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Research Triangle Institute

Asian Health Trends and Emerging Issues for the 1990s

Final Report

August 1991

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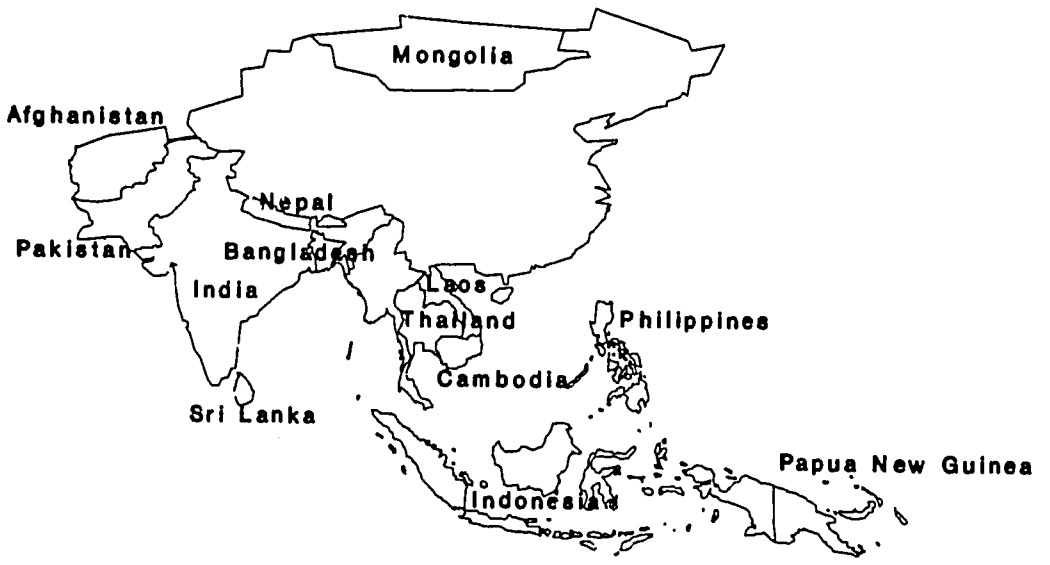

Report prepared for the Asia Bureau, Office of Technical Resources, U.S. Agency for International Development

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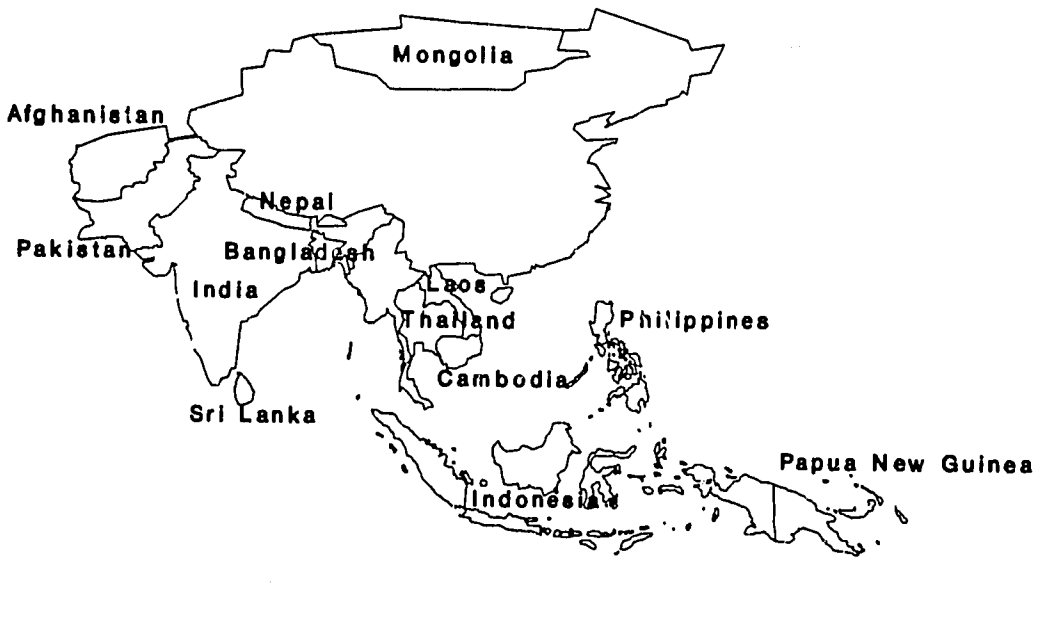

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Executive Summary

Asia is the region of the world's demographic giants. Seven of the 10 most populous developing countries in the world are in this region, and the combined population of the 14 USAID-assisted countries in Asia is about 1.5 billion--half the total population of the developing world (excluding China). The population of these 14 countries is projected to increase to about 2 billion in 2005.

This is also an extremely diverse region. Mortality and fertility rates have declined appreciably in many parts of Asia in recent decades, yet overall they are still high by developing country standards, and in some major parts of the region they are still quite high--especially among the very large populations in South Asia. The population under age 15 will continue to grow rapidly, but the growth of the population age 15-49 will be even more rapid, with accompanying growth in women's, maternal and other adult health care needs as well as continued rapid increase in family planning service needs.

For over 25 years USAID has committed significant financial and technical resources to reducing fertility and improving health in this region. Since 1985 USAID has had a global child survival program with roughly one-quarter of total funding committed to this region. However, about half of all children under age 5 in the developing world are in this region, and 75 percent of all children under age 5 in USAID child survival emphasis countries are located in this region.

Remarkable progress has been made in some countries in immunization and Oral Rehydration Therapy (ORT) coverage and in access to fertility control, but hundreds of millions continue to lack adequate access to basic health services. This is particularly true for children, among whom mortality and morbidity from measles, malnutrition, diarrhea, tetanus, and upper or acute lower respiratory infections continue to take their toll. Maternal mortality is still extremely high, especially in South Asia, and maternal health services are woefully neglected. Total expenditures for health care, both public and private, are low relative to other world regions.

This region is predominately rural (73 percent in 1990). During the next 15 years the urban population is expected to grow about 4 percent annually (four times the expected rural growth rate), nearly doubling in 15 years to about 720 million in the year 2005--about 36 percent of the total population. This rapid urban growth will be accompanied by increasing demands on urban health care services, ever more serious environmental health problems, and greatly increased pressures on already overburdened infrastructures for providing water, sanitation, and other essential services.

This study concludes that there have been significant accomplishments in reducing fertility and infant mortality in recent years, but the goals of low infant and child mortality and fertility throughout the region are far from being achieved. At the same time, in the more economically, technologically and demographically advanced parts of the region, new health conditions and health care needs are emerging that will make growing claims on scarce public and private financial and technical health care resources during the next decade and beyond. In addition, there is compelling evidence that during the next decade HIV/AIDS is likely to become an epidemic in some parts of this region.

Four major recommendations have emerged from our analysis of the health and family planning trends and emerging issues for this region in the 1990s and their possible programmatic implications for USAID, as follows:

1. USAID should stay the course in its support to the major, priority program areas of child survival (including breastfeeding), AIDS, family planning and a program-wide emphasis on finance and sustainability. Despite progress in reducing mortality and fertility, the goals of these programs are far from being achieved. The focus must continue to be on providing basic services to the large impoverished populations of this region. Governments, private sector, USAID and other donors must expand coverage significantly while addressing inequities in allocation of resources. Access and equity should continue to be guiding principles for assistance. A much larger private sector role, including service provision, is essential to achieving these ambitious health and family planning objectives.

2. USAID should significantly expand the size and scope of assistance to these major programs in response to the demographic and epidemiologic realities of the region, especially in India and the other countries of South Asia. Achievement of the goals of these programs is certainly not assured in the absence of significantly increased technical and financial support. Technologies have improved and permit increased cost-effectiveness in provision of a larger set of interventions.

3. USAID should develop new donor-recipient relationships in provision of health and family planning assistance that reflect the emergence in Asia of some large, economically prosperous nations with large and rapidly growing middle and professional classes. These partnerships should feature scientific and technical exchanges in both public and private sectors and should foster more active participation of the private sector in provision of health care services.

4. USAID should monitor and identify appropriate opportunities to provide assistance to address major new health care needs of the region that are emerging in response to changing economic, epidemiologic and technological circumstances. Creative approaches are needed to involve the media and both public and private service providers through broad multisectoral approaches, especially for the issues of environmental health, urban services, tuberculosis and tobacco-related health issues.

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Acknowledgements

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The authors alone are responsible for any errors or omissions in this Report.

The Focus of this Study

Research Triangle Institute was commissioned by the United States Agency for International Development (USAID) Asia Bureau, Office of Technical Resources, to undertake an assessment of health trends and emerging issues for the 1990s in Asia and to identify possible assistance interventions for the health sector. More specifically, this was to be a quick examination of published and available data on the USAID-assisted countries of Asia with particular attention to the principal broad USAID program areas of Child Survival, AIDS, Family Planning, and Health Finance. We were also requested to look at other important health issues in the region. For each of the principal USAID program areas, we were to identify sectoral needs or areas for improvement that could be addressed by donor-financed assistance programs and to articulate possible intervention approaches outlining the general nature of assistance that might be required to bring about desired changes in the health and family planning services environment in Asia.

We were requested to include the following 14 countries in our study. Afghanistan, Bangladesh, Cambodia, Fiji, India, Indonesia, Mongolia, Laos, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, and Thailand.

Basic Demographic and Health Conditions, Trends and Projections

Population: Size and Growth

Perhaps the most distinguishing feature of the Asia region during the decade of the 1990s and into the early years of the 21st century will be the magnitude of the population growth that the countries in this region will experience. Associated with this large population growth will be relatively young age distributions that will characterize most countries in the region at the turn of the century and the built-in momentum that this will provide for continued substantial growth well into the 21st century.

The population is large and it is growing rapidly. The total population of these 14 countries in 1990 was about 1.46 billion which was about half of the population of the developing world excluding China. From 1990 to 2000 the population of these 14 countries is projected to increase nearly 25 percent, to over 1.8 billion by the year 2000 and to nearly 2 billion by the year 2005. Of these 14 countries, six (India, Indonesia, Bangladesh, Pakistan, Philippines and Thailand) are among the ten most populous countries in the developing world. Basic demographic data for each of the 14 countries are provided in Table 1 where the 14 countries are organized into five groups based primarily on current infant mortality levels.

The first four groups are presented from lowest to highest mortality levels (see Infant Mortality Rates and Life Expectancies at Birth, in columns 4 and 6, respectively). The fifth group contains the five smallest countries--a particularly diverse group--with a combined population of about 1 percent of the total. The five groups are as follows:

1. Philippines, Sri Lanka, Thailand
2. Indonesia
3. India
4. Other Mainland South Asia (Afghanistan, Pakistan, Nepal, Bangladesh)
5. Five remaining countries (Cambodia, Fiji, Laos, Mongolia, Papua New Guinea)

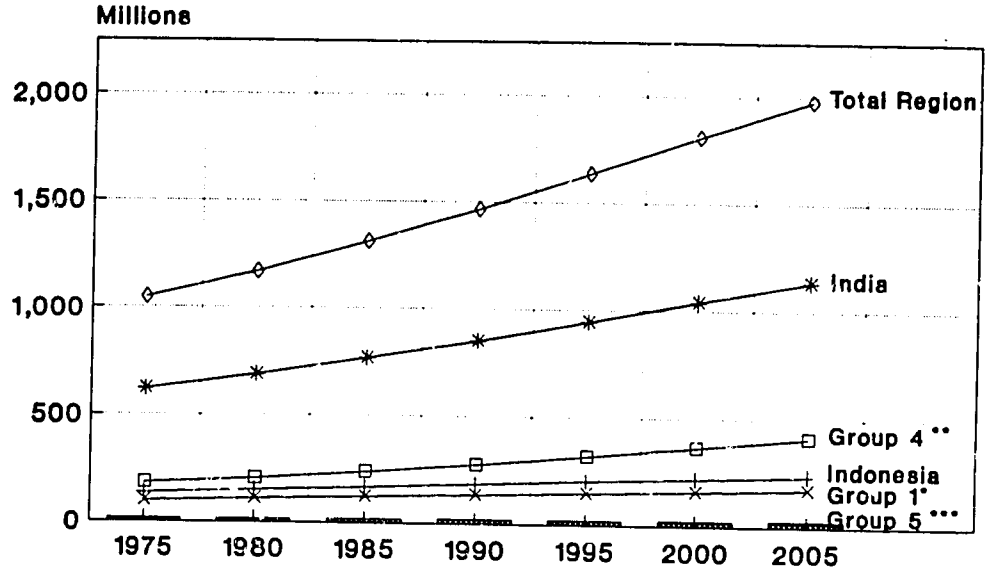
Groups 1 through 4 are all demographically large. Group 1 is the smallest with an estimated combined population of 139 million in 1990. This is a larger population than that of any developing country outside Asia except Brazil. Figure 1 shows estimated and projected population growth for each of the five groups and for the total region (all 14 countries) for the period 1975 to 2005. Appendix Tables 1 and 2 give estimated and projected total population and implied annual population growth rates for all 14 countries for the period 1975 to 2005. Appendix Tables 3 and 4 give the same data for each of the five groups.

Table 1. Basic Demographic Data for 1990, by Five Country Groups Based on Mortality Rates.

