MODELS AND TOOLS FOR MATERNAL HEALTH DECISION MAKING, PLANNING, AND STRATEGY
November 2020

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Cover photo: Richard Nyberg, USAID


ISBN: 978-1-59560-262-6


This report was produced for review by the U.S. Agency for International Development. It was prepared by HP+. The information provided in this report is not official U.S. Government information and does not necessarily reflect the views or positions of the U.S. Agency for International Development or the U.S. Government.
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Acknowledgments

The authors would like to thank the following individuals for providing input or reviewing this report:

- Allisyn Moran, World Health Organization
- Badara Seye, independent consultant
- Beth McClure, RTI International
- Bill Winfrey, Avenir Health
- Doris Rouse, RTI International
- Elisabeth Sommerfelt, FHI 360
- Jim Ricca, JHPIEGO
- Lakshmi Narasimhan Balaji, UNICEF
- Neff Walker, Johns Hopkins Bloomberg School of Public Health
- Nick Scott, Burnet Institute
- Rachel Sanders, Avenir Health
- Rob Cohen, U.S. Agency for International Development
- Robert Goldenberg, RTI International
- Shahrouh Sharif, UNICEF
- Shilu Adhikari, U.S. Agency for International Development/Nepal
- Thierno Dieng, Regional Center of Training, Research, and Advocacy in Reproductive Health
- Victoria Chou, Johns Hopkins Bloomberg School of Public Health
Abbreviations

EQUIST  Equitable Impact Sensitive Tool
HCV    hepatitis C virus
HEAT  Health Equity Assessment Toolkit
HIV  human immunodeficiency virus
HP+  Health Policy Plus
LiST  Lives Saved Tool
MANDATE Maternal and Newborn Directed Assessment of Technology
RMNCAH reproductive, maternal, newborn, child, and adolescent health
RMNCH reproductive, maternal, newborn, and child health
TB  tuberculosis
UNICEF United Nations Children’s Fund
USAID U.S. Agency for International Development
WHO  World Health Organization
Executive Summary

Maternal health programs need country-specific evidence to support programmatic decision making and advocacy, including how program scale-up and use of resources may result in achieving national goals, such as reduced maternal mortality and inequities in access to care. Several analytical tools are available to generate evidence for informing maternal health program decision making within countries, but there are no resources available to support them in selecting appropriate tools to address their policy and research questions. As a result, the Health Policy Plus project, funded by the U.S. Agency for International Development (USAID), conducted a literature review, survey of tool developers and consumers, and key informant interviews with select survey respondents to identify key analytical tools available. This report summarizes the key characteristics and use of seven analytic tools.

The following tools are covered in this report:

- **Lives Saved Tool (LiST):** This mathematical model estimates the impact of scaling up health and nutrition interventions on maternal, newborn, and child health. Parameters in LiST are used in other maternal health models.
- **Equitable Impact Sensitive Tool (EQUIST):** Building on LiST, this tool estimates the impact of scaling up interventions among specific populations on inequities in maternal, newborn, and child health outcomes.
- **OneHealth Tool:** This tool forecasts the costs and health impacts associated with investments in the health system designed to meet population health needs and strategic targets. The health impacts are estimated using LiST, which is linked to the costing model in OneHealth.
- **Optima:** A mathematical model that helps countries optimize budget allocations across program interventions, Optima considers budget constraints and health impacts.
- **Maternal and Newborn Directed Assessment of Technology (MANDATE):** Building on LiST, this tool serves as a decision-making model for countries with limited resources to assess the impact of specific technologies for reducing maternal, fetal, and newborn mortality.
- **Health Equity Assessment Toolkit (HEAT and HEAT Plus):** This health equity monitoring tool analyzes current and past trends in inequities across reproductive, maternal, newborn, and child health indicators.
- **REDUCE-ALIVE:** This advocacy tool estimates how achieving maternal and neonatal health goals reduces mortality, disabilities, and productivity losses.

This report is intended to serve a guide for potential users and consumers of maternal health analytical tools to better understand the different tools available and make an informed choice when selecting one to apply in a country. The audience for this report is anticipated to be USAID Missions, governments, and implementing partners.
Introduction

Development agencies, research institutions, and implementing partners have designed a variety of tools, models, and approaches to help advocates, policymakers, donors, and program staff determine the costs and impacts of investing in maternal and newborn health. These tools and models differ in their intended uses, methodologies, inputs, outputs, flexibility, and ease of use. However, there is no comprehensive guide available to help potential users and consumers of these models and tools understand the different types that exist and how they have been applied to improve maternal and newborn health in developing countries. To address this gap, the Health Policy Plus (HP+) project, funded by the U.S. Agency for International Development (USAID), identified and assessed tools that can provide evidence to support decision making for maternal health investments and advocacy.

This report discusses various tools, models, and approaches used for maternal health decision making, planning, and strategy in low- and middle-income countries. They will be referred to as “tools” throughout the report and described in detail under each subsection. The tools identified include the following:

- Lives Saved Tool (LiST)
- Equitable Impact Sensitive Tool (EQUIST)
- OneHealth Tool
- Optima
- Maternal and Newborn Directed Assessment of Technology (MANDATE)
- Health Equity Assessment Toolkit (HEAT and HEAT Plus)
- REDUCE-ALIVE

These seven tools have been used to analyze maternal health-related costs, health impacts, and equity issues. Many of them also examine reproductive, newborn, and child health and nutrition through improved understanding of how maternal health is affected by and affects these other health issues. However, the focus of this report is how these tools have been used for maternal health. To learn more about them, HP+ undertook the following approach:

1. **Conducted a literature review**: HP+ searched peer-reviewed and grey literature to identify maternal health-related tools and models. The review identified a few core maternal health tools. However, there is a lack of published literature on how these tools have been used to make decisions regarding planning, advocacy, and budgeting. Recognizing this limitation, HP+ began a consultative process with USAID and partner organizations to identify key stakeholders who could be interviewed about their experiences using these and other tools, which may not be cited in the literature.

2. **Administered a short electronic survey**: HP+ prepared a short questionnaire to conduct an initial online survey among known model developers and consumers across development partners, USAID implementing partners, and other organizations. HP+ and the USAID maternal and child health and nutrition team identified individuals to target for completing the survey. Overall, HP+ reached out to 64 contacts, 19 of whom completed the questionnaire. Survey respondents provided baseline information on
which tools existed or were under development, new features being added to them, and their strengths and limitations.

