ADDING IT UP:
The Costs and Benefits of Investing in Sexual and Reproductive Health 2014—Estimation Methodology

APPENDIX B.
Estimating Sexual and Reproductive Health Program and Systems Costs

by Jacqueline E. Darroch, Susheela Singh and Eva Weissman

Full report:
https://www.guttmacher.org/report/adding-it-costs-and-benefits-investing-sexual-and-reproductive-health-2014-methodology

Table of Contents

Introduction

This report presents findings from a review of studies on the cost of scaling up global health programs. The review was undertaken in the fall of 2012 in an effort to improve the program and system cost component of the 2014 version of the Adding It Up project. The goal of the study was to identify what kind of costs make up "program and systems costs" and to find cost information that could be adapted and used in Adding It Up–2014.[1]

Four major sources of information on the cost of scaling up health programs at the global level were identified and included in the study:

- Cost estimates on scaling up maternal and child health from the *World Health Report 2005: Make Every Mother and Child Count* (WHR 2005).[2,3,4]
- Revised cost estimates developed in 2009 for the implementation of the International Conference on Population and Development (ICPD) consensus (henceforth referred to as ICPD Revision);[5,6]
- Estimates extracted from a 2010 report by Working Group 1 of the WHO Taskforce on Innovative Financing for Health Systems (referred to as High-Level Taskforce, or HLTF).[7,8,9]
- Cost estimates from *A Global Investment Framework for Women's and Children's Health 2015–2035: Investment Gaps and Projected Outcomes*, developed by the Study Group for the Global Investment Framework for Women's and Children's Health (referred to as Global Investment Framework, or GIF)[10,11]

In addition, we searched the literature for any country-specific studies that aimed to measure program and systems costs for SRH services.

The goal was to analyze and synthesize the different estimates to arrive at as comprehensive as possible an estimate of program and systems costs appropriate for the scale-up of SRH service provision as presented in Adding It Up. The four global sources differed in many respects, including their coverage of populations and countries, the method for expressing and presenting costs (for example, WHR 2005 provided the absolute amount of dollars for a given component, while the High Level Taskforce expressed costs as dollars and cents per capita of the population covered), and the number of years covered by the estimate (annual, seven and 10 years, respectively). We converted all the different cost estimates into annual costs per capita and, where possible, separated the cost estimates into capital and recurrent costs, in order to be able to compare the cost data across sources and to check for consistency, assess differences and examine plausibility of the different estimates.

After an extensive analysis of the available data we came to the conclusion that none of the approaches and methodologies used for costing out the scale-up required to provide universal health coverage in developing countries provided a perfect model for costing out these kinds of endeavors. Each model had its own strengths and weaknesses. Some had well-documented assumptions and/or cost breakdowns, some did not. In the end, we had to give up on our initial idea of putting together a solid and comprehensive costed health system model which would combine the strongest components of the different studies and revert to the health system costing approached used in previous versions of Adding It Up for 2008 and 2012 (Annex 1).[12,13,14,15] Details of the methodology for 2014 are presented in Section 8 of the main text of the Estimation Methodology (https://www.guttmacher.org/report/adding-it-costs-and-

benefits-investing-sexual-and-reproductive-health-2014-methodology) and resulting estimates are included in Table 50 of the accompanying tables.

This write-up is mainly intended to document the work we did. We hope that highlighting the different approaches taken might inspire future researchers in their quest to finally answer the question of what it takes to provide developing countries with the health system required to provide high-quality SRH care to 100% of their population.

Background on the four reports included in the analysis

The WHR 2005 estimated the costs of expanding the coverage of 67 essential maternal and newborn health (MNH) interventions at facilities toward universal access (family planning was only partially included, under postpartum family planning; Table 1 and Annex 2). Costs included activities assessed to be crucial in strengthening maternal and newborn health care services to improve health and reduce morbidity and mortality. The report focused on the 74 countries (with a combined population of about 4.7 billion in 2005) that account for the majority of the maternal and newborn ill-health and mortality burden in low- and middle-income countries. Cost estimates were made for the 10-year period 2006–2015.

The ICPD report published in 2009 reviewed and updated the cost estimates generated for the Cairo conference 15 years prior. It presented revised estimates for the four components of the ICPD population package, comprising family planning services; basic reproductive health services; prevention activities for HIV/AIDS and other STIs; and basic research, data and population and development policy analysis projected for the years 2009–2015. The analysis covered 155 developing countries with a population of about 5.3 billion. Unlike the WHR 2005, which only looked at the additional cost of increasing coverage from current to universal levels, the ICPD report calculated total costs. The ICPD report used the maternal health estimates and many of the health system cost estimates generated by the WHR 2005, adjusting them to its target population and adding some new components. It also used some of the cost estimates that were concurrently developed by the High-Level Taskforce.

The High-Level Taskforce report, also published in 2009, identified what it would take to strengthen health systems to scale up service provision and reach all the health-focused Millennium Development Goals (MDGs) in low-income countries. Costing focused on the 49 poorest countries. The areas of intervention covered not only maternal and reproductive health but included MDG 1 (undernutrition), MDG 4 (maternal health), MDG 5 (child health) and MDG 6 (HIV, tuberculosis and malaria). The projections were for the time period 2009–2015.

The Global Investment Framework report (published in 2014, available to the authors in draft prior to publication) was developed by a number of partners, coordinated by the World Health Organization, the Partnership for Maternal, Newborn & Child Health (PMNCH) and the Lancet Commission on Investing in Health. The analysis covered 74 of the 75 Countdown to 2015 countries (South Sudan was excluded due to limited data availability) which were estimated to have a total population of 4.9 billion in 2013, and jointly account for more than 95% of maternal and child deaths. The group developed a global investment framework to make the case for accelerated and better targeted investment and to position

women's and children's health firmly on the post-2015 development agenda. The approach extended previous work on reproductive, maternal, newborn and child health (RMNCH) investment needs. The projections cover the years 2013–2035.

Table 1. Major estimates of the cost of scaling up health programs and their characteristics

Characteristic	WHR 2005	ICPD Revision	HLTF	GIF
Year published	2005	2009	2009	2014
Projection period	2006–2015	2009–2015	2009–2015	2013–2035
Number of countries covered	75 countries with highest maternal newborn mortality burden	155 developing countries	49 poorest countries (2007 GDP $935 or less, 33 are in Sub-Saharan Africa)	74 Countdown countries, accounting for ≥95% of all maternal and child mortality
Population covered	4.9 billion	5.3 billion	1.4 billion	4.9 billion
Coverage increase	From current to 95%	Total cost of universal coverage	From current to a range of country and global targets; many 95%	From current to an average of 88% across interventions
Health areas included	Maternal and newborn health, postpartum FP	Maternal and newborn health, FP	MH, FP, CH, TB, HIV, malaria	Maternal, newborn and child health

Key staff from WHO and (to a lesser degree) from UNFPA were involved in all four reports. Even though the reports were published with different foci and target populations, a large amount of data and methodologies were recycled throughout these publications.

Components of Program and Systems Costs

A total of eight health system components were identified and costed in the four reports, with the later reports being more comprehensive than the earlier ones (Table 2). The WHR 2005 only included cost information on the first four components (program costs, investments in infrastructure, transportation and communication as well as training of medical staff). The ICPD Revision added two additional components (investments in the logistics and supply chain and health information systems) but did not provide any information on their cost or what was included in these components. The High-Level

Taskforce Report included components 1–6 (providing detailed cost estimates on all of them), it also added one more component (costs of improving leadership and governance). The Global Investment Framework publication also covered components 1–8, reusing many of the Taskforce estimates (2009–2015) and updating them for its 2013–2035 projection period. The ICPD, with its unique focus on population and reproductive health, also included a section on the cost of population and RH surveys (component 9).

Table 2. Cost components included in major estimates of the cost of scaling up health programs

Cost component	WHR 2005	ICPD Revision	HLTF	GIF
1. Program management	X	X	X	X
2. Infrastructure—Facilities	X	X	X	X
3. Transport and communication	X	X	X	X
4. Human resources (pre- and in-service training)	X	X	X	X
5. Logistics and supply chain		X	X	X
6. Health information systems		X	X	X
7. Leadership and governance			X	X
8. Health financing			X	X
9. Research/data/policy analysis		X		

The following provides a more detailed analysis of how health system components 1–8 are costed in the four reports. Component 9 (research/data/policy analysis) is included only in the ICPD revision and is not discussed here because these costs are not directly related to program and health systems costs. Wherever possible we tried to separate capital from recurrent costs.

1. Program and Program Management Costs

Program management costs are included in all four reports, in more or less detail (Table 3). The most detailed description of what types of items and activities are included is provided by the WHR 2005, which provides cost estimates not only for total maternal health program management cost but also for its different subcomponents (management, supervision, IEC, advocacy and M&E). The ICPD report states that program costs are included but does not provide any description or cost estimate. The Taskforce also includes program management costs but they are combined and presented together with drug and supply costs as well as some program specific capital costs as "program costs." The GIF report takes the cost estimates from the Taskforce report and disaggregates them again into drug/supply costs and program management costs.

Table 3. Program management costs included in major estimates of the cost of scaling up health programs

	WHR 2005	ICPD	HLTF	GIF
Cost details	Included, detail on cost and description of what cost items included provided	Included under total program and systems costs, no breakout or description of included items given*	Included, not shown separately, but presented together with drug and supply costs + some program-specific capital costs	Included, based on HLTF values, added: child health and immunization
Total costs	$1.6 billion over 10 years (average 4% of total cost)	u	Excluding drugs and capital costs, about $8 billion over 7 years	$84 billion over 23 years (avg. 8.7% of total cost)
Avg. annual cost	From $98 million in 2006 to $191 million in 2015	u	Just above $1 billion	Average per year: $3.5 billion
Per capita	About $0.04 per year	u	Just under $1 per year excluding drugs and capital costs	About $0.70 per year
Recurrent/ capital cost	Recurrent costs only	Using WHR data so recurrent only	Recurrent + program-specific capital costs	Recurrent cost only

Note: u=unavailable. *Staff supervision is included here under program management although it is listed as a separate category in the ICPD revision documentation.

WHR 2005

Based on the WHR 2005 definition, program cost include the recurrent cost for:

- Program planning and management
- Supervision
- Health education
- Advocacy
- Monitoring and evaluation

The WHR 2005 put these costs at approximately $1.6 billion over 10 years, rising from $98 million in 2006 to $191 million in 2015 when universal coverage is reached. Table 4 shows the distribution of these program costs among its different components.

Table 4. WHR 2005-estimated distribution of program costs by component

	2006–2015 total costs (in millions)	% of total costs
Program management	$250	15
Supervision	$75	5
Health education	$756	46
Advocacy	$287	18
M&E	$269	16
TOTAL	$1,637	100

Source: reference 3.

The following is a brief explanation of what is included in the different WHR 2005 program cost components (more detail can be found in Annex 2):

a) Program management

- Development and assessment of policy, regulations and strategic and operational plans for MNH programs
- Costs included: meeting costs, travel costs, per diem, consultant days, staff salaries, and supplies
- $0.003 per capita per year; in 2006, $0.006 per capita per year; in 2015, 0.6% of total cost over 10 years

b) Supervision

- Supervision of MNH related staff, services and programs (includes districts, referral facilities and first-level facilities)
- Costs included: per diem and travel costs
- $0.001 per capita per year in 2006, $0.002 per capita per year; in 2015, 0.2% of total cost over 10 year

c) Health education

- Community mobilization to raise awareness on MNH-related issues through media (radio and TV time) and printed material (posters, fliers)
- $0.01 per capita per year; in 2006, $0.02 per capita per year; in 2015, 1.9% of total cost over 10 year

d) Advocacy

- Development of advocacy strategy, advocacy materials and implementation of advocacy activities
- $0.004 per capita per year; in 2006, $0.008 per capita per year; in 2015, 0.7% of total cost over 10 year

e) Monitoring and evaluation

- Establishing or integrating MNH into M&E frameworks and designs, conducting community-based surveys (Demographic and Health Surveys etc.) and conducting facility-based surveys
- Costs included: staff salaries, supplies, per diem, traveling costs, meeting costs, consultant days

- $0.003 per capita per year; in 2006, $0.006 per capita per year; in 2015, 0.7% of total cost over 10 years

Overall, program management costs for maternal health at universal coverage level (in the year 2015) added up to $191 million or about $0.04 per capita per year with 100% of these costs considered recurrent.