Country	Population 1990 (million)	% Tot Pop (Reg)	IMR 1990	Maternal Mort. Ratio	Life Exp.at Birth (yrs) 1990	TFR 1990	CPR modern (%) 1990	CBR 1990	CDR 1990	PGR (%) 1990	Per Capita GNP [US$] 1988
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. Lowest Mortality											
Philippines	66.1	4.5	48	93	65.0	4.3	22	33	7	2.6	630
Sri Lanka	17.2	1.2	22	60	71.6	2.3	41	21	6	1.5	420
Thailand	55.7	3.8	39	48	67.1	2.1	65	22	7	1.5	1000
Sub-total	139.0	9.5									
2. Indonesia	189.4	12.9	89	450	62.7	3.3	44	27	9	1.8	430
3. India	853.4	58.3	95	340	60.4	4.2	41	32	11	2.1	330
4. Other South Asia Mainland											
Afghanistan	15.9	1.1	182	690	43.5	7.1	NA	48	22	2.6	NA
Bangladesh	114.8	7.8	120	600	52.9	4.9	26	39	14	2.5	170
Nepal	19.1	1.3	112	830	53.5	6.6	15	42	17	3.7	170
Pakistan	114.6	7.8	110	500	59.0	6.1	7	44	13	2.5	350
Sub-total	264.4	18.1									
5. All Others											
Cambodia	7.0	0.5	126	?	51.0	4.5	NA	39	16	2.2	NA
Fiji	0.8	0.1	21	?	63.0	3.3	35	27	6	2.2	1540
Laos	4.0	0.3	110	?	51.0	5.5	NA	41	16	2.5	NA
Mongolia	2.2	0.2	50	100	63.7	4.8	NA	36	8	2.8	NA
Papua New Guinea	4.0	0.3	59	900	55.9	5.7	NA	39	12	2.7	770
Sub-total	18	1.2									
Total	1464.2	100.0			59.6						

Sources: Population Reference Bureau, 1990 World Population Data Sheet. The source for Thailand's 1990 TFR estimate is Huber et al., 1991.
Maternal Mortality Ratios (MMR) are from UNICEF, "The State of the World's Children, 1991. [MMR is number of maternal deaths per 100,000 live births.]

Figure 1. Estimated and Projected Total Populations, by Country Group, 1975-2005.



* Group 1 = Philippines, Sri Lanka, Thailand
** Group 4 = Afghanistan, Bangladesh, Nepal, Pakistan
*** Group 5 = Cambodia, Fiji, Laos, Mongolia, Papua New Guinea
Source: UN median projection, 1990.

Mortality is high in most of the region; it is particularly high in group 4 countries; but has reached relatively low levels in group 1 countries. Note the diversity in mortality levels among groups 1 through 4. All three countries in group 1 have infant mortality rates (IMRs) below 50 and their maternal mortality ratios (MMRs) are estimated to be less than 100 per 100,000 live births. At the other extreme, all countries in group 4 have IMRs of 110 or above, with MMRs estimated to be 500 or above. India's overall IMR of 95 masks large state-level and urban-rural differences.

Fertility ranges from very low to very high, and high mortality is not in all cases associated with high fertility (and vice versa). As expected, there is some association between mortality levels and fertility levels. Generally, countries with relatively low mortality also have relatively low fertility. However, this is not uniformly the case. Although the IMR for the Philippines is only about half the level in Indonesia, Indonesia's total fertility rate (TFR) is 3.3 while the Philippine's is 4.3 (see Table 1, column 7). Bangladesh's mortality conditions--IMR of 120 and MMR of 600--are roughly similar to those for Nepal and Pakistan, yet Bangladesh's TFR is about 5 while the TFRs for Nepal and Pakistan are about 6. Fertility throughout India and the rest of South Asia (excluding Sri Lanka) ranges from moderately high (TFR of 4.2 in India) to very high (TFR of 7.1 in Afghanistan). Again, the fertility rate for India as a whole masks large regional differences. In 1989, the crude birth rate (CBR) for all of India was about 31 while the state-level CBRs ranged from 20 in Kerala and 23 in Tamil Nadu to 37 in Uttar Pradesh and 35 in Madya Pradesh [Talwar, 1991].

The population still has a young age distribution. Despite considerable progress in raising contraceptive prevalence rates and reducing fertility, children under age 5 account for 14 percent of the population, and the number of children under age 5 in these countries will increase by over 10 percent during the 1990s. Due to previous increases in total births each year together with expected continued declines in infant and young child mortality, the size of the population under age 5 is projected to increase from about 205 million in 1990 to about 227 million in the year 2000 (see Appendix Table 5).

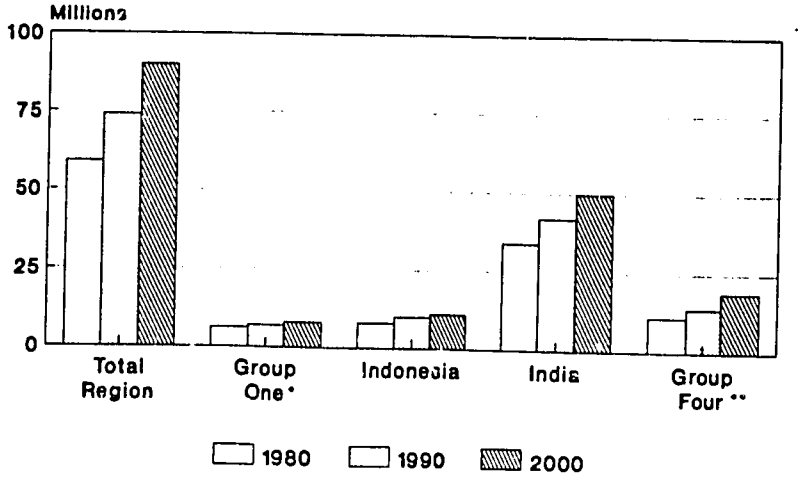
Due to past and present high fertility, the number of women of reproductive age will continue to increase rapidly in the years ahead. Figure 2 shows the growth in the number of women ages 15-44 from 1980 to 2000 for the total region and for each of the four large groups. For these 14 countries combined, the number of women of this age group (reproductive age) is projected to increase by 27 percent between 1990 and 2000. Appendix Tables 6 and 7 give estimated and projected numbers and implied annual growth rates of women ages 15-44 for each of the 14 countries for the period 1975 to 2005. Appendix Tables 8 and 9 give the same data for each of the five country groups.

The number of women ages 15-19 will also continue to grow substantially in the years ahead (22 percent between 1990 and 2000) but at a somewhat slower rate than for women of reproductive age as a whole, reflecting the impact of family planning programs and fertility decline--and therefore fewer births--during the 1970s and 1980s. Figure 3 shows the expected growth in number of women ages 15-19 from 1980 to 2000 for the total region and the four large country groups. Appendix Tables 10 and 11 give estimated and projected numbers and implied growth rates for each of the 14 countries for the period 1975 to 2005. Appendix Tables 12 and 13 give the same data for each of the five country groups.

The annual number of births, estimated to have averaged about 46.5 million during 1985 to 1989, is projected to increase slightly to about 50 million throughout the 1990s and begin to decline slightly after the turn of the century (provided, of course, that fertility continues to decline relatively rapidly). Substantial fertility decline has already occurred in this region and the projections assume that fertility will continue to decline relatively rapidly. Still, this region will account for nearly half of all births in the developing world during the next decade (excluding China). Appendix Table 14 gives estimated and projected annual numbers of births for all 14 countries for the periods 1975-1979 through 2000-2004.

The population age 65 and older will grow rapidly but will still constitute a relatively small proportion of the total population. In 1990 the population 65 and over was 4 percent of the region's total population. Appendix Tables 15 and 16 show estimated and projected sizes and annual growth rates for this population from 1975 through 2005. For the region, the annual growth rate is expected to exceed 3 percent during the next 15 years, while annual growth rate of the region's total population is expected to decrease from about 2.2 percent during 1985-1990 to about 1.8 percent during 2000-2005. Despite this much higher growth rate for the population 65 and over, in 2005 this age group is expected to constitute only 4.9 percent of the total regional population. For a few countries, it will be a larger percentage. For Thailand it is expected to be about 5.6 percent of the country's total population; for Sri Lanka, 7.1 percent; and for Indonesia, 5.8 percent.

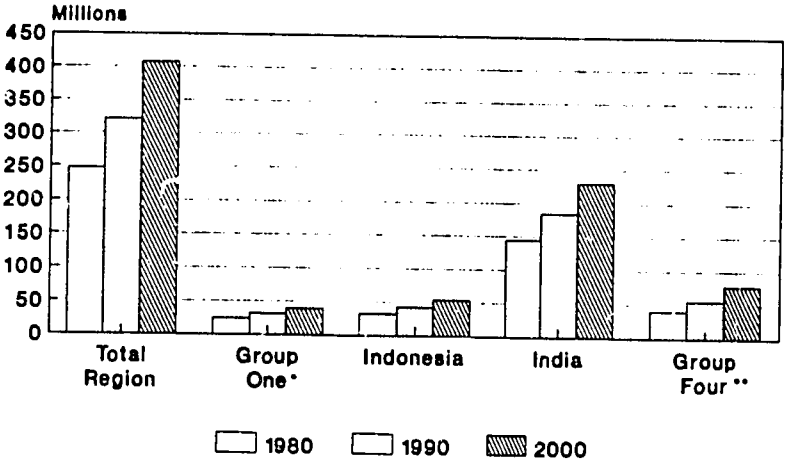
Figure 2. Estimated and Projected Number of Women of Reproductive Age (Ages 15-44), by Country Group, 1980, 1990 and 2000.



* Group One = Philippines, Sri Lanka, Thailand
** Group Four = Afghanistan, Bangladesh, Nepal, Pakistan

Source: Calculated from UN median projection, 1990.

Figure 3. Estimated and Projected Number of Women Ages 15-19, by Country Group, 1980, 1990 and 2000.



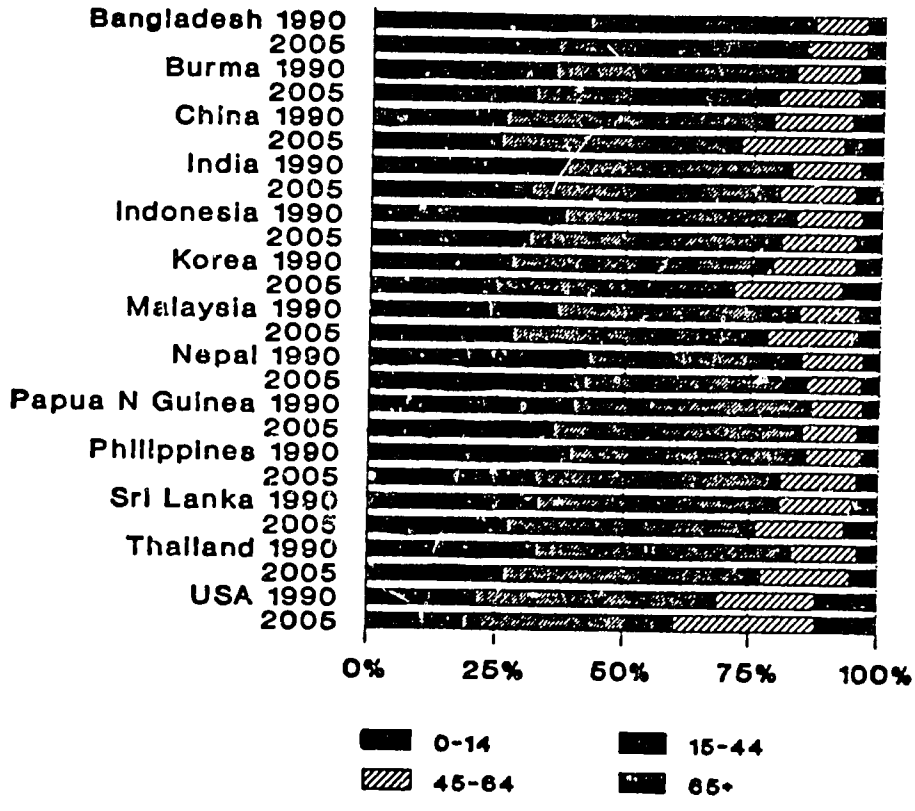
* Group One = Philippines, Sri Lanka, Thailand
** Group Four = Afghanistan, Bangladesh, Nepal, Pakistan

Source: UN median projection, 1990.

Figure 4 shows the changes in the relative sizes of four key age groups (0-14, 15-44, 45-64, and 65+) from 1990 to 2005, for eight of the countries in this study plus a few others in the region compared to the U.S. As noted above, the proportionate change in age group 65+ is small. As also noted above, age group 15-44 will continue to grow rapidly and, as reflected in Figure 4, in some countries it will be a larger share of the total population in 2005 than it was in 1990. The demographics of a large and rapidly growing adult population with changing health needs, including maternal health care services, will drive health care program development. As shown below, a large share of this growth will be in urban areas.