3. **Developed an in-depth interview guide and conducted interviews:** Based on the initial survey results, HP+ developed an in-depth interview guide and selected specific respondents for the interview. HP+ interviewed 17 people across academia, development partners, and implementing partners engaged in developing and applying models for maternal and newborn health. These interviews further informed HP+’s understanding of the core features—including advantages and disadvantages—of models available to inform maternal health decision making and how they have been applied in developing countries.

The information collected during these activities is summarized in the following sections. This report builds on lessons learned in the *Crosswalk of Family Planning Tools* (Godbole and Smith, 2012) and broadens understanding of the application of models and tools to guide country-level planning and evaluation aimed at reducing women’s morbidity and mortality during pregnancy, childbirth, and the postpartum period.

The information included in this report is intended to support the needs of USAID Missions, governments, and implementing partners to better understand how modeling tools and analytic approaches can answer their policy and research questions regarding target setting, prioritization, budget development, and other program issues. The tools can be used to improve project design as well as performance and development outcomes. Additionally, this report identifies tools to facilitate maternal health advocacy and ultimately contribute toward efforts to improve the maternal health policy environment.
Comparison of Tools

No one model or tool alone can provide a comprehensive understanding of maternal health or answer the full range of policy and program questions that decisionmakers ask (see Figure 1). The tools outlined in this report summarize the existing resources available to estimate maternal health costs, outcomes, and inequities in low- and middle-income settings. Depending on the country context and key questions of decisionmakers, one tool may be more appropriate to use than another. Also, model outputs are only as good as the data and assumptions used within a model.

Figure 1. Selecting a Maternal Health Model Based on a Policy or Research Question

- **LIST**
  - How much will it cost to scale up maternal health services?
  - How can the country reach its target for reductions in the maternal mortality ratio?

- **MANDATE**
  - What is the maternal health impact of introducing specific clinical innovations and technologies?

- **EQUIST**
  - What are the productivity impacts of improved maternal health outcomes?

- **OneHealth Tool**
  - How can a country target scale-up of services to specific populations to reduce maternal health disparities?

- **REDUCE-ALIVE**
  - What inequities exist in maternal health outcomes?

- **Optima**
  - What is the maternal health impact of introducing specific clinical innovations and technologies?

- **HEAT**
  - What are the health system investments, including human resources for health, needed to improve maternal health?

- **What is the impact on maternal health outcomes from improving quality of care?**

- **How can a country maximize maternal health outcomes, given budget constraints?**

- **How can a country target scale-up of services to specific populations to reduce maternal health disparities?**
It is important to be aware of the intended uses and relative strengths of each tool, as they are complementary resources available to support critical decisions about maternal and newborn interventions. Table 1 provides an overview comparison of various tool characteristics. When assumptions are understood and models and tools are used judiciously, they can provide unique insights into maternal health decision making, planning, and strategy, and can contribute to improvements in maternal and newborn mortality.

Examples of modeling considerations include the variance in quality of data to inform baseline country-specific disease burden, coverage, and cost estimates; the comparative efficacy of an intervention when studied in a hospital versus clinic versus home setting; the presence of health system constraints, including poor supply chain or health worker skills in low- and middle-income countries; and the definition of the intervention itself.

**Key Characteristics of Each Tool**

**LiST** is the core impact modeling tool used for maternal and newborn health impact projections and is updated on a routine basis. LiST calculates changes in cause-specific mortality based on intervention coverage change, intervention effectiveness for that cause, and the percentage of cause-specific mortality sensitive to that intervention. There are default data for each country in the tool, which users can change if desired. The tool also includes features for subnational, equity, and cost analyses. Outputs include lives saved, deaths, and mortality rates for mothers, newborns, and children under five years of age.

**EQUIST** is a mathematical model that estimates how scaling up services among specific populations impacts inequities in maternal and newborn health outcomes—specifically estimating lives saved among mothers and children under five years of age. The model includes a bottleneck analysis outlining health systems-strengthening opportunities, challenges, and costs. The parameters in the model are based on LiST.

The **OneHealth Tool** is a comprehensive costing and health impact modeling platform. The tool’s costing component links directly with LiST, so assumptions for costing and impact modeling are aligned. The OneHealth Tool costing component is the most detailed costing model available for maternal and newborn health; it costs program interventions, program management, and health systems requirements for meeting maternal and newborn health targets. Costed programs include maternal and child health, malaria, HIV, tuberculosis (TB), immunization, and nutrition interventions.

**Optima** is the only model that considers budget constraints and determines the optimal resource allocation across interventions within a program to achieve maximum impact, given the financial resources available. Optima models exist for several health areas, such as HIV and nutrition. The nutrition model has a limited set of maternal and child health interventions included; parameters in this model are based on those in LiST.

**MANDATE** is an online modeling platform designed to explore the impact of introducing or scaling up specific maternal and newborn health interventions and technologies, including lifesaving referrals and transfer to higher levels of maternal healthcare, on maternal and neonatal lives saved. For example, the model considers the impact of using anti-shock garments or ultrasound. The model also considers where services are provided (at a facility versus at home). The parameters in the model were originally based on LiST, but inputs and assumptions are more disaggregated in MANDATE.
HEAT is a health equity monitoring tool. It can be used by countries to monitor different dimensions and measures of inequity in maternal health.

REDUCE-ALIVE is an Excel-based advocacy tool that was used from 2000 to 2005 under a USAID-funded project. Users enter country-specific data on maternal and newborn health to estimate how investments in maternal and newborn health affect maternal mortality and morbidity as well as economic productivity. FHI 360 has since adapted and used this tool in PROFILES, its nutrition advocacy tool. Unlike other tools in this report, REDUCE-ALIVE does not estimate the health impacts of scaling up specific interventions.