High-Level Taskforce

The HLTF made separate estimates of the costs of interventions to prevent or treat specific types of disease and of health care, as well as the costs of health systems that are not specific to any one type of program or service.

In calculating the costs of disease- or health-focused interventions, they used a more comprehensive definition of program costs than WHR 2005, including not only the program management costs mentioned above, but also some program-specific capital costs and, most importantly, commodity costs (drugs and supplies) for the different disease or health intervention program. Table 5 shows examples of these costs for maternal health and family planning programs. The human resources costs for specific health programs such as these included salaries of staff responsible for program management (i.e., staff costs incurred at national, regional and district level for employing staff for administration, data management and monitoring of the specific health programs). Other expenses for health programs that were incurred for personnel training, per diems and incentives etc. are classified as other costs. The costs of the frontline health workers are included in the health system component for human resources rather than under health program-specific costs because most would provide care across multiple disease and health interventions.

The category for drugs (medicines) and commodities includes costs for drugs, vaccines and other consumables incurred as interventions are scaled up.

The category for infrastructure, equipment and vehicle costs include purchasing and maintainence on capital investments, such as buildings, equipment and infrastructure. Costs presented here under each programmatic area are those costs which would be specific to the program and not counted under the systems-wide construction costs. For example, the construction of maternity waiting homes is included here for maternal and newborn health, and the purchase of equipment specifically for ensuring a functioning cold chain for vaccines is includedunder costs for immunization programs.

Other program costs include those resources not included in the above three categories, such as per diems and other costs for conducting meetings, workshops and training courses; costs for disease-specific surveys; information and education campaigns; and advocacy events.[7]

Table 5. HLTF-estimated resource requirements for all disease- and health-focused intervention programs and for maternal health and family planning programs, by type of components (in per capita 2005 U.S. dollars)

	2009	2010	2011	2012	2013	2014	2015	Total
All programs	**3.84**	**4.62**	**5.66**	**6.40**	**7.17**	**7.85**	**9.25**	**44.79**
Maternal health	**0.51**	**0.65**	**0.85**	**1.04**	**1.37**	**1.66**	**1.93**	**8.01**
HR costs (salaries)	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.08
Drugs and commodities	0.05	0.11	0.20	0.32	0.49	0.66	0.84	2.67
Infrastructure, equipment and vehicles	0.11	0.15	0.20	0.20	0.29	0.32	0.31	1.58
Other	0.35	0.38	0.44	0.50	0.59	0.68	0.76	3.69
Family planning	**0.73**	**0.88**	**1.03**	**0.96**	**0.89**	**0.77**	**0.57**	**5.83**
HR costs (salaries)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drugs and commodities	0.02	0.04	0.07	0.09	0.11	0.13	0.14	0.60
Infrastructure, equipment and vehicles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	0.71	0.84	0.96	0.87	0.78	0.64	0.43	5.23

Source: reference 6.

Extracting only program management costs from these estimates, salary costs were about $0.01 per year per capita for maternal health and family planning combined, similar to the personnel cost estimated in the WHR 2005 for program management and supervision. Cost for meetings, training courses, IEC materials and advocacy events, on the other hand, were substantially higher than in the WHR 2005. They ranged from $1.00 to $1.10 per year per capita (again combined for the two areas).

Global Investment Framework

The GIF report used the cost estimates from the HLTF report but broke these costs into two separate categories: commodities and program management costs (Table 6). Costs directly related to RMNCH were identified as those costs included under the areas of management of childhood illness, immunizations, maternal health and family planning. The average annual estimated cost was calculated for seven years (2009–2015) and applied to the first seven years of its scale-up period (2013–2019). The 2019 level of investment was then maintained over time from 2020 onwards. Costs were included only for the 49 countries for which HLTF estimates were available (not all 74 countries covered by the study).

"For the High scenario we multiplied the estimates by 1.5 on the assumption that additional investments will be needed for RMNCH programs in order to push coverage up to more accelerated targets. While arguably some of the components of this cost would be a fixed investment that would not vary much with population growth (e.g., policy development, mass media campaigns), other inputs would be expected to vary with population growth and coverage (e.g., monitoring surveys), and there may be more training and communication activities required as services are extended to cover a larger part of the population."[11]

Table 6. HLTF-estimated additional RMNCH-specific costs in 74 countries for high scenario compared to low scenario (billion US$, 2011)

	2025	2035
Commodities	6.1	6.7
Program management costs (a, b)	3.5	3.5
Improving adolescents accessibility to health services	1.6	1.7
Conditional cash transfers (c)	0.2	0.2

Notes: (a) Costs for programme management, health information systems and governance include expenditure for monitoring and evaluation. (b) A 50% share is allocated towards RMNCH. (c) Conditional cash transfers for improving access to safe institutional delivery.

Source: reference 11.

Total cost for program management came to $84.3 billion over 23 years, and about $3.5 billion annually or about $0.70 per capita (this includes not only maternal health and family planning, but also child health and immunization programs).

Comparison of different values

The WHR 2005 report estimates for program costs of $0.04 per capita that were also used in the ICPD report seem rather low. More credible are the estimates of the Taskforce and the GIF estimates ($1.00 and $0.70, respectively, for management personnel, meetings, training, IEC etc., and excluding drugs, medical supplies and capital costs). The second number probably needs to be modified to take into account that it also includes program management for child health, so it would more likely be half the stated amount (in the $0.30–0.40 per capita range). Applied to the population covered by AIU-2014, this would imply a total cost of program management of between $0.30–1.00 x 6 billion = $1.8–6 billion (average $3.9 billion in 2009 dollars).

2. Infrastructure Investments—Facilities

The four reports covered very different investments into countries' medical infrastructure (Table 7). The WHR 2005 report costed only upgrades of existing facilities, while the ICPD report included upgrades as well as the construction of additional facilities. Unfortunately no details were given on the number of facilities constructed or the cost of this effort. The Taskforce report focused solely on new construction and contains cost estimates for the construction and equipment of 89,000 health centers, 6,400 district

hospitals and 1,100 provincial hospitals. The GIF report used the HLTF capital cost estimates and, using the assumption that none of these investments had actually taken place during the 2009–2015 projection period of the HLTF, redistributed them over the first 10 years of its 2013–2035 projection period.

Table 7. Infrastructure costs included in major estimates of the cost of scaling up health programs

	WHR 2005	ICPD Revision	HLTF	GIF
Cost details	Upgrades only	Upgrades and new construction	New construction	New construction
Total costs	$6.1 billion over 10 years	$108 billion over 7 years (includes unspecified amount for logistics and HMIS)	$90 billion over 7 years	$68.4 billion over 12 years (only for 47, not all 74 countries)
Per capita	$1.20 per capita	About $20 per capita for 7-year period	$64 per capita over 7 years ($45 p.c. total capital costs and $6.30 annual recurrent costs once 100% operational)	$14 per capita if spread out over population of all 74 countries or $68 if only applied to 47 countries
% of total	15% of total cost	Including all the other components, 51% of total costs	36% of total	7% of total cost
Recurrent/ capital cost	Capital and recurrent cost	Capital and recurrent cost	Capital and recurrent cost	Capital cost only

WHR 2005

The WHR 2005 report included some modest cost estimates for improving the medical infrastructure of countries. It did not cost the building of new health facilities/hospitals but focused on the upgrade of existing facilities (in particular, the upgrade of first and backup level of care hospitals/health centers to birthing centers comprising infrastructure, equipment, supplies, drugs and transportation).

Countries were divided into four health system constraint (HSC) categories depending on their development status and the constraints and challenges they faced in implementing a scale-up of maternal health. It was assumed that all hospitals in countries in HSC category 1 and 2 (11,473 hospitals) and half of all HSC category 3 hospitals (1,500) would require upgrading of facilities, equipment and supplies to enable health care professionals to provide around-the-clock, quality backup MNH services. In order to ensure two midwifery-led birthing centers per district with a population of 120,000, approximately 12,000 health centers would need to be upgraded (to birthing centers).

According to information provided by Karin Stenberg, the author of the report, an average hospital upgrade was estimated to cost about $47,000, while a health center upgrade was assumed to cost about $4,600. Facilities were assumed to become operational after three years of construction (for hospitals) and after one year (health centers). Maintenance once the facility was functional was budgeted at 10% of the capital investment amount.

In total, health system investments cost $8.8 billion over 10 years, 22% of total projected costs of $39 billion (Table 8). Infrastructure costs, including operating and maintenance costs, accounted for $6.1 billion (69%) of health system costs. No annual numbers for instructure costs were available, but total health system costs for the initial and final year, as shown in Table 9 ($475 million in 2006 and $716 million in 2015, respectivel, but a graph shows a curve which reaches approximately $800 a year around 2010 before going down again when capital investments are gradually replaced by operating costs.

Table 8. WHR 2005-estimated incremental costs to scale-up maternal and newborn health care, by type of intervention, 2006–2015

Intervention	Total costs (U.S. dollars)	% of total
Antenatal care	$9,045,479,063	23
Care during birth	$15,264,738,489	39
Postpartum & postnatal care	$2,049,539,823	5
Postpartum family planning	$1,633,631,445	4
Abortion and postabortion care	$843,301,416	2
Program management	$249,662,591	1
Supervision	$75,172,339	<0.5
Health education	$756,422,919	2
Advocacy	$286,617,137	1
M&E	$268,617,137	1
Health system investments	**$8,802,913,123**	**22**
Infrastructure	$6,077,503,077	15
Transportation	$1,884,992,189	5
Training	$840,417,857	2
Total	**$39,276,030,887**	**100**

Source: reference 3.

Table 9. WHR 2005-estimated incremental costs to scale-up maternal and newborn health care by expenditure category, 2006, 2015 and 2006–2015 (U.S. dollars)

Cost components	2006	% of total	2015	% of total	Total	% of total
Remuneration of service providers	190,873,037	18	1,703,544,317	28	9,804,422,758	25
Drugs, supplies, & lab tests	269,927,348	26	3,543,705,254	58	19,032,267,477	48
Investments in the health system	474,982,750	46	715,711,011	12	8,802,913,123	22
Program costs	98,227,590	9	191,648,858	3	1,636,427,528	4
Total	**1,034,010,725**	**100**	**6,154,609,441**	**100**	**39,276,030,887**	**100**

Source: reference 3.

ICPD Revision

The ICPD report says that the WHR 2005 figures for facility upgrades were used in its cost estimation, adjusting the number to account for the additional countries included in its calculations. To that number were added costs of constructing new facilities (no information was given on what types of facilities and in what number).

Unfortunately, the ICPD report only presented a total health system cost number (US$108 billion over seven years) that included not only the mentioned infrastructure costs but also the cost of improving logistics and health information systems and miscellaneous unspecified health system components.