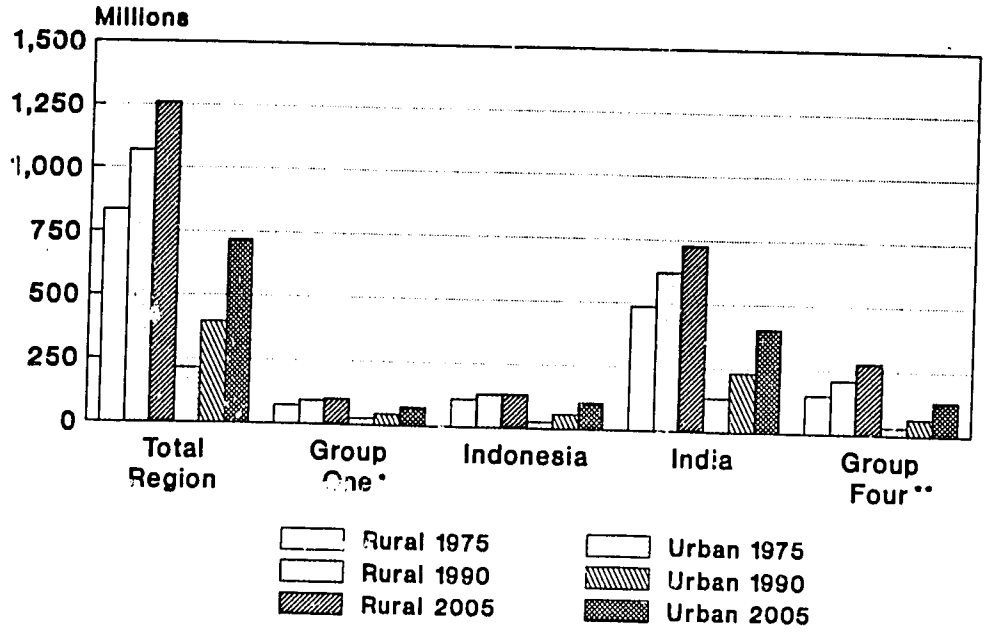
The urban population will grow enormously but this region will still be predominantly rural in 2000 and beyond. Figure 5 shows the estimated rural and urban populations for 1975 and 1990 and projected rural and urban populations for 2005. Appendix Table 19 gives rural, urban and total populations for all 14 countries for each of these 3 years. Appendix Table 20 gives the corresponding percentages of rural and urban for those years, and Appendix Table 21 gives the average annual rural, urban and total growth rates for all 14 countries for these 3 years.

Figure 4. Age Structure for Selected Populations, 1990 and 2005.



Source: Griffin, 1990

Figure 5. Estimated and Projected Rural, Urban and Total Populations by Country Group, 1975, 1990 and 2005.



* Group One - Philippines, Sri Lanka, Thailand
** Group Four - Afghanistan, Bangladesh, Nepal, Pakistan
Source: UN median projection, 1990.

However, urban populations are growing rapidly. From 1975 to 2005, the total urban population in these 14 countries is expected to more than triple, from 215 million to 719 million. From 1990 to 2005 the urban population in this region is expected to grow about 4 percent annually while the rural population is expected to grow about 1 percent annually, with the urban population increasing by over 80 percent during these 15 years, the rural population increasing by 18 percent, and the total population increasing by 35 percent. The projected size of the urban population in these 14 countries (719 million) will be enormous in 2005. To illustrate, this would be about 150 million more than the projected total population of Latin America in 2005.

The enormous urban growth will have profound implications for health conditions, health care needs, quality of life (e.g., tens and tens of millions of people living in urban slums), provision of services, cost and finance issues, and issues of donor support to address these and related issues. Addressing urban health will require increased access to infrastructure and services for water and sanitation, family planning and Maternal and Child Health services, TB-related care, etc

Despite this anticipated urban growth, in 2005 this region will still be nearly two-thirds rural. In 2005 the urban population is projected to be larger than the rural population in only two countries, Mongolia (57 percent urban) and Philippines (52 percent urban). In the five mainland South Asian countries of Afghanistan, Bangladesh, India, Nepal and Pakistan, it is projected that there will be more than 1 billion people still living in rural areas in 2005.

Again, the size of this rural population and the impoverishment of a large share of it will have important implications for health conditions, health care needs, provision of services, and cost and finance issues. Infrastructure and health/family planning services are currently inadequate for a large portion of the rural population of these countries, especially for large areas of South Asia. Tremendous effort will be required to meet the service delivery needs of these people.

Donor support will need to be balanced to respond to both the pressing needs of people in burgeoning urban centers and the continued presence of the bulk of the population in rural areas. Without provision of basic services to the large and growing numbers of poor in both urban and rural areas, it is unlikely that child survival will improve rapidly and that fertility and infant mortality will continue their rates of decline of the recent past.

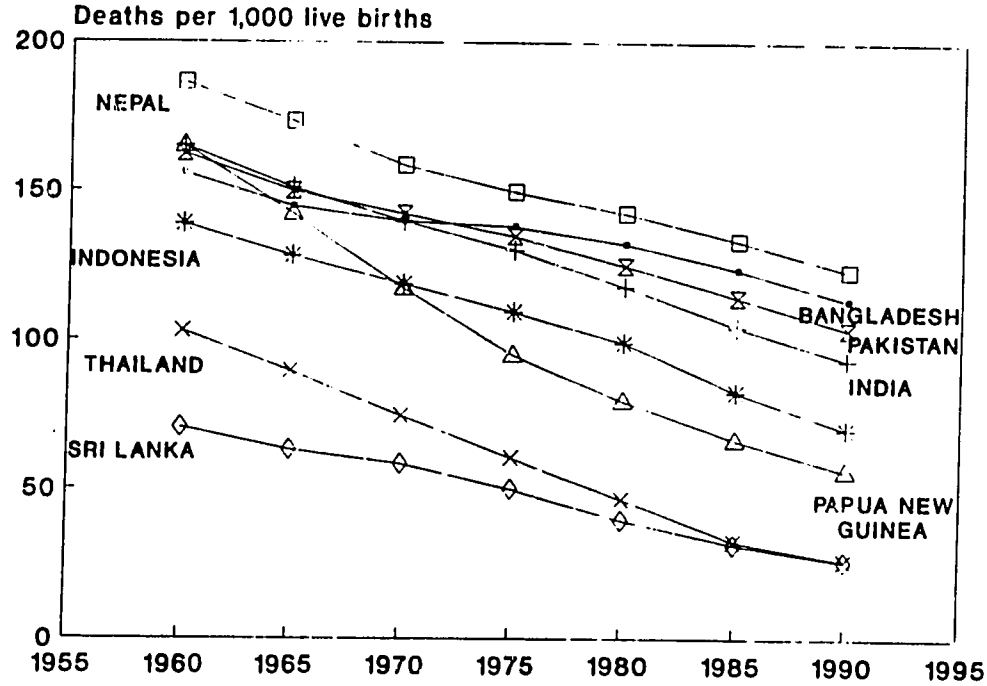
Child Survival

Indicators: Levels, Trends and Projections

Child Survival is USAID's largest and most important health assistance program. Its goal is to bring about a significant reduction in the number of preventable child deaths in the developing world. In 1990 the overall infant mortality rate in the developing world (excluding China) was nearly 100 deaths per 1000 live births--10 times the rate of North America and Northern and Western Europe, and nearly 20 times the rate in Japan. In 1985 USAID undertook to reduce the infant mortality rate from the 1985 average of 96 in USAID-assisted countries to an average of 75 [Child Survival Report to Congress, May 1991].

Infant mortality has been declining rapidly in this region but in most countries it is still very high. Figure 6 shows that during the period 1960 to 1990 IMRs declined substantially in all eight countries for which data are presented, including the four largest--India, Indonesia, Bangladesh and Pakistan. The figure also graphically shows how large the differences still are among this group of countries, and that the IMRs for the largest countries are still quite high. As shown in Table 1, column 4 (page 2), in 1990 Bangladesh, India, Indonesia and Pakistan all had IMRs in the range of 89 to 120. The total population of these four countries in 1990 was nearly 1.3 billion. Although--with only few exceptions--IMRs are still high in this region, the UN estimates that IMRs declined about 20 percent during the 10-year period, 1975-1980 to 1985-1990, from about 121 to about 97.

Figure 6. Infant Mortality Rates in Selected Asian Countries, 1960-1990.



Sources:World Population Prospects, 1990

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Table 2 shows estimated and projected IMRs for each of the five country groups, for the period 1975-1980 through 2000-2005. Appendix Table 22 gives estimated and projected IMRs for this period for each of the 14 countries in this study. Note the extreme range in IMRs among the country groups in Table 2. The overall IMR for the first group (Philippines, Sri Lanka, Thailand) was 37 in 1985-1990. According to these estimates, the IMR was 75 for Indonesia during this period, 99 for India, and 118 for the fourth group (the rest of mainland South Asia--Afghanistan, Bangladesh, Nepal and Pakistan) which is more than triple the IMR of group 1. [On Table 1 a 1990 IMR estimate for Indonesia of 89 is provided from the Population Reference Bureau's 1990 Data Sheet.] The range is also very large within some countries. In India, state-level IMRs in 1989 ranged from 23 in Kerala and 66 in Maharashtra to 126 in Uttar Pradesh and Orissa. The IMR in urban areas of India was 58, while it was about 100 in rural areas [Talwar, 1991].

Table 2. Estimated and Projected Infant Mortality Rate, by Country Group, 1975-2005

Country	1975-80	1980-85	1985-90	1990-95	1995-00	2000-05
Ph., S.L., Th.	54	44	37	33	29	24
Indonesia	105	90	75	65	57	51
India	126	110	99	88	77	67
Mainland Asia	139	129	118	109	98	88
Other	164	124	103	91	79	68
Total	121	107	97	87	77	68

Infant Mortality Rate is Number of Deaths of Children Under One Year of Age per 1000 Live Births.

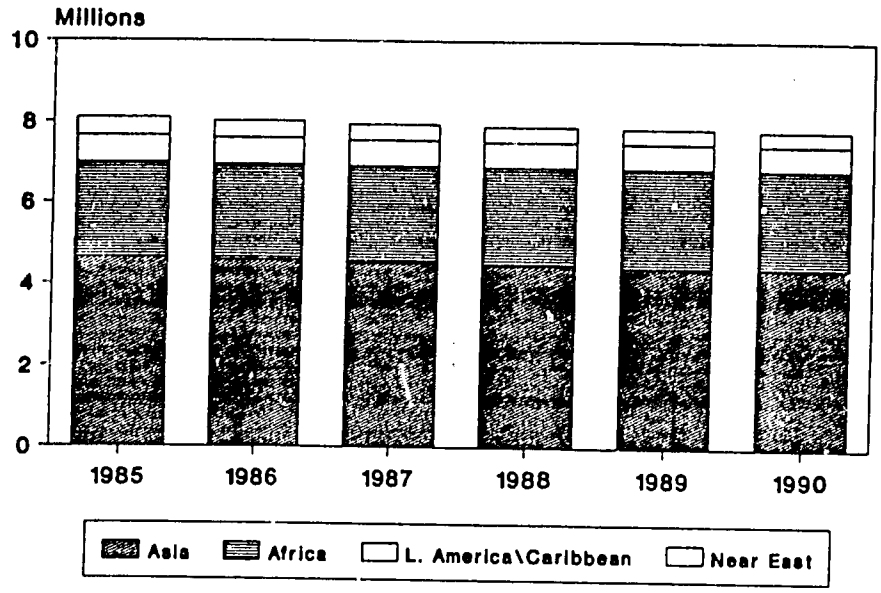
Source: Calculated from UN median projection, 1990.

The bulk of infant mortality occurs in the neonatal period (between birth and 27 days after birth). Typically 60 to 80 percent of all infant deaths are in this period. The highest risk of death is in the perinatal period (from birth through day 7). Perinatal mortality is largely determined by delivery care and the maturity of the fetus, as reflected by birth weight and gestational age, with birth weight as the predominant factor. As infant mortality declines and prenatal and obstetric care improve, the neonatal mortality rate also declines but more slowly than does the postneonatal rate so that perinatal and neonatal deaths are a rising portion of all infant deaths. For example, the IMR in Mauritius declined from 70 in 1967 to 29 in 1982; perinantal deaths as a percentage of all infant deaths increased from 61 percent to 70 percent during the same period [Walsh et al., 1991]. In India, an estimated 1.2 million perinatal deaths take place annually, out of a total of about 1.8 to 1.9 million infant deaths (total annual births are about 20 million) [Rao, 1990].

The UN expects that over the 25-year period, 1975-1980 to 2000-2005, the IMRs in these four large country groups will both decline significantly and converge. In 1975-1980 the IMR for the low group was 54 and for the high group (excluding the small countries in group 5) was 139, a difference of 85 points. The UN projects that in 2000-2005 the IMR for the first group will be 24 (decline of 30 points) and for the Mainland Asia group (excluding India) 88, which is still quite high but represents a fall of 51 points over 25 years. India's IMR is expected to decline 59 points and Indonesia's 54 points over this 25-year period. This appears to be an optimistic assumption that clearly requires continued success in country-wide interventions to improve child survival.

Because this region accounts for such a large share of the world's population and because IMRs in this region are still quite high, over half the infant deaths in the developing world occur in this region. Figure 7 shows that during the 1985-1990 period, of around 8 million annual infant deaths in all USAID-assisted countries, about 4.5 million were in the 14 countries in this study - over 55 percent of the total (Figure 8).

Figure 7. Total Annual Infant Deaths in USAID-Assisted Countries, By Region, 1985-1990.



