicated directly with UNICEF and the technical committee the reasons for these.

3.3.1.1. The First 1'000 Days

Based on the first of UNICEF's recommended ECD packages, The First 1,000 Days focuses its multisectoral interventions on optimizing this most important window of opportunity in a young child's life. Beginning at conception, this package aims to provide a safe and secure environment conducive to a child's holistic development. It focuses on the pregnant mother, newborn and young child and is delivered primarily through the health system – often by community health workers, doctors, nurses and nutrition counselors. By building on pre-existing implementation and service delivery structures, it makes this package attractive in low-resource settings and in settings where ECD-specific services are nascent. Table 4 lists the specific interventions selected.

Table 4: Package 1 – The First 1,000 Days – interventions[142]

Active management of third stage of labour	Manual removal of placenta
Antenatal corticosteroids	Maternal sepsis management
Antibiotics for preterm labour	Measles vaccine
Antibiotics for treatment of dysentery	Neonatal resuscitation
Assisted vaginal delivery	Newborn sepsis – injectable antibiotics
Balanced energy supplementation	Oral rehydration solution (ORS) – treatment of diarrhoea
BCG vaccination	Paediatric antiretroviral therapy (ART)
Breastfeeding counselling and support	Parenteral administration of antibiotics
Clean birth environment	Piped water
Clean cord care	Prevention of mother-to-child transmission (PMTCT) of HIV/AIDS
Complementary feeding – education only	Pneumococcal vaccine
Complementary feeding – supplementary feeding and education	Pneumonia treatment (children)
Consumption of iron-fortified foods	Polio vaccine
Contraceptive prevalence rate (birth intervals)	Psychosocial care for perinatal depression
C-section	Removal of retained products of conception
Daily iron and folic acid supplementation	Rotavirus vaccine
Deworming in children	Salt iodization
Diabetes case management in pregnancy	Severe case management of malaria
DPT vaccine	Syphilis detection and treatment (pregnant women)
Handwashing with soap	Tetanus toxoid
Hib vaccine	Thermal protection
Hygienic disposal of children's stools	Treatment of moderate acute malnutrition (MAM) in children
Hypertensive disorder case management	Treatment of severe acute malnutrition (SAM) in children
Immediate drying and additional stimulation	Uncomplicated case management of malaria
Improved excreta disposal (latrines/toilets – basic sanitation)	Vitamin A for measles (children)
Insecticide-treated nets	Vitamin A supplementation for children 6–59 months
Management of pre-eclampsia and eclampsia (magnesium sulphate)	Zinc treatment for diarrhoea

3.3.1.2. Family Support and Strengthening

The second package we propose to examine in this study is Family Support and Strengthening, the last of the ECD packages recommended by UNICEF. It differs from the previous package, The First 1,000 Days, in that it is not tied to a specific age of the child and covers the entire early childhood period (defined here as including children up to age eight). In addition, it takes a more holistic approach to care, focusing on strengthening and supporting the whole family as a unit, rather than looking solely at the infant. This programme is based on the premise that, for parents and caregivers to provide the nurturing care that is essential for their children's healthy development (including before conception), they themselves must be supported and equipped to do so.

The package takes a multisectoral, life cycle approach to social service provision – it is built around the need to ensure that all have access to essential services, that mechanisms are in place to develop key skills and that social supports are in place to protect families. It has the potential to significantly benefit the most vulnerable and complements the intervention packages recommended in the recent adolescent study. This package can be delivered through community services and social protection mechanisms, making it feasible within the Burundian social sector.

Package 2 includes all of the same interventions as Package 1; however, it also entails early learning, as well as safety and security interventions. For this reason, it is particularly relevant, as it focuses on all aspects of the nurturing care environment, including preschool education. As preschool education is a central priority in Burundi's emerging ECD Strategy, it is important that this study emphasize the centrality of providing quality child care (whether formal or informal) to improve children's development and learning.

We propose to divide our analysis of this package into three sub-packages: Health and Nutrition; Early Learning; and Safety and Security. When presenting our results, we provide evidence of the cost-effectiveness of this package, as well as the breakdown of our results in each of these sub-packages. The specific interventions selected for this package are shown below in Table 5.

Table 5: Package 2 – Family Support and Strengthening – interventions[143]

Health and Nutrition	
Active management of third stage of labour	Manual removal of placenta
Antenatal corticosteroids	Maternal sepsis management
Antibiotics for preterm labour	Measles vaccine
Antibiotics for treatment of dysentery	Neonatal resuscitation
Assisted vaginal delivery	Newborn sepsis – injectable antibiotics
Balanced energy supplementation	ORS – treatment of diarrhoea
BCG vaccination	Paediatric ART
Breastfeeding counselling and support	Parenteral administration of antibiotics
Clean birth environment	Piped water
Clean cord care	PMTCT of HIV/AIDs
Complementary feeding – education only	Pneumococcal vaccine
Complementary feeding – supplementary feeding and education	Pneumonia treatment (children)
Consumption of iron-fortified foods	Polio vaccine
Contraceptive prevalence rate (birth intervals)	Psychosocial care for perinatal depression
C-section	Removal of retained products of conception
Daily iron and folic acid supplementation	Rotavirus vaccine
Deworming in children	Salt iodization
Diabetes case management in pregnancy	Severe case management of malaria
DPT vaccine	Syphilis detection and treatment (pregnant women)
Handwashing with soap	Tetanus toxoid
Hib vaccine	Thermal protection
Hygienic disposal of children's stools	Treatment of MAM in children
Hypertensive disorder case management	Treatment of SAM in children

Table 5 (cont.)

Health and Nutrition	
Immediate drying and additional stimulation	Uncomplicated case management of malaria
Improved excreta disposal (latrines/toilets – basic sanitation)	Vitamin A for measles (children)
Insecticide-treated nets	Vitamin A supplementation for children 6–59 months
Kangaroo mother care	Zinc (diarrhoea treatment)
Management of pre-eclampsia and eclampsia (magnesium sulphate)	
Early Learning	
Pre-primary education	
Safety and Security	
Birth registration	Unconditional cash transfers

3.3.2. Scale-up scenarios

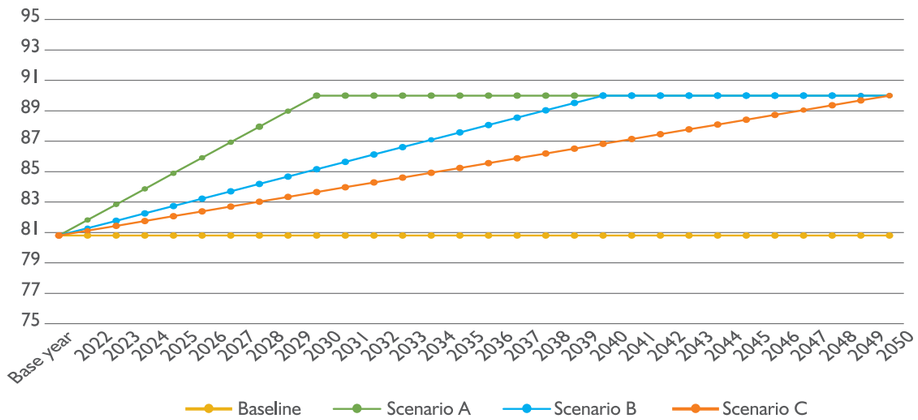
For each package, a series of scenarios were evaluated to account for different challenges that may take place during the implementation of the packages/interventions. As the year for meeting the international targets of the Agenda for Sustainable Development is 2030, the most ambitious scenario (Scenario A) proposed achieving a normative level of coverage levels (i.e. normative target coverage) in 2030. However, to account for more realistic scenarios, a total of three scale-up scenarios were proposed, and adopted. These are presented below.

A **Scale-up Scenario A:** Increase baseline coverage until reaching normative target levels from 2022 to 2030, followed by a maintenance phase at 2030 target levels until 2050. This is aligned with the Agenda for Sustainable Development.

B **Scale-up Scenario B:** Increase baseline coverage until reaching normative target levels in 2040 to account for reduced fiscal space for interventions. Coverage will increase in linear increments from 2022 to 2040, followed by a maintenance phase until 2050.

C **Scale-up Scenario C:** Increase baseline coverage until reaching normative target levels from 2022 to 2050 to account for reduced fiscal space and difficulty in reverting the disruptions in the public system owing to COVID-19. Coverage will increase in linear increments.

Figure 32: Example of scenarios for scaling up exclusive breastfeeding among children below 6 months[144]



3.3.3. Coverage rates of interventions

This section outlines the respective coverage targets for each scenario analysed. These are presented in the tables below. The coverage levels represent the percentage of the population in need – that is, the population requiring the intervention – being covered or with access to each intervention. These coverage levels are presented in the tables; the Annex presents the population in need addressed.

Table 6: Baseline scenario, coverage percentage by year

Intervention	Base year	Year										
		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Active management of third stage of labour	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0
Antenatal corticosteroids	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9
Health facility delivery	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9
Antenatal care 4 visits	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7
Antibiotics for preterm labour	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8
Antibiotics for treatment of dysentery	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9
ART coverage	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0
Assisted vaginal delivery	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2
Balanced energy supplementation (ANC4)	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0
BCG vaccine	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0
Blood transfusion (labour)	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6
Breastfeeding counselling	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8
Clean birth environment	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8
Clean cord care	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1
Complementary feeding - education only	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5
Complementary feeding - supplementary feeding and education	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5
Consumption of iron-fortified foods	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0
Contraceptive prevalence rate (birth intervals)	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4
Cotrimoxazole (children)	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
C-section	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8
Daily iron and folic acid supplementation (pregnant women)	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0
Diabetes case management (ANC4)	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5
Pentavalent (DPT, Hingb, HebB) 3 doses	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0
Handwashing with soap	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8
Hib vaccine	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0
Hygienic disposal of children's stools	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7
Hypertensive disorder case management	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2
Immediate drying and additional stimulation	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9
Improved excreta disposal (latrine/toilets)	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0
Induction of labour (beyond 41 weeks)	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1
Insecticide-treated nets (pregnant women)	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8
Intermittent preventative therapy (pregnant women)	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5

Year																		
2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0	75,0
78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9	78,9
83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9
50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7	50,7
62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8
32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9	32,9
61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0	61,0
21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2	21,2
48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0
92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0	92,0
10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6	10,6
80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8	80,8
68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8	68,8
80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1	80,1
18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5
18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5	18,5
14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0	14,0
22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4	22,4
100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8	41,8
48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0
9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5	9,5
91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0
43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8	43,8
91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0
73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7	73,7
12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2	12,2
76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9	76,9
52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0	52,0
34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1	34,1
46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8	46,8
24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5	24,5



Table 6: Baseline scenario, coverage percentage by year *(cont.)*

Intervention	Base year	Year										
		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Kangaroo mother care	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0
Management of pre-eclampsia and eclampsia (magnesium sulphate)	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0
Manual removal of placenta	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4
Maternal sepsis management	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0
Measles vaccine (1 dose)	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0
Measles 2	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5
Neonatal resuscitation	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2
Newborn sepsis - injectible antibiotics	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9
ORS treatment of diarrhoea	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6
Paediatric ART	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0
Parenteral administration of antibiotics	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8
Piped water	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0
PMTCT	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0
Pneumococcal vaccine	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0
Pneumonia treatment (children)	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5
Polio vaccine	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0
Psychosocial care for perinatal depression	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0
Removal of retained products of conception	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8
Rotavirus vaccine	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0
Severe case management coverage of malaria	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0
Syphilis detection and treatment (pregnant women)	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7
Tetanus toxoid	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Thermal protection	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0
Treatment of MAM in children	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0
Treatment of SAM in children	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6
Uncomplicated case management malaria	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1
Vitamin A for measles treatment (children)	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0
Vitamin A supplementation in children 6–59 months	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0
Salt iodization	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4
Mass deworming among children 0–4 years	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8
Birth registration	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5
Cash transfers	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3
Preschool education	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8

Year																		
2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0	80,0
60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0
31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4
51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0	51,0
45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0
41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5	41,5
46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2	46,2
83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9	83,9
35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6	35,6
25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0
62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8	62,8
34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0
69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0	69,0
91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0
58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5	58,5
91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0
10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0
27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8	27,8
91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0	91,0
48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0	48,0
24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7	24,7
90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0	83,0
78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0	78,0
82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6	82,6
61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1	61,1
89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0
89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0	89,0
89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4	89,4
90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8	90,8
83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5	83,5
3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3
10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8	10,8

Table 7: Scale-up for Scenario A, coverage percentage by year

Intervention	Base year	Year										
		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Active management of third stage of labour	75,0	76,7	78,3	80,0	81,7	83,3	85,0	86,7	88,3	90,0	90,0	90,0
Antenatal corticosteroids	78,9	80,1	81,4	82,6	83,8	85,1	86,3	87,5	88,8	90,0	90,0	90,0
Health facility delivery	83,9	84,6	85,3	85,9	86,6	87,3	88,0	88,6	89,3	90,0	90,0	90,0
Antenatal care 4 visits	50,7	55,1	59,4	63,8	68,2	72,5	76,9	81,3	85,6	90,0	90,0	90,0
Antibiotics for preterm labour	62,8	65,8	68,8	71,9	74,9	77,9	80,9	84,0	87,0	90,0	90,0	90,0
Antibiotics for treatment of dysentery	32,9	39,2	45,6	51,9	58,3	64,6	71,0	77,3	83,7	90,0	90,0	90,0
ART coverage	61,0	64,2	67,4	70,7	73,9	77,1	80,3	83,6	86,8	90,0	90,0	90,0
Assisted vaginal delivery	21,2	28,8	36,5	44,1	51,8	59,4	67,1	74,7	82,4	90,0	90,0	90,0
Balanced energy supplementation (ANC4)	48,0	52,7	57,3	62,0	66,7	71,3	76,0	80,7	85,3	90,0	90,0	90,0
BCG vaccine	92,0	92,3	92,7	93,0	93,3	93,7	94,0	94,3	94,7	95,0	95,0	95,0
Blood transfusion (labour)	10,6	19,4	28,2	37,1	45,9	54,7	63,5	72,4	81,2	90,0	90,0	90,0
Breastfeeding counselling	80,8	81,8	82,8	83,9	84,9	85,9	86,9	88,0	89,0	90,0	90,0	90,0
Clean birth environment	68,8	71,2	73,5	75,9	78,2	80,6	82,9	85,3	87,6	90,0	90,0	90,0
Clean cord care	80,1	81,2	82,3	83,4	84,5	85,6	86,7	87,8	88,9	90,0	90,0	90,0
Complementary feeding - education only	18,5	26,4	34,4	42,3	50,3	58,2	66,2	74,1	82,1	90,0	90,0	90,0
Complementary feeding - supplementary feeding and education	18,5	26,4	34,4	42,3	50,3	58,2	66,2	74,1	82,1	90,0	90,0	90,0
Consumption of iron fortified foods	14,0	22,4	30,9	39,3	47,8	56,2	64,7	73,1	81,6	90,0	90,0	90,0
Contraceptive prevalence rate (birth intervals)	22,4	25,5	28,5	31,6	34,7	37,7	40,8	43,9	46,9	50,0	50,0	50,0
Cotrimoxazole (children)	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
C-section	41,8	47,2	52,5	57,9	63,2	68,6	73,9	79,3	84,6	90,0	90,0	90,0
Daily iron and folic acid supplementation (pregnant women)	48,0	52,7	57,3	62,0	66,7	71,3	76,0	80,7	85,3	90,0	90,0	90,0
Diabetes case management (ANC4)	9,5	18,4	27,4	36,3	45,3	54,2	63,2	72,1	81,1	90,0	90,0	90,0
Pentavalent (DPT, Hingb, HebB) 3 doses	91,0	91,4	91,9	92,3	92,8	93,2	93,7	94,1	94,6	95,0	95,0	95,0
Handwashing with soap	43,8	48,9	54,1	59,2	64,3	69,5	74,6	79,7	84,9	90,0	90,0	90,0
Hib vaccine	91,0	91,4	91,9	92,3	92,8	93,2	93,7	94,1	94,6	95,0	95,0	95,0
Hygienic disposal of children's stools	73,7	75,5	77,3	79,1	80,9	82,8	84,6	86,4	88,2	90,0	90,0	90,0
Hypertensive disorder case management	12,2	20,8	29,5	38,1	46,8	55,4	64,1	72,7	81,4	90,0	90,0	90,0
Immediate drying and additional stimulation	76,9	78,4	79,8	81,3	82,7	84,2	85,6	87,1	88,5	90,0	90,0	90,0
Improved excreta disposal (latrine/toilets)	52,0	56,2	60,4	64,7	68,9	73,1	77,3	81,6	85,8	90,0	90,0	90,0
Induction of labour (beyond 41 weeks)	34,1	40,3	46,5	52,7	58,9	65,2	71,4	77,6	83,8	90,0	90,0	90,0
Insecticide-treated nets (pregnant women)	46,8	51,6	56,4	61,2	66,0	70,8	75,6	80,4	85,2	90,0	90,0	90,0
Intermittent preventative therapy (pregnant women)	24,5	31,8	39,1	46,3	53,6	60,9	68,2	75,4	82,7	90,0	90,0	90,0

Intervention	Year																	
	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Active management of third stage of labour	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Antenatal corticosteroids	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Health facility delivery	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Antenatal care 4 visits	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Antibiotics for preterm labour	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Antibiotics for treatment of dysentery	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
ART coverage	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Assisted vaginal delivery	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Balanced energy supplementation (ANC4)	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
BCG vaccine	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
Blood transfusion (labour)	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Breastfeeding counselling	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Clean birth environment	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Clean cord care	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Complementary feeding - education only	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Complementary feeding - supplementary feeding and education	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Consumption of iron fortified foods	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Contraceptive prevalence rate (birth intervals)	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0
Cotrimoxazole (children)	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
C-section	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Daily iron and folic acid supplementation (pregnant women)	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Diabetes case management (ANC4)	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Pentavalent (DPT, Hingb, HebB) 3 doses	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
Handwashing with soap	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Hib vaccine	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
Hygienic disposal of children's stools	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Hypertensive disorder case management	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Immediate drying and additional stimulation	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Improved excreta disposal (latrine/toilets)	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Induction of labour (beyond 41 weeks)	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Insecticide-treated nets (pregnant women)	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Intermittent preventative therapy (pregnant women)	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0

Table 7: Scale-up for Scenario A, coverage percentage by year *(cont.)*

Intervention	Base year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Kangaroo mother care	80,0	81,1	82,2	83,3	84,4	85,6	86,7	87,8	88,9	90,0	90,0	90,0
Management of pre-eclampsia and eclampsia (magnesium sulphate)	60,0	63,3	66,7	70,0	73,3	76,7	80,0	83,3	86,7	90,0	90,0	90,0
Manual removal of placenta	31,4	37,9	44,4	50,9	57,4	64,0	70,5	77,0	83,5	90,0	90,0	90,0
Maternal sepsis management	51,0	55,3	59,7	64,0	68,3	72,7	77,0	81,3	85,7	90,0	90,0	90,0
Measles vaccine (1 dose)	45,0	45,3	45,6	45,8	46,1	46,4	46,7	46,9	47,2	47,5	47,5	47,5
Measles 2	41,5	41,9	42,3	42,7	43,1	43,4	43,8	44,2	44,6	45,0	45,0	45,0
Neonatal resuscitation	46,2	51,1	55,9	60,8	65,7	70,5	75,4	80,3	85,1	90,0	90,0	90,0
Newborn sepsis - injectible antibiotics	83,9	84,6	85,3	85,9	86,6	87,3	88,0	88,6	89,3	90,0	90,0	90,0
ORS treatment of diarrhoea	35,6	41,6	47,7	53,7	59,8	65,8	71,9	77,9	84,0	90,0	90,0	90,0
Paediatric ART	25,0	32,2	39,4	46,7	53,9	61,1	68,3	75,6	82,8	90,0	90,0	90,0
Parenteral administration of antibiotics	62,8	65,8	68,8	71,9	74,9	77,9	80,9	84,0	87,0	90,0	90,0	90,0
Piped water	34,0	40,2	46,4	52,7	58,9	65,1	71,3	77,6	83,8	90,0	90,0	90,0
PMTCT	69,0	72,4	75,9	79,3	82,8	86,2	89,7	93,1	96,6	100,0	100,0	100,0
Pneumococcal vaccine	91,0	91,4	91,9	92,3	92,8	93,2	93,7	94,1	94,6	95,0	95,0	95,0
Pneumonia treatment (children)	58,5	62,0	65,5	69,0	72,5	76,0	79,5	83,0	86,5	90,0	90,0	90,0
Polio vaccine	91,0	91,4	91,9	92,3	92,8	93,2	93,7	94,1	94,6	95,0	95,0	95,0
Psychosocial care for perinatal depression	10,0	18,9	27,8	36,7	45,6	54,4	63,3	72,2	81,1	90,0	90,0	90,0
Removal of retained products of conception	27,8	34,7	41,6	48,5	55,4	62,4	69,3	76,2	83,1	90,0	90,0	90,0
Rotavirus vaccine	91,0	91,4	91,9	92,3	92,8	93,2	93,7	94,1	94,6	95,0	95,0	95,0
Severe case management coverage of malaria	48,0	52,7	57,3	62,0	66,7	71,3	76,0	80,7	85,3	90,0	90,0	90,0
Syphilis detection and treatment (pregnant women)	24,7	32,0	39,2	46,5	53,7	61,0	68,2	75,5	82,7	90,0	90,0	90,0
Tetanus toxoid	90,0	90,6	91,1	91,7	92,2	92,8	93,3	93,9	94,4	95,0	95,0	95,0
Thermal protection	83,0	83,8	84,6	85,3	86,1	86,9	87,7	88,4	89,2	90,0	90,0	90,0
Treatment of MAM in children	78,0	79,3	80,7	82,0	83,3	84,7	86,0	87,3	88,7	90,0	90,0	90,0
Treatment of SAM in children	82,6	83,4	84,2	85,0	85,9	86,7	87,5	88,3	89,2	90,0	90,0	90,0
Uncomplicated case management malaria	61,1	64,3	67,5	70,7	73,9	77,1	80,4	83,6	86,8	90,0	90,0	90,0
Vitamin A for measles treatment (children)	89,0	89,7	90,3	91,0	91,7	92,3	93,0	93,7	94,3	95,0	95,0	95,0
Vitamin A supplementation in children 6–59 months	89,0	89,7	90,3	91,0	91,7	92,3	93,0	93,7	94,3	95,0	95,0	95,0
Salt iodization	89,4	90,6	91,8	92,9	94,1	95,3	96,5	97,6	98,8	100,0	100,0	100,0
Mass deworming among children 0–4 years	90,8	91,8	92,8	93,9	94,9	95,9	96,9	98,0	99,0	100,0	100,0	100,0
Birth registration	83,5	85,3	87,2	89,0	90,8	92,7	94,5	96,3	98,2	100,0	100,0	100,0
Cash transfers	3,3	12,9	22,6	32,2	41,8	51,5	61,1	70,7	80,4	90,0	90,0	90,0
Preschool education	10,8	19,6	28,4	37,2	46,0	54,8	63,6	72,4	81,2	90,0	90,0	90,0

Intervention	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Kangaroo mother care	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Management of pre-eclampsia and eclampsia (magnesium sulphate)	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Manual removal of placenta	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Maternal sepsis management	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Measles vaccine (1 dose)	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5
Measles 2	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0
Neonatal resuscitation	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Newborn sepsis - injectible antibiotics	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
ORS treatment of diarrhoea	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Paediatric ART	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Parenteral administration of antibiotics	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Piped water	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
PMTCT	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Pneumococcal vaccine	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
Pneumonia treatment (children)	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Polio vaccine	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
Psychosocial care for perinatal depression	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Removal of retained products of conception	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Rotavirus vaccine	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
Severe case management coverage of malaria	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Syphilis detection and treatment (pregnant women)	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Tetanus toxoid	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
Thermal protection	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Treatment of MAM in children	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Treatment of SAM in children	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Uncomplicated case management malaria	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Vitamin A for measles treatment (children)	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
Vitamin A supplementation in children 6–59 months	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
Salt iodization	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Mass deworming among children 0–4 years	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Birth registration	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Cash transfers	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
Preschool education	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0

Table 8: Scale-up for Scenario B, coverage percentage by year

Intervention	Base year	Year										
		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Active management of third stage of labour	75,0	75,8	76,6	77,4	78,2	78,9	79,7	80,5	81,3	82,1	82,9	83,7
Antenatal corticosteroids	78,9	79,5	80,1	80,7	81,2	81,8	82,4	83,0	83,6	84,2	84,7	85,3
Health facility delivery	83,9	84,2	84,5	84,9	85,2	85,5	85,8	86,1	86,5	86,8	87,1	87,4
Antenatal care 4 visits	50,7	52,8	54,8	56,9	59,0	61,0	63,1	65,2	67,2	69,3	71,4	73,5
Antibiotics for preterm labour	62,8	64,2	65,7	67,1	68,5	70,0	71,4	72,8	74,3	75,7	77,1	78,5
Antibiotics for treatment of dysentery	32,9	35,9	38,9	41,9	44,9	47,9	50,9	53,9	56,9	59,9	63,0	66,0
ART coverage	61,0	62,5	64,1	65,6	67,1	68,6	70,2	71,7	73,2	74,7	76,3	77,8
Assisted vaginal delivery	21,2	24,8	28,4	32,1	35,7	39,3	42,9	46,5	50,2	53,8	57,4	61,0
Balanced energy supplementation (ANC4)	48,0	50,2	52,4	54,6	56,8	59,1	61,3	63,5	65,7	67,9	70,1	72,3
BCG vaccine	92,0	92,2	92,3	92,5	92,6	92,8	92,9	93,1	93,3	93,4	93,6	93,7
Blood transfusion (labour)	10,6	14,8	19,0	23,1	27,3	31,5	35,7	39,9	44,0	48,2	52,4	56,6
Breastfeeding counselling	80,8	81,3	81,8	82,3	82,7	83,2	83,7	84,2	84,7	85,2	85,6	86,1
Clean birth environment	68,8	69,9	71,0	72,1	73,3	74,4	75,5	76,6	77,7	78,8	80,0	81,1
Clean cord care	80,1	80,6	81,1	81,7	82,2	82,7	83,2	83,7	84,3	84,8	85,3	85,8
Complementary feeding - education only	18,5	22,3	26,0	29,8	33,6	37,3	41,1	44,8	48,6	52,4	56,1	59,9
Complementary feeding - supplementary feeding and education	18,5	22,3	26,0	29,8	33,6	37,3	41,1	44,8	48,6	52,4	56,1	59,9
Consumption of iron-fortified foods	14,0	18,0	22,0	26,0	30,0	34,0	38,0	42,0	46,0	50,0	54,0	58,0
Contraceptive prevalence rate (birth intervals)	22,4	23,9	25,3	26,8	28,2	29,7	31,1	32,6	34,0	35,5	36,9	38,4
Cotrimoxazole (children)	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
C-section	41,8	44,3	46,9	49,4	51,9	54,5	57,0	59,6	62,1	64,6	67,2	69,7
Daily iron and folic acid supplementation (pregnant women)	48,0	50,2	52,4	54,6	56,8	59,1	61,3	63,5	65,7	67,9	70,1	72,3
Diabetes case management (ANC4)	9,5	13,7	18,0	22,2	26,4	30,7	34,9	39,2	43,4	47,6	51,9	56,1
Pentavalent (DPT, Hingb, HebB) 3 doses	91,0	91,2	91,4	91,6	91,8	92,1	92,3	92,5	92,7	92,9	93,1	93,3
Handwashing with soap	43,8	46,2	48,7	51,1	53,5	56,0	58,4	60,8	63,3	65,7	68,1	70,5
Hib vaccine	91,0	91,2	91,4	91,6	91,8	92,1	92,3	92,5	92,7	92,9	93,1	93,3
Hygienic disposal of children's stools	73,7	74,6	75,4	76,3	77,1	78,0	78,8	79,7	80,6	81,4	82,3	83,1
Hypertensive disorder case management	12,2	16,3	20,4	24,5	28,6	32,7	36,8	40,9	45,0	49,1	53,1	57,2
Immediate drying and additional stimulation	76,9	77,6	78,3	79,0	79,7	80,3	81,0	81,7	82,4	83,1	83,8	84,5
Improved excreta disposal (latrine/toilets)	52,0	54,0	56,0	58,0	60,0	62,0	64,0	66,0	68,0	70,0	72,0	74,0
Induction of labour (beyond 41 weeks)	34,1	37,0	40,0	42,9	45,9	48,8	51,7	54,7	57,6	60,6	63,5	66,5
Insecticide-treated nets (pregnant women)	46,8	49,1	51,3	53,6	55,9	58,2	60,4	62,7	65,0	67,3	69,5	71,8
Intermittent preventative therapy (pregnant women)	24,5	27,9	31,4	34,8	38,3	41,7	45,2	48,6	52,1	55,5	59,0	62,4