High-Level Taskforce

The HLTF report did not cost out facility updates, only new construction and required equipment and furniture for the following facilities, for a total capital investment costs of about $65 million in 2005 U.S. dollars:

- 89,000 health centers (about $200,000 per facility)
- 6,400 new district hospitals (about $4,000,000 per facility)
- 1,100 provincial hospitals(about $20,000,000 per facility)

It was estimated that health centers would be operational in one year, district hospitals in three and hospitals in five years. Once operational, facilities were assumed to incur operating costs that were equivalent to 15% of their construction costs (i.e., $30,000 per HC, $600,000 per district hospital and $3 million per provincial hospital). Overall health system infrastructure costs were just above $90 billion over 7 years, or $63 per capita (Table 10). Annual per capita cost rose from $6.13 per capita in 2009 to $6.33 in 2015. Infrastructure costs accounted for 49% of total health system costs and 36% of total cost.

Table 10. HLTF-estimated incremental infrastructure costs (in 2005 US$ billions) and costs per capita (in 2005 US$), by component, by year 2009–2015 and total

	2009	2010	2011	2012	2013	2014	2015	Total
Total (billions of US$)	8.34	12.84	17.33	18.45	13.09	11.42	9.75	91.23
HR costs (salaries)	0.02	0.03	0.05	0.05	0.05	0.05	0.05	0.28
Drugs and commodities	0.03	0.06	0.10	0.13	0.17	0.21	0.25	0.94
Infrastructure, equipment and vehicles	8.30	12.74	17.19	18.27	12.88	11.17	9.46	90.01
Per capita total (US$)	6.13	9.23	12.20	12.72	8.84	7.56	6.33	63.01

Source: reference 7.

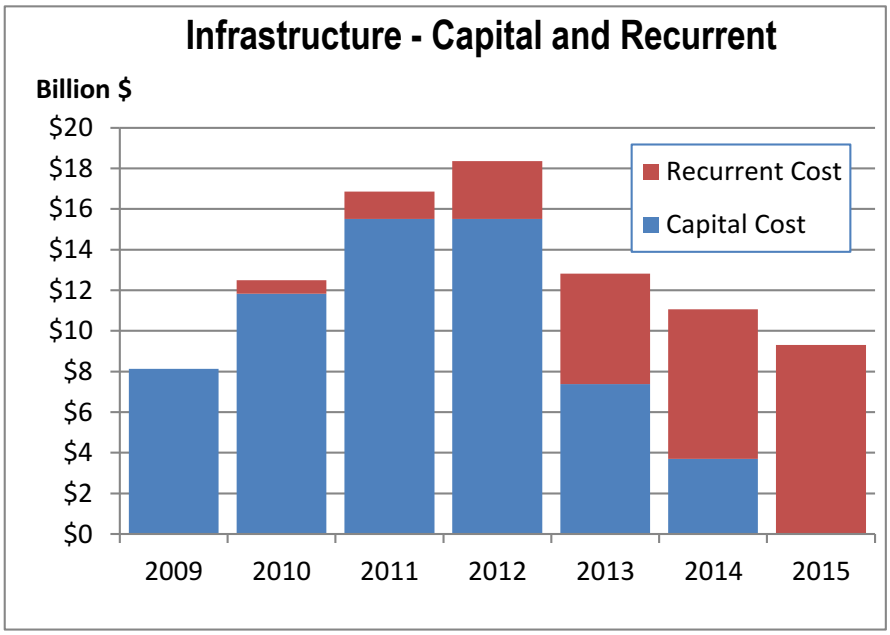
Table 11 and Figure 1 show the timing of the infrastructure investments for health facilities assumed in the High-Level Taskforce report. Construction of facilities was ramped up rapidly in the first years, reaching a peak in 2013. By 2015 there is no new construction and all costs are actually recurrent operating costs of running the newly constructed facilities. Of the $90 million total costs, $65 million were for construction, while $25 million were operating costs. Costs in $2015 ($9.5 billion) represent total recurrent cost with all the new facilities in place. On a per capita basis, total investment costs over the 7 years amount to $45 per capita in investment and $6.80 per capita in recurrent facility operation and maintenance costs with all the new facilities in place.

Table 11. HLTF-estimated cumulative number of newly built health facilities by level, by year

	2009	2010	2011	2012	2013	2014	2015
Health centers construction started	22,240	22,240	22,240	22,240			
Health centers operating		22,240	44,480	66,720	88,960	88,960	88,960
District hospitals construction started	1,603	1,603	1,603	1,603			
District hospitals operating				1,603	3,205	4,808	6,410
Provincial hospitals construction started	364	364	364				
Provincial hospitals operating					364	729	1,093

Source: reference 7.

Figure 1. HLTF-estimated annual capital and recurrent infrastructure costs, 2005 US$ billions



Source: reference 7.

Global Investment Framework

The GIF study did not add anything to the HLTF estimates. It simply used the HTLF estimates, assumed that none of the suggested investment had actually taken place (not explicitly mentioned but implied), and redistributed the total cost over its 2013–2035 projection period. The one change that was made was the conversion of 2005 U.S. dollars to 2011 U.S. dollars. Capital investment costs that had been spread over seven years in the HLTF report were reallocated over the first 10 years (2013–2022) of the GIF study's 23-year projection period. The GIF report only looked at investment costs and did not include any of the operating costs that had been included in the HLTF report. Infrastructure costs were only included for the 47 countries for which the HLTF had estimated costs. No infrastructure costs were assumed for the other 27 countries included in the GIF model. Infrastructure investments were the same in the moderate and low scenario.

Total infrastructure costs for 2013–2035 amounted to $68.4 billion, which represented 7.1% of total costs. All these costs were capital costs for the construction of new facilities. No maintenance and operating costs were included in that number as those costs were covered by the service delivery costs (cost per hospital bed day and per outpatient visit from WHO's CHOICE database) included in the service provision section of the report (Annex 5).

Infrastructure investments are frontloaded and occur in the first twelve years (2013 through 2024),* growing from about $5 billion in 2013 to around $10 billion in the year 2016, decreasing after that and going to $0 by 2025.

The GIF uses data from WHO's CHOICE database (specifically, cost per visit and cost per bed day) to estimate recurrent costs related the operation of the health facilities. These country-specific cost estimates were developed by WHO using an Ordinary Least Squares regression model based on unit cost data from 49 countries, with a total of 2,173 country-years of observations from the period 1973–2000.[16] 96% of the data were from after 1990.

Cost per hospital bed day and cost per visit essentially include all costs of the health system associated with a patient's (20-minute) visit/or (one-day) hospital stay except drugs and diagnostic tests. That means the cost estimate includes all personnel (medical and other, such as administrative, support, cleaning and security), capital costs (in the form of depreciation costs of facility and equipment) as well as food costs (for hospital stays). Table 12 shows the average cost per patient in terms of commodity and service delivery cost.

Table 12. GIF-estimated average recemt direct costs per patient for hospital facilities, 2005, 2035 and total and average annual costs over 2013–2035, and percentage distribution of costs 2013–2035, U.S. dollars

	2025	2035	2013–2035	Annual average 2013–2035	% of total
Total	**16.29**	**16.53**	**607.97**	**26.43**	**100.0**
RMNCH commodities	**6.09**	**6.73**	**180.97**	**7.87**	**29.8**
Service delivery	**10.20**	**9.80**	**427.00**	**18.57**	**70.2**
Inpatient care	3.60	3.00	142.30	6.19	23.4
Outpatient care - community	0.90	1.10	46.30	2.01	7.6
Outpatient care - primary care	5.10	5.10	209.50	9.11	34.5
Outpatient care - hospital level	0.60	0.60	28.90	1.26	4.8

Source: reference 11.

Comparison of different values

The different infrastructure cost estimates per capita are difficult to interpret as they are an amalgam of both capital and recurrent costs, which are difficult to separate out. The WHR 2005 contains the lowest estimates (it only contained facility upgrades, not new construction). The ICPD estimates used the WHR

*The graphs and the text in the GIF report differ slightly from one another with respect to the length of the infrastructure investment period;the graphs show infrastructure investments from 2013 through 2024 and the text mentions investments through 2022.

2005 update costs and added the construction of new facilities. Unfortunately, the report did not provide any detail on the cost of this construction or the scale-up pattern to enable an estimate as to which percentage of the total cost were capital and which were recurrent costs. The Taskforce Report came up with its own estimate for the 49 countries it covered—approximately $64 per capita. Data provided regarding the cost and timeline of construction makes it possible to separate capital from recurrent costs ($45 per capita in total capital costs plus $6.80 annually for recurrent costs once all the new facilities are operational). One possible concern might be that, as the report covered the 49 poorest countries in the world, the infrastructure requirements might be higher than for other countries and thus not generalizable when additional countries are included in this estimate. The GIF, which covers 74 countries, simply used the 49-country cost estimate and assumed no additional infrastructure investment was necessary for the other 27 countries included in its framework. When infrastructure costs are divided by total population covered by the GIF, one obtains an average of $14 cost per capita, if the number is divided only by the population of the 47 countries included in the original Taskforce report, the number is about $68 per capita in 2011 U.S. dollars, consistent with the original Taskforce estimate for capital costs.

3. Transportation and Communication

Costs for transportation and communication are included to varying degrees (Table 13). None of the reports provides much detail. The WHR 2005 mentions including costs for the acquisition, operation and maintenance of vehicles and telecommunication systems needed to transport patients, carry out supervision, and perform training and outreach services. The ICPD estimates presumably included these costs also. The Taskforce report refers to investments in vehicles, not in communications equipment, but gives no separate estimate for this cost. The GIF mentions neither type of investment, but it does include recurrent costs for vehicle operation under service delivery costs.

Table 13. Transportation and communications costs included in major estimates of the cost of scaling up health programs

	WHR 2005	ICPD	HLTF	GIF
Cost details	Included, some detail on total cost and description of what cost items included	Included under total HS costs, no breakout given	Included under infrastructure, no breakout given	No capital costs, recurrent cost of vehicle operation incl. under service delivery costs
Total costs	$1.85 billion over 10 years	u	u	u
Per capita costs	$0.03 per capita per year	u	u	u
% of total cost	4.8%	u	u	u
Recurrent/capital cost	Capital + recurrent cost	Capital + recurrent cost	Capital costs only	Recurrent

Note: u=unavailable.

WHR 2005

To strengthen referral and enable outreach and supervision activities, ambulances and vehicles are included based on the following assumptions:[3]

For referral:	Assumption that 10–15% of these costs are MNH-related
Hospital level	1 ambulance per 450,000 pop + mobile phones
District level	1 vehicle per 120,000 pop + phones for every health facility
For outreach and supervision:	1 vehicle per 220 outreach days (25% assumed to be MNH related)

WHR 2005 total cost over 10 years: $1.85 billion, $0.36 total per capita (2006–2015), $0.03 per capita per year.

The WHR 2005 cost calculations include not only the capital acquisition costs for the above items but also recurrent annual operation and maintenance cost at 10–15% of the capital costs. The total costs for transportation and communications in the WHR 2005 are $1.85 billion, with capital costs accounting for approximately 80% of these costs. This amounts to capital investments of about $0.30 per capita and subsequent operating and maintenance costs of about $0.04 per capita on an annual basis.

ICPD Revision

The ICPD does not provide details on transportation and communications costs..

High-Level Taskforce

Vehicles appear grouped together with facilities and equipment in the Taskforce report in one of the tables, but the text provides no detail or breakdown of these costs (Table 14).

Table 14. HLTF-estimated infrastructure, equipment and vehicles costs in billions of U.S. dollars

	2009	2010	2011	2012	2013	2014	2015	Total
Infrastructure, equipment and vehicles	8.34	12.84	17.33	18.45	13.09	11.42	9.75	91.23

Source: reference 7.

Global Investment Framework

No capital costs are included for the purchase of vehicles or communications equipment, but maintenance and operating costs for transportation are included under service delivery cost for outpatient care through community outreach.