Source: World Population Prospects 1990
UN Population Division

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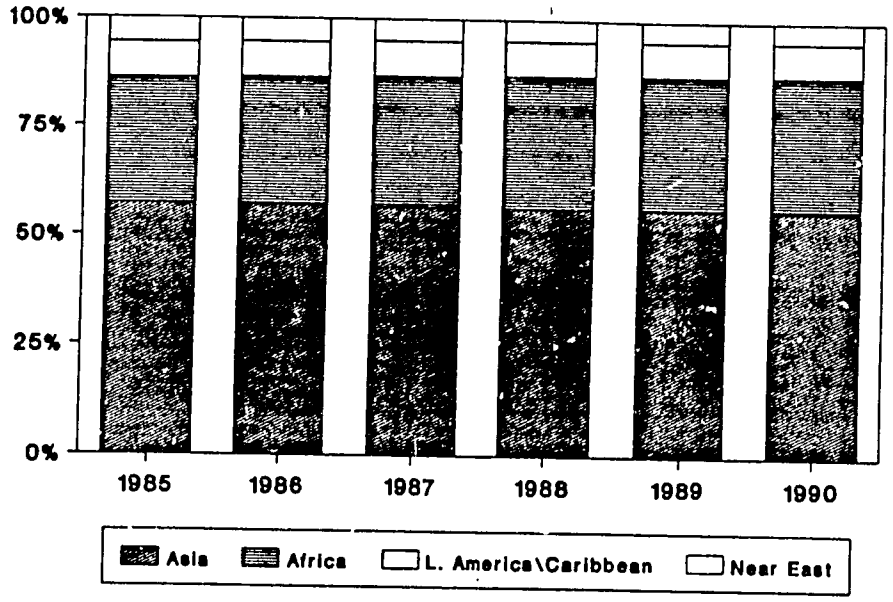
Figure 8. Percentage Distribution of Annual Infant Deaths in USAID-Assisted Countries, By region, 1985-1990.



Source: World Population Prospects 1990
UN Population Division

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Figure 9 shows that of about 5 million annual infant deaths in USAID child survival emphasis countries, over 4 million were in this region - about 75 percent of the total (Figure 10). During the 1980s there has been an enormous global effort to improve infant and child health. The United Nations anticipates that child health throughout the developing world wil continue to improve rapidly and that IMRs will continue to decline rapidly. UN projections expect the overall IMR for these 14 countries to decline from 97 in 1985-1990 to 68 during 2000-2005--a 30 percent decrease.

Immunization coverage has increased dramatically since 1985. Table 3 shows coverage for BCG, DPT3, polio and measles immunizations for each of the five country groups, for 1985 through 1990. To the extent that the data are accurate, they indicate that this global effort has been remarkably successful. USAID has been a major contributor to this effort. All of the first four groups (accounting for 99 percent of the population of these 14 countries) show an increase of 30 points or more for each of these four immunizations, except for BCG in group one (Philippines, Sri Lanka, Thailand) which was already 77 percent in 1985. Some increases were 50 points or more during these 5 years. Appendix Tables 23, 24, 25, and 26 show levels of immunization coverage achieved in each of these countries during the period 1985-1990.

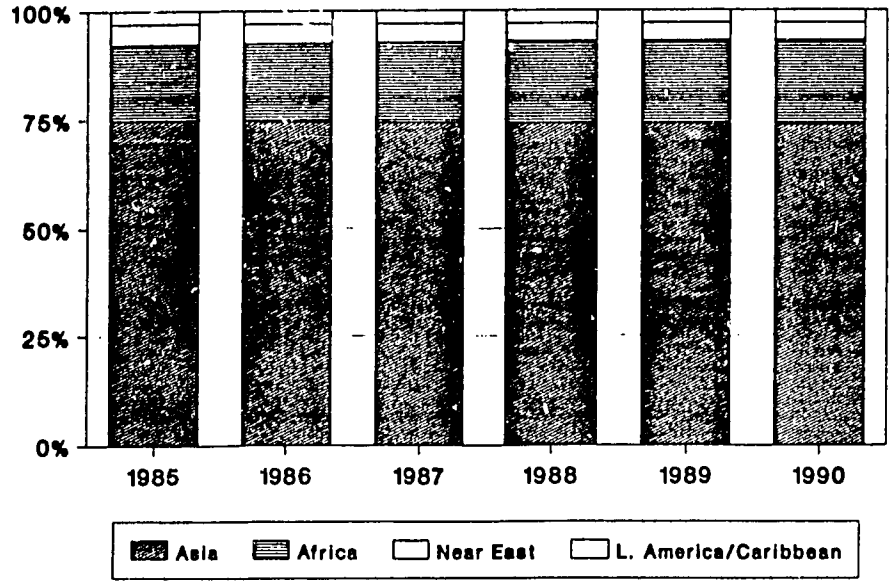
Tetanus Toxoid (Tetanus-2) coverage has been less successful. Table 4 shows that in 1990 the coverage was in the 40-60 percent range for the first four country groups. The mainland Asia group shows a remarkable increase from 28 percent in 1989 to 64 percent in 1990. The other three groups show a 10 percent to 15 percent increase in coverage over this 5-year period. Data for all countries are given in Appendix Table 27.

Most authorities believe that dehydration due to diarrhea and acute respiratory infections (ARI) are the two biggest causes of infant and young child deaths in the developing world. It is estimated that about 16.5 million children in the developing world die each year from infectious and parasitic diseases, with half to two-thirds of this due to acute respiratory infections and diarrheal diseases [Commission, 1990]. Table 5 gives a World Health Organization (WHO) estimate of the major causes of death in children--about 5 million deaths annually from diarrhea and about an equal number from pneumonia and whooping cough combined. Table 6 provides more detailed estimates of major causes of the estimated 38 million annual total deaths in developing countries. The data suggest that ARI and diarrheal diseases account for fully one-third of all deaths in the developing world.

Some progress has been made against diarrheal disease. Figure 11 gives data on access to oral rehydration solutions (ORS) and use of oral rehydration therapy (ORT) in 10 of the 14 countries during 1985 and 1989, including the 6 largest, accounting for 95 percent of the total population of these 14 countries. The data suggest that by and large there has been greater success in providing access to ORS than in achieving use. Panel A shows that excluding Afghanistan, from 57 percent (India) to 95 percent (Papua New Guinea and Sri Lanka) of all children under age 5 were estimated to have had ready access to ORS in 1989. The percentage with access was higher in 1989 than in 1985 in six countries (much higher in Nepal, Papua New Guinea and Sri Lanka), about the same in Bangladesh (but still moderately high--60 percent), and lower in Afghanistan, India and Philippines.

However, the data in Panel B show that in 1989, in all countries except Sri Lanka (58 percent, up from 15 percent in 1985), less than 50 percent of all diarrheal cases among children under age 5 were treated with ORT. In Bangladesh it was 51 percent in 1985 and 25 percent in 1989. [We do not know if this apparent large reduction reflects a problem with the data or a major deterioration in the system's capability to deliver ORT.] Use was higher in 1989 than in 1985 in five countries, essentially unchanged in India, and lower in four.

Figure 9. Percentage Distribution of Annual Infant Deaths in USAID Child Survival Emphasis Countries, By Region, 1985-1990.



Source: World Population Prospects 1990
UN Population Division

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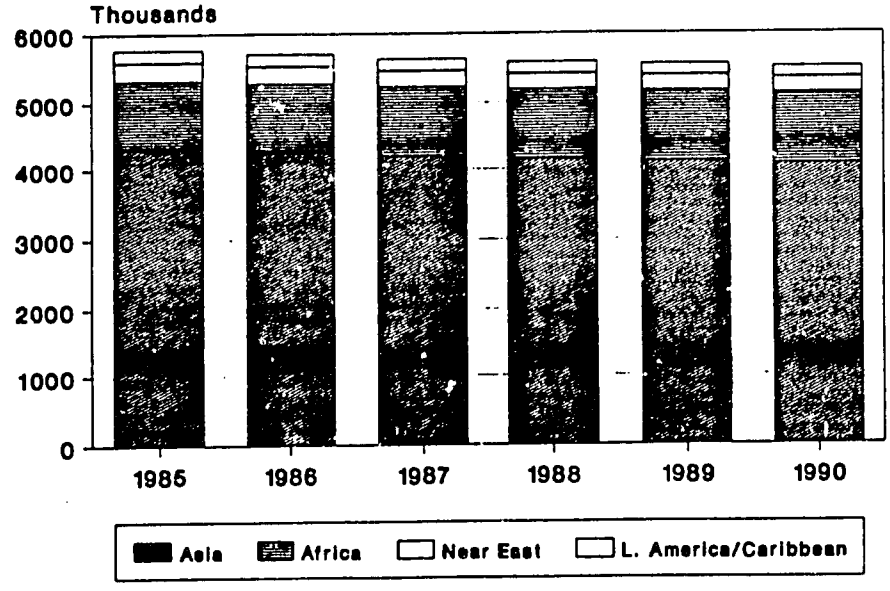
Figure 10. Total Annual Infant Deaths in USAID-Assisted Child Survival Emphasis Countries, By Region, 1985-1990.



Source: World Population Prospects 1990
UN Population Division

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Table 3. BCG, DPT3, Polio and Measles Coverage (Percent of Target Group), by Country Group, 1985-1990.

Panel A. BCG Immunization Coverage (Percent of Target Population), by Country Group, 1985-1990.

Country	1985	1986	1987	1988	1989	1990
Ph., S.L., Th.	77.2%	80.3%	79.6%	83.0%	96.8%	96.8%
Indonesia	68.0%	67.0%	68.0%	81.0%	81.0%	99.0%
India	24.0%	29.0%	46.0%	72.0%	80.0%	80.0%
Mainland Asia	25.8%	39.9%	46.2%	59.8%	68.8%	83.0%
Other	16.5%	16.9%	24.7%	16.5%	18.1%	75.2%
Total	33.5%	39.7%	50.9%	70.1%	77.9%	84.1%

Panel B. DPT3 Immunization Coverage (Percent of Target Population), by Country Group, 1985-1990.

Country	1985	1986	1987	1988	1989	1990
Ph., S.L., Th.	60.7%	62.9%	64.9%	74.9%	85.4%	90.0%
Indonesia	16.0%	48.0%	48.0%	71.0%	71.0%	71.0%
India	45.0%	53.0%	58.0%	74.0%	79.0%	92.0%
Mainland Asia	18.3%	31.5%	37.3%	52.8%	61.7%	71.0%
Other	37.8%	43.3%	47.6%	55.9%	61.3%	35.5%
Total	36.6%	48.0%	52.4%	68.4%	74.3%	83.7%

Panel C. Polio Immunization Coverage (Percent of Target Population), by Country Group, 1985-1990.

Country	1985	1986	1987	1988	1989	1990
Ph., S.L., Th.	61.4%	62.5%	64.6%	74.2%	84.9%	89.3%
Indonesia	14.0%	46.0%	45.0%	73.0%	74.0%	97.0%
India	35.0%	45.0%	50.0%	63.0%	74.0%	93.0%
Mainland Asia	17.2%	30.8%	36.5%	52.7%	48.3%	70.9%
Other	17.6%	20.4%	23.2%	24.5%	36.6%	37.3%
Total	30.3%	42.8%	47.0%	62.0%	68.2%	87.0%

Panel D. Measles Immunization Coverage (Percent of Target Population), by Country Group, 1985-1990.

Country	1985	1986	1987	1988	1989	1990
Ph., S.L., Th.	41.3%	49.6%	55.5%	67.3%	77.0%	82.9%
Indonesia	38.0%	67.0%	68.0%	81.0%	81.0%	91.0%
India	0.0%	1.0%	17.0%	45.0%	56.0%	87.0%
Mainland Asia	23.5%	38.7%	38.3%	52.0%	53.9%	68.5%
Other	6.5%	10.0%	13.3%	16.9%	21.5%	33.2%
Total	13.2%	21.3%	30.8%	52.0%	59.4%	81.9%

Source: Calculated from ISTI/CIHI Database, UNICEF, and Ross

Table 4. Tetanus Immunization Coverage (Percent of Target Population), By Country Group, 1985-1990.

Country	1985	1986	1987	1988	1989	1990
Ph., S.L., Th.	45.9%	49.8%	45.5%	43.8%	52.3%	54.0%
Indonesia	25.0%	26.0%	27.0%	29.0%	41.0%	41.0%
India	37.0%	40.0%	47.0%	61.0%	67.0%	49.0%
Mainland Asia	6.8%	11.8%	16.8%	17.5%	28.2%	64.3%
Other	5.1%	4.4%	3.0%	9.1%	18.5%	22.9%
Total	31.6%	35.2%	40.6%	49.7%	58.5%	57.4%

Source: Calculated from ISTI/CIHI Database, UNICEF, and Ross

Table 5. Estimates of Major Causes of Death in Children

Causes	Estimated Number of Children Dying Per Year
Dehydration due to Diarrhea	5 million
Pneumonia	3 million
Measles	2 million
Whooping Cough	1-1/2 million
Tetanus of Newborn	1 million
Poliomyelitis	50,000
Diphtheria	5,000

Table 6. Estimated Number of Deaths by Cause in Developing Countries (millions of persons).

