

INVESTING IN MATERNAL HEALTH AND FAMILY PLANNING IN SMALL ISLAND DEVELOPING STATES

Produced by United Nations Population Fund

May 2021



Health and economic benefits from investing in the achievement of three transformative results by UNFPA in the Pacific and Caribbean



● Ending preventable maternal deaths ● Ending the unmet need for family planning ● Ending gender-based violence and all harmful practices, including child marriage and female genital mutilation

INVESTING IN MATERNAL HEALTH AND FAMILY PLANNING IN SMALL ISLAND DEVELOPING STATES

Health and economic benefits from investing in the
achievement of three transformative results by UNFPA
in the Pacific and Caribbean





United Nations Population Fund

This publication focuses on new research to estimate the costs associated with achieving UNFPA's three transformative results by 2030: (a) ending preventable maternal deaths, (b) ending the unmet need for family planning, (c) ending gender-based violence and all harmful practices, including child marriage and female genital mutilation.

UNFPA wishes to thank the following researchers at the Burnet Institute who have contributed to this work:

Dr. Debra ten Brink

Dominic Delpont

Dr. Caroline Homer

Dr. Sherrie L Kelly

Dr. Rowan Martin-Hughes

Dr. Nick Scott

Tom Walsh

UNFPA further recognizes the efforts of the following UNFPA colleagues for their inputs in this publication: Jennifer Butler, Alison Drayton, Davide DeBeni, Doretta Di Marco, Federica Maurizio, Tharanga Godallage, Howard Friedman, and Helena Carvalho Schmidt in preparing this publication.

Design and layout:

RecDesign

Editing:

Words for the World

Photo credits:

UNFPA photo collection

How to cite this publication:

UNFPA (United Nations Population Fund), 2021. Investing in Maternal Health and Family Planning in Small Island Developing States. New York: UNFPA.

Available at: www.unfpa.org

Contact information:

United Nations Population Fund

605 Third Avenue

New York, New York 10158

+1-212-963-6518

psd@unfpa.org

ISBN: 978-0-89714-052-2

Copyright © 2021 United Nations Population Fund

All rights reserved

CONTENTS

FOREWORD	5
MESSAGES AND KEY FINDINGS	7
METHODOLOGY	15
Analysis aims.	15
Analysis design	15
Business-as-usual scenario	15
Coverage-targets-achieved scenario	15
Coverage reductions due to COVID-19 disruptions	16
Costs, interventions and benefits	16
RESULTS FOR COUNTRIES IN THE PACIFIC	17
Kiribati.	17
Progress towards maternal health and family planning targets	17
Resources needed to achieve targets.	19
Benefits	19
Samoa.	20
Progress towards maternal health and family planning targets	20
Resources needed to achieve targets.	22
Benefits	22
Solomon Islands	23
Progress towards maternal health and family planning targets	23
Resources needed to achieve targets.	24
Benefits	25
Tonga	26
Progress towards maternal health and family planning targets	26
Resources needed to achieve targets.	27
Benefits	28

Vanuatu	28
Progress towards maternal health and family planning targets	29
Resources needed to achieve targets	30
Benefits	31
RESULTS FOR COUNTRIES IN THE CARIBBEAN	32
Barbados	32
Progress towards maternal health and family planning targets	32
Resources needed to achieve targets	33
Benefits	34
Guyana	35
Progress towards maternal health and family planning targets	35
Resources needed to achieve targets	36
Benefits	37
Jamaica	38
Progress towards maternal health and family planning targets	38
Resources needed to achieve targets	39
Benefits	40
Saint Lucia	41
Progress towards maternal health and family planning targets	41
Resources needed to achieve targets	42
Benefits	43
FINDINGS	44
APPENDICES	46
REFERENCES	60

FOREWORD

In the quarter century since the International Conference on Population and Development (ICPD), the global mobilization for sexual and reproductive health has greatly advanced the fulfillment of the ICPD promise; and yet, many women and girls are still left behind. At the Nairobi Summit on ICPD25, acknowledging that there is still much work to be done in order to achieve the Sustainable Development Goals by 2030, the global community rallied behind the three transformative results set forth by the United Nations Population Fund: ending the unmet need for family planning, ending preventable maternal deaths, ending gender-based violence and all harmful practices against women and girls.

The need for acceleration towards reaching these transformative results is aggravated in small island developing states, where developing communities are particularly vulnerable to the direct and indirect effects of climate change, and requires prompt mobilization of flexible funding to enable adaptation to contextual changes. This investment case considers the potential impact, investment requirements and return on investment for scenarios to meet coverage targets by 2030.

Dr. Jennifer Butler

Director and Representative
UNFPA Sub-Regional Office for the Pacific

The evidence presented herein accounts for the disruptions and long-term impact of the COVID-19 pandemic, and makes the case for targeting synergetic interventions, such as maternal health and contraceptive prevalence, and favoring scaling up with a focus on efficiency and cost-savings rather than a more comprehensive, less focused, approach. These estimates aim to illustrate that reaching coverage targets in the Pacific and the Caribbean is not only possible, but affordable, through the prioritization of family planning and maternal health services.

In the long-term, the economic benefits of ensuring that all women have the autonomy to plan and space pregnancies, that no woman dies of preventable maternal complications, and that girls are enabled to complete their schooling and join the job market are quantifiable and, over time, will far exceed the investment made towards achieving our transformative results. Since the ICPD, we have learned that governments and donors must seize the opportunity to “create financing momentum” around these targets in order to achieve them, and, while the costs of achieving the three zeros will be high, the benefits will be far greater.

Alison Drayton

Director and Representative
UNFPA Sub-Regional Office for the Caribbean

MESSAGES AND KEY FINDINGS

UNFPA is committed to achieving three transformative, people-centred results: to end preventable maternal deaths, to end unmet need for family planning, and to end gender-based violence and harmful practices by 2030. With less than a decade to go, accelerating progress and increasing domestic financing will be required to achieve these goals.

This study on small island developing States will inform actions to accelerate achievement of the transformative results. It presents evidence for governments on how to prioritize health system interventions amid the disruptions of the COVID-19 pandemic and in the years to follow. Focused on countries in the Pacific and the Caribbean, this investment case emphasizes scaling up maternal health interventions to reach national targets and reduce maternal mortality, as well as empowering women by reducing high levels of unmet need for family planning through increased investment in high-quality, rights-based contraceptive services.

The investment case finds that a synergistic effect may be achieved through improved coverage of maternal health interventions alongside increased contraceptive prevalence, as reducing unintended pregnancies can cut demand for, and the cost of, maternal health services. The report considers scaling up family planning and maternal health interventions at the same time, rather than separately, and hence captures the efficiencies and cost savings that stem from a more comprehensive approach.

This investment case considers the potential impact, investment requirements and return on investment for scenarios to meet coverage targets by 2030. These targets are: achieving 95 per cent coverage by maternal health services and realizing 0 per cent unmet need for family planning, compared with the business-as-usual scenario of maintaining existing coverage, which reflects reductions in 2020 and 2021 due to disruptions from the pandemic.

If an additional \$13.4 million (with an uncertainty range of \$10.9–\$16 million) is invested between 2020 and 2030 in Kiribati, Samoa, Solomon Islands, Tonga and Vanuatu (19 per cent more than the \$70.5 million required to maintain business as usual), then the 2030 family planning and maternal health coverage targets could be achieved.

This additional investment could avert 38 per cent more unintended pregnancies than business as usual (17 per cent of all pregnancies), 28 per cent more stillbirths and 29 per cent more maternal deaths, and could bring an elevenfold economic benefit of \$149.7 million (\$54.5–\$214.7 million).

If an additional \$18.8 million (\$15.3–\$22.4 million) is invested between 2020 and 2030 in Barbados, Guyana, Jamaica and Saint Lucia (5 per cent more than the \$342.3 million required to maintain business as usual), then the 2030 family planning and maternal health coverage targets could be achieved. This additional investment could avert 23 per cent more unintended pregnancies than business as usual (10 per cent of all pregnancies), 23 per cent more stillbirths and 25 per cent more maternal deaths, and could bring a twentyfold economic benefit of \$375.4 million (\$137.9–\$540.6 million).

Additional investment is required for a mix of consumables, human resources, infrastructure, and other programme and logistics resources (see appendix B for further details).

COUNTRIES IN THE PACIFIC

This analysis considered five countries in the Pacific: Kiribati, Samoa, Solomon Islands, Tonga and Vanuatu (see table 1 for a demographic summary). Meeting their coverage targets by 2030 could avert an additional 126,000 unintended pregnancies (38 per cent more than maintaining existing coverage, 17 per cent of all pregnancies averted), 2,200 stillbirths (28 per cent more than maintaining existing coverage) and 121 maternal deaths (29 per cent more than maintaining existing coverage) over the 2020 to 2030 period, compared with the business-as-usual scenario (figure 1). Between 2020 and 2030, this would require a total investment of \$83.8 million (\$81.3–\$86.4 million) and an additional investment of \$13.4 million (\$10.9–\$16 million), or 19 per cent more than maintaining business as usual. This additional investment could bring an elevenfold economic benefit of \$149.7 million (\$54.5–\$214.7 million) from the prevention of maternal and newborn deaths, stillbirths and unintended pregnancies (figure 2).

Table 1. Estimates for population size, women of reproductive age, and number of births for Kiribati, Samoa, Solomon Islands, Tonga, and Vanuatu in 2019.

2019	Kiribati	Samoa	Solomon Islands	Tonga	Vanuatu
Population size	119,000	201,000	656,000	109,000	299,000
Women of reproductive age	30,000	46,000	156,000	27,000	75,000
Births	3,200	6,000	21,000	3,000	7,500

Source: LiST v5.88.

In the scenario where coverage targets are met by 2030, all five countries in the Pacific could achieve Sustainable Development Goal (SDG) target 3.7 on universal access to sexual and reproductive health services, including family planning, and experience an expected two-thirds reduction in maternal deaths from 2010 levels by 2030. SDG target 3.1, on achieving a maternal mortality ratio of under 70 maternal deaths per 100,000 live births by 2030, is already being met by Samoa, Tonga and Vanuatu, but by ensuring coverage targets are met by 2030, these countries could additionally achieve their country-specific SDG targets for maternal mortality (a two-thirds reduction compared with 2010 levels) (figure 3). If coverage targets are reached, Kiribati is also expected to meet the SDG targets by 2030. While Solomon Islands is not projected to reach target 3.1 even if coverage targets are achieved, due to a high estimated maternal mortality ratio in 2019, a scale-up of interventions modelled could result in a 29 per cent reduction in the projected 2030 maternal mortality ratio.

Due to small population sizes and low numbers of births per year in these countries, projected maternal mortality ratios should be interpreted with caution.¹ This report focuses on cumulative outcomes between 2020 and 2030. When scaling up family planning and maternal health interventions, the relative reduction in the number of maternal deaths is expected to be greater than the relative reduction in the maternal mortality ratio; however, because the full coverage scenario includes a gradual increase in intervention coverage, the reduction in cumulative maternal deaths from 2020 to 2030 is often lower than the reduction in the

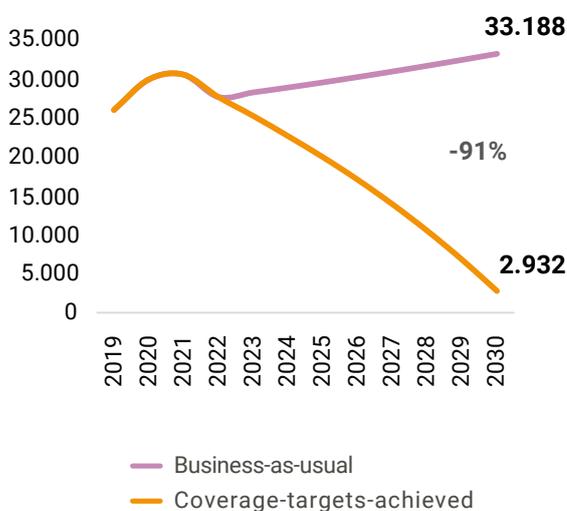
maternal mortality ratio for 2030. To emphasize this, the percentage reduction in maternal deaths in the year 2030 alone has also been reported. This allows a comparison with the reduction in the maternal mortality ratio in 2030.

For the Pacific countries included in this study, an estimated \$6.7 million was spent on family planning and maternal health interventions in 2019. This amount, however, still leaves a high proportion of women in each country with an unmet need for modern family planning methods by 2030 (ranging from 18 per cent in Kiribati to 35 per cent in Samoa). To achieve 95 per cent coverage of maternal health services and zero unmet need for family planning by 2030, the annual investment requirements would increase over time. By 2030, the annual resources needed to achieve coverage targets would be 36 per cent greater than business as usual in that year (figure 4).

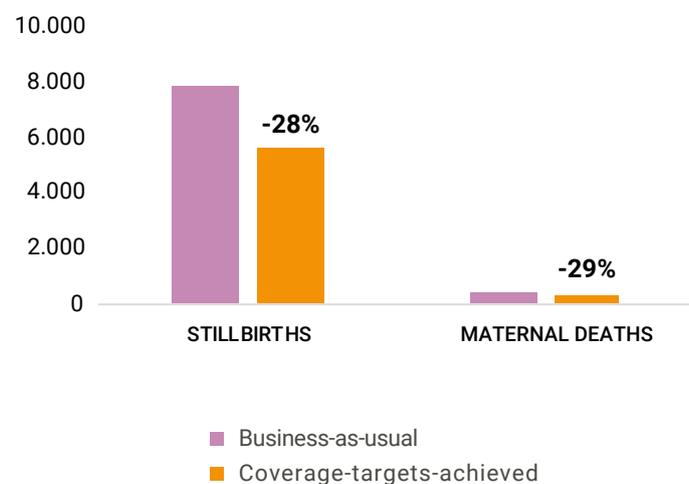
Major differences in the impacts, incremental investment requirements, benefits and benefit-cost ratios of achieving the coverage targets exist among countries due to differences in baseline mortality rates, stillbirth rates, unmet need for family planning and intervention coverage, as well as different (unvalidated) estimates for costs, differences in per capita gross domestic product (GDP) and work participation rates among women (used to derive economic benefits), as well as the ratio of estimated health-care worker costs to per capita GDP. For example, benefit-cost ratios in Kiribati and Tonga were considerably lower than regional averages due to high health-care worker costs relative to per capita GDP, and low estimated workforce participation among women (see tables B.3 and B.4 in appendix B).

Figure 1. Annual unintended pregnancies (right), and total stillbirths and maternal deaths that could be averted from 2020 to 2030 (left) for aggregated values for Kiribati, Samoa, Solomon Islands, Tonga, and Vanuatu

Annual unintended pregnancies, select countries in the Pacific

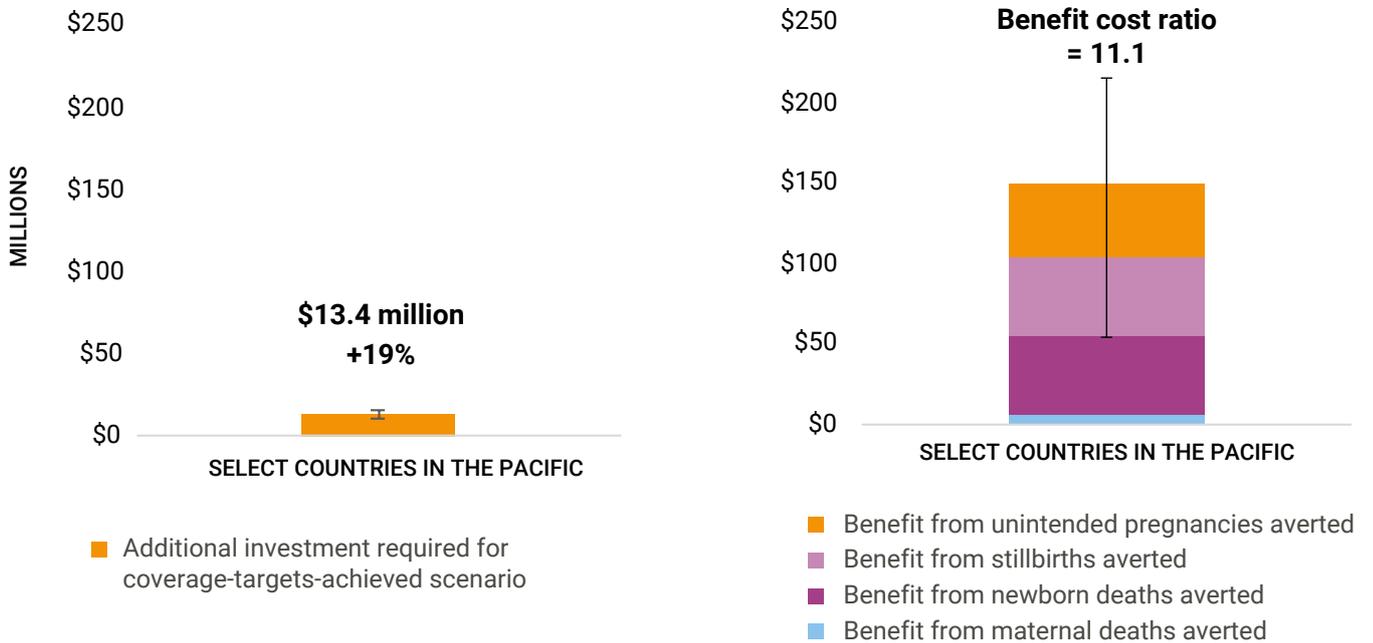


Total stillbirths and maternal deaths, select countries in the Pacific (2020 - 2030)



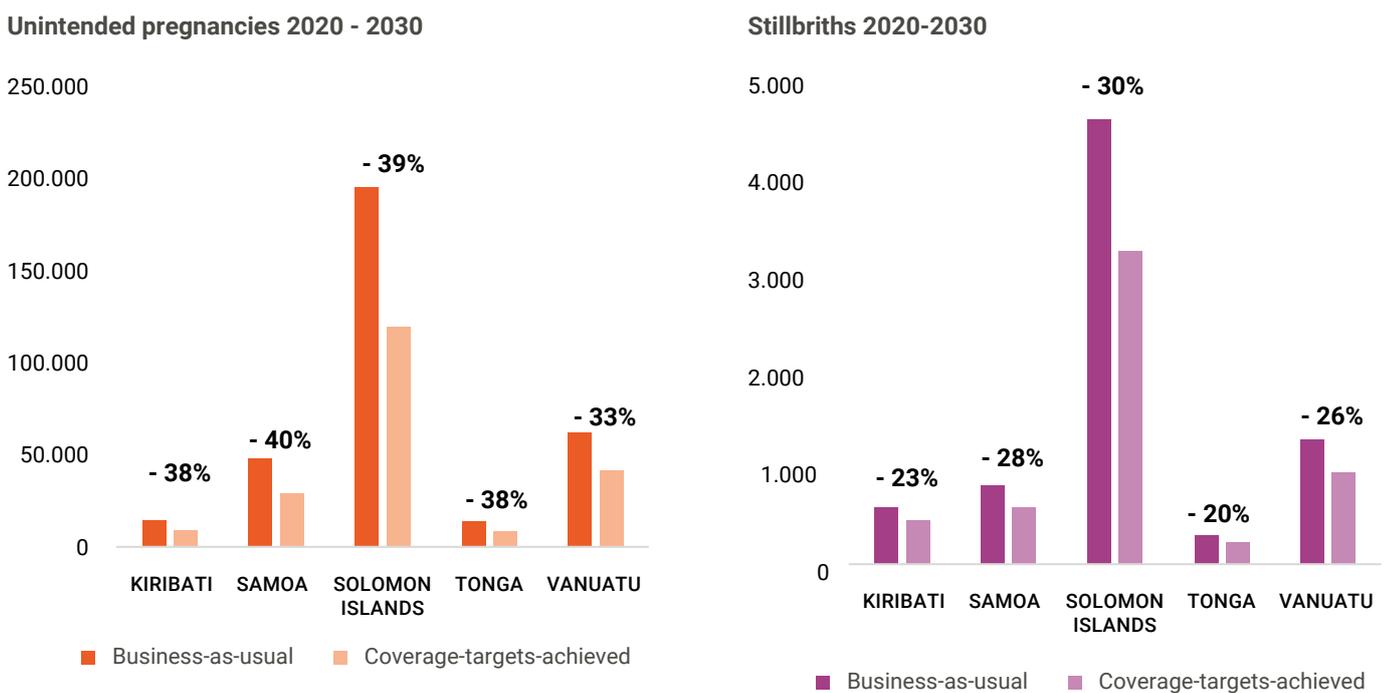
¹ The maternal mortality ratio is calculated as "maternal deaths per 100,000 live births", meaning that in settings with a low number of births, a singular maternal death may have a substantial effect.

Figure 2. Estimated additional resources required (2020-2030) to reach 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030, compared with business as usual (left), and the corresponding return on investment estimated by 2040 from the prevention of maternal and newborn deaths, stillbirths and unintended pregnancies (right)

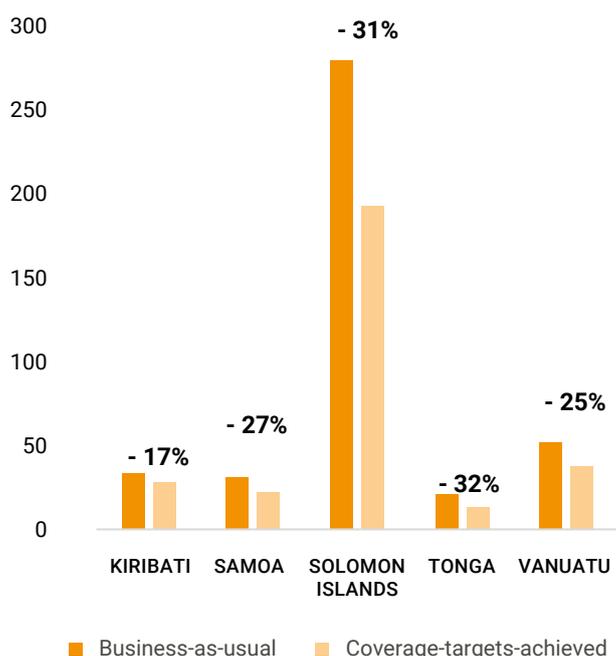


Note: The range bar represents the benefits calculated to 2030 (lower bound) and 2050 (upper bound), aggregated for Kiribati, Samoa, Solomon Islands, Tonga and Vanuatu, in dollars.

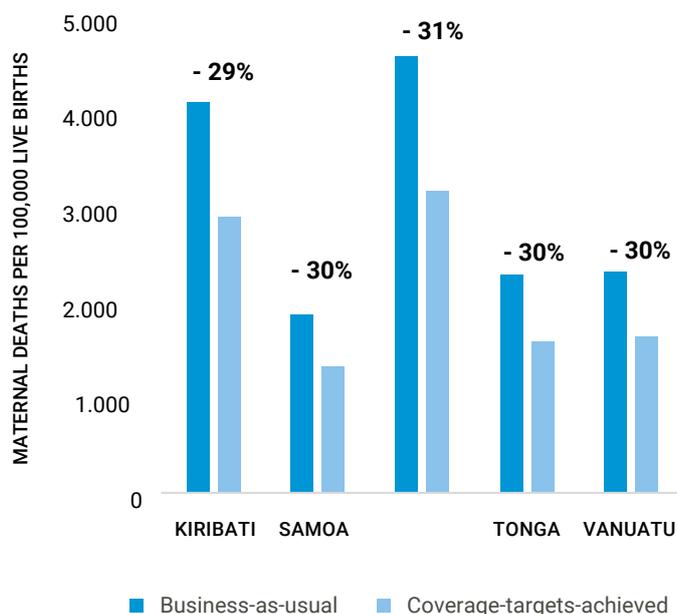
Figure 3. Projected unintended pregnancies (top left), stillbirths (top right) and maternal deaths (bottom left) between 2020 and 2030, and projected maternal mortality ratio in 2030 (bottom right) for the business-as-usual and coverage-targets-achieved scenarios, showing percentages that could be averted



Maternal deaths 2020-2030

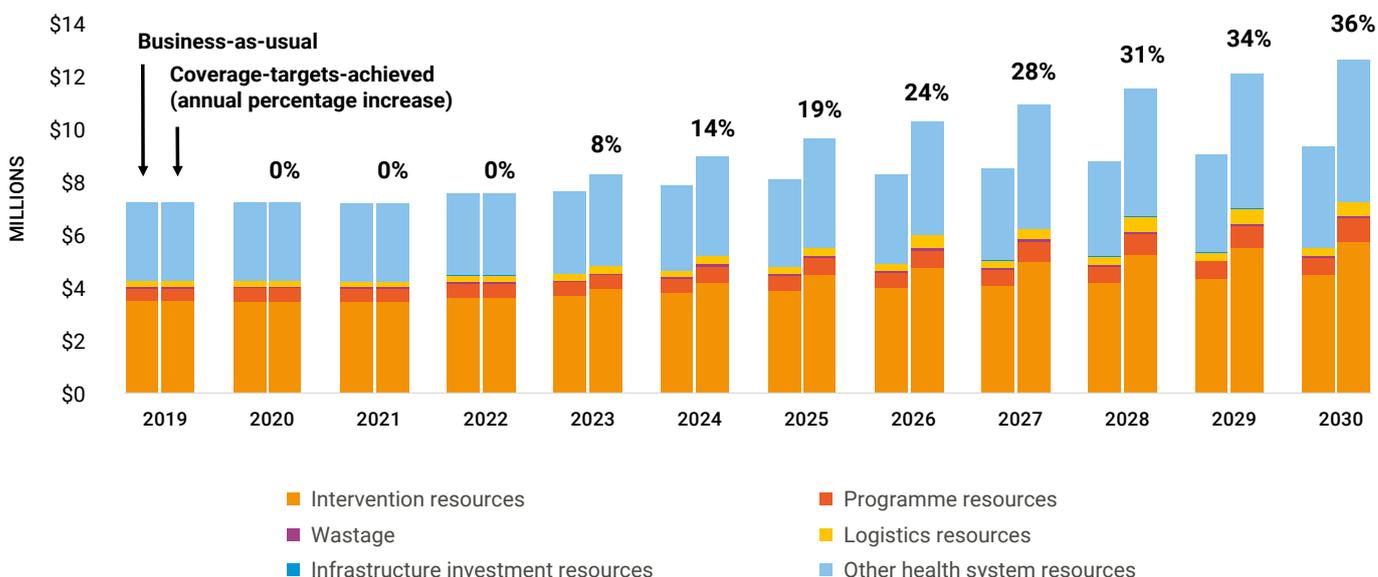


Maternal mortality ratio in 2030



Note: The impact on the maternal mortality ratio is shown solely for 2030, whereas other indicators are cumulative from 2020 to 2030. Due to small population sizes and low numbers of births per year, maternal mortality ratios should be interpreted with caution.

Figure 4. Aggregated annual maternal health and family planning resources for Kiribati, Samoa, Solomon Islands, Tonga and Vanuatu in the business-as-usual (left bars) and coverage-targets-achieved (right bars) scenarios, 2020-2030, in dollars



Note: In the business-as-usual scenario with intervention coverages maintained, annual costs increased slightly due to population growth.

COUNTRIES IN THE CARIBBEAN

This analysis considered four countries in the Caribbean: Barbados, Guyana, Jamaica and Saint Lucia (see table 2 for a demographic summary). Meeting the coverage

targets by 2030 for all four could avert an additional 127,000 unintended pregnancies (23 per cent more than maintaining existing coverage, 10 per cent of all pregnancies averted), 3,600 stillbirths (23 per cent than

maintaining existing coverage), and 221 maternal deaths (25 per cent than maintaining existing coverage) from 2020 to 2030, compared with the business-as-usual scenario (figure 5). Between 2020 and 2030, this would require a total investment of \$361.1 million (\$357.6-\$364.7 million) and an additional investment of \$18.8 million (\$15.3-\$22.4 million),

or 5 per cent more than maintaining business as usual. This additional investment could bring at least a twentyfold economic benefit of \$375.4 million (\$137.9-\$540.6 million) from the prevention of maternal and newborn deaths, stillbirths and unintended pregnancies (figure 6).

Table 2. Estimates for population size, women of reproductive age and number of births for Barbados, Guyana, Jamaica and Saint Lucia in 2019

2019	Barbados	Guyana	Jamaica	Saint Lucia
Population size	301,000	851,000	3,071,000	186,000
Women of reproductive age	70,000	223,000	820,000	52,000
Births	3,400	19,000	57,000	2,400

Source: LiST v5.88.

For the scenario where coverage targets are met by 2030, all four Caribbean countries could achieve SDG target 3.7 on universal access to sexual and reproductive health services, including family planning, and experience an expected two-thirds reduction in maternal deaths from 2010 levels by 2030. SDG target 3.1, reaching a maternal mortality ratio of under 70 deaths per 100,000 live births by 2030, is projected to be met in Barbados and Jamaica if 2030 coverage targets for family planning and maternal health interventions are achieved. While Guyana and Saint Lucia are not projected to reach SDG target 3.1, even if coverage targets are achieved (as a result of a high estimated maternal mortality ratio in 2019), 31 and 36 per cent reductions in the 2030 maternal mortality ratio could be achieved for Guyana and Saint Lucia, respectively (figure 7). Due to small population sizes and low numbers of births per year, however, maternal mortality ratios should be interpreted with caution.

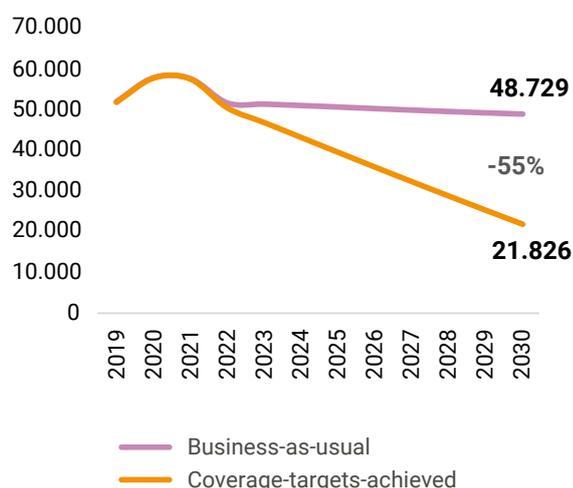
For the countries in the Caribbean included in this study, an estimated \$34.5 million was spent on maternal health

and family planning services in 2019. This amount, however, still leaves a high proportion of women in each country with an unmet need for modern family planning methods by 2030 (ranging from 8 per cent in Jamaica to 28 per cent in Guyana). To achieve 95 per cent coverage of maternal health interventions and zero unmet need for family planning by 2030, annual investment requirements must increase over time. By 2030, annual resources to achieve coverage targets would be 11 per cent greater than business as usual in that year (figure 8).

Differences exist in the impacts, incremental investment requirements, benefits and benefit-cost ratios of achieving coverage targets among countries due to differences in baseline mortality rates, stillbirth rates, unmet need and intervention coverage, as well as different (unvalidated) estimates for costs, differences in per capita GDP and work participation rates among women (used to derive economic benefits), and the ratio of estimated health-care worker costs to per capita GDP.