Comparison of different values

The WHR 2005 is the only report that explicitly spells out investments in transportation and communication equipment though the total cost estimate seems low - $0.30 per capita for capital costs and $0.04 for operating and maintenance.

4. Human Resources—Training

The four reports handle training cost for health service providers very differently (Table 15). The WHR 2005 includes the cost of pre-service training for about 320,000 midwives as well as refresher/in-service training for about 120,000 midwives and approximately 20,000 health professionals involved in the provision of obstetric and neonatal care. The ICPD report makes no mention of either pre-service or in-service training costs. The Taskforce report includes pre-service training for a wide range of health service providers (ranging from midwives to community health workers to dental technicians) in its "Human Resources for Health" category along with salaries for the trained cadres once they enter the workforce. In-service training is covered under program management costs. The Global Investment Framework report does not include pre-service training costs, but includes in-service training in its program management costs.

Table 15. Human resources training costs included in major estimates of the cost of scaling up health programs

	WHR 2005	**ICPD Revision**	**H**LTF	**G**IF
Cost details	Pre- and in-service training	Not mentioned.	Pre-service training + salaries for new service providers; in-service training included under program management	In-service training included under program mgmt cost
Total costs	$840 million over 10 yrs	u	$62 billion over 7 years	u
Per capita	$0.17 per capita over 10 yrs	u	$42 per capita over 7 years (includes salaries)	u
% of total cost	2%	u	u	u
Recurrent/capital cost	Capital (pre-service component) and recurrent costs (in-service training)	u	Capital (pre-service component) and recurrent costs (salaries)	Recurrent

Note: u=unavailable.

WHR 2005

The WHR 2005 mentions the following activities:

- Increasing training capacity and number of new skilled birth attendants needed to scale up to target coverage levels
- Upgrading of pre-service training for midwifery, obstetric and neonatal care
- Review of training materials
- Establishment of refresher training courses
- Establishment of in-service training programs

Included in the cost estimate are the pre-service training of an additional 330,000 midwives by 2030 (186,000 of them trained by 2015). To make up for attrition (assuming a 5% annual attrition ratio), an additional 146,300 midwives are assumed to require training. In terms of in-service training, the WHR 2005 assumes that at minimum half of all the current stock of midwives (about 120,000) will require three months of in-service training, and approximately 20,000 current health professionals who provide obstetric care or special newborn care will need 12 months of training. In total, training costs amount to $840 million total over 10 years, or $0.16 per capita over 10 years

ICPD Revision

The ICPD makes no mention of any training costs.

High-Level Taskforce

The cost estimate for pre-service education in the High-Level Taskforce report covers training for a wide range of medical staff, not only for doctors, nurses and midwives, but also for community health workers, pharmacists, laboratory technologists, pharmacy aides, laboratory technicians, radiology technicians and dental technicians.

The number of health staff required was calculated based on the goal of achieving universal coverage. The target for nurses/midwives was to have 1.9 per 10,000 population in 2015. Community health workers are recruited to fulfil a target of one community health worker per 1,000 population in rural areas and one community health worker per 1,500 population in urban areas. The community workers are paid a living wage (lowest scale level of the WHO CHOICE salary database). Salaries for all workers are based on current levels, inflated by an extra 50% to cover the costs of retention/relocation incentives for those going to rural areas, performance bonuses, salary top-ups etc.

In addition, the human resource cost estimates include the costs of the human resource managers who prepare strategic plans, write job descriptions, and determine feasibility of implementing performance bonuses or retention/relocation incentives.

Overall, costs amount to $42 billion over seven years which includes not only training but also salaries for all the additional health staff (Table 16). Annual per capita costs rise from $2.41 per capita in 2006 to $9.21 in 2015, with a seven-year total of $42 (34% of total health system strengthening costs).

Table 16. HLTF-estimated incremental human resources costs per capita, by component, by year 2009–2015 and total, in 2005 billions of U.S. dollars

	2009	2010	2011	2012	2013	2014	2015	Total
Total human resources for health	2.41	3.82	5.10	6.42	7.17	8.16	9.21	42.28
Pre-service training	1.90	2.61	3.20	3.33	2.23	1.31	0.00	14.59
Salaries and incentives	0.51	1.20	1.89	3.09	4.93	6.86	9.21	27.69

Source: reference 7.

Global Investment Framework

Explicitly mentions that no pre-training costs are included. In-service training activities are included under program management costs and there are no separate cost estimates for this category or any detail on the number and type of health staff trained. RMNCH program management costs are defined as in-service training activities, development of pre-service training materials, IEC, supervision of community health workers and routine program management.

Comparison of different values

While the Taskforce report seems to provide the most comprehensive training cost estimate, it focuses exclusively on pre-service training. The WHR 2005, on the other hand, excludes pre-service training and provides a relatively low estimate for in-service training ($0.17 per capita over seven years), the ICPD makes no mention of training, and the GIF includes the in-service training component under program management. If one makes the (very rough) assumption that about half of the program management costs in the GIF are for in-service training one would get an annual cost of about $0.30–0.40 (including child health training) or maybe $0.15–0.20 for maternal health and family planning. While this puts the WHR 2005 and the GIF estimates in the same ballpark ($0.17 vs. $0.20–0.40), the first value is actually over seven years, the other annual.

5. Supply Chain and Logistic Systems

Investments in countries' supply chain are only included in the later reports (Table 17). The ICPD report is the first to mention them but provides no cost estimate. The High-Level Taskforce report provides specifics as does the Global Investment Framework report. Estimates are also available from the USAID DELIVER project.[17]

Table 17. Supply and logistics costs included in major estimates of the cost of scaling up health programs

	WHR 2005	ICPD Revision	HLTF	GIF	Other - USAID
Cost details	Not included	Included, but no information given on cost	Included	Included	Recurrent logistic costs adding about 25–30% to commodities costs
Total costs	u	u	$8.73 over 7 years	$1.0 billion in 2035	u
Per capita	u	u	About $0.10 per capita per year	$0.16 per capita per year	u
% of total	u	u	5%	1.8%	u
Recurrent/ capital cost	u	u	Both capital and recurrent	Only recurrent	Recurrent

Note: u=unavailable.

WHR 2005

Supply and logistics costs are not included.

ICPD Revision

The ICPD report claims to include investments in the supply and logistics system but does not provide any data or details on what is included.

High-Level Taskforce

Logistics and supply chain costs include the purchase or construction of warehouses, forklifts and other equipment, delivery vehicles and their operating costs. The quantities required were provided by technical experts, and costs include getting equipment to the necessary location in the country. Included are also the salaries of personnel like logisticians and drivers.

Total cost over the seven-year period (2009–2015) amounts to $8.73 per capita, with annual costs ranging from $0.86 in the first year to $1.63 in the final year (Table 18). Logistics and supply costs represent just under 7% of total costs (Table 19). Salary costs constitute about 66% on average of these costs; the construction of warehouses and purchase of vehicles account for about 7%; and equipment, fuel and others average about 27% of logistics costs. For an estimated breakdown into capital and recurrent costs, see below.

Table 18. HLTF-estimated incremental supply chain and logistics costs per capita (US$), by component, by year 2009–2015 and total

	2009	2010	2011	2012	2013	2014	2015	Total
Total	0.86	0.62	0.99	1.44	1.45	1.74	1.63	8.73
Human resource costs (salaries)	0.39	0.43	0.67	1.00	1.00	1.19	1.07	5.74
Warehousing	0.30	0.01	0.06	0.02	0.04	0.07	0.12	0.61
Vehicles	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.04
Equipment, fuel and others	0.16	0.18	0.27	0.41	0.41	0.48	0.44	2.34

Source: reference 7.

Table 19. HLTF-estimated percentage of total health program and systems for supply chain and logistics costs and distribution of supply chain and logistics costs by component, by year 2009–2015 and total

	2009	2010	2011	2012	2013	2014	2015	Total
Supply chain and logistics as % of total costs	8.3	4.1	5.0	6.4	7.4	8.7	8.1	6.9
Total supply chain and logistics	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Human resource costs (salaries)	45.2	70.0	67.4	69.6	68.7	68.0	65.6	65.9
Warehousing	34.9	1.0	4.7	1.7	3.0	3.8	7.2	6.8
Vehicles	1.4	0.4	0.4	0.2	0.3	0.3	0.4	0.4
Equipment, fuel and others	18.5	28.6	27.5	28.4	28.1	27.8	26.8	26.9

Source: reference 7.

The following shows the incremental per capita costs for logistics given in the Taskforce report.

The breakdown into capital and recurrent costs was estimated as follows:

- Initial investment in infrastructure/warehouses: $400 million for the 49 countries
    - Included in the Taskforce report at $0.30 per capita
    - Recurrent cost after initial year about $0.03 a year (10% of capital cost)
- Initial investment in vehicles: $20 million or $0.01 per capita, recurrent cost about 10% of that amount, <$0.01
- Human Resources: 100% recurrent cost, annual cost about $1 per capita at full scale-up
- Equipment, fuel and other: This was the one category which was difficult to separate into capital and recurrent mix. The admittedly arbitrary assumption was made that investment in equipment would be equivalent or lower than investment in physical infrastructure/warehouses. This meant that of the total $2.34 per capita over seven years, $0.30 would be for equipment and the rest for recurrent costs such as equipment maintenance and fuel. At full scale-up, recurrent cost were estimated to be about $0.40 per capita per year.

As outlined above, for capital costs, total costs over the 2009–2015 period were included (for logistics it appears most of them were incurred in the first year) while for recurrent cost an average annual value was estimated that would apply in the final year when scale-up was complete. It was estimated it would take about $0.70 per capita in total capital costs to scale up the logistics and system and about $1.40 per capita in recurrent costs per year.

Global Investment Framework

Based on the description given in the GIF, the estimation of costs for logistics drew on the HLTF report as well as research by Sarley et al.[17] to estimate the costs of logistics and supply chain in the form of markup rates to the value of commodity costs (Table 20). Those markup rates, which differed by countries' development status, were then multiplied with total commodity costs to give total supply chain costs. The estimates were thought "to approximate resource requirements for expanding the supply chain." Looking in more detail at the numbers provided, the estimates seem to rely much more heavily, if not completely, on the Sarley estimates. The percentages quoted are the exact averages of the ranges provided by Sarley et al. for the different country categories (e.g., Group 2: 25–35%, GIF 30%; Group 3: 20–25%, GIF 22.5%; Group 4: 12–20%, GIF 16.5%).

For all 74 countries, GIF estimated logistics costs were $0.9 billion in 2025, $1.0 billion in 2035 and $17.9 billion over the 23-year period from 2013 to 2035, for an annual average cost of $0.8 billion. Logistics accounted for 1.8% of total costs.

The Sarley et al. report upon which these estimates are based (see Annex 3) explicitly states that these estimates are for recurrent logistics costs only, so the estimate used by WHO might actually be an underestimate of the true supply and logistic system investment required.

Table 20 shows markup percentages for the different types of countries used in the GIF estimates.

