Revised Cost Estimates for the Implementation of the Programme of Action of the International Conference on Population and Development:

A Methodological Report

Technical Division

United Nations Population Fund

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ISBN 978-0-89714-924-2

Foreword

In 1994, the International Conference on Population and Development (ICPD) held in Cairo outlined a comprehensive population and development agenda in the area of reproductive health, mortality reduction, women's empowerment, poverty eradication and educational attainment. The ICPD goals in these areas are reinforced by the agreements of other global United Nations conferences including by the Millennium Declaration adopted by Member States in 2000. The ICPD Programme of Action estimated that in developing countries and countries with economies in transition, the implementation of programmes in the area of reproductive health, including those related to family planning, maternal health and the prevention of sexually transmitted diseases, as well as programmes that address the collection and analysis of population data would cost US $17 billion by 2000, $18.5 billion by 2005, $20.5 billion by 2010 and $21.7 billion by 2015. Approximately two-thirds of the projected costs were expected to come from developing countries and one third from the international donor community.

The ICPD financial targets were fixed some 15 years ago and do not meet current needs that have grown dramatically since the targets were agreed upon. At that time, the population and health situation in the world was much different than it is today. The HIV/AIDS pandemic has reached proportions that were never anticipated, and maternal and newborn mortality remains unacceptably high in many parts of the world. Health-care costs have increased dramatically and the lack of progress on ICPD targets has been identified as being linked to a number of issues including the lack of investment in the development and support of health systems and programmes. Costs of data collection, particularly censuses, have risen substantially. In addition, the value of the dollar today is far lower than it was in 1993. As a result, the ICPD targets are simply not sufficient to meet current developing-country needs in the area of family planning, reproductive health, STD/HIV/AIDS and basic research, data and population and development policy analysis.

The escalating costs and needs, as compared with original ICPD estimates, call for a review and update of the resource requirements to finance population and reproductive health programmes in developing countries today. Sufficient resources must be mobilized to fully implement the ICPD consensus. This is particularly important if the international community is to achieve the Millennium Development Goals (MDGs). Indeed, population and reproductive health are central to development and the achievement of the MDGs. At the 2005 World Summit, world leaders committed themselves to "achieving universal access to reproductive health by 2015, as set out at the International Conference on Population and Development, integrating this goal in strategies to attain the internationally agreed development goals, including those contained in the Millennium Declaration, aimed at reducing maternal mortality, improving maternal health, reducing child mortality, promoting gender equality, combating HIV/AIDS and eradicating poverty" (A/RES/60/1, para 57(g)). This led to the addition of a new universal access to reproductive health target (5B) to the official MDG framework under the goal "Improve Maternal Health".[1]

The ICPD made a ground-breaking attempt to estimate the resources needed to achieve the ICPD "Programme of Action" goal of universal coverage of reproductive health care in developing countries. Now, some fifteen years later, it is time to revisit the ICPD cost estimates and to update them by includ-

1 United Nations (2007). Report of the Secretary-General on the Work of the Organization. General Assembly. Official Records. Sixty-second Session. Supplement No. 1 (A/62/1).

ing the results of new investigations and new data sources that have become available.

In response to the ICPD Programme of Action call that the "estimates should be reviewed and updated" (para 13.15), and to harmonize the ICPD financial targets with MDG costing, UNFPA undertook the task of reviewing estimates for the four components of the ICPD costed population package and produced revised estimates to meet current costs and needs. The revised cost estimates were presented to the Commission on Population and Development at its 42nd Session in March 2009.[2] This report provides the revised estimates and explains the methodology used to arrive at them.

The objective here is to present the methodologies used to produce updated and improved global estimates of the resource requirements to achieve the general objectives as expressed in the ICPD and in the Millennium Development Goals (MDGs), related to the four components of the costed package, taking the 1994 estimates as the departure point.

The text will first describe the methodology used in calculating the 1994 estimates. For the reproductive health and family planning components, the new SRH initiatives and data sources will be reviewed, followed by a discussion of the assumptions behind costing SRH interventions, as well as methodological constraints and shortcomings. Next, the details of the methodology used for the updated cost estimates are presented, together with the estimated costs in summary form. In the case of HIV/AIDS estimates, UNAIDS new estimates are considered. Finally, the results for the fourth component (basic data, research and policy) is estimated taking into account the 2010 round of censuses.

We wish to thank all who collaborated in this methodology. In alphabetic order, from UNFPA: Stan Bernstein, Howard Friedman, Jose Miguel Guzman, Ralph Hakkert, Charlotte Juul Hansen and Ann Pawliczko and consultants: Iqbal Alam, John Ross and Eva Weissman. Finally, we extend our appreciation to all participants in the Costing ICPD Meeting held at UNFPA Headquarters in November 2008.

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2 United Nations (2009), Report of the Secretary-General on *The Flow of Financial Resources for the implementation of the Programme of Action of the International Conference on Population and Development*, E/CN.9/2009/5.

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I. The 1994 ICPD Estimates of Resource Requirements

1.1 The Components of the ICPD "Costed Package"

The cost estimates that emerged from the 1994 ICPD (UNFPA 1994) appear in Table 1. These are the overall resource requirements to implement the ICPD Programme of Action (in billions of US dollars):

Table 1: ICPD "Costed Package" Components

Component	2000	2005	2010	2015
I. Family Planning	$10.2	$11.5	$12.6	$13.8
II. Basic RH Services	$5.0	$5.4	$5.7	$6.1
III. HIV/AIDS Prevention	$1.3	$1.4	$1.5	$1.5
IV. Basic research, data and policy analysis	$0.5	$0.2	$0.7	$0.3
Total	**$17.0**	**$18.5**	**$20.5**	**$21.7**

The ICPD recognized that the total cost for providing universal reproductive health care by 2015 would exceed these estimates, but it presented this table in its Programme of Action as representative of what existing data could support and the basis from which full cost estimates might be derived subsequently.

The ICPD "costed package" referred to a specific set of health interventions. The relevant paragraph from the ICPD Programme of Action reads (UN 1995):

> *13.14. Basic reproductive health, including family-planning services, involving support for necessary training, supplies, infrastructure and management systems, especially at the primary health-care level, would include the following major components, which should be integrated into basic national programmes for population and reproductive health:*
>
> *(a) In the family-planning services component - contraceptive commodities and service delivery; capacity-building for information, education and communication regarding family planning and population and development issues; national capacity-building through support for training; infrastructure development and upgrading of facilities; policy development and programme evaluation; management information systems; basic service statistics; and focused efforts to ensure good quality care;*
>
> *(b) In the basic reproductive health services component - information and routine services for prenatal, normal and safe delivery and post-natal care; abortion (as specified in paragraph 8.25); information, education and communication about reproductive health, including sexually transmitted diseases, human sexuality and responsible parenthood, and against harmful practices; adequate counseling; diagnosis and treatment for sexually transmitted diseases and other reproductive tract infections, as feasible; prevention of infertility and appropriate treatment, where feasible; and referrals, education and counseling services for sexually transmitted diseases, including HIV/AIDS, and for pregnancy and delivery complications;*
>
> *(c) In the sexually transmitted diseases/HIV/AIDS prevention programme component - mass media and in-school education programmes, promotion of voluntary abstinence and responsible sexual behaviour and expanded distribution of condoms;*
>
> *(d) In the basic research, data and population and development policy analysis component - national*

capacity-building through support for demographic as well as programme-related data collection and analysis, research, policy development and training.

The ICPD recognized that the costed package did not include all interventions or all costs necessary to achieve its goal of universally accessible reproductive health by 2015. For example, given the holistic nature of the goal, efforts in other areas such as education of the girl child would be required and additional resources would need to be expended. This is spelled out in three further paragraphs in the ICPD Programme of Action (UN 1995):

> *13.17. Additional resources will be needed to support programmes addressing population and development goals, particularly programmes seeking to attain the specific social- and economic-sector goals contained in the present Programme of Action. The health sector will require additional resources to strengthen the primary health-care delivery system, child survival programmes, emergency obstetrical care and broad-based programmes for the control of sexually transmitted diseases, including HIV/AIDS, as well as the humane treatment and care of those infected with sexually transmitted diseases/HIV/AIDS, among others. The education sector will also require substantial and additional investments in order to provide universal basic education and to eliminate disparities in educational access owing to gender, geographical location, social or economic status etc.*
>
> *13.18. Additional resources will be needed for action programmes directed to improving the status and empowerment of women and their full participation in the development process (beyond ensuring their basic education). The full involvement of women in the design, implementation, management and monitoring of all development programmes will be an important component of such activities.*
>
> *13.19. Additional resources will be needed for action programmes to accelerate development programmes; generate employment; address environmental concerns, including unsustainable patterns of production and consumption; provide social services; achieve balanced distributions of population; and address poverty eradication through sustained economic growth in the context of sustainable development. Important relevant programmes include those addressed in Agenda 21.*

It should be noted that not all elements of the reproductive health component were costed at the time (estimates were dominated by the cost of integrating maternal health with family planning) and that system costs, particularly at the primary health care level, were included within the family planning component.

