Supplementary web appendix 4:

INVESTING IN A GRAND CONVERGENCE IN HEALTH: METHODOLOGY

Tables

Introduction

In the last several years, a number of investment cases have projected the costs and expected burden reduction from increased investments in health in low- and middle-income countries. These estimates have focused on individual diseases, clusters of health conditions, key population segments, and efforts to achieve the Millennium Development Goals.[1-7] The investment case analysis for the "grand convergence" in health presented in the *Lancet's* Global Health 2035 report draws heavily on these earlier forecasts and seeks to produce an integrated set of projections. The aim is to estimate what an "all-in" investment would cost, and what it would return in improved health outcomes.

The Global Health 2035 investment case covers a number of preventive, diagnostic and therapeutic interventions. The analysis estimates the costs and potential avertable burden from scaling up health interventions for:

- Leading infectious diseases such as HIV, tuberculosis, and malaria
- A range of maternal and young child health conditions
- Family planning
- Immunization
- Child health, including treatment for diarrheal diseases and pneumonia
- The elimination of neglected tropical diseases.

In addition, our analysis incorporates the costs of system-wide investments, including:

- Investments to strengthen health systems and enable sufficient absorptive capacity to deliver these interventions at scale
- Costs of research and development (R&D) to support the health needs of low- and middle-income countries
- The costs (and incremental impact) of scaling up new health interventions that emerge from these investments in R&D.

The projection focuses on countries defined as low-income or lower-middle-income economies using the World Bank's Atlas Method.[8] Low-income economies all have a gross national income (GNI) per capita of less than US$1035. Lower-middle income economies have a GNI per capita between US$1306 and US$4085. The countries are listed in Table A4.1.

Incremental costs for scaling up these interventions are estimated from 2011 through 2035. This time frame is intended to reflect what a committed increase in investment could achieve in less than a generation. In addition, 2035 marks a 20-year period after the Millennium Development Goals, a fitting time horizon for a report that addresses the 20th anniversary of the 1993 World Development Report.

Our methodology combines a set of country-specific analyses for a range of conditions with global estimates for certain categories of investment. The methodology used to calculate each portion of the analysis is described below.

Reproductive, maternal and neonatal health (RMNCH) interventions

The RMNCH interventions span a broad number of categories, including family planning, antenatal care, labour and delivery, neonatal and post-delivery interventions, immunisation, tools for treating common causes of childhood illnesses and mortality. The full set of interventions is listed in Table A4.2.

Our analysis of these interventions leverages the work conducted by WHO and the Partnership for Maternal, Newborn and Child Health (PMNCH) on a Women's and Children's Health (WCH) investment case.[9] The analysis was conducted using the One Health Tool (OHT), version 3.18 Beta 8, a software product whose development is overseen by the UN Inter Agency Working Group on costing, and carried out by the Futures Institute.[10,11] OHT draws on a variety of other models and inputs – including the Lives Saved (LiST) model– to project the costs and health impacts of scaling up specific interventions in a given country. The WCH investment case modeled the scale up of 51 evidence-based interventions in 74 countries under three different scenarios. Our analysis

incorporates the results of the most ambitious WCH scenario (the "convergence" scenario) in the subset of 34 low-income countries listed in Table A4.1 and three large lower-middle income countries, India, Indonesia, and Nigeria. These results are compared to the results from the least ambitious scenario (the "constant coverage" scenario).

Assumptions for the scale up of RMNCH interventions were based on accelerating current trends using a "best performer" approach. In this calculation, projected trends in coverage levels for an intervention in a given country were based on the fastest rate of positive change achieved historically (since year 2000) in other nations with comparable starting coverage levels. In general, most countries reach very high levels of coverage by the end date of the forecast (2035), often exceeding 95% intervention coverage. Coverage of family planning interventions was set to max out at a level that yields a Total Fertility Rate (TFR) of 2.1, the replacement rate. In the case of new vaccines, scale-up was based on the GAVI Alliance's roll-out predictions. HIV interventions for maternal and child populations (i.e., prevention of mother to child transmission (PMTCT), anti-retroviral therapy (ART), and cotrimoxazole) were adapted from the UNAIDS investment framework.[1]

The constant coverage scenario is based on an extrapolation of each country's recent coverage levels for different health interventions. These coverage levels are projected to remain constant through 2035.