All of the tools discussed in this report consider maternal and newborn outcomes, but there are currently no tools available that analyze maternal and newborn morbidity. This absence is mainly a result of data limitations, particularly because data on maternal or newborn illness may not be collected or sufficiently linked to understand how complications between mother and infant are connected.
Table 1. Comparison of Models and Tools for Maternal Health Decision Making, Planning, and Strategy

<table>
<thead>
<tr>
<th>Description</th>
<th>LIST</th>
<th>EQUIST</th>
<th>OneHealth Tool</th>
<th>Optima</th>
<th>MANDATE</th>
<th>HEAT</th>
<th>REDUCE-ALIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>USE tool if you want to...</td>
<td>Estimate health outcomes and costs of scaling up interventions</td>
<td>Estimate disparities in health outcomes by wealth quintile or other subpopulation</td>
<td>Estimate resources required for health programs and cross-cutting health systems</td>
<td>Optimize spending within a health program, given budget constraints</td>
<td>Estimate health outcomes of scaling up specific interventions and technologies</td>
<td>Analyze current and past trends in inequities across reproductive, maternal, newborn, and child health indicators</td>
<td>Advocacy and strategic planning process, focusing on the impacts that maternal and neonatal mortality and morbidity can have on a country; REDUCE supports advocacy to reduce maternal mortality, and ALIVE supports advocacy to increase newborn survival</td>
</tr>
<tr>
<td>Health areas covered</td>
<td>Reproductive, maternal, newborn, and child health (RMNCH), nutrition, immunization, malaria</td>
<td>RMNCH, nutrition, immunization, malaria, HIV</td>
<td>RMNCH, nutrition, immunization, malaria, TB, HIV, noncommunicable diseases, mental health, other health areas</td>
<td>HIV, nutrition, TB, hepatitis C virus, child health (each model is specific to a single health area)</td>
<td>Maternal and newborn health</td>
<td>RMNCH</td>
<td>Maternal and newborn health</td>
</tr>
<tr>
<td>Predictive model?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No, analyzes current and past trends</td>
<td>Yes</td>
</tr>
<tr>
<td>Data inputs</td>
<td>Epidemiological data (e.g., baseline maternal mortality ratio, cause-of-death structure), demographic data (e.g., fertility rate), programmatic coverage, costs of interventions, and effectiveness of interventions in averting maternal and child mortality</td>
<td>Epidemiological data (e.g., baseline maternal mortality ratio, cause-of-death structure), demographic data (e.g., fertility rate), programmatic coverage, costs of interventions, and effectiveness of interventions on averting maternal and child mortality</td>
<td>Epidemiological data (e.g., baseline maternal mortality ratio, cause-of-death structure), demographic data (e.g., fertility rate), programmatic coverage, costs of interventions, and effectiveness of interventions on averting maternal and child mortality</td>
<td>Funding available for health area, health goals/targets, cost of interventions, and impact of interventions on maternal and child mortality</td>
<td>Geography (country), timeframe, health conditions and subconditions, available preventions, diagnostics, available settings where pregnant women may seek care, and treatments</td>
<td>RMNCH health intervention coverage and health outcomes disaggregated by different subpopulation groups</td>
<td>Epidemiological data (maternal mortality ratio, neonatal mortality rate, infant mortality rate, under-five mortality rate, maternal anemia, goiter [optional]), neonatal health indicators, and demographic information (number of live births, number of women)</td>
</tr>
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</tr>
<tr>
<td>Model outputs</td>
<td>Costs and maternal and child lives saved by intervention; estimates of reductions in mortality rates</td>
<td>Costs and maternal and child lives saved by intervention scenario and subpopulation</td>
<td>Costs and health system inputs/requirements (e.g., number of health workers needed) by health program</td>
<td>Optimal funding allocation strategy, total costs, deaths averted</td>
<td>Maternal and child lives saved by cause of death and level of care</td>
<td>15 summary measures of inequality across 30 RMNCH indicators and five dimensions of inequality (economic status, education, place of residence, subnational region, and child’s sex)</td>
<td>Maternal and neonatal deaths and lives saved, maternal disabilities and averted disabilities, and economic productivity losses and gains</td>
</tr>
<tr>
<td>Can be applied subnationally?</td>
<td>Yes</td>
<td>Yes</td>
<td>Possible, but requires updating all default data</td>
<td>Yes</td>
<td>No, except for India, where state-level application is available</td>
<td>No, but can compare across subnational regions</td>
<td>No, national-level data are recommended for the model; however, advocacy messages can be tailored for the subnational area</td>
</tr>
<tr>
<td>Publicly available?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Connected to or built off of other models?</td>
<td>Connected to Spectrum</td>
<td>Builds off of LiST</td>
<td>Connected to Spectrum</td>
<td>Stand-alone model</td>
<td>Builds off of LiST</td>
<td>Stand-alone model</td>
<td>Stand-alone model</td>
</tr>
<tr>
<td></td>
<td>LiST</td>
<td>EQUIST</td>
<td>OneHealth Tool</td>
<td>Optima</td>
<td>MANDATE</td>
<td>HEAT</td>
<td>REDUCE-ALIVE</td>
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<tr>
<td><strong>Software or web-based platform</strong></td>
<td>Software</td>
<td>Web-based</td>
<td>Software</td>
<td>Software</td>
<td>Web-based</td>
<td>Web-based and software</td>
<td>Software</td>
</tr>
<tr>
<td><strong>Tool support available?</strong></td>
<td>Support available from developers and online resources</td>
<td>Limited support largely available from country UNICEF offices to national stakeholders</td>
<td>Support available from developers and online resources</td>
<td>Support available from developers (Optima team leads model applications) and online resources</td>
<td>Support available from developers and online resources</td>
<td>Support available from online resources</td>
<td>Support available from developers</td>
</tr>
<tr>
<td><strong>Ease of use on a scale of 1–3 (1 = easy, 3 = difficult)</strong></td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>Persons intended to apply tool</strong></td>
<td>Trained policymakers, professional modelers</td>
<td>Trained policymakers, civil society, analysts</td>
<td>Trained policymakers, professional modelers</td>
<td>Optima team</td>
<td>Trained policymakers, civil society, analysts</td>
<td>Trained policymakers, civil society, analysts</td>
<td>Multisectoral country teams encompassing representatives from the public and private sector</td>
</tr>
<tr>
<td><strong>Country applications</strong></td>
<td>Application in more than 100 countries</td>
<td>Application in more than 60 countries</td>
<td>Botswana, Cambodia, Ethiopia, Indonesia, Kenya, Madagascar, Malawi, Mozambique, Myanmar, Sudan, Tanzania, Uganda, among others</td>
<td>Nutrition model applied in Bangladesh, Benin, Democratic Republic of the Congo, India, Nigeria, Pakistan, Sierra Leone, Tajikistan, Tanzania</td>
<td>Sub-Saharan Africa and Indian States</td>
<td>World Health Organization (WHO) Eastern Mediterranean Region, WHO Region of the Americas, Indonesia</td>
<td>Burkina Faso, Cameroon, Ethiopia, Ghana, Mali, Mauritania, Mozambique, Niger, Nigeria, Senegal, Tanzania, Togo, Uganda, Vietnam, Zambia</td>
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<td><strong>LIST</strong></td>
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<td><strong>MANDATE</strong></td>
<td><strong>HEAT</strong></td>
<td><strong>REDUCE-ALIVE</strong></td>
<td></td>
</tr>
</tbody>
</table>
Lives Saved Tool (LiST)

**Developer:** LiST was developed by a consortium of academic and international organizations, including the Institute for International Programs at Johns Hopkins Bloomberg School of Public Health and Avenir Health, with funding from the Bill and Melinda Gates Foundation and other donors, including USAID.