Year																		
2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
84,5	85,3	86,1	86,8	87,6	88,4	89,2	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
85,9	86,5	87,1	87,7	88,2	88,8	89,4	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
87,8	88,1	88,4	88,7	89,0	89,4	89,7	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
75,5	77,6	79,7	81,7	83,8	85,9	87,9	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
80,0	81,4	82,8	84,3	85,7	87,1	88,6	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
69,0	72,0	75,0	78,0	81,0	84,0	87,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
79,3	80,8	82,4	83,9	85,4	86,9	88,5	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
64,7	68,3	71,9	75,5	79,1	82,8	86,4	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
74,5	76,7	78,9	81,2	83,4	85,6	87,8	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
93,9	94,1	94,2	94,4	94,5	94,7	94,8	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
60,7	64,9	69,1	73,3	77,5	81,6	85,8	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
86,6	87,1	87,6	88,1	88,5	89,0	89,5	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
82,2	83,3	84,4	85,5	86,7	87,8	88,9	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
86,4	86,9	87,4	87,9	88,4	89,0	89,5	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
63,7	67,4	71,2	74,9	78,7	82,5	86,2	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
63,7	67,4	71,2	74,9	78,7	82,5	86,2	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
62,0	66,0	70,0	74,0	78,0	82,0	86,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
39,8	41,3	42,7	44,2	45,6	47,1	48,5	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0
100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
72,2	74,8	77,3	79,9	82,4	84,9	87,5	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
74,5	76,7	78,9	81,2	83,4	85,6	87,8	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
60,3	64,6	68,8	73,1	77,3	81,5	85,8	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
93,5	93,7	93,9	94,2	94,4	94,6	94,8	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
73,0	75,4	77,8	80,3	82,7	85,1	87,6	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
93,5	93,7	93,9	94,2	94,4	94,6	94,8	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
84,0	84,9	85,7	86,6	87,4	88,3	89,1	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
61,3	65,4	69,5	73,6	77,7	81,8	85,9	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
85,2	85,9	86,6	87,2	87,9	88,6	89,3	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
76,0	78,0	80,0	82,0	84,0	86,0	88,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
69,4	72,3	75,3	78,2	81,2	84,1	87,1	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
74,1	76,4	78,6	80,9	83,2	85,5	87,7	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
65,9	69,3	72,8	76,2	79,7	83,1	86,6	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0



Table 8: Scale-up for Scenario B, coverage percentage by year *(cont.)*

Intervention	Base year	Year										
		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Kangaroo mother care	80,0	80,5	81,1	81,6	82,1	82,6	83,2	83,7	84,2	84,7	85,3	85,8
Management of pre-eclampsia and eclampsia (magnesium sulphate)	60,0	61,6	63,2	64,7	66,3	67,9	69,5	71,1	72,6	74,2	75,8	77,4
Manual removal of placenta	31,4	34,5	37,6	40,7	43,7	46,8	49,9	53,0	56,1	59,2	62,2	65,3
Maternal sepsis management	51,0	53,1	55,1	57,2	59,2	61,3	63,3	65,4	67,4	69,5	71,5	73,6
Measles vaccine (1 dose)	45,0	45,1	45,3	45,4	45,5	45,7	45,8	45,9	46,1	46,2	46,3	46,4
Measles 2	41,5	41,7	41,9	42,1	42,2	42,4	42,6	42,8	43,0	43,2	43,3	43,5
Neonatal resuscitation	46,2	48,5	50,8	53,1	55,4	57,7	60,0	62,3	64,6	66,9	69,3	71,6
Newborn sepsis - injectible antibiotics	83,9	84,2	84,5	84,9	85,2	85,5	85,8	86,1	86,5	86,8	87,1	87,4
ORS treatment of diarrhoea	35,6	38,5	41,3	44,2	47,1	49,9	52,8	55,6	58,5	61,4	64,2	67,1
Paediatric ART	25,0	28,4	31,8	35,3	38,7	42,1	45,5	48,9	52,4	55,8	59,2	62,6
Parenteral administration of antibiotics	62,8	64,2	65,7	67,1	68,5	70,0	71,4	72,8	74,3	75,7	77,1	78,5
Piped water	34,0	36,9	39,9	42,8	45,8	48,7	51,7	54,6	57,6	60,5	63,5	66,4
PMTCT	69,0	70,6	72,3	73,9	75,5	77,2	78,8	80,4	82,1	83,7	85,3	86,9
Pneumococcal vaccine	91,0	91,2	91,4	91,6	91,8	92,1	92,3	92,5	92,7	92,9	93,1	93,3
Pneumonia treatment (children)	58,5	60,2	61,8	63,5	65,1	66,8	68,4	70,1	71,8	73,4	75,1	76,7
Polio vaccine	91,0	91,2	91,4	91,6	91,8	92,1	92,3	92,5	92,7	92,9	93,1	93,3
Psychosocial care for perinatal depression	10,0	14,2	18,4	22,6	26,8	31,1	35,3	39,5	43,7	47,9	52,1	56,3
Removal of retained products of conception	27,8	31,1	34,3	37,6	40,9	44,2	47,4	50,7	54,0	57,3	60,5	63,8
Rotavirus vaccine	91,0	91,2	91,4	91,6	91,8	92,1	92,3	92,5	92,7	92,9	93,1	93,3
Severe case management coverage of malaria	48,0	50,2	52,4	54,6	56,8	59,1	61,3	63,5	65,7	67,9	70,1	72,3
Syphilis detection and treatment (pregnant women)	24,7	28,1	31,6	35,0	38,4	41,9	45,3	48,8	52,2	55,6	59,1	62,5
Tetanus toxoid	90,0	90,3	90,5	90,8	91,1	91,3	91,6	91,8	92,1	92,4	92,6	92,9
Thermal protection	83,0	83,4	83,7	84,1	84,5	84,8	85,2	85,6	85,9	86,3	86,7	87,1
Treatment of MAM in children	78,0	78,6	79,3	79,9	80,5	81,2	81,8	82,4	83,1	83,7	84,3	84,9
Treatment of SAM in children	82,6	83,0	83,4	83,7	84,1	84,5	84,9	85,3	85,7	86,1	86,5	86,9
Uncomplicated case management malaria	61,1	62,6	64,1	65,6	67,2	68,7	70,2	71,7	73,2	74,8	76,3	77,8
Vitamin A for measles treatment (children)	89,0	89,3	89,6	89,9	90,3	90,6	90,9	91,2	91,5	91,8	92,2	92,5
Vitamin A supplementation in children 6–59 months	89,0	89,3	89,6	89,9	90,3	90,6	90,9	91,2	91,5	91,8	92,2	92,5
Salt iodization	89,4	90,0	90,5	91,1	91,6	92,2	92,7	93,3	93,9	94,4	95,0	95,5
Mass deworming among children 0–4 years	90,8	91,3	91,8	92,3	92,7	93,2	93,7	94,2	94,7	95,2	95,6	96,1
Birth registration	83,5	84,4	85,2	86,1	87,0	87,8	88,7	89,6	90,4	91,3	92,2	93,1
Cash transfers	3,3	7,8	12,4	17,0	21,5	26,1	30,7	35,2	39,8	44,4	48,9	53,5
Preschool education	10,8	15,0	19,1	23,3	27,5	31,6	35,8	40,0	44,1	48,3	52,5	56,7

Year																		
2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
86,3	86,8	87,4	87,9	88,4	88,9	89,5	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
78,9	80,5	82,1	83,7	85,3	86,8	88,4	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
68,4	71,5	74,6	77,7	80,7	83,8	86,9	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
75,6	77,7	79,7	81,8	83,8	85,9	87,9	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
46,6	46,7	46,8	47,0	47,1	47,2	47,4	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5	47,5
43,7	43,9	44,1	44,3	44,4	44,6	44,8	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0	45,0
73,9	76,2	78,5	80,8	83,1	85,4	87,7	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
87,8	88,1	88,4	88,7	89,0	89,4	89,7	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
70,0	72,8	75,7	78,5	81,4	84,3	87,1	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
66,1	69,5	72,9	76,3	79,7	83,2	86,6	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
80,0	81,4	82,8	84,3	85,7	87,1	88,6	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
69,4	72,3	75,3	78,2	81,2	84,1	87,1	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
88,6	90,2	91,8	93,5	95,1	96,7	98,4	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
93,5	93,7	93,9	94,2	94,4	94,6	94,8	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
78,4	80,1	81,7	83,4	85,0	86,7	88,3	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
93,5	93,7	93,9	94,2	94,4	94,6	94,8	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
60,5	64,7	68,9	73,2	77,4	81,6	85,8	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
67,1	70,4	73,6	76,9	80,2	83,5	86,7	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
93,5	93,7	93,9	94,2	94,4	94,6	94,8	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
74,5	76,7	78,9	81,2	83,4	85,6	87,8	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
65,9	69,4	72,8	76,3	79,7	83,1	86,6	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
93,2	93,4	93,7	93,9	94,2	94,5	94,7	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
87,4	87,8	88,2	88,5	88,9	89,3	89,6	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
85,6	86,2	86,8	87,5	88,1	88,7	89,4	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
87,3	87,7	88,0	88,4	88,8	89,2	89,6	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
79,3	80,9	82,4	83,9	85,4	87,0	88,5	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
92,8	93,1	93,4	93,7	94,1	94,4	94,7	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
92,8	93,1	93,4	93,7	94,1	94,4	94,7	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0	95,0
96,1	96,7	97,2	97,8	98,3	98,9	99,4	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
96,6	97,1	97,6	98,1	98,5	99,0	99,5	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
93,9	94,8	95,7	96,5	97,4	98,3	99,1	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
58,1	62,6	67,2	71,7	76,3	80,9	85,4	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0
60,8	65,0	69,2	73,3	77,5	81,7	85,8	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0	90,0



Table 9: Scale-up for Scenario C, coverage percentage by year

Intervention	Base year	Year										
		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Active management of third stage of labour	75,0	75,5	76,0	76,6	77,1	77,6	78,1	78,6	79,1	79,7	80,2	80,7
Antenatal corticosteroids	78,9	79,3	79,7	80,0	80,4	80,8	81,2	81,6	82,0	82,3	82,7	83,1
Health facility delivery	83,9	84,1	84,3	84,5	84,7	85,0	85,2	85,4	85,6	85,8	86,0	86,2
Antenatal care 4 visits	50,7	52,1	53,4	54,8	56,1	57,5	58,8	60,2	61,5	62,9	64,3	65,6
Antibiotics for preterm labour	62,8	63,7	64,7	65,6	66,6	67,5	68,4	69,4	70,3	71,2	72,2	73,1
Antibiotics for treatment of dysentery	32,9	34,9	36,8	38,8	40,8	42,7	44,7	46,7	48,7	50,6	52,6	54,6
ART coverage	61,0	62,0	63,0	64,0	65,0	66,0	67,0	68,0	69,0	70,0	71,0	72,0
Assisted vaginal delivery	21,2	23,6	25,9	28,3	30,7	33,1	35,4	37,8	40,2	42,6	44,9	47,3
Balanced energy supplementation (ANC4)	48,0	49,4	50,9	52,3	53,8	55,2	56,7	58,1	59,6	61,0	62,5	63,9
BCG vaccine	92,0	92,1	92,2	92,3	92,4	92,5	92,6	92,7	92,8	92,9	93,0	93,1
Blood transfusion (labour)	10,6	13,3	16,1	18,8	21,6	24,3	27,0	29,8	32,5	35,2	38,0	40,7
Breastfeeding counselling	80,8	81,1	81,4	81,8	82,1	82,4	82,7	83,0	83,3	83,7	84,0	84,3
Clean birth environment	68,8	69,5	70,3	71,0	71,7	72,5	73,2	73,9	74,6	75,4	76,1	76,8
Clean cord care	80,1	80,4	80,8	81,1	81,5	81,8	82,1	82,5	82,8	83,2	83,5	83,9
Complementary feeding - education only	18,5	21,0	23,4	25,9	28,4	30,8	33,3	35,8	38,2	40,7	43,2	45,6
Complementary feeding - supplementary feeding and education	18,5	21,0	23,4	25,9	28,4	30,8	33,3	35,8	38,2	40,7	43,2	45,6
Consumption of iron-fortified foods	14,0	16,6	19,2	21,9	24,5	27,1	29,7	32,3	35,0	37,6	40,2	42,8
Contraceptive prevalence rate (birth intervals)	22,4	23,4	24,3	25,3	26,2	27,2	28,1	29,1	30,0	31,0	31,9	32,9
Cotrimoxazole (children)	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
C-section	41,8	43,5	45,1	46,8	48,4	50,1	51,8	53,4	55,1	56,8	58,4	60,1
Daily iron and folic acid supplementation (pregnant women)	48,0	49,4	50,9	52,3	53,8	55,2	56,7	58,1	59,6	61,0	62,5	63,9
Diabetes case management (ANC4)	9,5	12,3	15,1	17,8	20,6	23,4	26,2	28,9	31,7	34,5	37,3	40,0
Pentavalent (DPT, Hingb, HebB) 3 doses	91,0	91,1	91,3	91,4	91,6	91,7	91,8	92,0	92,1	92,2	92,4	92,5
Handwashing with soap	43,8	45,4	47,0	48,6	50,2	51,8	53,4	55,0	56,5	58,1	59,7	61,3
Hib vaccine	91,0	91,1	91,3	91,4	91,6	91,7	91,8	92,0	92,1	92,2	92,4	92,5
Hygienic disposal of children's stools	73,7	74,3	74,8	75,4	75,9	76,5	77,1	77,6	78,2	78,8	79,3	79,9
Hypertensive disorder case management	12,2	14,9	17,6	20,2	22,9	25,6	28,3	31,0	33,7	36,3	39,0	41,7
Immediate drying and additional stimulation	76,9	77,4	77,8	78,3	78,7	79,2	79,6	80,1	80,5	81,0	81,4	81,9
Improved excreta disposal (latrine/toilets)	52,0	53,3	54,6	55,9	57,2	58,6	59,9	61,2	62,5	63,8	65,1	66,4
Induction of labour (beyond 41 weeks)	34,1	36,0	37,9	39,9	41,8	43,7	45,7	47,6	49,5	51,4	53,4	55,3
Insecticide-treated nets (pregnant women)	46,8	48,3	49,8	51,3	52,8	54,2	55,7	57,2	58,7	60,2	61,7	63,2
Intermittent preventative therapy (pregnant women)	24,5	26,8	29,0	31,3	33,5	35,8	38,1	40,3	42,6	44,8	47,1	49,3

Year																		
2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
81,2	81,7	82,2	82,8	83,3	83,8	84,3	84,8	85,3	85,9	86,4	86,9	87,4	87,9	88,4	89,0	89,5	90,0
83,5	83,9	84,3	84,6	85,0	85,4	85,8	86,2	86,6	86,9	87,3	87,7	88,1	88,5	88,9	89,2	89,6	90,0
86,4	86,6	86,8	87,1	87,3	87,5	87,7	87,9	88,1	88,3	88,5	88,7	88,9	89,2	89,4	89,6	89,8	90,0
67,0	68,3	69,7	71,0	72,4	73,7	75,1	76,4	77,8	79,2	80,5	81,9	83,2	84,6	85,9	87,3	88,6	90,0
74,1	75,0	75,9	76,9	77,8	78,7	79,7	80,6	81,6	82,5	83,4	84,4	85,3	86,2	87,2	88,1	89,1	90,0
56,5	58,5	60,5	62,4	64,4	66,4	68,3	70,3	72,3	74,2	76,2	78,2	80,2	82,1	84,1	86,1	88,0	90,0
73,0	74,0	75,0	76,0	77,0	78,0	79,0	80,0	81,0	82,0	83,0	84,0	85,0	86,0	87,0	88,0	89,0	90,0
49,7	52,0	54,4	56,8	59,2	61,5	63,9	66,3	68,6	71,0	73,4	75,8	78,1	80,5	82,9	85,3	87,6	90,0
65,4	66,8	68,3	69,7	71,2	72,6	74,1	75,5	77,0	78,4	79,9	81,3	82,8	84,2	85,7	87,1	88,6	90,0
93,2	93,3	93,4	93,6	93,7	93,8	93,9	94,0	94,1	94,2	94,3	94,4	94,5	94,6	94,7	94,8	94,9	95,0
43,5	46,2	48,9	51,7	54,4	57,1	59,9	62,6	65,4	68,1	70,8	73,6	76,3	79,0	81,8	84,5	87,3	90,0
84,6	84,9	85,2	85,6	85,9	86,2	86,5	86,8	87,1	87,5	87,8	88,1	88,4	88,7	89,0	89,4	89,7	90,0
77,6	78,3	79,0	79,8	80,5	81,2	82,0	82,7	83,4	84,2	84,9	85,6	86,3	87,1	87,8	88,5	89,3	90,0
84,2	84,5	84,9	85,2	85,6	85,9	86,2	86,6	86,9	87,3	87,6	88,0	88,3	88,6	89,0	89,3	89,7	90,0
48,1	50,6	53,0	55,5	57,9	60,4	62,9	65,3	67,8	70,3	72,7	75,2	77,7	80,1	82,6	85,1	87,5	90,0
48,1	50,6	53,0	55,5	57,9	60,4	62,9	65,3	67,8	70,3	72,7	75,2	77,7	80,1	82,6	85,1	87,5	90,0
45,4	48,1	50,7	53,3	55,9	58,6	61,2	63,8	66,4	69,0	71,7	74,3	76,9	79,5	82,1	84,8	87,4	90,0
33,8	34,8	35,7	36,7	37,6	38,6	39,5	40,5	41,4	42,4	43,3	44,3	45,2	46,2	47,1	48,1	49,0	50,0
100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
61,7	63,4	65,1	66,7	68,4	70,1	71,7	73,4	75,0	76,7	78,4	80,0	81,7	83,4	85,0	86,7	88,3	90,0
65,4	66,8	68,3	69,7	71,2	72,6	74,1	75,5	77,0	78,4	79,9	81,3	82,8	84,2	85,7	87,1	88,6	90,0
42,8	45,6	48,4	51,1	53,9	56,7	59,5	62,2	65,0	67,8	70,6	73,3	76,1	78,9	81,7	84,4	87,2	90,0
92,7	92,8	92,9	93,1	93,2	93,3	93,5	93,6	93,8	93,9	94,0	94,2	94,3	94,4	94,6	94,7	94,9	95,0
62,9	64,5	66,1	67,7	69,3	70,9	72,5	74,1	75,7	77,3	78,8	80,4	82,0	83,6	85,2	86,8	88,4	90,0
92,7	92,8	92,9	93,1	93,2	93,3	93,5	93,6	93,8	93,9	94,0	94,2	94,3	94,4	94,6	94,7	94,9	95,0
80,4	81,0	81,6	82,1	82,7	83,3	83,8	84,4	84,9	85,5	86,1	86,6	87,2	87,8	88,3	88,9	89,4	90,0
44,4	47,1	49,8	52,4	55,1	57,8	60,5	63,2	65,9	68,5	71,2	73,9	76,6	79,3	82,0	84,6	87,3	90,0
82,3	82,8	83,2	83,7	84,1	84,6	85,0	85,5	85,9	86,4	86,8	87,3	87,7	88,2	88,6	89,1	89,5	90,0
67,7	69,0	70,3	71,7	73,0	74,3	75,6	76,9	78,2	79,5	80,8	82,1	83,4	84,8	86,1	87,4	88,7	90,0
57,2	59,2	61,1	63,0	64,9	66,9	68,8	70,7	72,6	74,6	76,5	78,4	80,4	82,3	84,2	86,1	88,1	90,0
64,7	66,2	67,7	69,1	70,6	72,1	73,6	75,1	76,6	78,1	79,6	81,1	82,6	84,0	85,5	87,0	88,5	90,0
51,6	53,9	56,1	58,4	60,6	62,9	65,2	67,4	69,7	71,9	74,2	76,4	78,7	81,0	83,2	85,5	87,7	90,0

Table 9: Scale-up for Scenario C, coverage percentage by year *(cont.)*

Intervention	Base year	Year										
		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Kangaroo mother care	80,0	80,3	80,7	81,0	81,4	81,7	82,1	82,4	82,8	83,1	83,4	83,8
Management of pre-eclampsia and eclampsia (magnesium sulphate)	60,0	61,0	62,1	63,1	64,1	65,2	66,2	67,2	68,3	69,3	70,3	71,4
Manual removal of placenta	31,4	33,4	35,4	37,5	39,5	41,5	43,5	45,5	47,6	49,6	51,6	53,6
Maternal sepsis management	51,0	52,3	53,7	55,0	56,4	57,7	59,1	60,4	61,8	63,1	64,4	65,8
Measles vaccine (1 dose)	45,0	45,1	45,2	45,3	45,3	45,4	45,5	45,6	45,7	45,8	45,9	45,9
Measles 2	41,5	41,6	41,7	41,9	42,0	42,1	42,2	42,3	42,5	42,6	42,7	42,8
Neonatal resuscitation	46,2	47,7	49,2	50,7	52,2	53,8	55,3	56,8	58,3	59,8	61,3	62,8
Newborn sepsis - injectible antibiotics	83,9	84,1	84,3	84,5	84,7	85,0	85,2	85,4	85,6	85,8	86,0	86,2
ORS treatment of diarrhoea	35,6	37,5	39,4	41,2	43,1	45,0	46,9	48,7	50,6	52,5	54,4	56,2
Paediatric ART	25,0	27,2	29,5	31,7	34,0	36,2	38,4	40,7	42,9	45,2	47,4	49,7
Parenteral administration of antibiotics	62,8	63,7	64,7	65,6	66,6	67,5	68,4	69,4	70,3	71,2	72,2	73,1
Piped water	34,0	35,9	37,9	39,8	41,7	43,7	45,6	47,5	49,4	51,4	53,3	55,2
PMTCT	69,0	70,1	71,1	72,2	73,3	74,3	75,4	76,5	77,6	78,6	79,7	80,8
Pneumococcal vaccine	91,0	91,1	91,3	91,4	91,6	91,7	91,8	92,0	92,1	92,2	92,4	92,5
Pneumonia treatment (children)	58,5	59,6	60,7	61,8	62,8	63,9	65,0	66,1	67,2	68,3	69,4	70,4
Polio vaccine	91,0	91,1	91,3	91,4	91,6	91,7	91,8	92,0	92,1	92,2	92,4	92,5
Psychosocial care for perinatal depression	10,0	12,8	15,5	18,3	21,0	23,8	26,6	29,3	32,1	34,8	37,6	40,3
Removal of retained products of conception	27,8	29,9	32,1	34,2	36,4	38,5	40,7	42,8	45,0	47,1	49,2	51,4
Rotavirus vaccine	91,0	91,1	91,3	91,4	91,6	91,7	91,8	92,0	92,1	92,2	92,4	92,5
Severe case management coverage of malaria	48,0	49,4	50,9	52,3	53,8	55,2	56,7	58,1	59,6	61,0	62,5	63,9
Syphilis detection and treatment (pregnant women)	24,7	27,0	29,2	31,5	33,7	36,0	38,2	40,5	42,7	45,0	47,2	49,5
Tetanus toxoid	90,0	90,2	90,3	90,5	90,7	90,9	91,0	91,2	91,4	91,6	91,7	91,9
Thermal protection	83,0	83,2	83,5	83,7	84,0	84,2	84,4	84,7	84,9	85,2	85,4	85,7
Treatment of MAM in children	78,0	78,4	78,8	79,2	79,7	80,1	80,5	80,9	81,3	81,7	82,1	82,6
Treatment of SAM in children	82,6	82,8	83,1	83,3	83,6	83,9	84,1	84,4	84,6	84,9	85,1	85,4
Uncomplicated case management malaria	61,1	62,1	63,1	64,1	65,1	66,0	67,0	68,0	69,0	70,0	71,0	72,0
Vitamin A for measles treatment (children)	89,0	89,2	89,4	89,6	89,8	90,0	90,2	90,4	90,7	90,9	91,1	91,3
Vitamin A supplementation in children 6–59 months	89,0	89,2	89,4	89,6	89,8	90,0	90,2	90,4	90,7	90,9	91,1	91,3
Salt iodization	89,4	89,8	90,1	90,5	90,9	91,2	91,6	92,0	92,3	92,7	93,1	93,4
Mass deworming among children 0–4 years	90,8	91,1	91,4	91,8	92,1	92,4	92,7	93,0	93,3	93,7	94,0	94,3
Birth registration	83,5	84,1	84,6	85,2	85,8	86,3	86,9	87,5	88,1	88,6	89,2	89,8
Cash transfers	3,3	6,3	9,3	12,3	15,2	18,2	21,2	24,2	27,2	30,2	33,2	36,2
Preschool education	10,8	13,5	16,3	19,0	21,7	24,5	27,2	29,9	32,6	35,4	38,1	40,8

Year																		
2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
84,1	84,5	84,8	85,2	85,5	85,9	86,2	86,6	86,9	87,2	87,6	87,9	88,3	88,6	89,0	89,3	89,7	90,0
72,4	73,4	74,5	75,5	76,6	77,6	78,6	79,7	80,7	81,7	82,8	83,8	84,8	85,9	86,9	87,9	89,0	90,0
55,6	57,7	59,7	61,7	63,7	65,8	67,8	69,8	71,8	73,8	75,9	77,9	79,9	81,9	83,9	86,0	88,0	90,0
67,1	68,5	69,8	71,2	72,5	73,9	75,2	76,6	77,9	79,2	80,6	81,9	83,3	84,6	86,0	87,3	88,7	90,0
46,0	46,1	46,2	46,3	46,4	46,5	46,6	46,6	46,7	46,8	46,9	47,0	47,1	47,2	47,2	47,3	47,4	47,5
42,9	43,1	43,2	43,3	43,4	43,6	43,7	43,8	43,9	44,0	44,2	44,3	44,4	44,5	44,6	44,8	44,9	45,0
64,3	65,8	67,3	68,9	70,4	71,9	73,4	74,9	76,4	77,9	79,4	80,9	82,4	84,0	85,5	87,0	88,5	90,0
86,4	86,6	86,8	87,1	87,3	87,5	87,7	87,9	88,1	88,3	88,5	88,7	88,9	89,2	89,4	89,6	89,8	90,0
58,1	60,0	61,9	63,7	65,6	67,5	69,4	71,2	73,1	75,0	76,9	78,7	80,6	82,5	84,4	86,2	88,1	90,0
51,9	54,1	56,4	58,6	60,9	63,1	65,3	67,6	69,8	72,1	74,3	76,6	78,8	81,0	83,3	85,5	87,8	90,0
74,1	75,0	75,9	76,9	77,8	78,7	79,7	80,6	81,6	82,5	83,4	84,4	85,3	86,2	87,2	88,1	89,1	90,0
57,2	59,1	61,0	63,0	64,9	66,8	68,8	70,7	72,6	74,6	76,5	78,4	80,3	82,3	84,2	86,1	88,1	90,0
81,8	82,9	84,0	85,0	86,1	87,2	88,2	89,3	90,4	91,4	92,5	93,6	94,7	95,7	96,8	97,9	98,9	100,0
92,7	92,8	92,9	93,1	93,2	93,3	93,5	93,6	93,8	93,9	94,0	94,2	94,3	94,4	94,6	94,7	94,9	95,0
71,5	72,6	73,7	74,8	75,9	77,0	78,1	79,1	80,2	81,3	82,4	83,5	84,6	85,7	86,7	87,8	88,9	90,0
92,7	92,8	92,9	93,1	93,2	93,3	93,5	93,6	93,8	93,9	94,0	94,2	94,3	94,4	94,6	94,7	94,9	95,0
43,1	45,9	48,6	51,4	54,1	56,9	59,7	62,4	65,2	67,9	70,7	73,4	76,2	79,0	81,7	84,5	87,2	90,0
53,5	55,7	57,8	60,0	62,1	64,3	66,4	68,6	70,7	72,8	75,0	77,1	79,3	81,4	83,6	85,7	87,9	90,0
92,7	92,8	92,9	93,1	93,2	93,3	93,5	93,6	93,8	93,9	94,0	94,2	94,3	94,4	94,6	94,7	94,9	95,0
65,4	66,8	68,3	69,7	71,2	72,6	74,1	75,5	77,0	78,4	79,9	81,3	82,8	84,2	85,7	87,1	88,6	90,0
51,7	54,0	56,2	58,5	60,7	63,0	65,2	67,5	69,7	72,0	74,2	76,5	78,7	81,0	83,2	85,5	87,7	90,0
92,1	92,2	92,4	92,6	92,8	92,9	93,1	93,3	93,4	93,6	93,8	94,0	94,1	94,3	94,5	94,7	94,8	95,0
85,9	86,1	86,4	86,6	86,9	87,1	87,3	87,6	87,8	88,1	88,3	88,6	88,8	89,0	89,3	89,5	89,8	90,0
83,0	83,4	83,8	84,2	84,6	85,0	85,4	85,9	86,3	86,7	87,1	87,5	87,9	88,3	88,8	89,2	89,6	90,0
85,6	85,9	86,2	86,4	86,7	86,9	87,2	87,4	87,7	88,0	88,2	88,5	88,7	89,0	89,2	89,5	89,7	90,0
73,0	74,0	75,0	76,0	77,0	78,0	79,0	80,0	81,0	82,0	83,0	84,0	85,0	86,0	87,0	88,0	89,0	90,0
91,5	91,7	91,9	92,1	92,3	92,5	92,7	92,9	93,1	93,3	93,6	93,8	94,0	94,2	94,4	94,6	94,8	95,0
91,5	91,7	91,9	92,1	92,3	92,5	92,7	92,9	93,1	93,3	93,6	93,8	94,0	94,2	94,4	94,6	94,8	95,0
93,8	94,2	94,5	94,9	95,2	95,6	96,0	96,3	96,7	97,1	97,4	97,8	98,2	98,5	98,9	99,3	99,6	100,0
94,6	94,9	95,2	95,6	95,9	96,2	96,5	96,8	97,1	97,5	97,8	98,1	98,4	98,7	99,0	99,4	99,7	100,0
90,3	90,9	91,5	92,0	92,6	93,2	93,7	94,3	94,9	95,4	96,0	96,6	97,2	97,7	98,3	98,9	99,4	100,0
39,2	42,2	45,1	48,1	51,1	54,1	57,1	60,1	63,1	66,1	69,1	72,1	75,0	78,0	81,0	84,0	87,0	90,0
43,6	46,3	49,0	51,8	54,5	57,2	60,0	62,7	65,4	68,2	70,9	73,6	76,3	79,1	81,8	84,5	87,3	90,0

3.4. FISCAL SPACE ANALYSIS

In order to support informed decision-making, a fiscal space analysis is an important component of this analysis. The fiscal space analysis incorporates the projected costs of intervention packages with the existing macro-economic environment so as to show the fiscal space, or budgetary room, the government has to invest.