The OHT model produces a range of health outcomes, demographics, and cost metrics for each scenario. To enable a comparison, the outputs of the model for the convergence scenario were compared to the constant coverage scenario, starting in 2011. The WCH scale-up assumptions served as a foundation for our analysis, and interventions focused on other diseases or population segments (e.g., adults) were added to the WCH assumptions in the OHT.

Malaria interventions

Assumptions about malaria scale-up were drawn from the Roll Back Malaria (RBM) Global Malaria Action Plan, specifically updates published in 2011 that reflected new consensus targets for key interventions.[12] The RMNCH projections included a number of malaria interventions that benefit children and pregnant women, such as antimalarials, intermittent preventive treatment in pregnancy (IPTp), and access to insecticide-treated bednets (ITNs). We added assumptions for interventions that targeted the general adult populations, including artemisinin-based combination therapies (ACTs) and ITNs; the RMNCH coverage targets for these interventions focused on children or pregnant women. All the malaria interventions were set to levels consistent with the RBM global targets. These are listed in Table A4.3.

An adjustment was made to update the cost estimates for ITNs calculated using OHT. The unit cost of a long-lasting insecticidal net (LLIN) has fallen over the last several years to an average of US$3.73, among WHOPES-recommended suppliers.[13] This commodity cost is applied uniformly in our projections to LLINs. For service delivery costs, we drew on a benchmarking analysis conducted by White and colleagues, published in *Malaria Journal* in 2011, which reported data on commodity and service delivery costs for ITNs in an earlier period.[14] This analysis found that non-commodity costs represented on average US$1.36 per unit (20% of a mean total cost of US$6.82). For our analysis, therefore, the total unit cost we used for a delivered LLIN is US$5.09.

To measure the total number of LLINs delivered, we took into account other factors beyond the coverage projections: the population in need of a bednet, the duration of LLIN coverage, and the number of people who would use a bednet given that some beds are shared. Population-in-need is taken from World Bank projections that use the Malaria Atlas Project to calculate the populations who live in areas with levels of low, medium or high malaria endemicity.[15] Countries whose endemicity was unreported in the World Bank projects were assigned population at risk levels based on the WHO's Global Malaria Program (GMP) forecasts.[16] For duration of coverage, we assumed an average LLIN life of 3 years, which is consistent with GMP guidelines. Finally, consistent with RBM guidelines for procurement practices, we

assumed that one LLIN would be distributed for every 1.8 people in the relevant population.

As a result the calculation of annual cost for ITNs is:

US$5.09 x (Coverage rate x (Population-in-need/1.8)/3)

In addition, for adult malaria treatments, default rates for the number of treatments in each country in OHT were adjusted when they diverged significantly from recent WHO projections of malaria cases.[17]

HIV/AIDS

As in the case of malaria, some HIV interventions were included in the RMNCH assumptions, such as PMTCT, cotrimoxazole, and ART for children and pregnant women. To extend the scale-up of essential HIV interventions to the broader population and incorporate the most up-to-date aspirations for HIV intervention plans, additional estimates were drawn from recent HIV investment frameworks produced by UNAIDS. In a 2011 HIV/AIDS Investment Framework, Schwartländer and colleagues called for an increase in coverage of ARTs to roughly 80% of eligible patients in countries with generalized and hyperendemic epidemics.[1] Based on new data suggesting the benefits of treatment for prevention, the authors of that Investment Framework have proposed a new "Enhanced Investment Framework" that would scale ART and PMTCT covered to even higher levels (Schwartländer B, UNAIDS, personal communication).

In our model, we projected adult ART coverage reaching 80% by 2015, and rising to 90% by 2025, where it would remain until 2035. PMTCT coverage would reach 90% starting in 2015.

A number of additional preventive interventions and critical enablers were recommended under the Enhanced Investment Framework. The costs and impact of these interventions and enablers were estimated separately. We used the cost projections reported in the 2011 investment framework paper to calculate the proportion of costs attributed to preventive interventions and critical enablers as a ratio of the costs of PMTCT and ART. For this calculation, the combined costs of PMTCT and ART were inflated (by ~25%) over the 2015-2035 period to reflect the increased volume of these interventions in the Enhanced Investment Framework. This adjustment in cost was applied to each country to estimate the costs of preventive interventions and critical enablers.