Table 20. GIF-estimated supply chain and logistics costs as percentage markup on commodity cost

Country group	Logistics system condition	Drugs and other commodities	Insecticide-treated nets	Equip-ment
GROUP 1				
Afghanistan, Central African Republic, Democratic People's Republic of Korea, Democratic Republic of the Congo, Myanmar, Somalia	No or very limited public health infrastructure in place. Substantial health systems strengthening and infrastructure investments required. Humanitarian response is the only option in near to medium term.	50%	63%	16%
GROUP 2				
Chad, Comoros, Ethiopia, Eritrea, Guinea, Guinea-Bissau, Haiti, Liberia, Niger, Rwanda, Sierra Leone, Zimbabwe	Countries have more infrastructure in place than Group 1, allowing a partial public sector response that still requires substantial investment but countries could also contract out to NGO and private logistics service providers.	30%	42%	16%
GROUP 3				
Burkina Faso, Burundi, Côte d'Ivoire, Madagascar, Malawi, Mali, Mozambique, Nepal, Papua New Guinea, Sao Tome and Principe, Solomon Islands, Tajikistan, Tanzania, Togo, Zambia	Public sector systems exist and work but are not very efficient. Nonetheless, the infrastructure is in place to allow a mixed public private response.	22.5%	34%	16%
GROUP 4				
Bangladesh, Benin, Cambodia, Gambia, Ghana, Kenya, Kyrgyzstan, Lao People's Democratic Republic, Mauritania, Nigeria, Pakistan, Senegal, Uganda, Uzbekistan, Viet Nam, Yemen	Countries have a more developed public and private sector infrastructure and capability to expand existing logistics systems to meet increased commodity handling needs.	16.5%	27.5%	16%

GROUP 5				
Angola, Azerbaijan, Bolivia, Botswana, Brazil, Cameroon, China, Congo, Djibouti, Egypt, Equatorial Guinea, Gabon, Guatemala, India, Lesotho, Mexico, Morocco, Peru, Philippines, South Africa, Sudan, Swaziland, Turkmenistan	These countries were not included in the original 49-country analysis. They have a more developed infrastructure and capability to meet increased commodity handling needs.	8%	14%	8%

Source: reference 11.

Additional information from USAID DELIVER

There are two studies produced by Sarley et al. for the USAID's DELIVER Project that provide more detailed estimates of the recurrent cost of running a supply and logistics system. Both of the studies (one looks at 49 low-income countries[17] and the other one which focuses on Zimbabwe[18]) point to recurrent logistics costs as adding about 25–30% to the cost of commodities moved through the system. Neither of the study provides estimates of the cost for setting up or improving the system. See Annexes 2 and 3 for details.

6. Health Information Systems

Investments into countries' health information system are also only mentioned in later reports (Table 21). Like for logistics cost, the ICPD report is the first to mention them but again provides no cost estimate. The Taskforce report provides some detail as to what costs are included. The GIF report recycles the HLTF estimates.

Table 21. Health information systems costs included in major estimates of the cost of scaling up health programs

	WHR 2005	ICPD	HLTF	GIF
Cost details	Not included	Included, but no information given on cost of this component	Included	Included
Total costs	u	u	$4.5 billion over 7 years (final year $0.69 billion)	$80.6 billion over 23 years, $4.0 billion in 2035
Per capita	u	u	$0.49 per capita in final scale-up year	$0.77 per capita (avg. year)
% of total	u	u	2%	8.6%

Recurrent/capital cost	u	u	Mainly recurrent, about 5% capital costs	Same as HLTF

Note: u=unavailable.

High-Level Taskforce

Costs in the health information system category include the specialist staff that collate and report on health statistics, capital costs for data warehouses and computers, and meetings, training and advocacy events to improve the reliability of the data and its use.

Table 22 shows the incremental per capita costs for logistics given in the Taskforce report, ranging from $0.27 per capita p.a. to $0.60 per capita p.a. Meetings, training etc. account for the bulk of these costs (60% to 84%), salaries account for 13% to 27% and capital costs for buildings, equipment and vehicles on average for 5% of total costs (Table 23).

Table 22. HLTF-estimated incremental health information system costs per capita (US$), by component, by year 2009–2015 and total

	2009	2010	2011	2012	2013	2014	2015	Total
Total	0.27	0.60	0.38	0.48	0.47	0.46	0.45	3.11
Human resources costs (salaries)	0.07	0.15	0.06	0.07	0.06	0.06	0.06	0.54
Infrastructure, equipment and vehicles	0.01	0.01	0.08	0.01	0.01	0.01	0.01	0.16
Other	0.19	0.44	0.23	0.40	0.39	0.38	0.38	2.41

Source: reference 7.

Breaking down total costs into capital and recurrent costs led to the following estimates:

- Human resources were assumed to be all recurrent costs; in the final year (at full scale-up) they were about $0.06 per capita, which would mean about $320 million when applied to the population covered under AIU-2014.
- Infrastructure costs were assumed to be all capital costs and at $0.16 per capita over the course of the investment period (2009–2015) translated into $850 million for the AIU-2014 population.
- Other costs included cost of meetings and training, all recurrent costs, and averaged $0.34 per year per capita, or $1.8 billion.

Table 23. HLTF-estimated percentage of total health program and systems for health information system costs and distribution of health information system costs by component, by year 2009–2015 and total

	2009	2010	2011	2012	2013	2014	2015	Total
Health information systems as % of total costs	2.6	4.0	1.9	2.1	2.4	2.3	2.2	2.4
Total health information systems	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Human resources costs (salaries)	27.0	25.4	17.0	14.1	13.1	13.1	13.1	17.1
Infrastructure, equipment and vehicles	3.0	2.4	22.1	2.9	2.9	2.9	2.9	5.1
Other	69.9	72.2	61.0	83.0	83.9	83.9	83.9	77.7

Source: reference 7.

Global Investment Framework

The GIF study uses the High-Level Taskforce estimates and inflates them from 2005 U.S. dollars to 2011 U.S. dollars. It then uses the 2009–2015 numbers to calculate average annual per capita investment need. Arguing that most of the activities covered are recurrent in nature, these annual costs are then applied to the entire 23 years of the projection period (2013-2035). For the 38 countries that were not covered by the HLTF report, median values depended on the development group the different countries were assigned to (1, 2 or 3). The same costs are included for the high and medium scenario.

For all 74 countries, they estimate costs of $3.7 billion in 2025, $4.0 billion in 2035 and a total $83.4 billion over 2013–2035 (23 years), for an annual average of $3.8 billion. This is equivalent to a cost of $0.77 per capita per year and makes up 8.6% of total cost health program and systems costs.

7. Leadership and Governance

Only the Taskforce report and the Global Investment Framework report contain cost estimates for this component (Table 24).

Table 24. Leadership and governance costs included in major estimates of the cost of scaling up health programs

	WHR 2005	ICPD	HLTF	GIF
Cost details	Not included	Not included	Included	Included
Total costs	u	u	$5.6 billion over 7 years, average $0.9 billion annually at full scale-up	$61.1 billion over 23 years, $2.7 billion average annually, $3.0 at full scale-up
Per capita	u	u	$0.60 per capita per year	$0.54 per capita
% of total	u	u	3.0%	6.3%
Recurrent/capital cost	u	u	98% recurrent	u

Note: u=unavailable.

High-Level Taskforce

Governance has been defined as "the set of traditions and institutions by which authority in a country is exercised, and includes a) the process by which governments are selected, monitored and replaced, b) the capacity of the government to effectively formulate and implement sound policies, and c) the respect of citizens and the state for the institutions that govern economic and social interactions among them".

In the Taskforce estimates, the cost of leadership and governance are almost exclusively recurrent cost. They include the costs of improving the performance of the Ministry of Health in several domains associated with governance, including strategic vision, accountability and transparency (including regulation) and participation and consensus orientation. Costs consist mostly of the salary of a strategic policy unit in the Ministry of Health and at subnational levels, consultation and consensus meetings and activities associated with accreditation, licensing and certification of health facilities, equipment, drugs and human resources.

The following tables show total cost (Table 25) and cost per capita (Table 26), as estimated in the Taskforce report, and the percentage of total costs that are estimated for governance, accreditation and regulation activities and the distribution of their components (Table 27). The category "Other" includes

mainly meetings and accreditation and licensing activities. Recurrent costs account for more than 98% of total cost.

Table 25. HLTF-estimated incremental cost for governance, accreditation and regulation, by year 2009–2015 and total (US$ in billions)

	2009	2010	2011	2012	2013	2014	2015	Total
Total	0.62	0.60	0.83	0.84	0.85	0.92	0.90	5.56
Human resources costs (salaries)	0.26	0.26	0.30	0.31	0.32	0.34	0.35	2.14
Drugs and commodities	0.04	0.04	0.05	0.05	0.05	0.06	0.06	0.36
Infrastructure, equipment and vehicles	0.03	0.00	0.01	0.01	0.01	0.04	0.01	0.10
Other	0.29	0.29	0.47	0.47	0.47	0.48	0.49	2.96

Source: reference 7.

Table 26. HLTF-estimated incremental governance, accreditation and regulation costs per capita (US$), by component, by year 2009–2015 and total

	2009	2010	2011	2012	2013	2014	2015	Total
Total	0.46	0.43	0.58	0.58	0.58	0.61	0.58	3.82
Human resources costs (salaries)	0.19	0.19	0.21	0.22	0.22	0.22	0.23	1.47
Drugs and commodities	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.25
Infrastructure, equipment and vehicles	0.02	0.00	0.00	0.00	0.00	0.03	0.00	0.07
Other	0.21	0.21	0.33	0.32	0.32	0.32	0.32	2.03

Source: reference 7.

Table 27. HLTF-estimated percentage of total health program and systems for governance, accreditation and regulation and distribution of governance, accreditation and regulation costs by component, by year 2009–2015 and total

	2009	2010	2011	2012	2013	2014	2015	Total
Governance, accreditation and regulation as % of total costs	4.4	2.9	3.0	2.6	3.0	3.0	2.9	3.0
Total governance, accreditation and regulation costs	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Human resources costs (salaries)	41.1	43.6	36.5	37.2	37.7	36.8	38.9	38.5
Drugs and commodities	6.9	7.1	6.6	6.5	6.4	6.2	6.4	6.5
Infrastructure, equipment and vehicles	5.2	0.8	0.7	0.7	0.6	4.5	0.6	1.8
Other	46.9	48.5	56.3	55.7	55.2	52.5	54.1	53.2

Source: reference 7.

Global Investment Framework

Similar to the treatment of health information systems costs, the GIF study again uses the High-Level Taskforce estimates of governance, accreditation and regulation costs and updates the values to 2011 U.S. dollars. Due to the assumed recurrent nature of the costs, the annual costs are then applied to the study's longer projection period (2013–2035). For the 38 countries that were not covered by the HLTF report, countries were assigned median values depending on which group they fell in (1, 2 or 3). The same costs are included for the high and medium scenario.

In all 74 countries, GIF estimated governance cost $2.7 billion in 2025, $3.0 billion in 2035 and $61.1 billion in 2013–2035 (23 years), for an annual average of $2.7 billion. This was equivalent to $0.54 per capita per year and accounted for 6.3% of total costs.

8. Health Financing

Only the Taskforce report and the Global Investment Framework report contain cost estimates for this component (Table 28).

Table 28. Health financing costs included in major estimates of the cost of scaling up health programs

	WHR 2005	ICPD	HLTF	GIF
Cost details	Not included	Not included	Included	Included
Total costs	u	u	$9.3 billion over 7 years	$6.8 billion over 23 years; $0.3 billion annually
Per capita	u	u	$4.88 over 7 years, $1.85 in final year	$0.04 in final year
% of total	u	u	3.7%	1.0%
Recurrent/capital cost	u	uu	Mix, mainly recurrent	u

Note: u=unavailable.

High-Level Taskforce

The Taskforce report includes costs for social health insurance/financing systems based on data for 13 of its 49 countries that in 2009 either had already started implementation of a social health insurance scheme (such as Rwanda) or were considering it. Estimated are administrative costs of scaling up risk/fund pooling mechanisms including administrative expenses associated with increasing membership in the eight countries that already had started social health insurance and the start-up and recurrent costs in the five countries that were thinking about implementing a scheme. Total costs are estimated at $9.3 billion over seven years (3.7% of total costs) or $1.85 per capita in final scale-up year (Table 29).