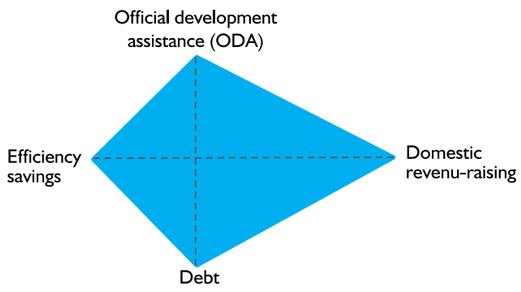
3.4.1. Defining fiscal space

Fiscal space is a key factor underpinning public finance management. A commonly used definition is that of Heller et al. (2006):[145]

> "Fiscal space can be defined as the availability of budgetary room that allows a government to provide resources for a desired purpose without any prejudice to the sustainability of a government's financial position."

Fiscal space can be increased through four pathways: (i) additional domestic revenue dedicated to a particular purpose, (ii) additional foreign grants and aid, (iii) additional borrowing or (iv) efficiency gains and reprioritization of expenditure. The available sources to increase fiscal space, or budgetary room, can be visualized as a diamond, whose shape reflects the relative contribution of each of the sources to the available budgetary room. In certain low-income countries with weak tax collection systems that rely heavily on aid, ODA will have a larger contribution compared with domestic revenue.

Figure 33: The fiscal space diamond[146]



Corner 1: Additional domestic revenue

Domestic public revenue is mainly a function of economic development in a country, indicated by a positive relationship between economic development and public revenues. This suggests that it is often more challenging for lower-income countries to generate as much revenue as upper-income countries. The majority of domestic revenue is derived from taxes, the most common of which are consumption or sales taxes (such as value-added tax, or VAT), corporate taxes, personal income taxes, inheritance taxes, property taxes and tariffs (e.g. on imports or exports).[147]

Corner 2: Official Development Assistance

Another source of revenue is ODA allocated to particular sectors or to the general government budget. Aid can be granted either on-budget, meaning the government can allocate resources as it wishes, or to sectoral budgets (such as the education budget) or towards specific projects (such as maternal, newborn and child health). While ODA is a valuable resource to boost development of resource-constrained countries, countries must be weary of relying too heavily on ODA.[148]

Corner 3: Borrowing or deficit financing

Borrowing offers the government additional financing in the short term but constrains future resources through repayment of debt obligations. Because of this, large levels of debt to finance a government's ordinary expenditure is not an advisable strategy. Continuous debt levels over time become unsustainable. While appropriate levels of borrowing are country-dependent, the IMF suggests a benchmark of 40% as a long-term debt-to-GDP ratio ceiling that developing countries should not exceed.[149]

Corner 4: Efficiency savings

A government's allocation of resources may not be optimal. Efficiency gains typically occur in two ways: (i) by realising better outputs for the same level of investment or (ii) by achieving the same outputs at a lower level of investment. Although efficiency gains can lead to reduced costs, the objective of efficiency gains is to maintain or improve the level of output. In other words, a reduction in costs should not lead to a reduction in the quality of service delivery. Simply, efficiency gains entail a reallocation of existing resources to maximize efficiency.[150]

3.4.2. Measuring additional fiscal space

For this analysis, yearly additional fiscal space is compared with yearly costs of each intervention package and scale-up scenario. In each year, current government revenues are compared with revenues in the previous period, the difference being additional fiscal space that emerges as a result of economic growth. This annual figure is then compared with the annual projected cost of each package, in each scale-up scenario. The additional fiscal space is thus used to assess how much of an intervention can be funded by additional revenue from economic growth.

This method was chosen because, by allocating additional revenue instead of redistributing existing budgets, budget cuts to other sectors are avoided. Given Burundi's financing constraints and difficulties around improving living standards for a growing population, as discussed earlier, allocating additional rather than existing government revenue avoids the need to take funding away from other areas where it is much needed.

3.4.3. Process

The first step in this fiscal space analysis was to conduct background research into trends on key macro-economic indicators over the past decade. The indicators considered included size and composition of government revenue and expenditure, government debt, GDP indicators, growth, inflation and exchange rates. This research formed a base from which projections could be run, as seen in Table 10. Key sources consulted included publications from the IMF[151,152] and national publications (particularly yearly budget reports from the Finance Law). This historical data was sourced primarily from national statistics, using data from Burundi's central bank, the Bank of the Republic of Brundi (BRB), MFBEP, the yearly budget reports from the Finance Law and ISTEEBU, Burundi's national statistics department.[153]

Table 10: Current macro-economic context[154,155,156]

	2017	2018	2019	2020	2021
Macroeconomic environment					
BIF (billion)					
Total government revenue	**944**	**1,093**	**1,295**	**1,360**	**1,527**
Domestic	800	881	1,041	1,131	1,194
Tax revenue	745	815	941	1,028	1,082
Non-tax revenue	55	66	100	103	112
External grants	144	211	254	229	333
Total government expenditure	**1,145**	**1,312**	**1,515**	**1,707**	**1,714**
Current expenditure	863	914	929	1,318	1,040
of which: interest payments	27	22	28	80	62
Capital expenditure	282	398	585	389	674
Overall balance	**-201**	**-219**	**-220**	**-347**	**-152**
Total central government debt	**2,549**	**2,734**	**3,569**	**4,333**	**5,022**
Real					
Nominal GDP (BIF billion)	5,702	5,914	6,217	6,656	7,299
Nominal GDP (US$ billion)	3	3	3	3	4
Nominal growth		3.7%	5.1%	7.1%	6.9%
GDP per capita (BIF)	496,032	502,400	516,176	540,683	575,056
GDP per capita (US$)	287	282	280	282	303
Real growth		6.5%	4.5%	-0.5%	3.1%
Inflation	16%	-3%	-1%	8%	7.9%
External					
Exchange rate (BIF/US$)	1,729	1,783	1,846	1,915	1,898
Memorandum Items (calculated based on values above)[157]					
Tax:GDP	13.1%	13.8%	13.1%	14.1%	14.8%
Non-tax:GDP	1.0%	1.1%	1.1%	1.5%	1.4%
External grants as % of GDP	2.5%	3.6%	3.4%	3.8%	3.1%
General government expenditure as % of GDP	20.1%	22.2%	21.1%	22.8%	23.4%
Current expenditure:GDP	15.1%	15.4%	14.7%	14.0%	18.1%
Capital expenditure:GDP	4.9%	6.7%	6.4%	8.8%	5.3%
Interest payments as % of GDP	0.5%	0.4%	0.4%	0.4%	1.1%
Public debt as % of GDP	**44.7%**	**46.2%**	**57.4%**	**65.1%**	**68.8%**
Fiscal balance as % of GDP	**-3.5%**	**-3.7%**	**-3.5%**	**-3.3%**	**-4.7%**
Population (million)	11.50	11.77	12.04	12.31	12.7

Second, after the base was created, projections were carried out according to four different growth scenarios, as described in Section 3.4.4. In accordance with the three scale-up scenarios and the two presented packages, six fiscal space projections were to be presented for each of the four growth scenarios. After these initial findings were discussed with UNICEF Burundi, certain packages and scenarios were to be presented in the main body of the text to provide a clearer advocacy piece.

Third, portions of additional fiscal space were calculated by computing the difference between government revenues in a current period and those from a previous period. This portion of additional fiscal space was then compared with the projected costs in that particular year. This enabled estimation of how much additional fiscal space needed to be allocated to fund the particular scenario in question and made it possible to measure the financing gap, should there be one.

3.4.4. Growth scenarios analysed in the fiscal space analysis

In 2018, the Burundian government launched its NDP 2018–2027, which outlines three projected growth paths following the intended structural transformation of the economy. These scenarios were considered as potential growth paths; however, as the NDP was published prior to COVID-19, an additional post-COVID scenario was also created. The COVID-19 pandemic has represented a dramatic shock for the Burundian (and the global) economy, a shock that is likely to set Burundi's development on a lower growth path than previously expected, with a resultant impact on fiscal space.

As such, the four scenarios considered were:

1. The NDP low growth path where real economic growth averages 4% by 2027
2. The NDP medium growth path where real economic growth averages 6% by 2027
3. The NDP high growth path, where real economic growth averages 10.7% by 2027
4. An additional post-COVID scenario that takes into account the macro-economic shocks imposed by the pandemic and revises projected growth paths

The NDP growth paths were modelled on the assumption that, from 2022 onwards, economic growth grows linearly until it meets the expected rate in 2027. Thereafter, long-term growth remains stable as is predicted by the NDP. The post-COVID scenario instead assumes a more modest post-pandemic recovery that follows pre-pandemic and low-income country trends until 2030. Thereafter, real economic growth is expected to improve in the long term to reach 4%, as seen in low-income country trends.[158] The post-COVID scenario is described in more detail below.

Box 3: Cost-benefit analysis versus growth scenarios

These scenarios should not be confused with the scenarios evaluated in the cost-benefit analysis. The latter are scale-up scenarios where different assumptions regarding increases in coverage for each intervention are analysed, whereas the scenarios of the fiscal space analysis present different economic and revenue growth situations in Burundi. While the scenarios presented in the cost–benefit analysis allow us to understand the different resources needed to implement each package according to how fast interventions are scaled up, the fiscal space scenarios shed light on whether there are, and there will be, enough resources to finance the increase in coverage presented in the scale-up scenarios, providing entry points for feasibility discussions.

Short-term predictions of the post-COVID scenario (Scenario 4)

Given the dramatic shock that COVID-19 has imposed on both the Burundian and the global economy, it is necessary to consider how the pandemic has influenced Burundi's projected growth path and the resultant implications for fiscal space. According to MFBEP estimates, the Burundian economy will experience modest nominal economic growth of 10.2% in 2022 with nominal GDP reaching 8,872 billion BIF.[159] However, inflation is expected to remain high at 6% as Burundi's large agriculture sector continues to experience price fluctuations caused by the pandemic.[160] It is expected to remain at this level throughout the time period studied.[161] Thereafter, following projections from the IMF World Economic Outlook (WEO) 2021, economic growth is predicted to fall again, with 5% nominal economic growth reached in 2030 – its pre-pandemic level of stability, which is in line with low-income country averages. This growth trend is largely attributed to Burundi having a large agriculture sector and potential climate-related changes and continuing decreases in prices of tea and coffee, Burundi's dominant exports.[162] Exchange rates are assumed to follow the broad trend estimated by the IMF WEO 2021.[163]

As a result of improved revenue collection measures, domestic revenue is projected to increase steadily over time, with tax-to-GDP stabilizing at around 18%. While government expenditures have risen slightly during the COVID-19 pandemic, these are expected to reduce and stabilize to pre-COVID levels. A prospective reduction in spending levels combined with increases in government revenues will help reduce the overall budget deficit in the short term. Given that many donors have not reinstated funding since 2015, external grants are expected to remain at their current levels in the near future. Because of this, and the fact that most capital spending is donor-funded, capital spending is similarly expected to stagnate around current levels.

With limited external grants and the economic shocks imposed by the COVID-19 pandemic, public debt is expected to increase further to 71% in 2023,[164] driven primarily by the issuance of new domestic debt. Thereafter, public debt is expected to begin falling as a result of increased domestic revenues and reductions in government expenditures.[165] The fiscal balance (percentage of GDP) is similarly expected to improve along with the recovery from the COVID-19 pandemic, as outlined in the Public Financial Management Strategy in the NDP.[166,167]

Table 11: Short-term post-COVID projections[168]

	2022	2023	2024	2025	2026	2027	2028	2029	2030
Macro									
Real									
Real growth	4.2%	4.1%	4.0%	3.3%	3.2%	2.9%	2.6%	2.3%	2.0%
Inflation	2.0%	2.1%	2.1%	2.1%	2.1%	2.3%	2.5%	2.8%	3%
External									
Exchange rate (BIF/USD)	1,899	1,900	1,901	1,902	1,903	1,903	1,903	1,903	1,903
Memorandum Items /assumptions									
Tax:GDP	**17.4%**	**17.4%**	**17.6%**	**17.8%**	**17.9%**	**18.0%**	**18.0%**	**18.0%**	**18.0%**
Revenue from tax (BIF billion)	1140	1211	1297	1380	1467	1544	1625	1708	1795
Non-tax:GDP	1.8%	1.7%	1.6%	1.5%	1.3%	1.2%	1.1%	1.0%	0.9%
External grants as % of GDP	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
General government expenditure as % of GDP	28.1%	27.6%	27.1%	26.9%	26.6%	26.7%	26.8%	26.9%	27.0%
Current expenditure:GDP	17.0%	17.2%	17.2%	17.2%	17.1%	17.2%	17.3%	17.4%	17.5%
Capital expenditure:GDP	11.0%	10.4%	9.9%	9.7%	9.5%	9.5%	9.5%	9.5%	9.5%
Public debt as % of GDP	**70.4%**	**71.4%**	**71.2%**	**70.2%**	**68.2%**	**66.1%**	**64.1%**	**62.0%**	**60.0%**

This section has outlined the methodology used for the fiscal space analysis that follows in the next section. The development of the post-COVID scenario is an important addition to the three growth scenarios estimated in the NDP, as it takes into account the economic shocks imposed by the pandemic.

4. RESULTS

4.1. COST-EFFECTIVENESS AND COST–BENEFIT ANALYSIS: STATEMENT OF IMPACTS

The tables below present the health outcomes that were modelled for each scale-up scenario outlined in the previous section and for each package. We present first the impact summary for Package 1 followed by the impact derived from Package 2. The analysis produced direct health outcomes, including child deaths, maternal deaths, stunting cases and maternal anaemia cases averted. These were all calculated based on algorithms built in the OHT software, which uses inputs of health, coverage level of interventions and effectiveness of interventions. These health outcomes were converted into DALYs averted, which provides the long-term health impact of interventions. All figures indicate the additional (or incremental) health outcomes compared with the baseline scenario. All DALYs were discounted at a rate of 12%. Results are expressed as rate to account for differences in population across projections.

4.1.1. Impact of Package 1

The impact of scaling up interventions in Package 1 was modelled jointly in the OHT software. This is important because many interventions overlap in terms of the impact pathway, and therefore not modelling them jointly may result in double-counting of the impact in terms of cases prevented and DALYs averted.

Table 12: Additional cases and DALYs averted, based on Scale-up Scenario A in Package 1[169]

2021	Base year	Base year	Base year	Base year	Base year
2022	1,604	9,632	16,263	13,685	2,578
2023	3,885	33,678	38,524	33,226	5,298
2024	6,237	74,133	61,352	53,391	7,961
2025	8,620	131,844	84,363	73,805	10,558
2026	10,982	205,858	107,118	94,010	13,108
2027	13,300	284,356	129,475	113,829	15,646
2028	15,587	365,601	151,528	133,393	18,135
2029	17,807	449,031	172,965	152,386	20,578
2030	20,006	534,763	194,261	171,200	23,062
2031	21,211	613,820	205,379	181,477	23,901
2032	22,145	680,928	213,994	189,355	24,639
2033	22,975	734,201	221,780	196,348	25,432
2034	23,757	773,526	229,145	202,971	26,174
2035	24,483	798,856	236,157	209,168	26,988
2036	25,226	823,379	243,311	215,513	27,798
2037	25,986	848,379	250,641	222,007	28,634
2038	26,779	874,186	258,309	228,781	29,528
2039	27,605	901,036	266,290	235,842	30,448
2040	28,462	929,156	274,534	243,165	31,369
2041	29,355	958,763	283,162	250,800	32,362
2042	30,289	990,095	292,191	258,781	33,410
2043	31,284	1,023,524	301,760	267,288	34,472
2044	32,344	1,059,576	311,996	276,352	35,645
2045	33,482	1,098,830	322,901	286,085	36,816
2046	34,689	1,141,860	334,490	296,408	38,082
2047	35,974	1,188,948	346,752	307,395	39,357
2048	37,335	1,240,116	359,731	319,029	40,702
2049	38,780	1,295,415	373,481	331,380	42,102
2050	40,305	1,354,946	387,956	344,414	43,542
Total	690,494	21,418,436	6,669,808	5,901,485	768,323

Table 12 shows that scaling up Package 1 of interventions in Scenario A (i.e., target levels achieved in 2030, followed by a maintenance phase until 2050), compared with the baseline, would result in a significantly large number of cases prevented and DALYs averted. Compared with continuing the baseline level of coverage, if Scenario A was implemented, a total of 690,494 child lives would be saved and a total of 21.4 million additional stunting cases would be averted between 2022 and 2050. Furthermore, scaling up the interventions under Scenario A will avert 6.7 million additional DALYs over the 30-year time horizon.

In all three scale-up scenarios, a set of 10 interventions contribute 80% to all additional child deaths averted. These interventions are presented in Figure 34. Oral antibiotics for pneumonia, ORS for treatment of diarrhoea in children under five, protection of households against malaria with insecticide-treated nets/indoor residual spraying (ITN/IRS) and assisted vaginal delivery avert already between 46% and 50% of all child deaths averted across all scenarios in both packages.

Figure 34: Interventions that contribute the most to child deaths reduction across all scenarios

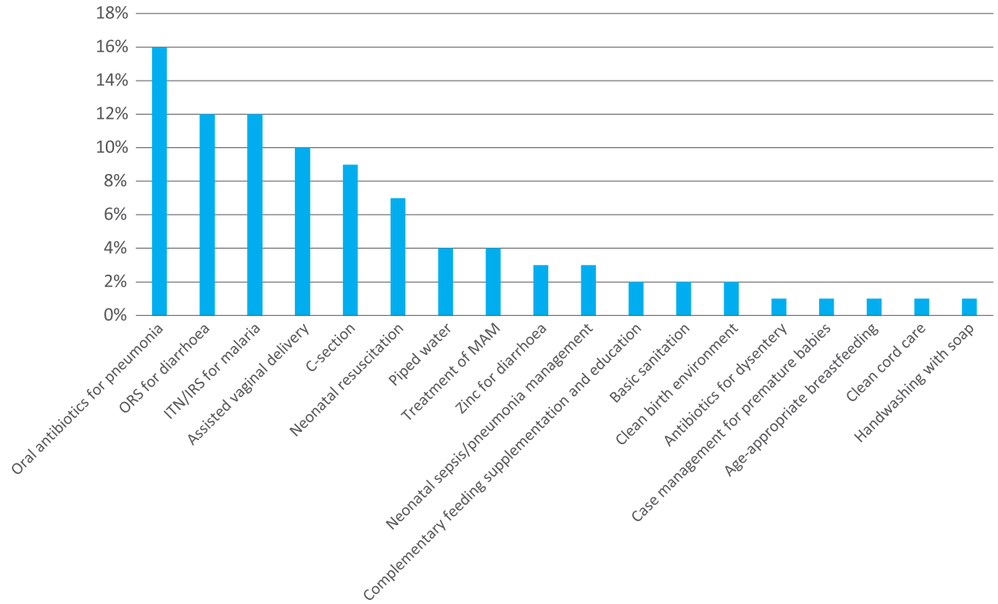


Table 13 shows that, under Scenario B (i.e., target levels achieved in 2040, with maintenance phase until 2050), a total of 592,109 child lives would be saved and 17.6 million additional stunting cases averted, compared with the baseline, from 2022 to 2050.



Table 13: Additional cases and DALYs averted, based on Scale-up Scenario B in Package 1[170]

2021	Base year	Base year	Base year	Base year	Base year
2022	773	4,649	7,804	6,594	1,211
2023	1,914	16,247	18,906	16,363	2,543
2024	3,154	35,873	30,856	26,981	3,876
2025	4,448	63,953	43,337	38,112	5,225
2026	5,819	100,345	56,576	49,933	6,643
2027	7,193	139,327	69,861	61,792	8,069
2028	8,599	180,275	83,445	73,932	9,513
2029	10,022	222,820	97,208	86,227	10,981
2030	11,469	267,451	111,254	98,738	12,516
2031	12,943	313,818	125,529	111,490	14,039
2032	14,448	362,448	140,152	124,516	15,636
2033	15,985	412,978	155,095	137,828	17,267
2034	17,564	465,882	174,442	151,508	22,934
2035	19,159	520,790	185,963	165,341	20,622
2036	20,805	578,202	202,013	179,619	22,394
2037	22,455	637,706	218,113	193,948	24,165
2038	24,171	699,956	234,873	208,848	26,026
2039	25,911	764,553	251,902	223,976	27,926
2040	27,701	832,222	269,391	239,541	29,851
2041	28,927	896,622	281,304	250,318	30,985
2042	29,992	954,944	291,762	259,629	32,133
2043	31,024	1,005,589	301,924	268,617	33,307
2044	32,043	1,048,795	312,004	277,474	34,530
2045	33,073	1,084,470	322,203	286,412	35,792
2046	34,142	1,121,439	332,776	295,692	37,084
2047	35,263	1,160,743	343,900	305,428	38,472
2048	36,443	1,202,618	355,576	315,681	39,895
2049	37,684	1,247,245	367,841	326,470	41,371
2050	38,985	1,294,831	380,685	337,788	42,896
Total	**592,109**	**17,636,791**	**5,766,697**	**5,118,794**	**647,902**

All in all, implementing Scenario B will prevent 5.8 million DALYs, of which more than 90% are prevented as a result of health gains realized in children's health and well-being. Compared with Scenario A, Scenario B has lower gains in terms of the number of cases and DALYs averted. This finding is not surprising given that Scenario A reaches coverage targets earlier than Scenario B (2030 vs. 2040); thus, more children in Scenario A accrue benefits for a longer time.

Finally, under Scenario C (i.e., target levels achieved in 2050), the number of cases averted is the lowest compared with the previous scenarios because of the slow scale-up of coverage and the achievement of the outcomes in 2050. This means that beneficiaries are exposed to the interventions for a shorter period. However, Scenario C still produces important improvements in terms of health outcomes. As Table 14 shows, the scenario yields 377,000 child lives saved and prevents 13.3 million stunting cases. Overall, Scenario C would avert 4.7 million DALYs as a result of the reduction in morbidity and mortality, mainly in children under five. This means that five times the existing, baseline, DALYs can be averted under this scenario.[171]

Table 14: Additional cases and DALYs averted, based on Scale-up Scenario C in Package 1[172]

2021	Base year	Base year	Base year	Base year	Base year
2022	441	3,087	5,184	4,367	817
2023	991	10,740	12,706	10,916	1,791
2024	1,614	23,718	20,829	18,095	2,734
2025	2,278	42,287	29,496	25,792	3,704
2026	3,000	66,441	38,850	34,067	4,783
2027	3,730	92,333	48,206	42,378	5,828
2028	4,501	119,744	58,007	51,095	6,912
2029	5,287	148,251	68,021	59,989	8,031
2030	6,114	178,379	78,452	69,210	9,242
2031	6,962	209,742	89,077	78,664	10,413
2032	7,848	242,818	100,096	88,425	11,671
2033	8,753	277,266	111,363	98,405	12,958
2034	9,709	313,579	123,119	108,826	14,293
2035	10,681	351,288	135,097	119,427	15,670
2036	11,706	390,998	147,574	130,483	17,091
2037	12,745	432,179	160,279	141,725	18,554
2038	13,840	475,501	173,518	153,449	20,069
2039	14,960	520,584	187,144	165,505	21,639
2040	16,131	568,055	201,277	178,019	23,258
2041	17,328	617,490	215,692	190,805	24,887
2042	18,593	669,613	230,826	204,177	26,650
2043	19,890	723,903	246,316	217,908	28,408
2044	21,249	781,261	262,452	232,179	30,272
2045	22,653	841,268	279,024	246,871	32,153
2046	24,130	904,808	296,399	262,252	34,148
2047	25,641	971,350	314,146	278,005	36,141
2048	27,228	1,041,664	332,659	294,403	38,256
2049	28,857	1,115,071	351,631	311,250	40,381
2050	30,563	1,192 436	371,405	328,771	42,634
Total	**377,423**	**13,325,854**	**4,688,844**	**4,145,457**	**543,387**



As can be seen in the tables above and in Figures 35 and 36, Scenario A yields the largest health gains.