Now it has become possible to begin costing out some elements beyond the "costed package" elements, particularly some of the interventions mentioned in paragraph 13.17 above. The present analysis does so, but it should be realized that a complete and comprehensive costing of the broad panoply of interventions to deliver and support SRH must remain a task in progress.

1.2 The 1994 Costing Methodology

Component I, Family Planning

The methodology used by UNFPA for the costs included in the ICPD Programme of Action was based at the regional level. At that time, detailed per user or per service costs were largely unavailable, with the exception of some information for family planning services. Current estimates for contraceptive use were also problematic. For that the solution was to convert the UN projections for total fertility rates (TFRs) to contraceptive use rates (CPRs). The TFRs in the UN's "medium variant"[3] projection for each country incorporate assumptions concerning the future course of fertility decline as extrapolated from

3 The medium variant is one of several variants the United Nations Population Division uses in world population projections. The first five variants (low, medium, high, constant-fertility and instant replacement-fertility) differ in the assumptions made regarding the future path of fertility with a common path of mortality and international migration. Two other variants (constant-mortality and zero-migration) have the same fertility assumptions as the medium variant but differ respectively in the path of future mortality and in the path of future international migration. The medium variant is the most frequently referenced variant.

historical trends and the concomitant past rise in contraceptive prevalence. The following relationship, based on a large number of country surveys, was used to estimate current CPRs from current TFRs:

$$CPR = (7.3142 - TFR) / 7.04$$

From these estimated CPRs for each country, the regional totals of contraceptive users were calculated as a baseline. For the CPR projections however a different analytic strategy was used, based on a statistical model prepared by World Bank demographers (Bulatao and Bos, unpublished) that recurrently predicted future contraceptive levels based on current CPR and current unmet need for family planning services (Westoff and Ochoa 1991; Casterline and Sinding 2000). Additional adjustments were made to the total number of users so that contraceptive prevalence among unmarried adolescents was incorporated where information was available. The analysis resulted in most regions being projected to attain a CPR that implied a TFR (as assessed in the 1992 Revision) between the "medium variant" and the "low variant" UN projections. To obtain absolute numbers of users the UN Population Division projections of adult population size and structure and proportions married among women of reproductive age were employed. (For any projection of 15 years or less the cohorts whose adolescent and adult service needs are being forecast are already alive.)

Next, for costs per user (CPU) there was again a dearth of detailed country information, so another relationship (Knowles and Wagman, 1991) was used to estimate regional costs per user (CPU):

$$CPU = 8.29 + 287.8 / (CPR \times 100)$$

This equation produces a lower cost per user as the CPR rises. That reflected the expected economies of scale and other efficiencies as programmes grew in size and capacity over the 20-year projection period. The estimated CPUs ranged from $8.05 per user (for South-East Asia in 2015) to $28.33 per user (for Sub-Saharan Africa in 2000). The final total costs concerned the first ICPD component, for family planning, but they also included some infrastructure costs that were shared with the reproductive health and HIV components.

Component II, Reproductive Health

The reproductive health component simply used a per woman estimate of the cost of supplying reproductive health services (largely maternal health costs) as provided by WHO and the World Bank (Tinker and Koblinsky 1994), equal to $1.03 per person.

Component III, HIV

The HIV component used a cost per capita of $0.26 for education interventions and condom supplies. This figure was derived from the proportion of the total estimate for the included selected preventive interventions as reported by the Global Programme on AIDS (the precursor to UNAIDS).

Component IV, Population Data and Policy Development

The final component, population data and policy development, used historical data on costs of censuses (taken as a cost proxy for the total range of data needs) available at the United Nations Statistical Division. A per capita figure was used to estimate future needs; the time scheduling reflected peaks in 2000 and 2010 due to the decennial pattern of censuses.

1.3 Information on Sexual and Reproductive Health Costs Available post-ICPD

At the time of the ICPD, the actual scope of SRH was still partially undefined, and the actual set of interventions that would constitute a complete package for addressing SRH needs remained under development. Much progress has been made in the fifteen years since the ICPD in collecting data on the state of SRH care in developing countries and on estimates of current and future needs. While this process is necessarily continuous, a body of specific interventions is now generally recognized and data concerning them are now available in increasing degrees of detail. In

this section, information on costs that has become available since 1994 is briefly described.

UNAIDS Costing Data

The accuracy of estimates for the size and geographic extent of the AIDS pandemic have improved considerably since the early 1990s, when figures were first issued for HIV/AIDS infections from the WHO Global Programme on AIDS. Over the last decade UNAIDS has made substantial efforts to cost out the interventions necessary to meet the international goals regarding HIV/AIDS. In an article published in 2001, UNAIDS estimated that by 2005 $9.2 billion would be needed annually to support an expanded response to HIV/AIDS in low and middle-income countries (Schwartlander et al. 2001) ($4.8 billion for prevention activities and $4.4 billion for care and support). Twelve activities or interventions were specified in the article.

Later analyses have increased these estimates even further. In a recent global report by UNAIDS (UNAIDS 2003), 25 activities are defined. Later communications from UNAIDS suggest that the set of HIV interventions continues to evolve. Unpublished data for 135 countries, made available for use at regional levels, detailed costs for 26 interventions. The UN Millennium Project (2005) pro-rated components of the prevention set using expert judgments for their degree of relevance/involvement to sexual and reproductive health concerns. This approach has not been replicated here, though we will briefly note the comparison. UNAIDS continues to work with countries to develop specific country estimates. It adjusts regional and global estimates of requirements on an ongoing basis. In fact, the cost estimates provided by UNAIDS for this report have since been updated by UNAIDS.[4]

WHO Mother and Newborn Health (MNH) Cost Estimates

WHO, under its "Making Pregnancy Safer" programme, has developed estimates of MNH costs for 75 countries (WHO 2004a, WHO 2005a). The programme has identified over 80 interventions according to levels of health care, with partial estimates for the percent of the population in need of services (see Annex 1). The WHO estimates suggest that around an additional $1.0 billion should be spent in 2006, rising to $6.2 billion in 2015 ($39.3 billion cumulatively), to achieve realistic targets for coverage. This is less than universal coverage in many countries that were judged to have such health system constraints and challenges that universal coverage by 2015 was not considered a viable option.

Other WHO Initiatives

WHO-CHOICE, an ongoing initiative focusing on cost-effectiveness analysis of health systems, has developed regional cost estimates for "programme costs", i.e., costs associated with health interventions that are not incurred at the point of service (WHO 2005b). This includes salaries, infrastructure, maintenance, etc. WHO-CHOICE has also estimated regional unit costs for hospitals and health centers, e.g., cost per bed day for hospitals. In addition, WHO has developed the Mother-Baby Package, a spreadsheet for estimation of local costs for services dealing with maternal and neonatal care. In this package 18 interventions are modeled (see WHO 1999). The package includes an abundance of detailed cost information as default values, many of which may not require modification in particular applications.

Alan Guttmacher Institute's Contraceptive Services Estimates

In 2003-04 the Alan Guttmacher Institute (AGI) undertook a project with UNFPA funding to comprehensively analyze the costs and benefits of SRH (AGI and UNFPA 2003; Vlassoff et al. 2004). A broad framework of costs and benefits was presented that went beyond using monetary or health yardsticks to measure net effects. In particular, a detailed estimation of costs for contraceptive services in the developing world was made for the year 2003 using an extensive set of data available at the time. It was estimated that $7.1 billion was spent in 2003 on contraceptive services in developing countries and that providing contraceptive services to the estimated 201

4 UNAIDS (2009). *What Countries Need. Investments Needed for 2010 Targets*. Geneva.

million women with an unmet need[5] for these services would have cost a further $3.9 billion (Vlassoff *et al*. 2004: Tables 3.7 and 3.14). The average cost per user of contraceptive services was $14, ranging from $10 in China to $27 in Eastern Africa. Regional average costs per user were employed, updating the 1994 regional costs, along with many system costs under the family planning component.

UNFPA SRH Cost Estimates

Over more than a decade UNFPA has been tracking donor spending on SRH commodities and comparing the collected data to projected requirements. (UNFPA 2004, 2003, 2002, 2001) In 2005, UNFPA undertook a major study projecting the amounts and cost of drugs, supplies and contraceptive commodities required to achieve universal access to SRH by the year 2015 (UNFPA 2005a). Since 2002, UNFPA has also been involved in collating costing information on SRH care. A comprehensive database of costing studies is available internally on its intranet site.

In addition, UNFPA has developed a Reproductive Health Costing Tool[6] for forecasting SRH costs and maternal and newborn costs (UNFPA 2005b). This model estimates SRH direct costs for 38 interventions (see Annex 3). Tabulations using this model serve as the basis of the SRH component estimates for the new analyses reported here.