**Contact:** Neff Walker, Johns Hopkins Bloomberg School of Public Health ([pwalke20@jhu.edu](mailto:pwalke20@jhu.edu))

**Website:** [http://www.livessavedtool.org/](http://www.livessavedtool.org/)

**Description:** LiST is a model that estimates the impact of scaling up health and nutrition interventions on maternal, newborn, and child health. LiST is part of the Spectrum suite of policy models maintained by Avenir Health. It includes default data on intervention coverage and effectiveness for more than 80 maternal and child health interventions in more than 120 countries. The model has been used for more than 10 years and is regularly updated to incorporate the latest evidence from scientific literature and household survey data.

The latest version of the model includes a costing component, which allows countries to consider the resource requirements and cost-effectiveness of interventions when determining scale-up strategies for maternal and child health. LiST has also been adapted to include two additional features: a “Subnational Wizard,” which allows for subnational applications, and “Missed Opportunity and Equity Tools,” which allow for quick comparison of the impact of different interventions and determine the biggest missed opportunities in a country for maternal and child health. The model’s framework and data are used in other models, including MANDATE, EQUIST, and the OneHealth Tool.

**Primary Uses:** LiST can be used to model multiple health impact and cost scenarios—either across countries or for just one country—for scaling up key maternal and child health interventions. The model can be applied to support national and subnational strategic planning, global advocacy, and retrospective evaluation analyses for reproductive, maternal, newborn, and child health.

**Year Released:** 2003

**Health Areas Covered:** Reproductive, maternal, newborn, and child health; nutrition; immunization; malaria

**Data Inputs:** Epidemiological data, such as baseline maternal mortality ratio and prevalence of health conditions; demographic data, such as the baseline fertility rate; programmatic coverage for default and user-defined interventions; and effectiveness ratios for preventive and curative interventions’ effect on cause-specific maternal, child, and newborn mortality.

**Model Outputs:** LiST outputs include number of deaths by cause, intervention, and age group; newborn, under-five, and maternal mortality rates and ratios; number of stillbirths; and the number of deaths averted by cause, intervention, and age group from scaling up coverage of interventions. There are also nutrition-related outputs, including prevalence of stunting, wasting, and anemia.

**Model and Methodology:** LiST models health impacts based on (1) change in intervention coverage; (2) effectiveness of the intervention in averting adverse outcomes that cause mortality;
and (3) the affected fraction, meaning the proportion of cause-specific deaths than can be averted by a specific intervention. The model takes into account the impact of preventive, curative, and nutrition interventions.

The accompanying database for LiST includes national levels of coverage for health, nutrition, and water, sanitation, and hygiene interventions; mortality rates and cause-of-death distributions; and data on key risk factors, such as stunting, wasting, adverse birth outcomes, disease prevalence, and micronutrient deficiencies. LiST can interact with other models in Spectrum to take into account the impacts of changing demography, family planning, and HIV on maternal and child mortality.

**Usability and Flexibility:** LiST software is publicly available for download. The model developers are working to make it available online. Given the large number of inputs required, users of the model should receive training or be familiar with other Spectrum models before using it. A wide range of stakeholders—from donors, governments, nongovernmental organizations, and academic institutions—have used LiST.

Most of the data inputs in LiST are customizable and editable. Users can define their own timeframe for analysis and the interventions to be included. However, users are unable to change existing interventions within LiST, and several of these interventions are not very specific (e.g., antenatal care is an intervention in LiST, rather than the specific technologies or services provided during antenatal care, such as ultrasound). Users can edit the pre-loaded default data in the model to better reflect the current country context if better or more recent data exist. Default country data are routinely updated using data from United Nations population projections, Demographic and Health Surveys, and other sources; for many countries, however, key data inputs, such as the cause-of-death structure for maternal mortality, are outdated and need to be re-examined during a model application.

**Country Applications:** LiST has been applied in many countries to inform global advocacy and national strategic planning. For example, USAID used LiST in developing its *Acting on the Call* reports in 2014, 2015, and 2016. There have also been several applications at the subnational level. For example, in 2014, South Africa applied LiST to determine priority interventions to reduce child, newborn, and maternal mortality in KwaZulu-Natal province for its strategic plan for 2015 to 2019. The Maternal, Child and Women’s Health Unit within the Department of Health updated default data for South Africa in LiST, including entering coverage values that reflected achievement in KwaZulu-Natal province. Two scenarios were generated for the analysis: (1) a “full coverage” scenario of 95 percent coverage for all interventions and (2) an “achievable coverage” scenario that assumed gradual scale-up based on input from experts within the province. The unit also applied the LiST costing module to determine the relative cost-effectiveness of key interventions. The team concluded that the strategic plan should prioritize 17 cost-effective maternal, newborn, and child health interventions, plus family planning, to maximize health impacts in KwaZulu-Natal province.

**For More Information:**
- Manuals for Spectrum, LiST, and LiST Costing: [www.livesavedtool.org/manuals](http://www.livesavedtool.org/manuals)
Equitable Impact Sensitive Tool (EQUIST)


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Website: http://www.equist.info/

Description: EQUIST is an online strategic planning, modeling, and monitoring platform that links several tools. It integrates the conceptual framework of the Marginal Budgeting for Bottlenecks (a tool that addresses health systems deficiencies) with the LiST impact projection function. EQUIST is designed to help governments and the global health community consider issues of equity in maternal, newborn, and child health in a more systematic and evidence-based way. It also aims to help design health strategies that will lead to stronger, more resilient health systems. Applications of EQUIST at national or subnational levels can serve as background or follow-up analysis to support OneHealth applications, which are primarily intended to inform sector-wide national strategic health plans and policies.

Primary Uses: EQUIST estimates maternal and under-five lives saved by wealth quintile, region, and residence (e.g., urban/rural), based on increasing the coverage of key interventions. In some countries, analyses can be done by sex, ethnicity, or caste as well. Decisionmakers can use EQUIST to identify disadvantaged populations; assess why they are disadvantaged; and determine which combination of evidence-based, high-impact interventions and health systems-strengthening strategies could produce the best health outcomes.