Figure 35: Incremental DALYs averted from child and maternal causes in each scenario by year[173]

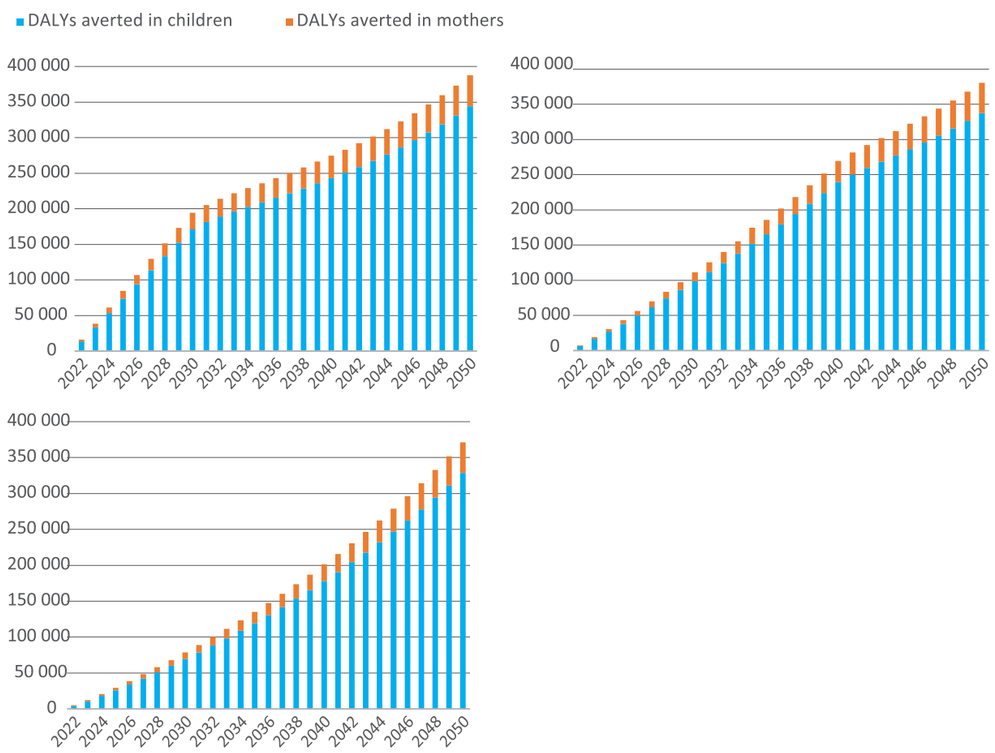
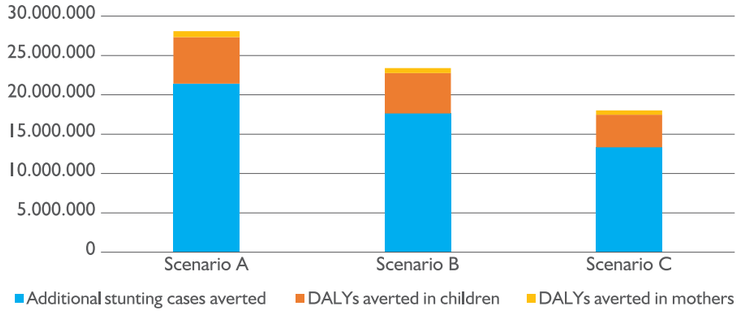


Figure 36: Impact in terms of stunting cases and DALYs averted for the entire time period of study for each scenario[174]



Box 4: What does this mean? A summary of impacts for Package 1

- We have modelled the **scaling-up of interventions in Package 1** (ECD health and nutrition interventions) from their **current coverage levels** (baseline) to **specified target levels**.
- Increasing the coverage of these important interventions has many benefits, which include **averting child deaths** and **stunting cases**, as well as **disability-life years lost** to illness and disease.
- We modelled this scale-up across **different time horizons** – a **fast scale-up** (achieving target by 2030), a **medium scale-up** (achieving target by 2040) and a **slow scale-up** (achieving target by 2050).
- Regardless of the speed of the scale-up, the benefits of increasing the coverage of the interventions in Package 1 are significant.
- In the **slowest scale-up** scenario, a total of **377,423 child deaths** and **over 13.3 million cases of child stunting** could be averted up until the end of the study period (2050).
- In the **fastest scale-up** scenario, the impact of implementing this package is even greater. This is because populations are covered by, and benefiting from, these interventions at an earlier stage. By the end of the study period (2050), a total of 690,494 child deaths and 21.4 million cases of child stunting could be averted.
- As is intuitive, the **faster the pace of the scale-up**, the **greater the potential benefits**. Indeed, **child deaths averted are 45% higher** if target coverage levels are met by 2030, rather than 2050.
- **Scaling up Package 1**, therefore, would have **important benefits for the population** – leading to a decrease in preventable child deaths, as well as improving the health and development of young children. This would significantly improve the upholding of critical child rights in Burundi, as well as constituting a major human capital gain for the country.

4.1.2. Impact of Package 2

As explained earlier, Package 2 includes the same interventions as Package 1, but it adds interventions related to early childhood stimulation and learning, as well as child protection interventions – that is, cash transfers and birth registration. Therefore, this section describes the impact of preschool education in terms of learning outcomes and high school completion rates. As was explained in the Methods section, cash transfers were not modelled in terms of impact on education and health outcomes because interventions related to these were already being evaluated on their own, and only the multiplier effect of cash transfers was modelled and is presented as an economic benefit. The impact of scaling up preschool education was modeled in SimuED open access model. As with OHT software, separate projections in SimuED were created for each scenario and the results were analysed separately.

Given the importance of this intervention in the current Burundian context, we modelled the scale-up of preschool education separately – that is, assuming it is implemented outside of the package, and as part of Package 2. The rationale for this is that some interventions in Package 2 – the most relevant being contraception – have an impact on the number of births and population under five, and thus on the number of students who will need to start education as time progresses, and thus on the level of educational impact yielded. Therefore, scaling up the intervention as part of Package 2 provides a good estimation of the overall impact of implementing the package but it hinders interpretation of the impact of scaling up preschool education in more "real-life" scenarios where the intervention may be implemented outside of or at different timelines with respect to the rest of the interventions in the package. Therefore, we believe this provides valuable evidence to inform decision-making regarding preschool education investments in Burundi, either as a standalone investment or as part of Package 2.

Table 15 shows the impact of scaling up coverage of preschool education in terms of the additional number of children who would finish high school with an adequate level of skills and knowledge. Results were estimated by cohort, meaning that the increase in preschool attendance levels in 2022 will yield benefits from 2034 onwards (i.e., after complementing a year of preschool education plus the additional 12 years of primary and high school education). Therefore, results in Table 15 are presented from 2034 to 2050.

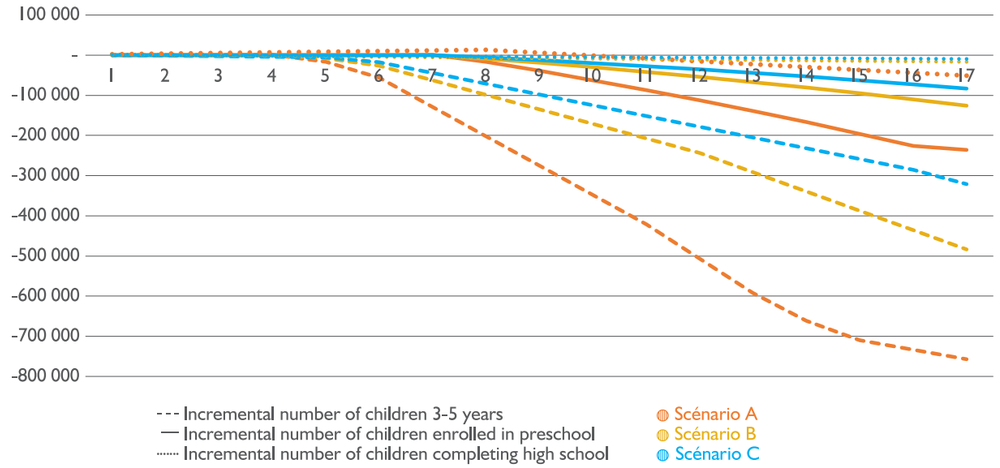
Table 15: Additional children graduating from secondary school Scenario A, B and C in Package 2[175]

2034	2,462	1,166	764	2,577	1,221	800
2035	5,220	2,473	1,620	5,446	2,580	1,690
2036	8,210	3,889	2,548	8,582	4,065	2,663
2037	11,373	5,387	3,529	11,941	5,656	3,705
2038	14,677	6,952	4,555	15,484	7,333	4,804
2039	18,125	8,585	5,625	19,124	9,055	5,931
2040	21,664	10,262	6,723	16,871	8,158	5,360
2041	25,286	11,977	7,847	12,946	6,666	4,478
2042	28,989	13,732	8,997	8,209	4,783	3,303
2043	29,447	15,499	10,154	- 69	2,889	2,192
2044	29,900	17,311	11,341	-8,469	638	809
2045	30,353	19,170	12,560	-17,468	-1,603	-494
2046	30,805	21,077	13,809	-26,910	-4,240	-2,095
2047	31,258	23,032	15,090	-36,533	-6,870	-3,613
2048	31,710	25,034	16,402	-46,873	-9,941	-5,459
2049	32,225	27,137	17,780	-49,282	-13,012	-7,221
2050	32,741	29,294	19,193	-50,936	-16,566	-9,340
Total	**384,444**	**241,978**	**158,537**	**-135,359**	**810**	**7,513**

Scenario A results in a significantly larger number of children completing high school per cohort and in total. On its own – that is, not linked to the implementation of Package 2 – scaling up preschool education under Scenario A yields an additional 384,444 children finalizing high school up to 2050, which corresponds to the cohorts of students from 2021 to 2037 (finalizing high school between 2034 and 2050). Scaling up the intervention as part of Package 2 results in a reduction in the number of students graduating from high school because of the effect that other interventions exert on the projected population.

As other interventions are scaled up in Package 2, they shape the population of interest for this intervention downwards, mainly because of the impact of contraception on the number of births. This causes the number of children who are eligible to start preschool (i.e., children between three and five years) to drop significantly compared with the baseline scenario, in which no changes in the contraception prevalence rate are realized and the population continues to grow. This means that, in the long term, fewer children will finish high school in the scale-up scenarios of Package 2 compared with the baseline since fewer children are eligible to begin preschool, as numbers of births and children decrease over time (compared with the baseline). This explains why the number of children finishing high school is below zero (negative sign) in the education intervention scaled up as part of Package 2. The difference in the number of eligible children, children starting preschool and children finishing high school between the baseline and scale-up scenarios, per cohort, is depicted below. As such, the interpretation of the results of this intervention as part of Package 2 cannot be done in isolation from interpretation of the other interventions in the package. As this report shows later, the impact and investment value of Package 2 largely exceeds the impact of any of its interventions assessed alone.

Figure 37: Difference in the number of eligible children, children starting preschool and children finishing high school between baseline and scale-up scenarios (incremental estimate), Cohorts 1–17 (2021–2037)[176]



There is a drop in the number of children eligible to start, and thus finish, high school in the scale-up scenarios of Package 2. Meanwhile, the baseline scenario presents a growing population. This means that, even without scaling up education, the number of children finishing high school in the baseline scenario offsets the same indicator in the scale-up scenarios. However, in relative terms, a larger proportion of children would finish high-school in the scale-up scenarios relative to the baseline scenario.

Box 5: What does this mean? A summary of impacts for Package

- As with Package 1, we modelled the **scaling-up of interventions in Package 2** from their **current coverage levels** (baseline) to **specified target levels**. We modelled this scale-up across different time horizons – a fast scale-up (achieving target by 2030), a medium scale-up (achieving target by 2040) and a slow scale-up (achieving target by 2050).
- **Package 2 is more extensive than Package 1**, covering all the same health and nutrition interventions, as well as interventions in early learning, child protection and social protection. For this reason, the **positive impacts** of implementing this package **are far greater** than for Package 1.
- Increasing the coverage of these important interventions has many benefits. The results of **scaling up health and nutrition interventions have already been presented** in Section 4.1.1. Broadly, we found that, regardless of the speed of scale-up, the interventions had the potential to extensively improve child outcomes – including **averting child deaths** and **stunting cases**, as well as reducing **disability-life years lost** to illness and disease.
- In addition to these benefits, Package 2 also **positively impacts other areas of child development** – namely, improvements in **educational outcomes**, a **reduction in poverty** and an increased **ability to access critical social services**.
- We measured the impact of these outcomes by projecting the additional number of children completing high school. In a scenario of **slow scale-up, nearly 160,000 extra children are estimated to graduate high school** by 2050 (if pre-primary education is modelled separately). In a **fast-scale up** scenario, this **more than doubles** to nearly **385,000 additional high school graduates**.

Box 5: What does this mean? A summary of impacts for Package (cont.)

- **Modelling the impact of pre-primary education interventions as part of Package 2** can be **confusing**. This is because Package 2 includes family planning interventions, which are expected to trigger a **reduction in the birth rate** (and subsequently a **lower absolute number of children attending**, and thus graduating from, the school system).
- **Figure 35** usefully depicts the **reduction in the number of eligible children not completing high school** for each scenario. It illustrates that, in all three scenarios, the **number of eligible children not completing high school** is projected to **decline significantly** year on year. This reduction is **most significant in Scenario A** (rapid scale-up), where **757,153 more eligible students will graduate high school** than had the intervention not been scaled up. This improvement in educational access and outcome would constitute a **major human capital resource** to propel Burundi's economic development.
- As it is difficult to quantify or isolate the impacts of some of the interventions in Package 2, it is **likely that our projections of benefit are an underestimate**.
- **Scaling up Package 2**, therefore, would have **important benefits for the population**. Not only would it lead to a reduction in preventable child deaths and an improvement in the health and development of young children, as in Package 1, but also it would support their holistic development and future potential. If implemented, it is likely that Package 2 would generate the most wide-reaching and profound impacts on human capital formation in Burundi.

4.2. COST–BENEFIT ANALYSIS: STATEMENT OF COSTS

Following the impact assessment, we estimated the annual total costs of scaling up the interventions analysed using validated costed data, mainly sourced from the LiST Costing Tool, key informant interviews in Burundi (for birth registration), **national expenditure and budget data** (mainly for the education intervention), **other local secondary sources** (for cash transfers) **and international literature** (on the cost of promotion of salt iodization and deworming).

The modelling of the costs assumed a linear increase in service delivery costs relative to the increase in coverage. Service delivery costs were also modelled in line with population growth; therefore, in cases where the population decreases, for example as a result of the impact of increases in the coverage rates of contraception, the total costs of providing specific interventions decreases over time as the number of beneficiaries also decreases. Table 16 below present the incremental (additional) costs associated with each scale-up scenario for the two packages analysed. Three totals are provided, one that covers 2022–2030, another that covers up to 2040 and finally one that presents the discounted costs for the total timeframe of analysis of the investment case. All costs are presented at a 12% discount rate and adjusted for inflation at a rate of 7.9% for 2021 and 6% from 2022 onwards.

As Table 16 shows, implementing the Package 2 leads to overall higher costs. However, these higher costs are derived from the implementation of a larger number of interventions, including enabling interventions. Both packages yield cost savings in some of the interventions scaled up. This is explained mainly by the effect of scaling up contraception. Increasing the contraceptive prevalence rate decreases the number of pregnancies and births and, with it, the number of children and women susceptible to pregnancy and childbirth-related consequences that need to be addressed at a cost for the system.

Two costs estimates are provided for Package 2. The difference between them is the cash transfer (CT) programme scaled up. CT-1 makes reference to the scale-up of the already-in-place unconditional cash transfer called Merankabandi, which is intended to provide households living in extreme poverty an annual transfer of approximately 240,000 BIF (around 50% of GNI per capita distributed per household). The programme covers less than 5% of households in need, and was scaled up in Package 2 to cover 90% of household living under the poverty line with a child under the age of 12. Package 2 with CT-2 scales up a cash transfer programme as described by Cummins et al. (2021), which consists of providing an unconditional transfer of 20% of GNI per capita to every child under the age of five. The methodology for estimating the costs of the cash transfer interventions is presented in the Annex. The (undiscounted) annual incremental costs of each package across each scenario are presented in the tables below.

Table 16: Total incremental costs in present value for scaling up the interventions and packages evaluated, under different scale-up scenarios (BIF million)[177]

Intervention	Scenario A: rapid scale-up			Scenario B: medium scale-up			Scenario C: slow scale-up		
	Total (2022–2030)	Total (2022–2040)	Total (2022–2050)	Total (2022–2030)	Total (2022–2040)	Total (2022–2050)	Total (2022–2030)	Total (2022–2040)	Total (2022–2050)
Contraception	31 134	61 731	73 727	9 704	37 642	50 568	24 867	9 943	36 145
Iron fortification	4 999	9 603	11 353	1 587	5 943	7 819	3 964	5 597	
Antenatal care (at least 4 visits)	2 478	4 063	4 520	1 196	3 320	3 850	2 867	3 719	
Tetanus toxoid vaccination	- 1 842	- 4 034	- 5 184	- 525	- 2 382	- 3 491	- 1 490	- 2 359	
Prevention of malaria in pregnancy (intermittent prophylaxis)	1 430	2 650	3 173	559	1 861	2 403	1 368	1 887	
Syphilis detection and treatment	4 198	8 064	9 883	1 648	5 688	7 551	4 223	6 036	
Iron supplementation in pregnancy	1 293	2 147	2 427	585	1 697	2 019	1 365	1 766	
Balanced energy supplementation	10 107	16 222	18 010	4 552	12 932	15 136	10 112	12 660	
Hypertensive disorder case management	852	1 664	2 056	326	1 156	1 555	843	1 220	
Diabetes case management	1 314	2 467	2 968	499	1 697	2 211	1 226	1 704	
Malaria case management	13 007	20 581	23 454	11 332	18 393	21 384	17 405	20 179	
PMTCT of HIV	1	1	0	1	1	1	2	1	
Clean birth environment	- 2 529	- 6 078	- 8 148	- 633	- 3 503	- 5 514	- 2 022	- 3 506	
Immediate drying and additional stimulation	- 198	- 480	- 661	- 58	- 305	- 485	- 185	- 324	
Thermal protection	- 1 032	- 2 134	- 2 645	- 319	- 1 279	- 1 771	- 838	- 1 237	
Clean cord care	- 770	- 1 608	- 1 999	- 234	- 953	- 1 329	- 619	- 921	
MgSO4 for eclampsia	- 246	- 894	- 1 371	- 887	- 420	- 887	- 104	- 380	
Antibiotics for preterm or prolonged PROM	- 53	- 145	- 200	- 125	- 73	- 125	- 35	- 70	
Parenteral administration of antibiotics	- 486	- 1 312	- 1 785	- 1 072	- 629	- 1 072	- 298	- 601	
Assisted vaginal delivery	45 250	88 749	111 346	64 093	86 844	64 663	71 224		
Neonatal resuscitation	62	99	111	96	110	30	70	90	



Table 16 (cont.)

Intervention	Scenario A: rapid scale-up			Scenario B: medium scale-up			Scenario C: slow scale-up		
	Total (2022–2030)	Total (2022–2040)	Total (2022–2050)	Total (2022–2030)	Total (2022–2040)	Total (2022–2050)	Total (2022–2030)	Total (2022–2040)	Total (2022–2050)
Parenteral administration of uterotonics	- 10	- 24	- 32	- 5	- 15	- 22	- 3	- 9	- 15
Manual removal of placenta	274	495	592	164	365	466	116	280	382
Removal of retained products of conception	6	11	13	3	8	10	2	6	8
Induction of labour for pregnancies lasting 41+ weeks	274	517	638	165	387	508	119	307	438
Antenatal corticosteroids for preterm labour	- 562	- 1 248	- 1 630	- 268	- 772	- 1 147	- 171	- 492	- 788
Caesarean delivery	7 143	12 250	14 317	4 515	9 632	11 807	3 290	7 904	10 572
Blood transfusion	161	298	360	92	211	274	64	155	215
Promotion of breastfeeding	- 4 803	- 11 070	- 14 844	- 2 325	- 7 001	- 10 742	- 1 464	- 4 405	- 7 345
Complementary feeding – education only	16 665	32 515	41 190	9 243	23 289	31 943	6 431	17 394	26 051
Complementary feeding – supplementary feeding	140 021	245 826	290 304	78 049	172 881	218 579	53 643	125 994	170 103
Vitamin A supplementation	- 1 924	- 6 186	- 8 500	- 937	- 3 625	- 5 888	- 593	- 2 313	- 3 973
Basic sanitation	0	0	0	0	0	0	0	0	0
Piped water	0	0	0	0	0	0	0	0	0
Handwashing with soap	4 803	10 026	12 394	2 263	6 314	8 885	1 530	4 362	6 838
Hygienic disposal of children's stools	1 391	2 208	1 973	595	1 309	1 276	442	1 037	1 308
ITN/IRS – households protected from malaria	3 418	6 340	7 308	1 646	3 958	5 083	1 086	2 648	3 673
BCG vaccine	- 1 201	- 2 548	- 3 241	- 583	- 1 580	- 2 257	- 381	- 1 035	- 1 584
Polio vaccine	- 3 597	- 7 554	- 9 520	- 1 735	- 4 637	- 6 552	- 1 133	- 3 038	- 4 590
Pentavalent	- 7 877	- 16 418	- 20 568	- 3 790	- 10 034	- 14 067	- 2 482	- 6 587	- 9 864
Pneumococcal vaccine	- 23 934	- 49 228	- 61 021	- 11 468	- 29 848	- 41 256	- 7 540	- 19 673	- 28 976
Rotavirus vaccine	- 12 513	- 25 831	- 32 113	- 6 002	- 15 696	- 21 781	- 3 942	- 10 334	- 15 291

Table 16 (cont.)

Intervention	Scenario A: rapid scale-up			Scenario B: medium scale-up			Scenario C: slow scale-up		
	Total (2022–2030)	Total (2022–2040)	Total (2022–2050)	Total (2022–2030)	Total (2022–2040)	Total (2022–2050)	Total (2022–2030)	Total (2022–2040)	Total (2022–2050)
Measles vaccine	- 1 373	- 2 867	- 3 591	- 657	- 1 746	- 2 449	- 430	- 1 144	- 1 714
Maternal sepsis case management	1 008	1 183	1 093	812	1 326	1 305	604	1 223	1 373
Kangaroo mother care	- 2 010	- 4 623	- 6 185	- 968	- 2 908	- 4 454	- 609	- 1 827	- 3 038
Injectable antibiotics for neonatal sepsis	- 1 257	- 2 837	- 3 764	- 618	- 1 803	- 2 721	- 395	- 1 155	- 1 886
ORS	11 814	15 622	16 914	7 314	13 405	14 844	5 269	11 062	13 730
Antibiotics for treatment of dysentery	2 034	2 811	3 091	1 241	2 313	2 623	885	1 846	2 294
Zinc for treatment of diarrhoea	25 253	42 547	50 807	14 718	32 063	40 463	10 354	24 576	33 592
Oral antibiotics for pneumonia	- 3 384	- 16 289	- 23 618	- 1 405	- 9 268	- 16 472	- 781	- 5 683	- 10 949
Vitamin A for treatment of measles	- 1 183	- 3 438	- 4 654	- 648	- 2 314	- 3 450	- 378	- 1 233	- 2 124
SAM treatment	- 9 404	- 22 190	- 28 617	- 4 692	- 13 756	- 20 097	- 3 079	- 9 193	- 14 281
MAM treatment	- 14 452	- 56 710	- 77 193	- 6 213	- 30 195	- 49 653	- 3 971	- 19 068	- 32 906
ART	- 1	- 1	- 1	- 1	- 1	- 1	- 1	- 1	- 1
Deworming (children 1–4)	- 457	- 1 769	- 2 396	- 222	- 1 019	- 1 648	- 150	- 674	- 1 136
Salt iodization	288	236	23	139	186	66	91	126	68
Birth registration	- 1 404	- 5 832	- 7 989	- 561	- 3 009	- 5 044	- 348	- 1 855	- 3 283
Total Package 1	**232 175**	**337 579**	**372 577**	**143 110**	**273 396**	**315 206**	**104 710**	**220 584**	**279 731**
Cash Transfer Option 1 (CT-1)	1 090 846	2 108 418	2 503 244	525 943	1 303 225	1 721 737	346 500	869 447	1 231 825
Cash Transfer Option 2 (CT-2)	494 050	862 998	1 014 069	260 903	586 063	741 151	176 531	416 041	562 924
Education	50 732	72 290	83 061	39 191	74 770	85 763	30 708	66 619	82 960
Total Package 2 (CT-1)	**1 373 753**	**2 518 287**	**2 958 882**	**708 244**	**1 651 391**	**2 122 706**	**481 918**	**1 156 650**	**1 594 517**
Total Package 2 (CT-2)	**776 957**	**1 272 867**	**1 469 707**	**443 204**	**934 229**	**1 142 120**	**311 949**	**703 244**	**925 616**

Package 2 (CT-1) includes the scale-up of the Merankabandi programme. Package 2 (CT-2) includes the scale-up of an alternative cash transfer programme in which every child under the age of five receives a transfer of 20% of the average annual income. All costs are discounted at 12% and adjusted for inflation at a 7.9% annual rate for 2021 and a 6% annual rate from 2022 onwards.

The faster the speed of the scale-up, the higher the present value of implementing the package at the end of the study period (2050). For example, the present value of Package 1 is 373 billion BIF by 2050 in the fastest scale-up scenario, but this falls to 280 billion BIF in the slowest scale-up scenario. This translates to a yearly cost of Package 1 of 731 BIF (US$0.40) per capita or 5,953 BIF (US$3.10) per child under five for the fast scale-up scenario, and 507 BIF (US$0.26) per capita or 3,680 BIF (US$1.9) per child under five for the slow scale-up scenario (2022–2050). The reason for this is two-fold. On the one hand, increasing coverage rates faster means that more people will utilize services faster, costing money that is highly concentrated in the years in which the coverage expansion occurs and while coverage is sustained a posteriori. On the other hand, costs informed here are informed in their present value, a method used to determine the current value of future expenditure that will be generated by the costs of scaling up the interventions. In the fast scale-up scenario (Scenario A), costs increase rapidly before 2030 to meet the targets. Investments need, therefore, to be realized upfront and are concentrated in the near future (first eight years). Costs that occur earlier in time have a higher value in the present than costs that will occur later. The later the cost is incurred, the lower its present value. In this context, then, it is not surprising that the present values of the costs for Scenarios B and C are lower than that for Scenario A, since costs in these scenarios are expected to occur later in the future. These costs expressed in present value (discounted) are presented in Table 16.

On the other hand, it is relevant for decision-makers to understand the costs in real terms (before discounting) for resource planning. The average annual cost for Package 1 is 50 billion BIF (US$26 million) in the fast scale-up scenario, and 59 billion BIF (US$31 million) in the slow-scale up scenario for the years 2022 to 2050. For Package 2, the cost per year is 520 billion BIF (US$270 million) in the fast scale-up scenario, and 400 billion BIF (US$200 million) in the slow scale-up scenario for increasing coverage of the Merankabandi (cash transfer) programme. When scaling up Package 2 with an alternative cash transfer programme, [178] the average cost per year from 2022 to 2050 is 240 billion BIF (US$126 million) and 213 billion BIF (US$110 million) in the fast and slow scale-up scenarios, respectively. Average annual real costs by decade are presented in Tables 17–19. Furthermore, Figure 38 (right) shows how real costs are expected to evolve over time.

Cost savings can be achieved by implementing these interventions together. A notable example involves increasing contraceptive and family planning coverage, which significantly reduces the costs of increasing the coverage of other interventions. This is because family planning and contraception use shape the population in need downwards, mainly because of the impact on the number of births. This means, for example, that the number of children eligible to start preschool (i.e., children between three and five years) drops significantly compared with the baseline scenario, in which no changes in the contraception prevalence rate are realized and the population continues to grow. In the long term, fewer children will finish high school in the scale-up scenarios of Package 2 compared with the baseline since fewer children are eligible to begin preschool – as numbers of births and children decrease over time compared with the baseline. This explains why the number of children finishing high school is below zero (negative sign) in the education intervention scaled up as part of Package 2. This means that expenditures on interventions targeting young children, especially in the long term, result in cost savings. The demographic modelling and how the population is expected to decrease as a result of the scale-up of contraception and family planning are depicted below.