Figure 5. Annual unintended pregnancies (right), and total stillbirths and maternal deaths that could be averted from 2020 to 2030 (left), aggregated for Barbados, Guyana, Jamaica and Saint Lucia

Annual unintended pregnancies, select countries in the Caribbean



Total stillbirths and maternal deaths, select countries in the Caribbean 2020-2030

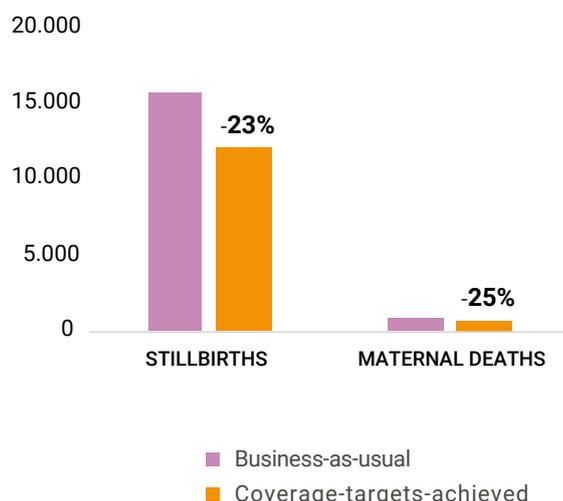
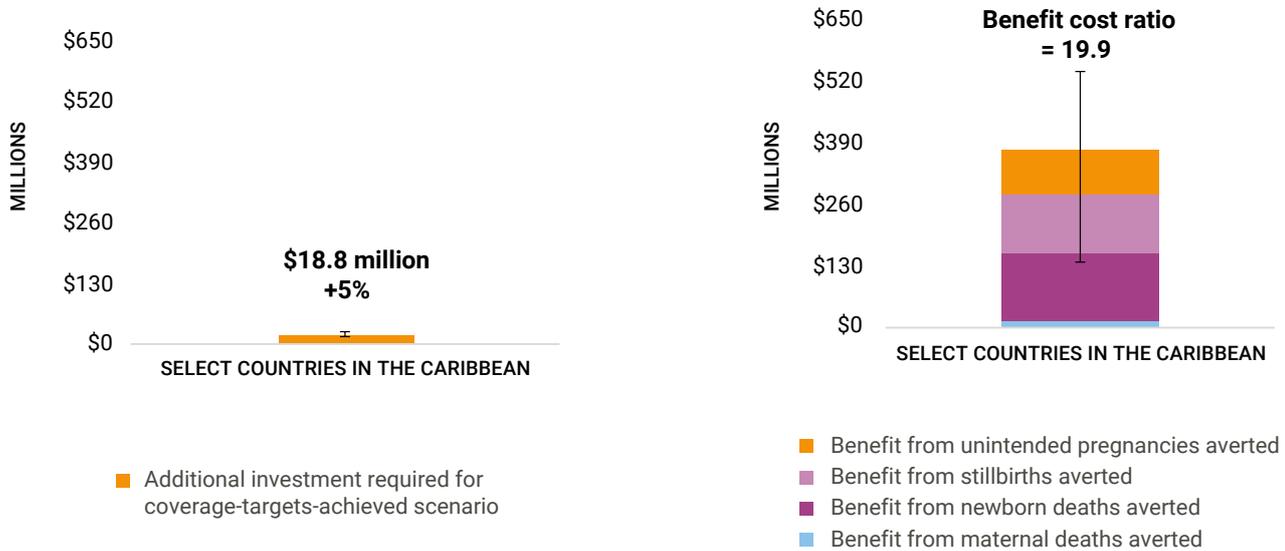
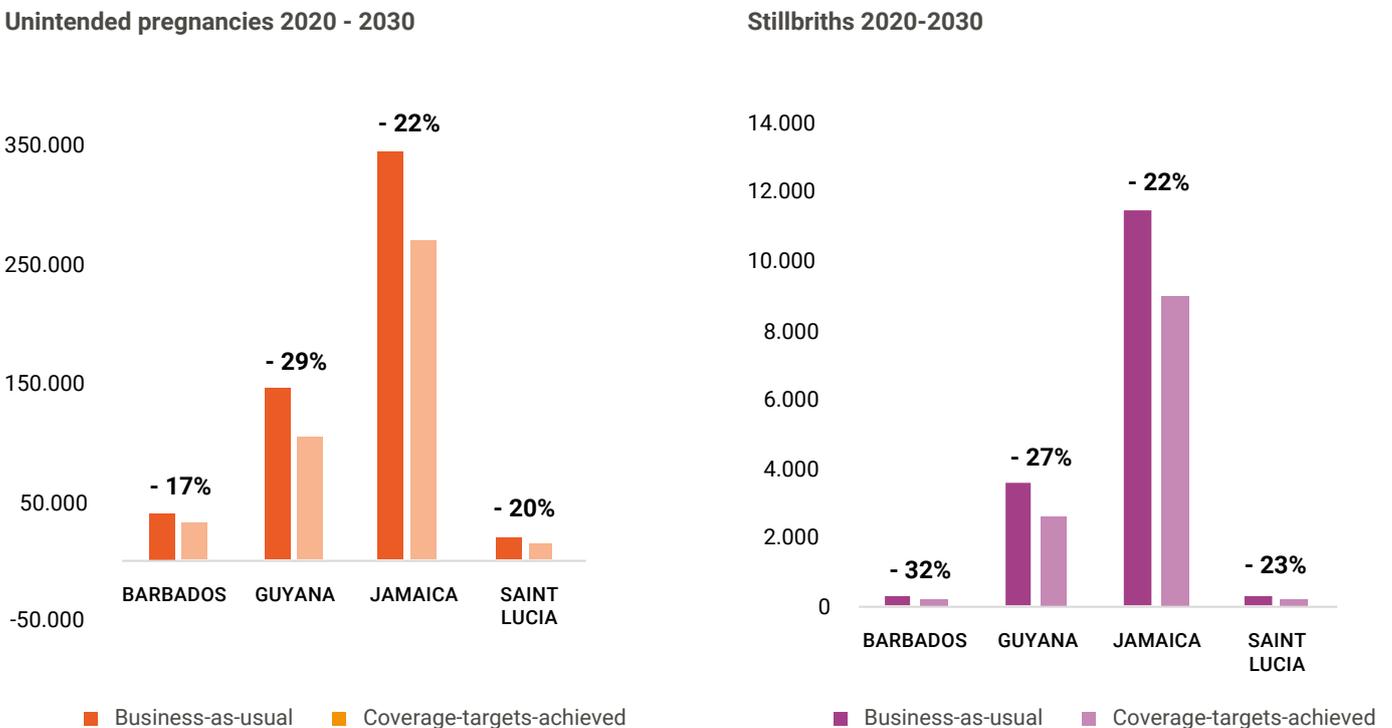


Figure 6. Estimated additional resources required (in dollars, 2020-2030) to reach 95 per cent coverage of maternal health interventions and 0 per cent unmet need by 2030, compared with business as usual (left), and the corresponding return on investment estimated by 2040 from the prevention of maternal and newborn deaths, stillbirths and unintended pregnancies (right)

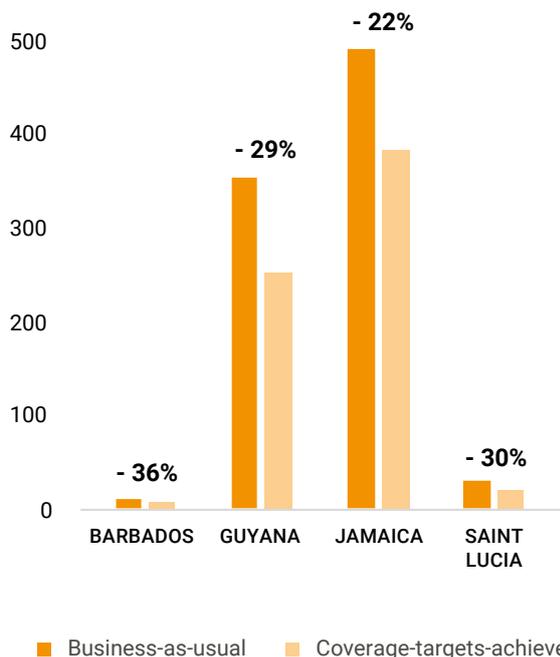


Note: The range represents the benefits calculated to 2030 (lower bound) and 2050 (upper bound), aggregated for Barbados, Guyana, Jamaica and Saint Lucia.

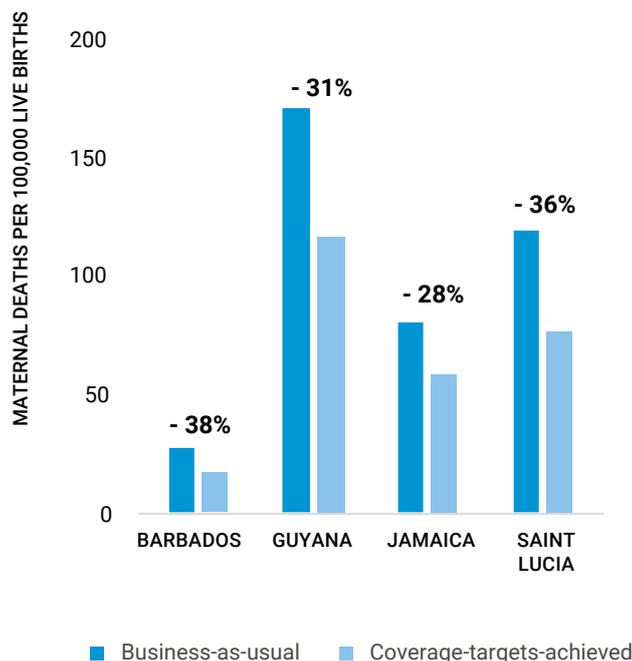
Figure 7. Projected unintended pregnancies (top left), stillbirths (top right) and maternal deaths (bottom left) between 2020 and 2030, and projected maternal mortality ratio in 2030 (bottom right) for the business-as-usual and coverage-targets-achieved scenarios, showing percentages that could be averted



Maternal deaths 2020-2030

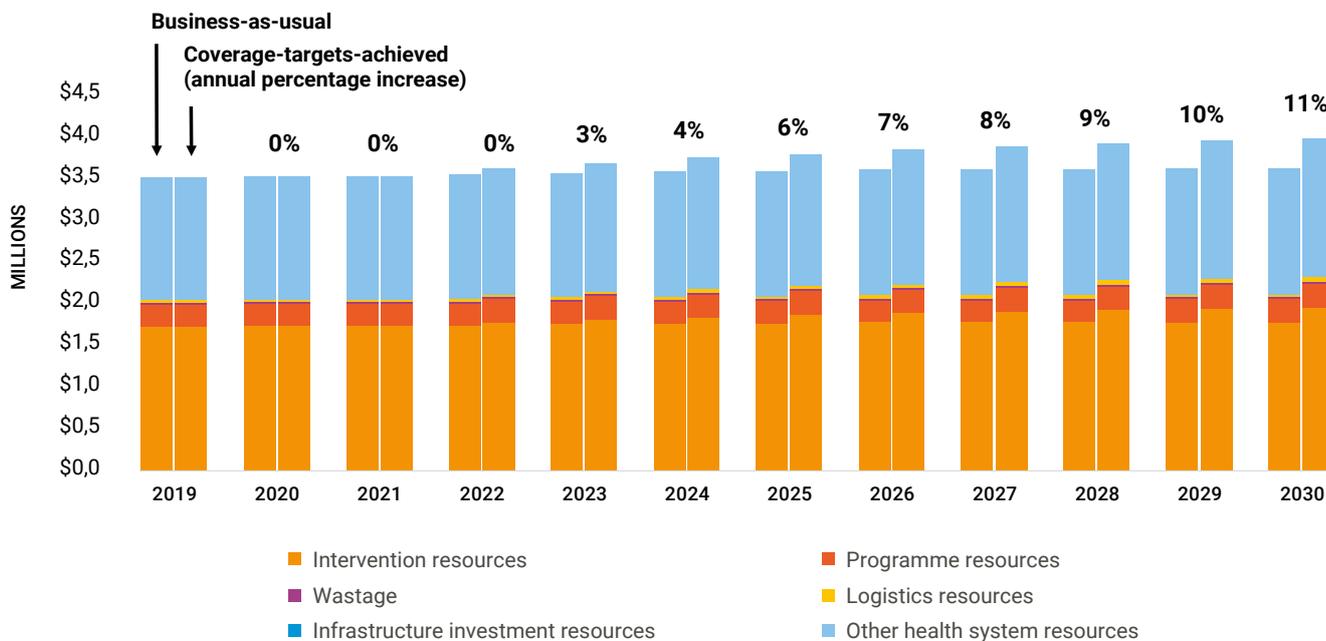


Maternal mortality ratio in 2030



Note: The impact on maternal mortality ratio is shown solely for 2030, whereas other indicators are cumulative from 2020 to 2030. Due to small population sizes and low numbers of births per year, maternal mortality ratios should be interpreted with caution.

Figure 8. Aggregated annual maternal health and family planning resources for Barbados, Guyana, Jamaica and Saint Lucia in the business-as-usual (left bars) and coverage-targets-achieved (right bars) scenarios, 2020-2030, in dollars



Note: In the business-as-usual scenario with intervention coverages maintained, annual costs increase slightly due to population growth.

METHODOLOGY

ANALYSIS AIMS

This study aims to estimate the health gains, financial needs, benefits and benefit-cost ratios of investing in a range of family planning and maternal health interventions to meet two of UNFPA's three transformative results: to end preventable maternal deaths, and to end unmet need for family planning. The third transformative result of ending gender-based violence and harmful practices by 2030 was not considered in the current analysis but could be included in the future.

Outcomes were compared across two scenarios between 2020 and 2030 for a business-as-usual scenario, as well as a coverage-targets-achieved scenario, which was defined as maternal health interventions reaching 95 per cent coverage targets by 2030 and family planning interventions achieving 0 per cent unmet need by 2030. Any reductions to service coverage due to disruptions from the COVID-19 pandemic for 2020 and 2021 (as described below and shown in table 1) were reflected in both scenarios.

The analysis was performed for a selection of small island developing States in the Pacific (Kiribati, Samoa, Solomon Islands, Tonga and Vanuatu) and the Caribbean (Barbados, Guyana, Jamaica and Saint Lucia), based on the availability of data.

ANALYSIS DESIGN

The Lives Saved Tool (LiST) version 5.88, as maintained by Avenir Health, was used to generate estimates for this study. The timeframe considered for costs and health benefits was from 2020 to 2030. For the cohort of women and girls receiving interventions during this period, the economic benefits were calculated up to 2040, with a lower bound for 2030 and an upper bound for 2050 used to generate uncertainty bounds (Sheehan and others, 2017). The discrepancy between the timeframe for costs and economic benefits stems from the fact that each intervention will only directly impact those who receive it during the 2020-2030 period. In many cases, benefits will last well into the future. For example, if an intervention prevents a maternal death, the mortality benefit will extend well beyond 2030.

BUSINESS-AS-USUAL SCENARIO

For the business-as-usual or baseline scenario, intervention coverage for 2019 was based on the most recent estimates from major population surveys (e.g., the Demographic and Health Survey, DHS, or the Multiple Indicator Cluster Survey, MICS; see tables C.1 and C.2 in appendix C for country-specific details). The surveys were supplemented by LiST estimates where specific estimates were not available. For 2020 and 2021, intervention coverage levels were reduced according to country-specific COVID-19 disruption estimates (table 3). Coverage was then returned to 2019 levels in 2022 and maintained to 2030.

The possibility of applying trends in intervention coverage to the business-as-usual scenario based on historic trends was explored, but due to data limitations in the countries considered, this was not possible. Despite the assumed constant coverage from 2022 to 2030, the business-as-usual scenario included projected changes in population size and structure, and so some changes in trends for costs and health indicators are evident based on demographic changes.

Except for the modelled COVID-19 disruptions in 2020 and 2021, contraceptive use prevalence and the methods mix (i.e., traditional and modern methods) in 2019 was assumed to be maintained to 2030.

COVERAGE-TARGETS-ACHIEVED SCENARIO

For the coverage-targets-achieved scenario, intervention coverage for 2019 was based on the most recent estimates as per the business-as-usual scenario. For 2020 and 2021, coverage levels were reduced according to any country-specific COVID-19 disruption estimates (table 3). From 2022, intervention coverages were linearly scaled up to target coverage levels by 2030 (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning). The coverage-targets-achieved scenario assumed the same changes to projected population size and structure as the business-as-usual scenario.

As well as reaching zero unmet need for family planning, the methods mix for contraceptive use was assumed to transform from the mix applied for 2019 to exclusively modern methods by 2030.

COVERAGE REDUCTIONS DUE TO COVID-19 DISRUPTIONS

Potential reductions in family planning and maternal health services in 2020 and 2021 due to COVID-19 disruptions may be influenced by factors on both the supply and demand sides. On the supply side, the availability of care may have been or be limited due to health-care workers being diverted to other tasks (including those related to COVID-19 as well as redesigning services to be delivered via telephone or video), staffs being deployed in shifts in reduced numbers to protect their health (and to enable a replacement shift should one group of workers become exposed and require quarantine) or staffs refusing to work for fear of being infected with the

virus. In addition, the COVID-19 response requires significant financial resources, either directly to support public health initiatives such as contact tracing and surveillance, or indirectly to support individuals who are unable to work due to workplace closures and stay-at-home orders.

On the demand side, stay-at-home orders may reduce service-seeking behaviour; individuals may make their own assessments when weighing the benefits of antenatal care or other health-care visits (e.g., family planning, immunization) against the risk of becoming infected with the virus (perceived or real) when attending health-care clinics and/or using crowded public transport to reach health-care facilities.

Table 1. Assumed reductions in intervention coverage due to COVID-19 disruptions for 2020 and 2021

Country	Maternal health intervention coverage reduction (health facility delivery), percentage			Family planning intervention coverage reduction (short-acting contraceptive methods), percentage		
	Lower bound	Estimate	Upper bound	Lower bound	Estimate	Upper bound
Barbados	0%	0%	10 %	0%	0%	10%
Guyana	0%	5%	20%	0%	0%	10%
Jamaica	0%	5%	20%	0%	5%	20%
Saint Lucia	0%	0%	10%	0%	5%	20%
Kiribati	20%	35%	50%	20%	35%	50%
Samoa	5%	10%	20%	10%	20%	35%
Solomon Islands	5%	10%	20%	10%	20%	35%
Tonga	10%	10%	10%	10%	20%	30%
Vanuatu	20%	35%	50%	20%	35%	70%

Source: Derived from assumptions from select data sources (PAHO, 2019; UNICEF, 2020) and other global health models (Stenberg and others, 2017; Walker, Tam and Friberg, 2013; WHO, 2020) in consultation with UNFPA.

COSTS, INTERVENTIONS AND BENEFITS

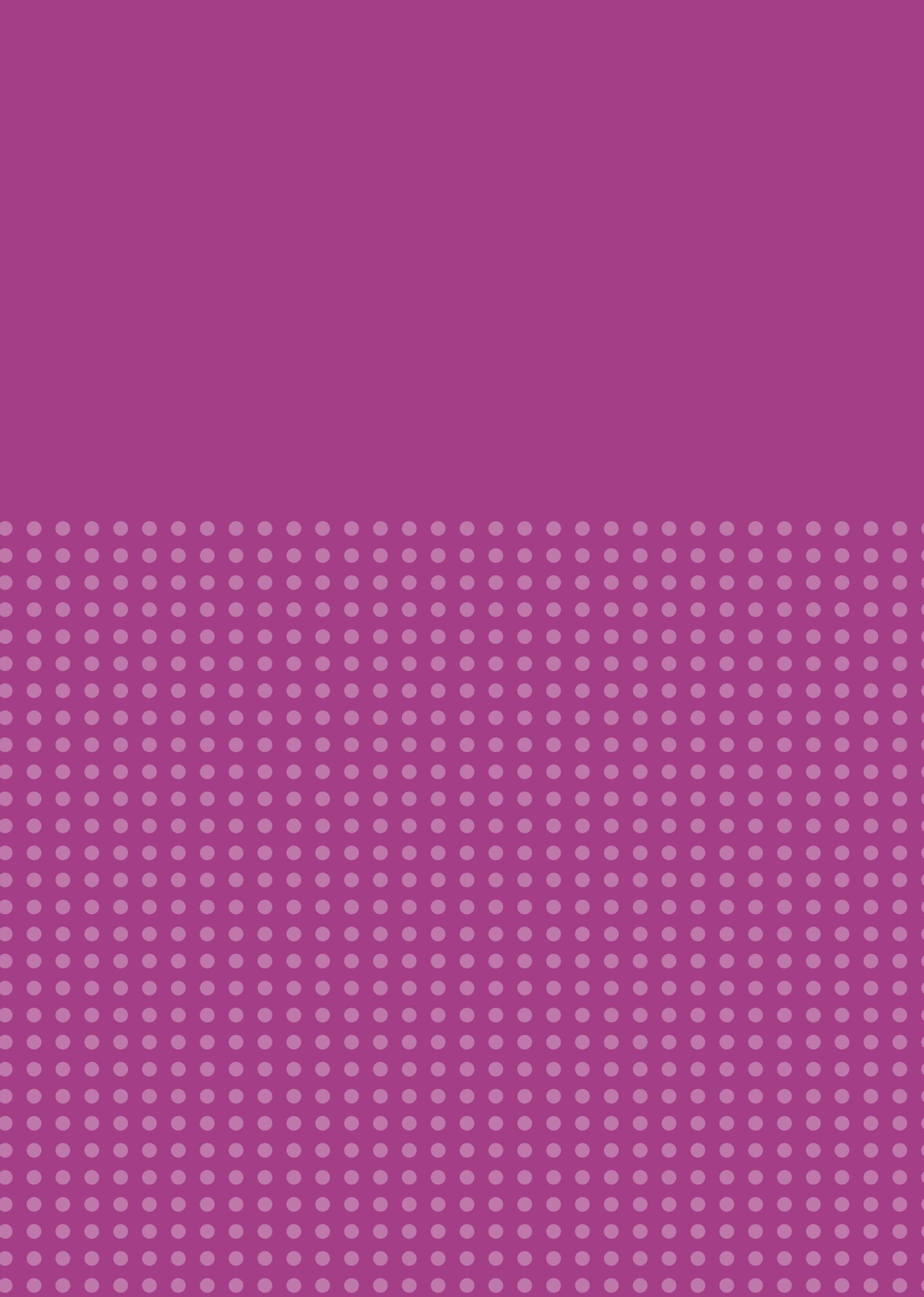
For this analysis, costs were considered between 2020 and 2030. Costs were derived from LiST (for commodities and human resources needs) and inflated based on a study from Stenberg and others (2017) to account for the additional financing needs of health service expansion. Costs were not validated through consultations with national teams.

Family planning and maternal health interventions considered in this analysis, and their estimated 2019 coverage, are listed in appendix C (tables C.1 and C.2). Within this study, the coverage of both family planning and maternal health interventions increased, and the estimates of total costs and investment requirements include direct cost savings from reduced unintended pregnancies leading to reduced demand for maternal health services.

Benefits from maternal health interventions encompass consideration of averted maternal deaths and stillbirths. Benefits from family planning interventions included consideration of averted unintended pregnancies, maternal

deaths, stillbirths and newborn deaths due to the reduction in unintended pregnancies (based on country-specific rates of occurrence), additional education (and increased lifetime earnings) from averting unintended teenage pregnancies, and additional workforce participation from averting unintended adult pregnancies. Economic benefits were calculated up to 2040 for the cohort of women and girls receiving interventions in the 2020-2030 period, with a range reflecting benefits accrued by the end of the investment period in 2030, and if a longer time frame is considered, up to 2050 (Sheehan and others, 2017).

Detailed methodological frameworks for calculating costs and benefits are provided in appendix B.



RESULTS FOR COUNTRIES IN THE PACIFIC

KIRIBATI

In 2019, Kiribati had a population of 119,000, including 30,000 women of reproductive age, and an estimated 3,200 births, 86 per cent of which occurred in health facilities. The 2018-2019 Social Development Indicator Survey suggested that Kiribati has an estimated 25 per cent contraceptive prevalence rate (modern and traditional methods), 17 per cent unmet need for family planning and a total fertility rate of 3.3. The maternal mortality ratio for 2019 was an estimated 92 per 100,000 live births (WHO and others, 2019).

A commitment to enhancing access to quality family planning services, made as part of Kiribati's 2016-2019 Health Strategic Plan, was renewed in the 2020-2023 Health Strategic Plan (Kiribati, Ministry of Health and Medical Services, 2020). Targets for 2023 include a contraceptive prevalence rate of 25 per cent for modern family planning methods and no maternal deaths.

Progress towards maternal health and family planning targets

The business-as-usual scenario with estimated 2019 coverage levels maintained until 2030, incorporating any reductions in 2020 and 2021 due to COVID-19, predicted 14,382 unintended pregnancies, 603 stillbirths, and 35 maternal deaths between 2020 and 2030, with the 2030 maternal mortality ratio projected to be 91 deaths per 100,000 live births.

A total investment of \$6.7 million (\$6.4-\$7 million), with additional investment of \$1.4 million (\$1.1-\$1.7 million) between 2020 and 2030, or 26 per cent more than business as usual, could enable Kiribati to achieve 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030. The additional investment to meet these targets could return \$6.1 million (\$2-\$9 million) in economic benefits by 2040 through the prevention of an additional 5,422 unintended pregnancies (38 per cent more than business as usual, 10 per cent of all pregnancies), 137 stillbirths (23 per cent more averted), and 6 maternal deaths (17 per cent more averted) between 2020 and 2030 (figure 9), with the projected 2030 maternal mortality ratio falling to 66 deaths per 100,000 live births (figure 10).



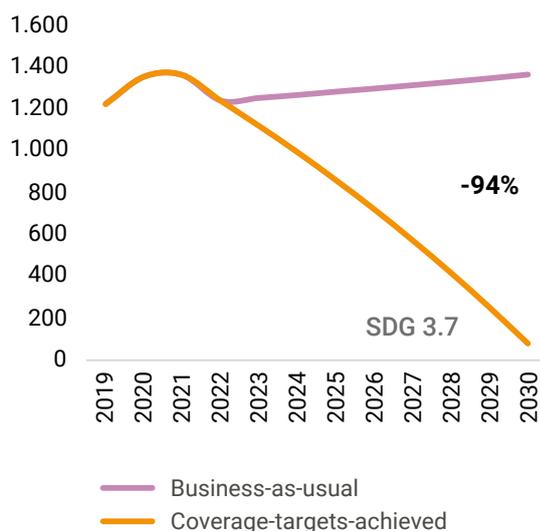
For every **\$1.00** invested in maternal health and family planning there could be **\$4.40** in economic benefit by 2040

If coverage targets were reached, Kiribati could achieve SDG target 3.7 on universal access to sexual and reproductive health services, SDG target 3.1 on reducing maternal deaths to less than 70 per 100,000 live births (figure 10) as well as the country-specific SDG target of reducing the maternal

mortality ratio by two thirds from 2010 levels by 2030. A small population size and a low number of births per year, however, mean the maternal mortality ratio should be interpreted with caution.

Figure 9. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on unintended pregnancies (left), and stillbirths and maternal deaths (right)

Annual unintended pregnancies



Total stillbirths and maternal deaths, 2020-2030

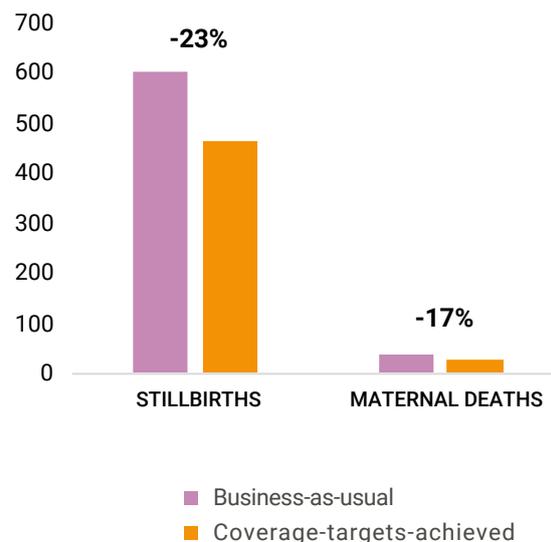
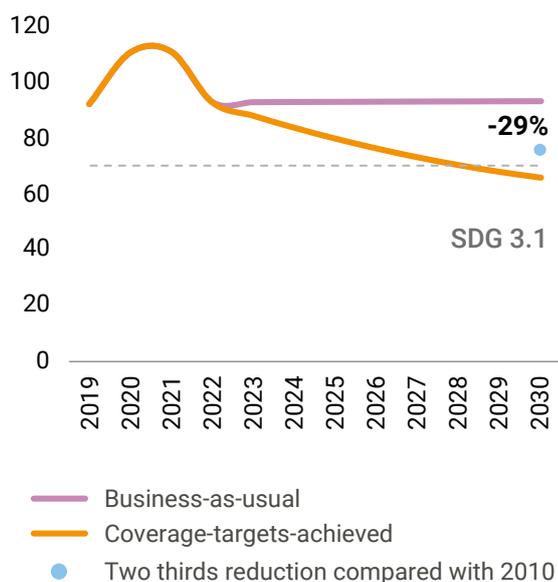
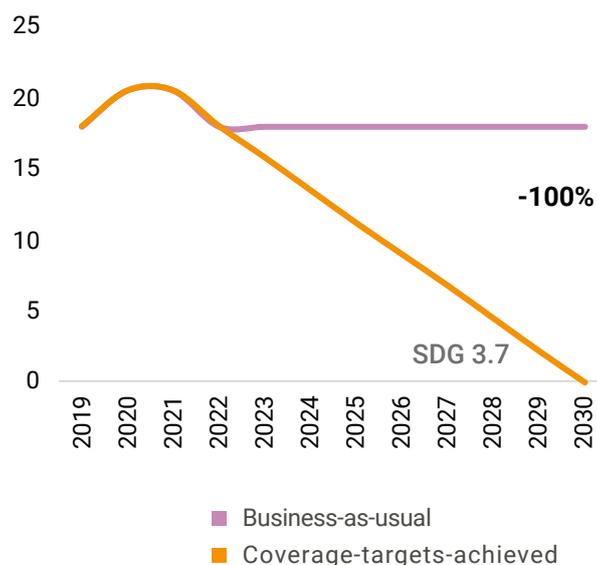


Figure 10. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on the maternal mortality ratio (left) and unmet need for family planning (right)

Annual maternal mortality ratio



Annual unmet need for family planning



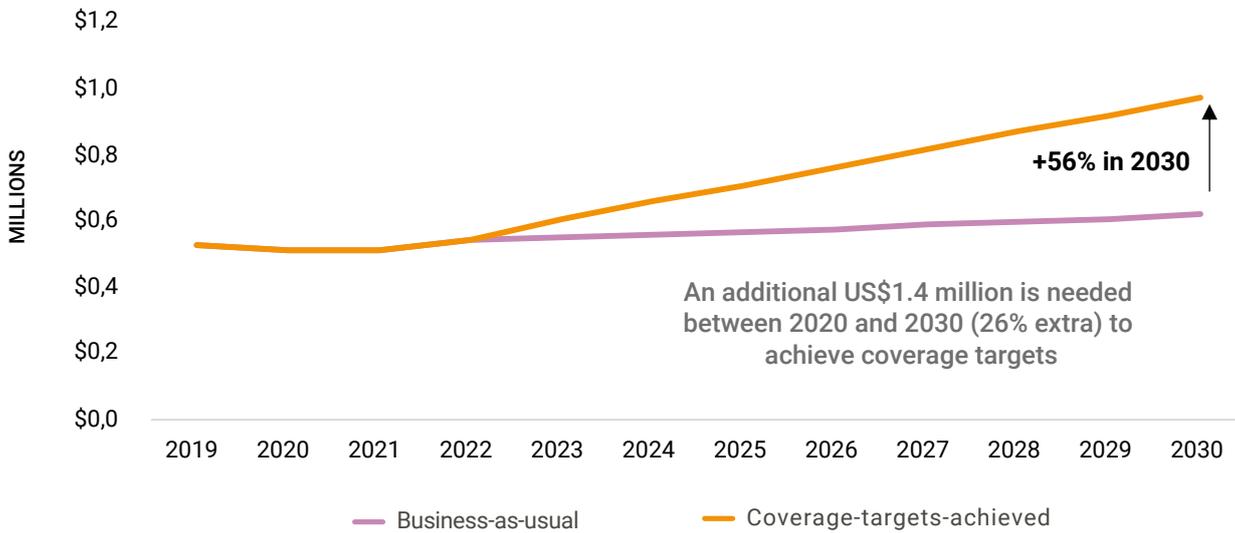
Note: Due to a small population size and a low number of births per year, the maternal mortality ratio should be interpreted with caution.