Disease Control Priorities Project (DCPP1 and DCPP2)

Work on costing family planning programmes, as well as STIs including HIV/AIDS and maternal health, forms an important part of the DCPP1 project. The original project (DCPP1) was completed in 1993 and served as an important input into the World Bank's 1993 World Development Report, *Investing in Health* (Jamison *et al*. 1993). The second phase of the project (DCPP2) updated estimates of the first phase using a health framework that reflects changes in thinking about public health policy during the intervening decade. DCPP2 results suggest that family planning investments are cost-effective.

5 In the study unmet need included women using traditional methods of contraception as well as those using no contraceptive method at all. However the current methodology for the revised ICPD cost estimates includes traditional method users among those with met need and, accordingly, projects lower proportional increases in demand and use (see the discussion in the results section).

6 This work was further developed in collaboration with the UN Millennium Project and serves as the basis for the SRH components of the needs assessment tool they developed. This was introduced into a UNDP/UNFPA health system costing tool and is becoming a component of a multi-agency Unified Health Model.

II. Methodology for the Updated Resource Estimates

The methods used in these updated cost estimates are quite different from those used for the 1994 ICPD estimates. Therefore any close comparison for individual components is not feasible. For example the UNFPA costing model has been employed to obtain commodity and associated personnel costs for 10 family planning methods and 28 other reproductive health services including pre and postnatal care, delivery care, obstetric complications, and others, and these are built up for each country separately. All costs of the general "overhead" or "systems" types are also treated much differently than in the ICPD estimates. (At that time, to the extent that they were captured, they were included in the family planning component.)

Furthermore, the estimates presented here make use of other work, recently completed or ongoing, that cover parts of the ICPD package. Specifically, the HIV/AIDS cost projections are a special, ongoing exercise by UNAIDS, so those are employed here (See Annex 4).

The current analysis accepts the current UNAIDS estimates that include interventions for prevention, treatment, care and support in toto. As the large majority of HIV/AIDS cases result from sexual transmission (with significant regional and national variation) and because of the difficulty of separating budgetary allocations among intervention components, the current UNAIDS estimates (UNAIDS, 2009) for all are accepted without adjustment. These estimates, however, conform with the target of reaching universal access to HIV/AIDS interventions by 2010 and represent activities associated with prevention, treatment, care and support.

As the HIV/AIDS estimates are amply documented elsewhere, this report focuses on two major subsections; one addresses methods employed for Systems Costs, Family Planning, Other RH Activities; another, methods employed for Population Data, Training, and Dissemination.

2.1 Resource Requirements for System Costs, Family Planning, and Other RH Activities

Direct material and personnel costs for service delivery are available from the Reproductive Health Costing Tool developed by UNFPA in collaboration with the UN Millennium Project (UNFPA 2005b). In general, costs for service delivery were divided into three subcomponents: direct material costs (drugs, supplies and other materials), direct personnel costs (labour costs), and indirect costs (overhead costs and other general system costs; see WHO 2005d). This model uses international drug and medical supply prices from UNICEF, with unit labour costs based on work by WHO-CHOICE.[7] The programme produces these direct costs separately for family planning and non-family planning interventions specified in Annex 3.

Systems costs: "Systems" costs are often thought of as "overhead" costs. These refer to both the physical infrastructure costs and the "programme-related" costs of management, supervision, evaluation etc. The systems costs calculation was based upon prior work by WHO in its 2005 report[8] at the country level, to

7 Consistent with other analyses undertaken by the UN Millennium Project, unit labor costs have been doubled from the WHO-CHOICE base estimates. This adjustment is recommended to improve staff motivation and retention.

8 WHO. 2005c. *Make Every Mother and Child Count: The World Health Report 2005*. Geneva.

which we added non-included items[9] for construction of new health facilities and maintenance, commodity supply chain systems, and improvements to HMIS[10].

Because of differences in the countries included in the ICPD list of countries and the countries included in the WHO 2005 report, regional estimates were derived for the percent of total costs associated with programmes and systems. Several steps were involved in developing these regional estimates: first, at country level the percent having skilled attendance at delivery was used to assign all countries to five levels of investment need, from greatest to least need. With those in hand, construction and maintenance costs followed, which were added to the original set of WHO estimates and then a percent of systems and programmes costs was computed. Variable schedules of timing for the investments were assigned based on the GDP per capita, with the expectation that the poorest countries would require more time to get started with new resources. The individual country estimates were aggregated to develop a regional level estimate of the percent of total costs associated with programmes and systems.

Family Planning: the baseline total CPR (modern methods plus traditional) was increased so that unmet need reduces to zero in 2015. For example if the total CPR was 40% at the outset and unmet need was 20%, the CPR was projected linearly to reach 60% in 2015. Empirically, actual unmet need will fluctuate during the projection period, and it always remains above zero even in advanced countries, but this method provided an order of magnitude for a target to aspire to, and discrepancies were expected to average out somewhat at the regional level. To generate absolute numbers of contraceptive users (and therefore costs), prevalence at the outset was adjusted to allow for users among unmarried women, based upon national survey data that showed prevalence among all women as well as among married/in union women[11]. The method mix distribution was assumed to be constant which is a conservative assumption since the percent of total users that are using modern methods usually increases as the total CPR increases. The commodity costs and personnel costs of contraception for each of 10 contraceptive types, are contained in the UNFPA costing tool. All costs were adjusted to 2008 dollars.

Other Reproductive Health Services: The RH Costing similarly provides information on the direct supply/equipment and personnel costs for the additional interventions in Annex 3. All interventions were projected to attain 100% coverage by 2015.

Obstetric Fistula: Data in the UNFPA costing tool were updated[12] to reflect the latest available information concerning incidence rates and treatment costs, building up from the country level.

Reproductive Organ Cancers: Consistent with the life-cycle approach promoted in the Programme of Action of the International Conference on Population and Development, the current exercise includes an estimate of resources required to address reproductive organ cancers. An initial approximation of these requirements, which were included among maternal health direct costs in the results, was generated separately for different categories of cancer as follows:

1. Breast cancer baseline estimates came from regional prevalence rates[13] and regional screening and regional treatment costs[14]. It was assumed

9 It should be noted that elements not included in the WHO paper can be substantial to the overall health systems costs including facilities construction (and corresponding maintenance, operations), commodity supply system development, HMIS, etc . can be quite substantial. For instance improvements to Ethiopia's commodity supply system have been estimated at over $350 million.

10 HMIS: Health Management Information Systems.

11 The CPR among married/in union women is adjusted to reflect use among all women and that adjusted CPR is multiplied by the number of married/in union women. This procedure gives identical results to starting with survey information on the percent of all women using, and multiplying that times the number of all women. Unweighted regional averages for countries with all needed data are applied to unknown countries.

12 C. Stanton, S.A. Holtz, S. Ahmed. "Challenges in measuring obstetric fistula." International Journal of Gynecology and Obstetrics (2007) 99, S4–S9.

13 "Estimates of the World-Wide Prevalence of Cancer for 25 Sites in the Adult Population." International Journal of Cancer. 97, 72-81 (2002).

14 Page 1295 in Okonkwo, Quirine Lamberts, Gerrit Draisma, Arno der Kinderen, Martin Brown, Harry de Koning. 2008. *Journal of the National Cancer Institute*. 2008; 100: 1290 – 1300.; Groot, Martijn, Rob

that screening occurs every other year of age as women move from age 50 to age 69[15]. An adjustment of an additional 32% was made for such program-related costs as equipment and training.

2. Cervical cancer regional estimates came from prevalence rates,[16] screening costs (scaled up to 2008 dollars based on Goldie et al.[17]), together with treatment costs. WHO recommends cervical cancer screening for women between the ages of 25-65 every 3 to 5 years;[18] we assumed one screening every five years according to WHO guidelines. A 25% increment for equipment and specific training costs was added to the cost estimate. The predicted number of cases was similar to *World Cancer Report*, 2003.
3. The other major reproductive cancers (uterine, ovarian, prostate and testicular) have about the same total number of new cases in the developing world as either breast or cervical cancer. Lacking reliable data on these, their cost was set equal to 20% of the total costs.

2.2 Humanitarian Response

Recent regional data[19] were used to develop regional estimates for the projected number of people in camps and spontaneous settlements to 2015. This projection incorporates population growth as well as internal displacement movements associated with migration related to climate change[20]. Population projections were multiplied by per person (refugee or displaced person) costs using regional estimates for camps and spontaneous settlements. Commodity cost estimates were scaled up using estimates of special transport and security needs. Personnel costs were adjusted according to category of settlement. It was assumed that coverage of the needs of these persons started at 20% and reaches 100% by 2015. The resulting totals were equally divided between family planning and non-family planning direct costs in the absence of evidence for its allocation. System costs for this category of activities were assumed to be an additional one-third of the computed total costs.

2.3 Demand Generation

According to the WHO 2005 document, community awareness is already incorporated in the Health Education component of the Programme and Health Systems Strengthening, so no additional allowance for that was required.