Figure 38: Total incremental costs for each package (present value), by scenario and package, discounted at 12% rate (first graph), and real annual incremental costs (Package 1: second graph; Package 2 with scale-up of Merankabandi cash transfer (CT-1): third graph)[179]

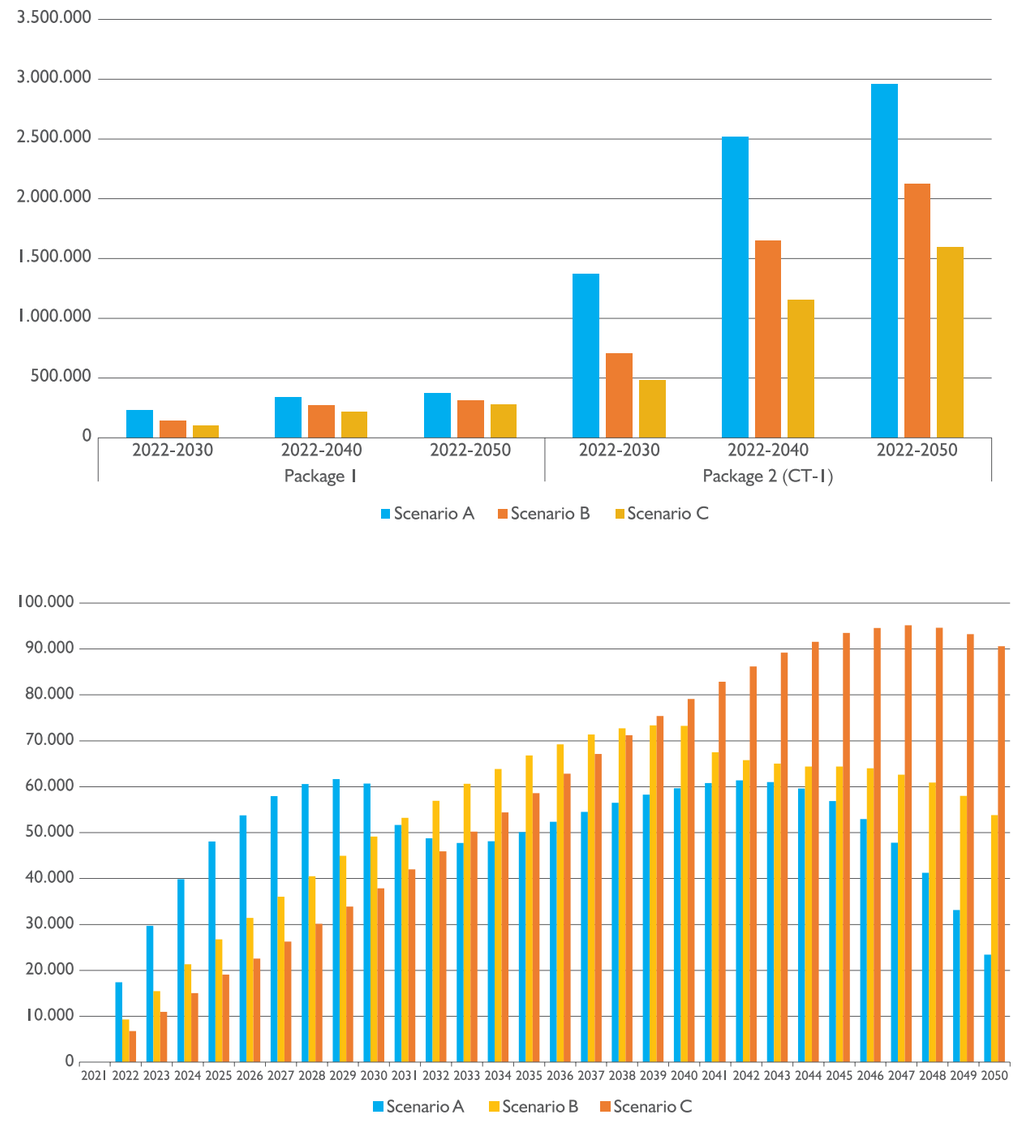




Figure 38 (cont.)

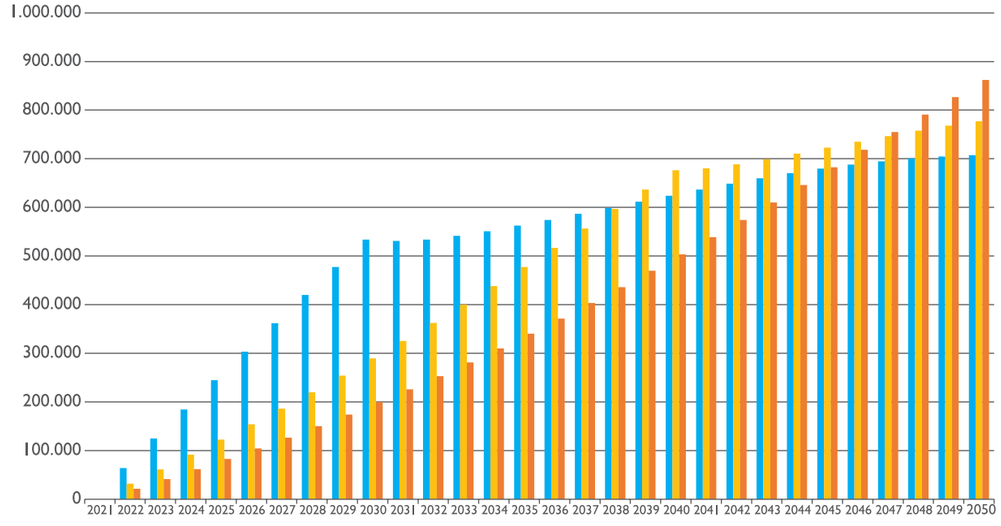


Table 17: Average annual additional (incremental) cost per period, by scenario (BIF million and US$ million)[180]

Package	Scenario A						Scenario B						Scenario C					
	2022–2030		2031–2040		2041–2050		2022–2030		2031–2040		2041–2050		2022–2030		2031–2040		2041–2050	
	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$
Package 1	47,741	25	52,781	28	49,828	26	30,547	16	62,651	35	66,132	33	22,509	12	60,689	32	91,154	48
Package 2 (CT-1)	243,358	127	571,506	298	679,099	355	117,651	61	728,632	260	498,652	380	77,576	41	359,298	188	700,436	366
Package 2 (CT-2)	165,493	86	248,448	130	301,017	157	96,711	51	320,497	133	254,257	167	68,451	36	206,234	108	349,641	183

Table 18: Average annual additional (incremental) cost per period per capita, by scenario (BIF and US$)[181]

Package	Scenario A						Scenario B						Scenario C					
	2022–2030		2031–2040		2041–2050		2022–2030		2031–2040		2041–2050		2022–2030		2031–2040		2041–2050	
	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$
Package 1	369	0.2	278	0.1	229	0.1	233	0.1	139	0.1	168	0.1	171	0.1	121	0.1	97	0.1
Package 2 (CT-1)	1,882	1.0	1 415	0.7	1 167	0.6	896	0.5	534	0.3	648	0.3	588	0.3	415	0.2	333	0.2
Package 2 (CT-2)	1,280	0.7	962	0.5	794	0.4	737	0.4	439	0.3	532	0.2	519	0.3	366	0.2	294	0.2

Table 19: Average annual additional (incremental) cost per period per child under five, by scenario (BIF and US$)[182]

Package	Scenario A						Scenario B						Scenario C					
	2022–2030		2031–2040		2041–2050		2022–2030		2031–2040		2041–2050		2022–2030		2031–2040		2041–2050	
	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$	BIF	US$
Package 1	2,572	1.3	2,724	1.4	2,022	1.1	1,505	0.8	2,477	1.5	2,839	1.3	1,080	0.6	2,311	1.2	3,154	1.6
Package 2 (CT-1)	13,110	6.8	29,494	15.4	27,553	14.4	5,797	3.0	28,810	11.2	21,403	15.0	3,721	1.9	13,681	7.1	24,239	12.7
Package 2 (CT-2)	8,916	4.7	12,822	6.7	12,213	6.4	4,765	2.5	12,672	5.7	10,913	6.6	3,283	1.7	7,853	4.1	12,100	6.3

Table 20: Average annual incremental (additional) costs for scaling up preschool education in Burundi, as standalone intervention (BIF million and US$ million)[183]

Scenario	2022–2030		2031–2040		2041–2050	
	BIF	US$	BIF	US$	BIF	US$
Scenario A	10,068	5.3	9,459	4.9	12,608	6.6
Scenario B	8,176	4.3	15,333	8.0	12,779	6.7
Scenario C	6,478	3.4	16,060	8.4	18,585	9.7

On average, it will cost an annual investment of 47 billion BIF (US$25 million) in the first nine years (from 2022 to 2030) to scale up Package 1 at a fast pace aiming to achieve most of the SDGs by 2030. This average annual investment is five times and over three times higher for Package 2 (CT-1) and (CT-2), respectively (Tables 17–19). We assessed the average annual cost if preschool education is scaled up as a standalone intervention (outside of any package). This would cost an average of 10 billion BIF per year to scale up preschool education to target levels from 2022 to 2030 (Table 20).

Changes in the population are relevant in this analysis. As contraception is part of the interventions, we present the per capita and per child under five average annual estimated costs. As expected, and as described before for the overall costs, these are higher at a higher scale-up pace. In terms of per capita, average annual estimated costs are relatively low. Implementing Package 1 under Scenario A, the most ambitious, would require an additional cost per capita (in real terms) of less than 400 BIF (US$0.20) in the first nine years, which reduces to half in the last decade of evaluation. This average annual per capita cost is less than 200 BIF for Scenario C. On the other hand, the average per capita investment required to implement Package 2 is significantly higher than for Package 1, mainly because of the inclusion of enabling interventions related to social and child protection. The average annual per capita cost in real terms of implementing any of Package 2 evaluated in this study in the first nine years (2022–2030) is between 1,800 BIF (US$1) and 1,300 BIF (US$0.70) in the fast scale-up scenario, and 590 BIF (US$0.30) and 520 BIF (US$0.30) in the slow scale-up scenario.

Box 6: What does this mean? A summary of costs

- Scaling up the ECD interventions included within each of the packages comes at a cost. **The annual cost of this scale-up is dependent on the package of interventions and the time horizon of the scale-up.**
- The **real cost of scaling up Package 1 is significantly lower than for Package 2, in all scale-up scenarios**. This is because Package 2 includes a higher number of multisectoral interventions. For example, scaling up Package 1 in a fast scale-up scenario costs a total of 1,500 billion BIF (an average annual cost of 50 billion BIF), whereas Package 2 costs four to ten times more, depending on the cash transfer programme chosen. A similar relationship is observed in the other scale-up scenarios.
- In real terms, **implementing the packages would require different levels of investment at different stages in time** depending on the speed of the scale-up. For example, implementing Package 1 involves **average annual real costs of 48 billion BIF (US$25 million) during the first nine years** (up to 2030) of scale-up, and nearly 50 billion BIF (US$26 million) annually from 2031 to 2050. Meanwhile, the **medium and slow scale-up plans involve lower real annual costs in the first decade** of implementation (31 billion and 23 billion BIF, respectively), but **higher real annual costs for the subsequent years**. For example, implementing Package 1 implies an annual additional cost, in real terms, of 64 billion and 76 billion BIF under the medium and slow scale-up scenarios, respectively, from 2031 to 2050.
- **The faster the speed of the scale-up, the higher the present value of the investment needed** for implementing the package at the end of the study period (2050). This is intuitive, as increasing coverage rates faster means that more people will utilize services faster, thus costing money that needs to be spent earlier in time – that is, a higher investment upfront.
- **Despite Scenario A (fast scale-up) having a lower average annual real cost, the present value of the investment required for its implementation is significantly larger than that of the medium and slow scale-up scenarios.** This is because costs that occur further in the future have a lower value in the present, and most costs to implement a fast scale-up take place in the nearer future (intensely in the first nine years). This contrasts with the slower scale-up scenarios, in which most costs take place further in the future. As a result, the present value of the additional costs needed to implement any of the packages is higher for Scenario A. For example, the present value of Package 1 from 2022 to 2050 is 373 billion, 315 billion and 300 billion BIF under the fast, medium and slow scale-up scenarios, respectively. Meanwhile, depending on the cash transfer option selected, Package 2 is projected to cost over 3,000 billion or 1,500 billion BIF by 2050 in the fast scale-up scenario and between 1,600 and 925 billion BIF in the slow scale-up scenario.
- **Cost savings** can be achieved by implementing these interventions together. A notable example involves increasing contraceptive and family planning coverage, which significantly reduces the costs of increasing the coverage of other interventions.

4.3. COST-EFFECTIVENESS AND COST–BENEFIT ANALYSIS

The additional impacts and additional costs derived in the sections above were used to generate incremental cost-effectiveness ratios and incremental benefit–cost ratios, through cost-effectiveness and cost–benefit analysis. This section presents these results.

4.3.1. Cost-effectiveness

After the assessment of impact in terms of outcomes and the additional costs for scaling up each package, ICERs were calculated – that is, the ratio of additional costs and additional impacts between the alternative scenario and maintaining the coverage at the current baseline level. The ICERs calculated in the analysis are cost per DALY averted and cost per child completing high school for the education intervention as a standalone intervention. These ratios reflect the cost of averting a DALY and of generating a youngster who is sufficiently skilled.

Tables 21 and 22 show these cost-effectiveness ratios for Scenarios A, B and C for the health-related interventions and for the education intervention, respectively. Estimates are presented in US dollars. DALYs and costs were discounted at 12%. Costs were initially estimated in local currency and adjusted by inflation using an annual inflation rate of 7.9% for 2021 and 6% for 2022 onwards. Finally, they were converted to US dollars.[184] We estimated that the health-related interventions – contained in both Package 1 and Package 2 – averted 1 DALY at a cost of US$29 in Scenarios A and B and US$31 in Scenario C, in the long term (2022–2050). These estimates are well below the target of 1.5 to 3 times GDP per capita recommended by WHO-CHOICE (Choosing Interventions that are Cost-Effective) to classify interventions as cost-effective. Even in a shorter timeframe – say, 2022–2030 – incremental costs per DALY averted are below the recommended threshold and interventions are, therefore, recommended. Based on WHO-CHOICE, they could be considered highly cost-effective as they are below 1 times GDP per capita in all timeframes of assessment. These values are in line with similar investment cases performed in Sub-Saharan Africa (such as Namibia and South Africa).

Table 21: Cost-effectiveness of the health-related interventions (US$)[185]

Indicator	Scenario A			Scenario B			Scenario C		
	2022–2030	2022–2040	2022–2050	2022–2030	2022–2040	2022–2050	2022–2030	2022–2040	2022–2050
Cost per child death averted	1,237	509	282	1 400	561	278	1,956	815	387
Cost per DALY averted	127	53	29	144	58	29	152	64	31

Table 22: Cost-effectiveness of scaling up pre-school education as a standalone intervention (US$)[186]

Indicator	Scenario A		Scenario B		Scenario C	
	2022–2030	2022–2038	2022–2030	2022–2038	2022–2030	2022–2038
Cost per additional child finishing high school	189	89	307	141	366	185

Box 7: What does this mean? A summary of cost effectiveness

- The **cost-effectiveness** of both packages was determined by comparing the benefits and costs explored earlier. The results of this analysis are clearly displayed in the tables above in US dollars.
- These figures are **highly useful for advocacy purposes**, as it is possible to compare the cost-effectiveness of these ECD packages with that of other packages and interventions. Packages with high levels of cost-effectiveness are those that have the lowest costs per DALY/child death averted/additional child completing high school.
- For **Package 1** (and the health and nutrition interventions of Package 2), this was calculated by dividing **the total cost of providing the package by the number of child deaths and disability-adjusted life years averted.** This provided a figure for the **cost per DALY** and the **cost per child death for these health and nutrition interventions.** Over all time horizons, the faster the scale-up of the intervention, the more cost-effective it appears.
- **Scaling up preschool education is highly cost-effective.** Even as a standalone intervention, achieving universal access to preschool would increase the number of students finishing high school. On average, the cost per additional child finishing high school for all cohorts analysed (cohorts of 2022–2038) is US$89 if scaled up fast and US$185 if scaled up slowly. It is worth noting that the cost-effectiveness is lower in the first years as preschool interventions require costs to take place early in the education cycle, with outcomes, and especially impact, achieved later in time.

4.3.2. Economic benefits and benefit–cost ratios

To inform the investment case, we put a monetary value to the gains obtained in health and productivity owing to less death, less disease and more ability to participate in the economy. That is, we estimated the monetary benefits of each set of interventions. Below, we describe step by step how this was performed.

1. First, we monetized health outcomes using the approach of "value of a statistical life" – this approach focuses on the economic return to society of each DALY averted, through productivity gains. Monetary benefits are assumed to be 1.5 times GDP per capita for each DALY saved, as used frequently in the literature on developing countries and in a recent return-on-investment study of maternal and child health interventions. The value of 1.5 corresponds to an average benefit of 1 times GDP per capita for the direct contribution to the economy through increased labour supply and productivity, while the value of 0.5 times corresponds to the social contribution (Stenberg, 2014). We used the GDP per capita reported by the World Bank for Burundi in 2020 (US$274 GDP per capita).
2. Next, we converted the child stunting cases averted into monetary benefits to account for the averted loss in future earnings through better cognitive development in children who have avoided stunting. This is based on Hoddinnott et al. (2011, 2013) and Horton and Ross (2003).
3. Then, we calculated the direct economic benefit of the promotion of iodized salt. There is robust evidence of the effect of this intervention on cognitive development and future earnings of children (Aburto et al., 2014). Productivity gains from better cognitive development leading to an increase in lifetime earnings were estimated in Excel. The methodological details of this approach are presented in the Annex.
4. Next, we estimated the benefits from additional individuals completing high school. We estimated that each additional individual who graduates high school as a result of preschool education will have a productivity that is a function of the employment rate, the average income per capita, the time period they have available to generate earnings (assumed to be from 18 to 63 years) and the share of income labour to GDP. To estimate the effectiveness of preschool education for high school completion rates, a relative risk of 1.28, informed by Heckman et al. (2006), was used to calculate the probability of children receiving ECE to finishing high school relative to peers. This approach is conservative and does not model other effects described in the literature, like increased income. However, the fact that it relies on average GNI per capita, which is already above the minimum income, to estimate future earning could be understood as already reflecting access to a more skilled job market.
5. Finally, we added the benefits in monetary terms from all these sources of impact and compared them with the additional costs, presented as a BCR for each scale-up scenario under each package evaluated. The BCR expresses the dollar value returned to each dollar invested in scaling up the set of interventions under each scenario. A BCR value of >1 implies >US$1 return for each US$1 invested.

Tables 23 and 24 show the incremental economic benefits and provide the BCR for the set of health-related interventions and all interventions, respectively. The estimates are provided by scenario, discounted, and from 2022 to 2030, 2040 and 2050. The tables also show the economic benefit from each source of impact: mortality and morbidity (mortality, morbidity, stunting, iodine deficiency, education and cash transfers). As mentioned above, in these calculations, benefits and costs have been included for all the interventions under analysis in each package. This includes the cost of scaling up birth registration, which has been included in the calculation of both health-related and non-health-related interventions.

Table 23: Economic benefits and benefit–cost ratio for Package 1[187]

Indicator	Scenario A			Scenario B			Scenario C		
	2022–2030	2022–2040	2022–2050	2022–2030	2022–2040	2022–2050	2022–2030	2022–2040	2022–2050
Economic benefits (US$ million)									
DALYs averted in children	365	1,291	2,571	200	956	2,230	138	688	1,806
DALYs averted in mother	961	1,081	1,245	26	123	282	19	91	237
Stunting cases averted	910	4,386	9,331	449	2,884	7,684	298	1,946	5,806
Disability avoided from iodine deficiency	0.1	0.2	0.4	0.0	0.2	0.3	0.0	0.1	0.3
Total additional economic benefit	2,237	6,758	13,148	675	3,963	10,197	455	2,725	7,849
Benefit–cost ratio	18	38	68	9	28	62	8	24	54

In Package 1, for the whole timeframe analysed, Scenario A yields US$68 in economic returns for each US$1 invested, while Scenarios B and C yield US$62 and US$54, respectively. In Package 2, all scenarios achieve relatively similar levels of return – that is, between US$10 and US$11 for every US$1 spent, in the long run if scaling up CT-1. If scaling up CT-2, Scenario A (fast scale-up) shows the best BCR at 2030, 2040 and 2050 (Table 24).

Table 24: Economic benefits and benefit–cost ratio for Package 2

Indicator	Scenario A			Scenario B			Scenario C		
	2022–2030	2022–2040	2022–2050	2022–2030	2022–2040	2022–2050	2022–2030	2022–2040	2022–2050
Economic benefits (US$ million)									
DALYs averted in children	365	1,291	2,571	200	956	2,230	138	688	1,806
DALYs averted in mother	961	1,081	1,245	26	123	282	19	91	237
Stunting cases averted	910	4,386	9,331	449	2,884	7,684	298	1,946	5,806
Disability avoided from iodine deficiency	0.1	0.2	0.4	0.0	0.2	0.3	0.0	0.1	0.3
Cash Transfer (Option 1) (CT-1)	1,088.0	2,102.9	2,496.6	524.6	1,299.8	1,717.2	345.6	867.2	1,228.6
Cash Transfer (Option 2) (CT-2)	492.7	860.7	1,011.4	260.2	584.5	739.2	176.1	414.9	561.4
Preschool education	56.1	10.3	10.3	27.2	19.0	19.0	17.9	13.9	13.9
Total additional economic benefit (CT-1)	3,381	8,871	15,655	1,227	5,282	11,933	819	3,606	9,091
Total additional economic benefit (CT-2)	2,786	7,629	14,170	963	4,567	10,955	649	3,154	8,424
Benefit–cost ratio (package with CT-1)	5	7	10	3	6	11	3	6	11
Benefit–cost ratio (package with CT-2)	7	11	19	4	9	18	4	9	17

Finally, we assessed the BCR for the preschool education intervention as a standalone intervention. As Table 25 shows, fast scale-up of pre-primary education generates the largest BCRs, and the most value for money. This means that the faster the increase in access to preschool to children under five, the larger the benefits accrued in the short and long run.

Table 25: Cost–benefit analysis of preschool education intervention as a standalone intervention[188]

Indicator	Scenario A		Scenario B		Scenario C	
	2022–2030	2022–2038	2022–2030	2022–2038	2022–2030	2022–2038
Total economic benefit from education as a separate intervention (US$ million)	118	237	56	138	37	90
Total cost (US$ million)	26	34	20	34	15	29
Benefit–cost ratio	5	7	3	4	2	3

Box 8: What does this mean? A summary of benefit–cost ratios

- **Benefits** (child deaths or stunting cases averted, DALYs averted, additional children finishing high school) can all be **monetized** using quantitative techniques. This makes it possible to **compare them with the total costs of implementing a package.** Comparing the monetary benefits with costs of a package allows us to create **a benefit–cost ratio**. This **ratio gives an indication of the magnitude of the return on investment of the package.**
- This analysis was run for both of the packages under study, across the three scale-up scenarios. For both packages, and across all interventions, the **rate of return on investment is impressive.**
- **Package 1 has higher average BCRs than Package 2.** For Package 1, the lowest BCR would occur under **Scenario C (slow scale-up), where for every US$1 invested in the package, US$54 would be returned by 2050.** The highest BCR would be witnessed if the package was scaled up quickly. In **Scenario A, by 2050 for every US$1 invested in the package, there would be a projected US$68 return by 2050.**
- Package 2 has high BCRs in the long run (by 2050), particularly if the second cash transfer option is implemented. In the fastest scale-up scenario, **Package 2 would see US$10 and US$19 returned for every US$1 invested by 2050** (depending on the cash transfer selected). Significantly, **this is a conservative estimation of benefits**, and therefore these are likely to be much higher as the true benefits of educational, social protection and child protection interventions are harder to monetize than the health and nutrition benefits of Package 1.
- For both packages, the **return on investment is greater the longer the time horizon it is viewed against**. For example, for Package 1, for every scale-up scenario, the BCR is higher for the period 2022–2050 than for 2022–2030. This is because of some long-term effects as well as lags modelled between the implementation of an intervention and the occurrence of an event or a cost.
- In general, **the faster the scale-up, the greater the BCR, for both packages**. This is notable, as we found earlier that, the faster the scale-up, the greater the cost of implementing the package. This increasing BCR ratio shows that, in spite of the increased costs, the benefits will far outweigh them.

4.3.3. ECD and progress towards the SDGs in Burundi

Implementing the multisectoral ECD packages will facilitate progress towards the SDGs in Burundi.

Through social protection measures like cash transfer programmes, families have access to increased income, facilitating access to ECD services and goods.

ECD multisectoral interventions evaluated in this study can decrease stunting prevalence rates by 10% by 2030.

Implementing the ECD packages will increase life expectancy by two to four years in the next decade.

Moreover, implementing any of the packages would allow Burundi to meet the target of a maternal mortality rate <70 by 2030.

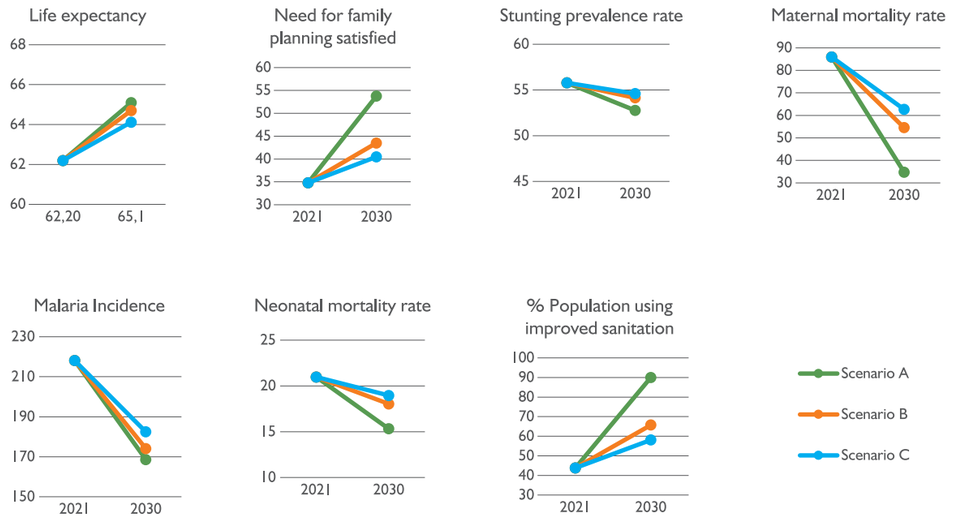
The packages studied could help significantly reduce the malaria incidence rate, by an average of 20%, by 2030.

Increasing enrolment rates in preschool education by boosting public investment in it and making it mandatory can accelerate progress towards SDG 4, indirectly impacting SDG 1 and SDG 8.

Only in the fast scale-up scenarios can Burundi meet SDG 6. This is challenging, as it would require doubling access to safe water and improved sanitation in a decade.

If rapidly scaled up, Package 2 could increase high school graduation rates by nearly 50%.

ECD multisectoral packages will generate an additional increase in GDP per capita of at least US$20 by 2030 if scaled up rapidly.



4.4. FUNDING GAP AND FISCAL SPACE ANALYSIS

As the ability of the Burundian government to implement and finance an ECD initiative is inextricably linked with the broader macro-economi c environment, a fiscal space analysis was conducted to understand the financial sustainability of each intervention. As described earlier in the Context section, Burundi's macro-economic environment has important implications for the funding of the ECD packages. Burundi's predominantly agriculture-based economy presents limited opportunities for sustainable growth and structural transformation. The economy has experienced low and unstable annual GDP growth rates over the past two decades, contributing to financing constraints, rising public debt levels and external imbalances. The COVID-19 pandemic has further complicated this already challenging macro-economic situation. The economic shock linked to the pandemic has jarred the fragile economic recovery taking place since the 2015 recession. Real GDP growth has been downgraded, with national sources estimating -0.5% in 2020 compared with 4.5% witnessed in 2019.[189] However, MFBEP predicts a rebound in economic growth in 2021 – projecting real GDP to increase to 3.1%.[190] Burundi's economic recovery is contingent on a number of uncertain factors, including both domestic and global recovery following the pandemic, and the impacts of climate change on crops, since Burundi's economy is predominantly agricultural.

This section presents the results of the fiscal space analysis, whereby annual additional fiscal space is measured against projected costs. Presentation of the results is structured around the three scale-up scenarios, where selected interventions are scaled up to their target rates by 2030, 2040 and 2050. In this first draft of the report, all variations of possible scenarios are presented. The financial feasibility of the two packages is assessed in all three scale-up scenarios according to the four prospective growth paths.

In each scenario, ECD interventions within each package are scaled up to 90% of their target rates by 2030, 2040 and 2050. The cost of achieving this scale-up is outlined for both packages. These costs are then compared against the projections of additional fiscal space for each year of study. Additional fiscal space is calculated by computing government revenue in a current year, less government revenue in the previous year, for each of the four growth scenarios. The growth trajectories considered are the three growth paths outlined the NDP (2018) of averaging 4%, 6% and 10.2% real economic growth by 2027.