Resources needed to achieve targets

An estimated \$6.7 million (\$6.4-\$7 million) is needed between 2020 and 2030 to reach the maternal health and family planning intervention coverage targets in Kiribati,

which is \$1.4 million (\$1.1-\$1.7 million) or 26 per cent more than business as usual with estimated 2019 coverage levels maintained to 2030, incorporating any reductions in 2020 and 2021 due to COVID-19 (figure 11).

Figure 11. Estimated resources needed to achieve coverage targets for family planning and maternal health interventions by 2030 compared with business as usual, 2020-2030



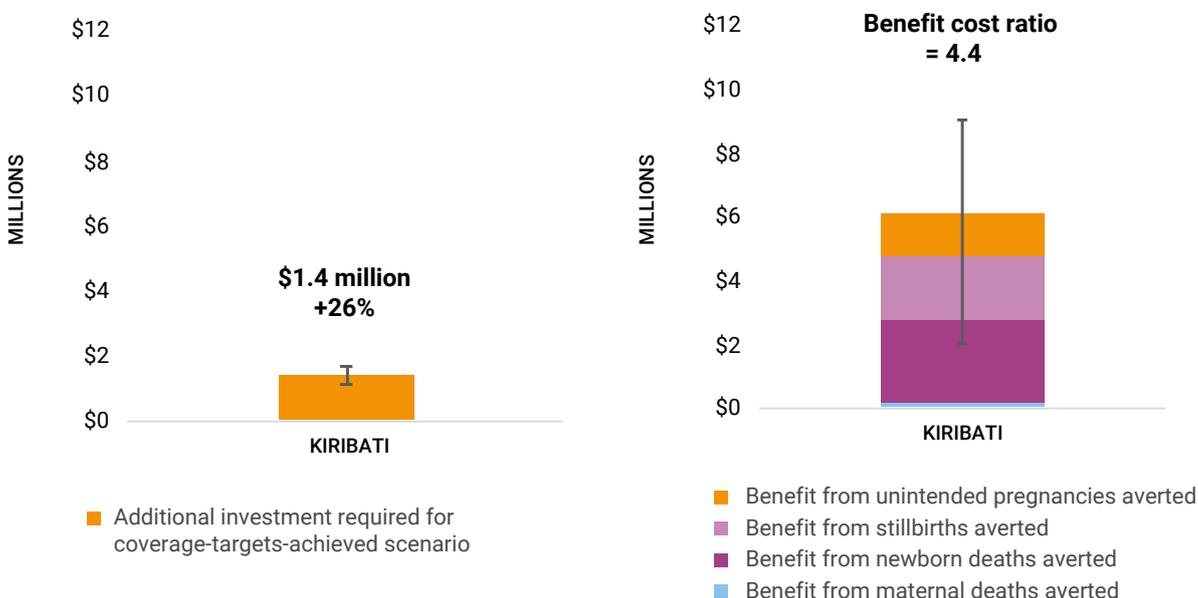
Note: The graph shows undiscounted annual spending for visual ease, while the \$1.4 million is the additional discounted total, at a discounting rate of 3 per cent, in dollars. In the business-as-usual scenario with intervention coverages maintained, annual costs increase slightly due to population growth.

Benefits

An additional \$1.4 million (\$1.1-\$1.7 million) invested over the 2020 to 2030 period could return \$6.1 million (\$2-\$9 million)

in economic benefits by 2040 (figure 12), with a resulting benefit-cost ratio of 4.4. Most benefits come from the prevention of newborn deaths and stillbirths.

Figure 12. Estimated additional resources required (2020-2030) to reach 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030, compared with business as usual (left), and the corresponding return on investment estimated by 2040 from the prevention of maternal and newborn deaths, stillbirths, and unintended pregnancies, where the range represents benefits calculated to 2030 (lower bound) and 2050 (upper bound) (right), in dollars



SAMOA

In 2019, Samoa had a population of 201,000, including 46,000 women of reproductive age, and an estimated 6,000 births, 89 per cent of which occurred in health facilities. The 2019-2020 Multi-Indicator Cluster Survey found that Samoa has an estimated 17 per cent contraceptive prevalence rate (for both modern and traditional methods), 35 per cent unmet need for family planning and a total fertility rate of 3.9. In addition, the maternal mortality ratio was an estimated 43 deaths per 100,000 live births in 2019 (WHO and others, 2019), already surpassing SDG target 3.1 on reducing maternal deaths to less than 70 per 100,000 live births.

The Samoan National Sexual Reproductive Health Policy for 2018-2023 aims to achieve safe, effective, affordable and acceptable delivery of sexual and reproductive health services for all Samoans. Since 2011, Samoa has developed policies to improve ongoing issues of low levels of contraceptive use, an increase in adolescent pregnancies, and rising perinatal and child mortality (Samoa, 2018).

Progress towards maternal health and family planning targets

The business-as-usual scenario with estimated 2019 coverage levels maintained until 2030, incorporating any reductions in 2020 and 2021 due to COVID-19, predicted 47,918 unintended pregnancies, 852 stillbirths and 33 maternal deaths between 2020 and 2030, with the 2030 maternal mortality ratio projected to remain the same as in 2019 at 43 deaths per 100,000 live births.

A total investment of \$12.3 million (\$11.9-\$12.7 million), with an additional investment of \$2.1 million (\$1.7-\$2.5 million) between 2020 and 2030, or 21 per cent more than business as usual, could enable Samoa to achieve 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030. The additional investment to meet these targets could return \$25.2 million (\$8.2-\$37.2 million) in economic benefits by 2040 through the prevention of 18,933 unintended pregnancies (40 per cent more averted than business as usual, 18 per cent of all pregnancies), 236 stillbirths (28 per cent more averted), and 9 maternal deaths (27 per cent more averted) between 2020 and 2030 (figure 13), with the projected 2030 maternal mortality ratio falling to 30 deaths per 100,000 live births (figure 14).



For every \$1 invested in maternal health and family planning there could be \$12 in economic benefits by 2040

If the coverage targets were reached, Samoa could achieve SDG target 3.7 on universal access to sexual and reproductive health services, as well as the country-specific target of reducing the maternal mortality ratio by

two thirds from 2010 levels by 2030 (figure 14). Its small population size and low number of births per year mean the maternal mortality ratio should be interpreted with caution.

Figure 13. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on unintended pregnancies (left), and stillbirths and maternal deaths (right)

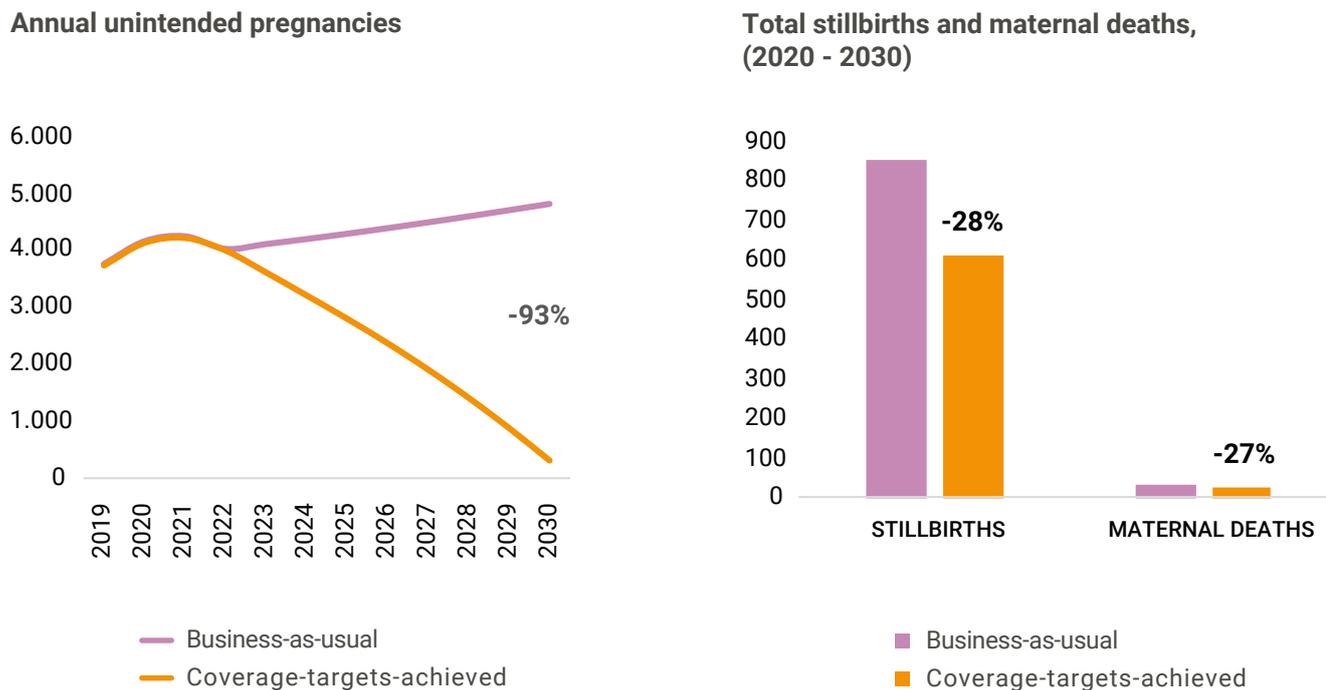
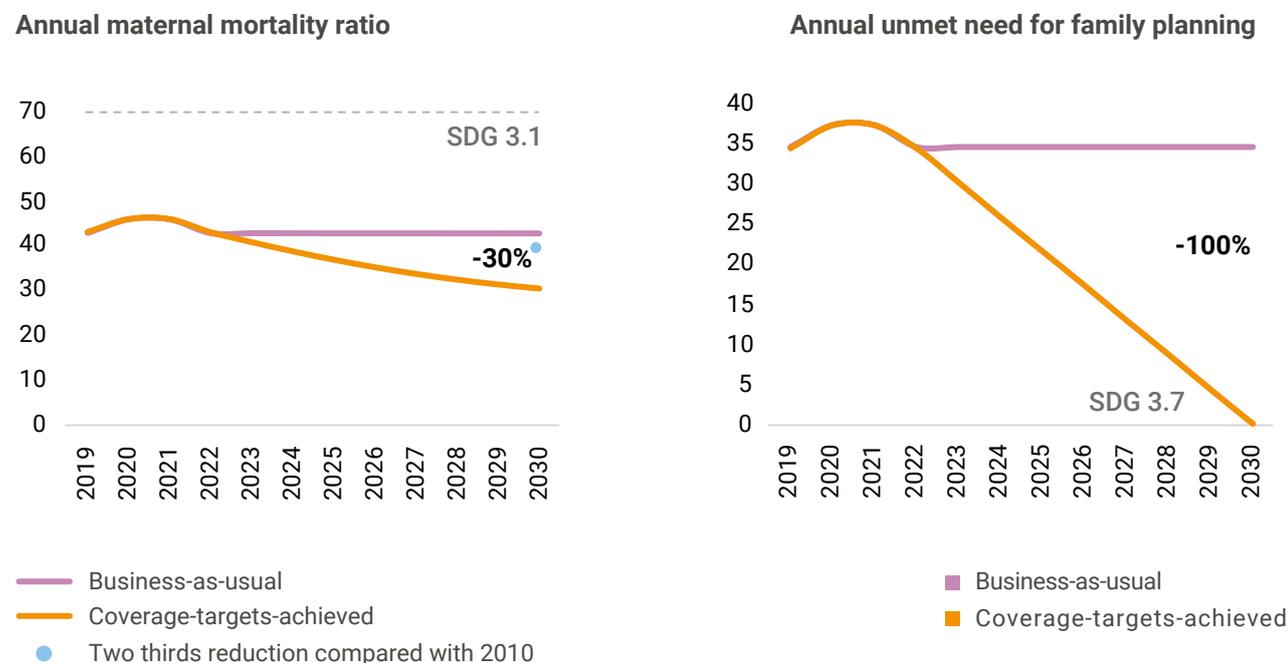


Figure 14. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on the maternal mortality ratio (left) and unmet need for family planning (right)



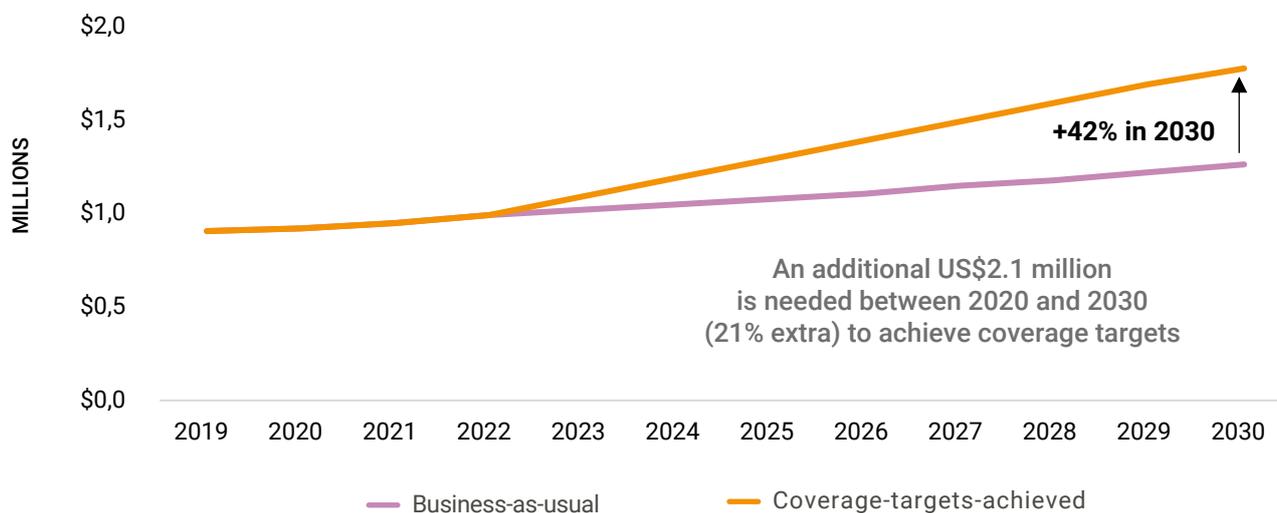
Note: Due to small population size and a low number of births per year, the maternal mortality ratio should be interpreted with caution.

Resources needed to achieve targets

An estimated \$12.3 million (\$11.9-\$12.7 million) is needed between 2020 and 2030 to reach the maternal health and family planning intervention coverage targets in Samoa,

which is \$2.1 million (\$1.7-\$2.5 million) or 21 per cent more than business as usual with estimated 2019 coverage levels maintained to 2030, incorporating any reductions in 2020 and 2021 due to COVID-19 (figure 15).

Figure 15. Estimated resources needed to achieve coverage targets for family planning and maternal health interventions by 2030 compared with business as usual, 2020-2030



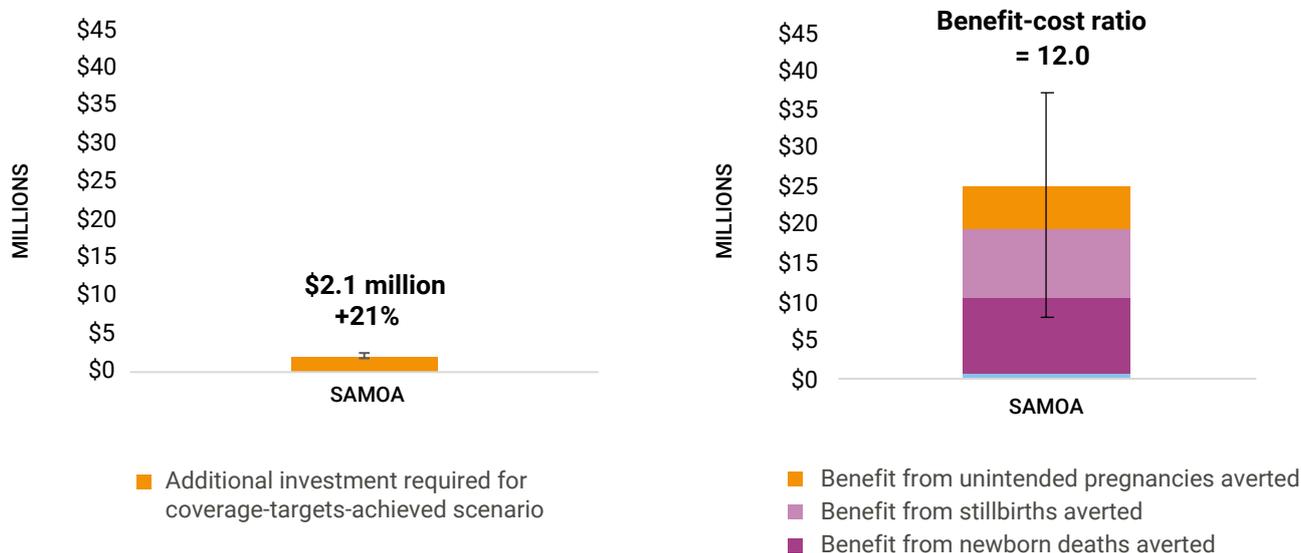
Note: The figure shows undiscounted annual spending for visual ease, while the \$2.1 million is the additional discounted total, at a discounting rate of 3 per cent, in dollars. In the business-as-usual scenario with intervention coverages maintained, annual costs increase slightly due to population growth.

Benefits

An additional \$2.1 million (\$1.7-\$2.5 million) invested from 2020 to 2030 could return \$25.2 million (\$8.2-\$37.2 million) in economic benefits by 2040 (figure 16), with a

resulting benefit-cost ratio of 12. Most benefits come from productivity gains through averted stillbirths and newborn deaths.

Figure 16. Estimated additional resources required (2020-2030) to reach 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030, compared with business as usual (left), and the corresponding return on investment estimated by 2040 from the prevention of maternal and newborn deaths, stillbirths and unintended pregnancies, with the range representing the benefits calculated to 2030 (lower bound) and 2050 (upper bound) (right), in dollars



SOLOMON ISLANDS

In 2019, Solomon Islands had a population of 656,000, including 156,000 women of reproductive age, and an estimated 21,000 births, 85 per cent of which occurred in health facilities. The 2015 Demographic Health Survey estimated a 29 per cent contraceptive prevalence rate (modern and traditional methods), 35 per cent unmet need for family planning and a total fertility rate of 4.4 births per woman. In addition, the maternal mortality ratio was estimated to be 104 deaths per 100,00 live births in 2019 (WHO and others, 2019).

A review of the Solomon Islands 2016-2020 National Health Strategic Plan is in progress to inform development of a new National Health Strategic Plan 2022-2026. Notable goals from the existing plan include increasing the contraceptive prevalence rate to 55 per cent, as well as improving maternal health for mothers in hard-to-reach communities, thereby aiming for 100 per cent health facility-based deliveries (Solomon Islands, Ministry of Health and Medical Services, 2016).

Progress towards maternal health and family planning targets

The business-as-usual scenario with estimated 2019 coverage levels maintained until 2030, incorporating any reductions in 2020 and 2021 due to COVID-19, predicted 195,337 unintended pregnancies, 4,679 stillbirths and 281 maternal deaths between 2020 and 2030, with the 2030 maternal mortality ratio projected to be 104 deaths per 100,000 live births.

A total investment of \$39.1 million (\$38.1-\$40.1 million), with an additional investment of \$5.4 million (\$4.4-\$6.4 million) between 2020 and 2030, or 16 per cent more than business as usual, could enable the Solomon Islands to achieve 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030. The additional investment to meet these targets could return \$82 million (\$31.5-\$115.9 million) in economic benefits by 2040 through the prevention of an additional 75,491 unintended pregnancies (39 per cent more averted than business as usual, 19 per cent of all pregnancies), 1,391 stillbirths (30 per cent more averted), and 86 maternal deaths (31 per cent more averted) between 2020 and 2030 (figure 17), with the projected 2030 maternal mortality rate falling to 72 deaths per 100,000 live births (figure 18).



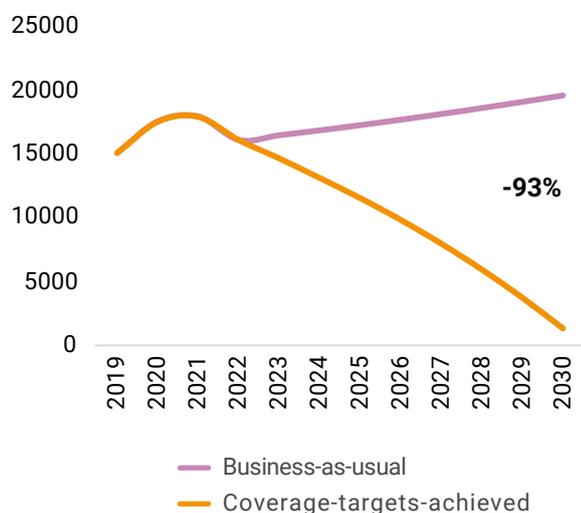
For every \$1 invested in maternal health and family planning there could be \$15.20 in economic benefits by 2040

If the coverage targets were reached, then the Solomon Islands could achieve SDG target 3.7 on universal access to sexual and reproductive health services. In addition, the country would experience a 31 per cent reduction in the

projected 2030 maternal mortality ratio (figure 18). A small population size and a low number of births per year mean the maternal mortality ratio should be interpreted with caution.

Figure 17. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on unintended pregnancies (left), and stillbirths and maternal deaths (right)

Annual unintended pregnancies



Total stillbirths and maternal deaths, (2020 - 2030)

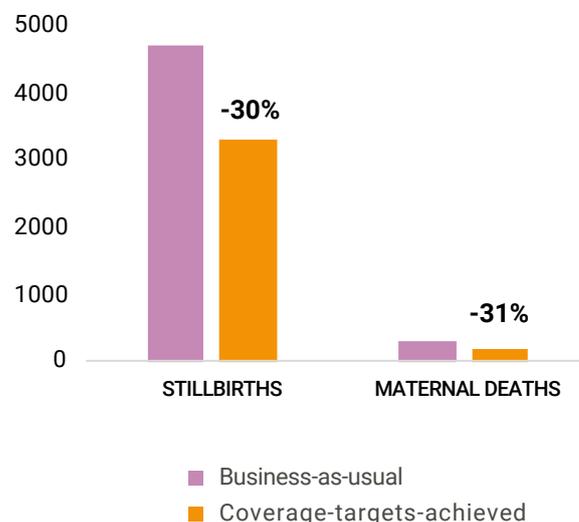
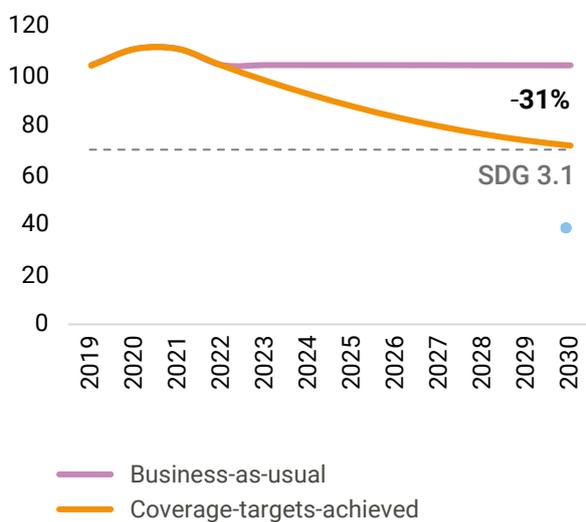
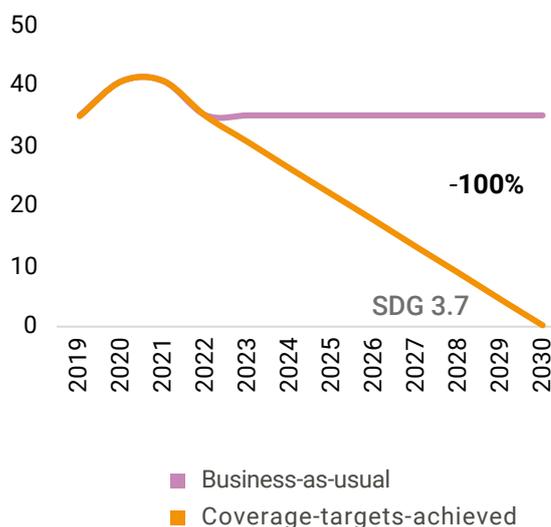


Figure 18. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on the maternal mortality ratio (left) and unmet need for family planning (right)

Annual maternal mortality ratio



Annual unmet need for family planning



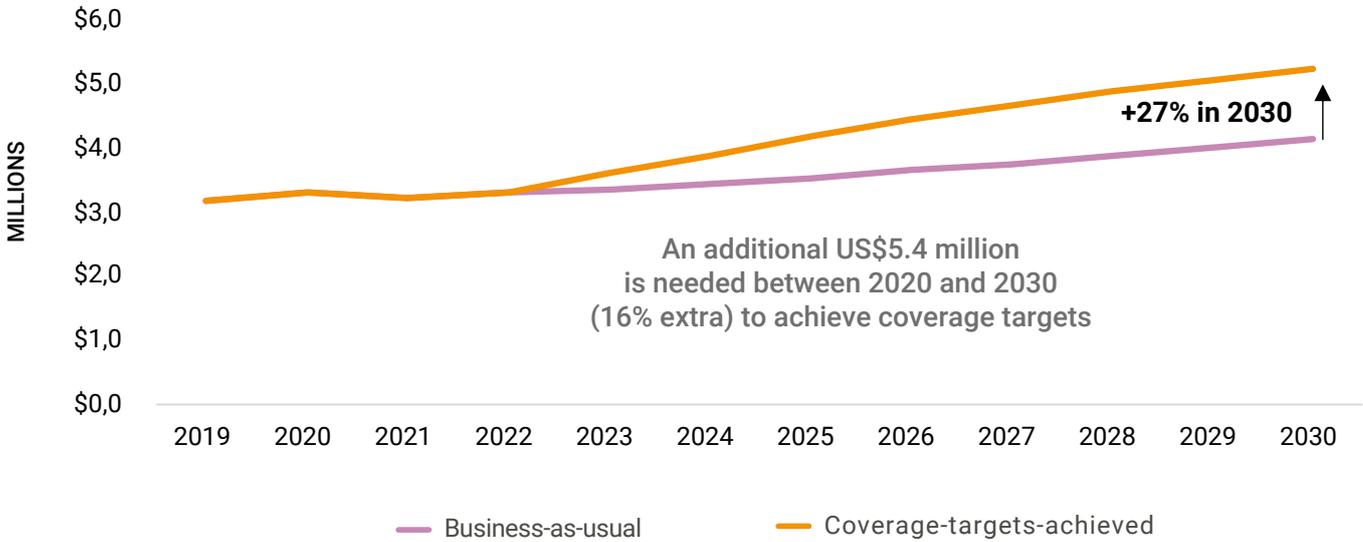
Note: Due to small population size and a low number of births per year, the maternal mortality ratio should be interpreted with caution.

Resources needed to achieve targets

An estimated \$39.1 million (\$38.1-\$40.1 million) is needed between 2020 and 2030 to reach the maternal health and family planning intervention coverage targets in Solomon

Islands, which is \$5.4 million (\$4.4-\$6.4 million) or 16 per cent more than business as usual with estimated 2019 coverage levels maintained to 2030, incorporating any reductions in 2020 and 2021 due to COVID-19 (figure 19).

Figure 19. Estimated resources needed to achieve coverage targets for family planning and maternal health interventions by 2030 compared with business as usual, 2020-2030



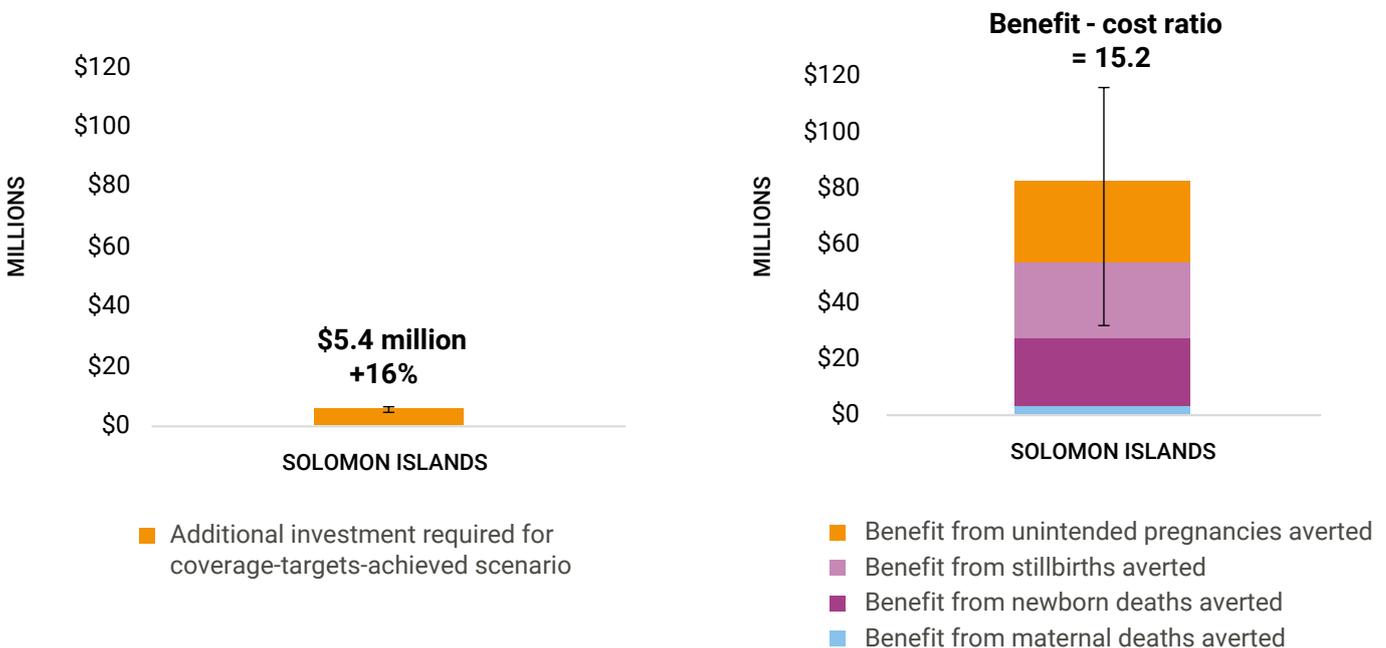
Note: The graph shows undiscounted annual spending for visual ease, while the \$5.4 million is the additional discounted total, at a discounting rate of 3 per cent. In the business-as-usual scenario with intervention coverages maintained, annual costs increase slightly due to population growth.