Gender Based Violence (GBV)

UNAIDS documents list only certain inclusions, with rather little additional detail, to promote gender equality, train staff for gender awareness in VCT programmes, prevent violence against women, and establish comprehensive post-rape services. We incorporated minor recognition of the impact of GBV by adding 5 minutes of personnel time to all family planning services to reflect the increased time associated with GBV screening and possible referral/counseling. For related systems costs, the GBV share is basically covered already under BCC/IEC.

2.4 Resource Requirements for Data, Research and Training

Resource mobilization for sustained socio-economic development is an ongoing challenge for developing

Baltussen, Carin Uyl-de Groot, Benjamin Anderson, Gabriel Hortobagyi. 2006. *The Breast Journal*. Volume 12 Suppl. 1, S81-S90.

15 Page 156 in Stewart, Bernard, and Paul Kleihues (Eds). 2003. *World Cancer Report*. WHO: Geneva.

16 From Gakidou, Emmanuela, Stella Nordhagen, Ziad Obermeyer. 2008. "Coverage of Cervical Cancer Screening in 57 Countries: Low Average Levels and Large Inequalities." PLoS Medicine. Volume 5, Issue 6, e132.

17 Goldie SJ, Gaffkin L et al, *NEJM* 2005; 353:2158-68.

18 Page 240. International Agency for Research on Cancer & World Health Organization. 2005. IARC Handbooks of Cancer Prevention: Cervix Cancer Screening. IARC Press: Lyon, France.

19 "2007 *Global Trends: Refugees, Asylum-seekers, Returnees, Internally Displaced and Stateless Persons*" (UNHCR). Also the IFRC 2007 World Disasters Report.

20 Personal communication with Dr. Manuel Carballo, International Centre for Migration Health and Development.

countries. Population-related programmes play an important role in enabling, facilitating and accelerating progress in sustainable development. The quality and success of these programmes benefit from a balanced allocation of resources. Data, research and integration of findings into programmes and development policies contribute towards achieving national development goals. The objective of this section is to update and improve the estimates of global resource requirements to enable countries to undertake population data collection and analysis, research, policy development and training, in order to improve the monitoring of the ICPD goals and Millennium Development Goals (MDGs).

The total costs of Component 4 consist of four sub-components:

1. Censuses;
2. Population surveys;
3. Civil registration;
4. Research and training of human resources.

Censuses

A population census is the process of collecting, compiling, evaluating, analyzing and publishing demographic, economic and social data pertaining, at a specified time, to all persons in a country or a well defined part of a country.[21] It is a national undertaking in which every member of civil society takes part and is the most elaborate and costly data collection activity that national statistical offices undertake. In recent decades census costs have increased very rapidly, both because of population growth and the use of new technologies in mapping, data processing and dissemination.

Estimating national census cost is difficult and not many developing countries report total census cost. Furthermore, the involvement of multiple national agencies and different census taking approaches followed makes it difficult to collect internationally comparable data on census costs. The UNSD has recently conducted a survey to collect census cost data with some success. A total of 132 (63%) countries, some partially, responded to the inquiry, out of 211 contacted.[22] The census costs per capita were estimated for regions and sub-regions and were used to estimate the total resource requirement for: (i) each sub-region, (ii) region, (iii) total for less developed countries (LDCs), (iv) for LDCs excluding China, (v) for LDCs excluding China and India, and (vi) for least developed countries. The base year for the unit cost estimates was 2008. The census cost estimates for 2005-2008 are based on 2008 prices. Beyond 2008, the unit cost data were not adjusted for inflation. It should be noted that response rate varied by region and this impacted comparability of regional estimates and the estimates of total resource requirements. Some estimates of unit cost - US$ 0.74 for Eastern Asia, US$ 0.52 for South Central Asia, and US$ 0.89 for Middle Africa - were considered too low and were adjusted upward to US$ 1.50. Similarly, the US$ 1.25 for Western Africa and US$ 1.39 for Middle Africa were adjusted to US$ 1.50. The impact of these adjustments, with the exception of East Asia including China, is not substantial on the total cost estimates. The projected population for each country is based on UN Population Projections, the medium variant.[23] The total population for each sub-region for each census year was multiplied by the unit cost per person to estimate the total sub-regional cost per year.

Sub-component 1, therefore, was computed based on:

1. The expected year of the next census;
2. The estimated and projected total population; and
3. An estimated regional per capita census cost for enumerating each individual. These costs were estimated at USD 1.50, except in Southern Africa (USD 10.20), Western Africa (USD 8.10), Southeastern Asia (USD 2.10), Western

21 *Principles and Recommendations for Population and Housing Censuses, Revision 2*. United Nations, New York. 2008. p. 7

22 For survey details see *Projected Census Dates, Funding Requirements and Sources, and Technical Assistance Needs for the 2010 Round of Population Censuses*, Diane Stukel, United Nations (UNSD), New York, 2008 (mimeographed).

23 *World Population Prospects: The 2006 Revision*. United Nations, New York, 2008.

Asia (USD 8.10), Eastern Europe (USD 5.10), Southern Europe (USD 11.70), the Caribbean (USD 3.40), Central and South America (USD 2.70).

Instead of concentrating all costs in the census year, these were rephased: 10% in the year prior to the census, 60% in the census year, and 15% in each of the two years following the census. This results in a smoother and more realistic expenditure pattern, with the following final values (in millions).

Surveys

Over the last 40 years, household-based population surveys have played a vital role in establishing and monitoring development goals. In the early 1970s, UNFPA in collaboration with other UN agencies and development partners, and in cooperation with the International Union for the Scientific Study of Population (IUSSP), established the first global initiative. The World Fertility Survey (WFS) programme's objective was to assist countries, particularly the developing countries, to carry out scientifically designed sample surveys of human fertility behavior. The Demographic and Health Survey (DHS) programme is the continuation of these efforts but with a wider scope. In addition, some developing countries have established population/demographic survey programmes to monitor national development goals on a regular basis.

The estimates of global resource requirement for a DHS type regular survey programme in developing countries is based on the understanding that over the 2005-2015 period, each country on an average, will conduct a survey every 4 years, one survey during 2005-2008 period and 1.5 surveys during 2009-2015 period, in addition to a decennial population census.

Survey costs vary considerably and depend mainly on the number of households covered, the sample design and the administrative/geographical level required[24]. The Demographic and Health Survey programme generally covers between 5,000 to 35,000 households in each country, with few exceptions such as, for example, India, where it covered about 103,000 households in the most recent survey. As the actual sample size will vary from country to country, it is assumed that the sample size of households will vary ranging 0.25% to 1.00% of the total number of households based on population size.

There is no database on survey costs. The DHS is the only organization currently executing a Global Survey Programme and has the most complete but still very limited information on survey costs. The DHS was unable to release this information for this

24 For a detailed discussion of sampling strategies, see *Designing Household Survey Samples: Practical Guidelines*, Chapter 3 – "Sampling Strategies". United Nations. New York, 2008. Pp. 25-74.

Table 2: Estimated Cost of Censuses by Region

(Millions of US $)

REGION (CENSUS (REPHASED))	2009	2010	2011	2012	2013	2014	2015
SUBSAHARAN AFRICA	233.2	449.9	528.8	325.3	160.4	73.8	12.3
ASIA AND PACIFIC	461.0	2,134.2	1,865.6	803.2	344.7	0	0
LATIN AMERICA AND CARIBBEAN	116.1	683.0	203,4	262.4	26.6	30.2	58.2
MIDDLE EAST & NORTH AFRICA	103.8	540.7	135.2	131.9	54.4	319.7	79.9
SOUTHERN & EASTERN EUROPE	213.1	602.8	780.4	284.4	160.0	2.8	0
TOTAL	**1,127.3**	**4,410.6**	**3,513.4**	**1,807.2**	**746.1**	**426.5**	**150.3**

exercise. In the absence of any documented survey cost information, a decision was made to use the unit cost of US$125 for all countries, except South and Central America and the Caribbean countries where $150 per household was used for estimating 2005-2008 and $150 and $200 respectively for 2009-2015 surveys.

The data on number of households in each country is generated by dividing the total population by the average household size, as estimated by the World Bank[25] for 2010. The same average household size data were used for the two periods. For countries where no information on household size is available, the average household size of the sub-region was used. The number of households was estimated for the years 2007 and 2012. The sum of sampled households was multiplied by the unit cost to get the respective regional and total resource requirement. The estimated total cost for the year 2007 was equally allocated to each year over the 2005-2008 period. The estimated total cost for 2012 was adjusted to cover 1.5 surveys during the 2009-2015 period and divided similarly.

Sub-component 2, therefore, was computed based on:

1. One survey each 4 years, with costs spread out evenly over the 4-year interval, with no surveys in the developed countries and countries in transition.
2. The estimated and projected total population;
3. The estimated and projected average household size;
4. An estimated sample size (1% for countries under 1 million, 0.5% for countries with 1-25 million inhabitants, and 0.25% for countries with more than 25 million inhabitants); and
5. An estimated regional per household survey cost (USD 125, except in South and Central America and in the Caribbean, where USD 150 was estimated).