Our model sought to understand how affordable each scale-up scenario would be by assessing the proportion of additional fiscal space that would need to be allocated to ECD to cover the costs of the package. In each year, the percentage of fiscal space required for the package in question is illustrated by a line graph. In certain cases, the proportion of additional fiscal space required is greater than 100%. This indicates that the total costs cannot be covered by the additional fiscal space emerging from projected economic growth. In these cases, a financing gap was measured (in BIF billion) and is illustrated with bars in the figures. Absence of a bar indicates that there is no financing gap, and that the required costs can be met with additional fiscal space. However, it would be unreasonable to assume that it is feasible to allocate the majority of additional space reaped from economic growth. This analysis assumes that a benchmark of 25% is deemed a realistic proportion of added fiscal space to be allocated towards ECD.

In the first few years of the intervention, there are greater fluctuations in the amount of revenue required to fund ECD. This is because of high initial start-up costs and unstable post-pandemic growth. Over time, there is a decline in the portion of revenue needed to be allocated to fund ECD. This is because implementation costs decrease and because the economy continues to grow in the medium to long term.

It is important to note that it is challenging to estimate long-term trends accurately, given the unpredictability of potential economic, health and climate-related shocks. This has been vividly illustrated by the COVID-19 pandemic. Nevertheless, every effort has been made to deliver the most accurate estimates possible with existing trends and resources.

4.4.1. Scale-up Scenario A: interventions scaled up to 90% by 2030

4.4.1.1. Scenario A: Package 1

Figure 39: Additional fiscal space allocated to Package 1 (fast scale-up scenario (A)) under different economic growth projections (fiscal space scenarios)[191]

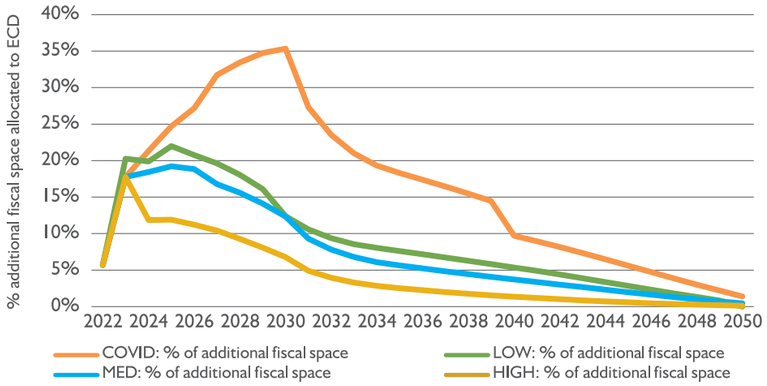


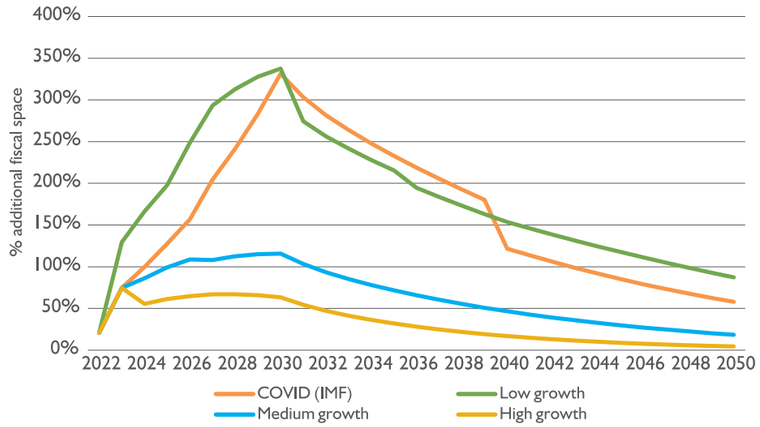
Figure 39 presents findings for Package 1. The vertical axis shows the percentage of additional revenue generated from economic growth that will need to be allocated to ECD in order to fund the scale-up of Package 1 under fast scale-up. For example, in 2025 in the medium growth scenario, 19% of the fiscal space generated from economic growth would need to be allocated towards ECD in order to fund the intervention.

Throughout the period, there are no financing gaps, indicating that Package A under the fast scale-up scenario can be funded largely through domestic sources. As mentioned above, this analysis assumes that a benchmark of 25% is deemed a realistic proportion of added fiscal space to be allocated towards ECD. A proportion larger than this would be deemed unrealistic as it is unreasonable to assume that the Burundian government would be able to allocate a substantial portion of government revenue to one sector.

In the first few years of the intervention, there are greater fluctuations in the amount of revenue required to fund ECD. This is because of high initial start-up costs and unstable post-pandemic growth. In the NDP scenarios, from 2025 onwards, there is a steady decline in the portion of revenue needed to be allocated to fund ECD. This is because implementation costs decrease and because the economy continues to grow in the medium to long term. The post-COVID scenario follows a different path, as this scenario assumes a more modest growth rate in the short to medium term. However, in the long run, economic growth improves as implementation costs decrease, illustrating the affordability of this package under the rapid scale-up scenario. It is important to note that, between 2025 and 2032, this analysis suggests that the intervention cannot be solely funded by domestic resources as this would mean that over a quarter of additional revenue from economic growth would need to be allocated towards ECD.

4.4.1.2. Scenario A: Package 2

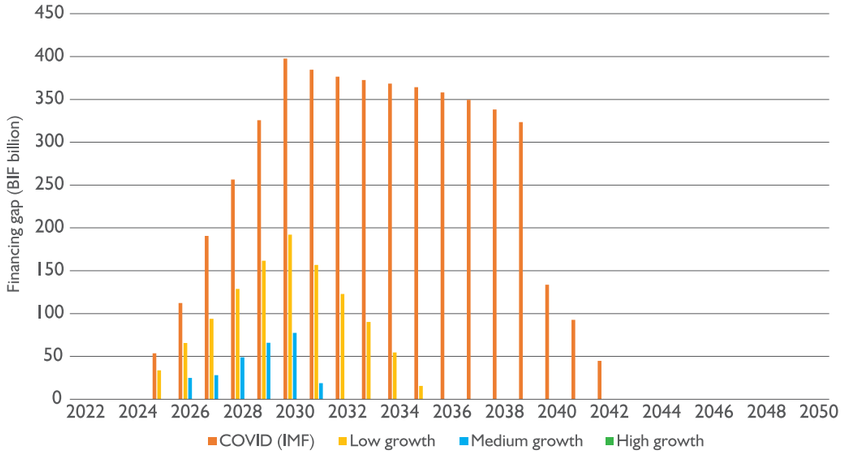
Figure 40: Additional fiscal space allocated to Package 2 (fast scale-up scenario (A)) under different economic growth projections (fiscal space scenarios)[192]



The vertical axis in Figure 40 shows the percentage of additional revenue generated from economic growth that will need to be allocated to ECD in order to fund the scale-up of Package 2. Much higher percentages of additional fiscal revenue are required to finance Package 2 than are seen for Package 1. This is because Package 2 is more holistic and has more components, and so is more costly – particularly in the first 10 years of the intervention. In this scenario, often over 100% of additional revenue would need to be allocated to fund ECD, which indicates a financing gap. Until 2030, the amounts of fiscal space allocated towards ECD increase across all growth scenarios, illustrating the effects of the rising costs of implementation. After 2030, the required fiscal space begins to decrease steadily because incremental costs are no longer rising along with increasing coverage, while the economy continues to grow. As a result, a comparatively smaller proportion of fiscal space is required.

The fact that Package 2 frequently requires over 100% of additional fiscal space indicates that there are substantial financing gaps. Figure 41 illustrates these financing gaps more clearly. Package 2 experiences substantial financing gaps over the next two decades for the COVID-19 and low growth path, with financing gaps disappearing only in 2042 for the COVID-19 scenario. In the medium growth scenario, financing gaps exist between 2026 and 2042. However, it is important to note that, even when the financing gaps are reduced, financing Package 2 requires that a substantial proportion of additional government revenue be allocated towards ECD. In the medium growth scenario, although Package 2 could theoretically be financed through domestic revenue, this would require that over 50% of additional revenue be allocated towards this intervention until 2040. This is deemed unrealistic. Even on the high growth path, large portions of growth would need to be allocated to fund the intervention. Overall, given the projected macro-economic environment, these figures show that it is generally unfeasible to fund Package 2 entirely through domestic revenue from economic growth in Scenario A, where interventions are scaled up rapidly to achieve 90% in 2030.

Figure 41: Funding gap for Package 2 under Scenario A[193]



4.4.2. Scale-up Scenario B: interventions scaled up to 90% in 2040

This section examines Scenario B, comparing the costs of scaling up interventions to 90% by 2040 against predicted fiscal space. This part of the analysis considers how fiscal space created from additional economic growth can be used in funding Packages 1 and 2 and identifies likely funding gaps.

4.4.2.1. Scenario B: Package 1

Figure 42: Additional fiscal space allocated to Package 1 (medium scale-up scenario (B)) under different economic growth projections (fiscal space scenarios)[194]

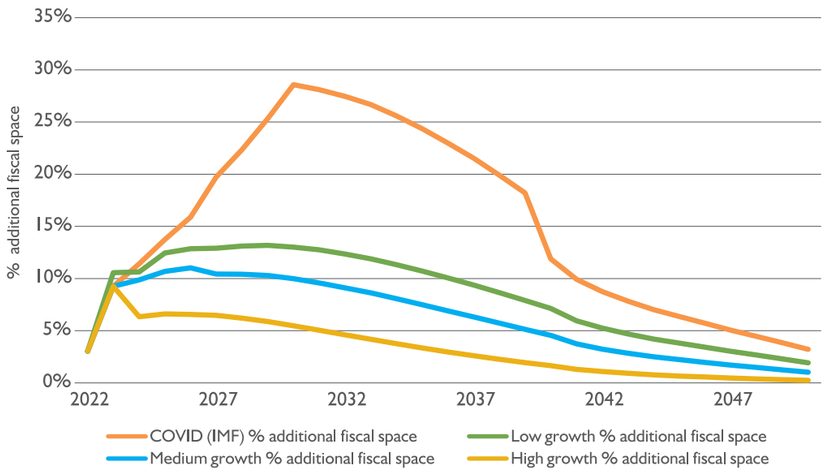
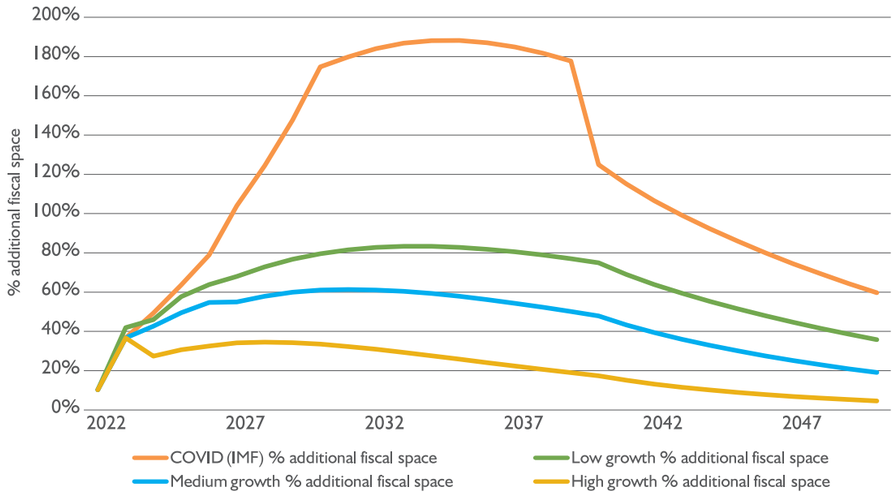


Figure 42 presents the fiscal space analysis for funding Package 1 in Scenario B. The vertical axis shows the percentage of additional revenue generated from economic growth that will need to be allocated to ECD in order to fund scale-up. Similar to under Scenario A, Package 1 in Scenario B is broadly affordable according to estimates of fiscal space. In particular, there are no funding gaps throughout the timeframe, even when considering the low and COVID-19 economic growth scenarios. Never more than 100% of fiscal space needs to be allocated towards ECD. Additionally, the proportions of additional revenue that would need to be allocated to fund this package are largely affordable for most of the time period considered, aside from the COVID-19 scenario between 2029 and 2035.

4.4.2.2. Scenario B: Package 2

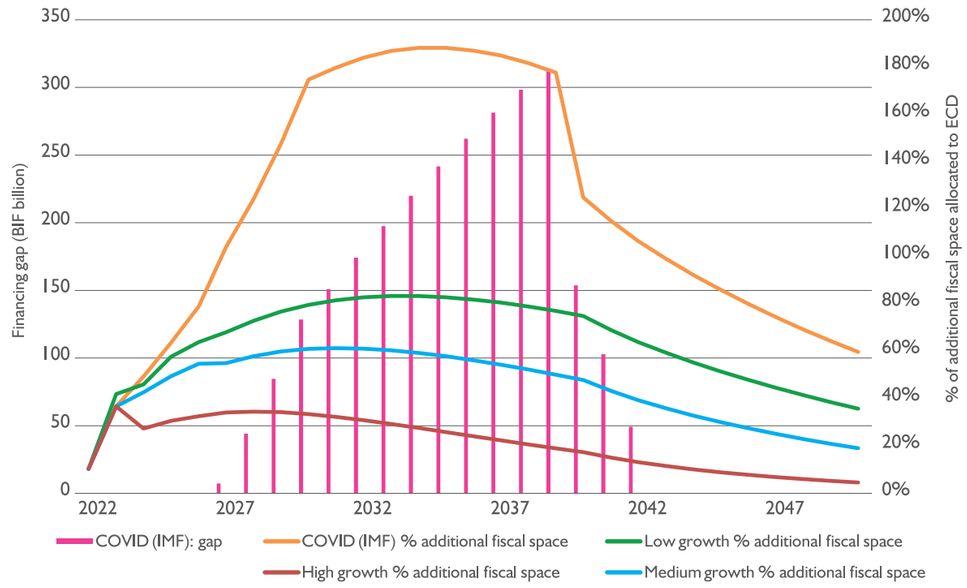
Figure 43: Additional fiscal space allocated to Package 2 (medium scale-up scenario (B)) under different economic growth projections (fiscal space scenarios)[195]



The analysis reveals substantial challenges to financing Package 2 under Scenario B. The vertical axis shows the percentage of additional revenue generated from economic growth that will need to be allocated to ECD in order to fund scale-up. Much higher percentages of additional fiscal revenue are required to finance Package 2 than were seen for Package 1. However, Package 2 is more affordable in the medium scale-up scenario (B) than in the rapid scale-up scenario (A). This is because costs are more evenly distributed across the timeframe considered. This cost-smoothing effect is noticeable in the curved shapes of the lines above. Particularly in the COVID-19 scenario, there is a concave shape between 2030 and 2039, where growth increases linearly and costs begin to plateau before increasing at a rate that is lower than the additional revenue generated from economic growth.

Throughout the period, substantial portions of additional fiscal space are required to finance Package 2 under Scenario B. Using the benchmark of 25%, even in the high growth scenario Package 2 cannot be funded solely through domestic revenue. This illustrates the need for Burundi to consider alternative financing sources to fund this intervention. Comparing Package 2 across Scenarios A and B shows that, although both follow similar trends, the proportions of required fiscal space are generally lower in Scenario B owing to the longer timeframe of the scale-up scenario – resulting in costs being more distributed across the timeframe.

Figure 44: Funding gap for Package 2 under Scenario B[196]



Moreover, often more than 100% of additional revenue would need to be allocated towards ECD in the COVID-19 scenario, illustrating large financing gaps (Figure 44). The financing gaps rise continuously from 2027 to 2039 (left hand axis), following the rising costs as the scale-up scenario seeks to increase coverage to 90% of its targets. From 2040 onwards, the financing gaps begin falling as scale-up scenarios are no longer increasing, and the economy continues to grow, creating fiscal space.

However, even when the financing gaps are reduced, financing Package 2 requires that a substantial proportion of additional government revenue be allocated towards ECD. For example, in the medium growth scenario between 2026 and 2039, over half of additional revenue from economic growth would need to be allocated towards this intervention – an unrealistic estimate. Overall, given the projected macro-economic environment, the analysis shows that it is generally unfeasible to fund the medium scale-up (Scenario B) of Package 2 through additional economic growth. This means that alternate sources of financing will need to be sourced.

4.4.3. Scale-up Scenario C: interventions scaled up to 90% by 2050

This section examines Scenario C, comparing the costs of scaling up interventions to 90% by 2050 against predicted fiscal space. This part of the analysis considers how fiscal space created from additional economic growth can be used towards funding Packages 1 and 2 and where there are likely to be funding gaps.

4.4.3.1. Scenario C: Package 1

Figure 45: Additional fiscal space allocated to Package 1 (slow scale-up Scenario C) under different economic growth projections (fiscal space scenarios)[197]

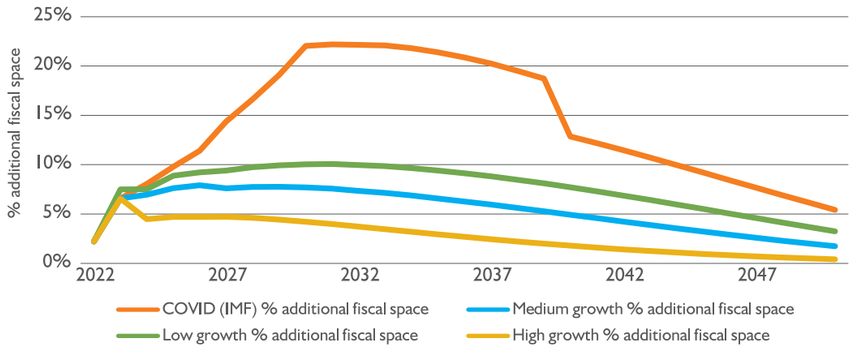
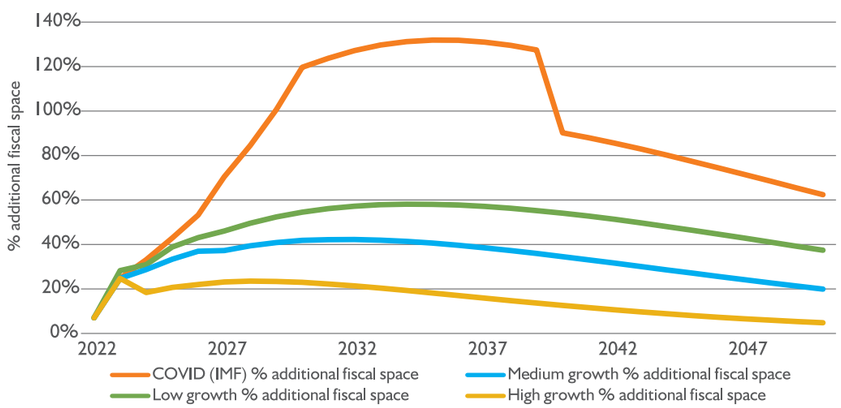


Figure 45 presents the fiscal space analysis for funding Package 1 in scenario C. The vertical axis shows the percentage of additional revenue generated from economic growth that will need to be allocated to ECD in order to fund scale-up. Package 1 in Scenario C is broadly affordable according to estimates of fiscal space – more so than the previous two packages. This is because, the slower the pace of the scale-up, the more distributed the costs are over the time period.

There are no funding gaps throughout the timeframe, even when considering the low and COVID-19 economic growth scenarios. Moreover, using the benchmark of 25%, it is possible that Package 1 in the slow scale-up scenario can be fully funded through domestic revenue. However, having an intervention funded solely through domestic revenue from economic growth may pose challenges as economic growth is highly susceptible to shocks – as the COVID-19 pandemic has illustrated.

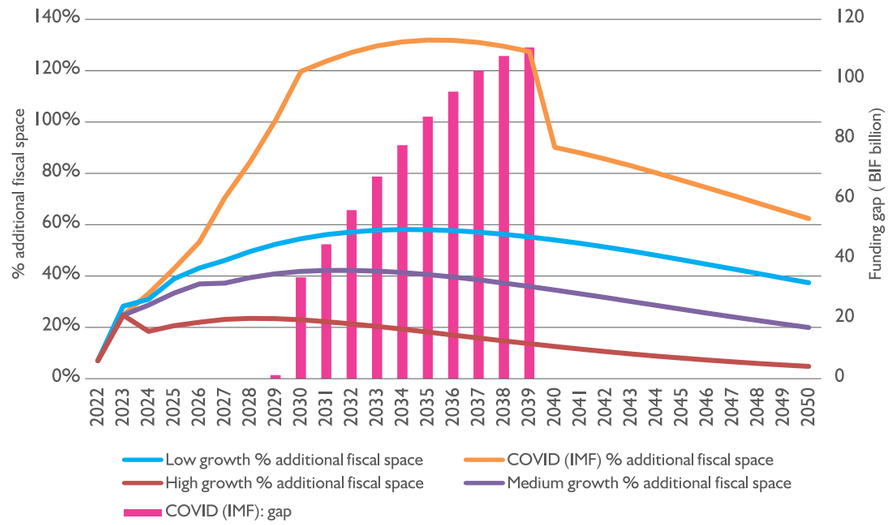
4.4.3.2. Scenario C: Package 2

Figure 46: Additional fiscal space allocated to Package 2 (slow scale-up Scenario C) under different economic growth projections (fiscal space scenarios)[198]



Once again, the more holistic Package 2 has a greater financial burden. The vertical axis shows the percentage of additional revenue generated from economic growth that will need to be allocated to ECD in order to fund scale-up. Except on the high growth path, over 25% of additional government revenue would be needed to fund Package 2 under Scale-up Scenario C. This illustrates that the government will be largely unable to fund Package 2 under the slow scale-up scenario. However, when comparing the financing of Package 2 across the scenarios, it is clear that the financial burden is lower under Scenario C. When the scale-up period is longer, the costs are distributed over a longer timeframe, making it more affordable.

Figure 47: Funding gap for Package 2 under Scenario C[199]



Moreover, the financing gaps (left hand side of Figure 47) under the COVID-19 scenario are particularly large. As before, financing gaps where over 100% of additional fiscal space would need to be allocated to the package in question are illustrated with bars. For the first few years of implementation, there are no financing gaps: the slower roll-out of the intervention coupled with the post-pandemic economic recovery means that the Burundian government could fund the majority of the intervention. However, financing gaps in the COVID-19 scenario are present for 2029–2039. This highlights the need for external financing for Package 2.

4.4.4. Alternate funding options

This section discusses alternative funding options in cases where packages cannot be funded through additional fiscal space.

The above fiscal space analysis revealed that, although it may be possible to finance the packages partially through additional economic growth, it is largely unfeasible that these interventions can be funded entirely in this way. As a result, the Burundian government should consider alternative funding options. A useful tool for this is the fiscal space diamond, in Figure 33 earlier in this report. The sources available to increase fiscal space, or budgetary room, can be visualized as a diamond, whose shape reflects the relative contribution of each of the sources to the available budgetary room. Fiscal space can be increased through four pathways:



1. Additional domestic revenue dedicated to a particular purpose
2. Additional foreign grants and aid
3. Additional borrowing or
4. Efficiency gains and reprioritization of expenditure

The fiscal space analysis focused on how additional domestic revenue (corner 1) can be allocated towards investing in ECD. The analysis centred on this channel, given limited donor aid in the past six years in Burundi and the country's debt levels, and to avoid the budget reallocations that come through efficiency savings. However, all possible means of increasing fiscal space are discussed here in more depth.

4.4.4.1. Corner 1: additional domestic revenue

The sizable improvements in domestic revenue collection are an important strength to acknowledge. Burundi has made significant progress in mobilizing domestic resources through tax reforms. Tax reforms introduced in the 2020/21 Finance Law are expected to lead to an important increase in tax revenue, with tax-to-GDP expected to increase to 17% from 2022 onwards.[200] Non-tax reforms also saw an increase between 2020 and 2021, as a result of property income, dividends and additional administrative laws (including fees for visas, passports, permits, fines and penalties). However, revenue from taxation is unlikely to grow further. As Burundi is currently a low-income country,[201] the potential income to be reaped from taxing its citizens is low. Thus, revenue from taxation is an unlikely source of funding for ECD.

4.4.4.2. Corner 2: debt financing

Debt levels in Burundi make deficit financing an inadvisable strategy. After the withdrawal of donor support, fiscal deficits increased rapidly between 2015 and 2019, averaging 7% of GDP per year. With reduced domestic funding available, the fiscal deficit was financed through borrowing from the central bank and domestic banks. While fiscal consolidation efforts were made by reducing government expenditure from 42% of GDP in 2011 to 22% in 2016, government expenditure has since been on the rise. In 2019, public debt was estimated at 57.4% of GDP, and this is expected to rise further as a result of COVID-19.[202] Burundi is at great risk of debt distress and filed for debt relief from the IMF in 2020. Burundi's fiscal deficit is expected to improve in the coming years, as a result of improved revenue collection and fiscal consolidation measures, but existing debt levels make deficit financing an ill-advised strategy for financing an ECD policy.

4.4.4.3. Corner 3: efficiency savings

Additional fiscal space can be generated through efficiency savings and budget reallocations. In a low-income country like Burundi,[203] with budget constraints and limited donor support, such reallocations must be exercised with caution so as not to take necessary funds away from other important sectors. Nevertheless, there is potential for budget reallocations if this is done in conjunction with a thorough budget analysis. In particular, analyses can be carried out to estimate allocative efficiency and technical efficiency. Allocative efficiency involves improving the allocation of resources to maximize the impact of interventions. Technical efficiency involves improvements that optimize implementation and result in interventions being implemented at the lowest possible cost. In Burundi, budgets could be analysed to determine how much is currently being allocated to different sectors (e.g. health care, education, the military), and estimates can be made regarding how to reallocate funds to other important sectors.

4.4.4.4. Corner 4: official development assistance

In recent years, the Burundian government has received minimal development support; many donors withdrew funding in 2015. Prior to 2015, donor aid contributed around half of total government revenue. Between 2014 and 2016, aid decreased from 8.5% to 2.3% of GDP. Some donors have since reinstated support, albeit slowly. In 2020, external grants made up 7.9% of GDP – up from 5.8% in 2016. ODA estimates for the coming years are currently uncertain, but there is room for optimism. The 2021/22 national budget demonstrates increases in development aid. For example, external financing to the education sector has gone up from 2,607,149,800 billion BIF in 2020/21 to 27,274,090,230 billion BIF in 2021/22.[204] This is a positive indication that donor financing may be a viable solution to plug the funding gaps observed, particularly in the first few years of implementation.

4.4.4.5. Key takeaways

Given Burundi's current macro-economic environment and likely future predictions, it is inadvisable for the country to seek funding for its ECD strategy through debt. Although generating further additional revenue through taxation is unlikely, there is the potential to fund at least part of an ECD strategy by channelling a portion of the anticipated gains from economic growth towards ECD. Additionally, the potential to fund ECD interventions through domestic revenue is greater in the slower scale-up scenario, given that in this scenario costs are distributed across a longer timeframe. However, we do not recommend choosing a package and scale-up scenario based on cost alone, as the faster scale-up scenario and more holistic interventions provide important gains, as this report shows.

While the fiscal space analysis suggested the possibility that interventions could be funded partially (in some cases entirely for Package 1) through government revenue, it is not recommended that the government seek to fund this important intervention through one source alone. Economic growth, and thus additional revenue from economic growth, is highly susceptible to shocks – as has been clearly experienced as the world deals with the shock of economic growth. Instead, we recommend diversifying funding resources so as to protect the sustainability of this important intervention. As a result, it is recommended that the government seek support from the connections re-established with donors to support financing ECD in the short term.

Nevertheless, it is important that ECD be prioritized in the government budget and that it receive additionally government spending. In the long term, the Burundian government should aim to decrease its reliance on ODA to finance the ECD Strategy. With the decrease in costs and funding gaps over time, the team is confident that the Burundian government will be able to fund investment in ECD in the long term.

5. CONCLUSION

Giving children the best opportunities to become healthy, happy and productive members of their society is challenging. It is not simply about providing them with an injection, signing a form or enrolling them in primary school. It involves a complex set of interventions that criss-cross the social sectors from the very moment of conception, including health, nutrition, WASH, education, child protection and social protection. Significantly, interventions will need to target not only the young children themselves but also their parents, caregivers and wider families, in order to ensure they can provide nurturing care and support. The diverse needs of young children are a reflection of their rapid growth and development at this stage in the life course. The implication of early childhood experiences can last a lifetime: a vast body of empirical research shows that this is the period in which people are most adaptable and influenced by their surroundings. This period thus represents a unique window of development, where interventions designed to promote growth have the greatest opportunities.