Benefits

An additional \$5.4 million (\$4.4-\$6.4 million) invested from 2020 to 2030 could return \$82 million (\$31.5-\$115.9 million) in economic benefits by 2040 (figure 20), with a

resulting benefit-cost ratio of 15.2. Most benefits come from productivity gains through averting unintended pregnancies.

Figure 20. Estimated additional resources required (2020-2030) to reach 95 per cent coverage of maternal health interventions and 0 per cent unmet need by 2030, compared with business as usual (left), and the corresponding return on investment estimated by 2040 from the prevention of maternal and newborn deaths, stillbirths and unintended pregnancies, with the range representing benefits calculated to 2030 (lower bound) and 2050 (upper bound) (right), in dollars



TONGA

In 2019, Tonga had a population of 109,000, including 27,000 women of reproductive age, and an estimated 3,000 births, 98 per cent of which occurred in health facilities. The 2019 Multiple Indicator Cluster Survey estimated a 29 per cent contraceptive prevalence rate (modern and traditional methods), 22 per cent unmet need for family planning and a total fertility rate of 3.5. The maternal mortality ratio for 2019 was an estimated 52 per 100,000 live births (WHO and others, 2019), already surpassing SDG target 3.1 on reducing maternal deaths to less than 70 per 100,000 live births.

In its 2015-2025 Strategic Development Framework, Tonga has committed to a “more progressive Tonga”, including to empower human development and gender equality (Tonga, 2015). The framework outlines strategies for improving family planning and maternal and child health.

Progress towards maternal health and family planning targets

The business-as-usual scenario with estimated 2019 coverage levels maintained until 2030, incorporating any reductions in 2020 and 2021 due to COVID-19, predicted 13,396 unintended pregnancies, 311 stillbirths and 22 maternal deaths between 2020 and 2030, with the 2030 maternal mortality ratio projected to be 52 deaths per 100,000 live births.

A total investment of \$6.8 million (\$6.6-\$7.1 million), with an additional investment of \$1.2 million (\$1-\$1.5 million) between 2020 and 2030, or 22 per cent more than business as usual, could enable Tonga to achieve 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030. The additional investment to meet these targets could return \$6.6 million (\$2.4-\$9.5 million) in economic benefits by 2040 through the prevention of 5,060 unintended pregnancies (38 per cent more than business as usual, 11 per cent of all pregnancies), 61 stillbirths (20 per cent more averted), and 7 maternal deaths (32 per cent more averted) between 2020 and 2030 (figure 21), with the projected 2030 maternal mortality ratio falling to 36 deaths per 100,000 live births (figure 22).



For every \$1 invested in maternal health and family planning there could be \$5.30 in economic benefits by 2040

If coverage targets were reached, Tonga could achieve SDG target 3.7 on universal access to sexual and reproductive health services, as well as the additional target of reducing the maternal mortality ratio by two thirds from 2010 levels

by 2030 (figure 22). A small population size and low number of births per year mean the maternal mortality ratio should be interpreted with caution.

Figure 21. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on unintended pregnancies (left), and stillbirths and maternal deaths (right)

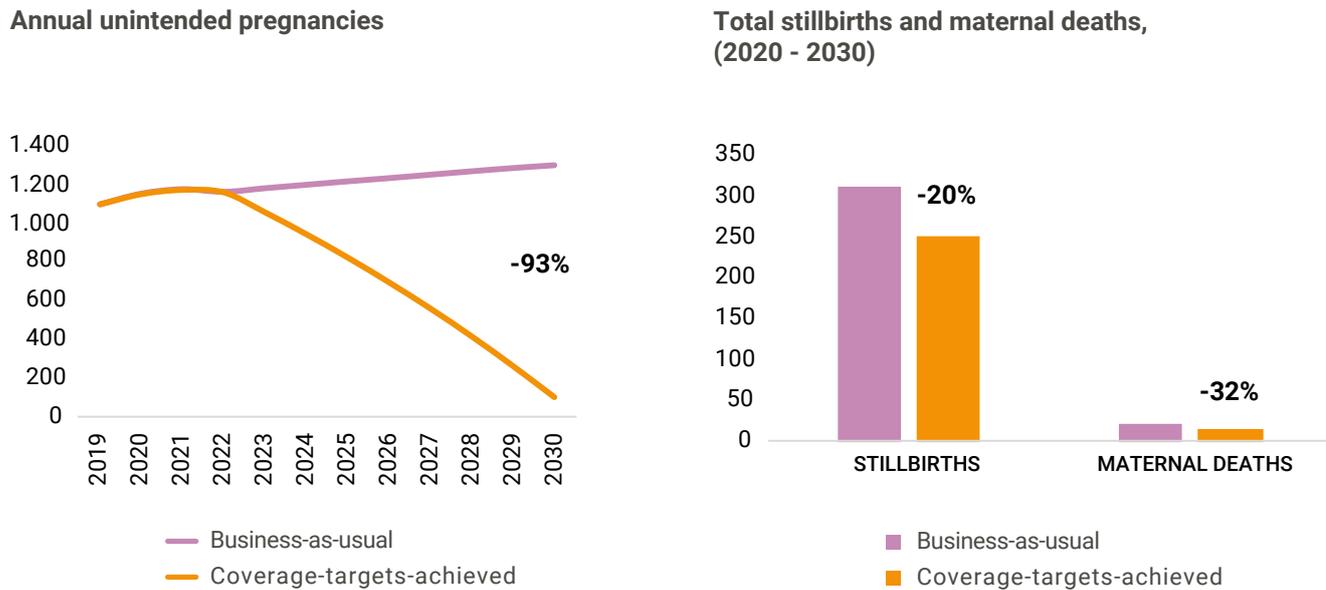
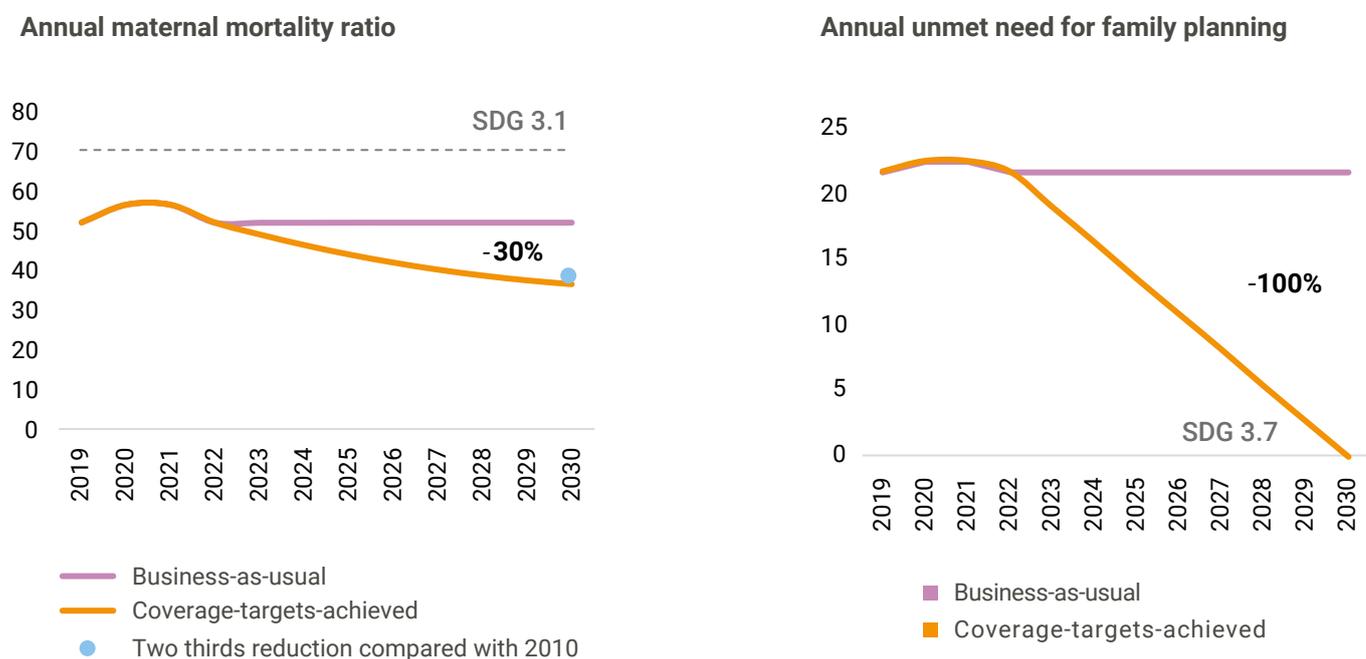


Figure 22. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on the maternal mortality ratio (left) and unmet need for family planning (right)



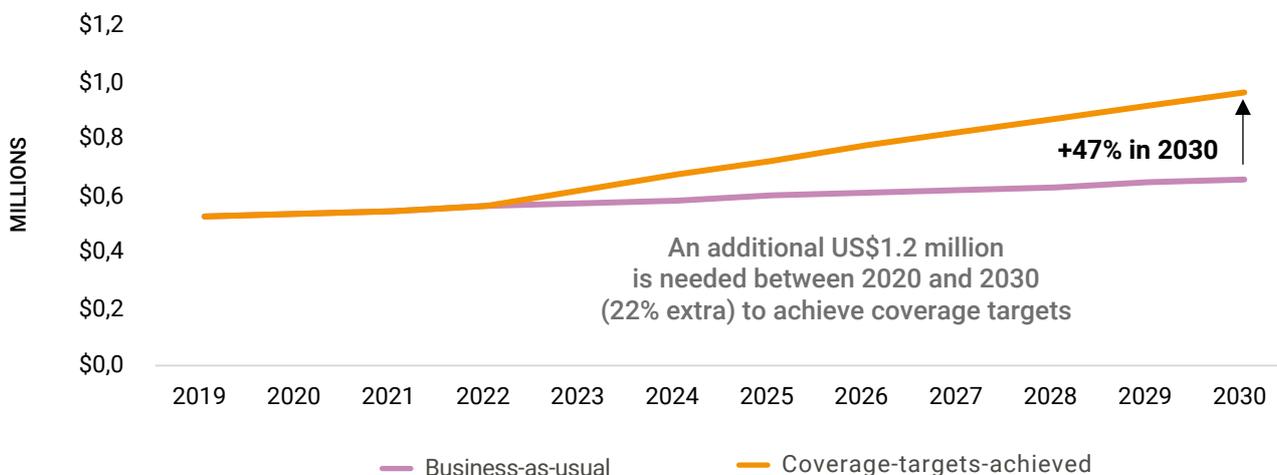
Note: Due to small population size and a low number of births per year, the maternal mortality ratio should be interpreted with caution.

Resources needed to achieve targets

An estimated \$6.8 million (\$6.6-\$7.1 million) is needed between 2020 and 2030 to reach the maternal health and family planning intervention coverage targets in Tonga,

which is \$1.2 million (\$1-\$1.5 million) or 22 per cent more than business as usual with estimated 2019 coverage levels maintained to 2030, and incorporating any reductions in 2020 and 2021 due to COVID-19 (figure 23).

Figure 23. Estimated resources needed to achieve coverage targets for family planning and maternal health interventions by 2030 compared with business as usual, 2020-2030



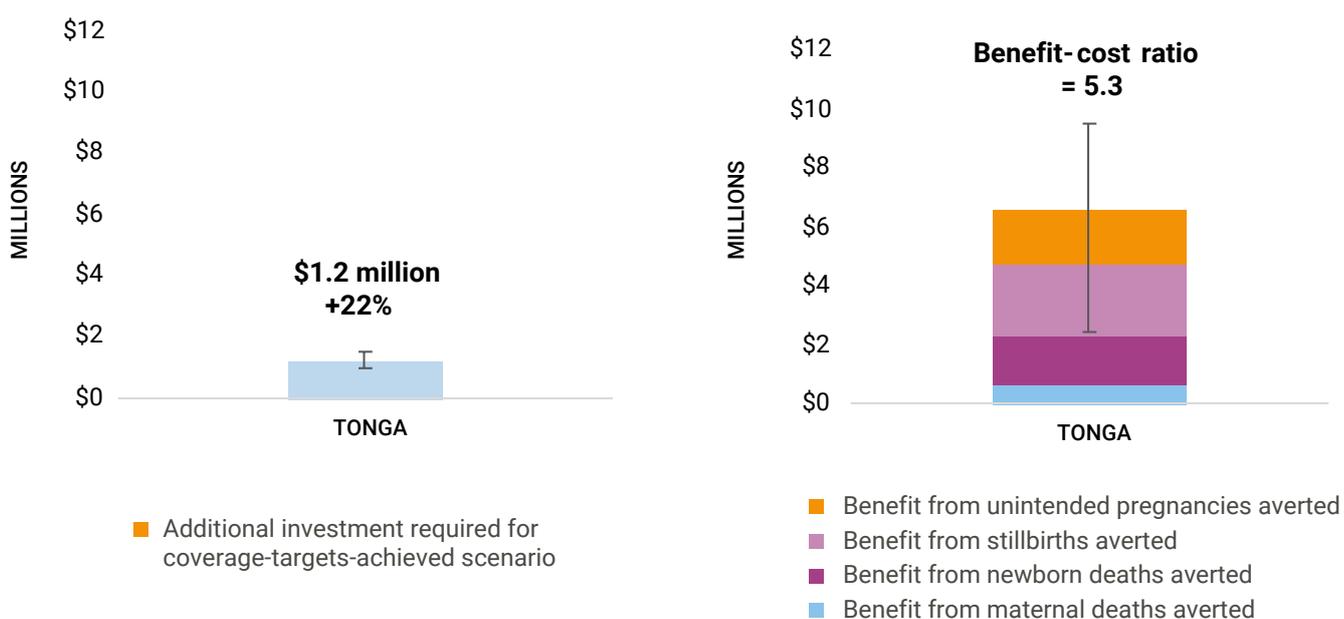
Note: The graph shows undiscounted annual spending for visual ease, while the \$1.2 million is the additional discounted total, at a discounting rate of 3 per cent, in dollars. In the business-as-usual scenario with intervention coverages maintained, annual costs increase slightly due to population growth.

Benefits

An additional \$1.2 million (\$1-\$1.5 million) invested from 2020 to 2030 could return \$6.6 million (\$2.4-\$9.5 million) in

economic benefits by 2040 (figure 24), with a resulting benefit-cost ratio of 5.3. Most benefits come from averting stillbirths.

Figure 24. Estimated additional resources required (2020-2030) to reach 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030, compared with business as usual (left), and the corresponding return on investment estimated by 2040 from the prevention of maternal and newborn deaths, stillbirths, and unintended pregnancies, with the range representing the benefits calculated to 2030 (lower bound) and 2050 (upper bound) (right), in dollars



VANUATU

In 2019, Vanuatu had a population of 299,000, including 75,000 women of reproductive age, and an estimated 7,500 births, 89 per cent of which occurred in health facilities. The 2013 Demographic and Health Survey estimated a 38 per cent contraceptive prevalence rate (modern and traditional methods), 24 per cent unmet need for family planning and a total fertility rate of 3.2. The maternal mortality ratio for 2019 was an estimated 72 deaths per 100,00 live births (WHO and others, 2019), almost meeting SDG target 3.1 on reducing maternal deaths to less than 70 per 100,000 live births.

Vanuatu's population growth rate of 2.4 per cent is the highest in the Pacific region.¹⁴ This, combined with a high fertility rate, results in a relatively large number of adolescent girls and adult women leaving the workforce during childbearing and rearing periods, which imposes significant burdens on Vanuatu's economy, according to its 2017-2020 Reproductive, Maternal, Newborn Child and Adolescent Health Policy and Implementation Strategy (Vanuatu, Ministry of Health, 2017). Improved access to family planning could ease this burden and increase (young) female participation in the workforce.

Progress towards maternal health and family planning targets

The business-as-usual scenario with estimated 2019 coverage levels maintained until 2030, incorporating any reductions in 2020 and 2021 due to COVID-19, predicted 62,190 unintended pregnancies, 1,324 stillbirths and 53 maternal deaths between 2020 and 2030, with the 2030 maternal mortality ratio projected to be 53 deaths per 100,000 live births.

A total investment of \$19 million (\$18.3-\$19.6 million), with an additional investment of \$3.3 million (\$2.6-\$3.9 million) between 2020 and 2030, or 21 per cent more than business as usual, could enable Vanuatu to achieve 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030. The additional investment to meet these targets could return \$29.8 million (\$10.5-\$43 million) in economic benefits by 2040 through the prevention of an additional 20,681 unintended pregnancies (33 per cent more than business as usual, 15 per cent of all pregnancies), 346 stillbirths (26 per cent more averted), and 13 maternal deaths (25 per cent more averted) between 2020 and 2030 (figure 25), with the projected 2030 maternal mortality ratio falling to 37 deaths per 100,000 live births (figure 26).



For every \$1 invested in maternal health and family planning there could be \$9.10 in economic benefits by 2040

If the coverage targets were reached, Vanuatu could achieve SDG target 3.7 on universal access to sexual and reproductive health services, as well as the additional target of reducing the maternal mortality ratio by two thirds from

2010 levels by 2030 (figure 26). A small population size and a low number of births per year mean the maternal mortality ratio should be interpreted with caution.

Figure 25. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on unintended pregnancies (left), and stillbirths and maternal deaths (right)

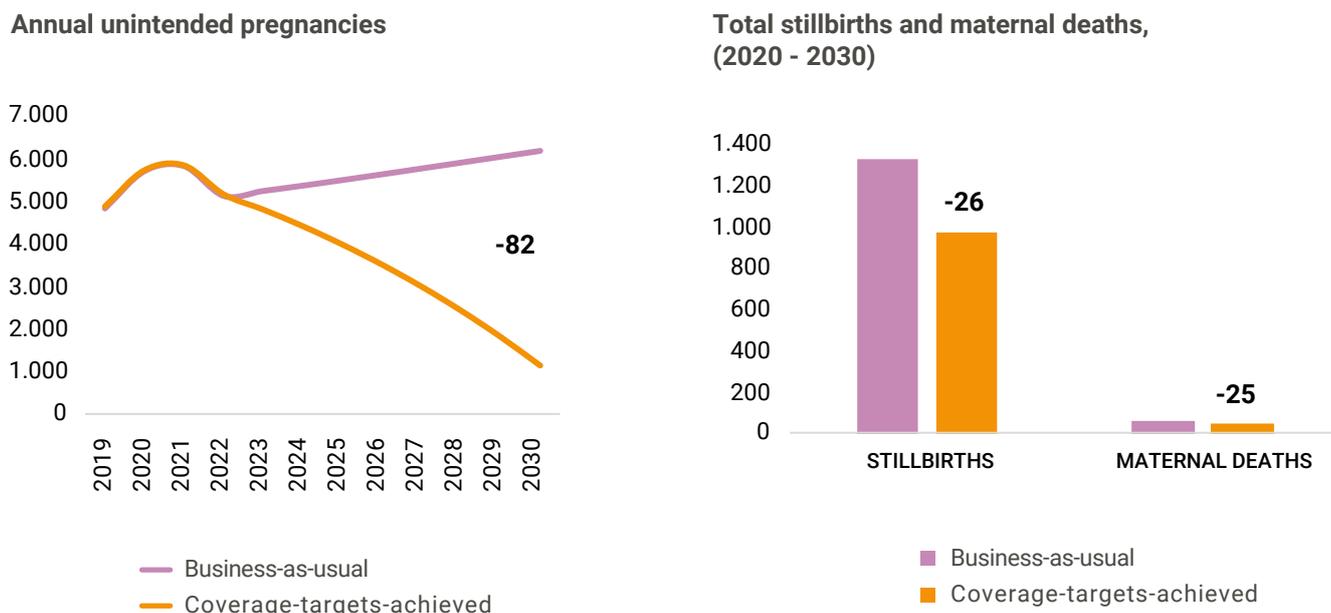
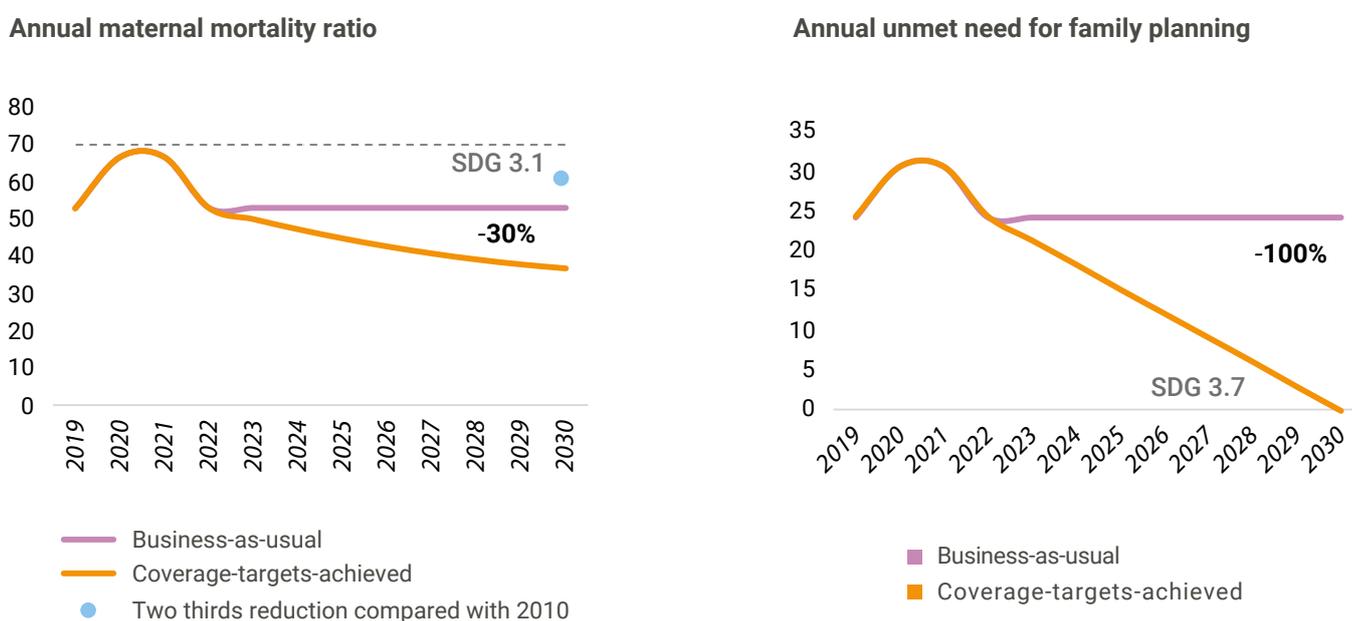


Figure 26. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on the maternal mortality ratio (left) and unmet need for family planning (right)



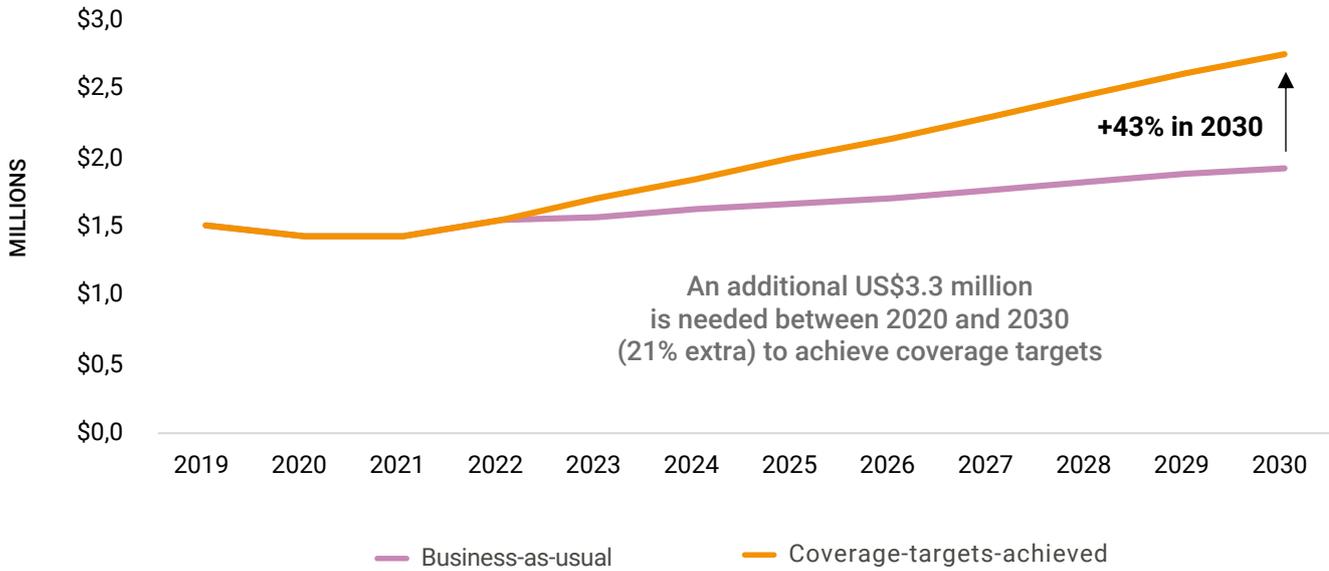
Note: Due to a small population size and a low number of births per year, the maternal mortality ratio should be interpreted with caution.

Resources needed to achieve targets

An estimated \$19 million (\$18.3-\$19.6 million) is needed between 2020 and 2030 to reach the maternal health and family planning intervention coverage targets in Vanuatu,

which is \$3.3 million (\$2.6-\$3.9 million) or 21 per cent more than business as usual with estimated 2019 coverage levels maintained to 2030, and incorporating any reductions in 2020 and 2021 due to COVID-19 (figure 27).

Figure 27. Estimated resources needed to achieve coverage targets for family planning and maternal health interventions by 2030 compared with business as usual, 2020-2030



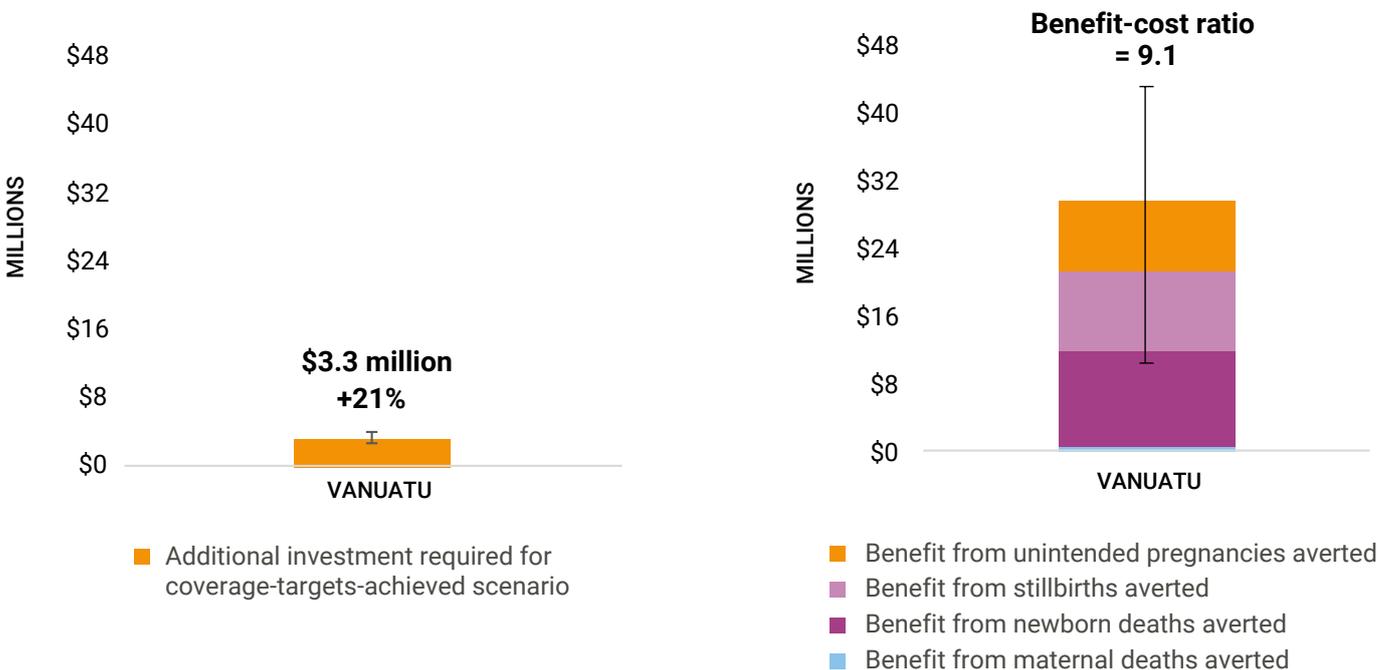
Note: The graph shows undiscounted annual spending for visual ease, while the \$3.3 million is the additional discounted total, at a discounting rate of 3 per cent, in dollars. In the business-as-usual scenario with intervention coverages maintained, annual costs increase slightly due to population growth.

Benefits

An additional \$3.3 million (\$2.6-\$3.9 million) invested from 2020 to 2030 could return \$29.8 million (\$10.5-\$43 million)

in economic benefits by 2040 (figure 28), with a resulting benefit-cost ratio of 9.1. Most benefits come from averting newborn deaths.

Figure 28. Estimated additional resources required (2020-2030) to reach 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030, compared with business as usual (left), and the corresponding return on investment estimated by 2040 from the prevention of maternal and newborn deaths, stillbirths and unintended pregnancies, with the range representing the benefits calculated to 2030 (lower bound) and 2050 (upper bound) (right), in dollars



RESULTS FOR COUNTRIES IN THE CARIBBEAN

BARBADOS

In 2019, Barbados had a population of 301,000, including 70,000 women of reproductive age, and an estimated 3,400 births, all of which occurred in health facilities. The 2012 Multiple Indicator Cluster Survey reported an estimated 59 per cent contraceptive prevalence rate (modern and traditional methods), 20 per cent unmet need for family planning and a total fertility rate of 1.7. The maternal mortality ratio for 2019 was an estimated 27 deaths per 100,00 live births. (WHO and others, 2019).

Progress towards maternal health and family planning targets

The business-as-usual scenario with estimated 2019 coverage levels maintained until 2030, incorporating any reductions in 2020 and 2021 due to COVID-19, predicted 37,964 unintended pregnancies, 309 stillbirths, and 10

maternal deaths between 2020 and 2030, with the 2030 maternal mortality ratio projected to be 27 deaths per 100,000 live births.