Table 29. HLTF-estimated incremental total cost and costs per capita (US$) for health financing, by year 2009–2015 and total

	2009	2010	2011	2012	2013	2014	2015	Total
Cost in US$ billions	0.32	0.49	0.73	1.13	1.55	2.26	2.85	9.34
Per capita cost	0.24	0.35	0.51	0.78	1.05	1.50	1.85	6.28

Source: reference 7.

Global Investment Framework

The GIF again used the High-Level Taskforce numbers and calculated the investment needs over the first seven years by adjusting the number to 2011 U.S. dollars. Considering the primarily recurrent nature of these costs the authors argue that they should be applied to the longer timeframe (2020–2035). They estimate the costs to be equivalent to the per capita estimate multiplied by the estimated population by year. After the first seven years, they apply the per capita estimate of the seventh year to all subsequent years. Costs are based on HLTF data for 13 countries. GIF estimates health financing costs of $0.3 billion in 2025 and in 2035, with a total of $6.8 billion over the 2013–2035 period.

Annex 1: Health Systems Costs in Adding It Up 2003 and 2008

AIU-2003

Assumptions written up in:

Michael Vlassoff et al., Assessing costs and benefits of sexual and reproductive health interventions, *Occasional Report,* New York: Guttmacher Institute, 2004, No. 11.

AIU-2003 used global average, method-specific costs for commodities, personnel and overhead. On average, overhead accounted for about 60–70% of total service provision cost (ranging from 50% for condoms to 82% for pills).

To estimate these costs, AIU-2003 used data from a database created by UNFPA's Costing Initiative in 2001 which compiled and analyzed cost studies on the cost of family planning and reproductive health service provision published between 1980 and 2001. The database contained more than 500 cost estimates for different methods, countries and delivery methods disaggregated into costs of commodities, personnel and overhead (which included facility overhead such electricity and water, in some cases annualized capital costs of facility and equipment, sometimes training and/or IEC costs and organizational overhead).

From Vlassoff et al., 2011, pages 39–40:

"The cost of contraceptives ranges widely across available studies, even within the same country, often reflecting different service settings and differing cost components. The estimates in this report use the average costs available from the UNFPA Costing Initiative database to represent annual cost across all regions. These average costs summarize results from a large number of studies, separating costs for each method into components of drugs and supplies, labor, overhead (including capital costs, although these are likely to be incompletely reported) and other costs such as hospitalization for tubal ligation.

The UNFPA Costing Initiative estimated average costs in 2001 dollars. These were projected to 2003 dollars using an inflation factor of 4%. The annual method-specific cost estimates used (in 2001 dollars) were as follows:

1. IUD: Average total cost per user was $26.43. *a. Drugs and Supplies:* An average cost of $4.05 was used. This was based on visit costs for insertion, follow-up and removal. The average drug and supply cost for IUD insertion is adjusted from $1.37 to $2.50, based on footnote 1 of UNFPA Costing Initiative noting that the $1.37 average cost was low, in large part because of very low drug and supply costs of $0.21 and $0.72 in a Turkish study, but that the median drug and supply cost would be $2.50 without the Turkish study. The UNFPA Costing Initiative averages of $1.02 for follow-up visit and $0.53 for removal visit were used. *b. Labor:* $3.35 ($1.46 for insertion, $1.30 for follow- up and $0.59 for removal visit). *c. Overhead:* $19.03, based on available studies showing that drugs, supplies and labor accounted for 28% of total costs and overhead for 72% of total costs.

2. Injectables cost an average of $30.35 per user per year. a. *Drugs and supplies:* $1.41 for acceptance visit and $1.21 for follow-up visit. b. *Labor:* $0.65 for acceptance visit and $0.43 for follow-up visit. c. *Overhead:* $6.90 for acceptance visit and $5.49 for follow-up visit, based on assumption that drugs, supplies and labor accounted for 23 percent of total costs and overhead for 77%. These proportions were estimated as the average of percentages from available studies for IUDs and for pills. d. For *total cost,* this study assumed one acceptance visit ($8.96) and three follow-up visits (3x $7.13).

3. Oral contraceptives cost an average of $35.70 per user per year. *a. Drugs and supplies:* $0.84 for acceptance visit (on average 2 cycles and other materials) and $0.78 for follow-up supply visits (2-3 cycles). *b. Labor:* $0.52 for acceptance visit and $0.36 for follow-up supply visits. *c. Overhead:* $6.42 for acceptance visit and $5.29 for follow-up visits, based on available studies showing that drugs, supplies and labor accounted for 18% and overhead for 82% of total costs. d. For *total cost,* we assumed one acceptance visit ($7.78) and 4.4 follow-up visits ($6.43) for a total of 13 cycles.

4. Condoms were estimated at an average annual cost per user of $13.56. *a. Drugs and supplies:* $0.79 per visit (12-20 condoms and other materials; the assumed average number of condoms dispensed was 16 per visit). *b. Labor:* $0.34 per visit. *c. Overhead:* Estimated at $1.13, assuming that overhead accounted for half of total cost. *d. Total cost:* We assumed six visits, for a total of 96 condoms per year (6x$2.26).

5. Female sterilization: Average total cost was estimated at $88.70. This includes $80.10 for surgery, $5.73 for an evaluation visit and $2.87 for a follow-up visit. *a. Drugs and supplies:* $20.39 for surgery visit. *b. Labor:* $22.21 for surgery visit, $3.26 for evaluation visit and $1.63 for follow-up visit. Estimated average costs for evaluation visit and follow-up visit assumed the same distribution between labor and overhead as for surgery visit. *c. Overhead:* $16.82 for surgery visit; estimated $2.47 for evaluation visit and $1.24 for follow-up visit, assuming the same distribution between labor and overhead as for surgery visit. *d. Hospitalization:* $20.68 for "bed" or hospitalization costs for the overnight stay required for some procedures.

6. Vasectomy: Total cost averaged $59.42. For vasectomy, we assumed the same drug and supply, labor and overhead costs as for tubal ligation, but no other or hospitalization costs. The UNFPA Costing Initiative gives information for only one study, a Brazilian vasectomy campaign, at $9.30 per couple year of protection. Acharya cites Janowitz, Bratt and Fried in estimating a unit cost of $100 for both female sterilization and vasectomy. "

AIU-2008

Assumptions written up in:

Darroch JE and Singh S, *Adding It Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health—Estimation Methodology,* New York: Guttmacher Institute, 2011.

AIU-2008 switched its methodology for projecting health systems costs. Instead of using average overhead and capital cost of small-scale, local or country-specific family planning programs, AIU-2008 used cost data from two documents that estimated the regional and global health system investments required to scale up FP and MH from current coverage to universal coverage levels. These documents are the following:

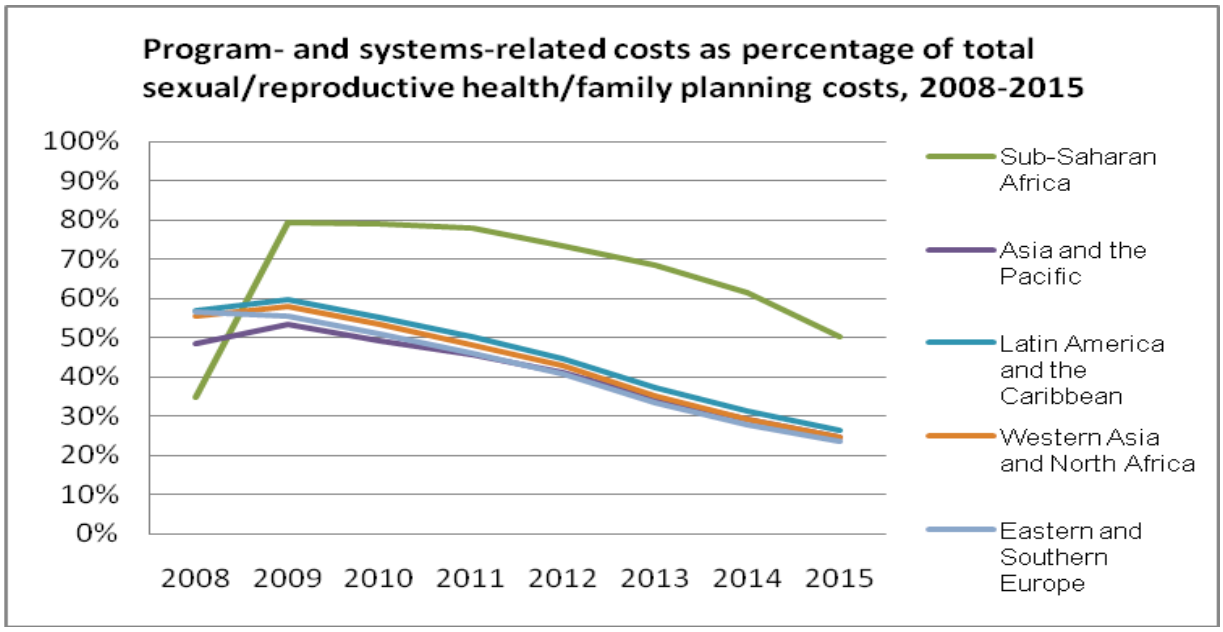
- UNFPA, *Revised Cost Estimates for the Implementation of the Programme of Action of the International Conference on Population and Development: Methodological Report*, New York: UNFPA, 2009
- WHO, *Estimating the Cost of Scaling-up Maternal and Newborn Health Interventions to Reach Universal Coverage: Methodology and Assumptions. Technical Working Paper,* Geneva: WHO, 2005.

The ICPD estimates, which included all the costs from the WHO scale-up document and expanded them to a larger number of countries and to additional health system components, were the primary data source used. As the ICPD document contains almost no description of how its estimates were arrived at, the WHO report provides an important source of information for at least some of the assumptions and original data used in the ICPD calculations.

AIU-2008 costs for current coverage scenario:

Health system costs were based on the ICPD cost revision's (unpublished) 2008 program- and systems-related percentages for each region, which were considered representative of the health- and system-related costs at the current level of service coverage. See figures below.

For the scenario in which 100% of service needs are met, 2009 percentages were used on the assumption that the year of the highest proportional program and systems costs would best represent the near-term challenge of ramping up services to fully meet family planning and maternal and newborn health care needs.



Source: reference 13.

AIU-2008 gives the following justification for selecting the year 2009 as opposed to possible other options, such as total or average investment costs:

"For the scenarios in which 100% of service needs are met, we used the 2009 percentages from the revised ICPD estimates. While the 2009 percentages are higher than later years, we used them as the best representation of the near-term health infrastructure investment needs, given our scenario based on all service needs being met in the near term. While we considered using cumulative or average program and systems costs for 2009–2015 by region, these include both ongoing costs, such as staff supervision and health education activities, and one-time costs, such as construction of facilities and establishing commodity supply systems. We decided to use 2009, the year of the highest proportional program and systems costs as best representing the near-term challenge of ramping up services to fully meet family planning and maternal and newborn health care needs."

More detail is covered on pages 25–27 and Table 14, page 57, of Darroch and Singh, 2011:

"**B. Program- and systems-related costs**

In addition to the direct costs of contraceptive commodities and supplies, other cost components are necessary for service delivery. These, often called indirect costs, are termed program- and system-related costs in the revised ICPD estimates.