Given their complexity, comprehensive ECD packages can be designed in a number of ways. We have found that the most effective ECD packages should (i) prioritize interventions that are likely to reap the largest benefits for the population, including disadvantaged and vulnerable populations; (ii) be responsive to local contexts, building on existing services and service delivery platforms; and (iii) take a multisectoral approach, which includes interventions from across the Nurturing Care Framework. Based on comprehensive research, this report includes some of the interventions we believe would be most effective at improving early childhood outcomes in Burundi. Some of these interventions, such as family planning and cash transfers, are not specific to early childhood. This means that increasing coverage would have positive reverberations across the population and draws attention to the need to take a life course approach to planning in the social sectors.

The two sample ECD packages developed in this report are indicative – both have been provided for comparative reasons and to provide an illustration of how ECD packages can differ. Of the two packages, the second, Family Support and Strengthening, is the most ambitious and holistic. While the first package, The First 1'000 Days, includes the health, nutrition and WASH interventions deemed most critical to support the development of Burundi's children, the second package additionally incorporates interventions in early stimulation and learning, as well as safety and security. Based on our findings, as well as on broader research, Package 2 should be long-term aim of the Burundian government. Its more extensive scope and coverage of multisectoral interventions make it the stronger option to promote development and uphold child rights in the long run. In the short term, however, Package 1 may be more realistic and attainable. As outlined below, it incorporates some of the most cost-effective interventions and has far lower total costs, which, given the current COVID-19 context, may make it more appealing initially to the government.

Both ECD packages under study in this report constitute exceptionally good areas for investment. Their impacts were found to be far-reaching. Health and nutrition interventions in both packages are projected to have the potential to avert over 6,600,000 DALYs lost and to reduce stunting cases by 21,418,436 by 2050. Further, interventions to promote early learning increase the number of children finishing high school by over 380,000 in the same period.[205] Even in the slowest scale-up scenario, improving coverage rates of these packages would still generate impressive results. Our research found it would result in a reduction in DALYs lost and stunting cases by nearly 4,700,00 and 13,300,000, respectively, by 2050, as well as 158,500 additional children finishing high school.

In comparison with the total costs of implementing this scale-up, these packages were found to be highly cost-effective and to have a very high return on investments. Package 1 was found to be particularly cost-effective, with the cost per DALY averted of just between US$29 and US$31 in the scale-up scenarios analysed and when viewed across the full study period (up to 2050). Our findings indicate that the cost-effectiveness and BCR of these intervention is improved by increasing the speed of roll-out. That is, the faster these packages are scaled up, the more cost-effective they will be and the greater return on investment they will have. Further, BCRs for both packages under study are impressive. For Package 2, depending on the speed of scale-up (and the cash transfer selected), for every US$1 invested up to US$19 could be returned to society by the year 2050. This is particularly impressive given that many of the benefits (and multiplier effects) of this package are indirect and/or difficult to monetize, thus making the total benefit valuation likely an underestimate. For Package 1, BCRs are even higher – a reflection of their high level of cost-effectiveness and the large impact on health and nutrition outcomes for young children. For example, in the most pessimistic scale-up scenario, for every US$1 invested, US$54 is projected to be returned in benefits by 2050, rising to US$68 in the most optimistic scenario where all targets are achieved by 2030.

The unequivocal message of these findings is that investing in ECD in Burundi is a no-brainer. Scaling up ECD packages, such as those presented, should be a priority as quickly as possible. Allocating sufficient financial resources to these packages, however, is challenging and often political. The prioritization and allocation of scarce government resources, especially in a low-income country such as Burundi,[206] is difficult and will interact with competing political priorities. As the Burundian economy is projected to grow significantly in coming years, this study has found that a large proportion of the costs of scaling up these ECD packages can be achieved through the use of additional fiscal revenue. This is heavily dependent on a number of factors, including which package is selected and the speed of the scale-up, as well as the path the economy takes (e.g. what rate real GDP growth occurs at). Given the priority to scale up an extensive ECD package as quickly as possible, other alternate options for funding have been offered. These include reprioritization of existing government allocations or increasing fiscal space by appealing for external donor funding or loans.

To conclude, this study has provided empirical evidence that resoundingly upholds previous findings in the literature on the cost-effectiveness and strong benefit–cost ratio of investing in early childhood. This research has found that investing in ECD is not only a good decision but also actually a *very* good decision. The existing landscape in Burundi is ripe for such development and expansion into the early childhood sector – with the government already showing strong policies and commitment to children in its free primary education and under five health care schemes. Yet, ultimately, scaling up investment in ECD is not just a sensible financial or economic proposal – it is fundamentally a strong moral and social one too.

In Burundi, where coverage of interventions critical to early childhood is currently overwhelmingly very low and the sector is chronically underfunded, the potential gains to be made in scaling up investment are extensive. While this is true in economic terms – potentially leading to massive improvements in human capital and productivity – this also stands in the upholding of rights and equality within the country. According to the United Nations Convention on the Rights of the Child, every child has the right to survival, development, identify, education and safety. The results from our projections show that investments in ECD can be essential to the upholding and attainment of these. Indeed, in the most optimistic scenario, implementing these interventions could avert nearly 700,000 preventable child deaths by 2050. Our understanding of the benefits and opportunities of ECD must, therefore, be seen through this dualistic lens.

6. RECOMMENDATIONS

Table 26: Table of recommendations

PRIORITIZE

Scaling up the provision of multisectoral ECD interventions must be a top priority for the Government of Burundi.

For Burundi to catalyse economic development and ensure the realization of basic child rights, investment in early childhood is essential. Without the rapid mobilization of adequate financing for ECD services, these rights and development will be put at risk. **It is the role of the government to strategize, mobilize resources, align actors and ensure the smooth roll-out of ECD interventions.** This requires action from a coalition of ministries around the budget cycle, including but not limited to MFBEP, the Ministry of Education and the Ministry of Health.

Our study has confirmed that investments in early childhood are highly cost-effective and beneficial – they will have long-term social and economic benefits for development that will far outweigh their costs. Evidence from this investment case suggests that investments in early childhood could stimulate returns of up to US$86 for every US$1 invested. Scaling up the ECD interventions will catalyse Burundi's progress towards the goals set out in the NDP and the SDGs – with potential to reduce maternal mortality rate by 60% and under-five mortality by 27%. These findings support global evidence that suggests that financing early childhood interventions is among the most cost-effective and impactful form of investment, especially in countries with large youthful populations, such as Burundi.

Based on our findings, it is not a case of *whether* the Government of Burundi and its partners should invest in ECD, but *how*. Our most important recommendation is the immediate political prioritization of ECD. Below, we provide recommendations on how to realistically and feasibly scale up ECD in the country.

ALIGN

Our second recommendation is to align Burundi's current ECD programmes with those studied in this report.

While Burundi has made substantial progress in a number of areas, including reductions in infant mortality and improved vaccination rates, there remain a number of gaps in coverage of important areas of ECD. The figure below provides an extract of some of the interventions with large gaps in coverage, many of which are similarly identified in the national ECD Strategy. This assignment shows how the gaps identified in both our project and the ECD Strategy can be addressed through the implementation of one of the proposed packages. In addition to addressing coverage gaps of important interventions needed to achieve the ECD Strategy objectives, both packages presented are highly cost-effective with high returns on investment. Package 1 is found to be particularly cost-effective, with the cost per DALY averted just US$29 when viewed across the full study period (up to 2050). **This is the responsibility of all stakeholders involved in implementing the ECD Strategy.**

Overall, the recommended packages studied in this report align strongly with the priority areas identified in the national ECD Strategy – namely, education, health, nutrition child protection and WASH. Package 1 focuses on providing basic health care and WASH services, whereas Package 2 goes further to also incorporate child protection services (through the upscaling of cash transfers) and ECE.



ALIGN

Intervention	Current coverage (%)
Daily iron and folic acid supplementation (pregnant women)	48.0
Antibiotics for treatment of dysentery	32.9
Assisted vaginal delivery	21.2
Complementary feeding – education only	18.5
Complementary feeding – supplementary feeding and education	18.5
Consumption of iron-fortified foods	14.0
Contraceptive prevalence rate (birth intervals)	22.4
Handwashing with soap	438
Induction of labour (beyond 41 weeks)	34.1
Insecticide-treated nets (pregnant women)	46.8
Intermittent preventative therapy (pregnant women)	24.5
Piped water	34.0

SEQUENCE

In the short term, we recommend that efforts focus on scaling up Package 1 – The First 1,000 Days.

We expect that Burundi will be faced with both fiscal and capacity constraints in scaling up a large package of multisectoral interventions. The Government of Burundi should start with rolling out Package 1, which contains high-impact health, nutrition and WASH interventions. These interventions that aim to improve the health outcomes of young children are often recommended within the global literature on ECD to be the first step in scaling up early childhood programmes.[207] Delivery mechanisms for health, nutrition and WASH are often better developed in low-income settings, such as Burundi. Therefore, it will be easier to reach pregnant women, young children and their families with nurturing care interventions at limited additional cost. Many of these interventions take effect shortly after delivery, meaning benefits are realized quickly. Evidence from this study suggests that, for these reasons, scaling up Package 1 will both be less expensive and have a greater return on investment than Package 2 in the short term.

In the long term, Package 2 – Family Support and Strengthening – should be rolled out. ECD packages should be multisectoral and holistically meet the needs of young children, including in health, nutrition, education, WASH, social protection and child protection. We therefore recommend that the Government of Burundi has a long-term plan to integrate the additional interventions included in Package 2. The additional interventions in Package 2, including pre-primary education, child protection and social protection measures, are also highly cost effective and are critical for a full and comprehensive early childhood programme. Many of the interventions in Package 2 will reinforce other ECD interventions (e.g. scaling up cash transfer programmes may reduce the need for nutrition interventions as families have more money to provide nutritious foods). Further, it is only with the implementation of the full range of interventions listed in Package 2 that all the long-term productivity, growth and development gains of investing in early childhood can be realized.

FINANCE

In order to ensure the longevity of the ECD interventions, establishing a suitable financing plan is of paramount importance.

While different sectors and strategies are spending towards certain interventions that benefit ECD, there has not yet been an established ECD budget. Creating an ECD budget is vitally important to consolidate political commitment and sustainability. The financial implications of the intervention depend on whether Package 1 or Package 2 is chosen and how rapidly the intervention is scaled up. Scaling up Package 1 has an average (undiscounted) annual cost per child under five of US$1.30 in the first decade (2022–2030) to US$1.10 in the last decade under the fastest scale-up. These (undiscounted) average yearly costs reduce to US$0.60 and US$1.60 if implemented at a slower pace (reaching targets in 2050 instead of in 2030).

Given the widely acknowledged benefits of ECD and the many gaps observed in current ECD care in Burundi, the team suggests that the selected package be scaled up as rapidly as possible (Scenario A). Even though this results in considerable upfront costs, the analysis has shown that the benefits derived from implementation far outstrip these. However, as was seen in the fiscal space analysis, the high upfront costs cannot be funded solely by the Burundian government – even in the more optimistic medium and high growth fiscal space scenarios.

Adequate resources will need to be committed through annual budgetary plans to achieve the required outcomes, which will need to be supplemented by budgetary commitments from other actors such as development partners. Given the long-term and multisectoral nature of the interventions, it is recommended that donor funding be integrated on-budget, to facilitate coordination efforts, reduce redundancy of spending and wastage, facilitate monitoring and boost transition towards domestic financing of ECD in the long run. **This is the responsibility of MFBEP.**

MOBILIZE FINANCIAL RESOURCES

The Government of Burundi and its partners must capitalize on all sources of financing available to mobilize sufficient resources for ECD.

The fiscal space analysis showed how fiscal space to fund an ECD intervention could be generated through four pathways: (i) additional domestic revenue dedicated to a particular purpose; (ii) additional foreign grants and aid; (iii) additional borrowing; or (iv) efficiency gains and reprioritization of expenditure.

The fiscal space analysis focused on how additional domestic revenue generated from economic growth could be allocated towards investing in ECD. The analysis was centred on this channel, given limited donor aid in the past six years, as well as Burundi's debt levels, and to avoid the budget reallocations that come from efficiency savings. The results of the analysis revealed that, regardless of the package and the scale-up scenario chosen, it will not be possible for the Burundian government to fully fund the intervention – at least in the short term.

As a result of Burundi's debt levels and the constraints already on the government in coping with recovery from the COVID-19 pandemic, we recommend seeking donor funding to support the short-term financing of the ECD interventions. The important messages conveyed in Burundi's national ECD Strategy, supported by the empirical evidence in this study, provide strong pieces of advocacy. The 2021/22 national budget already demonstrates evidence of reinstated donor funding. Donor collaboration and alliance will be important to pool resources to channel towards the ECD interventions.

ENABLE

However, in the long term, it is important that domestic resources (both public and private) be used to fund the ECD strategies.

Transitioning away from ODA is necessary to support the long-term sustainability of these interventions. While the fiscal space analysis revealed that the interventions could probably be financed entirely through additional revenue generated from economic growth, it is not advised that the Burundian government rely solely on predicted economic growth to fund such an important intervention. Growth predictions are estimates, at best, and are prone to substantial fluctuations – as has been so clearly recognized during the COVID-19 pandemic. As a result, it is advised that the government look into budget reprioritization, either within ECD-related sectors themselves, such as education, or within the entire budget (e.e.g channelling funds away from military and defence and towards the more cost-effective ECD). Additionally, private sector funding could be a key component of ECD financing. However, private sector support must be strategic and well planned so as to avoid potential equity concerns.

While the fiscal space analysis suggested the interventions could be funded partially (in some cases entirely for Package 1) through government revenue, **it is not recommended that the government seek to fund this important intervention through one source alone.** Economic growth, and thus additional revenue from economic growth, is highly susceptible to shocks – as has been clearly experienced as the world deals with the shock of economic growth. Instead, we recommend diversifying funding resources so as to protect the sustainability of this important intervention. Creating a financing plan is the responsibility of the MFBEP.

MOBILIZE FINANCIAL RESOURCES

One of the potential challenges that Burundi will face in scaling up multisectoral interventions in ECD is the limited capacity of the workforce to deliver services efficiently and effectively in a coordinated way.

This capacity issue is an outstanding point to be addressed by Burundi, as fast mobilization of resources aimed at achieving a fast coverage increase can rapidly become a source of large waste and frustration if sectors do not possess a sufficient workforce with the knowledge and tools to steer the process.

The capacities of the system, organizations and workforce to plan, budget, deliver, monitor and cooperate for multisectoral ECD services can limit the large-scale implementation of the ECD packages analysed for decades. As such, a capacity assessment should be conducted prior to implementation to elicit the gaps and opportunities for improvement. Finally, it is recommended that a multisectoral ECD capacity development framework be set in place with specific SMART (specific, measurable, achievable, relevant, timebound) indicators to measure progress in capacity and bottlenecks at both national and subnational levels. This can ensure the sustainability and efficiency of investments in ECD. This should be the responsibility of stakeholders involved in ECD in Burundi, led by key ministries, such as MFBEP.

ASSESS YOUR CAPACITY

In the context of Burundi, where a new ECD Strategy has been released and multisectoral interventions are recommended, **we strongly suggest the development of a Multisectoral Monitoring and Evaluation Framework with SMART indicators for performance measurement, monitoring and management of ECD investments and service delivery.** Furthermore, centralized and local sector authorities are recommended to set out three- or five-year programmes with commitments on progress on a range of mandatory and voluntary indicators linked to the key ECD outcomes pursued by the Strategy and aligned with the Multisectoral Monitoring and Evaluation Framework.

We recommend the process of monitoring ECD investments and progress begin at early stages of the budget cycle, where tagging specific budget lines as child-related expenditure, or specifically ECD-related, could facilitate the planning, tracking and monitoring of expenditure towards the ECD objectives outlined in the ECD Strategy and could enhance policy review. This is an interesting alternative relevant to the development of a specific ECD budget, suggested under "Finance." While both could potentially be implemented, actors in the public financial management system in Burundi can identify which is more feasible in the short and long term. This should be the responsibility of stakeholders involved in ECD in Burundi, led by key ministries, such as the Ministry of Health and MFBEP.

MONITOR

Our final recommendation is to undertake further work on the feasibility and implementation of these ECD packages.

While financing is an essential part of service delivery, funding alone is not enough. The enabling environment for high-quality and effective ECD services needs to be developed. This will include undertaking capacity development (of pre-primary teachers, for example), passing supportive national legislation and policies and setting out clear governance and institutional structures, as well as considering the logistics and management of scaling up interventions. The Government of Burundi will need to work with its partners (both those in the private sector and development partners) to design and fund structures with clear and empowered leadership of ECD within the country. There is a need for well-functioning, coherent implementation strategies to foster the broader ECD agenda. For either of the ECD packages studied in this report to be successfully implemented, such actions will be critical. This should be the responsibility of stakeholders involved in ECD in Burundi, led by key ministries, such as the Ministry of Health and MFBEP.

7. ANNEX

7.1. EXCEL-BASED MODELLING

7.1.1. Modelling of promotion of salt iodization

7.1.1.1. Benefits

We estimated the monetary impacts of promotion of salt iodization by estimating the productivity gains from avoiding iodine deficiency in under-five children. Avoiding iodine deficiency leads to better cognitive development, which in turn leads to increased earnings into adulthood.

To do so, we estimated the number of iodine deficiency cases averted in children under five and then translated this into monetary benefits. This was done based on a study (FSANZ, 2006) that finds an association between iodine deficiency cases and cognitive impairment (based on Santiago-Fernandez et al., 2004), leading to reduced lifetime earnings. Santiago-Fernandez et al. (2004) estimate that iodine deficiency is associated with cognitive impairment, measured as a 2.63 points reduction in IQ score. For every 1 point reduction in IQ score, a 0.8% reduction in productivity is expected throughout the lifetime, resulting in a 2.1% (i.e., 2.63 x 0.8) reduction in lifetime earnings. This was used to estimate the benefit of increasing the coverage of the salt iodization programme and preventing iodine deficiency. The main assumptions in the model are presented in Table A1 below.

Table A1: Assumptions in promotion of salt iodization model

Variable	Value	Source
Baseline coverage of fortified salt among total population	89.4%	UNICEF/ISTEEBU
Target coverage by 2025	100%	Normative
Incidence of iodine deficiency in U5 children in 2019 (number)	888	GBD 2019
U5 children in 2020	2,154	LiST model
% iodine deficiency incidence cases in U5 children	0.04%	Calculation
Effectiveness: 1-RR of salt iodization on risk of low intelligence	0.72	Aburto et al. 2014
IQ deficit in those with iodine deficiency (points)	2.63	Santiago-Fernandez et. al. 2004
Reduction in productivity for each 1 IQ point	0.008	FSANZ 2016
Total percentage reduction in productivity per iodine case	2.10%	Calculation (0.008*2,63)
Cost per person/year (US$)	0.06	GiveWell, updated from Mannar and Dunn 1995. Estimate for year 2014
GNI per capita Burundi (current US$)	274	World Bank WDI 2019
Age of children entering labour force	15	Assumption Shekar et al. 2016 (World Bank investment case study in Uganda)
Labour force participation rate	0.79	ILOSTAT, ILO modelled estimates, August 2021, year 2019
Labour income share of GDP	0.57	ILOSTAT, ILO modelled estimates, August 2021, year 2019
Age exiting labour force	63.8	Assumption Shekar et al. 2016 (life expectancy for Burundi, WHO 2019)
Exchange rate (US$ to BIF)[209]	1,915.05	World Bank, year 2020
Discount rate	12%	Assumption



7.1.1.2. Costs

In terms of the costs, we used the costs presented by GiveWell for the cost of salt iodization in low-income countries, which is US$0.06 per person.

7.1.1.3. Results and data validation

With the information above, we calculated a total benefit in US dollars for the scale-up period 2022-2030, 2022–2040 and 2022–2050 for all scenarios in both packages. These are presented in Table A2. These results were added accordingly to estimate the economic benefits resulting from each scenario. The economic benefits were estimated using GDP per capita estimates both pre-COVID-19 (2019) and post-COVID-19 (2020).

Table A2: Additional economic benefit (US$) of promotion of salt iodization

Scenario	Benefits from intervention		
	2022–2030	2022–2040	2022–2050
Scenario A	64,423	188,835	347,085
Scenario B	34,579	148,798	311,180
Scenario C	23,502	108,411	265,454

7.1.2. Modelling of deworming

In this cost-effectiveness calculation, we included the health-related (morbidity and mortality) impacts of deworming interventions targeting soil-transmitted helminths (STH), which includes infection by ascaris, trichuris and hookworm in preschool-age children, since coverage of the intervention of school-age children has coverage levels close to universal (>98% coverage).[210]

7.1.2.1. Benefits

In estimating the impact of the programme, we used latest data from WHO[211] to approximate programme coverage and the GBD Database 2019[212] to estimate prevalence of infection and disability weight. Target population was derived from LiST, for each scenario under analysis. Treatment effectiveness comes from Moser et al. 2017,[213] a meta-analysis on the efficacy of recommended drugs against STH.

To model the number of DALYs averted as a result of an increase in treatment coverage, we calculated the following for each year of the study timeframe (2021–2050) and target group (children aged one to four):[214]

X = (Treatment coverage Scenario A or B – Treatment coverage at baseline) x Target population of preschool-age children

W = Prevalence of infection at baseline

Y = Treatment effectiveness: Percent reduction in infection rate after treatment

Z = Disability weight of intestinal nematode infections

Then, to compute the number of DALYs averted per year, we calculated X*W*Y*Z for each year, target group and scenario of analysis. Finally, DALYs were calculated using a discount rate of 12%.

Table A3 sets out the inputs for the calculations above.

Table A3: Assumptions in deworming model

Indicator	Value	Source
Baseline treatment coverage (% of children with first dose of deworming medication (mebendazole) out of those requiring preventive treatment)		
Preschool-age children 1–4	90.8%	WHO PCT databank, year 2019.
School-age children 5–14	100%	WHO PCT databank, year 2019.
Target treatment coverage	100%	Assumption
Prevalence (infection rate) in preschool-age children 1–4	23%	Own calculation using GBD for numbers on prevalence and LiST for children population
Disability weight of intestinal nematode infections (symptomatic)	f7	GBD 2019
Treatment efficacy rate (weighted average by type of worm): % of children infected cured by intervention	69%	Moser et al. (2017)
Cost per child treated (US$)	$0.48	Fiedler and Semakula (2014)
Duration of disability	1 year	
Exchange rate (US$ to BIF)	1,915.05	World Bank, year 2020
Discount rate	12%	

Importantly, our DALY estimates include only the health-related impacts associated with deworming –that is, those directly associated with morbidity and mortality as a result of worm infection. This is a conservative estimation since there is some evidence showing impacts other than on health, such as on educational outcomes. However, these impacts are usually found – and not consistently – on interventions targeted at children screened for STH but they do not find significant or consistent effects on mass drug administration programmes for unscreened populations (Thayer et al., 2017;[215] Taylor-Robinson et al., 2012[216]).

DALYs were then monetized using the approach of "value of a statistical life" – this approach focuses on the economic return to society of each DALY averted, through productivity gains. Monetary benefits are assumed to be 1.5 times GNI per capita for each DALY saved following the approach by Stenberg et al. (2014).

7.1.2.2. Costs

Information on the cost of deworming was obtained from the literature in other East African countries. There are different sources of information for this cost. Brooker et al. (2008)[217] estimate an economic cost of $0.41 per child treated at a minimum output of more than 37,000 children treated. Fiedler and Semakula (2014)[218] estimate an average cost per child treated of $0.22 for the Ugandan Child Days Plus intervention, which distributes both Vitamin A and deworming medication. Evidence Action's Deworm the World Initiative calculates a cost per child treated in the range of US$0.10 to US$0.60[219] in the areas in which it works. Thus, we used US$0.22 for the unit cost per beneficiary in our estimates since this was the most updated costing source in a low-income neighbouring country (Uganda). Table A4 presents these costs and sources.

Table A4: Cost estimates for deworming – countries and sources

Countries	Cost per child (US$)	Source
Brooket et al., 2008 in Uganda	0.41	Brooker et al. (2008)
Fiedler and Semalkula, 2014 in Uganda	0.22	Fiedler et al. (2014)
Evidence Action – Deworm the World Initiative		Evidence Action (2018)
Kenya	0.56	
Rajasthan	0.1	
Bihar	0.09	
Delhi	0.24	
GiveWell estimates for Deworm the World		Deworm the World 2019[220]
Kenya	0.66	
India	0.35	
Vietnam	0.68	
Nigeria	1.02	
Pakistan	0.98	
Average all sources	0.48	

7.1.2.3. Results

Preliminary results in terms of cost-effectiveness can be seen in Table A5. Results are negative because implementation of the packages leads to a reduction in the overall population of children aged between one and four (the target population of this intervention) for all scenarios. This, in turn, results in reduced expenditure and fewer DALYs averted in the scale-up scenarios as the number of children accruing the benefits of the intervention reduces as a result of other interventions in the packages affecting the number of births and children under five. However, this does not mean that the intervention does not yield impact. In fact, up to 2024 – the year after which the population of children under five reduces drastically as a result of other interventions in the packages that affect the number of births – the intervention yields an additional 184, 83 and 53 DALYs averted at a cost of US$18,200, US$8,300 and US$5,300 for Scenario A, B and C, respectively, and with a cost-effectiveness ratio of US$100 per DALY averted in the period 2022–2024. This cost-effectiveness ratio makes this intervention highly cost-effective, as per the WHO-CHOICE threshold.[221]

Table A5 presents preliminary results in terms of cost-effectiveness.

Table A5: Additional costs and impacts over 2021-2030

Indicator	Scenario A	Scenario B	Scenario C
Additional costs (US$) (discounted at 12%)	-1,180,410	-811,863	-559,601
Additional DALYs averted (discounted at 12%)	-72,897	-61,102	-44,445
Cost per DALY averted (US$)	16	13	12

7.1.3. Modelling of birth registration

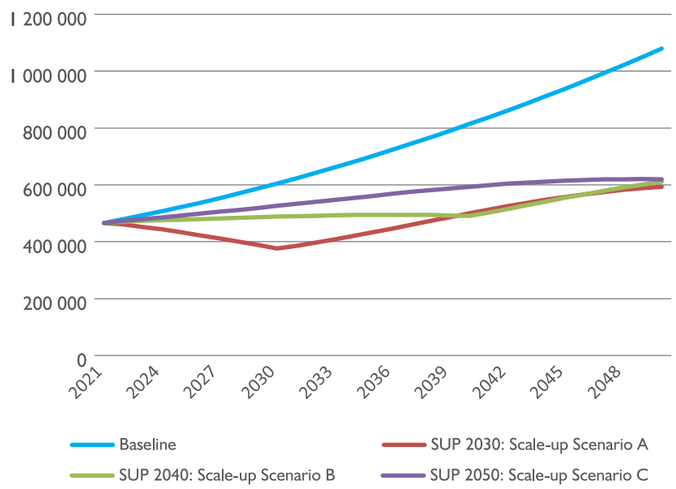
Only costs were modelled for birth registration. The rationale behind this is that, being recognized as a person before the law (i.e., to be registered) is a critical step in ensuring lifelong protection and is a prerequisite for exercising all other rights, including access to health and education services, among others. Thus, birth registration does not yield impact through an independent pathway, but rather functions as an enabler for other interventions evaluated in this project to exert their impact through guaranteeing/facilitating access to them. Table A6 presents the assumptions to model the costs of birth registration. Birth projections per year were estimated through OHT.

Table A6: Assumptions in the modelling of birth registration costs

Indicator	Value	Source
Baseline coverage	84%	UNICEF (from DHS 2017) – "Children under five whose births are registered"
Target coverage	100%	Assumption
Cost per child registered (US$)	1.50	Key informant interviews - data collected in Burundi, July 2021
US$ to BIF exchange rate	1,915	World Bank, year 2020

As seen with the rest of the interventions, the costs are affected by the number of births and children being born and surviving year by year of projection. As this intervention is being modelled as part of a package that models contraception, the projected number of births decreases over time, as Figure A1 shows. As a result of the decrease in the number of births in the scenarios with respect to the baseline, scaling up birth registration as part of the package yields costs savings (as fewer children are born to be registered).