A total investment of \$35.8 million (\$35.3-\$36.2 million), with an additional investment of \$2.3 million (\$1.8-\$2.7 million) between 2020 and 2030, or 6 per cent more than business as usual, could enable Barbados to achieve 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030. The additional investment to meet these targets could return \$42.5 million (\$18.3-\$58.8 million) in economic benefits by 2030 through the prevention of an additional 6,447 unintended pregnancies (17 per cent more than business as usual, 10 per cent of all pregnancies), 99 stillbirths (32 per cent more averted), and 3 maternal deaths (36 per cent more averted) between 2020 and 2030 (figure 29), with the projected maternal mortality ratio falling to 17 deaths per 100,000 live births (figure 30).



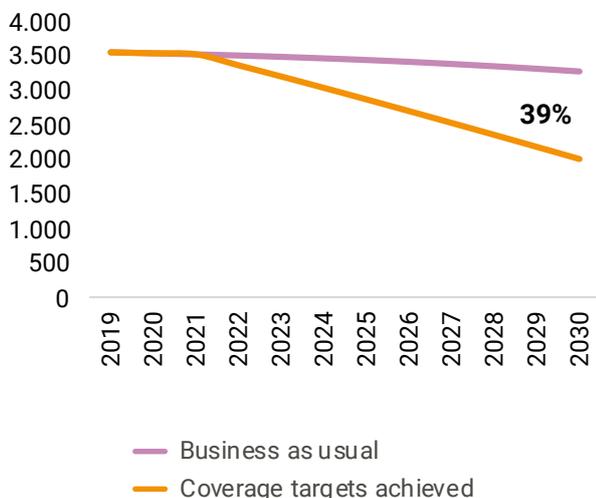
For every \$1 invested in maternal health and family planning there could be \$18.60 in economic benefits by 2040

If the coverage targets were reached, Barbados could achieve SDG target 3.7 on universal access to sexual and reproductive health services, as well as the target for reducing the maternal mortality ratio by two thirds from

2010 levels by 2030 (figure 30). A small population size and a low number of births per year mean the maternal mortality ratio should be interpreted with caution.

Figure 29. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on the maternal mortality ratio (left) and unmet need for family planning (right)

Annual unintended pregnancies



Total stillbirths and maternal deaths 2020-2030

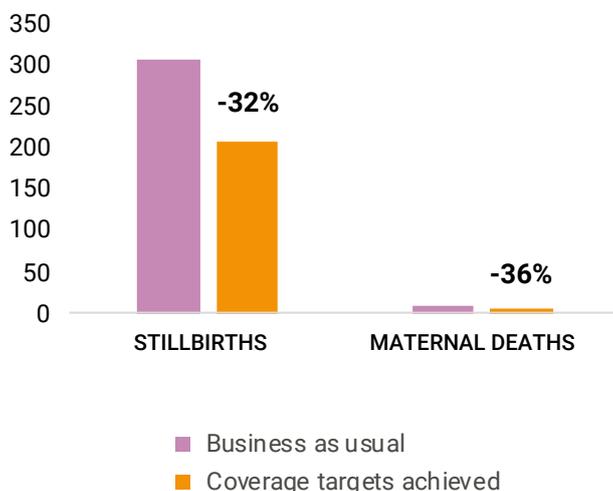
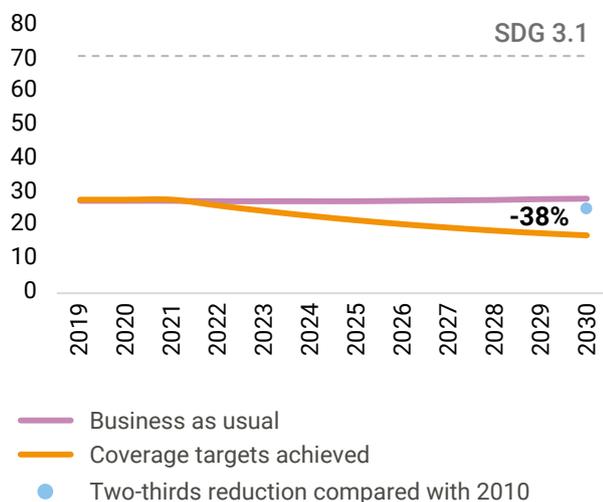
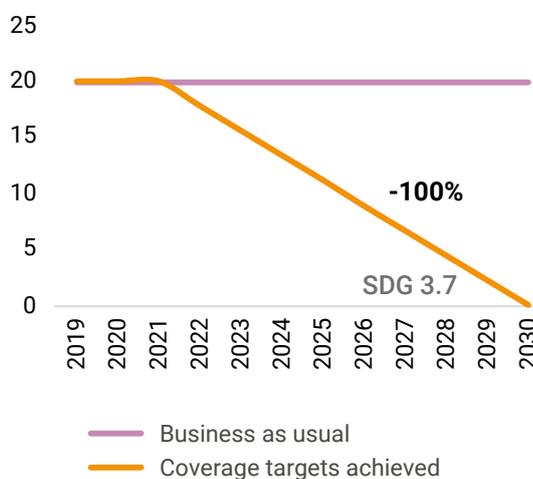


Figure 30. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on unintended pregnancies (left), and stillbirths and maternal deaths (right)

Annual maternal mortality ratio



Annual unmet need for family planning



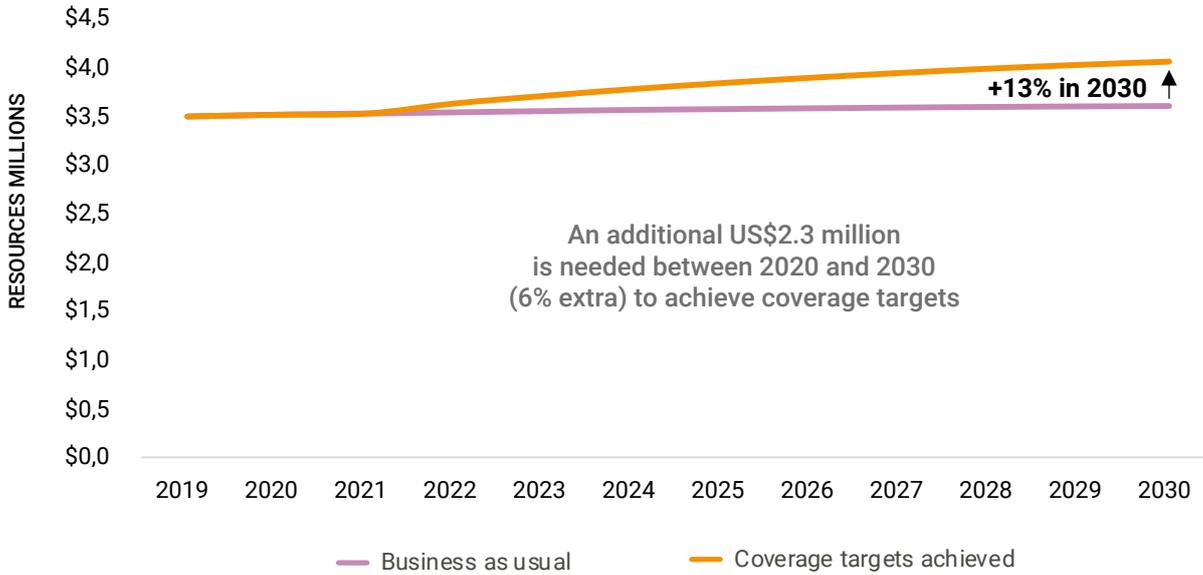
Note: Due to small population size and a low number of births per year, the maternal mortality ratio should be interpreted with caution.

Resources needed to achieve targets

An estimated \$35.8 million (\$35.3-\$36.2 million) is needed between 2020 and 2030 to reach the maternal health and family planning intervention coverage targets in Barbados,

which is \$2.3 million (\$1.8-\$2.7 million) or 6 per cent more than business as usual with estimated 2019 coverage levels maintained to 2030, incorporating any reductions in 2020 and 2021 due to COVID-19 (figure 31).

Figure 31. Estimated resources needed to achieve coverage targets for family planning and maternal health interventions by 2030 compared with business as usual, 2020-2030



Note: The graph shows undiscounted annual spending for visual ease, while the \$2.3 million is the additional discounted total, at a discounting rate of 3 per cent, in dollars. In the business-as-usual scenario with intervention coverages maintained, annual costs increase slightly due to population growth.

Benefits

An additional \$2.3 million (\$1.8-\$2.7 million) invested from 2020 to 2030 could return \$42.5 million (\$18.3-\$58.8 million) in economic benefits by 2040 (figure 32), with a resulting

benefit-cost ratio of 18.6. Most benefits come from averting newborn deaths and achieving productivity gains through the prevention of unintended pregnancies.

Figure 32. Estimated additional resources required (2020-2030) to reach 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030, compared with business as usual (left), and the corresponding return on investment estimated by 2040 from the prevention of maternal and newborn deaths, stillbirths, and unintended pregnancies, with the range representing the benefits calculated to 2030 (lower bound) and 2050 (upper bound) (right), in dollars



GUYANA

In 2019, Guyana had a population of 851,000, including 223,000 women of reproductive age, and an estimated 19,000 births, 93 per cent of which occurred in health facilities. The 2014 Multiple Indicator Cluster Survey estimated a 34 per cent contraceptive prevalence rate (modern and traditional methods), 28 per cent unmet need for family planning and a total fertility rate of 2.6. The Maternal Mortality Estimation Inter-Agency Group (WHO and others, 2019) estimated that the maternal mortality ratio was 169 deaths per 100,00 live births in 2019.

PROGRESS TOWARDS MATERNAL HEALTH AND FAMILY PLANNING TARGETS

The business-as-usual scenario with estimated 2019 coverage levels maintained until 2030, incorporating any reductions in 2020 and 2021 due to COVID-19, predicted 144,510 unintended

pregnancies, 3,562 stillbirths, and 353 maternal deaths between 2020 and 2030, with the 2030 maternal mortality ratio projected to be 170 deaths per 100,000 live births.

A total investment of \$53 million (\$52.1-\$53.8 million), with an additional investment of \$4.5 million (\$3.6-\$5.3 million) between 2020 and 2030, or 8 per cent more than business as usual, could enable Guyana to achieve 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030. The additional investment to meet these targets could return \$120.6 million (\$40.8-\$177.6 million) in economic benefits by 2040 through the prevention of an additional 41,793 unintended pregnancies (29 per cent more than business as usual, 12 per cent of all pregnancies), 955 stillbirths (27 per cent more averted), and 102 maternal deaths (29 per cent more averted) between 2020 and 2030 (figure 33), with the projected 2030 maternal mortality ratio falling to 116 deaths per 100,000 live births (figure 34).



For every \$1 invested in maternal health and family planning there could be \$27.10 in economic benefits by 2040

If the coverage targets were reached, Guyana could achieve SDG target 3.7 on universal access to sexual and reproductive health services. While Guyana is not projected to reach SDG target 3.1 even if the coverage targets are achieved (as a result of a high estimated maternal mortality

ratio in 2019), a 31 per cent reduction in the projected 2030 maternal mortality ratio could be achieved (figure 34). A small population size and a low number of births per year mean the maternal mortality ratio should be interpreted with caution.

Figure 33. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on unintended pregnancies (left), and stillbirths and maternal deaths (right)

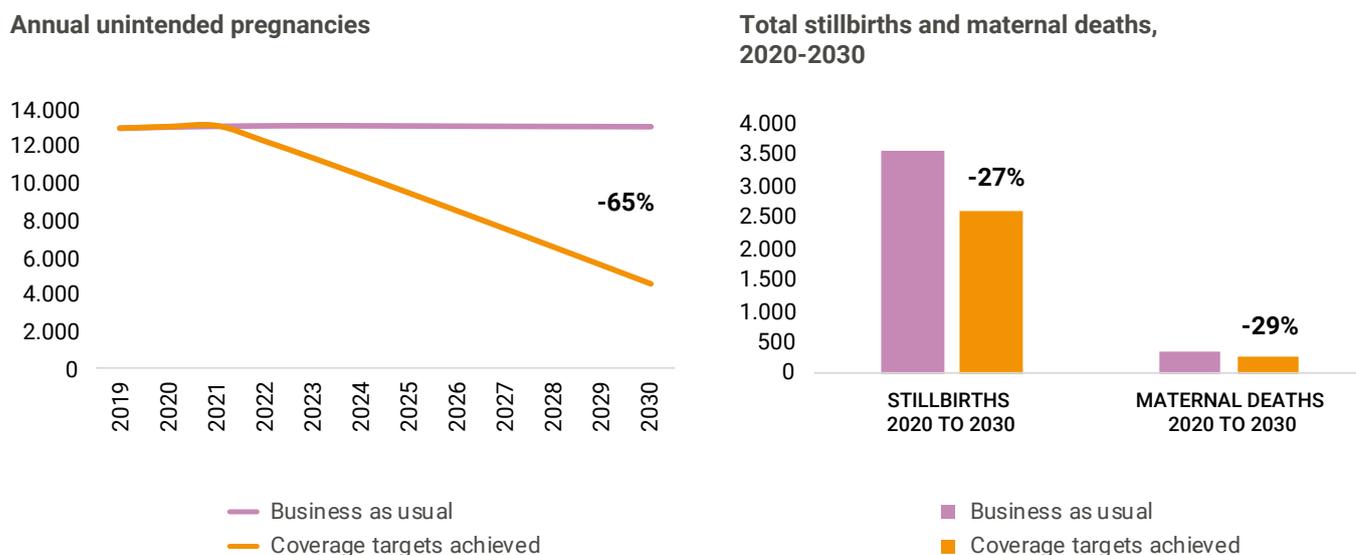
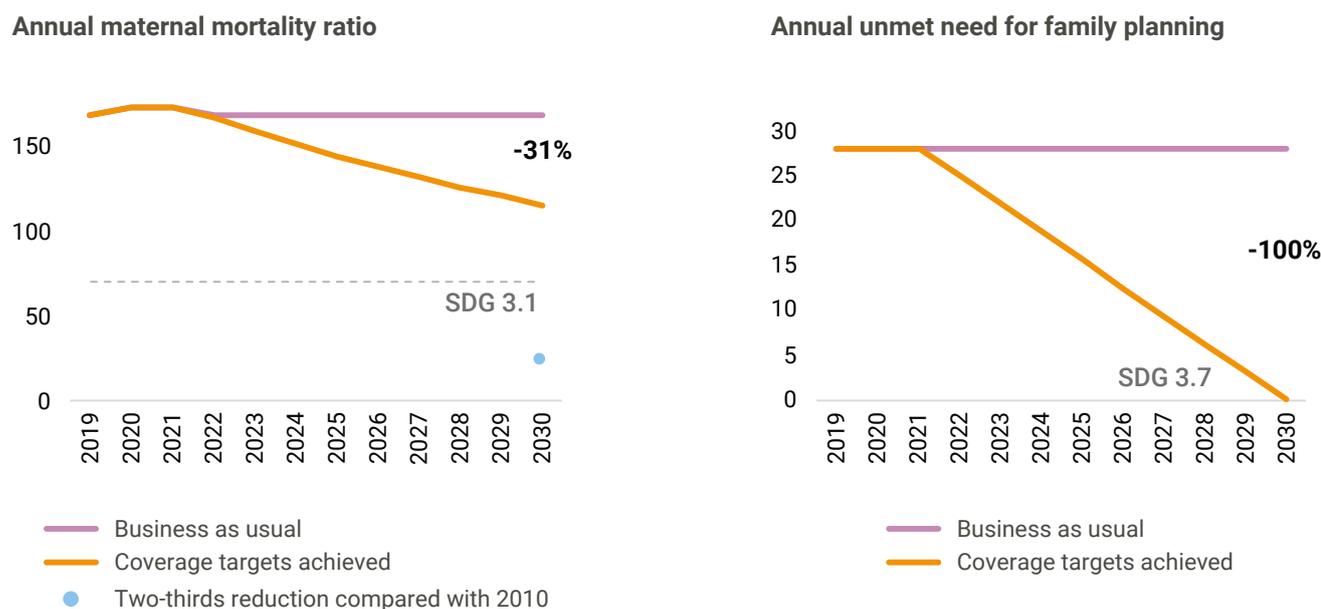


Figure 34. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on the maternal mortality ratio (left) and unmet need for family planning (right)



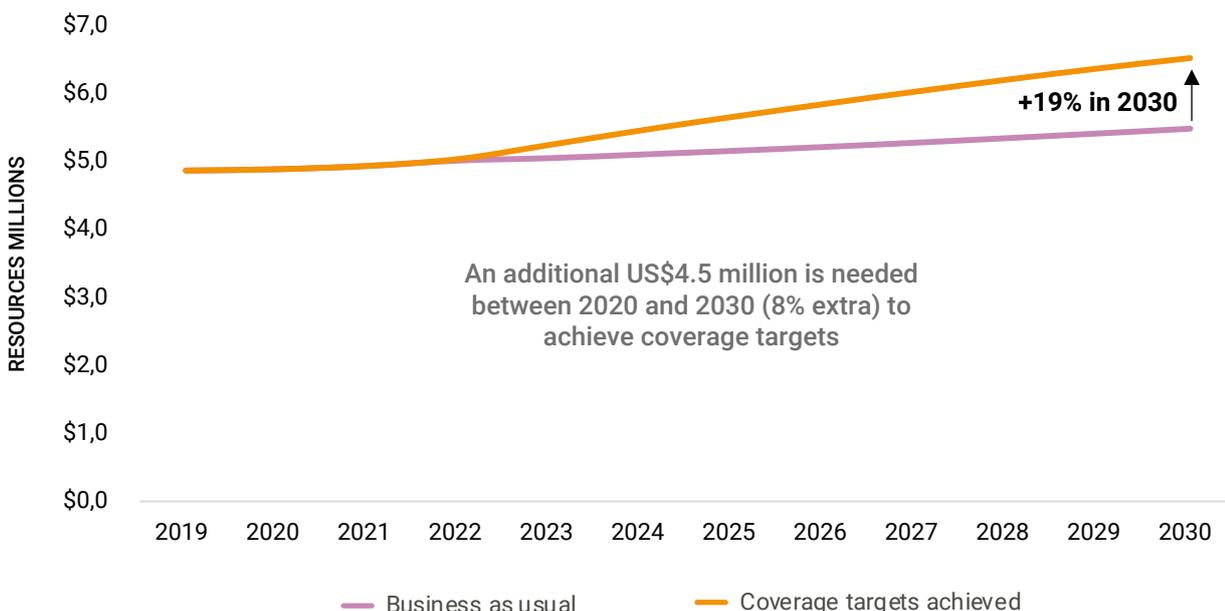
Note: Due to a small population size and a low number of births per year, the maternal mortality ratio should be interpreted with caution.

Resources needed to achieve targets

An estimated \$52.9 million (\$52.1-\$53.8 million) is needed between 2020 and 2030 to reach the maternal health and family planning intervention coverage targets in Guyana,

which is \$4.5 million (\$3.6-\$5.3 million) or 8 per cent more than business as usual with estimated 2019 coverage levels maintained to 2030, incorporating any reductions in 2020 and 2021 due to COVID-19 (figure 35).

Figure 35. Estimated resources needed to achieve coverage targets for family planning and maternal health interventions by 2030 compared with business as usual, 2020-2030



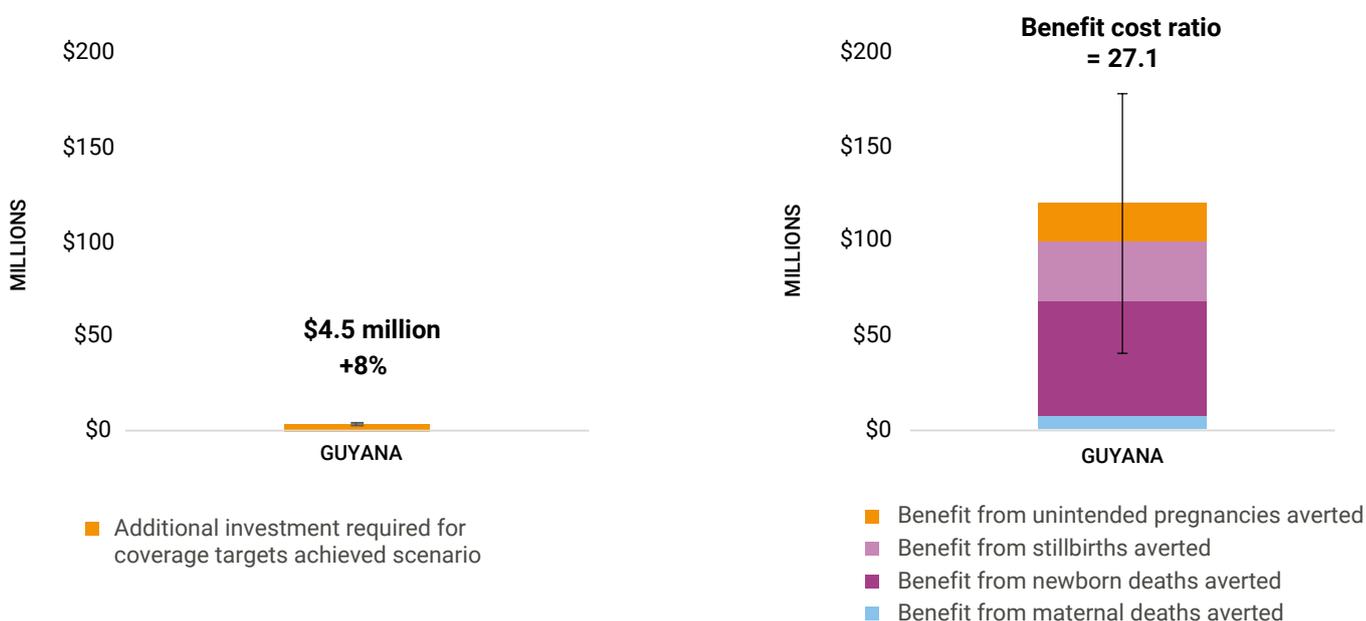
Note: The graph shows undiscounted annual spending for visual ease, while the \$4.5 million is the additional discounted total, at a discounting rate of 3 per cent, in dollars. In the business-as-usual scenario with intervention coverages maintained, annual costs increase slightly due to population growth.

Benefits

An additional \$4.5 million (\$3.6-\$5.3 million) invested over the 2020 to 2030 period could return \$120.6 million (\$40.8-

\$177.6 million) by 2040 (figure 36), with a resulting benefit-cost ratio of 27.1. Most benefits come from preventing newborn deaths.

Figure 36. Estimated additional resources required (2020-2030) to reach 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030, compared with business as usual (left), and the corresponding return on investment estimated by 2040 from the prevention of maternal and newborn deaths, stillbirths and unintended pregnancies, with the range representing the benefits calculated to 2030 (lower bound) and 2050 (upper bound) (right), in dollars



JAMAICA

In 2019, Jamaica had a population of 3,071,000, including 820,000 women of reproductive age, and an estimated 57,000 births, 99 per cent of which occurred in health facilities. The 2011 Multiple Indicator Cluster Survey estimated a 40 per cent contraceptive prevalence rate (modern and traditional methods), 10 per cent unmet need for family planning and a total fertility rate of 2.2. The Maternal Mortality Estimation Inter-Agency Group (WHO and others, 2019) estimated the maternal mortality ratio at 80 deaths per 100,000 live births in 2019.

Progress towards maternal health and family planning targets

The business-as-usual scenario with estimated 2019 coverage levels maintained until 2030, incorporating any reductions in 2020 and 2021 due to COVID-19, predicted 343,719 unintended

pregnancies, 11,436 stillbirths, and 490 maternal deaths between 2020 and 2030, with the 2030 maternal mortality ratio projected to be 81 deaths per 100,000 live births.

A total investment of \$261 million (\$158.9–\$263.1 million), with an additional investment of \$11 million (\$8.9–\$13.1 million) between 2020 and 2030, or 4 per cent more than business as usual, could enable Jamaica to achieve 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030. The additional investment to meet these targets could return \$194.4 million (\$71.8–\$278.9 million) in economic benefits by 2040 through the prevention of an additional 75,003 unintended pregnancies (22 per cent more averted than business as usual, 9 per cent of all pregnancies), 2,487 stillbirths (22 per cent more averted), and 106 maternal deaths (22 per cent more averted) between 2020 and 2030 (figure 37), with the projected 2030 maternal mortality ratio falling to 58 deaths per 100,000 live births (figure 38).



For every \$1 invested in maternal health and family planning there could be \$17.70 in economic benefits by 2040

If the coverage targets were reached, Jamaica could achieve SDG target 3.7 on universal access to sexual and reproductive health services, and SDG target 3.1 on reducing maternal deaths to less than 70 per 100,000 live births

(figure 38). A small population size and a low number of births per year mean the maternal mortality ratio should be interpreted with caution.

Figure 37. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on unintended pregnancies (left), and stillbirths and maternal deaths (right)

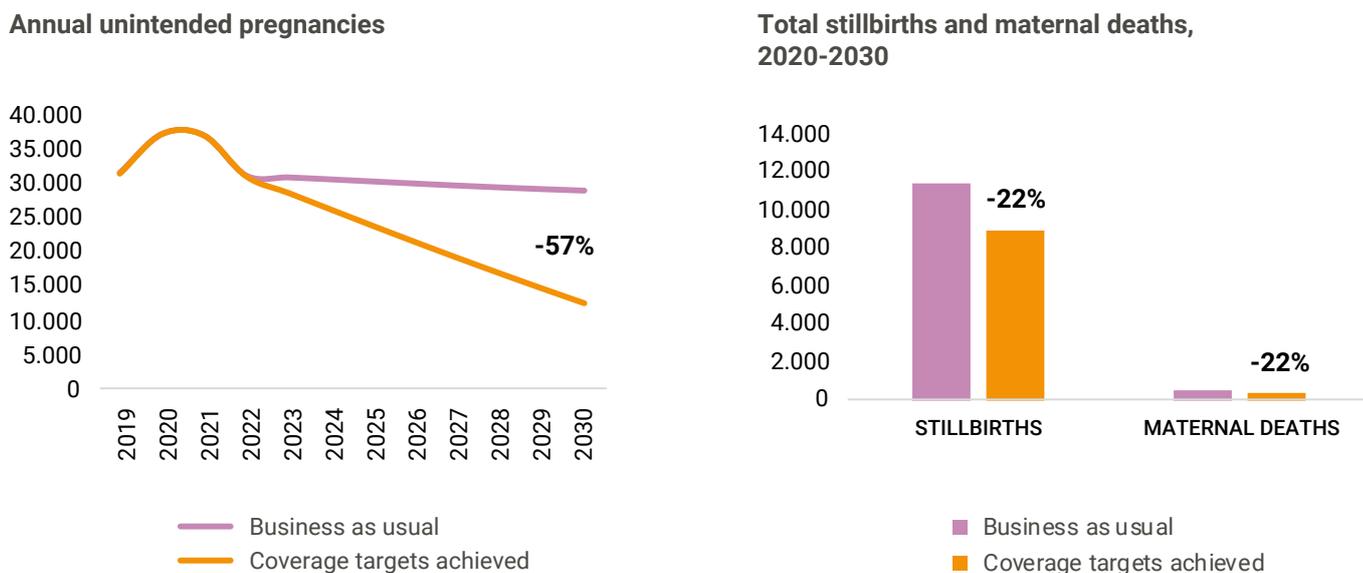
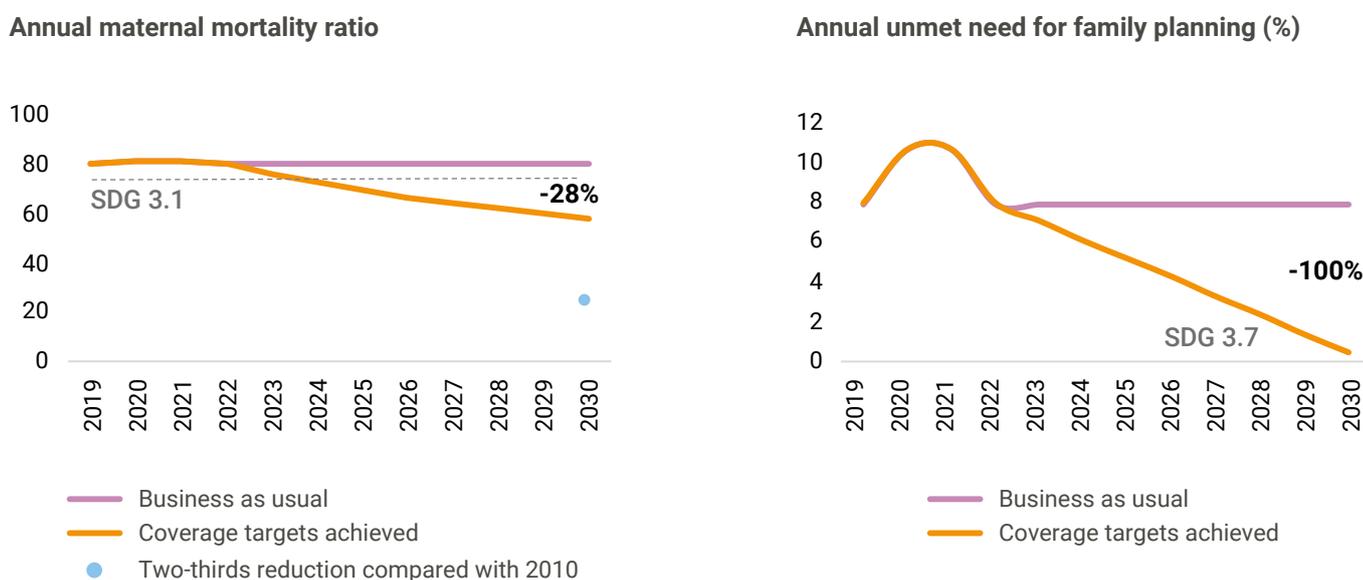


Figure 38. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on the maternal mortality ratio (left) and unmet need for family planning (right)



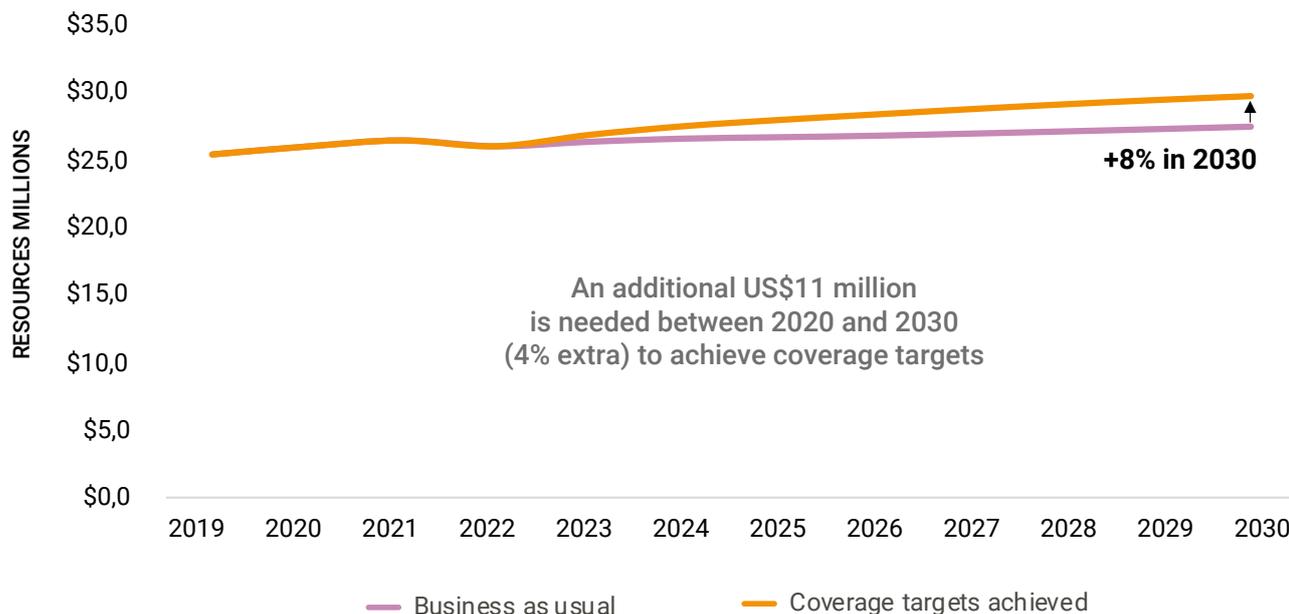
Note: Due to a small population size and a low number of births per year, the maternal mortality ratio should be interpreted with caution.