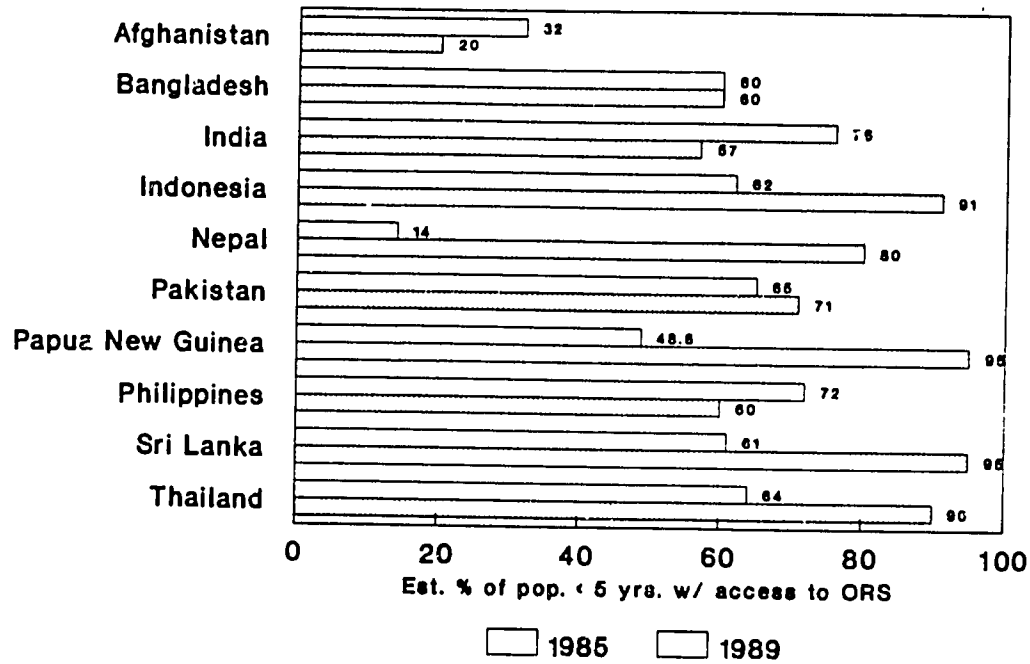
HEALTH PROBLEM	ESTIMATES		
	UNDP (1988)	WHO (1985)	COMMISSION (1986)
PRE-TRANSITION			
Acute respiratory infections	10.0	7.4	4.2 - 9.2
Diarrheal diseases	4.3	5.0	3.4 - 7.5
Immunizable diseases	3.8	*	1.7 - 4.3
Tuberculosis	0.9	2.8	0.6 - 4.3
Malaria	1.5	1.0	0.4 - 2.0
Other infections	2.6	0.3	0.4 - 1.8
Pregnancy complications	0.5	0.5	0.4 - 0.6
Perinatal conditions	·	3.2	· - ·
POST-TRANSITION			
Cardiovascular and metabolic diseases	8.0	6.5	4.5 - 9.9
Cancers	2.0	2.5	1.1 - 2.5
Accidents and violence	2.0	2.4	1.2 - 2.2
AIDS/Sexually transmitted diseases	0.1	·	0.1 - 0.2
Substance abuse	·	·	· - 1.0
Environmental/Occupational hazards	·	·	· - 0.2
OTHER	2.3	6.3	-
TOTAL	38.0	37.9	-

* Not classified, contained in other categories

Source: Commission on Health Research for Development, 1990

Figure 11. Use of and Access to Oral Rehydration Therapy, 1985-1989.

A. ACCESS TO ORAL REHYDRATION SOLUTIONS, ASIA BUREAU, 1985-1989



Source: Annual reports of the CDD Program/WHO and other data reported to CIHI/ISTI.

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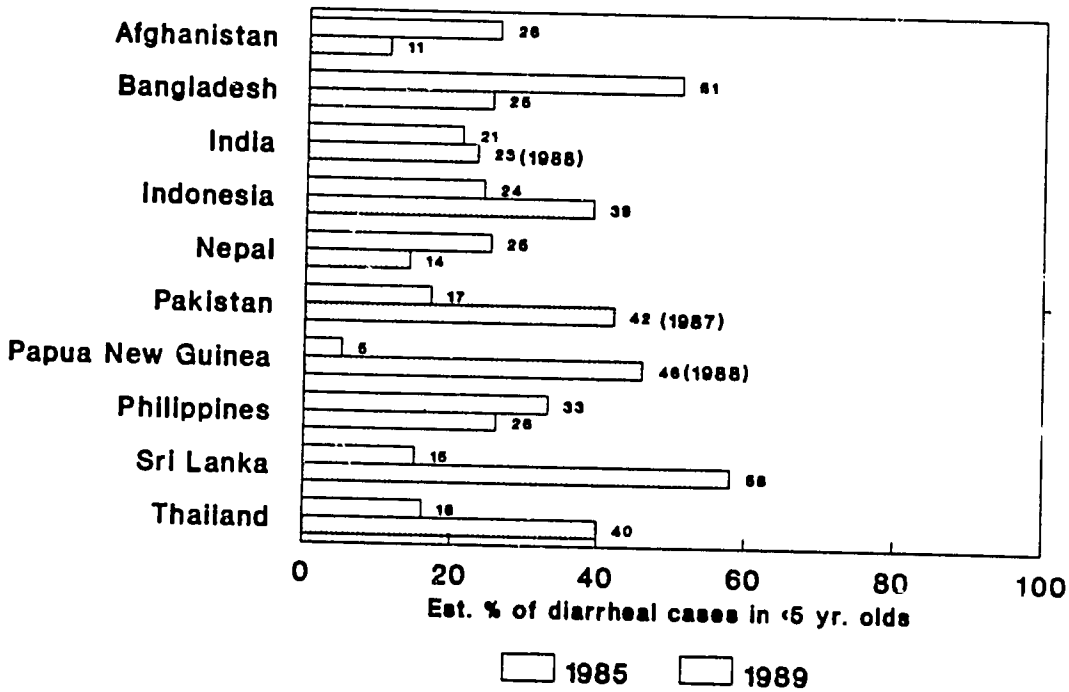
B. USE OF ORAL REHYDRATION THERAPY, ASIA BUREAU, 1985-1989



Data on number of diarrheal episodes and their treatment is considered incomplete and unreliable. Appendix Table 28 presents available data on reported mean number of annual diarrhea episodes per child under age 5, by country, for 1985-1990. Data are presented for 9 of the 14 countries in our study. Table 7 gives Demographic and Health Survey (DHS) data for Sri Lanka and Thailand (no DHS data are available for Indonesia) on percentage of children reported to have had a diarrhea episode during the past 24 hours and the past 2 weeks. For reasons that are unclear, the percentage is nearly 3 times higher in Thailand than it is in Sri Lanka.

Table 7. Percent of Children Reported to Have had a Diarrhea Episode.

Country	Past 24 hours	Past 2 weeks
Sri Lanka	2.1%	6.0%
Thailand	6.1%	15.6%

Source: DHS data

Interpretation of available data on diarrhea presents a number of problems, but the DHS data for Sri Lanka and Thailand suggest that diarrhea is more frequent than reports from the Center for International Health Information (CIHI) database indicate (see Appendix Table 28). For example, 6.1 percent of the children in the DHS (1987) survey in Thailand were reported to have had diarrhea in the past 24 hours but a mean of only 2.1 episodes per child per year is reported in the CIHI database for 1987. If an episode was presumed to last less than 24 hours (i.e, the 6.1 percent can be treated as the probability of experiencing an episode within a period of 24 hours), one would expect 20 episodes per year. Clearly the length of an episode is an important factor in reporting the number of episodes.

In the same instance (DHS-Thailand), 15.6 percent of the children were reported to have had diarrhea in the past 2 weeks. Obviously a mother is more likely to remember a minor episode in the past 24 hours than in the past 2 weeks, and the issue of severity of an episode arises. Further, a child could have had multiple episodes in the past 2 weeks and contribute to the numerator only once.

Because ORT use as a percent is based on the number of episodes, under-reporting the number of episodes inflates the proportion of use. This suggests that the gap between availability and use is greater than the data would first indicate.

Diarrhea remains a leading cause of death for infants and young children, especially in South Asia. IE&C programs should be strengthened. Operations research should be conducted to determine (a) the level of effective access in a variety of settings--especially in South Asia, and (b) why ORT is not used properly when access is assured. Operations research should also address home-based remedies and roles of the private sector.

Low weight births are one of the great maternal and infancy problems in this region. Wallace and Giri [1990, page 10] present WHO data which show that of an estimated 19 million low weight births in the developing world in 1982, nearly 15 million (over 75 percent) were in Asia, most of those in South Asia.

Children born to women under age 20 or age 40 or older, high birth order children, and children born before or after a close birth are at increased risk of infant death. Table 8 presents data for the three DHS countries--Indonesia, Sri Lanka and Thailand. Although there are differences among the

countries, Panel A shows that the infant death rate in Sri Lanka and Thailand is 50 percent to 100 percent higher for children born to women over age 40 compared to those born to women age 20-29. Panel B shows that children of birth order 7 or higher have a 35 percent to 100 percent greater chance of death in infancy than children of birth order 2 or 3. Panel C shows that children born after a birth interval of less than 2 years have a 55 percent to 80 percent greater risk of death in infancy than children born after a birth interval of between 2 and 4 years. This has implications for increased program efforts in family planning and MCH services, including promotion of optimal breastfeeding, targeted to these particular groups of women that promote birthspacing and birth limitation to reduce the number of high risk births to the lowest level possible.

Table 8. Infant Mortality Rates by Age of Mother at Child's Birth, Child's Birth Order, and Length of Birth Interval, for Indonesia, Sri Lanka, and Thailand.

A. Infant Mortality Rates by Age of Mother at Birth of Child

	IMR by Age of Mother				Relative Risk of IMR			
Country	<20	20-29	30-39	40+	<20	20-29	30-39	40+
Indonesia	99.2	68.1	74.2	71.1	1.45	1.00	1.09	1.04
Sri Lanka	34.6	33.4	28.8	51.9	1.03	1.00	0.86	1.55
Thailand	39.5	33.4	47.4	68.8	1.18	1.00	1.42	2.06

B. Infant Mortality Rates (IMR) by Birth Order of Child

	IMR by Birth Order				Relative Risk of IMR			
Country	1	2-3	4-6	7+	1	2-3	4-6	7+
Indonesia	78.1	70.3	70.5	94.0	1.11	1.00	1.00	1.34
Sri Lanka	31.1	29.6	37.5	46.5	1.05	1.00	1.27	1.57
Thailand	29.8	36.1	48.0	72.8	0.83	1.00	1.32	2.01

C. Infant Mortality Rates (IMR) by Length of Retrospective Birth Interval In Months

	IMR by Birth Interval			Relative Risk of IMR		
Country	<24m	24-47m	48+m	<24m	24-47m	48+m
Indonesia	110.7	63.5	51.8	1.74	1.00	0.80
Sri Lanka	45.5	25.1	35.3	1.81	1.00	1.41
Thailand	59.3	38.3	34.1	1.55	1.00	0.89

Source: DHS Data

One of the most important determinants of infant and child survival is the mother's level of formal education. Children born to mothers with several years of formal education are far more likely to survive than children born to mothers with no formal education. The strong relationship between maternal education and infant/child survival has been observed in many studies over the past decade [Jamison and Mosley, 1991, forthcoming]. DHS data show that infant mortality is 2-to-3 times higher among children of mothers with no education compared to mothers with secondary education, and in those countries where a significant proportion of women had higher than secondary education, the mortality differentials ranged from 3-to-6 fold [Jamison and Mosley, 1991, forthcoming]. The range of female enrollment in formal education is enormous within the Asia region. UNICEF [1991] data show that the percentage of females (of the relevant age group) enrolled in secondary school in countries in this study ranges from about 5 in Afghanistan and about 10 in Bangladesh, Nepal and Pakistan, to about 70 in Sri Lanka. Female enrollment in primary school ranges from less than 15 percent in Afghanistan and less than 30 percent in Pakistan, to nearly 100 percent in Indonesia and Sri Lanka.

Breastfeeding

Optimal breastfeeding is probably the single most important component of child survival. Breastfeeding provides numerous important health benefits to both mother and child. Because suckling hastens contraction of the uterus, women who breastfeed their babies at birth are less likely to hemorrhage or retain the placenta. Breastmilk is, in effect, the infant's first immunization because it is rich in the immunoglobulins and antibodies produced and transmitted by the mother. Breastfeeding can be effective for birth spacing. Without breastfeeding, ovulation resumes, on average, about 2 months after delivery, increasing the chance of a pregnancy closely following the birth for women who are not contracepting, with all the attendant risks to both mother and child. Children born closely spaced are at increased risk of dying. With exclusive, or almost exclusive, breastfeeding on demand, women have 98 percent protection from pregnancy in the first 6 months, if menstruation has not returned. Even partial breastfeeding has some contraceptive effect for up to 2 years.

To achieve the full benefits from breastfeeding requires that the mother practice "optimal" breastfeeding. Optimal breastfeeding means the following:

1. Breastfeeding should begin within an hour after birth.
2. The baby should have only breast milk for the first 4-6 months of its life.
3. Breastfeeding should be "on demand" including throughout the night.
4. Breastfeeding should continue for at least one year.