To estimate the impact of the additional HIV preventive interventions and enablers on new infections and deaths, we drew on projections for declines in global infections presented at the *Lancet* Commission on Investing in Health's technical meeting held in Oslo, Norway in March, 2013. This analysis showcased the potential change in new infections under a range of investment scenarios. The decline under the Enhanced Investment Framework scenario was used and applied to each country modeled. The Enhanced Investment Framework assumptions were aggregated from an analysis of 23 high-burden countries and projected to a global level; in applying this global projection to each of the countries we modeled, we recognize that we may overstate or understate each country's potential for impacting this epidemic.

Tuberculosis

The current module for tuberculosis (TB) in OHT is not well-suited for long-term projections of disease incidence in a context of significantly scaled up interventions. As a result, the TB module in OHT was used only to track the impact of HIV intervention scale-up on HIV and TB co-infection, and to create a starting point that reflected the current rates of TB in a country. A separate calculation was made of the projected overall decline in TB incidence and mortality, based on analyses provided by WHO's Stop TB Department.

The potential improvement in TB control under the accelerated cases is based on two assumptions: (1) that incidence rates for TB would decline at rates comparable to the best historical performing regions, and (2) with increases in health coverage, case fatality rates (CFR) in developing countries can decline over time to rates comparable to those

that exist in richer countries (about 6%) by 2035. The incidence of TB was projected to decline from its current global rate of about 2%- 10% starting in 2015 and extending to 2020. These projections match the steeped recorded declines in history, such as the experience in Western Europe after World War II. The reason for such aggressive assumptions is the significant number of HIV-infected cases where TB emerges as an opportunistic infection. Worldwide, the prevalence of HIV among incident TB cases is 13%, although the figure is much higher in sub-Saharan Africa (e.g., the prevalence is 60% or higher in Botswana, Lesotho, Malawi, Mozambique, South Africa, Swaziland, Zambia, and Zimbabwe).[18] Therefore, aggressive scale-up of HIV interventions and ART increases the likelihood of major reductions in TB incidence in countries with a significant HIV epidemic during the scale-up period. The rate of decline then is assumed to fall to 4% annually through 2030 (based on recent decade-long experiences of China and other high performing countries), before falling to 2% annually for the remainder of the forecast. In addition, scale-up of TB interventions and improvements in health systems capabilities could close the gap in TB case fatality rates.

The declines in incidence were applied to each country uniformly. CFR was projected to decline in straight-line fashion from the country's starting point to a 6% level in 2035. The HIV module in the OneHealth Tool was used to forecast a decline in the number of HIV-positive deaths attributable to TB with the scale-up of ART. The global rate of decline in TB incidence was applied to current projections to calculate the total number of cases over time (HIV-positive and HIV-negative). Declines in TB deaths projected under the global assumptions that exceeded the OHT forecasts for HIV-positive cases were assigned as HIV-negative cases. Adjustments were made in each country to ensure HIV-positive TB deaths did not exceed 75% of the total number of TB deaths in any given year, and to ensure the case fatality rate for HIV-positive infections was not 3.5 times larger than for HIV- cases.

The cost of TB interventions was estimated at US$693 per case, based on input from the Stop TB Department. This amount includes direct costs for TB diagnosis and treatment (drugs, laboratory supplies and equipment, environmental, "administrative" and personal protection measures for TB infection control, costs of delivering DOTs through hospitalization, clinic visits or community involvement, TB monitoring and evaluation and operational research and technical assistance.) It also includes collaborative TB/HIV activities – excluding ART treatment covered by HIV programs. Finally, the figure also covers several programmatic costs (staff for TB control, training, routine program management and supervision, practical approach to lung health interventions, private-public strategies, and management of multi-drug-resistant TB).

A calculation was made to avoid double-counting the deaths of TB patients who are HIV-positive. The ratio of deaths among co-infected people to total HIV plus total TB deaths was calculated for the baseline year (2011). By subtracting the number of co-infection deaths from the number of total HIV deaths plus the number of TB deaths, the total number of deaths from either HIV or TB was calculated. This ratio was then applied uniformly in each country to subsequent years' totals for HIV and TB deaths. Further adjustments were made in a small number of individual country cases where the application of that simple ratio led to anomalous results.

Adjustments to the country analyses

Once these inputs were included in OHT, country projections were modeled and outputs exported to Excel for analysis. Upon review, a series of adjustments were made to the outputs from OHT to correct for anomalies and other issues in the modeling.