Resources needed to achieve targets

An estimated \$261 million (\$158.9-\$263.1 million) is needed between 2020 and 2030 to reach the maternal health and family planning intervention coverage targets in Jamaica,

which is \$11 million (\$8.9-\$13.1 million) or 4 per cent more than business as usual with estimated 2019 coverage levels maintained to 2030, incorporating any reductions in 2020 and 2021 due to COVID-19 (figure 39).

Figure 39. Estimated resources needed to achieve coverage targets for family planning and maternal health interventions by 2030 compared with business as usual, 2020-2030



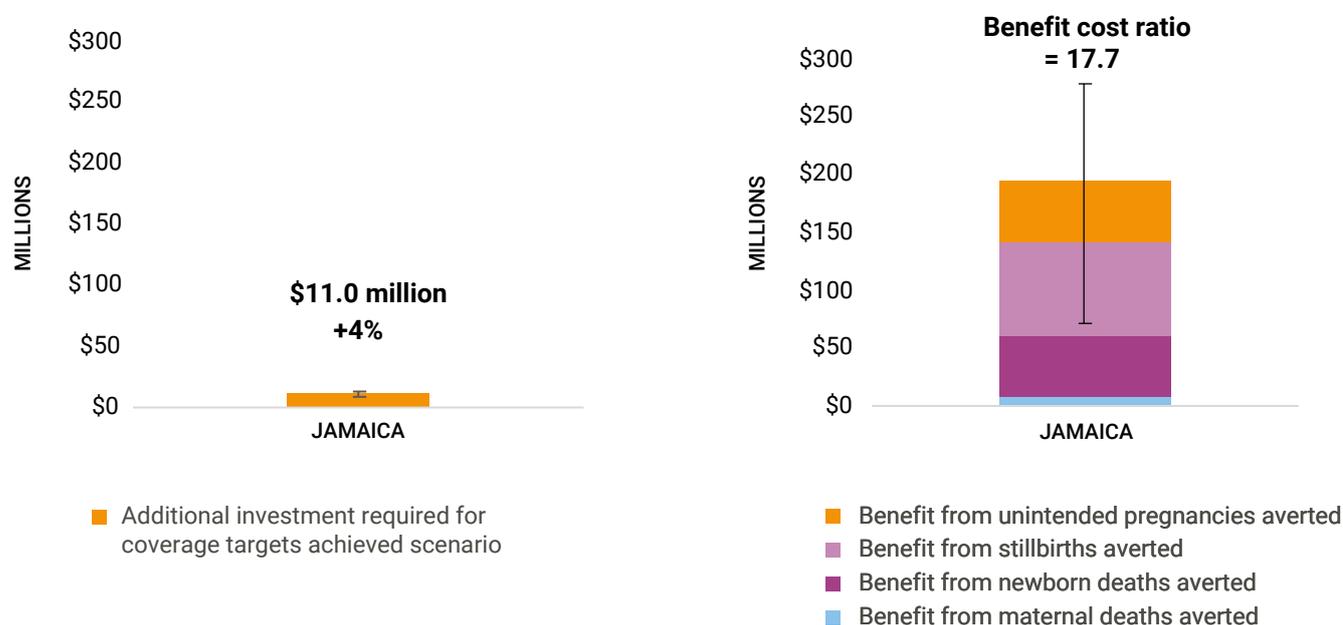
Note: The graph shows undiscounted annual spending for visual ease, while the \$11 million is the additional discounted total, at a discounting rate of 3 per cent, in dollars. In the business-as-usual scenario with intervention coverages maintained, annual costs increase slightly due to population growth.

Benefits

An additional \$11 million (\$8.9-\$13.1 million) invested from 2020 to 2030 could return \$195.4 million (\$71.8-\$278.9

million) by 2040 (figure 40), with a resulting benefit-cost ratio of 17.7. Most of these benefits come from averting stillbirths.

Figure 40. Estimated additional resources required (2020-2030) to reach 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030, compared with business as usual (left), and the corresponding return on investment estimated by 2040 from the prevention of maternal and newborn deaths, stillbirths and unintended pregnancies, with the range representing the benefits calculated to 2030 (lower bound) and 2050 (upper bound) (right), in dollars.



SAINT LUCIA

In 2019, Saint Lucia had a population of 186,000, including 52,000 women of reproductive age, and an estimated 2,400 births, all of which occurred in health facilities. The 2012 Multiple Indicator Cluster Survey estimated a 55 per cent contraceptive prevalence rate (modern and traditional methods), 17 per cent unmet need for family planning and a fertility rate of 1.4. The Maternal Mortality Estimation Inter-Agency Group (WHO and others, 2019) estimated the maternal mortality ratio at 117 deaths per 100,00 live births in 2019.

Progress towards maternal health and family planning targets

The business-as-usual scenario with estimated 2019 coverage levels maintained until 2030, incorporating any reductions in 2020 and 2021 due to COVID-19, predicted 18,056 unintended pregnancies, 294 stillbirths and 30

maternal deaths between 2020 and 2030, with the 2030 maternal mortality ratio projected to be 119 deaths per 100,000 live births.

A total investment of \$11.3 million (\$11.1-\$11.5 million), with an additional investment of \$1.1 million (\$0.9-\$1.3 million) between 2020 and 2030, or 10 per cent more than business as usual, could enable Saint Lucia to achieve 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030. The additional investment to meet these targets could return \$17.9 million (\$7-\$25.4 million) in economic benefits by 2040 through the prevention of an additional 3,613 unintended pregnancies (20 per cent more averted than business as usual, 9 per cent of all pregnancies), 69 stillbirths (23 per cent more averted), and 9 maternal deaths (30 per cent more averted) between 2020 and 2030 (figure 41), with the projected 2030 maternal mortality ratio falling to 77 deaths per 100,000 live births (figure 42).



For every \$1 invested in maternal health and family planning there could be \$16.60 in economic benefits by 2040

If the coverage targets were reached, Saint Lucia could achieve SDG target 3.7 on universal access to sexual and reproductive health services. While Saint Lucia is not projected to reach SDG target 3.1 even if the coverage targets are achieved, given a high estimated maternal mortality

ratio in 2019, a 36 per cent reduction in the projected 2030 maternal mortality ratio could be achieved (figure 42). A small population size and a low number of births per year mean the maternal mortality ratio should be interpreted with caution.

Figure 41. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on unintended pregnancies (left), and stillbirths and maternal deaths (right)

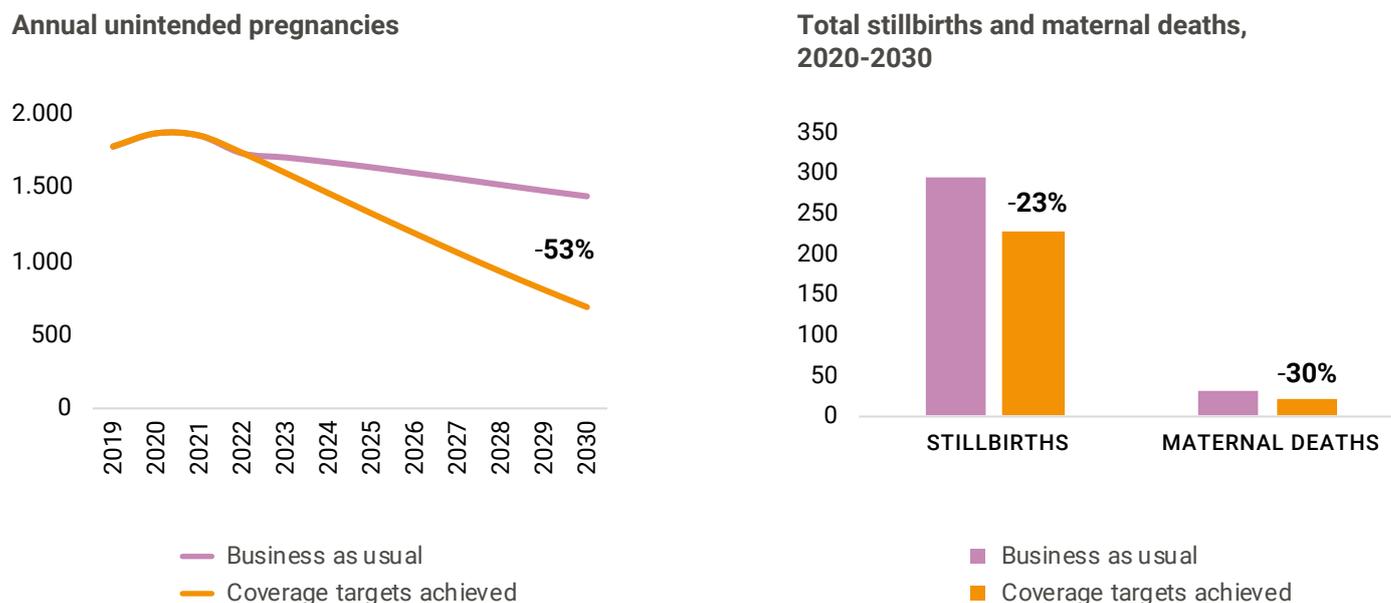
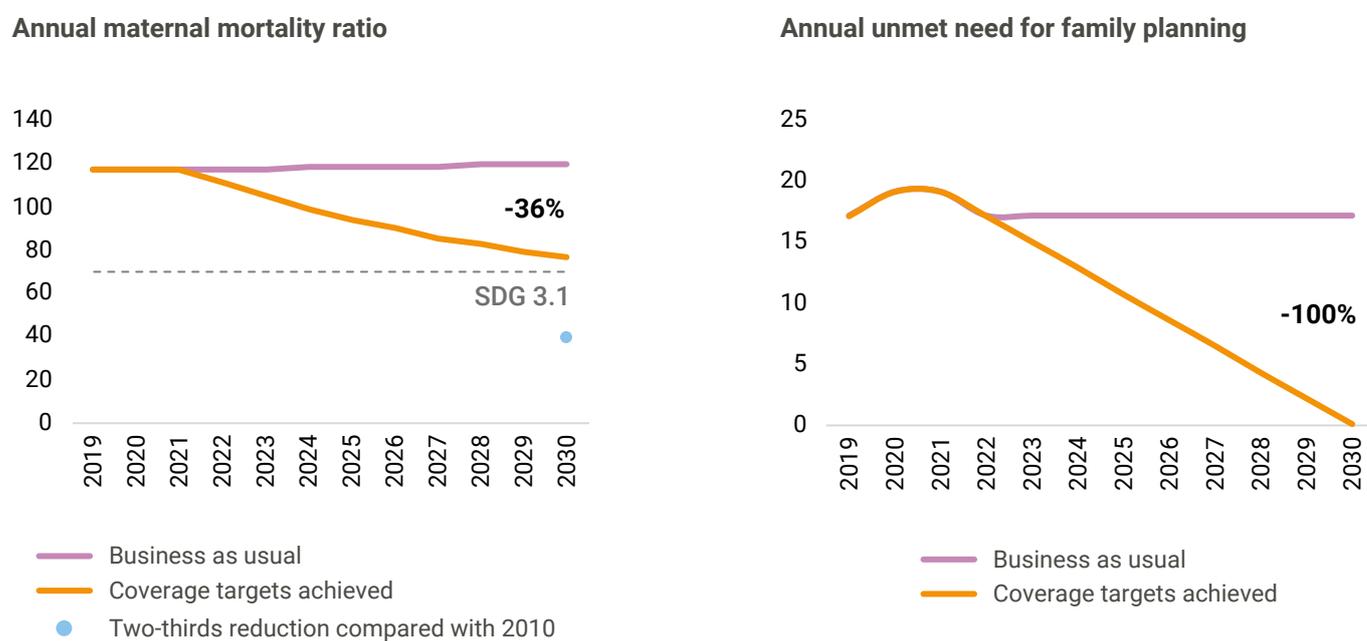


Figure 42. Impact of achieving coverage targets (95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning) on the maternal mortality ratio (left) and unmet need for family planning (right).



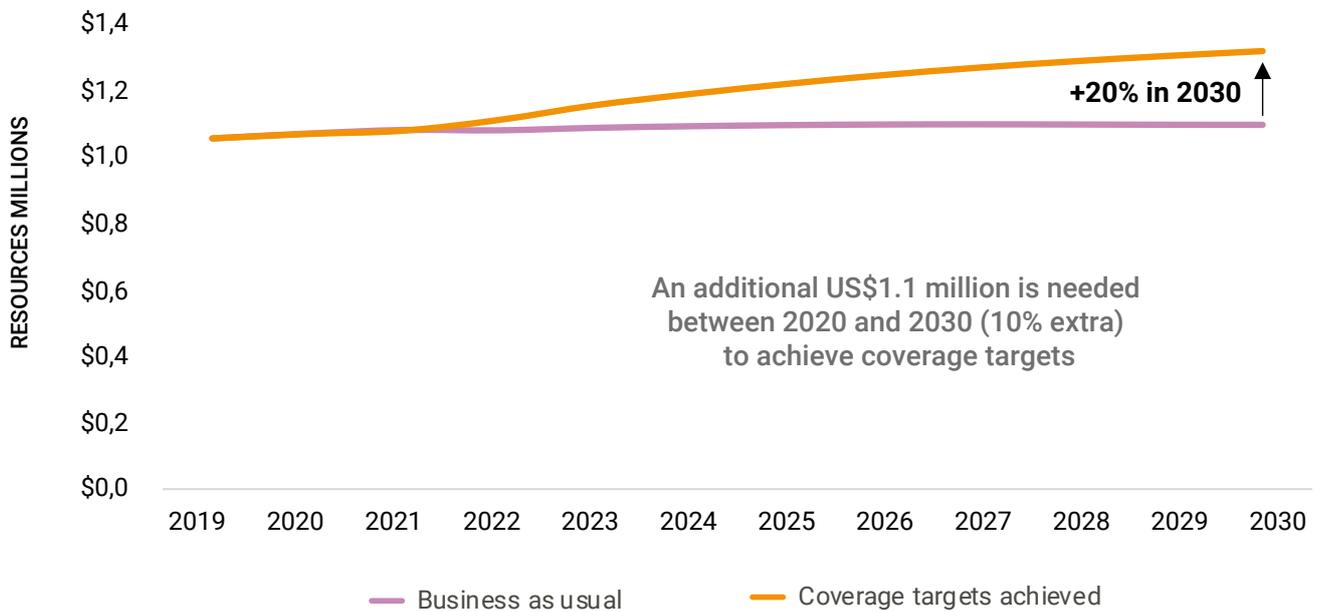
Note: Due to a small population size and a low number of births per year, the maternal mortality ratio should be interpreted with caution.

Resources needed to achieve targets

An estimated \$11.3 million (\$11.1-\$11.5 million) is needed between 2020 and 2030 to reach the maternal health and family planning intervention coverage targets in Saint

Lucia, which is \$1.1 million (\$0.9-\$1.3 million) or 10 per cent more than business as usual with estimated 2019 coverage levels maintained to 2030, incorporating any reductions in 2020 and 2021 due to COVID-19 (figure 43).

Figure 43. Estimated resources needed to achieve coverage targets for family planning and maternal health interventions by 2030 compared with business as usual, 2020-2030



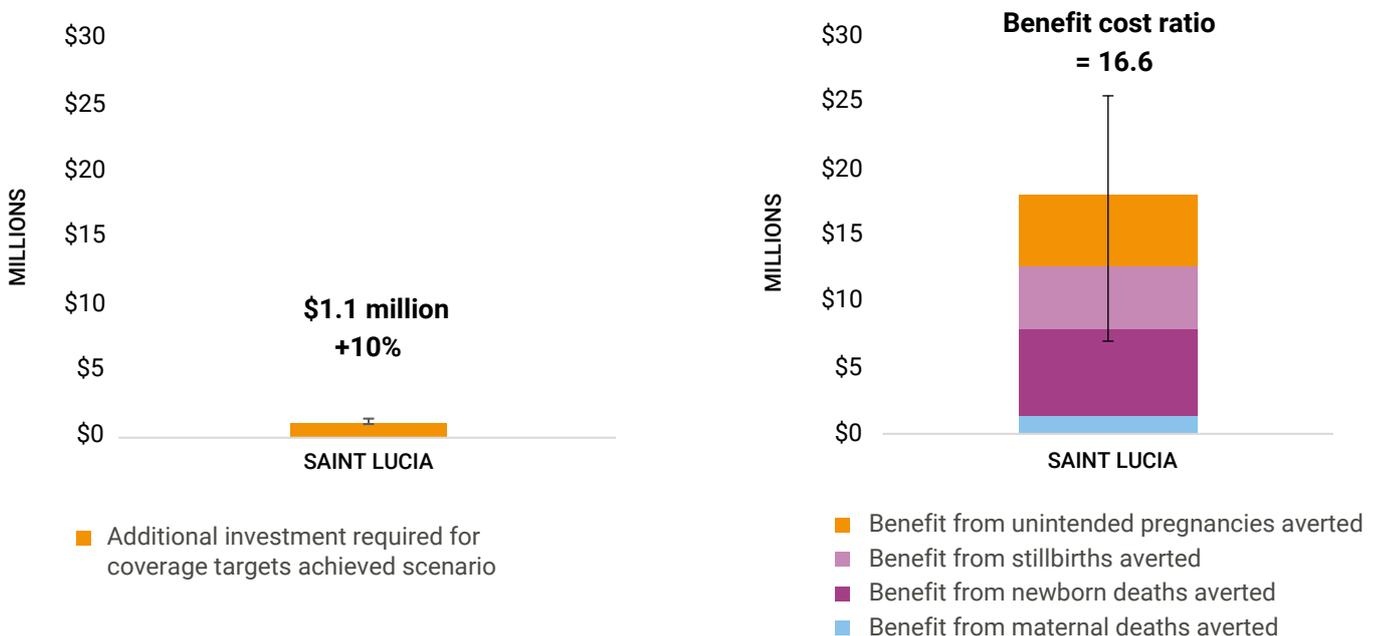
Note: The graph shows undiscounted annual spending for visual ease, while the \$1.1 million is the additional discounted total, at a discounting rate of 3 per cent, in dollars. In the business-as-usual scenario with intervention coverages maintained, annual costs increase slightly due to population growth.

Benefits

An additional \$1.1 million (\$0.9-\$1.3 million) invested from 2020 to 2030 could return \$17.9 million (\$7-\$25.4

million) in economic benefits by 2040 (figure 44), with a resulting benefit-cost ratio of 16.6. Most benefits come from preventing newborn deaths.

Figure 44. Estimated additional resources required (2020-2030) to reach 95 per cent coverage of maternal health interventions and 0 per cent unmet need for family planning by 2030, compared with business as usual (left), and the corresponding return on investment estimated by 2040 from the prevention of maternal and newborn deaths, stillbirths and unintended pregnancies, with the range representing the benefits calculated to 2030 (lower bound) and 2050 (upper bound) (right), in dollars



FINDINGS

This study focuses on tackling two of the most pressing national priorities for health and women's economic empowerment, and the realization of women's human and reproductive rights: reducing high levels of unmet need for family planning by increasing investments in the provision of high quality, rights-based contraceptive services, and ensuring access to appropriate maternal health services.

In the five Pacific countries in this study, reaching 0 per cent unmet need for family planning and 95 per cent maternal health intervention coverage by 2030 could prevent an additional 126,000 unintended pregnancies, 2,200 stillbirths and 121 maternal deaths over the 2020 to 2030 period, compared with business as usual. In the four Caribbean countries, reaching the same targets could prevent an additional 127,000 unintended pregnancies, 3,600 stillbirths and 221 maternal deaths. The additional \$13.4 million (\$10.9-\$16 million) and \$18.8 million (\$15.3-\$22.4 million) needed in the two regions, respectively, to reach coverage targets represents only 19 per cent more than business as usual for the Pacific countries and 5 per cent more for the Caribbean countries. This means that the required investment may well be within reach. This investment is estimated to lead to an elevenfold return in economic benefits by 2040 for the five Pacific countries and a twentyfold return in the four Caribbean countries, with benefits continuing to accrue over the longer term.

Increased contraceptive prevalence rates will reduce unintended pregnancies, which will result in fewer maternal deaths, stillbirths and newborn deaths. Increasing access to family planning services, and averting unwanted and unintended pregnancies, can further reduce the costs of maternal health services. This means that the investment in family planning in part represents a redistribution of funds that can lead to improved outcomes. Similarly, investment in maternal health can have major benefits beyond simply reduced mortality, leading to lower morbidity and health complications associated with childbirth. This can also decrease downstream costs associated with these health conditions and avert complications such as loss of income, although such costs can be difficult to quantify.

The estimates in this report are intended to illustrate to governments and donors that reaching coverage targets is affordable, and to provide evidence to support the prioritization of family planning and maternal health services. This includes in essential health benefit packages,

and towards universal health coverage and improved access to sexual and reproductive health. Reaching the coverage targets is not solely dependent on direct intervention and health system funding, however; it will require other supporting factors. Implementers and programme managers need to ensure that services are accessible, that skilled nurses, midwives and health-care providers are available, and that the services provided are locally accepted and high in quality (Wilson and others, 2020; WHO, 2019; Nove and others, 2020). Demand generation activities may be necessary to increase awareness and change perceptions of family planning interventions. The importance of these factors cannot be understated, and further work is needed to understand the financial requirements beyond direct intervention and health system costs.

COVID-19, and policy responses to it, have impacted health systems and services around the world. In the small island developing States in this study, the pandemic has been largely contained by measures such as lockdowns of services, closures of non-essential work and general advice to stay home when possible. Health workers may have been and may still be redeployed to support the COVID-19 response, while reductions in family planning services for certain countries may have resulted due to supply issues. This is expected to have influenced the coverage of services and is therefore considered in this analysis. Reduced coverage of service provision due to COVID-19 disruptions could have long-term impacts, threatening progress towards SDG 3 targets, and leading to significant increases in morbidity and mortality. If this is the case, and disruptions continue beyond 2021, then the business-as-usual scenario may be worse than estimated.

The costs of family planning and maternal health interventions estimated in this report are consistent with other published estimates, though are more specific to small island developing States, particularly those in the Pacific and the Caribbean. For example, in 2014, it was estimated that addressing a significant proportion of need for maternal and newborn health, child health, immunization, family planning, HIV/AIDS and malaria in 74 high-burden countries would require an additional investment of \$30 billion between 2013 and 2035, 2 per cent more than business as usual or an average of an additional \$5 per person per year. This investment was estimated to yield up to a ninefold economic return on investment by 2035.¹⁹ The projections in this current investment case

suggest that a 16 to 26 per cent increase in total costs is required in the selected Pacific countries, and a 4 to 11 per cent increase in the selected Caribbean countries. If family planning and maternal health coverage targets are reached, the additional investment requirement (at a maximum value in 2030) would correspond to an additional \$6.5 per capita and \$8.9 per capita in the Pacific and Caribbean countries, respectively, based on coverage target population size projections. The total additional investment was estimated to yield 11.1 and 19.9 times the investment value in returns by 2040, respectively.

There are some limitations to this study. First, epidemiological estimates were taken from DHS and MICS surveys conducted between 2011 and 2020, and supplemented by regional estimates where it was impractical to measure indicators for these surveys (e.g., maternal mortality ratio, due to low population and birth numbers). While these sources represent the best available values, the situation in each country may have changed since the surveys were conducted. Second, cost data were not validated by national teams. Unit cost estimates were scaled between countries to reflect differences in average wages and service delivery based on per capita GDP, but require further work with countries to ensure that costs accurately reflect the health system and service delivery constraints.

Third, the effect sizes of interventions were based on global literature, primarily systematic reviews, and meta-analyses of randomized controlled trials. The actual impact of scaling up interventions in each country will depend heavily on the quality of care, which is difficult to quantitatively measure and thus could not be included in this analysis. Additional interventions that may reduce unwanted pregnancies and mortality include education, social protection, health security and interventions to improve women's empowerment. These are difficult to quantify. Similar issues apply to addressing underlying health conditions and comorbidities that may contribute to excess mortality.

Fourth, the impact of the COVID-19 pandemic on maternal health and family planning service coverage remains uncertain, and emerging evidence on disruptions to national services may change projections. Fifth, due to the smaller population sizes of most of the small island developing States, the impact due to increased coverage of interventions might be misleadingly large in reported outcomes. This is apparent in the considerable reductions in the maternal mortality ratio due to a low number of annual births in a small population size. For example,

a singular maternal death may then have a substantial effect on the maternal mortality ratio, and therefore, reductions in maternal deaths are considered in total over the 2020-2030 period, alongside whether or not coverage targets are achieved. For this reason, maternal deaths have not been extracted by cause, nor have averted maternal deaths been attributed to maternal health or family planning interventions. Maternal deaths may also be averted by interventions not included in this analysis, particularly where underlying comorbidities, such as non-communicable diseases, are present.

Sixth, the methods used to capture the economic benefits of averted mortality only consider years of life lost up to 2040, with bounds estimated for 2030 and 2050, and are hence likely to underestimate the benefit-cost ratio over longer time horizons. Moreover, the economic benefits of averting unwanted pregnancies among adults are based on a three-month gain to the labour force, scaled for women's rates of participation, and do not account for the benefits of a reduced dependency ratio. Alternate assumptions for the benefits calculations are explored in the sensitivity analyses, but overall mean that investing in family planning and maternal health is likely to have significantly greater benefits than estimated.

Additional investigation to identify efficiencies in improving equitable access to culturally appropriate, high-quality family planning and maternal health services, to prioritize cost-effective service delivery modalities, and to increase human resources and absorptive capacity and demand generation can be considered in future studies, towards further improving outcomes and accelerating progress in achieving targets.

The high demand for modern contraceptive options across the small island developing States has yet to be satisfied. Ensuring women can access contraceptive services will have a ripple effect in other areas of health and socioeconomic development. It will improve maternal health outcomes, ensure adolescent girls can continue their education and develop their professional skills, and increase women's participation in the economy and in society. For each \$1 invested, economic returns could range from \$4.40 to \$27.10. Investment in women's sexual and reproductive health services could also improve access to counselling and health interventions in response to widespread gender-based violence.

APPENDICES

A. EPIDEMIOLOGICAL DATA AND DATA SOURCES

Table A.1. Main epidemiological data inputs and respective data sources for select countries in the Pacific

Key indicator	Kiribati (SDIS 2018-2019 unless noted)	Samoa (MICS 2019-2020 unless noted)	Solomon Islands (DHS 2015 unless noted)	Tonga (MICS 2019 unless noted)	Vanuatu (DHS 2013 unless noted)
Maternal mortality ratio ¹	92	43	104	52	72
Tetanus toxoid vaccination	45 per cent ²	37.5 per cent	22.8 per cent	5.9 per cent	29.8 per cent
Skilled birth attendant	91.9 per cent	88.9 per cent	86.2 per cent	100 per cent	89.4 per cent
Health facility delivery	86.1 per cent	88.6 per cent	84.5 per cent	97.6 per cent	88.5 per cent
Contraceptive prevalence rate, all methods	25 per cent	16.6 per cent	29.3 per cent	29.3 per cent	37.7 per cent
Unmet need for family planning	17.3 per cent	34.8 per cent ⁴	34.7 per cent	21.8 per cent	24.2 per cent
Total fertility rate	3.3	3.9	4.4	3.5	3.2
Percentage of women in union	69 per cent	59.8 per cent ⁴	55.8 per cent	54.2 per cent	68.3 per cent
Percentage of pregnant women with anaemia	36 per cent ³	42.5 per cent ³	54.1 per cent	28.8 per cent ³	27.8 per cent ³

¹ Internationally comparable maternal mortality ratio estimates by the Maternal Mortality Estimation Inter-Agency Group (WHO and others, 2019).

² LiST v5.88

³ Anaemia in pregnant women of reproductive age (2017) is from the WHO Global Health Observatory data repository. <https://apps.who.int/gho/data/view.main.ANAEMIAWOMENPREVANEMIAv?lang=en>.

⁴ Samoa DHS 2014.

Table A.2. Main epidemiological data inputs and respective data sources for select countries in the Caribbean

Key indicator	Barbados (MICS 2012 unless noted)	Guyana (MICS 2014 unless noted)	Jamaica (MICS 2011 unless noted)	Saint Lucia (MICS 2012 unless noted)
Maternal mortality ratio ¹	27	169	80	117
Tetanus toxoid vaccination	0 per cent ²	99 per cent	91 per cent	0 per cent ²
Skilled birth attendant	99 per cent	92 per cent	99 per cent	99 per cent
Health facility delivery	100 per cent	93 per cent	99 per cent	100 per cent
Contraceptive prevalence rate, all methods	59 per cent	34 per cent	40 per cent	55 per cent
Unmet need for family planning	20 per cent	28 per cent	10 per cent	17 per cent
Total fertility rate	1.70	2.6	2.2	1.43
Percentage of women 15-49 years in union	65 per cent	68 per cent	35 per cent	39 per cent
Percentage of pregnant women with anaemia ⁴	26 per cent	29 per cent	27 per cent	27 per cent

¹ Internationally comparable maternal mortality ratio estimates by the Maternal Mortality Estimation Inter-Agency Group (WHO and others, 2019).

² LiST v5.88

³ World Bank indicators, 2018. <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?view=chart>.

⁴ Anaemia in pregnant women of reproductive age (2017) from the WHO Global Health Observatory data repository. <https://apps.who.int/gho/data/view.main.ANAEMIAWOMENPREVANEMIAv?lang=en>

B. METHODOLOGICAL FRAMEWORK

B.1 Costs

For family planning and maternal health interventions with available evidence on effectiveness (tables C.1 and C.2), costs were calculated for the business-as-usual and coverage-targets-achieved scenarios. These costs for 2020 to 2030 were derived using LiST v5.88 country models (for commodities and human resources needs) and based on the literature (Stenberg and others, 2017), but were not validated by national teams. Costs for the following seven components were included in this analysis:

- Capital costs
- Drugs and supply costs
- Labour costs
- Logistics and wastage
- Other health system costs
- Other recurrent costs
- Programme costs

Drug and supply costs and labour costs were calculated using an ingredients-based approach, estimated intervention coverages (tables C.1 and C.2), and unit costs, including labour time and health-care worker salary estimates from LiST (tables B.1 and B.2). Capital and other recurrent costs were calculated using estimates of the number and costs of inpatient days and outpatient visits (Bollinger and others, 2017).