Of these, perhaps the single most important is that babies should be exclusively breastfed for the first 4-6 months of their lives. Unfortunately, studies have shown that most breastfed infants are also given water and/or breastmilk substitutes, typically commencing within days or weeks of (and often immediately following) birth. Failure to use colostrum, the first milk, is also an extremely serious problem. There are widely-shared views across many cultures that colostrum is bad for the child, and throughout much of the world it is a relatively common practice not to give colostrum to the newborn. No breastmilk substitute is the nutritional or immunological equivalent of human milk which alone provides all the nutrients a child needs through 4-6 months of age.

Data from World Fertility Surveys (WFS) and Demographic and Health Surveys (DHS) on trends in breastfeeding in the Asia region are available only for Indonesia, Sri Lanka and Thailand--the only countries (to date) that have conducted both a WFS and a DHS. Appendix Table 29 presents data for

all three countries for both surveys (1975-76 and 1987), by urban-rural residence, age group of mother (15-24, 25-34, and 35-49), mother's formal education, and mother's employment status (working, not working). Data are given on "ever breastfed" and "median" months breastfed.

Some of this information is summarized in Figure 12. Panel A shows that in all three countries (and in both surveys), over 90 percent of all infants were breastfed. Panel B shows that although the percentage breastfed declined a little in Indonesia, it increased in Sri Lanka (by 2.5 percent) and Thailand (4.5 percent). Panel C shows the change in median duration of breastfeeding. There was a small decline in Indonesia, a decline of a little more than a month in Sri Lanka (from 22.1 to 20.9 months) and a large decline in Thailand (down from 20.4 months to 15.0 months). However, Appendix Table 29 shows that the median breastfeeding duration of infants in urban areas actually increased in all three countries, from 3.7 to 5.6 months in Thailand, from 12.3 months to 13.9 months in Sri Lanka, and from 16.8 months to 22.4 months in Indonesia. Thailand, especially, experienced very substantial socioeconomic development and fertility decline during the intervening years so this improvement in breastfeeding patterns in urban areas is encouraging.

It is unknown whether the patterns observed in these three countries are representative of patterns elsewhere in the region. No South Asian countries are included in these data even though that is the location of the great bulk of the region's population. Health professionals and others have long been concerned that breastfeeding will sharply decline as a consequence of urbanization, increased employment of women in the formal sector, and increased exposure to advertising and promotion of breastmilk substitutes by health practitioners.

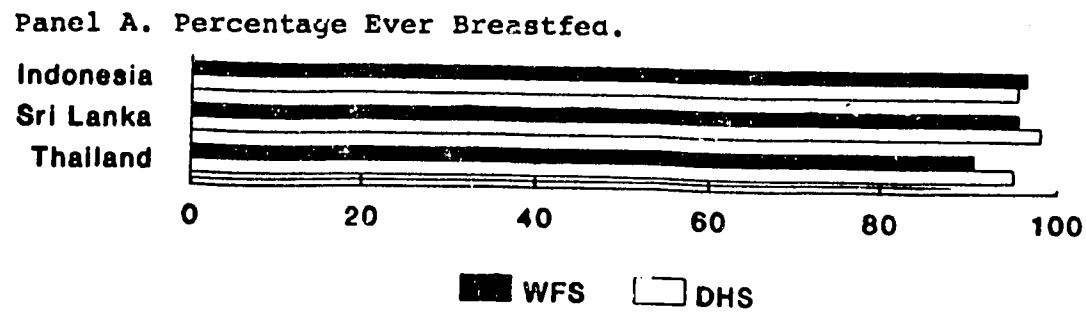
Sharma et al. [1991] analyzed data on breastfeeding for 15 developing countries that had both WFS and DHS surveys, including the 3 from this region. They conclude that there has been no pervasive decline in breastfeeding incidence as had been predicted by some previous studies. Of the 15 countries, only Thailand shows a definitive decline, although they cite another study (Chayova et al.) that suggests that the decline in Thailand may have come to a halt. Some breastfeeding is still virtually a universal experience for children in the 15 countries studied. Their results do not support earlier expectations that breastfeeding will inevitably and pervasively decline as a result of increasing urbanization, female wage employment and economic development. "It is apparent that development does not inevitably lead to breastfeeding declines, and if declines occur, they can be reversed" [Sharma et al., 1991: 26]. They conclude that important factors halting or slowing the decline in breastfeeding may be breastfeeding promotion programs and maternal knowledge of, and practices related to, proper infant feeding practices.

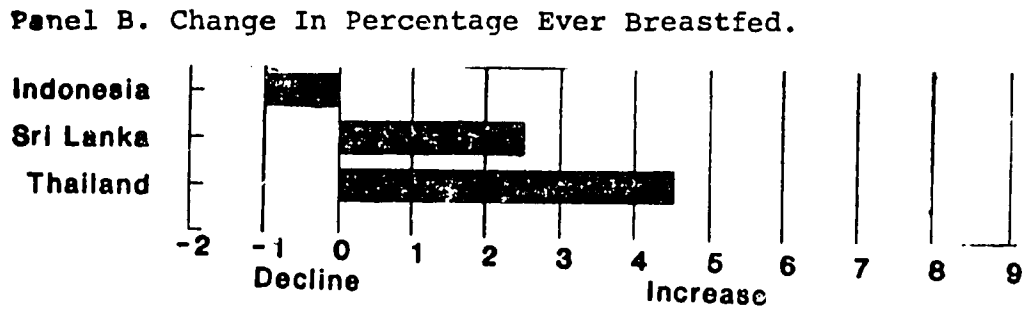
Unfortunately, while breastfeeding continues to be a near universal experience for mothers and children throughout most of the developing world, the percentage who practice optimal breastfeeding is usually small and probably has been declining over time. For example, in the DHS surveys, the percentages of infants four months or younger who were exclusively breastfed were about 36 in Indonesia, 12 in Sri Lanka and only 4 in Thailand.

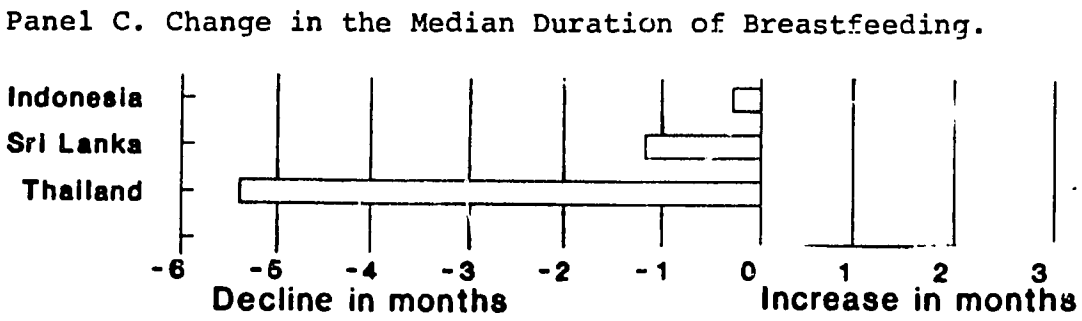
In 1989-90 USAID developed a Breastfeeding for Child Survival Strategy to guide the intensification of the Agency's breastfeeding activities [USAID, May 1990]. The specific goals of the Strategy are to increase the percentage of infants in each of the following categories:

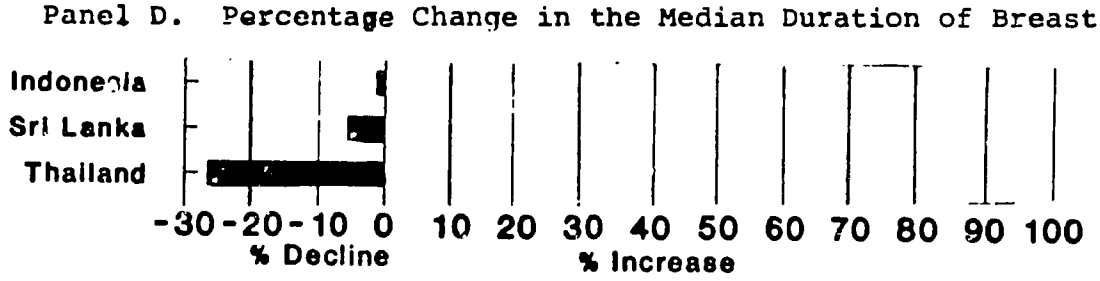
- Breastfed within one hour of delivery
- Exclusively breastfed from birth through 4-6 months of age

Figure 12. Percentage Ever Breastfed and Median Duration of Breastfeeding, Indonesia, Sri Lanka and Thailand, 1975/6 and 1987.









Source: DHS and WFS data, reported in Sharma, et al., 1991

- Fed appropriate complementary foods in addition to breastmilk by the end of their sixth month, and
- Breastfed for at least one year.

This Strategy includes the following Action Agenda:

- Assess the breastfeeding situation in assisted countries
- Develop country-specific strategies
- Implement appropriate activities, especially within ongoing related programs
- Continue and expand centrally funded field support
- Disseminate information on the problem and solutions
- Support research on breastfeeding.

If the analysis of breastfeeding trends based on WFS and DHS gives reason for some optimism, it does not justify complacency. The global campaign of the 1980s to promote breastfeeding appears to have had some success, and hundreds of thousands (possibly millions) of children and their mothers are healthier as a consequence. Without doubt these achievements have been immensely beneficial to the health of children and their mothers. The economic benefits consequent to better health and reduced expenditures for breast-milk substitutes are also significant. However, the goal of significantly increasing the proportion of mothers who practice optimal (or near-optimal) breastfeeding remains elusive.

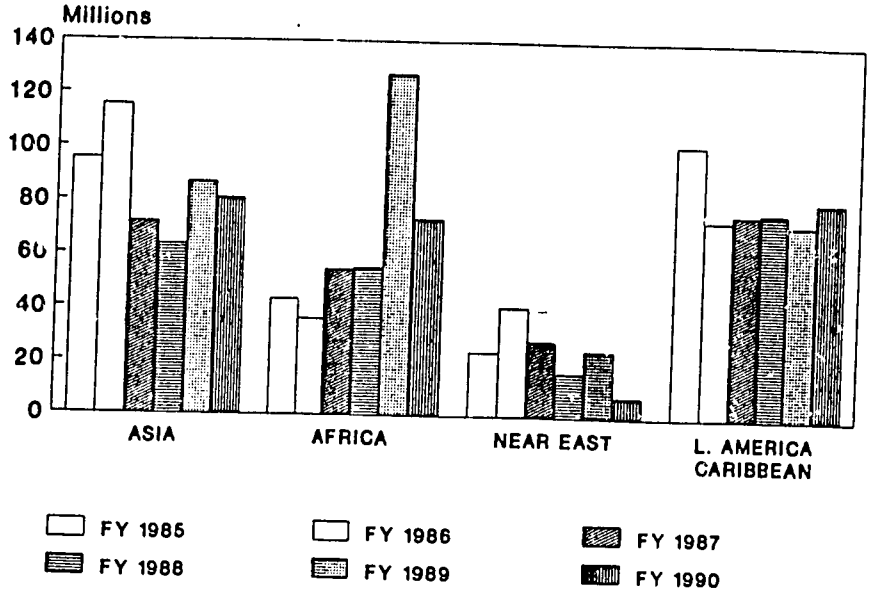
USAID and other international and national agencies should continue their efforts to promote optimal breastfeeding throughout the world. USAID's Breastfeeding Strategy and the Action Agenda remain well conceived and they should continue to be the top priority component of the Agency's Child Survival Strategy. USAID should continue unabated its efforts to achieve the goals of its Breastfeeding Strategy. USAID activities should continue to emphasize support to field missions for strategy formulation, rapid assessment of breastfeeding practices, and project design.

Funding for Child Survival and Other Health Programs in the Asia Region

Appendix Table 30 lists all individual USAID-funded projects that are providing child survival assistance together with the FY90 funding obligations for each project by country and for the total region. It shows that total child survival obligations in the Asia region in FY90 were about $40 million.

Figure 13 shows total USAID health funding obligations by region for FY85 through FY90. In FY90 total funding in the Asia, Africa and LAC regions were roughly similar.

Figure 13. Total Investment in Health, Child Survival, and AIDS by Region, FY 1985-1990.



Note: Figures represent actual obligations for health, child survival and AIDS as reported in Congressional Presentations and Health and Child Survival questionnaires.

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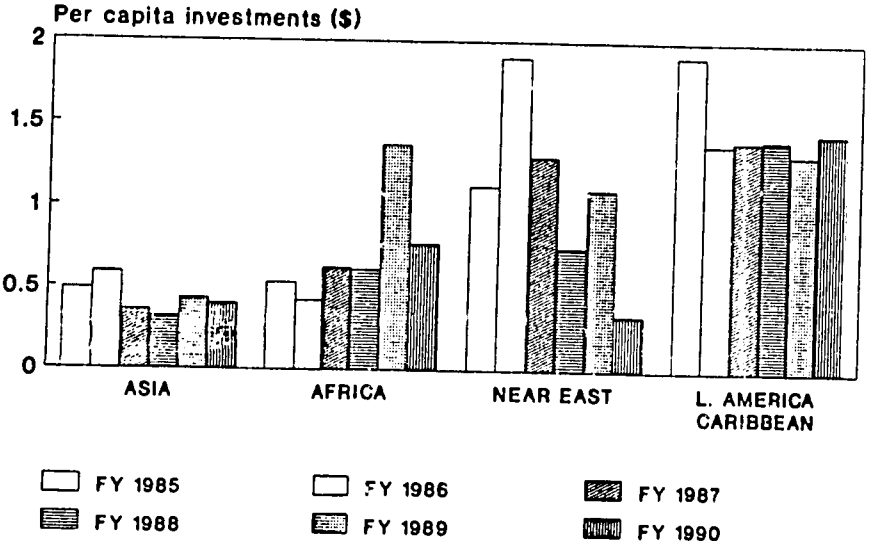
Figure 14. Per Capita Investment in Health and Child Survival, By Region, FY 1985-1990.