- **Resizing stillbirths.** An adjustment was made to the number of stillbirths reported in OHT to ensure consistency with more recent calculations of the burden. New stillbirth figures for each country modeled were taken from the World Health Organization and Save the Children, and used as the starting point for each country's projection.[19] The rate of decline in stillbirths projected in OHT was

then applied to each country to derive the number of stillbirths in each scenario.

- **Removing double counts of costs.** Adjustments were made to remove the excess costs of interventions that were counted more than once in the modeling. For example, the model includes malaria treatment for pregnant women and also for "adults" – yielding potential double-counting of costs.
- **WHO-CHOICE growth costs.** To reflect the fact that countries will need to invest in their health work force and systems to absorb the projected increases in funding and scale-up these interventions, a real inflation factor of 4% was applied to the estimates of WHO-CHOICE unit costs for inpatient and outpatient visits. This amount reflects increases in salaries to expand the health work force and other costs aimed at enabling the delivery of these interventions. Commodity costs were left unchanged. However, this real cost inflation adjustment yields a higher incremental cost for programmatic interventions in our analysis than in the WCH analysis on which our intervention coverage assumptions are based.
- **Extrapolating for LMICs.** The OHT was used to calculate the impact and costs of scaling up health interventions in three lower-middle-income countries (LMICs): India, Indonesia, and Nigeria. These are the three largest LMICs, accounting for more than 70% of the population in LMICs. The aggregate figures and trends in the scenarios for these three LMICs were extrapolated to the rest of the LMICs on the basis of relevant demographic information, such as births and population. Where baseline information was available for the LMIC segment as a whole, (e.g., under-5 mortality rates), the segment figure was used as the starting point for the analysis and changed based on the rates derived from the scenarios for the three-country sample.

Health systems costs

The above analyses include the costs related to the scale-up of these interventions. However, they do not speak to the increased investment needed in infrastructure and health systems to ensure there is adequate absorptive capacity to handle these investments effectively. To estimate the costs of health system strengthening, we relied on the 2009 report of the High Level Task Force on Innovative International Financing for Health Systems (HLTF), which projected the investment needed in developing countries to achieve the Millennium Development Goals. That report estimated per capita investments would need to start at US$14.20 in 2009 and increase to US$29.30 in 2015 in 49 low income countries to achieve the MDGs. The figures in that report were adapted to remove costs that overlap with the OHT outputs and adjustments, and extended through 2035.

Specifically, cost projections for several categories in the HLTF report from 2008-2015 were pulled out and aggregated:

- Program management HR costs—which are not included in OHT—for the relevant program areas covered in this investment case (e.g., HIV, RMNCH, malaria, etc.)
- Infrastructure, equipment and transport
- Logistics
- Health information systems
- Governance
- Health financing

These costs were then projected to begin in 2013 and extend for a seven year period, at which point they would stabilize at the final year level. The costs were set to US $2011 dollars, and a real inflation factor of 2% was applied to the human resources costs in these categories to reflect the increasing investment required to support the health work force over time.

While the portfolio of interventions modeled in the Global Health 2035 report is extensive, it does not include all the demands on a health system. Injuries, chronic diseases, and other conditions contribute to the burden of disease in countries. As a result, we assumed that only 80% of the health system strengthening costs included in the elements above would be allocated to the convergence investment case. The remaining 20% would be borne by conditions not

covered in our analysis. This compares to an assumption of 50% of the health systems strengthening costs in the WCH report being borne by the interventions it includes; the incremental 30% may be considered as representing the health systems strengthening costs for HIV, TB and malaria interventions for adults.

In the case of many LMICs, the need for health system strengthening investments is less than that of lower income countries. To estimate this need, an analysis was conducted comparing current levels of per capita health spending in LMICs to LICs. According to the World Bank, LMICs in 2011 spent US$79.44 per capita on health, while LICs spent US$33.17 on average. The need for health system strengthening in LMICs was calculated as the inverse ratio of spending to the LIC average; for example, a country that spent three times as much on health as LICs was deemed to need one-third the health system strengthening investment to have the absorptive capacity to accommodate the higher levels of intervention coverage characteristic of the convergence scenario. For the LMICs as a whole, the health system strengthening costs were projected as 31% of the High Level Task Force's estimates.