1. **Program- and systems-related cost components**

Components a–h were adapted by UNFPA from WHO's estimation of the program and systems costs needed for scaling up interventions to attain universal coverage of maternal and newborn health services. Components h–j were adjusted or added for the revised ICPD estimates. Elements that were added to the WHO estimates include facility construction (and corresponding maintenance and operations), commodity supply system development and health management information systems. UNFPA notes that such elements can entail substantial health systems costs.[†]

a. **Program management**—developing and assessing policy, regulations, and strategic and operational plans for programs

b. Staff supervision

c. Monitoring and evaluation—establishing or integrating services into monitoring and evaluation frameworks and designs, conducting community surveys (such as DHS) and conducting facility-based surveys**d.**

d. Human resources development—increasing training capacity and number of trained staff to scale up to target coverage levels, accounting for attrition; upgrading preservice training; reviewing training materials; establishing refresher training courses; and establishing in-service training programs.

e. Transport and telecommunication—acquiring, running and maintaining vehicles and telecommunications systems for transporting patients, supervising staff, and performing training and outreach services

[†]Ed. note: The following list contains a correction of a mistake published in the original document from which it is copied. The original assigned no letter to "staff supervision;" we have assigned it a letter and adjusted the following letters accordingly.

f. **Health education**—mobilizing the community to raise awareness of family planning and maternal and newborn health–related issues using mass media (radio, TV) and printed material (posters, fliers).

g. **Advocacy**—developing advocacy strategy and materials, and implementing advocacy activities

h. **Infrastructure**—upgrading and maintaining existing facilities and building new ones

i. **Commodity supply systems**—establishing, upgrading and maintenance

j. **Health management information system improvements**

2. Estimation

a. Since the WHO program and systems cost estimates included only 75 countries and were not as inclusive as UNFPA deemed appropriate for updating the ICPD family planning and maternal health costs, UNFPA adapted the WHO estimation methodology to calculate new regional program and system costs.24 Variable timing schedules for program and system investments were developed based on per capita gross domestic product, with the assumption that the poorest countries would require more time to ramp up these resources. Country estimates were aggregated into regional estimates of the percentage of total costs associated with programs and systems.

b. The percentages of total sexual/reproductive health/family planning costs that were program and systems costs used in UNFPA's revised ICPD cost calculations are shown in Table 14 [reproduced below on page 40] and in Figure 3 [reproduced above, on page 37], by region and year. Current (2008) spending on program- and systems-related costs was estimated at 35% of total sexual/reproductive health/family planning costs in Sub-Saharan Africa and 49–57% of total costs in the other developing regions. This reflects the fact that, in general, health infrastructure is less developed in Sub-Saharan Africa than in other parts of the developing world.

c. It was estimated that by 2015, program-and systems-related costs will fall to about one-quarter of total costs, except in Sub-Saharan Africa, where they will be at 50% of total costs. The shapes of the curves over time reflect timing of capital expenditures and associated recurrent costs following construction. However, projections of future program and systems costs are predicated on prior years' investments at the full needed levels, since much of the needed investment, especially in Sub-Saharan Africa, is needed for constructing, as opposed to maintaining, health infrastructure. As Figure 3 [reproduced above, on page 37] shows, these estimates adapted from WHO data with the adjustments described above assume that health infrastructure expenditure needs related to sexual and reproductive health services will rise quickly and much more steeply in Sub- Saharan Africa than in other regions.

d. The UNFPA estimates did not distinguish between program and systems costs specific to family planning vs. maternal health. In order to estimate total costs of each of these areas of care, in *AIU-2008*, we estimated the ratio of program and systems costs to total direct costs for family planning and for maternal health from the UNFPA estimates. We applied the same ratio to the direct cost estimates for family planning and for maternal and newborn health to estimate the program and systems costs, and the total costs, for each area of care.

e. *AIU-2008* estimates of the total costs of care actually provided in 2008 used the UNFPA 2008 program- and systems-related percentages for each region. For the scenarios in which 100% of service needs are met, we used the 2009 percentages from the revised ICPD estimates. While the 2009

percentages are higher than later years, we used them as the best representation of the near-term health infrastructure investment needs, given our scenario based on all service needs being met in the near term. While we considered using cumulative or average program and systems costs for 2009–2015 by region, these include both ongoing costs, such as staff supervision and health education activities, and one-time costs, such as construction of facilities and establishing commodity supply systems. We decided to use 2009, the year of the highest proportional program and systems costs as best representing the near-term challenge of ramping up services to fully meet family planning and maternal and newborn health care needs."

Program- and systems-related costs as a percentage of total sexual and reproductive health and family planning costs, according to region, 2008–2015

Region	2008	2009	2010	2011	2012	2013	2014	2015
Sub-Saharan Africa	35%	79%	79%	78%	73%	69%	61%	50%
Asia and the Pacific	49%	53%	49%	46%	41%	34%	29%	25%
Latin America and the Caribbean	57%	60%	55%	50%	45%	37%	31%	26%
Western Asia and North Africa	56%	58%	53%	48%	43%	35%	29%	25%
Eastern and Southern Europe	56%	55%	51%	46%	41%	33%	28%	24%

Note: Sub-Saharan Africa includes all countries in Eastern, Middle, Southern and Western Africa, as well as Sudan, which is in Northern Africa.

Sources: Friedman H, special tabulations of data used for UNFPA revised ICPD cost estimates, 2009; and reference 5.

Annex 2: Program Cost Calculations in WHR 2005

Source: WHO, *Methodology and Assumptions Used to Estimate the Cost of Scaling Up Selected Child Health Interventions, WHO/FCH/CAH,* 2005, pp. 60–68, http://www.who.int/whr/2005/td_one_en.pdf.

Detail on how program costs were calculated for WHR's program costs for child health; calculations were done the same way for maternal health. The child health example is shown as it is better documented.

1. Program management

Employment of staff for under-five programme management

This category includes the cost of employing additional staff at the national level for one fulltime programme manager, one general assistant, one assistant for training and one assistant for community issues. In countries with a population of 30 million and above, the incremental cost of employing similar staff teams at the provincial level was also included.

Development of strategic plans for child health

Costs include development and/or revision of four strategic plans for under-five health, based on diarrhoea, ARI [acute respiratory infections], malnutrition and newborn health. Activities are assumed to occur every three years.

Situational sssessment

Costs include setting up a co-ordination group, holding consensus-building meetings, hiring consultants to do a literature review to gather and analyse relevant data, and the cost for site visits for situational assessment (national staff visiting on average ten facilities per year). These activities are assumed to take place every three years.

Annual work plans and inter-departmental coordination meetings

The situational assessment process is assumed to feed into the development of annual work plans (four work plans per country for the four key areas), for which costs include travel costs and Per Diems for both national and extra-national experts, meetings costs and support staff. Estimated costs also include holding one inter-departmental coordination meeting per year.

District microplans

Incremental costs for the development of annual district micro plans for child health include workshops with national and local attendants, and meeting costs.

Policies and regulations

Costs are included for revision and distribution of policies and regulations every three years. Activities required are background research based on the situation analysis, policy review and policy reformulation. Assumed two policy review processes for each three-year plan period.

2. Supervision

Costs of supervision were included at four levels, as shown in the table below: supervision at the district level, at first referral care level hospitals, at primary level health centers, and of community health workers. Cost for support staff and drivers were included for each supervision visit. It was assumed that all supervision visits include observation of case management, as well as systematic discussions on barriers to full implementation of case management guidelines. We assumed that barriers may be encountered in a small proportion of visits and thus a small budget for problem-solving associated with each supervisory visit was included.

Assumptions used by the WHO Department of Child and Adolescent Health and Development to estimate supervision costs:

Level of supervision	Number of supervisors	No. of trips per year	Number of days for each trip (including travel)	Proportion attributable to child health (%)	Number of visits requiring problem-solving expenditure	Supportive supervision expenditure	Yearly estimate spent by supervisor
National to district level	2	3	2	100	20	US $20	US $12 per district
National to referral level	1	2	5	25	20	US $20	US $8 per district
District level to individual health facilities	1	4	1	25	20	US $10	US $8 per district
Health facility supervision of community health workers (CHW)	1	4	1	100	10	US $2	US $0.80 per CHW

3. Information, education and communication

General awareness to improve care seeking

Activities for which costs are included on a regular basis include formative research every four years for developing and improving child health strategies in the community. Costs for conducting the formative

research were based on the recruitment of one international consultant and a national research team for one month, as well as follow-up research every year by the same team for a shorter period of time, plus transport costs.

Media and social mobilization

Costs were included for hiring agencies to produce radio and TV spots, and for airing three radio spots and one TV spot per day for the whole period, in every country. Costs for printing posters were estimated on a population basis with 15 posters required every 3 years per 1000 population. Costs were also included for training staff to use the communication materials effectively in communication with clients.

Staff costs

Staff costs included hiring social mobilization officers as designated focal points for IEC and advocacy at the national level. It was assumed that these are already present in CMH 4 countries. Staff costs were included for one social mobilization officer and one part-time secretary in CMH 3 countries, and for three social mobilization officers and one secretary in CMH 1 and 2. Costs also include office supplies and equipment for staff.

4. Advocacy

Planning the advocacy strategy

Costs include the formulation and review of the advocacy strategy: in this case costs were included for a strategic review every three years, a number of yearly meetings involving both 108 Costs related to the procurement and transport of drugs have however not been included, as we assumed piggybacking on existing logistics for supplies.

Advocacy activities

Costs include meetings held within the country and a number of advocacy events to be held every year. Examples of events could be soccer matches, concerts etc where costs in addition to travel costs, per diems, and travel would also include incentives to media, the cost of venue, equipment, refreshments etc. In addition costs were included for annual meetings held with private practitioners' associations, with the aim of informing private practitioners on issues relevant to child health.

Advocacy materials

Costs for advocacy materials are calculated separately for brochures/leaflets, pens, information kits and video documentaries.

Annex 3: Recurrent Supply Chain Costs (USAID/DELIVER)

Source: Sarley D, Allain L and Akkihal A, *Estimating the Global In-Country Supply Chain Costs of Meeting the MDGs by 2015,* Task Order 1, Arlington, VA, USA: USAID DELIVER PROJECT, 2009.

Details of supply chains and cost estimates

Country cluster	Investment requirements	Identified examples	Supply chain costs as % of commodity cost (range)	Cost of delivery of bed nets
Failed and post-conflict states	Humanitarian-type response needed as very limited infrastructure is available.	No data	Greater than 50% likely, depending on the commodity	Greater than 63%
Post-conflict and limited-resource	Substantial investment required or NGO/humanitarian response.	Liberia 31%, Zimbabwe > 25% (requires further work)	25–35%	38–45%
Less-developed and geographically challenged states	Larger capital investment required in the supply chain.	Tanzania 24%, Malawi 22.5%, Rwanda 19%	20–25%	30–38%
More-developed states	Marginal capital investment required.	Uganda 22.2%, Zambia ARV: 9.9% urban SDP, 16.1% rural SDP, Ghana 13%, Bangladesh 12%	12–20%	25–30%

Condition of logistics systems and examples of logistics costs by country grouping

Country cluster	Logistics system condition	Examples of logistics costs
Failed states/post-conflict		
Congo, Dem. Rep. Korea, Dem. Rep. Central African Republic, Afghanistan, Myanmar, Somalia	No or very limited public health infrastructure in place. Substantial health systems strengthening and infrastructure investments required. Humanitarian-type response is the only option in the near to medium term; work with UNICEF on logistics costs.	No data points; informal estimates from a humanitarian organization for lower-value bulk items suggest they could be as high as 100%; reference to UNICEF is advised.