Year Released: 2016 (original); EQUIST 2.0 released in 2018

Health Areas Covered: Reproductive, maternal, newborn, and child health; nutrition; malaria; HIV; water, sanitation, and hygiene

Data Inputs: EQUIST comes preloaded with country-specific data, which the EQUIST technical assistance team regularly updates. The tool’s principal data sources are the Demographic and Health Surveys, Multiple Indicator Cluster Surveys, and estimates of mortality rates and causes developed by the Child Health Reference Group and the Inter-agency Group for Child Mortality Estimation. EQUIST allows users to edit default data within the tool or upload more up-to-date or private data sources, including at a subnational level (e.g., provincial or district level).

EQUIST must be set up and customized for a country before the online platform can be used. This customization process occurs at least once every three to five years. The more carefully it is customized, the more precise and valid the results. The customization process must be performed and documented by a well-trained and supported team of experts in a given country.

Model Outputs: Costs and maternal and child lives saved by intervention scenario and subpopulation

Model and Methodology: EQUIST works in a step-wise fashion, which means that as decisions are made, data are entered within a module. This process will have an impact on the data and analysis in subsequent modules. The updated program walks users through a theory of change, which populations are most vulnerable, causes of mortality and morbidity and severity, which interventions are most impactful in addressing causes, which bottlenecks impede
interventions, and which bottleneck-reduction strategies enhance implementation of these interventions. Users can now adjust the effect sizes of selected strategies according to local context if local data are available. Users can visualize data to help inform decision making, including visualizing key drivers of inequity at national and subnational levels. EQUIST consists of seven steps (see Figure 2).

![Figure 2. EQUIST’s Seven-Step Approach](image)


**Usability and Flexibility:** EQUIST is a free tool, available for users to access online. Intended users are persons from funding organizations or those involved in the health policy or health systems-strengthening field, as the tool can guide decisions about how to allocate resources to maximize lives saved while reducing inequities.

EQUIST is a user-friendly tool. The online platform directs users logically through the analysis, and calculations are automatic. The tool is flexible in allowing users to define scenarios and input their own data.

**Country Applications:** EQUIST has been applied in more than 60 countries. In 2017, it was applied in Cameroon, where UNICEF organized an EQUIST workshop with key reproductive, maternal, newborn, child, and adolescent health (RMNCAH) stakeholders from government, United Nations agencies, and international nongovernmental organizations. Use of the EQUIST tool allowed stakeholders to conduct a situational analysis and visualize growing regional disparities by health indicator and worsening access over the last 10 years. The situational analysis revealed that the regions of Adamaoua, the East, the Far North, and the North had the most critical gaps; each of them were selected for the next phase of the analysis, with EQUIST walking stakeholders through Cameroon’s theory of change (see Figure 3), which also underpins the rationale for health system-strengthening efforts.
Cameroon’s theory of change assumes that investments in and implementation of equity-focused strategies that remove quantifiable health system bottlenecks will lead to improvements in the coverage of high-impact health interventions and improved health outcomes for target populations. Stakeholders identified key bottlenecks that prevent effective coverage of the population with both supply- and demand-side high-impact interventions. Costs, acceptability, and continuity were the main bottlenecks for the various identified high-impact interventions. RMNCAH stakeholders then used the EQUIST tool to review data and drivers of poor outcomes and built consensus to select the following priorities: combating maternal and neonatal mortality and malnutrition; adolescent reproductive health; and vital statistics registration. For each of these areas, EQUIST identified a series of high-impact interventions based on their respective potential impacts in terms of lives saved: immunizations, family planning, prenatal care, postnatal care, skilled birth attendance, prevention and treatment of child health illness through integrated management of childhood illness, and expanding access to girls’ education. The main outcomes included prioritization of interventions and geographic areas into Cameroon’s strategic plan.

For More Information:


The OneHealth Tool

**Developer:** Inter-Agency Working Group on Costing (UNICEF, World Bank, World Health Organization, United Nations Population Fund, United Nations Development Programme, Joint United Nations Programme on HIV/AIDS), and Avenir Health

**Contact:** Rachel Sanders, Avenir Health (rsanders@avenirhealth.org); Tessa Tan-Torres Edeje, World Health Organization (tantorrest@who.int)


**Description:** The OneHealth Tool was created in 2009 to forecast the costs and health impacts associated with investments in the health system to meet population health needs and strategic targets. The tool estimates the costs of service delivery under individual health programs (e.g., maternal and newborn health) and the costs of cross-cutting health system components (e.g., infrastructure, human resources for health, logistics, health information systems, and health financing and governance) under a single framework. The OneHealth Tool is integrated into the Spectrum suite of software models, allowing for investment targets to be linked to various health outcome and impact models, such as LiST. The tool continues to expand and improve through routine updates.

**Primary Uses:** The OneHealth Tool can be used to support national strategic planning for the health sector, individual program planning, cross-country comparisons, and advocacy.

**Year Released:** 2012

**Health Areas Covered:** Reproductive, maternal, newborn, and child health; nutrition; immunization; malaria; TB; HIV; noncommunicable diseases; mental health; and other health areas

**Data Inputs:** The OneHealth Tool includes some default data based on global and regional averages. However, all data are editable. The main inputs to the tool include the following:

- Demographic data
- Epidemiological data (e.g., prevalence or incidence of particular diseases or conditions)
- Baseline and targeted intervention coverage
- Health program activity requirements (e.g., health personnel training, mass media campaigns)
- Health system requirements and targets (e.g., planned numbers of health workers to be employed or health facilities to be constructed and equipped)
- Prices of commodities and other inputs

**Model Outputs:** The outputs of the tool include annual and total costs by health program, health system component, and type of cost and estimates of health program and health system requirements (e.g., number of health workers needed to meet intervention coverage targets).

**Model and Methodology:** The tool uses a bottom-up, ingredients-based costing approach. Health program costs include the costs of medicines and supplies needed to deliver specific interventions, as well as programmatic support costs related to training, monitoring and evaluation, supportive supervision, and other activities. The OneHealth Tool estimates
intervention costs by multiplying the number of cases per year by the average unit cost of the commodities needed per case per year. The health systems modules also estimate costs by multiplying the quantities of inputs required each year by the average annual cost. The structure and exact inputs vary by module.

The link to epidemiological models allows for health service costs to be dynamically estimated over time, taking into account population growth, reduced mortality, and reduced incidence or prevalence of disorders as coverage of interventions (preventive and curative) increases. The OneHealth Tool is the only currently existing tool to allow links between disease projection models and to link service targets to health system requirements. The tool can be used to model scenarios around different delivery strategies and targets and to assess associated cost and impact.