R&D

In April 2012, the WHO's Consultative Expert Working Group (CEWG) on Research and Development issued a report on strengthening global financing and coordination of health R&D.[20] The goals of that study were to take stock of current spending on health R&D for low- and middle-income countries and to estimate what future needs might require. The CEWG estimated that current investment in R&D for low- and middle-income countries was roughly US$3billion per year and that an additional US$3billion per year would be needed to ensure adequate levels of innovation to meet the emerging health needs in these geographies.

To calculate the costs and impact of scaling up the new innovations that emerge from these investments in R&D, a new scenario was created. This "enhanced investment with R&D" scenario projects an incremental reduction in mortality rates from new tools, as well as an incremental cost to procure and deploy those tools. To estimate the potential reduction in burden we drew on research conducted by Jamison and colleagues, which showed that R&D investments had contributed roughly 2% to the average annual decline in under-5 mortality rates in the past.[21] We applied this 2% as an accelerator to the average annual decline in under-5 mortality and maternal mortality rates for the LIC and LMIC analyses. In addition, we applied a 2% incremental decline in the total levels of stillbirths and deaths from HIV or TB.

The additional costs for scaling up these interventions were projected to be equivalent in productivity to the convergence scenario. A cost per death averted was calculated by comparing the incremental costs and deaths for the convergence scenario with the constant coverage scenario. This cost per death averted factor was multiplied by the incremental number of deaths averted when the 2% accelerator in mortality declines was applied to generate an additional incremental cost for scaling up new tools.

Neglected tropical diseases

A separate set of analyses were conducted to project the costs associated with eliminating a set of neglected tropical diseases (NTDs) that remain prevalent in low income countries and that can be controlled with mass drug administration. The analysis focused on onchocerciasis, lymphatic filariasis (LF), schistosomiasis, blinding trachoma and soil-transmitted helminths (STH). This projection is based on a secondary data analysis that takes a stepwise approach to estimate target population growth and forecasting of inputs and programmatic activities to achieve control and elimination by 2040. In 2012 the WHO Africa Region required its countries member states to produce integrated NTD master plans for the period 2012-2015 using an Excel-based program (WHO, AFRO).[22,23] Target populations were derived from country stated population targets and growth rates contained in the report. These were disaggre-

gated according to demographic profiles as constituted by the population pyramid. The main demographic categories were Pre-School Age Child, School Age Child and Adults corresponding to the treatment protocol. Where women of child bearing age were extracted the population figure was added to the adult population. The base year adopted for this analysis was 2014. An average population growth rate of 2.3% was used based on the 36 countries that provided data. None of the countries had estimated the decline due to systematic elimination. The rate of decline was thus calculated based on published literature or expert opinion on the period probabilities towards attaining elimination for each of the diseases.[23,24] The basic analysis for forecasting each year disease target population was simply put:

$$P= y+(y \times r)\, n - \ldots Rn$$

Where P is the target population, y is the base year target population, r is the population growth rate, n is the nth year and Rn is the annual rate of decline in target population for each of the conditions in an nth year. The population was grouped into periods with the first period running till 2020, which coincides with the proposed dates for most of the diseases by WHO, and the subsequent group in five year periods.

Based on the projected population figures for each of the diseases a logarithmic trend line was developed using Excel. The trend was used to smooth out the outliers. First this shows the gradient of drop in endemic populations over time. Secondly, this compensates for various recommendations in each of the disease areas to lower the threshold for mass treatment towards elimination so that all those infected can receive treatment.[23,25] Confidence intervals were not calculated as it may be insignificant statistically generally given the large sample size. The population figures generated by the logarithmic trend were used to forecast drug needs and cost. For each person in the target population the treatment protocol as provided by the World Health Organization was used to calculate the quantity of drugs required.[24] The unit cost of drugs was the same as used by the master plans. Donated drugs were not included in the cost.

Mapping and surveillance activities were estimated based on population ratios or geographic coverage as per the protocols used in the master plans and cost simply aggregated from the budgets provided in the plans. The standard activities and costs for pre and post treatment stoppage surveillance were not provided by the master plans. For both onchocerciasis and lymphatic filariasis the principle of transmission zones assessment and the standard steps and input requirements are well established.[23] WHO had also established a well laid out stepwise approach for determining when elimination or break in transmission has been achieved for schistosomiasis and soil-transmitted helminths.[26] These provided good guides and were used to forecast the cost of mapping and surveillance activities.