N.B. Per capita investment is derived by dividing FY health, child survival and AIDS obligations by regional pop. <5 yrs

CIHI/ISTI 5/91

Figure 8 (presented earlier) shows that about 55 percent to 60 percent of all infant deaths in the developing world (excluding China) occur in Asia compared to about 25 percent in Africa and less than 10 percent in the LAC region. Figure 10 shows that among USAID child survival emphasis countries, about 75 percent of all infant deaths occur in Asian countries. Therefore, relative to other regions, the Asia region is clearly underfunded for child survival and other health activities. This is reflected in Figure 14, which shows that on a per capita (per child under age 5) basis, total USAID funding obligations during FY85 through FY90 averaged about $0.40 for Asia. For Africa they had increased over that 6-year period from about $0.50 to about $0.75 (but were about $1.40 in FY89), and in the LAC region they averaged nearly $1.50 throughout the period. Although these funding levels are relatively low for all regions, Asia is particularly disadvantaged.

Indicators: Levels, Trends and Projections

Table 9 gives the most recently available data on reported cases of AIDS in these countries. Not surprisingly, the number of cases reported to date is very low. This is primarily a function of the fact that the spread of HIV began later in Asia than in the Americas, Europe and Africa. The first case in Thailand was identified in 1984 and the first "indigenous" case was identified only in 1987. In Asia, as in Europe and the Americas, the spread of HIV has been driven initially by intravenous (IV) drug use and through homosexual contacts. However, subsequently the principal mode of transmissions has become heterosexual contact (although homosexual contact will also probably continue to be an important transmission mode, especially in India). There is also a relationship between sexually transmitted diseases (STDs) and the likelihood of becoming HIV infected. HIV in men is often associated with a history of syphilis and in women with a history of genital warts.

Table 9. Reported Number of AIDS Cases, 1979 to 1990.

Country	1979-1987	1988	1989	1990 to date	Last Report	Cumul. Cases
Afghanistan	0	0	0	0	4/30/90	0
Bangladesh	0	0	0	0	5/31/90	0
Cambodia						
Fiji	0	0	1	0	4/10/90	1
India	9	19	12	8	8/31/90	48 *
Indonesia	1	2	3	1	3/31/90	7
Laos						
Mongolia	0	0	0	0	7/31/90	0
Nepal	0	2	0	2	8/31/90	4
Pakistan	3	3	7	0	6/30/90	13
Papua New Guinea	1	7	5	0	6/28/89	13
Philippines	12	8	8	9	9/28/90	37 **
Sri Lanka	1	2	1	2	8/31/90	6
Thailand	8	4	20	32	9/30/90	64 ***
Totals	35	47	57	54		193 ****

Source: AIDSTECH Project (WHO GPA data)

* 57 cases through 11/30/90 according to official GOI data [USAID cable]
** 43 cases through 3/31/90 according to GOP data (provided by AIDSTECH)
*** 86 cases through 4/30/91 according to GOT statistics; Mechai Veeravidhaya recently estimated that nearly 300,000 Thais are now HIV-positive
**** 235 cases incorporating more recent data for India, Philippines and Thailand

As with so many other conditions, in Asia the demography of the region is driving this epidemic. Because populations are so large in this region, even if high risk groups represent relatively small proportions of the total population, the total number exposed to HIV could be very large. As shown in Appendix Tables 31 through 34, the population age 15-49 is projected to increase by about 28 percent during the 1990s, from about 725 million to about 925 million. Over half of this growth is projected to occur in urban environments--much of which will be in low income and slum conditions. Such urban settings are much more likely to be conducive to behavioral patterns that foster the heterosexual spread of HIV than are rural environments.

No large-scale surveillance or large surveys have been implemented to date in Asia. Surveys have focused on suspected high risk populations such as commercial sex workers and military recruits. Key findings from some of those surveys are as follows:

- In northeast Thailand (Chiang Mai), a recent survey found an HIV infection rate of 14 percent among new military recruits [WHO data].

- In Bangkok, prevalence among IV drug users increased from less than 1 percent in 1988 to about 50 percent in 1990 [Report to Congress, 1991].

- In Bombay, about 20 percent of the estimated 100,000 to 150,000 commercial sex workers are HIV positive [Government of India, in USAID/New Delhi cable].

- In Madras, the estimated infection rate was about 70 percent among a group of prostitutes relocated from Bombay to Madras as part of a social rehabilitation program [WHO data].

- In Thailand, data from the sentinel surveillance system shows that the median infection rate for pregnant women, by province, was 0.2 percent in June 1990, and 0.7 percent in December 1990 [U.S. Census Bureau].

Projections

Technically sound projections of the spread of HIV and AIDS during the next decade have not yet been completed for Asia, with the exception of a projection for Thailand conducted by the Population and Community Development Association (PDA) of Bangkok [PDA, 1990]. The projection shows that at least in Thailand HIV/AIDS is becoming a major epidemic. Below are highlights from the analysis:

- By the year 2000, at least 2 million Thais will be infected with HIV if acceleration of the epidemic's annual rate of increase can be slowed by 1994.

- If the rate of increase in infections does not begin to slow until 1996, it is estimated that there will be 3.4 million HIV positive cases in 2000--over 5 percent of the projected total population of 64 million.

- The cumulative number of deaths from AIDS by 2000 is projected to be about 460,000 for the first projection and 590,000 for the second.

- Under the assumptions of the first projection, in the first few years of the next century, the annual number of AIDS deaths would be around 200,000; for the second projection, the annual AIDS deaths would be around 350,000 [our estimates, based on data from the PDA analysis]. This latter figure would be roughly half of all projected annual deaths in Thailand.

Assistance Needs and Issues in the 1990s

In fiscal year 1990 USAID provided about $25 million in region- or country- specific assistance to combatting AIDS. Only about 10 percent of this was allocated to the Asia region. The $2.5 million in assistance provided to this region in FY90 was allocated as follows: $1.3 million to Philippines; $367,000 to Thailand; $127,000 to Indonesia; $262,000 to South Pacific countries; and $464,000 to regional activities [Report to Congress, 1991].

USAID must increase significantly the total funding committed to Asia in the years ahead given the potential for an explosion in the number of HIV infections in the region. The top priority must be to slow the HIV epidemic and prevent the sexual transmission of HIV, especially in high risk groups that are demographically large. The central USAID cooperative agreement is flexible and relatively comprehensive for responding to AIDS research and programmatic needs.

Key programmatic implications for support to the Asia region in the 1990s include the following:

- USAID should support additional policy impact analyses and policy development, focusing on the priority countries, to address public and private sector resource and personnel needs--for example, the development and presentation of "RAPID"-like models for informing key decision-makers about the magnitude and impact of the epidemic including implications for early and effective prevention through media and education as well as the implications for scarce financial and human resources and for tertiary care facilities for treatment.

- USAID should concentrate its assistance in those countries where numbers of AIDS cases are likely to be the greatest; this will probably be India, Indonesia, Philippines, and Thailand, which together have more than twice the population of sub-Saharan Africa. It is possible that by the year 2000 the number of HIV-infected people in these four countries will exceed the number in all of Africa.

- USAID should support activities to involve a wide range of sectors and agencies and strengthen the institutional capability of government and private sector (NGO) agencies in education and prevention activities. Efforts should focus on high HIV-risk groups--prostitutes, military recruits, prison inmates.

- USAID should provide increased levels of support for training and technical assistance to promote condom use and ensure adequate condom supply.

- Special efforts need to be made to address more effectively the control and treatment of STDs:

  -- HIV screening, counselling and intensive education should be offered to all patients who attend STD clinics as well as through outreach programs to groups with high risk behavior (e.g., commercial sex workers, IV drug users).

  -- Treatment of STDS and health education on STDs and AIDS should also be incorporated into protocols of MCH, antenatal and family planning clinics. Greater efforts should be made to diagnose and treat women's reproductive tract infections which will reduce their susceptibility to HIV infections.

  -- Operations research should be undertaken to develop improved, inexpensive clinic-based diagnosis and to document the benefits of integrated care for STDs within broader MCH or general medicine clinic settings. U.S. and international AIDS research protocols should include study of STDs and their relationship to HIV.

- USAID should provide assistance in analyzing crucial finance issues: Overriding questions will be who will pay for all the prevention and care services, and how will they pay? There will be resource competition between prevention and care for AIDS patients. What resources will be provided by governments and what resources by others?

Family Planning

Asia is the region with many of the world's greatest family planning successes. With significant assistance from USAID during the 1960s and 1970s, fertility declined rapidly in Taiwan and South Korea and both are now at well below replacement level (TFRs of about 1.8 and 1.6, respectively). Fertility is also below replacement level in both Hong Kong and Singapore.

Table 10 groups the 14 countries included in this study into five categories based on estimated levels of current (1990) modern method contraceptive prevalence (see column 4), using a typology recently adopted by USAID's Office of Population [Destler et al., 1990]. The five groups are presented from lowest level of prevalence to highest levels. Three of the six largest countries are in the two most advanced categories, "Mature" (Thailand) and "Consolidation" (India and Indonesia, which together have over 70 percent of the combined population of these 14 countries). In addition, Bangladesh is progressing rapidly through the "Growth" stage. Among the region's large countries, only Pakistan lags far behind. Also disappointing are indicators for the Philippines, where about a decade ago contraceptive prevalence plateaued in the low 20s and has remained at about that level since.

Accomplishments and Shortfalls

Thailand, Indonesia, Sri Lanka and Bangladesh have had considerable success in family planning and fertility decline. All four received very significant levels of USAID assistance during the 1970s and well into the 1980s. Since the late 1960s, fertility has plummeted in Thailand, declining from a TFR of about 6.2 in 1969 to about 2.1 by 1987. Thailand's contraceptive prevalence (CPR) rate in 1969-70 was about 15 percent; in 1987 it was about 65 percent.

In Indonesia, with a population now approaching 200 million, fertility decline began somewhat later than in Thailand and has proceeded somewhat more slowly. However, in 1990 about 44 percent of eligible couples were using modern contraceptives and the total fertility rate had declined to about 3.3. This has been accomplished despite persistently high mortality rates, with infant mortality estimated to be 89 deaths per 1000 births in 1990 and a maternal mortality ratio of about 450 per 100,000 live births. Mortality in Indonesia is far higher than in Sri Lanka and Thailand, where IMRs are 22 and 39 respectively, with maternal mortality ratios estimated to be about 60 and 50, respectively.

The Government of Bangladesh's family planning program only got underway following independence in 1971. The total fertility rate at that time was about 7 with contraceptive prevalence below 8 percent. In 1990 the TFR was about 5 and the CPR was around 30--officially estimated by the Government of Bangladesh as 4.9 and 33, respectively [Huber et al., 1990]. This significant progress has occurred among the world's largest concentration of impoverished people where the IMR is estimated to still be about 120.

Table 10. Basic Demographic Indicators, by Family Planning Program Status, 1990.