**Usability and Flexibility:** The OneHealth Tool requires detailed data inputs. The tool is prepopulated with epidemiological and demographic data, treatment guidelines for effective interventions, and commodity costs to deliver interventions. These data are based on global or regional averages and can be adjusted by the user to be country specific. All inputs for estimating health systems costs must be supplied by the user. Because the tool is fairly complicated, users should attend a one-week training and have intermediate quantitative and Excel skills.

The types of service delivery interventions and how health systems costs are estimated are highly flexible and can be user defined at the configuration stage. However, the outputs are not flexible because the model is hard coded. Users can further analyze data inputs and outputs in Excel.

**Country Applications:** The OneHealth Tool has been applied in at least 25 low- and middle-income countries to inform national health sector strategic planning. In several countries, the OneHealth Tool has been used specifically to cost programs on reproductive, maternal, newborn, child, and adolescent health (RMNCAH).

For example, the government of Tanzania selected the OneHealth Tool to project the costs and health impacts of achieving new commitments outlined in the *National Road Map Strategic Plan to Improve Reproductive, Maternal, Newborn, Child and Adolescent Health in Tanzania (2016–2020): One Plan II*. It was the country’s first application of the tool, and cost results were disaggregated by geographical zone. The results showed that if Tanzania scaled up coverage of 48 RMNCAH interventions, the funding gap could grow from just US$3 million to $38 million in the same timeframe before consideration of Global Financing Facility funding. Further, the model demonstrated that Tanzania’s scale-up plans could reduce newborn and under-five mortality in line with the *One Plan II* goals, but the planned scale-up would not be sufficient to meet 2020 targets for maternal mortality. The government used results from this analysis to form its RMNCAH investment case for the Global Financing Facility and built from this initial application to estimate resource requirements for the entire health sector under the *Fourth Health Sector Strategic Plan 2015/16–2019/2020*.

**For More Information:**

Optima

**Developer:** The Optima Consortium for Decision Science—formed by the Burnet Institute and other partners—designed and developed the model, with support from the World Bank. Model application partners include University College London and the University of Bern.

**Contact:** Nick Scott, Optima Nutrition and HCV Lead, Burnet Institute ([nick.scott@burnet.edu.au](mailto:nick.scott@burnet.edu.au)); general tool support: [info@optimamodel.com](mailto:info@optimamodel.com)

**Website:** [http://optimamodel.com/about.html](http://optimamodel.com/about.html)

**Description:** Initially designed as a research tool, Optima evolved to support countries in strategic planning and developing public health investment cases. Optima can inform resource allocation by determining optimal funding allocations across interventions that maximize health impacts within budget constraints. Optima applies the following approach:

- Assessing the burden of disease over time and for each disease state
- Specifying the efficacy and effectiveness of interventions (for different technologies and delivery modes) that may reduce disease burden and/or costs of service delivery
- Defining strategic objectives and national priority targets, as well as the logistic, ethical, and/or political constraints around achieving these objectives
- Using a formal mathematical optimization algorithm to assess the optimal allocation of resources to best achieve the objectives

Optima models are currently available for five public health programs—HIV, TB, malaria, nutrition, and hepatitis C virus (HCV) prevention and control. Some maternal health interventions are included in the nutrition model, but a separate maternal and child health model is currently under development. Developers plan to expand Optima to other health areas as well, such as noncommunicable diseases and neglected tropical diseases.

Optima is the only model with a formal mathematical optimization function, which compares large numbers of investment scenarios to identify the combination of interventions that have the most impact. The model includes a web-based user interface so users do not need to download the software.

**Primary Uses:** Optima can be used to support resource allocation decisions and strategic planning for specific health programs.

**Year Released:** 2013

**Health Areas Covered:** HIV, nutrition, TB, malaria, HCV infection (*each model is specific to a single health area*)

**Data Inputs:** The models require setting specific data on stunting, wasting, anemia, diarrhea, exclusive breastfeeding, and demographics (population sizes, poverty), all of which are generally available from Demographic and Health Surveys or online sources. Additional data are needed on coverage and cost of interventions, health goals/targets, and funding available for the health area.

**Model Outputs:** Optimal funding allocation strategy, total costs, deaths averted
Model and Methodology: The Optima nutrition model first examined how to optimally allocate funds across six nutrition interventions to maximize impact on stunting and mortality in children under five in a country. The Optima Consortium has expanded the nutrition model to include more than 20 additional maternal and child health interventions. Additional modules for maternal and child health include interventions focused on preventing and treating anemia, such as iron folic acid supplementation among pregnant women and women of reproductive age; family planning; preventing and treating severe and moderate acute malnutrition; and improving water, sanitation, and hygiene.

Optima is the only model that considers health system constraints in determining how to allocate resources (see Figure 4). The parameters in Optima are aligned with those in LiST, and the Optima Consortium is part of the technical advisory groups for LiST and other modeling consortiums.

Usability and Flexibility: Optima models require sophisticated skills to use, although anyone can register for an Optima account and begin using it. Users must be knowledgeable about program statistics, targets, costs, and the country’s epidemiology. The Optima Consortium provides training courses on the models and usually works closely with a country application team. To get the most out of an Optima analysis, national finance/economic experts, monitoring and evaluation experts, and other partners should run the model jointly with trained experts from the Optima Consortium and associated development partners.

Optima is flexible as to which population groups and interventions (or packages of interventions) are modeled, the time period for the analysis, the amount of input data used, and the types of outputs generated. The Optima Consortium continues to update and expand the models.

Country Applications: There have been more than 50 applications of the Optima HIV model in Africa, Asia, Eastern Europe, and Latin America. There are ongoing and planned applications for Optima TB, nutrition, and HCV models, which were developed following the initial development of the Optima HIV model.

The Optima nutrition model has been applied in Bangladesh and Tanzania to inform strategic planning. In Tanzania, the model application included a geospatial analysis that indicated the optimal allocation across regions to reduce child mortality. The analysis also found that the “best buy” in Tanzania is to scale up and support public provision of complementary food. Given
these results, Tanzania is trying to align the location of its food voucher program with locations in which complementary foods are sold.