The analysis used the standard Community-Based Directed Intervention (CDI) component guide provided by WHO Africa region and disaggregated costs by task, drawing out those activities that are essential for effectiveness and eliminating inefficiencies in implementation. Some of the essential tasks such as policy development, planning and logistics management, health sensitisation, education and advocacy activities, training and personnel, and data collection and information management were treated as having overlaps and double counts were identified and removed. The activities were grouped together as in Table A4.4.

Much attention was paid to technical detail in sequencing when determining when and how to integrate activities. While ivermectin may be safely administered at the same time as albendazole, praziquantel can only be added after at least one separate treatment round. Combining these drugs with azithromycin for trachoma control is currently not recommended.[27] With this understanding, integrated delivery may be carried out in areas endemic for onchocerciasis, LF, and STH, or for STH and schistosomiasis, and in communities that have previously received ivermectin or praziquantel.[28] This had implications for planning and estimating the cost of service delivery for the lead introductory drugs before combined delivery. These understandings were factored into the estimates as the master plan tool did not account for this.

Unit cost estimates were recalculated over the period based on the average GNI per capita using purchasing power parity (PPP) as an adjustment factor. The per capita cost of treatment was then determined through the simple equation of total cost including drugs divided by the target population.

Differences between the convergence analysis and other investment cases

While the convergence analysis relies heavily on the inputs and models used to produce other investment cases, differences in scope, methodology, and assumptions produce cost and impact figures that diverge somewhat from those reported in other published studies. For example, the scope of countries covered in the investment framework often differs. Our convergence analysis modeled 34 low-income economies, and estimated the cost and impact for 49 lower-middle income countries by extrapolating modeled analyses from three of the largest LMICs. The WCH investment framework focused on 35 low-income economies, 27 LMICs, 11 upper-middle income economies, and one high-income country that together constitute the largest burden of maternal and child mortality. Investment cases for specific disease often are global projections, or are focused on the set of countries where the health burden for those conditions is greatest. The HLTF analysis modeled investment costs for 49 low and lower-income countries.

There are also often differences in reporting periods that affect aggregate numbers reported by different investment frameworks. The convergence analysis focuses on costs and impact during the 20 years from 2016 to 2035. In its publication, the WCH report focuses on the period from 2013-35. HLTF addressed the period from 2009-2015, given its focus on the steps needed to address the MDGs. Different time periods will naturally produce different aggregate investment figures.

The cost and impact of R&D is also treated differently in different analyses. In our model, technical progress is critical to achieving convergence. As a result, we have included in our framework not only the costs for future R&D investments, but also estimates for the costs of scaling up new innovations and the impact those new tools will produce in the form of reduced mortality. These estimates have been applied evenly across conditions since it is unclear where the benefits of technical progress will be strongest. Other investment cases vary in their treatment of R&D. Some are silent on the impact of future R&D, focusing instead on the impact and cost of currently-available interventions. Others estimate the incremental impact of one kind of intervention (often a vaccine) with game-changing potential.

The breadth of interventions covered in our convergence analysis has also led us to use different assumptions in some areas than other investment frameworks. One example is the treatment of health-systems-strengthening investments. Because we include a large number of interventions – which collectively may challenge health systems' absorptive capacity to achieve robust scale-up – we have sought to include an appropriate share of health-systems-strengthening costs in our investment case. Investment cases for individual diseases sometimes do not directly address the question of health systems strengthening (HSS) investments. In the WCH case, which also features a large number of interventions, there is a significant cost attributed to HSS investments; however, because we include an even larger number of interventions in the convergence analysis, we have used a larger assumption for HSS costs. In addition, we have tried to address the increasing demand for health workers over time by applying a real inflation factor to non-commodity costs.

Finally, we have applied minor adjustments to other analyses in certain areas, including intervention coverage levels, intervention costs, rates of uptake, and starting burden. Many of these adjustments are summarized above. Collectively, these changes lead to slightly different figures than those reported in other investment cases, but which are generally consistent overall with the findings reported in other studies.