Figure A1: Number of births per year, by scenario (left), and difference in the number of births between scale-up scenarios and baseline – i.e., incremental births (right)





7.1.3.1. Results

Table A7 presents the results. It reports the (undiscounted) additional costs (US$ thousands) per year – that is, the difference in costs of registering all children under different levels of coverage for each year under different scale-up plans, and the total (discounted at 12%) costs for different time periods, i.e. 2022 to 2030, 2040 and 2050. The scale-up plan for birth registration under each scenario is presented earlier.

Considering that the cost of registering is US$1.50 dollars per child, and that the number of births is projected to decrease as result of implementing both packages as a result of scaling up contraception (from 22.4% to 50%), additional costs would be required only up to 2024. These additional costs equal US$77,900 for Scenario A (the fastest scale-up) and US$38,000 and US$24,900 for Scenarios B and C, respectively. In total, implementing the intervention as part of the packages analysed in this study will lead to cost savings of US$3.5 million and US$1.4 million in the long run.

Table A7: Costs of birth registration (US$ '000s)

2021	0	0	0	**2022**	37	17	11
2023	46	22	15	**2024**	24	13	9
2025	-31	-11	-6	**2026**	-123	-50	-31
2027	-230	-95	-59	**2028**	-348	-144	-90
2029	-477	-196	-123	**2030**	-616	-253	-158
2031	-784	-314	-195	**2032**	-922	-379	-236
2033	-1,027	-449	-278	**2034**	-1,101	-525	-324
2035	-1,139	-604	-372	**2036**	-1,174	-690	-425
2037	-1,210	-781	-479	**2038**	-1,247	-879	-539
2039	-1,287	-983	-601	**2040**	-1,329	-1,096	-669
2041	-1,375	-1,224	-740	**2042**	-1,425	-1,336	-817
2043	-1,481	-1,431	-899	**2044**	-1,543	-1,509	-989
2045	-1,615	-1,569	-1,084	**2046**	-1,696	-1,632	-1,188
2047	-1,788	-1,700	-1,299	**2048**	-1,890	-1,775	-1,419
2049	-2,004	-1,856	-1,547	**2050**	-2,128	-1,946	-1,686
Total up to 2024 (discounted)	77,87	37,98	24,90	**Total up to 2030 (discounted)**	-617	- 247	-153
Total up to 2040 (discounted)	-2,565	-1,323	-816	**Total up to 2050 (discounted)**	-3,514	- 2,219	-1,444

7.1.4. Modelling of cash transfers

The modelling of cash transfers in this study is based on the multiplier effect of these type of itnerventions on the economy as reported by Cummins (2021). The decision not to to model the impact of cash transfers on health, nutrition and education outcomes relies on the fact that health-, nutrition-, and education-specific and sensitive interventions relevant for ECD are already being modelled ¬– that is, scaled up – in other interventions included in the packages.

Cash transfers allow households and caregivers to obtain (more) access to services and goods as their level of income increases. This increase in the consumption of goods and services functions as an enabler of or facilitator to access to goods and services related to health, nutrition and education. In this sense, cash transfers are understood in the context of this study as an enabling intervention. This means that cash transfers could facilitate access to other interventions modelled in the packages and act as a catalyser to achieve the increase in coverage.

The increase in income and consumption of goods and services has an effect on the economic output as the propensity to consume of households increases with the transfer. This multiplier effect on the economy was modelled in this study. Experiences from Sub-Saharan Africa in cash transfers show that the effects on the economy can be substantial: every US$1 transferred to beneficiaries of cash transfer programmes in Zambia and Zimbabwe was found to generate around US$1.75 of economic activity, and US$2.50 or more in programmes in Ethiopia, Ghana and Kenya.[222] A recent review of available evidence from 10 programmes in Sub-Saharan Africa revealed that the average income multiplier was 1.91 (nearly double the value of the transfer).[223]

Two types of cash transfers were modelled:

CT-1. A poverty-based cash transfer: the provision of cash or cash equivalent to individuals or households that fall below a certain level of consumption was modelled by assuming an increase in coverage to 90% of all households in need – that is, households living under the national poverty line. The cash transfer was modelled based on the characteristics of the Merankabandi programme. Currently, this covers four provinces in the country. For this study, we expanded this to national coverage.

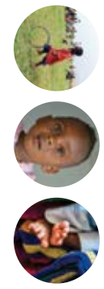
CT-2. A cash transfer based on age cut-off: this was modelled after the cash transfer suggested by Cummins (2021) in which a cash transfer is given to all children under five (through their caregivers). This type of cash transfer makes sense in Burundi where more than 65% of children under five live in poverty and projected child poverty after the COVID-19 pandemic is expected to have increased.

Table A8 presents the main characteristics of the cash transfers modelled.

Table A8: Cash transfers evaluated in this study, main characteristics and assumptions

Characteristic	**CT-1 (Merankabandi)**	**CT-2** (Cummins, 2021)	**Source**
Target population	Households	Children under five	OHT demographic projections
% of target population who would receive the transfer	64.5 (households living under national poverty line with a child under 12)	100	Assumption based on programme characteristics
Annual value of transfer (BIF)	240,000	105,000	UNICEF Burundi, Cummins (2021)
Current number of beneficiaries	56,090	56,090	UNICEF Burundi (CT-1 value for 2018), Cummins (2021)
Level of current coverage (%)	3.3	3	Own calculation
GDP per capita	274.01		World Bank
Exchange rate	1,915.05		World Bank
Economy multiplier effect	1.91 (1.75 in sensitivity analysis)		Cummins et al. (2021)
Average household size	4.8		DHS 2017
Population 2021	OHT		OneHealth Tool from UN World Population Prospects

The model assumed that each household currently reached by the Merabakandi programme had a child under five who was being reached. This was used as a proxy to estimate the current level of beneficiaries under five benefiting from a transfer to model CT-2. The model also assumed that the percentage of the population living under the national poverty line remains constant throughout 2022–2050.



7.1.4.1. Results

The results are presented in the tables below for CT-1 (Table A9) and CT-2 (Table A10).

All costs and benefits are adjusted for inflation. NPV: Net present value using discount rate of 12%.

Table A9: Additional households reached, additional costs and additional economic benefits under different assumptions on the economic multiplier effect of cash transfer CT-1 (Merankabandi)

Scenario and indicators	2021	2022	2023	2024	2025	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Additional households reached																
Scenario A	-	169,267	347,649	534,682	729,894	1,142,920	1,359,584	1,582,271	1,810,257	1,840,734	1,872,225	1,904,790	1,938,459	1,973,264	2,009,234	2,046,376
Scenario B	-	80,236	165,050	254,445	348,452	550,319	658,182	770,678	887,759	1,009,442	1,135,659	1,266,423	1,401,633	1,541,296	1,685,277	1,833,564
Scenario C	-	52,580	108,213	166,947	228,853	362,402	434,162	509,336	587,957	670,108	755,816	845,168	938,179	1,034,942	1,135,456	1,239,812
Incremental costs (BIF billion)																
Scenario A	-	43	88	136	186	291	346	403	461	468	476	485	493	502	511	521
Scenario B	-	20	42	65	89	140	167	196	226	257	289	322	357	392	429	466
Scenario C	-	13	28	42	58	92	110	130	150	170	192	215	239	263	289	315
Incremental economic benefits using a multiplier effect of 1.91 (BIF billion)																
Scenario A	-	82	169	260	355	555	661	769	880	894	910	926	942	959	976	994
Scenario B	-	39	80	124	169	267	320	374	431	490	552	615	681	749	819	891
Scenario C	-	26	53	81	111	176	211	247	286	326	367	411	456	503	552	602
Sensitivity analysis: Incremental economic benefits using a multiplier effect of 1.75 (BIF billion)																
Scenario A	-	75	155	238	325	509	605	704	806	819	834	848	863	878	895	911
Scenario B	-	36	73	113	155	245	293	343	395	449	506	564	624	686	750	816
Scenario C	-	23	48	74	102	161	193	227	262	298	336	376	418	461	506	552

Table A9 (cont.)

Scenario and indicators	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	NPV 2022–2030	NPV 2022–2040	NPV 2022–2050
Additional households reached																
Scenario A	2,084,685	2,124,146	2,164,738	2,206,432	2,249,167	2,292,839	2,337,319	2,382,466	2,428,148	2,474,242	2,520,610	2,567,106	2,613,414	8,609,351	28,568,002	52,639,745
Scenario B	1,985,970	2,142,458	2,302,782	2,344,552	2,387,505	2,431,630	2,476,880	2,523,195	2,570,506	2,618,736	2,667,798	2,717,607	2,767,907	4,162,188	20,466,694	45,973,010
Scenario C	1,347,989	1,460,073	1,576,013	1,695,884	1,819,598	1,947,214	2,078,599	2,213,785	2,352,586	2,495,011	2,640,828	2,790,031	2,942,178	2,744,430	13,747,985	36,723,697
Incremental costs (BIF billion)																
Scenario A	530	540	551	561	572	583	595	606	618	629	641	653	665	1,091	2,108	2,503
Scenario B	505	545	586	596	607	619	630	642	654	666	679	691	704	526	1,303	1,722
Scenario C	343	371	401	431	463	495	529	563	598	635	672	710	748	346	869	1,232
Incremental economic benefits using a multiplier effect of 1.91 (BIF billion)																
Scenario A	1,013	1,032	1,052	1,072	1,093	1,114	1,136	1,158	1,180	1,202	1,225	1,247	1,270	2,084	4,027	4,781
Scenario B	965	1,041	1,119	1,139	1,160	1,182	1,204	1,226	1,249	1,272	1,296	1,320	1,345	1,005	2,489	3,289
Scenario C	655	709	766	824	884	946	1,010	1,076	1,143	1,212	1,283	1,356	1,430	662	1,661	2,353
Sensitivity analysis: Incremental economic benefits using a multiplier effect of 1.75 (BIF billion)																
Scenario A	928	946	964	982	1,001	1,021	1,041	1,061	1,081	1,102	1,122	1,143	1,163	1,909	3,690	4,381
Scenario B	884	954	1,025	1,044	1,063	1,083	1,103	1,123	1,144	1,166	1,188	1,210	1,232	920	2,281	3,013
Scenario C	600	650	702	755	810	867	925	986	1,047	1,111	1,176	1,242	1,310	606	1,522	2,156



Table A10: Additional children reached, additional costs and additional economic benefits under different assumptions on the economic multiplier effect of cash transfers for CT-2 (proposed by Cummins et al. (2021))

Scenarios and indicators	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Additional children reached																		
Scenario A	-	210,787	422,003	628,571	825,202	1,007,790	1,176,614	1,332,352	1,475,064	1,603,459	1,562,174	1,541,050	1,541,211	1,562,913	1,607,679	1,656,068	1,705,970	1,756,826
Scenario B	-	100,276	202,704	306,563	411,253	516,492	622,035	728,092	835,006	942,262	1,050,249	1,158,232	1,266,674	1,374,581	1,482,493	1,589,146	1,695,157	1,798,947
Scenario C	-	65,784	133,382	202,666	273,624	346,468	420,936	497,177	575,513	655,699	738,102	822,347	908,854	997,090	1,087,532	1,179,475	1,273,463	1,368,613
Incremental costs (BIF million)																		
Scenario A	-	23	47	70	92	112	131	148	164	178	174	171	171	174	179	184	190	195
Scenario B	-	11	23	34	46	57	69	81	93	105	117	129	141	153	165	177	189	200
Scenario C	-	7	15	23	30	39	47	55	64	73	82	91	101	111	121	131	142	152
Incremental economic benefits using a multiplier effect of 1.91 (BIF billion)																		
Scenario A	-	45	90	134	175	214	250	283	313	341	332	327	327	332	342	352	362	373
Scenario B	-	21	43	65	87	110	132	155	177	200	223	246	269	292	315	338	360	382
Scenario C	-	14	28	43	58	74	89	106	122	139	157	175	193	212	231	251	271	291
Sensitivity analysis: Incremental economic benefits using a multiplier effect of 1.75 (BIF billion)																		
Scenario A	-	41	82	122	161	196	229	259	287	312	304	300	300	304	313	322	332	342
Scenario B	-	20	39	60	80	101	121	142	163	183	204	225	247	268	289	309	330	350
Scenario C	-	13	26	39	53	67	82	97	112	128	144	160	177	194	212	230	248	266

Table A10 (cont.)

Scenarios and indicators	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	Total 2022–2030	Total 2022–2040	Total 2022–2050
Additional children reached															
Scenario A	1,808,255	1,859,874	1,911,263	1,961,865	2,010,959	2,057,746	2,101,389	2,141,217	2,176,871	2,208,174	2,235,038	2,257,299	8,681,840	25,283,859	46,345,681
Scenario B	1,901,203	1,999,977	2,001,813	2,014,916	2,040,481	2,078,073	2,128,790	2,179,808	2,229,525	2,277,450	2,323,310	2,366,806	4,664,683	19,981,343	41,622,315
Scenario C	1,465,545	1,563,140	1,662,064	1,760,953	1,860,573	1,959,296	2,057,979	2,154,788	2,250,750	2,343,799	2,435,213	2,522,742	3,171,250	14,575,411	35,583,568
Incremental costs (BIF million)															
Scenario A	201	207	213	218	224	229	234	238	242	246	249	251	494	863	1,014
Scenario B	212	222	223	224	227	231	237	242	248	253	258	263	261	586	741
Scenario C	163	174	185	196	207	218	229	240	250	261	271	281	177	416	563
Incremental economic benefits using a multiplier effect of 1.91 (BIF billion)															
Scenario A	384	395	406	417	427	437	447	455	463	469	475	480	944	1,648	1,937
Scenario B	404	425	425	428	434	442	452	463	474	484	494	503	498	1,119	1,416
Scenario C	311	332	353	374	395	416	437	458	478	498	517	536	337	795	1,075
Sensitivity analysis: Incremental economic benefits using a multiplier effect of 1.75 (BIF billion)															
Scenario A	352	362	372	382	391	401	409	417	424	430	435	439	865	1,510	1,775
Scenario B	370	389	390	392	397	405	414	424	434	443	452	461	457	1,026	1,297
Scenario C	285	304	324	343	362	381	401	419	438	456	474	491	309	728	985



The net present value (NPV) of the investment needed to scale up coverage of the Merakabandi programme is approximately 1,090 billion BIF, 526 billion BIF and 346 billion BIF (US$570 million, US$275 million and US$181 million) up to 2030 for Scenarios A, B and C, respectively. The cost of the cash transfer targeting children under five (CT-2) would be almost half of that of CT-1 for the same period. Despite the larger number of beneficiaries in CT-2, the amount of the transfer is almost half the amount for CT-1, and this explains in large part the difference in costs across both cash transfers evaluated. Because the method used for the estimation of the economic benefits relies on a multiplier (constant factor), the BCR of the intervention is 1.91 (or 1.75 in the sensitivity analysis) in 2030, 2040 and 2050 for both cash transfers in all scenarios.

7.2. APPROACH TO ESTIMATING DALYS

The key output from LiST is "number of lives saved" or "number of deaths averted." Thus, we implement additional estimations to go from number of lives saved to DALYs averted, as suggested in Eberwein et al. (2016a) and Stegmuller et al. (2017).

For each intervention, DALYs averted is calculated as follows:

(DALY averted) intervention = (YLL averted) intervention + (YLD averted) intervention

The above is calculated using the Fox-Rusby and Hanson (2001) approach. The sections below explain in detail the specific methods used to calculate DALYs for the different outcomes under analysis.

7.2.1. DALYs – child lives saved

This section shows the calculations to convert child lives saved into YLL, YLD and DALYs averted.

YLL calculation: The additional number of children's lives saved is disaggregated by neonatal and children aged one to four years. The formula to obtain YLLs is the following:

- (YLL averted)neonatal or children 1–4 = (additional number of children lives saved) x (life expectancy at age of death)
- To approximate life expectancy at age of death we carry out the following:
  - For the neonatal group: We take the difference between the Zimbabwe life expectancy at birth and the age of neonatal deaths (assumed to be 0 years).
  - For the children 1–4 group: We take the difference between the Zimbabwe life expectancy at birth and the average age of a child's death (assumed to be 2.5 years).
- Then YLLs for each group are added together to obtain total YLLs averted.
- We apply the YLL formula with a discounting factor. The current discount rate used is in the "Assumption" tab and corresponds to 0.00001% so the formula works. The user can change this assumption and the calculations will be updated automatically.

$$YLL = \frac{N}{r}(1-e^{rL})$$

Where: N=number of deaths; L=standard life expectancy at age of death (years); r=discount rate (e.g. 3% corresponds to a discount rate of 0.3).

YLD calculation: To calculate YLDs averted, YLLs averted by group of children are multiplied by the group-specific ratio YLD/YLL, using the GBD database. The resulting YLD averted for each group is added to obtain the total YLD averted.

DALYs calculation: DALYs are the sum of YLL+YLD.

7.2.2. DALYs – maternal deaths

This section shows the calculations used to convert maternal deaths averted into YLL, YLD and DALYs averted.

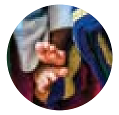
YLL calculation: The additional maternal deaths averted are disaggregated by cause of death. The formula to obtain YLLs is the following:

- (YLL averted)cause of death = (additional number of maternal deaths averted)cause of death x (life expectancy at age of death)cause of death
- The additional number of maternal deaths averted corresponds to the cause of death "maternal haemorrhage."
- Life expectancy at age of death for the cause of death "maternal haemorrhage" is calculated as average female life expectancy at the age range of death from maternal haemorrhage, weighted by the number of maternal haemorrhage deaths at the same age ranges.
- We also applied YLL formula with a discounting factor.

YLD calculation: To calculate YLDs averted, YLLs averted are multiplied by the disease-specific ratio YLD/YLL, using the GBD database.

DALYs calculation: DALYs are the sum of YLL+YLD.





7.3. TARGET POPULATION AND PERCENTAGE OF POPULATION IN NEED[224]

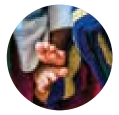
Interventions	Target population	Percentage (%) of target population in need of the interventions (population in need)										
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Periconceptual												
Pill – standard daily regimen	Women of reproductive age in union	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pill – progestin only	Women of reproductive age in union	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pill – peri-coital contraception	Women of reproductive age in union	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Condom – male	Women of reproductive age in union	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Condom – female	Women of reproductive age in union	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Injectable – 3 months (Depo Provera)	Women of reproductive age in union	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Injectable – 2 months (Noristerat)	Women of reproductive age in union	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Injectable – 1 month (Lunelle)	Women of reproductive age in union	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Injectable – 6 months	Women of reproductive age in union	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Injectable – Uniject	Women of reproductive age in union	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
IUD – copper-T 380-A IUD (10 years)	Women of reproductive age in union	31.8	31.8	31.5	30.7	30.4	29.9	29.3	29.1	28.6	28.4	24.1
Implant – Jadelle (5 years)	Women of reproductive age in union	35.8	35.8	35.5	34.8	34.5	34.0	33.5	33.3	32.8	32.6	28.6
Female sterilization	Women of reproductive age in union	20.8	20.8	20.3	19.4	19.1	18.6	17.9	17.6	17.0	16.8	11.8
Male sterilization	Women of reproductive age in union	20.8	20.8	20.3	19.4	19.1	18.6	17.9	17.6	17.0	16.8	11.8
Other contraceptives	Women of reproductive age in union	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Iron fortification	Total population	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pregnancy												
Antenatal care (at least 1 visit)	Pregnant women	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Antenatal care (at least 4 visits)	Pregnant women	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Tetanus toxoid vaccination	Pregnant women	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Prevention of malaria in pregnancy	Pregnant women	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0
Syphilis detection and treatment	Pregnant women	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Nutritional												
Calcium supplementation	Pregnant women	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Iron supplementation in pregnancy	Pregnant women	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Multiple micronutrient supplementation in pregnancy	Pregnant women	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Balanced energy supplementation	Pregnant women	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Percentage (%) of target population in need of the interventions (population in need)																		
2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Periconceptual																		
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
24.1	24.0	23.9	23.9	23.8	23.7	23.5	23.4	23.2	23.1	23.0	22.9	22.8	22.8	22.8	22.8	22.9	22.9	22.9
28.5	28.4	28.4	28.3	28.2	28.1	28.0	27.8	27.7	27.6	27.5	27.4	27.4	27.3	27.3	27.4	27.4	27.4	27.4
11.7	11.7	11.6	11.5	11.4	11.3	11.1	10.9	10.8	10.6	10.5	10.4	10.3	10.2	10.3	10.3	10.4	10.4	10.4
11.7	11.7	11.6	11.5	11.4	11.3	11.1	10.9	10.8	10.6	10.5	10.4	10.3	10.2	10.3	10.3	10.4	10.4	10.4
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pregnancy																		
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Nutritional																		
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Interventions	Target population	Percentage (%) of target population in need of the interventions (population in need)																													
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Case management																															
Hypertensive disorder case management	Pregnant women	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Diabetes case management	Pregnant women	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
Malaria case management	Pregnant women	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
MgSO4 management of pre-eclampsia	Pregnant women	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
HIV																															
PMTCT of HIV (including breastfeeding choices)	Women in need of PMTCT	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Childbirth – routine care																															
Clean birth environment	Pregnancies carried to term	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Immediate drying and additional stimulation	Live births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Thermal protection	Live births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Clean cord care	Live births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Childbirth – basic emergency care																															
MgSO4 for eclampsia	Pregnancies carried to term	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Antibiotics for preterm or prolonged PROM	Pregnancies carried to term	3.8	3.8	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Parenteral administration of antibiotics	Pregnancies carried to term	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Assisted vaginal delivery	Pregnancies carried to term	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0
Neonatal resuscitation	Live births	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Parenteral administration of uterotonics	Pregnancies carried to term	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Manual removal of placenta	Pregnancies carried to term	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Removal of retained products of conception	Pregnancies carried to term	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Induction of labor for pregnancies lasting 41+ weeks	Pregnancies carried to term	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Antenatal corticosteroids for preterm labour	Pregnancies carried to term	3.8	3.8	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Childbirth – comprehensive emergency care																															
Caesarean delivery	Pregnancies carried to term	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Blood transfusion	Pregnancies carried to term	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Breastfeeding																															
Promotion of breastfeeding	Live births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Interventions	Target population	Percentage (%) of target population in need of the interventions (population in need)										
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Preventive												
Complementary feeding – education only	Children 6–23 months	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Complementary feeding – supplementary feeding and education	Children 6–23 months	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8
Vitamin A supplementation	Children 6–59 months	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Zinc supplementation	Children 12–59 months	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
WASH												
Basic sanitation	Number of households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Piped water	Number of households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Handwashing with soap	Number of households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Hygienic disposal of children's stools	Number of households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Other												
ITN/IRS – households protected from malaria	Number of households	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Vaccines												
BCG vaccine	Infants surviving past 1 month	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Polio vaccine	Infants surviving past 1 month	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pentavalent vaccine	Infants surviving past 1 month	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Pneumococcal vaccine	Infants surviving past 1 month	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Rotavirus vaccine	Infants surviving past 1 month	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Measles vaccine	Infants surviving past 1 month	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Curative after birth												
Maternal sepsis case management	Pregnancies carried to term	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Case management of premature babies												
Kangaroo mother care	Live births	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4
Case management of neonatal sepsis/pneumonia												
Injectable antibiotics for neonatal sepsis	Live births	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
Diarrhoea												
ORS	Children 0–59 months	290.4	282.2	274.2	266.3	258.6	251.1	243.6	236.4	229.2	222.2	222.2
Antibiotics for treatment of dysentery	Children 0–59 months	39.6	38.5	37.4	36.3	35.3	34.2	33.2	32.2	31.3	30.3	30.3
Zinc for treatment of diarrhoea	Children 0–59 months	330.0	320.7	311.6	302.7	293.9	285.3	276.9	268.6	260.5	252.5	252.5

Percentage (%) of target population in need of the interventions (population in need)																		
2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Preventive																		
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8	71.8
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
WASH																		
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Other																		
21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Vaccines																		
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Curative after birth																		
4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Case management of premature babies																		
11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4
Case management of neonatal sepsis/pneumonia																		
7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
Diarrhoea																		
222.2	222.2	222.2	222.2	222.2	222.2	222.2	222.2	222.2	222.2	222.2	222.2	222.2	222.2	222.2	222.2	222.2	222.2	222.2
30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3	30.3
252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5	252.5

Interventions	Target population	Percentage (%) of target population in need of the interventions (population in need)										
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Other infectious diseases												
Oral antibiotics for pneumonia	Children 1–59 months	141.1	132.3	124.0	116.2	109.0	102.1	96.8	93.0	90.5	89.3	89.4
Oxygen and pulse oximetry for pneumonia	Total population	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vitamin A for treatment of measles	Children 1–59 months	7.5	6.7	5.8	5.0	4.2	3.5	2.8	2.4	2.2	2.0	2.0
ACTs – artemisinin compounds for treatment of malaria	Children 1–59 months	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6
Treatment for SAM	Children 6–59 months	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7
Treatment for MAM	Children 6–59 months	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2
HIV												
Cotrimoxazole	HIV+ children	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
ART	Number of children needing ART	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Other interventions												
Salt iodization	All population	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mass deworming among children 1–4 years	Children 12–59 months	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Birth registration	All newborns (live births)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Cash transfers (Meranbakandi)	All households living under	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Cash transfers (Cummins et al., 2021)	Children 1–59 months	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Preschool education	Children 36–59 months	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Percentage (%) of target population in need of the interventions (population in need)																		
2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Other infectious diseases																		
89.4	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.5	89.9	97.2	104.9	113.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.7	3.9	4.8	5.6
12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2
HIV																		
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Other interventions																		
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0



ENDNOTES

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[153]More detailed explanations on which line-item source is provided in the database. Only national sources were used for the historical data, aside from for total central government debt values, which were sourced from the IMF Debt Report (2020), and exchange rates, which were sourced from the World Bank up until 2020. The 2021 exchange rate was sourced from the IMF WEO estimations, as an actual annual estimate was not yet available for 2021 at the time of modelling.

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[169]Authors' calculations

[170]Authors' calculations

[171]This number compares total DALYs averted with the base DALYs existing in the base scenario (2019 – the latest year for which disease burden data is available). The baseline DALY for this calculation was taken from the GBD data.

[172]Authors' calculations

[173]Authors' calculations

[174]Authors' calculations

[175]Authors' calculations

[176]Authors' calculations

[177]All costs were adjusted for inflation using a rate of 7.9% for 2021 and 6% from 2022 onwards. Also, costs are presented discounted (12% discount rate). Sanitation and piped water interventions are not costed since they involve large capital investments, which is beyond the scope of this analysis. Authors' calculations

[178]Cash transfer programme consisting of providing cash transfers to all children under five, with a transfer value equal to 20% of monthly per capita income (Cummins M., 2021).

[179]Authors' calculations

[180]Authors' calculations. Costs are presented in real terms (not discounted and adjusted for inflation at a rate of 7.9% in 2021 and 6% from 2022 onwards).

[181]Authors' calculations. Costs are presented in real terms (not discounted and adjusted for inflation at a rate of 7.9% in 2021 and 6% from 2022 onwards).

[182]Authors' calculations. Costs are presented in real terms (not discounted and adjusted for inflation at a rate of 7.9% in 2021 and 6% from 2022 onwards).

[183]Authors' calculations. Costs are presented in real terms (not discounted and adjusted for inflation at a rate of 7.9% in 2021 and 6% from 2022 onwards).

[184]These numbers were converted using the latest annual exchange rate available at the time of modelling, using the World Bank exchange rate for 2020 where 1 USD=1915 BIF. The annual exchange rate for 2021/22 is predicted to be 1 USD=1976 BIF according to BRB. This is only a 3% difference, implying that these results could be 3% smaller in the 2021/22 period. This small change does not affect the directionality of findings and concluding remarks of this study.

[185]Authors' calculations

[186]Authors' calculations. Cost-effectiveness for the education intervention was evaluated only for those cohorts that produce students that could finish high-school – that is cohorts from the 2022–2038 period.

[187]Authors' calculations. The GDP per capita estimate used for the valuation of health gains is US$274.

[188]Authors' calculations. All costs and monetized benefits were adjusted for inflation at a constant annual rate of 7.9% for 2021 and 6% from 2022 onwards.

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[190]BRB (2021). Services des études et statistiques (unpublished)

[191]Authors' calculations

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[195]Authors' calculations

[196]Authors' calculations

[197]Authors' calculations

[198]Authors' calculations

[199]Authors' calculations

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[202]IMF (2021). WEO Database

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[205]When modelled separately.

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