The projections under point 3 were prepared based on the 1995 *Demographic Yearbook* and the 2006 *World Development Report*, through a regression of the change in mean household sizes between both years on the change in young and old age dependency ratios, for the 47 countries that had data from both sources that were at least 5 years apart. The regression was constrained to an intercept of 0, so that countries with no change in their dependency ratios would also experience no change in their mean household sizes. The resulting equation, therefore, was

$$\mathbf{HHSize2 = HHSize1 + 0.03938\ \Delta\ Young\ Dep.\ Ratio + 0.00540\ \Delta\ Old\ Dep.\ Ratio}$$

The first change is generally negative and the second is small, tending to positive. The reason for the positive sign of the first coefficient is fairly obvious (less children implies smaller household sizes); that the second coefficient is also positive means that older people still live predominantly with their children, rather than forming their own, small household units. The changes implied by the above equation were then projected forward based on the most recent available household size, whether listed in the Demographic Yearbook or the World Development Report, and the 2006 Revision of Population Prospects, for the dependency ratios of the most recent year available and the projected value for 2010. The resulting total cost estimates (in millions) are as follows:

25 World Bank, *World Development Report* 2006.

Table 3: Estimated Cost of Surveys by Region

(Millions of US $)

REGION	2009	2010	2011	2012	2013	2014	2015
SUBSAHARAN AFRICA	18.3	18.7	19.2	19.6	20.0	20.5	20.9
ASIA AND PACIFIC	76.2	76.9	77.7	78.5	79.2	79.9	80.7
LATIN AMERICA AND CARIBBEAN	18.3	18.5	18.8	19.0	19.2	19.4	19.6
MIDDLE EAST & NORTH AFRICA	7.8	7.9	8.1	8.2	8.3	8.5	8.6
SOUTHERN & EASTERN EUROPE	0	0	0	0	0	0	0
TOTAL	**120.6**	**122.1**	**123.7**	**125.2**	**126.8**	**128.3**	**129.8**

Administrative Records including Civil Registration

A primary source of national vital statistics is the administrative records of vital events collected through the civil registration system. A national civil registration (CR) system is the continuous, permanent, compulsory and universal recording of the occurrence of and characteristics of vital events pertaining to the population as provided under legal requirement for each country.[26] In developed countries medical records have played an important role in ensuring universal registration of vital events; however, the less developed countries are still lagging far behind in this regard. Concerted efforts by UNSD, UNFPA, WHO and the International Institute for Vital Registration and Statistics during the 1980s and 1990s have had limited success and during last decade suffered a real set back when many countries - such as India, Indonesia, Pakistan, Bangladesh - started to establish population registration systems to issue identity (security) cards and abolished or merged their civil registration systems. Future civil registration systems will only succeed if priority international effort is made to insure the inclusion of vital statistics in the emerging population registration paradigms. In the 1980s and 1990s, many demonstration projects to establish and strengthen civil registration and vital statistics were funded by UNFPA and implemented by UNSD. In the process many technical and administrative reports were prepared and regional, sub-regional and national advocacy and training workshops were organized. These materials need wider dissemination.

For estimation purposes, sub-component 3 was determined on the assumption that each registered event (birth, death, marriage, or divorce) has a cost equivalent to a third of the per capita census cost that was applied under sub-component 1. This does not include the systemic costs of maintaining the civil registration system as such, but only the specific processing costs of each event. The number of births and deaths was obtained from the same source as the population figures under sub-components 1 and 2, based on the regional averages of birth and death rates, as listed below. These were interpolated linearly, based on the different values for 2000-2005 and 2005-2010 that are part of the table. For the number of marriages, an approximation was used, based on the assumption that all first marriages occur exactly at age 20. In order to take account of divorces and remarriages, a simple multiplier was incorporated, with some regional variations. The details of the sub-regional rates used in the computation are presented in Annex 5. The resulting cost estimates (in millions) are as follows:

26 *Handbook on Training in Civil Registration and Vital Statistics Systems*. United Nations, New York, 2002, p.5.

Table 4: Estimated Cost of Civil Registration by Region

(Millions of US $)

REGION	2009	2010	2011	2012	2013	2014	2015
SUBSAHARAN AFRICA	80.4	81.2	82.0	82.8	83.5	84.2	84.9
ASIA AND PACIFIC	70.3	70.7	71.0	71.4	71.7	72.0	72.2
LATIN AMERICA AND CARIBBEAN	19.3	19.4	19.5	19.5	19.6	19.7	19.7
MIDDLE EAST & NORTH AFRICA	24.6	24.9	25.1	25.3	25.5	25.7	25.9
SOUTHERN & EASTERN EUROPE	24.7	24.7	24.7	24.7	24.7	24.6	24.6
TOTAL	**219.4**	**220.9**	**222.3**	**223.6**	**224.9**	**226.1**	**227.3**

Research and Human Resource Development (Training)

Sub-component 4, finally, was obtained simply as 5% of the average of the previous three sub-components over the 2005-2015 period, for each year. Summing these figures with the ones of the other three components, including censuses, surveys and civil registration, results in the following grand totals (in millions):

Annex 6 provides some additional considerations that follow from the census, survey, civil registration and research and training analysis.

Table 5: Estimated Cost of Censuses, Surveys, Civil Registration and Research and Training, by Region

(Millions of US $)

REGION	2009	2010	2011	2012	2013	2014	2015
SUBSAHARAN AFRICA	353.2	571.2	651.3	449.0	285.3	200.0	139.5
ASIA AND PACIFIC	641.5	2,315.7	2,048.3	986.9	529.5	185.8	186.8
LATIN AMERICA AND CARIBBEAN	162.2	729.3	250.1	309.3	73.8	77.7	105.9
MIDDLE EAST & NORTH AFRICA	145.3	582.5	177.4	174.5	97.2	362.9	123.5
SOUTHERN & EASTERN EUROPE	248.5	638.2	815.7	319.7	195.3	38.1	35.3
GRAND TOTAL	**1,550.6**	**4,836.9**	**3,942.7**	**2,239.4**	**1,181.1**	**864.3**	**590.8**

III. Collated Results of the Component Analyses: The Bottom Lines, Global and Regional

Application of the described methodologies results in the following global and regional estimates of resource requirements.

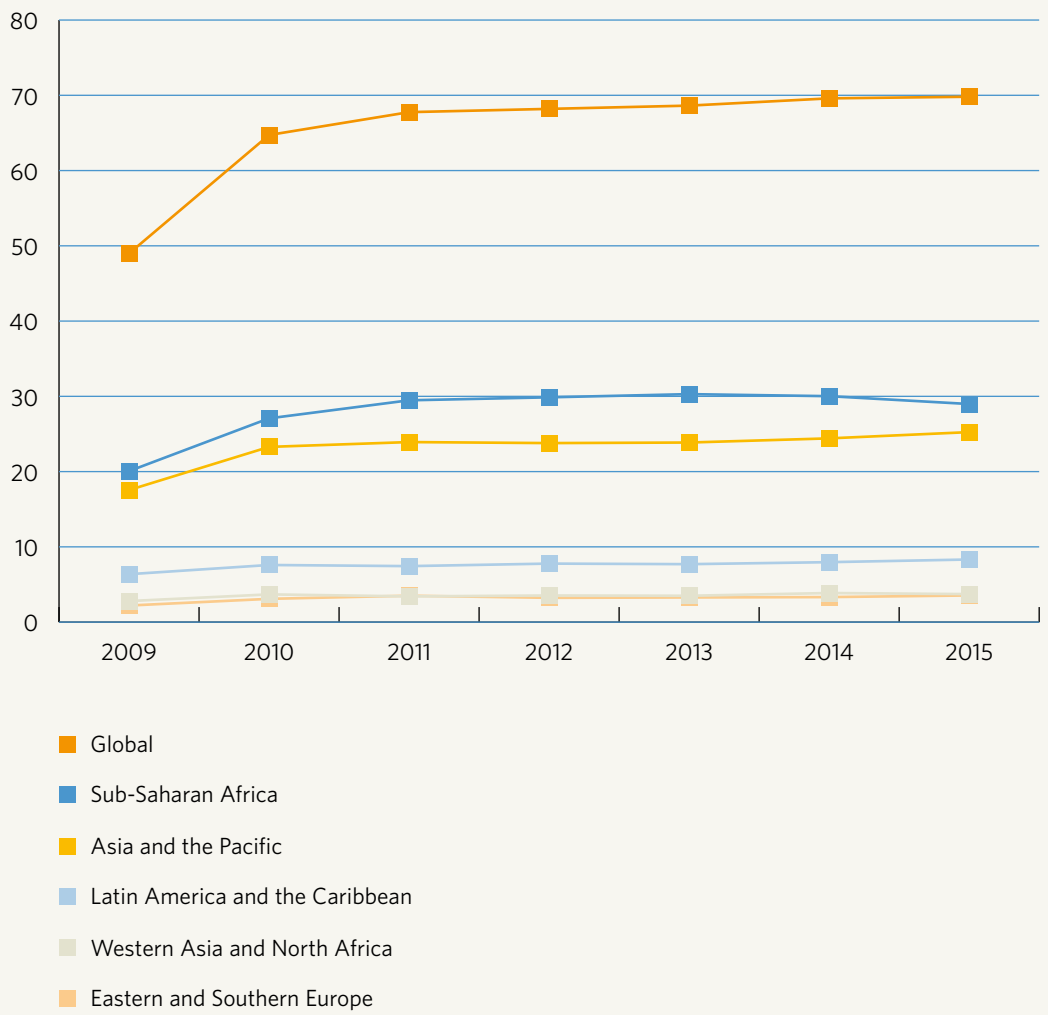
Table 6: Revised ICPD Cost Estimates, By Sub-Region, 2009-2015 (Millions of US $)