Logistics and wastage, other health system costs and programme costs were estimated as a percentage mark-up on commodity costs. These were estimated such that

the resulting distribution of total costs among each cost component approximated global estimates (Stenberg and others, 2017) for scaled-up health system resource needs to achieve universal health care. This resulted in mark-ups of 5 per cent for drugs and supply costs to account for wastage, as well as country specific percentage mark-ups of drugs and supply costs to account for logistics costs (ranging from 8 per cent in Jamaica and Vanuatu to 22 per cent in Kiribati, Guyana, Solomon Islands and Tonga), programme costs (15 per cent) and other health system costs (85 per cent).

For the countries considered in this analysis, additional funding would likely be required for health systems to absorb services and investments (e.g., for capacity building). We assume that the investment in health system strengthening to reach the coverage targets would need to be between equal and twice as much as global averages (Stenberg and others, 2017). Therefore, a lower bound for the additional investment requirements was based on health system strengthening costs described in the paragraphs above. An upper bound for additional investment requirements was calculated by doubling the non-intervention components. A point estimate for total annual costs was calculated as the midpoint between the upper and lower bounds (Stenberg and others, 2014).

Costs are presented in 2020 dollars and were discounted at 3 per cent per annum unless otherwise stated.

Additional costs are outside the scope of this investment case, for example, demand generation costs, as they are unknown and difficult to quantify.

Table B.1. Health-care worker annual salaries in dollars for countries in the Pacific

Country	Kiribati	Samoa	Solomon Islands	Tonga	Vanuatu
Generalists, primary care doctors	\$3,024	\$6,532	\$3,979	\$5,439	\$4,713
Obstetricians, gynaecologists, paediatricians and other specialist doctors	\$4,540	\$9,805	\$5,973	\$8,164	\$7,075
Nurses, midwives, clinical officers, surgical technicians, laboratory technicians/assistants, pharmaceutical technicians/assistants, radiographers, X-ray technicians, emergency medical technicians	\$1868	\$4,034	\$2,458	\$3,359	\$2,911
Assistant nurses and midwives, nursing aides	\$1,415	\$3,056	\$1,862	\$2,544	\$2,205
Community health workers	\$1,085	\$3,056	\$1,862	\$2,544	\$2,205
Other	\$1,415	\$2,343	\$1,428	\$1,951	\$1,691

Source: LiST v5.88, values were not validated by national teams.

Table B.2. Health-care worker annual salaries in dollars for countries in the Caribbean

Country	Barbados	Guyana	Jamaica	Saint Lucia
Generalists, primary care doctors	\$19,288	\$7,991	\$11,852	\$15,516
Obstetricians, gynaecologists, paediatricians and other specialist doctors	\$28,954	\$11,995	\$17,791	\$23,291
Nurses, midwives, clinical officers, surgical technicians, laboratory technicians/assistants, pharmaceutical technicians/assistants, radiographers, X-ray technicians, emergency medical technicians	\$11,913	\$4,935	\$7,320	\$9,583
Assistant nurses and midwives, nursing aides	\$9,023	\$3,738	\$5,544	\$7,258
Community health workers	\$6,920	\$2,867	\$4,252	\$5,566
Other	\$9,023	\$3,738	\$5,544	\$7,258

Source: LiST v5.88, values were not validated by national teams.

B.2 Benefits

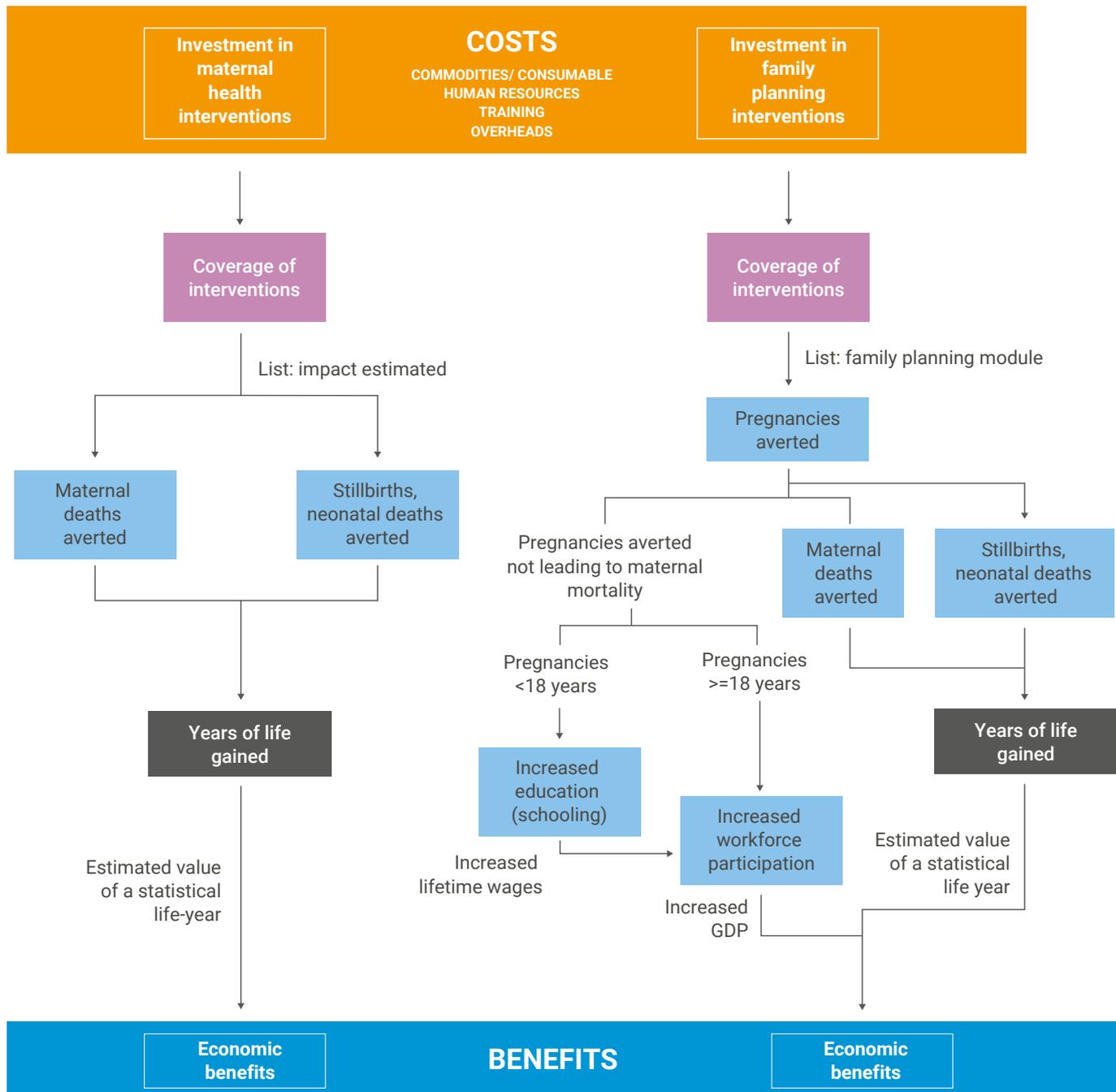
The benefits of investing in family planning and maternal health interventions were considered across three domains:

1. Mortality: maternal deaths, stillbirths, newborn deaths prevented
2. Education: average increase in years of school completed
3. Workforce participation: increased size of the workforce

Evidence-informed frameworks link increased intervention coverage to these benefits (Sheehan and others, 2017; Stenberg and others, 2014; Walker, Tam and Friberg, 2013; Winfrey, McKinnon and Stover, 2011) and each of these benefits to economic outcomes (figure B.1; Sheehan and

others, 2017; Stenberg and others, 2014). For maternal health interventions, mortality benefits were considered, while for family planning, education and workforce participation benefits were considered as well. Benefits were calculated based on the difference in outcomes between the coverage-targets-achieved scenario compared with the business-as-usual scenario.

Additional benefits are outside the scope of this investment case, for example, women's empowerment, gender equity, social cohesion, social protection, and health security benefits. These are difficult to quantify, and minimal evidence currently exists to support their inclusion. In addition, higher-quality maternal and newborn health is likely to result in reduced demand for other health interventions.

Figure B.1. Overview of the methodological framework for family planning and maternal health interventions

B.3 Benefits of maternal health interventions

Evidence for the impact of maternal health interventions typically comes from systematic reviews and meta-analyses, which are summarized in WHO guidelines (2013, 2016, 2017a, 2017b, 2018). They have also been presented across multiple Lancet series, including on child survival (Jones and others, 2003), maternal and child undernutrition (Bhutta and others, 2008, 2013), maternal health (Miller and others, 2016), child development (Britto and others, 2017) and the double burden of malnutrition (Popkin, Corvalan and Grummer-Strawn, 2019).

The LiST Tool was developed under the guidance of the Child Health Epidemiology Reference Group to estimate the expected impact of the increased coverage of maternal

health interventions on mortality and morbidity outcomes (Walker, Tam and Friberg, 2013). Using LiST, it is possible to quantify expected reductions in maternal mortality, stillbirths and newborn mortality when the coverage of maternal health interventions is increased according to the coverage targets scenario.

Mortality benefits (number of maternal deaths, stillbirths and child deaths prevented) can be converted to years of life gained based on the average life expectancy in each country. For newborn deaths averted, this was based on the most recent life expectancy estimates, while for maternal deaths averted, this was based on life expectancy at year of birth (World Bank, n.d.), with the age distribution of maternal mortality averted estimated as equal to the age distribution

of all pregnancies. There is some debate about years of life gained from averting stillbirths, more specifically, disability-adjusted life years gained (Jamison and others, 2006). For this analysis, years of life gained were considered for 50 per cent of the stillbirths averted, which is the global estimated percentage that are intrapartum (Lawn and others, 2016). Future years of life gained due to premature deaths averted were attributed to the year that they would otherwise have occurred, adjusted for all-cause mortality (e.g., some deaths averted may have occurred for other reasons).

Years of life gained were then converted to economic outputs based on the work of Jamison and others (2013), who estimated the statistical value of a life year to be between 1.4 and 4.2 times GDP per capita, and in particular, 2.2 in East Asia and the Pacific, and 1.4 in Latin America and the Caribbean.

Mortality benefits from deaths averted between 2020 and 2030 were only considered up to and including 2040, with a truncation of benefits at either 2030 or 2050 used to generate uncertainty bounds, since this was the most sensitive input, and were discounted at 3 per cent per annum.

B.4 Benefits of family planning interventions

Reductions in unintended pregnancies as a result of family planning services were assumed to lead to reductions in mortality, increases in the average level of schooling obtained by girls and a greater ability of mothers and caregivers to remain in the workforce (Stenberg and others, 2014).

Family planning interventions can have important mortality benefits, because unplanned or unintended pregnancies often pose a risk for unsafe abortion, stillbirths and maternal mortality. Among the unintended pregnancies averted when family planning services were increased, we assumed that some would otherwise have resulted in maternal deaths, stillbirths and newborn deaths according to the rates of these outcomes among current pregnancies. This is likely to be an underestimate of mortality averted, given that unplanned pregnancies may pose greater risks of these outcomes than planned pregnancies. The years of life gained, and economic benefits were calculated analogously to the maternal health interventions.

For unintended pregnancies averted that would not otherwise have resulted in mortality, a percentage were assumed to be among girls over 18 years old, based on estimates of the age distribution of pregnancies. Pregnancies averted among girls under 18 were assumed to lead to an average increase in education of six months, based on an expected disruption due to pregnancy and birth. Length of schooling is known to lead on average to increased lifetime earnings, with each additional year in education associated with a 3 to 35 per cent (median 18 per cent) increase in per capita income (UNICEF, 2015). GDP per capita was used as a proxy for average wage, which was multiplied by the percentage income increase to obtain an economic benefit for each working year. These benefits were applied from the year the girls turned 18 years until retirement age, scaled for workforce participation rates among women.

Unintended pregnancies averted among women over 18 years were assumed to lead to an increase in workforce participation. Pregnancy was assumed to remove a woman from the labour force for three months, based on country specific or regional maternity leave durations (ILO, n.d.). Hence, the economic benefit was calculated as 0.25 multiplied by GDP per capita (as a proxy for average wage), scaled for workforce participation rates among women.

Benefits were considered up to 2040, but only for women and girls receiving the interventions between 2020-2030. This is likely to be an underestimate of all future benefits; for example, for unintended pregnancies averted among school-age girls, their expected increase in earnings may begin, and would be expected to continue, well beyond 2040. Benefits were discounted at 3 per cent per annum.

There are significant additional benefits from family planning that are outside the scope of this analysis. In particular, empowering women to choose when and how many children they have can reduce poverty, and reducing the fertility rate can increase the proportion of working-age adults relative to dependent children, which can increase productivity (Ashraf, Weil and Wilde, 2013; Canning and Schultz, 2012). These factors can be difficult to quantify, and their exclusion from this analysis means that the benefits and benefit-cost ratios that have been calculated are likely to be underestimates.

Table B.3. Economic indicators used for benefit calculation for countries in the Pacific

Economic indicator	Kiribati	Samoa	Solomon Islands	Tonga	Vanuatu
GDP per capita ¹	\$1,655.10	\$4,315.90	\$2,127.50	\$4,443.105	\$3,058.10
Months of education gained due to teenage pregnancy averted ²	6	6	6	6	6
Proportion of women who participate in the workforce ³	82% ⁴	31%	82%	46%	61%

¹ 2019 GDP per capita in dollars from World Bank indicators. <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>.

² Assumption.

³ 2020 labour force participation rates for women from World Bank indicators. <https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS>.

⁴ The value is based on the Solomon Islands, given that recent estimates for Kiribati were not available.

⁵ 2018 value adjusted for inflation.

Table B.4. Economic indicators used for benefit calculation for countries in the Caribbean

Economic indicator	Barbados	Guyana	Jamaica	Saint Lucia
GDP per capita ¹	\$18,148	\$5,468.40	\$5,582.30	\$11,611.40
Months of education gained due to teenage pregnancy averted ²	6	6	6	6
Proportion of women who participate in the workforce ³	61%	44%	60%	60%

¹ 2019 GDP per capita in dollars from World Bank indicators <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>.

² Assumption.

³ 2020 labour force participation rates for women from World Bank indicators. <https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS>.

B.5 Sensitivity analyses for cost and benefit calculation assumptions

Sensitivity analyses were run to test the impact of different modelling assumptions on total costs, total benefits and benefit-cost ratios. This included the impact of benefits as of 2040, with a lower bound by 2030 and an upper bound by 2050 (Sheehan, 2017), as benefits need longer-term time frames to be better captured; lower or upper bounds for service reductions due to COVID-19 disruptions; 0 per cent or 6 per cent discounting, compared with 3 per cent; a 25 per cent decrease or increase in the mark-up used to estimate other health system costs; the value of a statistical life year of 1.4 or 4.2 times GDP per capita in the Pacific (compared with 2.2 in East Asia and the Pacific), and either 1 or 2.5 times GDP per capita in the Caribbean (compared with 1.4

in Latin America and the Caribbean); additional education gains when unintended teenage pregnancies are averted of zero months (i.e., no benefit) or 12 months, rather than six months; an average of 3 per cent (lower bound) or 35 per cent (upper bound) increase in earnings for every additional year of education (based on uncertainty estimates for the parameter), compared with the point estimate of 18 per cent; no (lower bound) or double (upper bound) the percentage of pregnancies averted among teenage girls, compared with the percentage derived from the fertility age distribution; an increase in workforce participation of zero months or six months for pregnancies averted among women, compared with 3 months; and an average wage estimated as 75 per cent or 125 per cent GDP per capita, compared with GDP per capita.

C. INTERVENTIONS

Table C.1. Intervention list and baseline coverage for 2019 using Spectrum version 5.88 (November 2020) for countries in the Pacific included in this analysis

	Baseline, 2019				
	Kiribati	Samoa	Tonga	Vanuatu	Solomon Islands
Maternal health interventions					
Folic acid supplementation/fortification	0.0	0.0	0.0	0.0	0.0
Safe abortion services	85.0	85.0	85.0	85.0	85.0
Post-abortion case management	0.0	0.0	0.0	0.0	0.0
Ectopic pregnancy case management	0.0	0.0	0.0	0.0	0.0
Blanket iron supplementation/fortification	0.0	0.0	0.0	0.0	0.0
Tetanus toxoid vaccination	90.0	0.0	71.2	78.0	95.0
Intermittent preventive treatment of malaria during pregnancy	0.0	0.0	0.0	0.0	0.0
Syphilis detection and treatment	21.9	14.4	24.3	19.1	19.8
Calcium supplementation	0.0	0.0	0.0	0.0	0.0
Micronutrient supplementation (iron and multiple micronutrients)	0.0	3.4	0.0	0.0	0.0
Balanced energy supplementation	0.0	0.0	0.0	0.0	0.0

	Baseline, 2019				
Hypertensive disorder case management	16.1	14.0	21.3	12.4	15.5
Diabetes case management	12.6	10.9	16.6	9.7	12.1
Malaria case management	51.9	45.3	68.6	40.2	50.1
MgSO4 management of pre-eclampsia	31.8	27.8	42.1	24.6	30.7
Clean birth environment	70.6	72.7	80.0	72.6	69.3
Manual removal of placenta	32.2	33.1	36.5	33.1	31.6
Parenteral administration of anti-convulsants	61.6	63.4	69.8	63.3	60.4
Antibiotics for preterm or prolonged PROM	64.4	66.3	73.0	66.2	63.2
Parenteral administration of antibiotics	64.4	66.3	73.0	66.2	63.2
Assisted vaginal delivery	21.8	22.4	24.7	22.4	21.4
Parenteral administration of uterotonics	76.9	79.2	87.2	79.1	75.5
Removal of retained products of conception	28.5	29.4	32.3	29.3	28.0
Induction of labour for pregnancies lasting 41+ weeks	1.5	1.6	1.7	1.6	1.5
Caesarean section delivery	7.5	7.7	8.5	7.7	7.4
Blood transfusion	10.8	11.2	12.3	11.1	10.6
Maternal sepsis case management	0.0	0.0	0.0	0.0	0.0
Family planning interventions					
Contraceptive prevalence rate	25.0	21.0	17.0	37.7	29.0
Modern contraceptive prevalence ratio	80.8	92.7	82.1	74.4	82.6
Unmet need for family planning	18.0	34.7	21.8	24.2	34.7
Family planning demand satisfied with modern methods	66.3	60.5	64.2	56.39	53.9
Family planning methods mix					
Condoms	2.0	0.7	4.7	4.3	6.1
Female sterilization	18.4	23.3	40.8	22.5	29.5
Male sterilization	0.8	0.0	0.0	1.1	1.9
Injections	23.2	47.7	19.6	19.9	27.2
Implants (3.8 years)	31.2	0.0	0.0	0.0	0.0
Intrauterine devices (4.6 years)	2.4	0.7	10.9	4.9	14.1
Pills	2.8	20.2	6.2	21.5	3.8
Vaginal ring	0.0	0.0	0.0	0.0	0.0
Withdrawal	5.6	2.1	7.3	9.6	9.4
Standard days method	1.2	4.2	9.1	13.3	6.1
Emergency contraception	0.0	0.0	0.0	0.0	0.0
Other	12.4	1.0	1.5	2.7	1.9

Table C.2. Intervention list and baseline coverage for 2019 using Spectrum version 5.88 (as of November 2020) for countries in the Caribbean included in this analysis

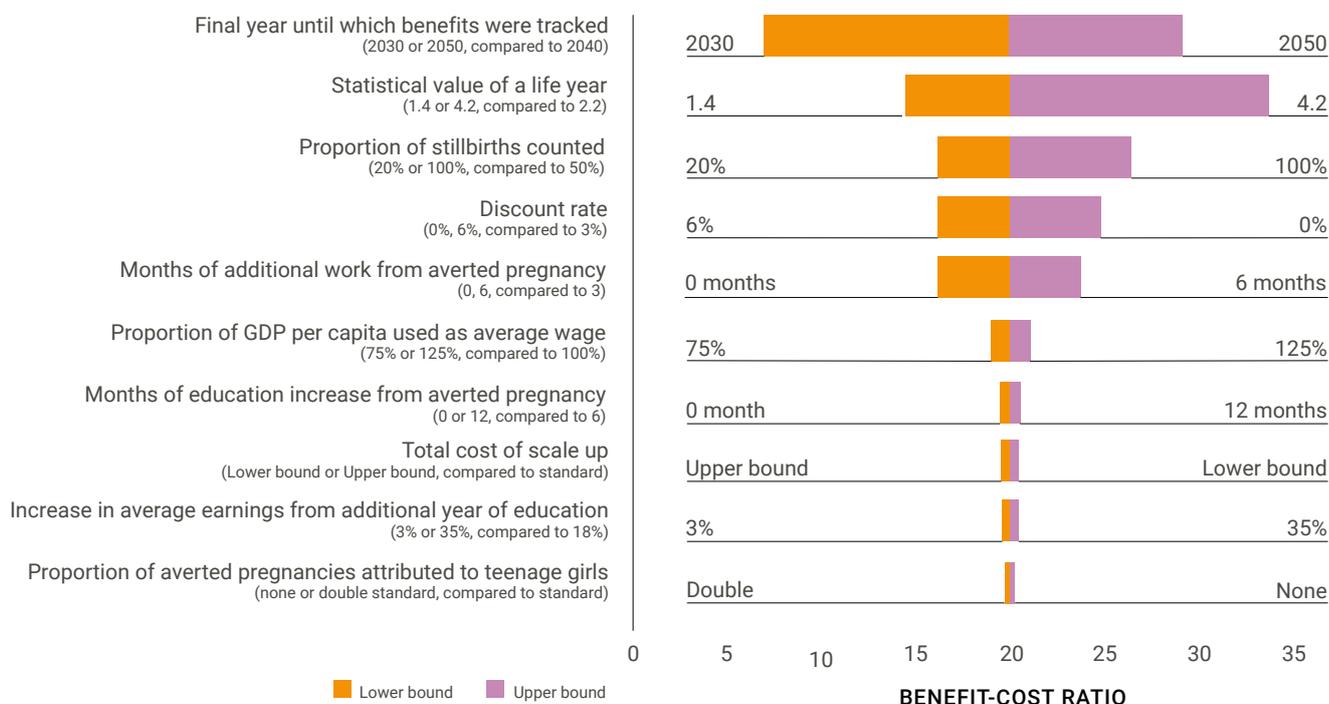
	Baseline, 2019			
	Barbados	Guyana	Jamaica	Saint Lucia
Maternal health interventions				
Folic acid supplementation/fortification	0.0	0.0	0.0	0.0
Safe abortion services	53.7	0.0	0.0	0.0
Post-abortion case management	0.0	0.0	0.0	0.0
Ectopic pregnancy case management	0.0	0.0	0.0	0.0
Blanket iron supplementation/fortification	0.0	0.0	0.0	0.0
Tetanus toxoid vaccination	0.0	99.0	91.0	0.0
Intermittent preventive treatment of malaria during pregnancy	0.0	0.0	0.0	0
Syphilis detection and treatment	23.1	22.4	24.1	24.5
Calcium supplementation	0.0	0.0	0.0	0.0
Micronutrient supplementation (iron and multiple micronutrients)	0.0	34.2	0.0	0.0
Balanced energy supplementation	0.0	0.0	0.0	0.0
Hypertensive disorder case management	21.1	20.8	20.6	21.7
Diabetes case management	16.5	16.2	16.0	16.9
Malaria case management	0.0	0.0	0.0	0.0
MgSO4 management of pre-eclampsia	41.8	41.2	40.7	42.9
Clean birth environment	82.0	76.3	80.8	82.0
Manual removal of placenta	37.4	34.8	73.8	37.4
Parenteral administration of anti-convulsants	71.5	66.5	70.0	71.5
Antibiotics for preterm or prolonged PROM	74.8	69.6	73.8	74.8
Parenteral administration of antibiotics	74.8	69.6	73.8	74.8
Assisted vaginal delivery	25.3	23.5	24.9	25.3
Parenteral administration of uterotonics	89.4	83.1	88.1	89.4
Removal of retained products of conception	33.1	30.8	32.7	33.1
Induction of labour for pregnancies lasting 41+ weeks	1.8	1.6	1.7	1.8
Caesarean section delivery	8.7	8.1	8.6	8.7
Blood transfusion	12.6	11.7	12.4	12.6
Maternal sepsis case management	0.0	0.0	0.0	0.0
Family planning interventions				
Contraceptive prevalence rate	59.2	34.1	72.5	55.0
Modern contraceptive prevalence ratio	91.2	93.5	93.7	92.8
Unmet need for family planning	19.9	28.0	7.9	17.0
Family planning demand satisfied with modern methods	73.1	67.3	86.3	77.0

	Baseline, 2019			
Family planning methods mix				
Condoms	32.9	26.5	36.6	25.4
Female sterilization	7.9	9.7	15.8	12.8
Male sterilization	0.2	0.3	0.0	0.0
Injections	8.4	14.4	16.3	8.8
Implants (3.8 years)	1.3	2.9	0.5	0.5
Intrauterine devices (4.6 years)	5.2	17.1	2.3	5.9
Pills	35.8	22.6	22.3	39.3
Vaginal ring	0.8	0.0	0.0	0.4
Withdrawal	3.4	1.2	4.8	2.0
Standard days method	1.7	1.2	0.5	0
Emergency contraception	0.0	0.0	0.0	0.0
Other	0.8	4.2	1.0	0.9

D. SENSITIVITY ANALYSIS

D.1 Sensitivity analysis – select countries in the Pacific

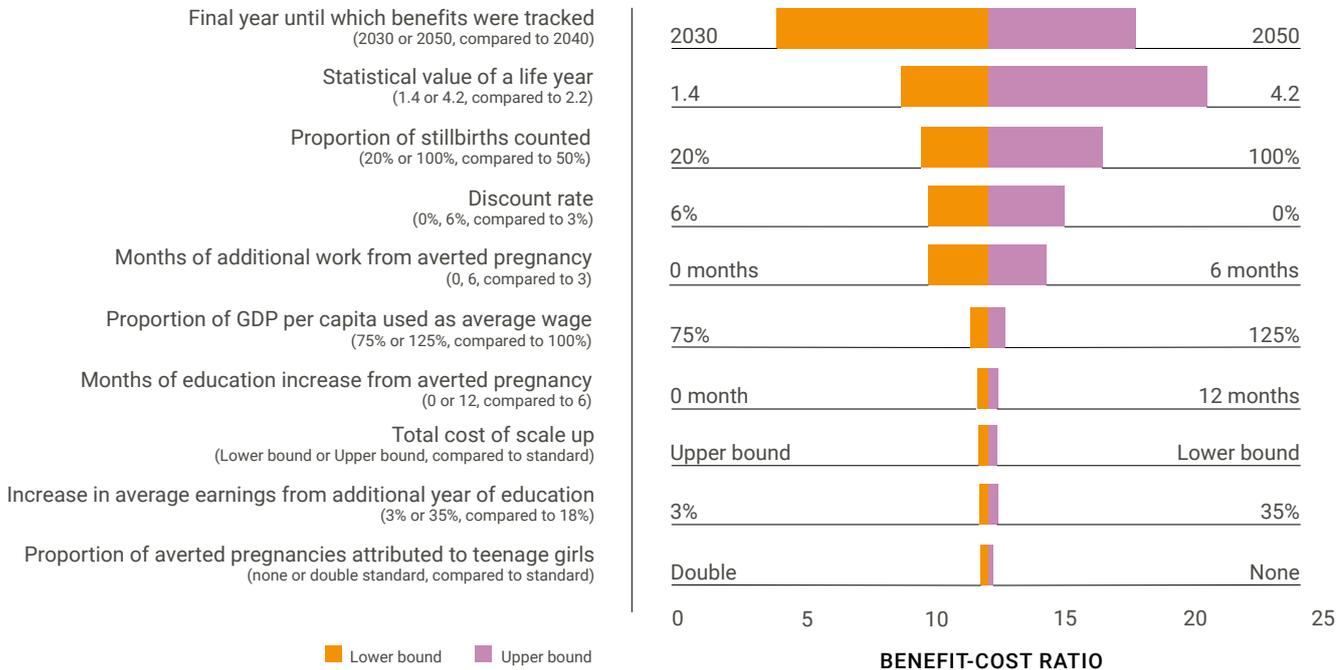
Sensitivity analysis of benefit-cost ratios



Values are aggregated for Kiribati, Samoa, Solomon Islands, Tonga and Vanuatu.

D.2 Sensitivity analysis – select countries in the Caribbean

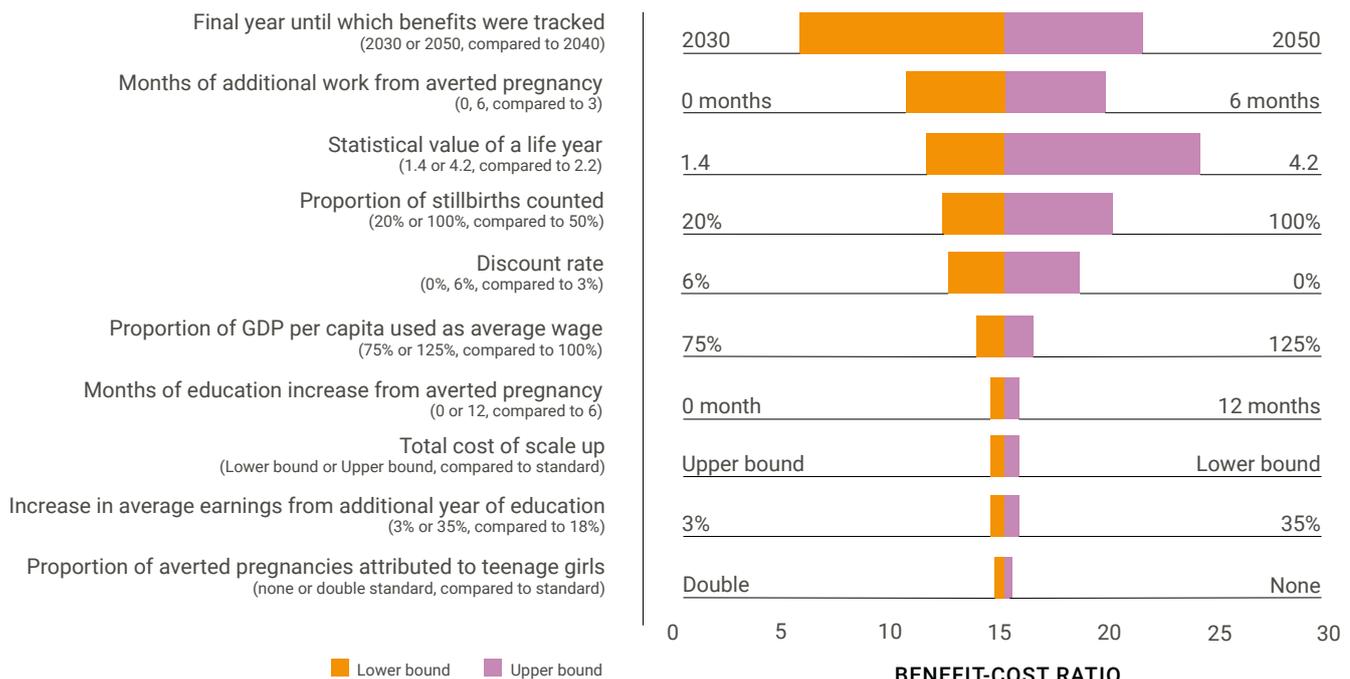
Sensitivity analysis of benefit-cost ratios



Values are aggregated for Barbados, Guyana, Jamaica and Saint Lucia.