For More Information:

- Optima HIV User Guide (2020): [https://docs.google.com/document/d/1tfoCRUSUAR80-nhfavOGPZJP5BcQRgQd4DqJjE8giIQ/edit](https://docs.google.com/document/d/1tfoCRUSUAR80-nhfavOGPZJP5BcQRgQd4DqJjE8giIQ/edit)
Maternal and Newborn Directed Assessment of Technology (MANDATE)

Developer: RTI International, with funding support from the Gates Foundation

Contact: Doris Rouse, RTI International (rouse@rti.org); Elizabeth McClure, RTI International (mcclure@rti.org); Robert Goldenberg, Columbia University (rlg88@cumc.columbia.edu)

Website: http://www.mandate4mnh.org/

Description: MANDATE was developed to guide decisions for investing in maternal and newborn health innovations in sub-Saharan Africa and India. MANDATE builds on the foundational methodology of LiST. It serves as a decision-making model for countries with limited resources to assess the impact of specific technologies for reducing maternal, fetal, and newborn mortality.

Primary Uses: MANDATE considers several factors in determining the impact of certain interventions on improving maternal, fetal, and newborn mortality. They include care settings, such as homes, clinics, and hospitals; transfers to facilities to receive further care services; and the impacts of maternal health conditions on fetal and newborn outcomes. MANDATE enables users to address questions such as the following:

- In what types of interventions should stakeholders invest?
- What is the impact of transfer to higher levels of care for maternal, fetal, and newborn outcomes?
- Among the interventions, which yield the greatest impact in reducing maternal and newborn mortality in different care settings?
- For a particular diagnostic measure, what are ways to manage the treatment of a particular condition?

Year Released: 2011

Health Areas Covered: Maternal and newborn health

Data Inputs: Users walk through a series of online data entry pages to develop scenarios. They select a country; timeframe for analysis; health conditions and subconditions to be addressed (illustrated below); and the prevention, diagnostic, and treatment interventions and specific technologies available. Users also enter data on penetration (percentage of population with access to the intervention), utilization (percentage of population with access to the intervention who use it), and efficacy of existing interventions and technologies in reducing adverse maternal health outcomes by care setting (e.g., home, clinic, or hospital). Default data are available in the model for these three categories.

Model Outputs: Maternal and child lives saved by cause of death and level of care

Model and Methodology: MANDATE considers major conditions and related subconditions that cause maternal, fetal, and newborn mortality in sub-Saharan Africa and India. The various conditions and subconditions integrated into the model appear in Figure 5.
**Figure 5. Modeled Conditions in MANDATE**

MANDATE applies a decision tree methodology based on the modeled conditions and subconditions (see Figure 6). The model estimates the population at risk for specific subconditions based on historical incidence rates and demographic data. It uses untreated case fatality rates to calculate the estimated mortality in the absence of an intervention.

**Usability and Flexibility:** MANDATE is a free tool available for users to access online. It is easy to use, with preloaded demographic, epidemiological, and other datasets and behind-the-scenes calculations. The model is fairly flexible in that users can select the specific conditions, subconditions, interventions, and technologies they wish to assess and can edit default data on penetration, utilization, and efficacy. However, default data are not country specific.

**Country Applications:** MANDATE is equipped with default data for geographic locations in sub-Saharan Africa and Indian states. However, applications of the model are mainly limited to analysts in the United States for publications and planning activities. The main goal in applying MANDATE for these types of analyses is to inform broader research and policy discussions on which technologies should be pursued in different country contexts to improve maternal health outcomes. There are currently no trainings developed or provided on how to apply this model at the country level.

Abbreviations: IUGR, intrauterine growth restriction; IVH, intraventricular hemorrhage; NEC, necrotizing enterocolitis; RDS, respiratory distress syndrome.

The following are some examples of MANDATE applications:

- **GSK** conducted an analysis on the impact of oxytocin delivery at the community level. Nigeria and Kenya were selected as countries for this study.

- **The Gates Foundation** conducted a study on tranexamic acid. The analysis sought to address the following question: How many potential lives could be saved by introducing tranexamic acid if it is effective?

- **The Gates Foundation** applied MANDATE to guide decisions on which interventions have the biggest impact on the lives of pre-term babies.

- **Merck** conducted a study that assessed the number of lives saved from using the Odon device during childbirth.
For More Information:

Health Equity Assessment Tool (HEAT)

Developer: World Health Organization (WHO)

Contact: Dr. Ahmad Reza Hosseinpoor, WHO (hosseinpoora@who.int)

Website: https://www.who.int/data/gho/health-equity/assessment_toolkit

Description: HEAT enables the assessment of within-country inequalities. Its software is available online and through download. Disaggregated data show the level of health by population subgroup on a given dimension of inequality. The dimensions include economic status, education, place of residence, subnational region, sex, and ethnicity.

There are two major components—HEAT and HEAT Plus. The HEAT application comes with default data for all countries included in the WHO health equity database. With the HEAT Plus application, a user can use their own country data without the default database. HEAT and HEAT Plus examine the latest situation and past trends of inequality in a country and allow users to set a benchmark for comparison with other countries. Users can assess inequalities using disaggregated data and summary measures visualized in a variety of customized tables and graphs. Results can be exported and saved in different formats.

Primary Uses: To analyze current and past trends in inequities at the country level and across reproductive, maternal, newborn, and child health indicators

Year Released: 2015

Health Areas Covered: Reproductive, maternal, newborn, and child health; nutrition; and malaria

Data Inputs: Coverage and impact indicators for reproductive, maternal, newborn, and child health; nutrition; and malaria

Model Outputs: Fifteen summary measures of inequality across 30 health indicators and five dimensions of inequality (economic status, education, place of residence, subnational region, child's sex, and ethnicity)

Model and Methodology: HEAT and HEAT Plus enable the assessment of within-country inequalities—that is, those that exist between population subgroups within a country—based on disaggregated data of differences in health coverage and status by subgroups. Summary measures of inequality present the degree of inequality across multiple population subgroups in a single numerical figure.

The model accounts for both absolute and relative inequality. Absolute inequality measures indicate the magnitude of differences in health between subgroups, whereas relative measures show proportional differences among subgroups. The model also accounts for equity comparisons across two groups (e.g., males versus females) and multiple groups of people (e.g., wealth quintiles).

Usability and Flexibility: HEAT is a detailed and comprehensive equity monitoring tool that should be used by experts. The online and software version of HEAT comes with default data. HEAT Plus is a more flexible version of the model, in which users enter their own data. Data
input into HEAT Plus must be analyzed from raw datasets, which requires advanced statistical analysis skills.