Post-conflict/limited-resource		
Niger, **Liberia**, Sierra Leone, **Zimbabwe**, Guinea-Bissau, Tajikistan, Solomon Islands, Ethiopia, Chad, Burundi	These countries have more infrastructure or systems in place than the failed states do, which would allow a partial public sector response that would still require substantial investment but could also be contracted out to NGO and private logistics service providers.	The cost of procurement and distribution to households of bed nets in Liberia was 44% of commodity values. The DTTU system in Zimbabwe costs an estimated 25%.
Less-developed economies/geographically challenged		
Papua New Guinea, Lao PDR, Eritrea, **Rwanda**, Comoros, Nepal, São Tomé and Principe, Haiti, Togo, Mozambique, **Tanzania** Côte d'Ivoire, Mali, Burkina Faso Madagascar, **Malawi,** Guinea	Public sector systems do exist and work but are either not efficient or are challenged. Nonetheless, the infrastructure is in place to allow a mixed public-private response	The ACT distribution in Malawi is estimated to have cost 17%, while medical stores charge 22.5% for essential drugs. For medical stores in Tanzania, an estimated 24% covers procurement, storage, and distribution to SDPs.
More-developed/less geographically challenged		
Zambia, Uzbekistan, **Uganda**, Kenya, **Nigeria**, Yemen, **Ghana**, Kyrgyz Republic, **Benin**, Cambodia, **Senegal**, Gambia, Mauritania, Pakistan, **Bangladesh**, Vietnam	These countries have the most-developed public and private sector infrastructure and capability to expand existing logistics systems to meet increased commodity handling needs.	The Ghana SC cost estimate is 13%; this was conducted before the advent of ARV and ACT in the system. Bangladesh is estimated at 12%.

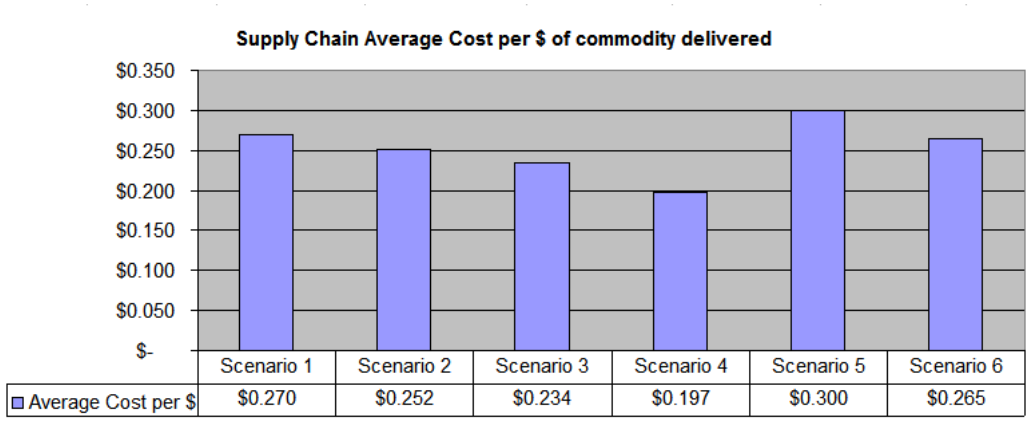
Note: Countries in bold have data points.

Annex 4: Recurrent Supply Chain Costs (Country Example: Zimbabwe)

Source: Sarley D, Baruwa E and Tien M, *Zimbabwe: Supply Chain Costing of Health Commodities,* Task Order 1, Arlington, VA, USA: USAID DELIVER PROJECT, 2010.

The supply chain costing tool is used to estimate the cost of getting individual commodities from the port of entry delivered through the supply chain, down to the service delivery point (SDP).

The core functions of a supply chain costed by the tool are procurement, storage, transportation and management (quantification, quality assurance/supervision, logistics management information systems [LMIS], training and operating costs).



Scenario 1: What is the cost of delivering 11 family planning commodities using the bimonthly DTTU system?

Scenario 2: What is the cost impact of moving from a bimonthly to a quarterly delivery schedule?

Scenario 3: What is the cost impact of adding the 44 PHC commodities to the currently structured DTTU?

Scenario 4: What is the cost impact of adding the 44 PHC commodities to the DTTU if staffed by personnel on public service salaries only as opposed to the development partner/project salaries assumed in scenario 3?

Scenario 5: What is the cost of delivering the 44 PHC commodities using the EDS system?

Scenario 6: What is the cost impact of adding the 11 family planning commodities to the EDS system costed in scenario 5?

Key scenarios: 3 and 6 (top-up system vs. pull system, both for 11 FP and 44 PHC commodities)

Cost between $0.23 and $0.26 per $1 moved

Supply chain cost per US$1.00 of commodities delivered for scenario 6

Scenario 6	NatPharm (US$)	MOH (US$)	Total (US$)	% of total
Management	0.02	0.06	0.08	30%
Transport	0.03	—	0.03	12%
Storage	0.01	0.05	0.05	20%
Training	0.00	0.04	0.04	16%
Supervision	0.00	0.02	0.02	7%
Other costs	0.00	0.04	0.04	15%
TOTAL	**0.07**	**0.20**	**0.26**	**100%**

Annex 5: WHO Visit and Hospitalization Costs

Sources: WHO, Note on the methodology used to predict unit costs for patient services, 2011, http://www.who.int/choice/country/Meth_predictUnitCPS2011.pdf.

Adam T, Evans DB and Murray CJL, Econometric estimation of country-specific hospital costs, *Cost Effectiveness and Resource Allocation*, 2003, 1(1):3.

CHOICE database, country-specific estimates for

a) Cost per hospital bed-day:

These estimates represent only the "hotel" component of hospital costs, i.e., excluding the cost of drugs and diagnostic tests but including costs such as personnel, capital and food costs.

b) Outpatient Unit Cost:

Estimated cost per outpatient visit for primary care facilities, include all cost components including depreciated capital items but excludes drugs and diagnostics.

Unit cost per bed day was estimated using an ordinary least squares regression model developed by WHO-CHOICE. The WHO dataset used to develop this model included estimates from the published literature and specially commissioned country studies. Unit cost data were drawn from 49 countries, with a total of 2173 country-years of observations from the period 1973–2000, 96% of which were after 1990.

"In 2011 the WHO Department of Health Systems Financing produced updated estimates of the cost of hospital bed-days and outpatient visits at different types of facilities as part of the WHO-CHOICE project.

As countries' use of technology evolves, so do their costs. The need to update the previous round of estimates was prompted by the expectation that inputs (including technology), prices and production efficiency all change over time. In 2008, the original set of WHO-CHOICE cost estimates was updated to reflect 2005 price levels. This was done by substituting new input values for the independent variables in the original 2000 regression analysis. However it was recognized that a new round of data collection was required in order to assess to what extent changes in policy practices and technology may have affected cost structures. New data was collected from 30 countries representing 13 WHO epidemiologic regions, with the majority of data obtained through contracts with local data providers. A new logarithmic model was developed to fit the new dataset, following a CobbDouglas production function. Estimates were produced for year 2007. In order to produce estimates for 2008, the model was updated with WHO data for GDP per capita and WHO data for exchange rates to US$ and I$, using 2008 base-year values."

An Excel file for making estimates from WHO-CHOICE data is available at http://www.who.int/entity/choice/country/WHO-CHOICEunit_cost_estimates_2007_2008.xls. The following illustrates the type of information used in estimation.

Econometric estimation of unit costs

WHO-CHOICE 2011

Publication forthcoming

WHO estimates of unit cost for selected countries

--> **click here to go back to the Overview pag**

Enter information in cells with yellow shade

1. General country parameters

Country	**Afghanistan**	select country/countries
Year	**2008**	select year (2007, 2008)
PPP rate	**41.78**	
GDP per capita in LCU	**32,436**	
GDP per capita in I $	**776**	
Exchange rate (LCUs per US$)	**50.25**	

2. Inpatient visit costs

Public facility costs (based on default input values)

	Primary-level hospital	Secondary-level hospital	Teaching hospital
Cost per bed day I $	$ 4.70	$ 4.90	$ 6.34
Cost per bed day LCU	196.3	204.8	264.8
Cost per bed day US$	$ 3.91	$ 4.08	$ 5.27

3. Outpatient visit costs

Public facility costs, urban area (based on default input values)

	Health Centre (no beds)	Health Centre (with beds)	Primary-level hospital	Secondary-level hospital
Cost per outpatient visit I $	$ 1.53	$ 1.89	$ 2.15	$ 2.24
Cost per outpatient visit LCU	63.8	78.8	89.8	93.5
Cost per outpatient visit US$	$ 1.27	$ 1.57	$ 1.79	$ 1.86

REFERENCES

[1] Singh S et al., *Adding It Up: The Costs and Benefits of Investing in Sexual and Reproductive Health–2014*, New York: Guttmacher Institute and United Nations Population Fund (UNFPA), 2014.

[2] World Health Organization (WHO), *World Health Report: 2005: Make Every Mother and Child Count*, Geneva: WHO, 2005.

[3] WHO, *Estimating the Cost of Scaling-Up Maternal and Newborn Health Interventions to Reach Universal Coverage: Methodology and Assumptions, Technical Working Paper*, Geneva: WHO, 2005.

[4] WHO, *Methodology and Assumptions Used to Estimate the Cost of Scaling Up Selected Child Health Interventions, Technical Working Document,* Geneva: WHO, 2005.

[5] UN Economic and Social Council, *Flow of Financial Resources for Assisting in the Implementation of the Programme of Action of the International Conference on Population and Development: Report of the Secretary General,* New York: UN, 2009.

[6] UNFPA Technical Division, *Revised Cost Estimates for the Implementation of the Programme of Action for the International Conference on Population and Development: A Methodological Report*, New York: UNFPA, 2009.

[7] WHO Taskforce on Innovative International Financing for Health Systems, *Constraints to Scaling Up the Health Millennium Development Goals: Costing and Financial Gap Analysis, Background Document for the Taskforce on Innovative International Financing for Health Systems*, Geneva: WHO, 2010.

[8] Taskforce on Innovative International Financing for Health Systems, *Constraints to Scaling Up and Costs: Working Group 1 Report,* Geneva: International Health Partnership, 2009.

[9] Taskforce on Innovative International Financing for Health Systems, *More Money for Health, and More Health for the Money*, Geneva: International Health Partnership, 2009.

[10] Stenberg K et al., Advancing social and economic development by investing in women's and children's health: a new Global Investment Framework, *The Lancet,* 2014, 383(9925):1333–1354.

[11] Stenberg K et al., Advancing social and economic development by investing in women's and children's health: a new Global Investment Framework, *The Lancet,* 2014, 383(9925):1333–1354, supplementary web appendix, http://www.sciencedirect.com.ezproxy.cul.columbia.edu/science/MiamiMultiMediaURL/1-s2.0-S014067361362231X/1-s2.0-S014067361362231X-mmc1.pdf/271074/html/S014067361362231X/5e5ef9644ed2949cc3a30fbb7bc62421/mmc1.pdf.

[12] Singh S et al., *Adding It Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health*, New York: Guttmacher Institute and UNFPA, 2009.

[13] Darroch JE and Singh S, *Adding It Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health—Estimation Methodology*, New York: Guttmacher Institute, 2011.

[14] Singh S and Darroch JE, *Adding It Up: Costs and Benefits of Contraceptive Services: Estimates for 2012,* New York: Guttmacher Institute, 2012.

[15] Singh S, Darroch JE and Ashford LS, *Adding It Up: The Need for and Costs of Maternal and Newborn Care—Estimates for 2012*, New York: Guttmacher Institute and UNFPA, 2013.

[16] WHO CHOICE, Note on the methodology used to predict unit costs for patient services, 2011, http://www.who.int/choice/country/Meth_predictUnitCPS2011.pdf?ua=1.

[17] Sarley D, Allain L and Akkihal A, *Estimating the Global In-Country Supply Chain Costs of Meeting the MDGs by 2015,* Task Order 1, Arlington, VA, USA: USAID DELIVER PROJECT, 2009.

[18] Sarley D, Baruwa E and Tien M, *Zimbabwe: Supply Chain Costing of Health Commodities,* Task Order 1, Arlington, VA, USA: USAID DELIVER PROJECT, 2010.