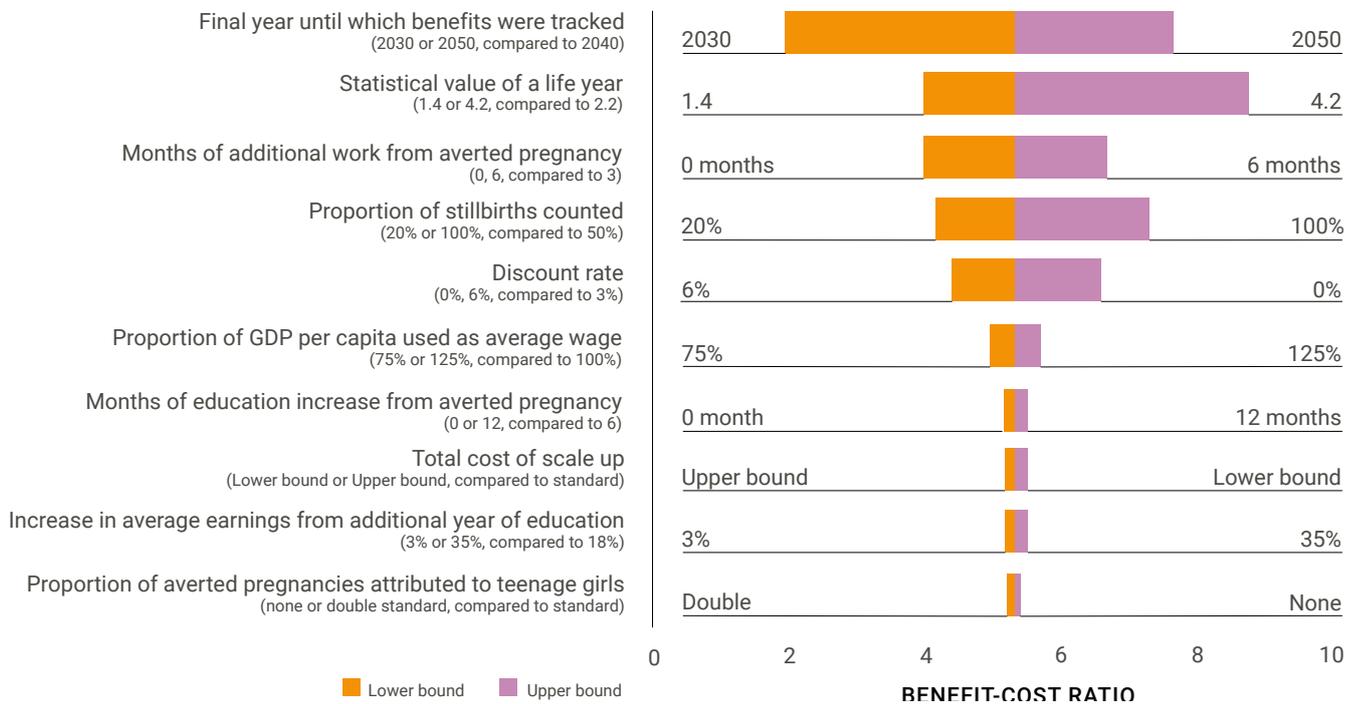
D.3 Sensitivity analysis – Kiribati

Sensitivity analysis of benefit-cost ratios



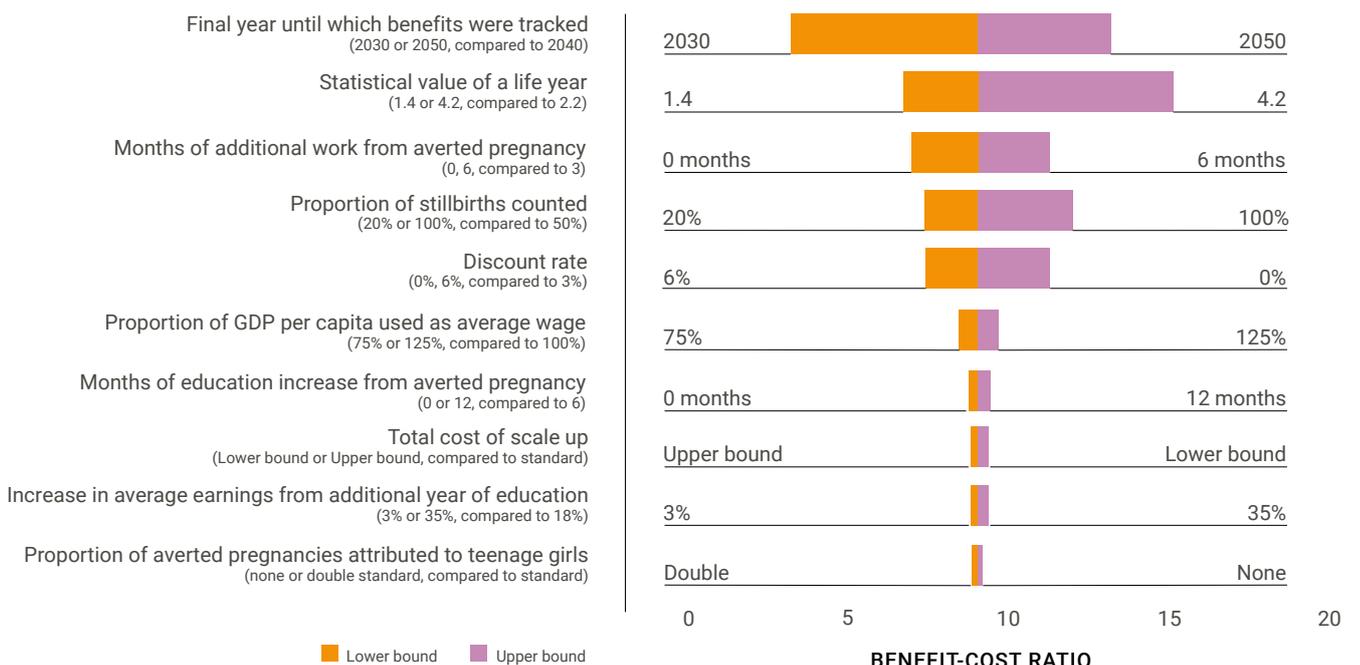
D.4 Sensitivity analysis – Samoa

Sensitivity analysis of benefit-cost ratios



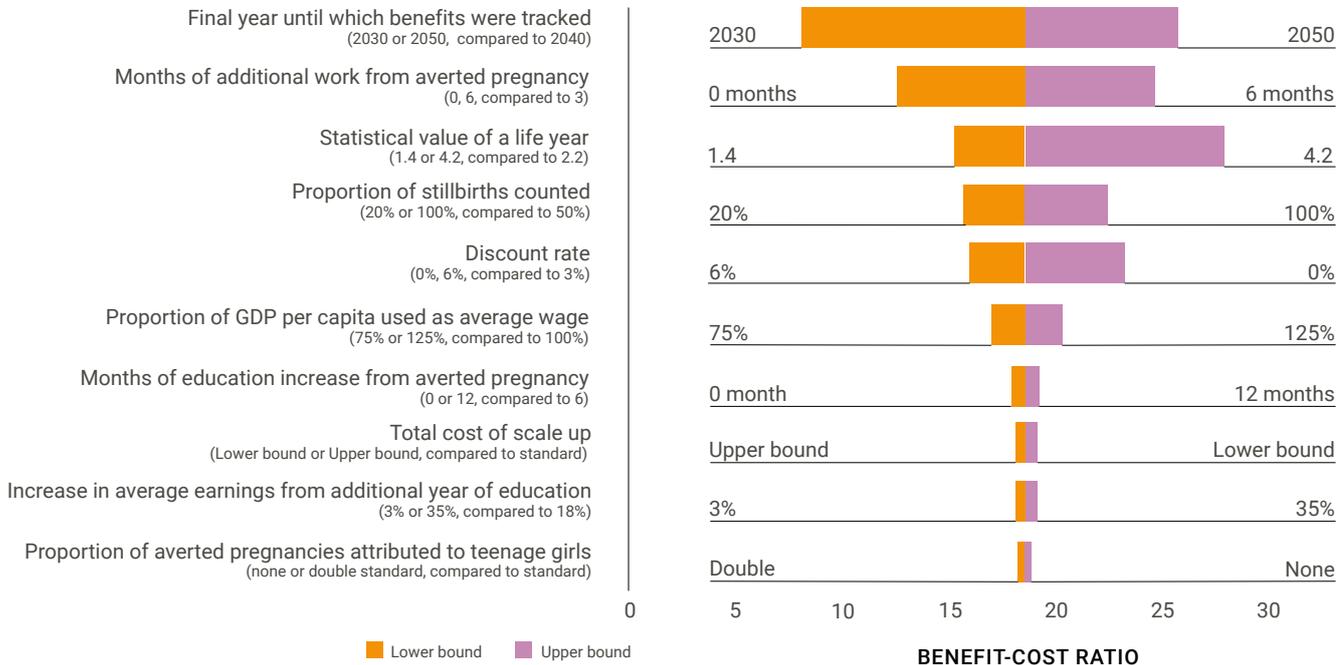
D.5 Sensitivity analysis – Solomon Islands

Sensitivity analysis of benefit-cost ratios



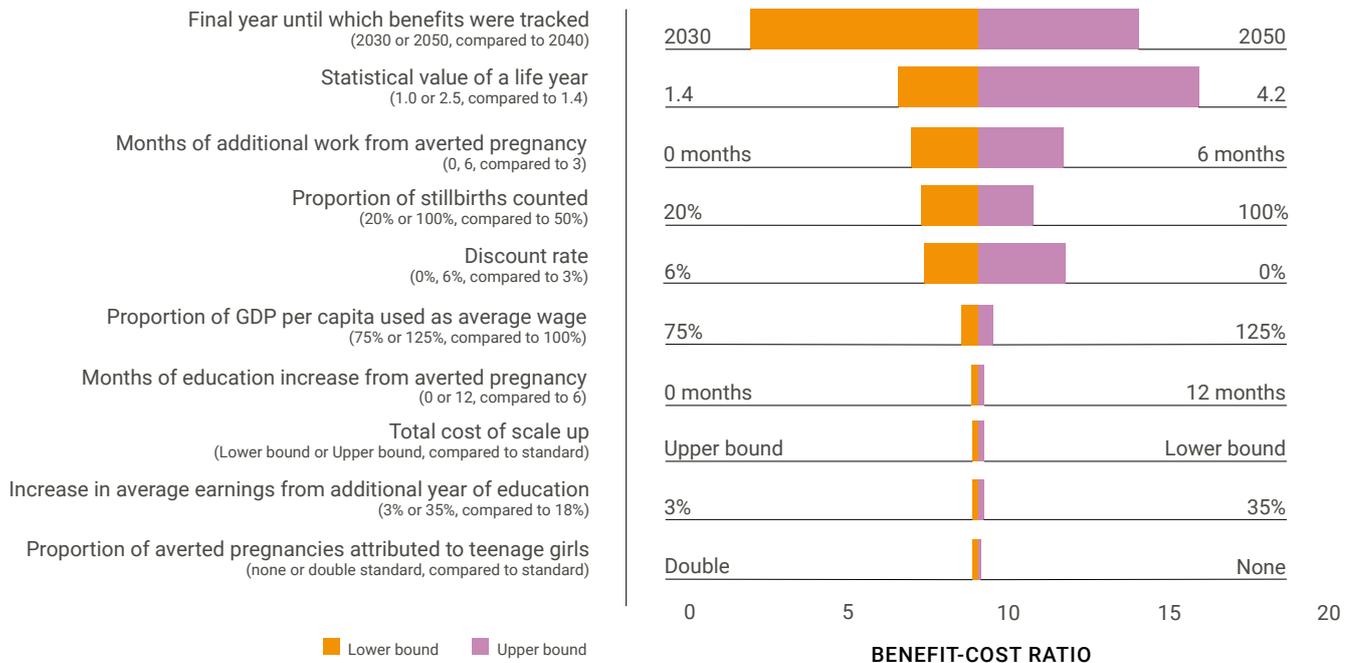
D.6 Sensitivity analysis – Tonga

Sensitivity analysis of benefit-cost ratios



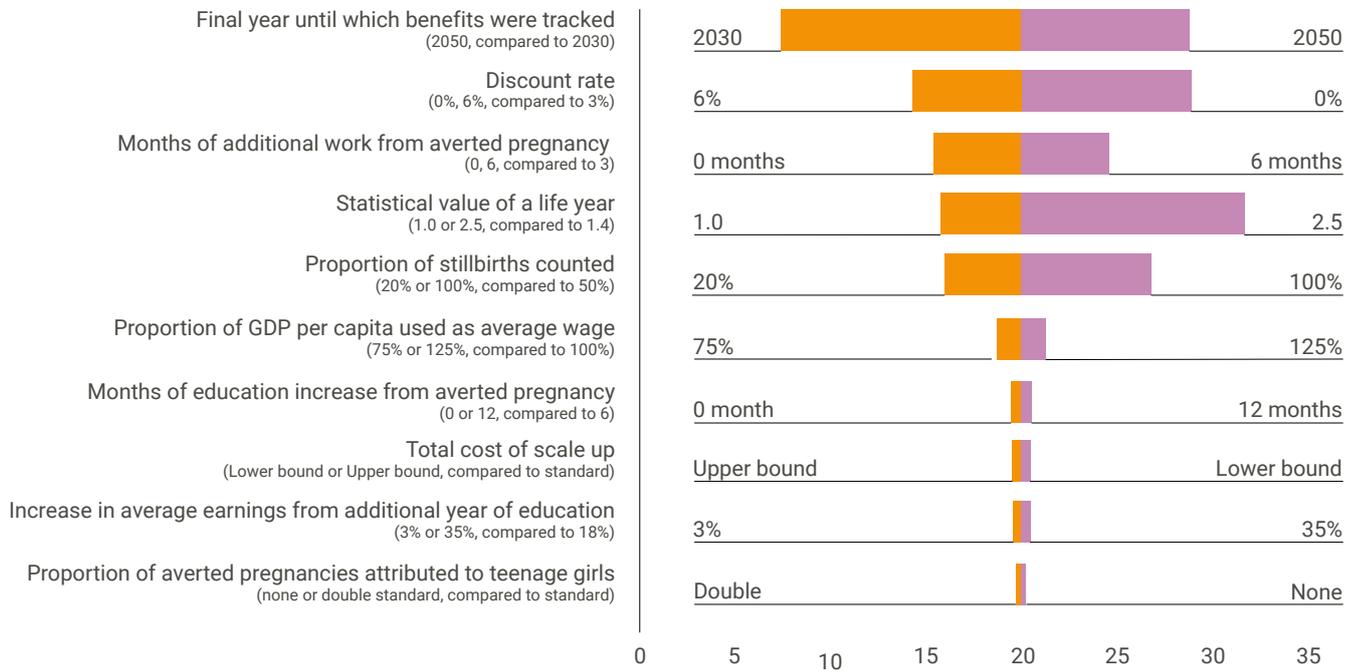
D.7 Sensitivity analysis – Vanuatu

Sensitivity analysis of benefit-cost ratios



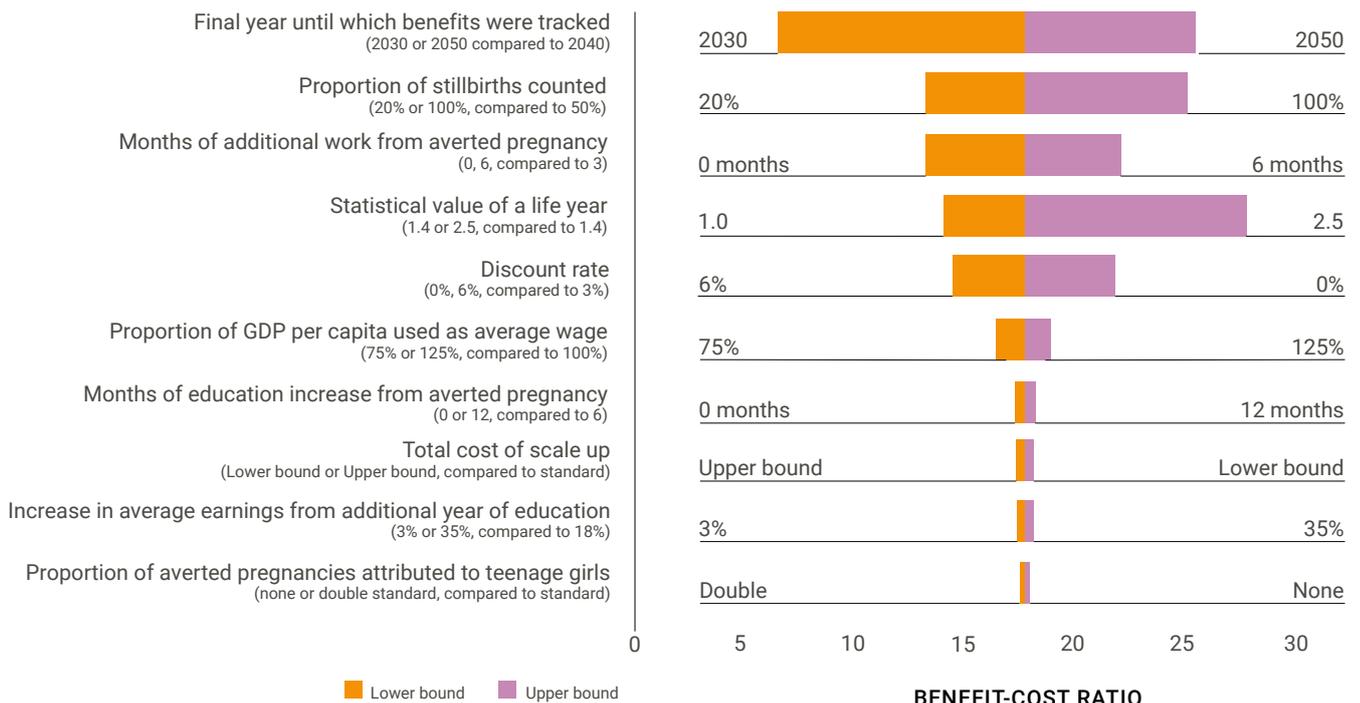
D.8 Countries in the Caribbean

Sensitivity analysis of benefit-cost ratios



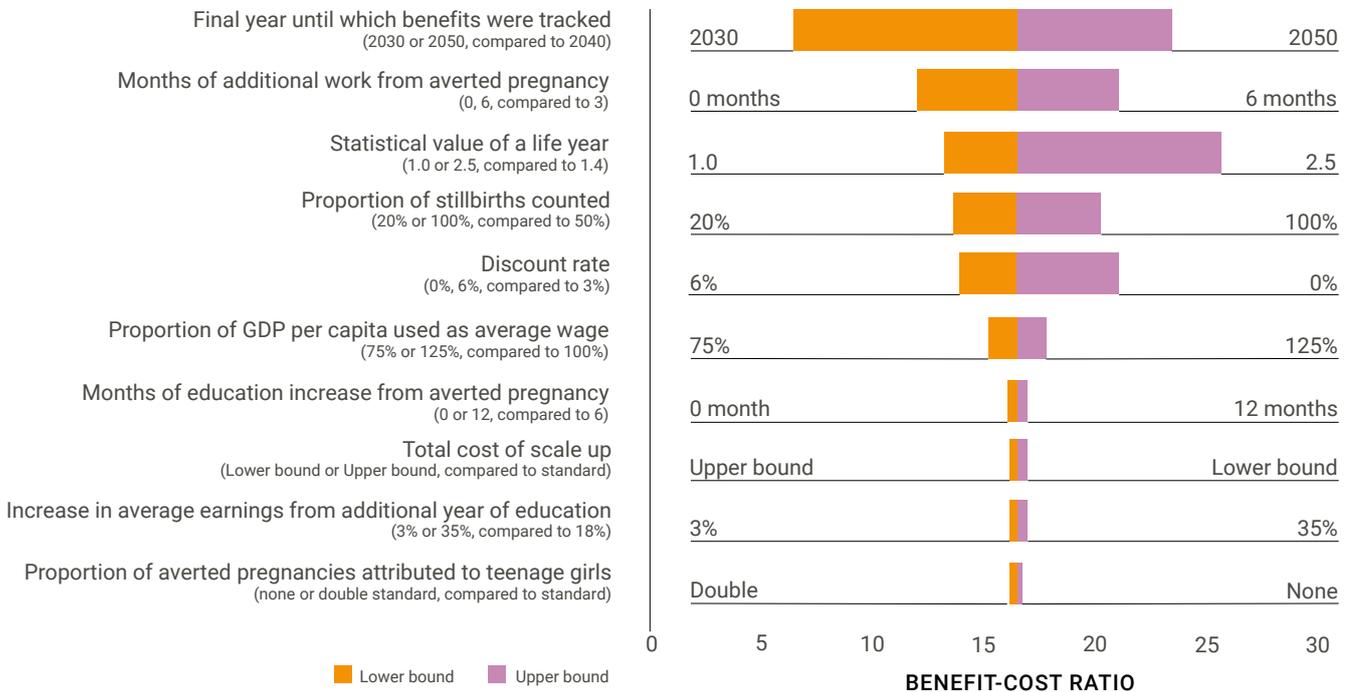
D.9 Sensitivity analysis – Barbados

Sensitivity analysis of benefit-cost ratios



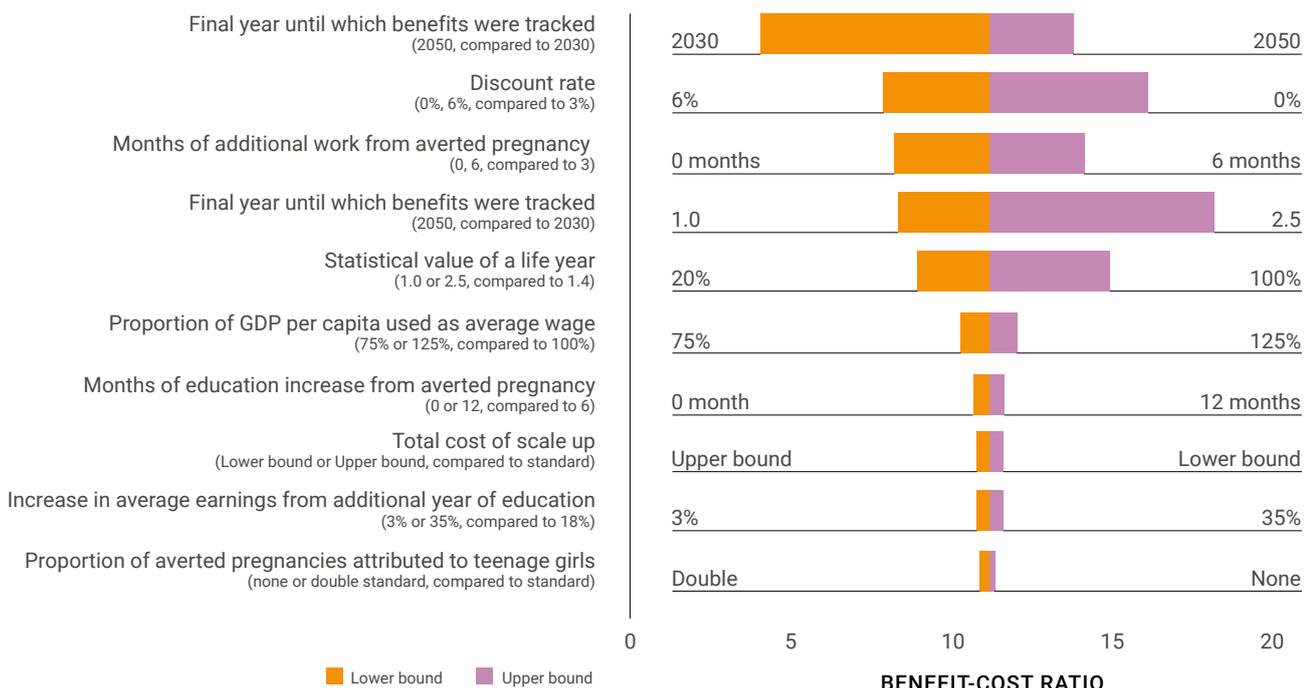
D.10 Sensitivity analysis – Guyana

Sensitivity analysis of benefit-cost ratios



D.11 Sensitivity analysis – Jamaica

Sensitivity analysis of benefit-cost ratios



REFERENCES

- Ashraf, Q. H., D. N. Weil and J. Wilde, 2013. "The effect of fertility reduction on economic growth." *Population and development review* 39(1): 97-130.
- Bhutta, Z. A., and others, 2008. "What works? Interventions for maternal and child undernutrition and survival." *The Lancet* 371(9610): 417-440.
- Bhutta, Z. A. and others, 2013. "Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost?" *The Lancet* 382(9890): 452-477.
- Bollinger, L. A., and others, 2017. "Lives Saved Tool (LiST) costing: a module to examine costs and prioritize interventions." *BMC Public Health* 17(4): 782.
- Britto, P. R., and others, 2017. "Nurturing care: promoting early childhood development." *The Lancet* 389(10064): 91-102.
- Canning, D., and T. P. Schultz, 2012. "The economic consequences of reproductive health and family planning." *The Lancet* 380(9837): 165-171.
- International Labour Organization, n.d. Maternity protection. https://www.ilo.org/dyn/travail/travmain.sectionReport1?p_lang=en&p_structure=3&p_sc_id=2490&p_sc_id=2580&p_countries=BB&p_countries=GY&p_countries=JM&p_countries=LC&p_countries=KI&p_countries=LA&p_countries=SB&p_countries=VU.
- Jamison, D. T., and others, 2006. "Incorporating deaths near the time of birth into estimates of the global burden of disease." *Global Burden of Disease and Risk Factors*. Washington, DC: The International Bank for Reconstruction and Development.
- Jamison, D. T., and others, 2013. "Global health 2035: a world converging within a generation." *The Lancet* 382(9908): 1898-1955.
- Jones, G., and others, 2003. "How many child deaths can we prevent this year?" *The Lancet* 362(9377): 65-71.
- Kiribati, Ministry of Health and Medical Services, 2020. National Health Strategic Plan 2020-2023. Naverere.
- Lawn, J. E., and others, 2016. "Stillbirths: rates, risk factors, and acceleration towards 2030." *The Lancet* 387(10018): 587-603.
- Lives Saved Tool (LiST). <https://www.livessavedtool.org/>.
- Miller, S., and others, 2016. "Beyond too little, too late and too much, too soon: a pathway towards evidence-based, respectful maternity care worldwide." *The Lancet* 388(10056): 2176-2192.
- Nove, A., and others, 2020. "Potential impact of midwives in preventing and reducing maternal and neonatal mortality and stillbirths: a Lives Saved Tool modelling study." *The Lancet Global Health* 9(1): E24-E32.
- Pan American Health Organization (PAHO), 2019. Core Indicators 2019: Health Trends in the Americas. PLISA Database. Washington, DC: PAHO.
- Popkin, B. M., C. Corvalan and L. M. Grummer-Strawn, 2019. "Dynamics of the double burden of malnutrition and the changing nutrition reality." *The Lancet* 395(10217): 65-74.
- Samoa, 2018. National Sexual and Reproductive Health Policy 2018-2023.
- Sheehan, P., and others, 2017. "Building the foundations for sustainable development: a case for global investment in the capabilities of adolescents." *The Lancet* 390(10104): 1792-1806.
- Solomon Islands, Ministry of Health and Medical Services, 2016. National Health Strategic Plan 2016-2020.
- Stenberg, K., and others, 2014. "Advancing social and economic development by investing in women's and children's health: a new Global Investment Framework." *The Lancet* 383(9925): 1333-1354.

- Stenberg, K., and others, 2017. "Financing transformative health systems towards achievement of the health Sustainable Development Goals: a model for projected resource needs in 67 low-income and middle-income countries." *The Lancet Global Health* 5(9): E875-E87.
- Tonga, 2015. *Tonga Strategic Development Framework 2015-2025*.
- Tonga, Statistics Department, 2020. *Tonga Multiple Indicator Cluster Survey 2019*. Nuku'alofa.
- United Nations Population Division, 2019. *World Population Prospects: 2019 Revision*. New York: United Nations.
- United Nations Children's Fund (UNICEF), 2015. *The Investment Case for Education and Equity*. New York: UNICEF. https://www.unicef.org/publications/files/Investment_Case_for_Education_and_Equity_FINAL.pdf.
- , 2020. *Tracking the situation of children during COVID-19*. New York: UNICEF.
- Vanuatu, Ministry of Health, 2017. *Vanuatu Reproductive, Maternal, Newborn Child and Adolescent Health Policy and Implementation Strategy 2017-2020*.
- Walker, N., Y. Tam and I. K. Friberg, 2013. "Overview of the Lives Saved Tool (LiST)." *BMC Public Health* 13(S1). <https://doi.org/10.1186/1471-2458-13-S3-S1>
- Wilson, A., and others, 2020. "Improving the quality of maternal and newborn care in the Pacific region: A scoping review." *The Lancet Regional Health-Western Pacific* 3: 100028.
- Winfrey, W., R. McKinnon and J. Stover, 2011. "Methods used in the lives saved tool (LiST)." *BMC Public Health* 11(3): S32.
- World Bank, n.d.. *Life expectancy at birth, female*. <https://data.worldbank.org/indicator/SP.DYN.LE00.FE.IN>.
- World Health Organization (WHO), 2013. *WHO recommendations on postnatal care of the mother and newborn*. Geneva: WHO. https://apps.who.int/iris/bitstream/handle/10665/97603/9789241506649_eng.pdf?sequence=1.
- , 2016. *WHO recommendations on antenatal care for a positive pregnancy experience*. Geneva: WHO. <https://apps.who.int/iris/bitstream/handle/10665/250796/9789241549912-eng.pdf?sequence=1>. 2016; ISBN 978 92 4 154991 2.
- , 2017a. *WHO recommendations on child health: guidelines approved by the WHO Guidelines Review Committee*. Geneva: WHO. https://www.who.int/maternal_child_adolescent/documents/child-health-recommendations/en/. 2017a.
- , 2017b. *WHO recommendations on maternal health: guidelines approved by the WHO Guidelines Review Committee*. Geneva: WHO. https://www.who.int/maternal_child_adolescent/documents/maternal-health-recommendations/en/.
- , 2018. *WHO recommendations intrapartum care for a positive childbirth experience*. Geneva: WHO. <https://apps.who.int/iris/bitstream/handle/10665/260178/9789241550215-eng.pdf?sequence=1>. 2018; ISBN 978-92-4-155021-5
- , 2019. *WHO recommendation on respectful maternity care during labour and childbirth*. Geneva: WHO. <https://extranet.who.int/rhl/topics/preconception-pregnancy-childbirth-and-postpartum-care/care-during-childbirth/who-recommendation-respectful-maternity-care-during-labour-and-childbirth>. 2019.
- , 2020. *Benefit Risk Analysis Model*. Geneva: WHO.
- World Health Organization (WHO) and others, 2019. *Trends in Maternal Mortality: 2000 to 2017: Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division*. Geneva: WHO. https://www.unfpa.org/sites/default/files/pub-pdf/Maternal_mortality_report.pdf