**Country Applications:** HEAT and HEAT Plus have been applied in more than 110 countries. Indonesia used HEAT to analyze, interpret, and report data on health inequalities. This analysis shed light on where investments were needed to expand services to those who did not have them and to improve their health. For example, since 2012, newborn tetanus had been a growing concern in Indonesia. As noted by WHO, newborn tetanus is a symbol of health inequality, and requires addressing basic infection prevention and control among the poorest and least educated in the population. After determining how to better target newborn tetanus, Indonesia’s government focused on improved vaccination rates in the most disadvantaged areas. As a result, the nation was declared to have eliminated tetanus in 2017, meaning less than one case of newborn tetanus occurs per 1,000 live births in each district. Subsequently, Indonesia has committed to integrating health inequality monitoring into its national health information system.

**For More Information:**

- Global Health Observatory—WHO overview and resources: http://www.equidade.org/ghowho
REDUCE-ALIVE

Developer: FHI 360 (originally created by Academy for Educational Development staff)

Contact: A. Elisabeth Sommerfelt, FHI 360 (esommerf@fhi360.org); Badara Seye, independent consultant (badouseye@gmail.com); Thierno Dieng, CEFOREP (thierno_dieng@hotmail.com)


Description: REDUCE-ALIVE is an Excel-based tool launched in 2000 by the former Academy for Educational Development. Using the theory of human capital as a foundation, the model serves as an advocacy tool to support policy efforts in reducing maternal mortality and increasing newborn survival.

Primary Uses: The REDUCE-ALIVE tool can be used for country-level advocacy and strategic planning around the impacts of achieving maternal and newborn health goals in a country. It does not estimate the health impacts of scaling up specific interventions.

Year Released: 2000

Health Areas Covered: Maternal and neonatal health

Data Inputs: REDUCE-ALIVE requires users to provide the best available data on the following inputs: maternal mortality ratio, neonatal mortality rate, infant mortality rate, under-five mortality rate, maternal anemia, iodine deficiency-goiter (optional), various neonatal health indicators, and—for each year in the analysis time period—demographic information (e.g., projected number of live births and number of women). The user must also enter maternal and newborn health goals (e.g., achievement of Sustainable Development Goals or national targets for reduction in mortality). The model calculates the health impact of meeting the desired health goals compared to a status quo scenario.

Model Outputs: Maternal and neonatal deaths and lives saved, maternal disabilities and averted disabilities, and economic productivity losses and gains

Model and Methodology: The REDUCE-ALIVE model has two primary components. REDUCE is used to support advocacy for policy changes that can improve maternal health outcomes, whereas ALIVE builds on REDUCE by generating data projections that can support advocacy in improving newborn survival. REDUCE can be used alone (without using ALIVE).

Unlike other models included in this report, REDUCE-ALIVE does not estimate the health impacts of scaling up coverage of maternal and newborn health interventions. Rather, it estimates the impact of achieving set maternal or newborn health goals. The model is Excel based and equipped with 15 calculation sheets. Using data from national and global sources, users build two scenarios:

- **Status quo scenario**: Estimates the effects of no changes or improvements in maternal/newborn health during the selected time period
• **Improved scenario**: Estimates the effects of improvements in maternal/newborn health if certain targets aligned with the country’s vision and goals are reached.

For country-level application, the following process takes place. One tool is developed per country. In most cases, REDUCE-ALIVE has been applied at the national level only, not subnationally. Working closely with each other, two teams are created—one that works on data collection and running the model scenarios and another focused on developing advocacy messages based on the generated model projections. Conducting a two-week workshop is another key component in the country application process. During the first week, high stakeholder engagement is demonstrated through the involvement of representatives from the Ministry of Health, Ministry of Finance, and other relevant government institutions. Stakeholders from civil society organizations and implementing partners are also present to validate the data and contribute toward the development of an advocacy plan. In the second week, a smaller group of stakeholders meet to finalize model projections and communication tools. Dissemination of the final products are shared with both government and local stakeholders.

**Usability and Flexibility**: To use REDUCE-ALIVE, users should be well versed in Excel. However, technical support is available by the model developers. Although the developers encourage users to incorporate country-specific data in the model, they recognize that not all data may be available. In this case, data from a similar country can be used. Additionally, the model is intended for national-level use. If users want to apply it subnationally, it is recommended that they use national-level data to run the model but tailor the advocacy messages for the subnational audience.

**Country Applications**: Since 2000, REDUCE-ALIVE has been applied to countries as part of the Action for West Africa Region Reproductive Health and Child Survival Project (AWARE-RH) project, involving collaborative work with the World Health Organization Regional Office for Africa. In addition, there have been several national-level applications conducted with country governments. Countries that have applied REDUCE-ALIVE include Burkina Faso, Cameroon, Ethiopia, Ghana, Mali, Mauritania, Mozambique, Niger, Nigeria, Senegal, Tanzania, Togo, Uganda, Vietnam, and Zambia.

Overall, applications of the REDUCE-ALIVE model have brought forth successful first steps toward improving maternal health-related outcomes for countries. The following are two examples of country applications:

- **Burkina Faso**—The REDUCE-ALIVE model was applied in Burkina Faso as part of the AWARE-RH project. This application emphasized bringing forth data and advocacy messages that support initiatives to improve the country’s HIV situation and decrease the maternal mortality ratio. The country used a methodology similar to the one described above for this application. Two weeks were set aside to conduct a series of workshops; an in-country consultant facilitated data collection. The Ministry of Health was closely engaged throughout the entire process. Following the workshops, dissemination occurred through producing a presentation and a pamphlet, both of which highlighted the model’s results and developed advocacy messages. The results and advocacy efforts from this application yielded positive outcomes for maternal health, as seen in changes in the national health budget. Specifically, improvements were seen in an 80 percent reduction of healthcare costs for C-sections and better resources allocated to obstetric care.

- **Nigeria**—The REDUCE component of the model was applied in Nigeria to train health professionals. Specifically, the following groups were trained on the model: (1)
reproductive health managers involved with the “Making Pregnancy Safer” program; and (2) public health nurses, midwives, and postgraduate public health and obstetrics/gynecology students at Lagos University. After the model development had been completed, the final presentation containing key advocacy messages was shared with the First Lady, the federal Minister of Health, five state assemblies, 31 state directors of primary healthcare, and all reproductive health focal persons from the 774 local government authorities in the country. This application of the REDUCE component contributed to the launch of the ministry’s “National Program on Maternal Mortality Reduction.” The United Nations Population Fund provided additional funding to conduct a rapid assessment of health facilities, which enabled it to determine their overall preparedness for emergency obstetrics care.

For More Information:

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