Region/year	2009	2010	2011	2012	2013	2014	2015
Global	**48,980**	**64,724**	**67,762**	**68,196**	**68,629**	**69,593**	**69,810**
Sexual/Reproductive Health/Family Planning	23,454	27,437	30,712	32,006	32,714	33,284	33,030
Family Planning Direct Costs	2,342	2,615	2,906	3,209	3,529	3,866	4,097
Maternal Health Direct Costs	6,114	7,868	9,488	11,376	13,462	15,746	18,002
Programmes and Systems Related Costs	14,999	16,954	18,319	17,422	15,723	13,672	10,931
HIV/AIDS	23,975	32,450	33,107	33,951	34,734	35,444	36,189
Basic Research/ Data/Policy Analysis	1,551	4,837	3,943	2,239	1,181	864	591
Sub-Saharan Africa	**20,063**	**27,075**	**29,473**	**29,869**	**30,292**	**30,022**	**28,980**
Sexual/Reproductive Health/Family Planning	8,482	10,612	12,596	12,675	12,764	12,184	10,731
Family Planning Direct Costs	329	414	506	606	713	827	931
Maternal Health Direct Costs	1,429	1,833	2,280	2,771	3,306	3,883	4,411
Programmes and Systems Related Costs	6,725	8,366	9,809	9,298	8,746	7,473	5,389
HIV/AIDS	11,228	15,891	16,227	16,746	17,243	17,638	18,110
Basic Research/ Data/Policy Analysis	353	571	651	449	285	200	139

Region/year	2009	2010	2011	2012	2013	2014	2015
Asia and the Pacific	**17,549**	**23,281**	**23,923**	**23,788**	**23,862**	**24,415**	**25,245**
Sexual/Reproductive Health/Family Planning	9,055	10,278	11,027	11,753	12,124	12,820	13,533
Family Planning Direct Costs	1,434	1,552	1,675	1,803	1,937	2,077	2,156
Maternal Health Direct Costs	2,799	3,664	4,299	5,110	6,018	7,024	8,054
Programmes and Systems Related Costs	4,822	5,062	5,053	4,840	4,169	3,719	3,323
HIV/AIDS	7,853	10,687	10,848	11,048	11,207	11,409	11,525
Basic Research/ Data/Policy Analysis	641	2,316	2,048	987	530	186	187
Latin America and Caribbean	**6,366**	**7,591**	**7,439**	**7,775**	**7,699**	**7,966**	**8,320**
Sexual/Reproductive Health/Family Planning	3,132	3,401	3,627	3,837	3,922	4,119	4,347
Family Planning Direct Costs	310	343	378	414	452	492	518
Maternal Health Direct Costs	958	1,182	1,431	1,706	2,009	2,340	2,680
Programmes and Systems Related Costs	1,864	1,876	1,818	1,717	1,461	1,286	1,150
HIV/AIDS	3,072	3,461	3,562	3,630	3,703	3,770	3,867
Basic Research/ Data/Policy Analysis	162	729	250	309	74	78	106
Western Asia and North Africa	**2,795**	**3,685**	**3,418**	**3,538**	**3,501**	**3,865**	**3,721**
Sexual/Reproductive Health/Family Planning	1,852	2,009	2,130	2,232	2,258	2,339	2,415
Family Planning Direct Costs	178	204	231	261	292	325	346
Maternal Health Direct Costs	603	735	873	1,019	1,171	1,328	1,471
Programmes and Systems Related Costs	1,071	1,070	1,025	953	796	686	598
HIV/AIDS	798	1,095	1,112	1,131	1,146	1,163	1,183
Basic Research/ Data/Policy Analysis	145	582	177	174	97	363	123
Eastern and Southern Europe	**2,204**	**3,091**	**3,508**	**3,226**	**3,275**	**3,326**	**3,542**
Sexual/Reproductive Health/Family Planning	933	1,137	1,334	1,510	1,645	1,824	2,004
Family Planning Direct Costs	91	103	116	125	135	145	146
Maternal Health Direct Costs	324	454	605	771	960	1,171	1,386
Programmes and Systems Related Costs	517	579	613	614	551	508	471
HIV/AIDS	1,023	1,316	1,358	1,397	1,435	1,465	1,503
Basic Research/ Data/Policy Analysis	248	638	816	320	195	38	35

Revised ICPD Cost Estimates by Sub-Region, 2009, 2012, 2015

Millions of US $



IV. Conclusion

The exercise undertaken in this paper, building on several diverse research activities since ICPD to better understand the cost implications of the ICPD Programme of Action, indicates that the overall level of funding required at the beginning of the projection period remains broadly similar to the 1994 ICPD "costed package" though the distribution between component services differs. (Some additional comments on methodology differences are in Annex 7.) The share of resources among the components has changed with a greater share now seen for HIV/AIDS prevention and a smaller relative share for other SRH interventions related to family planning, safe motherhood and neonatal health. However, the estimated requirements later in the projected period are significantly higher. Also, the resources needed for full implementation of the Programme of Action are higher across all intervention groups. While this is in large part due to the higher HIV/AIDS prevention requirements, SRH costs are also higher than the original projections but the increase is not as dramatic. Total direct SRH costs increase by just over $3 billion in 2015. However, in the current exercise these are direct service costs (for programme costs, see below). HIV/AIDS costs, now including all prevention, treatment and care needs, are $34.6 billion higher.[27] Further, within the SRH component, our analysis has also demonstrated that a strategy which focused on eliminating expressed unmet need for contraceptive services would lead to overall savings in the sector. Aggregate results indicate (see Annex 8) that each $1 of additional investment in family planning needed to raise contraceptive prevalence to rates commensurate with elimination of unmet need will lead to a reduction of other maternal and newborn required investments in the range of $2-3.

The current exercise, however, needs to be placed in a different context than existed in 1993. While different intervention-specific and health sub-programme costing exercises continue to be undertaken, largely as part of advocacy efforts, the policy discussions have moved towards a more systemic approach to health system needs. Various system costs have been included in these updated estimates explicitly (they were more implicitly included in the original unit costs). But key elements (e.g., infrastructure, training needs, supervision and management capacity development) require further analysis and elaboration. We estimate that by 2015 programme and system-related costs will be $10.9 billion. However, this represents the lowest level of required investment. In order to achieve the required health system service scale-up significant investments are needed earlier. The peak is reached in 2011 at $18.3 billion. Once the requisite infrastructure, personnel and administrative systems are in place these investments begin to moderate.

The added costs and potential savings of better integration of services must also be considered. Integration of services from the service delivery point up through policy and planning functions would most likely add additional costs because integrated systems require more management expertise than single-issue vertical programmes; monitoring and evaluation is more complex and more planning is needed to ensure a continuum of services for each client over a continuum of time.

27 Subsequent to the transmittal of the UNAIDS estimates for prevention, treatment, care and support, a new scenario was generated suggesting a lower level of coverage, particularly in the period before the original 2010 target. In this revision the 2009 HIV/AIDS total is $19..8 billion and increases less sharply initially, reaching $36.7 billion in 2015. The cumulative requirement (2009-2015) presented here totals $230 billion. The revised estimate totals $204 billion, with a different annual time course. For context, the pro-rated SRH portion of the HIV/AIDS prevention efforts, using the methodology of the UN Millennium Project report, would constitute about 30% of the HIV/AIDS total in each year, using the updated estimates.

Estimation of the marginal costs needed to scale up from current coverage levels has also become more common (WHO, 2005a). Some elements of marginal cost analysis (e.g., the additional costs of – and resulting savings from – meeting unmet need for family planning) have been incorporated in the current work. Total and marginal cost estimates for related service packages are difficult to evaluate without better information about current expenditure levels.

The task of estimating resources for the whole health system as part of an analysis of the needs for attaining all the health-related MDGs requires detailed attention to joint inputs and potential synergies. This new analysis of the resources required to implement the basic population and reproductive health package of the ICPD points the way towards a better evaluation of other health system cost estimate efforts that have been undertaken within the MDG discourse. The inclusion under MDG5, "Improve maternal health", of the new MDG target of "universal access to reproductive health" will require a re-evaluation of earlier cost estimates for maternal, newborn and child health programmes that did not include the full range of SRH services described here.