Table A4.1

Low-income countries (LICs) modeled in the Global Health 2035 investment case

Afghanistan	Guinea	Nepal
Bangladesh	Guinea-Bisau	Niger
Benin	Haiti	Rwanda
Burkina Faso	Kenya	Sierra Leone
Burundi	Korea, Dem Rep.	Somalia
Cambodia	Kyrgyz Republic	Tajikistan
Central African Republic	Madagascar	Tanzania
Chad	Malawi	Togo
Comoros	Mali	Uganda
Congo, Dem. Rep	Mauritania	Zimbabwe
Eritrea	Mozambique	
Ethiopia	Myanmar	

Table A4.2

List of interventions included in the RMNCH analysis

Intervention number	Package
	Package 1: Family Planning
1	Modern family planning methods (pill, condom, injectable, IUD, implant, female sterilization, male sterilization, lactational amenorrhea method, vaginal barrier method, vaginal tablets, other contraceptives)
	Package 2: Maternal and Newborn Health
2*	Safe abortion
3	Post-abortion case management
4	Ectopic case management
5	Syphilis detection and treatment (pregnant women)
6**	Multiple micronutrient supplementation
7**	Balanced energy supplementation
8	Management of pre-eclampsia (magnesium sulphate)
9**	Detection and management of diabetes in pregnancy
10**	Detection and management of fetal growth restriction
11	Labour and delivery management
12	Active management of the 3rd stage of labor
13	Management of eclampsia (magnesium sulphate)
14	Neonatal resuscitation (institutional)
15	Kangaroo mother care
16	Clean practices and immediate essential newborn care (home)
17	Antenatal corticosteroids for preterm labor
18	Antibiotics for preterm premature rupture of the membranes (pPRoM)
19	Induction of labour (beyond 41 weeks)
20	Neonatal infections/newborn sepsis - Full supportive care
21	Preventive postnatal care
22	Periconceptional folic acid supplementation
23	Calcium supplementation for prevention and treatment of pre-eclampsia and eclampsia

Table A4.2 continued

List of interventions included in the RMNCH analysis

Intervention number	Package
	Package 3: Malaria
24	Malaria treatment (children)
25	Insecticide treated materials
26	Pregnant women sleeping under an ITN
27	Intermittent preventive treatment - IPT (pregnant women)
28	Treatment of malaria (pregnant women)
	Package 4: HIV
29	Prevention of mother to child transmission (PMTCT)
30	ART (first-line treatment) for pregnant women
31	Cotrimoxazole for children
32	Pediatric ART
	Package 5: Immunization
33	Tetanus toxoid (pregnant women)
34	Rotavirus vaccine
35	Measles vaccine
36	DPT vaccination
37	Hib vaccine
38	Polio vaccine
39	BCG vaccine
40	Pneumococcal vaccine
41**	Meningitis vaccine
	Package 6: Child Health
42	Oral rehydration therapy
43**	Zinc (diarrhea treatment)
44	Antibiotics for treatment of dysentery
45	Pneumonia treatment (children)

Table A4.2 continued

List of interventions included in the RMNCH analysis

Intervention number	Package
	Package 6: Child Health *continued*
46	Vitamin A for measles treatment (children)
47	Breastfeeding counseling and support
48	Complementary feeding counseling and support
49	Management of severe malnutrition (children)
50**	Management of moderate acute malnutrition
51	Vitamin A supplementation in infants and children 6-59 months

* In countries where abortion is legal.

** Current analysis includes impact only, not cost.

Table A4.3

Malaria interventions based on Roll Back Malaria (RBM) objectives, targets and milestones

Target	Assumption
Objective 1: Reduce global malaria deaths to near-zero by end 2015	ACT scale-up to 100% by 2015 for adults and children
Objective 2: Reduce global malaria cases by 75% by end 2015 (from 2000 levels)	IPT coverage at 100% by 2015 Access to LLINs at 100% by 2015

Table A4.4

Community-based directed intervention (CDI) components and task/input areas

Component	Tasks and inputs
Infrastructure and logistics management	Operational equipment e.g. generators, torch light, etc. Vehicles, motorbikes and other transport Communication equipment Health Information and technology equipment Procurement and supply chain management
Human resource management	Community engagement and recruitment of community directed distributors (CDDs) Professionals support staff External technical assistance Training of CDDs Technical training and fellowships
Policy and programme implementation and management	Policy, plans and budget development Monitoring and evaluation Programme implementation and service delivery
Cross border activity management	Health sensitisation, education and advocacy Monitoring and evaluation Joint meetings and synchronised implementation Joint advocacy and community relations for displaced persons Joint monitoring and evaluation

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