Partnerships within the UN system and with outside experts continue to advance and harmonize the methodologies for estimating future resource requirements. Expert opinion is further informed by national level experts and their experience with these analyses, situation assessments and programme monitoring. As more detailed national analyses are undertaken, further advances in resource estimation, performance monitoring and impact assessment will be made. Periodic reassessment of the investments and their impacts by strengthened national institutions will further improve programme design and implementation.

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Annex 1

List of Maternal and Newborn Health Interventions Used by the World Health Organization

Intervention/care	Population in need of services (%)
Basic antenatal care: Assessment of mother and fetal well being Information and counseling Recording and reporting	100%
Screening for hypertensive disorders of pregnancy	100%
Screening for anaemia Prevention of anaemia	100%
Syphilis testing	100%
Voluntarily Counseling and Testing (VCT) for HIV	100%
Tetanus toxoid immunization	100%
Antimalarial Intermittent preventive treatment (IPT) Insecticide treated nets (ITNs)	100%
Treatment of hookworm infection	100%
Treatment of severe hypertension in pregnancy	5%
Treatment of moderate anaemia (Hb:7-11 g/dl)	5%
Treatment of syphilis	3-10%
Treatment of STIs: Treatment of bacterial vaginosis / trichomonas infection Treatment of vaginal candida infection Treatment of gonorrhoea / chlamydia infection	 6% 5-15% 6-10%
Screening for urinary tract infection UTI) Treatment of lower urinary tract infection Treatment of upper urinary tract infection	100% 4-7% 2%

Intervention/care	Population in need of services (%)
Basic childbirth care: Initial assessment and recognition of delivery complications Surveillance and regular monitoring of labor and delivery (the partograph) Social support throughout labor and delivery Prevention and control of infections Assistance during childbirth Active management of the third stage of labor Assessment, care and support of mother and baby	100%
Prevent mother to child transmission of HIV (PMTCT)	1-15%
Immediate postpartum care (1-2 hrs after birth): Examination of the mother Information and counseling Recording and reporting during PPC Give iron and folate supplementation	100%
Situational care	
Vitamin A supplementation	10-20%
Pre-referral care for maternal complications	7-15%
Basic Newborn Care: Immediate postnatal care Breastfeeding support	100%
Additional care – for at risk baby:	
Resuscitation	4%
Small baby care and kangaroo mother care	2.5%
Minor problem newborn care	7%
Presumptive sepsis care	1.5%

Intervention/care	Population in need of services (%)
Situational care:	
Eye prophylaxis	
PMTCT	
Presumptive syphilis	
Malaria prevention	
TB prophylaxis	
Pre-referral care for seriously ill baby	7%
Postnatal visit care	
Follow-up visit	
Sick baby visit	
Maternal stay for baby care	
Early postpartum visit (24 hrs up to 1 week): Postpartum examination of the mother Information and counseling	100%
Counseling on family planning methods	100%
Management of mastitis	<0.5%
Management of post partum depression	8-15%
Late postpartum visit (6 wks) – family planning Counseling on family planning methods	CPR – as proxy – to be added
Voluntary tubal ligation (female sterilization)	
Intrauterine device (IUD) insertion	
Combined oral contraceptives	
Combined injectables	
Complications care:	
Treatment of severe pre-eclampsia Treatment of eclampsia	2.2% 2.8%
Treatment of severe anaemia	3-5%
Treatment for HIV positive woman Management of HIV positive woman w/ opportunistic infections	9% 9%
Treatment of severe malaria	2.5%

Intervention/care	Population in need of services (%)
Treatment of severe UTI	2%
Screening all pregnant women for blood group isoimmunization	100%
Administration of anti-D immunoglobulin (rh-negative women at 28 wks) Postpartum administration of anti-D immunoglobulin	10-15% 8%
Ultrasound (selective use)	10-15%
Care for pregnant women with diabetes	3-5%
Corticosteroids to promote fetal maturation before preterm delivery	10%
Management of pre-labor rupture of membranes (PROM) and infection	5-7%
Management of ante-partum haemorrhage	2.2%
Management of puerperal sepsis	8%
Management of prolonged and obstructed labor	10-15%
Management of fetal distress	8%
Episiotomy	10-15%
External cephalic version (ECV)	4%
Breach delivery	3%
Craniotomy / embryotomy	0.5%
Management of postpartum haemorrhage	5%
Management of perineal infection	1%
Repair of vaginal/perineal tears	5%
Repair of cervical tears	2%
Symphysiotomy	<0.5%
Surgical repair of obstetric fistula	<0.5%
Abortion Care: Management of post-abortion complications	15%
Post-abortion care and counseling	15%
Safe abortion/induced abortion (where abortion is legal)	??

Intervention/care	Population in need of services (%)
Special newborn care – secondary health care level	
Special general care for seriously ill baby	7%
Very small baby care and Kangaroo mother care	3.4%
Sepsis management of newborn	4.2%
Management of convulsions	2.2%
Management of breathing difficulty of newborn	4.0%
Severe jaundice management (newborn)	4.4%
Severe birth trauma management	0.9%
Severe hypothermia management of newborn	2.3%
Congenital syphilis management (newborn)	0.1%
Neonatal tetanus management	0.1%
Supporting breastfeeding – maternal stay for baby care	

Source: WHO 2004

Annex 2

Interventions in the Mother-Baby Package

The WHO *Mother-Baby Package* spreadsheet estimates the cost of providing to a target population the following 18 maternal and newborn interventions:

	Terminology used in the model
Care during pregnancy	
Antenatal care	Antenatal Care
Treatment of severe anaemia	Anaemia, severe
Treatment of syphilis	STD – Syphilis
Treatment of other STDs such as gonorrhoea and chlamydia	STD – Other
Management of abortion complications	Abortion Complications
Care during and after delivery	
Delivery by a skilled birth attendant, including clean and safe delivery and routine newborn care	Normal Delivery
Management of eclampsia	Eclampsia
Management of postpartum haemorrhage	Haemorrhage
Management of obstructed labour/caesarean delivery	Obstructed Labour
Management of sepsis	Sepsis
Management of basic newborn complications	Neonatal Complications
Postpartum care	Postpartum Care
Postpartum family planning	
Condom	FP – Condom
Depo-Provera	FP – Depoprovera
IUD	FP – IUD
Norplant	FP – Norplant
Oral Contraceptives	FP – Pill
Sterilization	FP – Sterilization

Source: WHO 1999

Annex 3

SRH Interventions Used for Cost Estimation in the UNFPA Reproductive Health Costing Tool

ANC and Delivery Care	
1	Antenatal Care (ANC)
2	Malaria Prevention within ANC
3	Malaria Treatment within ANC
4	Treatment of Severe Anaemia
5	Delivery Care
6	Postpartum Care
Obstetric Complications	
7	Prolonged Labor (>18 hours)
8	Forceps or vacuum-assisted Delivery (AVD)
9	Eclampsia/Severe Pre-eclampsia
10	Cesarean Section (C-Section)
11	Prelabour rupture of membranes (PROM)
12	Emergency pre-referral care
13	Antepartum Hemorrhage
14	Postpartum Hemorrhage
15	Puerperal Sepsis
16	Hypertensive Disorders of Pregnancy
17	Management of Post-abortion Complications (PAC)

Other Maternal Conditions	
18	Obstetric Fistula (OF)
19	Urinary Tract Infection (UTI)
20	Mastitis
Newborn Interventions	
21	Routine Newborn Care
22	Newborn Sepsis/Infections
23	Birth Asphyxia/Breathing Difficulties
24	Low-Birth Weight (LBW)
Family Planning	
25	Condom, Male (MC)
26	Condom, Female (FC)
27	Oral Contraceptives (Pill)
28	Emergency Contraception (EC)
29	Intrauterine Device (IUD)
30	Injectable
31	Implant (Norplant)
32	Female Sterilization (FS)
33	Male Sterilization (MS)

Source: UNFPA 2009; updated to reflect model components that were used in the ICPD @ 15 costing

Annex 4

HIV/AIDS Interventions Used For Cost Estimation

Detailed Interventions from UNAIDS (UNAIDS 2004)

- Youth-focused interventions
- Condom social marketing
- STI management
- Workplace
- Special populations
- PMTCT
- Harm reduction
- PEP
- Universal precautions
- Testing costs
- Cost for prophylaxis for OI
- Cost for HAART
- Orphan care
- Commercial sex workers and clients
    - Public and commercial condoms
    - VCT
    - Prevention for PLHA
    - Blood safety
    - Mass media
- Men having sex with men
    - Safe injection
- Cost for palliative care
    - Cost for treatment for OI
    - Cost for HAART labs
- Other prevention
    - Policy, advocacy, administration and research + Programme costs

Annex 5

Birth, Death and Marriage Rates Used For Civil Registration Estimates

	Birth rates		Death rates		
	2000-05	2005-10	2000-05	2005-10	Marriage rate
Eastern Africa	39.4	36.8	13.8	12.4	10.35
Middle Africa	45.3	43.4	17.3	16.0	9.95
Northern Africa	24.1	22.6	6.4	6.2	9.85
Southern Africa	22.9	21.5	16.9	17.0	10.20
Western Africa	39.7	36.9	14.9	13.6	10.25
Eastern Asia	12.6	12.5	7.2	7.6	7.80
S Central Asia	23.8	22.2	8.1	7.6	10.00
S Eastern Asia	19.7	18.0	6.4	6.3	9.15
Western Asia	23.9	22.4	6.0	5.6	9.45
Eastern Europe	10.0	9.9	14.6	14.9	7.05
Southern Europe	10.2	9.6	9.9	10.4	5.40
Caribbean	18.9	18.1	7.5	7.5	8.65
Central America	21.4	19.5	4.9	5.0	9.30
South America	19.4	17.9	6.2	6.3	8.80
Melanesia	28.3	25.7	8.9	8.6	9.90

Annex 6

Implications of the Census, Survey, Civil Registration and Research and Training Analysis

The main source of population data in most developing countries is the decennial population and housing census. In addition, ad hoc surveys have played a crucial role in providing specific data on a regular basis, although not many countries have established regular survey programmes. The civil registration systems have not developed adequately to provide regular vital statistics in most developing countries and the outlook for the future is not very bright.

Census programmes are mostly financed by national governments. Some external assistance is required for adopting new technologies, training and data dissemination in selected countries, particularly in the least developed countries. Rapidly rising costs and fast changing data needs are putting tremendous pressure on national statistical systems to find alternative methods of data collection at reasonable costs. It is highly probable that many countries may follow the methodologies developed countries are currently testing and adopting, for the 2020 round of population censuses. Survey programmes, on the other hand, are mainly financed from external resources and are more prone to changes in the external funding environment. Some creative thinking as well as revisiting discarded approaches such as the UN Household Survey Capability Programme[28] is needed. Current arrangements, such as the DHS programme, are very useful but extremely costly and unlikely to survive without huge international financial support and this may undermine national efforts.

The generally weak civil registration systems in many countries are being replaced by "Population Registers" which are being developed and maintained by internal security agencies. The trend is likely to continue and may well accelerate. This could undermine conventional CR systems, but in the long run is likely to improve vital event coverage. There is, therefore, an urgent need for the international community to play a pro-active role to ensure that the principles/guidelines developed for civil registration programmes are not compromised. Active advocacy and wider dissemination of principles and recommendation for civil registration and other existing documents will help the discussions and dialogue.

28 *Household Survey Capability Programme*, United Nations (Department of Technical Co-operation for Development and Statistical Office), New York, 1986.

Annex 7

ICPD Costing: Comments on Differences Between Original 1994 Estimates and the Estimates of This Paper

There are many reasons for the differences between the 1994 estimates and those in this paper. With regard to SRH costs, the original estimates were "top down" in the sense that they attempted to use empirical data on actual costs per user. At the time costs-per-user data were available largely for family planning interventions; cost data for other reproductive health interventions were sketchy at best. The present set of SRH estimates, on the other hand, uses a "bottom up" approach whereby each of 38 SRH interventions (including 10 for family planning) is broken down into its constituent inputs and each is costed out in detail. The advantage of the former approach is that it is based on actual experience of how much certain services cost in practice, while the latter approach is based on what specific interventions ideally cost. On the other hand, empirical cost-per-user data are scarce and may have important measurement problems.

Another major reason that the two sets of SRH estimates differ is that the amount of detailed information available today, but non-existent in 1993, is enormous. At the time of the ICPD, no detailed SRH data existed other than for family planning services. In fact, it was only in the years after the ICPD that national, regional and international meetings were held to hammer out a detailed and specific set of health interventions that would be considered to constitute SRH.

With regard to HIV/AIDS prevention, the reasons for differences between the 1994 estimates and the revised ones in this paper are similar. In 1993 no generally agreed set of HIV/AIDS interventions existed.[29] In fact UNAIDS itself did not come into being until 1996, replacing the WHO Global Programme on AIDS. Of the 19 prevention interventions listed in Annex 4, only four were contemplated in the ICPD: mass media, in-school youth programs, condom social marketing and public and commercial sector condom provision. To illustrate this point, for 2005 the estimated costs of these four interventions sums to $1.5 billion, remarkably close to the estimate made in 1993.[30] It is the addition of 14 further interventions which has swollen the new cost estimates.

29 Of course, under the WHO Global Programme of AIDS work had begun on defining specific interventions, at the time mostly for prevention.

30 The 1993 cost estimate for HIV/AIDS prevention of $1.4 billion (1993 dollars) would amount to $1.9 billion (2005 dollars).

Annex 8

Comparison of Two Projection Methods: Cost-Savings from Family Planning

An earlier version of the current analysis was conducted for the UN Millennium Project (UN Millennium Project, 2006). This preliminary analysis was conducted at the regional/sub-regional level, not aggregated from country level data. This analysis, which is distinct from the analysis presented in the rest of this document, was used to develop the following calculations associated with the expected return on investments in family planning from the point of view of a Minister of Health.

Two methods of projecting contraceptive prevalence rates (CPRs) were compared: the main one was based on satisfaction of unmet need. The second was based upon the UN medium variant for total fertility rate trends. It converts the TFR values to CPR values using the regression equation from a large set of national surveys that measure both variables. This produces a projection of CPR values. For family planning, users and costs follow from that projection. The latest survey figures for method mix (which are assumed to remain constant in the 6 year time period) were used based on patterns from DHS surveys.

The unmet need-based approach assumes that the current CPR will rise linearly to erase all unmet need by the year 2015, i.e. the CPR in 2015 was assumed to be the current CPR plus the current percent of married women of reproductive age with unmet need.[31] When the two projections approaches were compared it turned out that generally, though not always, the unmet need approach gave a higher use of contraception in 2015 than did the UN fertility projections.[32] The unmet need approach is therefore closer to a more pro-active stance to meet the reproductive needs of women for limiting or spacing childbearing.

The results that emerged from the comparative exercise are shown in the following for the six major regions, showing annual and accumulated savings resulting from the "Satisfying Unmet Need" approach over the medium variant approach. The table shows that the larger expenditures in the unmet need option for family planning lead to savings in maternal and newborn health. These savings start from early in the projection period even though full satisfaction of unmet need occurs only by the end and is achieved by linear increases over time. The savings in maternal and newborn health amount to $473 million in 2010 and $1.4 billion in 2015. Reaching these savings would require additional family planning expenditures of $159 million in 2010 and $317 million in 2015. The overall savings would then amount to $314 million in 2010 and $1.1 billion in 2015. The accumulated savings over the 10-year period from 2005 (not shown) to 2015 would be $4.2 billion.

31 The unmet need estimations assume that total demand remains constant but the proportion being satisfied increases. This produces conservative estimates of the requirements. However, as the procedure already produces high annual usage growth rates in high unmet need countries no effort has been made to forecast even greater increases.

32 For instance, in the Western Africa region, the current CPR is around 15 percent and unmet need is 27 percent. In 2015, under the UN Medium Variant, the CPR is estimated to be 38 percent, whereas using the unmet need approach, the 2015 CPR would equal 42 percent. Both are optimistic since even the 38 percent option requires that prevalence rises by 23 points, or an average of about 2.3 points per year for 10 years, which is very unlikely compared to international experience over the years.

Investing in Unmet Need – Savings in Maternal Health Interventions (millions)

	2010	2015	Cumulative
Additional family planning expenditures for unmet need	$159	$317	$1,780
Maternal health savings	$473	$1,427	$5,947
Overall savings per year	**$314**	**$1,109**	**$4,167**

These are just the direct savings in maternal and newborn care from averting unintended pregnancies. Other cost savings in other sectors, including those in later time periods, and other benefits attained (such as savings in educational and other health costs) would further increase the cost-benefit calculations from the family planning investments (Vlassoff *et al* 2004; Moreland 2006).

While the overall conclusions of significant cost-savings from family planning investments are the same, it should be noted that the estimates presented here concerning resource requirements and savings from the unmet need scenario differ in some respects from those presented in an earlier publication (UN Millennium Project 2006). A significant contribution to the resource estimation totals derives from the fact that the current estimates were aggregated to the regional level from national level estimates while the former were calculated from sub-regional data.

United Nations Population Fund
220 East 42nd Street
New York, NY 10017

www.unfpa.org

Design, layout and production by
Phoenix Design Aid A/S, Denmark.
ISO 14001/ISO 9000 certified
and approved CO_2 neutral company –
www.phoenixdesignaid.dk.

Printed on environmentally friendly paper
(without chlorine) with vegetable-based inks.
The printed matter is recyclable.

ISBN 978-0-89714-924-2
E/1000/2009