Country	Population 1990 (million)	% Tot Pop (Reg)	CPR mod-ern (%) 1990	TFR 1990	IMR 1990	Life Exp.at Birth (yrs) 1990	CBR 1990	CDR 1990	PGR (%) 1990	Per Capita GNP [US$] 1988
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Emergent: 0-7% CPR (modern)										
Afghanistan	15.9	1.1	NA	7.1	182	43.5	48	22	2.6	NA
Pakistan	114.6	7.8	7	6.1	110	59.0	44	13	2.5	350
Sub-total	130.5	8.9								
Launch: 8-15% CPR										
Cambodia	7.0	0.5	NA	4.5	128	51.0	39	16	2.2	NA
Laos	4.0	0.3	NA	5.5	110	51.0	41	16	2.5	NA
Nepal	19.1	1.3	15	6.6	112	53.5	42	17	3.7	170
Papua New Guinea	4.0	0.3	NA	5.7	59	55.9	39	12	2.7	770
Sub-total	34.1	2.3								
Growth: 16-34% CPR										
Mongolia	2.2	0.2	NA	4.8	50	63.7	36	8	2.8	NA
Philippines	66.1	4.5	22	4.3	48	65.0	33	7	2.6	630
Bangladesh	114.8	7.8	26	4.9	120	52.9	39	14	2.5	170
Sub-total	183.1	12.5								
Consolidation: 35-49% CPR										
Fiji	0.8	0.1	35	3.3	21	63.0	27	6	2.2	1540
Sri Lanka	17.2	1.2	41	2.3	22	71.6	21	6	1.5	420
India	853.4	58.3	41	4.2	95	60.4	32	11	2.1	330
Indonesia	189.4	12.9	44	3.3	89	62.7	27	9	1.8	430
Sub-total	1060.0	72.4								
Mature: 50% and over CPR										
Thailand	55.7	3.8	65	2.1	39	67.1	22	7	1.5	1000
Sub-total	55.7	3.8								
Total	1464.2	100.0				59.6				

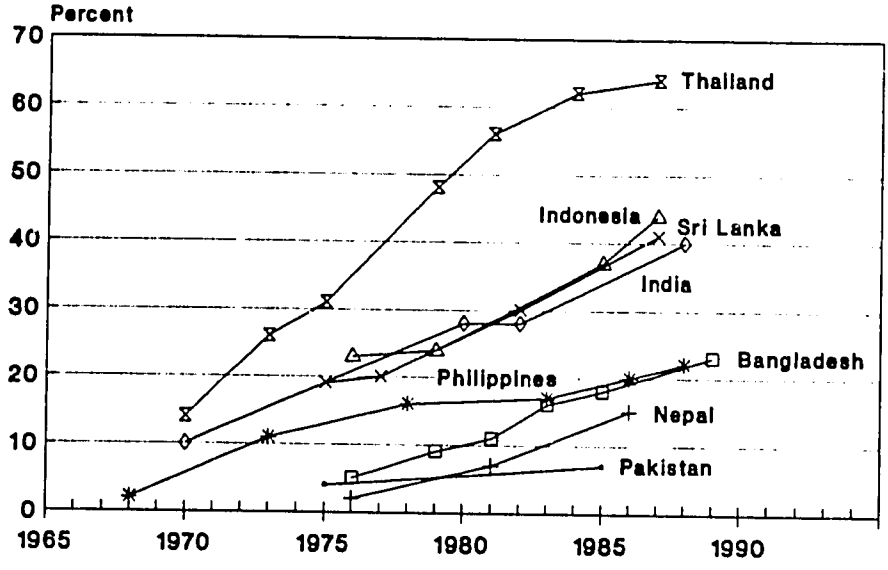
Source: Population Reference Bureau, 1990 World Population Data Sheet. The source for Thailand's 1990 TFR estimate is Huber et al., 1991.

Note: Countries for which there are no CPR data have been assigned to groups based on authors' estimates.

Even India, contrary to some popular perceptions, has had significant success in family planning and fertility decline. In 1951 India established the first government-supported family planning program in the developing world. By the early 1960s the government was providing services nationwide. India's TFR declined from about 6 in the early 1960s to about 4 by 1990 (officially estimated by the GOI as 3.9 in 1989). This has been accomplished in the country that has nearly one-third of the estimated 1 billion people in the developing world who are living in absolute poverty [World Bank, 1990]. However, the level of family planning success and fertility decline has varied greatly among the Indian states. The overall percentage of couples effectively protected in 1990 was 43. However, among the major states, the range was from a high of 74 percent in Punjab to lows of 26 percent effectively protected in Bihar, 34 percent in Uttar Pradesh and 29 percent in Rajastan. This low performance is particularly serious because the combined population of these three states--which stretch in an arc from east to west across northern India--is about 300 million.

Appendix Table 40 provides data on contraceptive prevalence rates for all countries for which data are available, 1968 through 1989 (all data from surveys conducted in the years shown). These data are shown in Figure 15 for eight of the nine largest countries (excludes Afghanistan). Note that in five of these countries (Bangladesh, India, Nepal, Pakistan and Philippines), in initial surveys conducted in the late 1960s and early 1970s, modern prevalence was 10 percent or less. In Thailand it was 14 percent. Only in Sri Lanka (19 percent in 1974) and Indonesia (23 percent in 1976) was prevalence moderately high at the time of the initial survey. However, by the time of the most recent survey in the late 1980s, modern prevalence in these eight countries ranged from 7 percent in Pakistan to 64 percent in Thailand.

Figure 15. Contraceptive Prevalence Rates: Percent Using Modern Methods, 1968-1989.



Source: Population Council Family Planning and Child Survival Data Bank.

In Bangladesh, Indonesia, Sri Lanka and Thailand, the actions of the governments themselves, USAID and other donors have been essential to the success of family planning efforts. Keys to USAID support have been the following [also see Conty, Speidel, and Camp, 1991]:

- Very large financial and technical investments by USAID
- Steadfastness of commitment by USAID over an extended time period
- A strong focus on provision of family planning services
- Technical leadership and innovation by USAID and its cooperating agencies.

Although in several countries contraceptive prevalence has increased rapidly, DHS surveys show there are still high levels of unmet needs for contraceptives. Table 11 shows the estimated levels of unmet need for family planning for the three Asian countries for which there are DHS data (Indonesia, Sri Lanka and Thailand). Although these are the three highest prevalence countries in the region, sizable proportions of married women wish to limit or space births but are not currently contracepting. The levels of "unmet" need in these countries are about 25 percent in Indonesia, 20 percent in Sri Lanka, and 15 percent in Thailand.

Table 11. Total Demand for Contraception and its Components for Currently Married Women.

	Demand for Contraception			Unmet Need			Current Use			Percent of Total Demand Satisfied
Countries	Total	For Spacing	For Limiting	Total	For Spacing	For Limiting	Total	For Spacing	For Limiting	
INDONESIA	64.7	28.5	36.1	16.0	10.1	6.0	47.8	17.8	29.9	73.8
Java/Bali	66.9	27.8	39.1	15.2	9.3	5.9	50.9	18.0	32.9	76.1
Outer Java/Bali I	60.2	29.8	30.3	17.4	11.5	6.0	41.7	17.4	24.3	69.3
Outer Java/Bali II	60.3	31.0	29.3	19.0	12.0	6.9	39.6	17.4	22.2	65.7
SRI LANKA	75.9	21.5	54.4	12.3	7.2	5.1	61.7	13.1	48.6	81.3
Colombo Metro	78.1	22.2	55.8	14.8	8.9	5.9	62.6	12.9	49.8	80.2
Colombo Feeder Areas	78.2	20.3	57.9	9.0	4.8	4.1	67.0	14.2	52.8	85.8
South Western Coastal Low Lands	78.3	24.9	53.5	12.0	6.8	5.2	63.7	16.7	47.0	81.4
Lower South Central Hill Country	74.8	22.7	52.1	11.0	6.9	4.0	61.8	14.2	47.5	82.6
South Central Hill Country	71.9	18.0	53.9	12.6	7.1	5.5	57.4	9.6	47.8	79.8
Irrigated Dry Zone	77.3	22.3	55.0	12.8	7.6	5.3	62.3	13.4	48.9	80.7
Rain Fed Dry Zone	76.6	21.6	55.0	16.8	9.8	7.0	58.1	10.8	47.3	75.8
THAILAND	77.1	21.8	55.3	11.1	5.6	5.5	65.5	15.9	49.6	85.0
North	79.5	22.9	56.5	7.7	2.6	5.1	71.3	19.9	51.4	89.8
Northeast	76.5	20.9	55.5	11.6	6.4	5.2	64.6	14.4	50.2	84.5
Central	79.4	21.4	58.0	8.7	4.4	4.3	69.7	16.7	53.0	87.8
South	69.7	21.4	48.4	19.4	9.9	9.5	49.9	11.3	38.6	71.5
Bangkok	78.0	23.3	54.7	10.7	6.1	4.7	66.6	16.9	49.6	85.3

Source: DHS Data

Family planning services in this region are still provided predominately by the public sector. Table 12 shows the reported distribution by "source" of contraceptives for the three DHS countries in 1987. "Public" and "private for-profit" combined supplied 93 to 98 percent of all users in these three countries ("NGOs" and "other" combined accounted for the remaining 2 to 7 percent). In these three countries, the public sector supplies the overwhelming majority of contraceptive services. The ratio of public source to private for-profit source was 5.6 to 1 in Thailand, 6.5 to 1 in Indonesia, and 8.6 to 1 in Sri Lanka.

Table 12. Source of Modern Contraceptives Among Currently Married Women 15-49, by Percentage, 1987.

Country	Modern Prevalence	Private For-Profit	NGO	Public	Other
Thailand	63.3	14.8	0.8	83.6	0.8
Indonesia	43.9	12.3	-	80.5	7.2
Sri Lanka	40.6	10.2	0.1	87.6	2.1

Note: In the NGO category, a "-" indicates information was not asked on the survey, was included in "other" category, or that the response was less than 0.1 percent.

Source: Cross et al., 1991, from DHS survey.

For nearly two decades, USAID has successfully promoted private sector provision of family planning services. However, governments in this region--especially in the more economically and demographically advanced countries--should promote the expansion of private sector services more aggressively. The initial target groups should be the large and growing middle classes currently served primarily by the public sector. Efforts should also be made to increase prevalence by expanding private sector services beyond this initial target group. USAID should provide assistance to assess the opportunities to utilize financial incentives, public-private sector cost-sharing arrangements, and policy and regulatory changes that would foster greater private sector provision of services to increase overall prevalence.

USAID Funding for Population/Family Planning

Although Asia is the region of demographic giants and the countries included in this study are producing about 50 million births annually--nearly half of the total births in the developing world (excluding China, which produces another 23 million births), USAID population/family planning assistance to the region has been relatively small. In FY90 USAID spent a total of about $280 million on population and family planning assistance of which about $257 million were committed to specific regional activities (the remaining $23 million were for "worldwide" activities). Of this $257 million, approximately one-quarter was committed to programs in the 14 countries in this study.

USAID Population Assistance in 1990 was equivalent to about $.05 per capita (total population) for the countries in the Asia region compared to about $.20 in the Africa, Latin America/Caribbean (LAC) and Near East regions combined. Moreover, about 80 percent of assistance to the Asia region was provided from regional bureau and mission accounts, while in the Africa and LAC regions only about 40 percent was from bureau and mission accounts [USAID, 1991]. In FY91, S&T/POP is responsible for about 65 percent of all USAID population funding. However, the proportion of S&T/POP funds going to the Asia region is especially small. On a per capita basis, S&T/POP provided $0.01 to the Asia region and $0.12 to all other regions combined.

The Challenge Ahead and Assistance Needs

Despite notable accomplishments in family planning and fertility decline, complete success is still far from assured. The overall total fertility rate for the region still exceeds 4. In Afghanistan, Nepal and Pakistan, the TFR exceeds 6. Although the TFR is now about 4 for India as a whole with an overall crude birth rate of about 32, in the populous eastern and north central states of Orissa, Bihar, Uttar Pradesh, Madya Pradesh and Rajastan (with a combined total population of over 350 million), state-level CBRs range from about 38 to nearly 45.

The region's population is still growing rapidly, currently adding over 30 million annually (these 14 countries combined)--double the annual increase in all of Africa. Moreover, the population of women in their reproductive ages is growing even faster than the population as a whole (due to past high fertility). Figure 2 (presented earlier) shows that the number of women of reproductive age is projected to increase from 321 million in 1990 to 408 million in 2000 (UN median projection)--a 27 percent increase. Figure 3 shows that for this same period the number of women age 15-19 is projected to increase 22 percent, from 74 million to 90 million.

Fertility can be expected to decline rapidly to low levels in this region only if both international donors and developing country governments themselves significantly increase their investment in family planning--by means of improved policies, increased funding and accelerated institutional development.

Program Priorities for the 1990s

The "Principles for the Nineties" [Destler et al., 1990] clearly lays out several keys that should guide USAID assistance in the 1990s. The following principles apply to USAID assistance to this region in the 1990s:

- Service delivery must expand to serve larger populations in more cost-effective ways
- Service delivery systems must emphasize quality of care
- Service delivery systems must evolve to meet the needs of a more diverse and younger population and changes in method mix
- All sectors--government, the private voluntary and the for-profit private sector--must cooperate to support family planning service delivery

- Attention must be directed to developing the institutional base and resources to sustain services

- Greater attention must be paid to comparative advantage, strategic position, and managerial efficiency. Donors and Cooperating Agencies must determine where and how they can be most effective given their human, financial and technical resources, and they must develop strategies that reflect these strengths. Project planners must be sure projects strengthen existing institutions. Assistance must be better managed, coordinated and streamlined for the best use of limited resources [Destler et al., 1990, p. 29].

Several recommendations are presented below for priority action for USAID population and family planning assistance to the Asia region. These are also consistent with a much larger set of recommendations recently made by the Population Crisis Committee (PCC) for USAID's global population assistance program for the 1990s [Conty, Speidel and Camp, 1991].

- Greatly Increased Assistance to the Largest Countries. USAID should greatly increase total assistance for population/family planning programs in the largest countries in the Asia region. For the five most populous USAID-assisted countries in the Asia region--India, Indonesia, Bangladesh, Pakistan and the Philippines with a combined population of over 1.3 billion, PCC recommends that USAID population funding be increased from about $43 million in 1991 to $120 million in 1992. On a per capita basis, in 1991 USAID population funding for these five large countries was $0.03 compared to about $0.20 per capita for all countries outside the Asia region combined.

- Priority to Demographically Significant Countries Even After Fertility has Fallen. USAID should continue to should provide substantial assistance to demographically significant countries even after fertility has fallen to moderate levels (e.g., Indonesia currently and, it is hoped, India several years hence). In those countries that have made significant progress in family planning, USAID should move toward broader program (rather than project) support.

- Much Larger Programs. To achieve greater demographic impact, USAID's existing service delivery programs, particularly those undertaken by private collaborating institutions, need to be designed on a significantly larger scale. Successful social marketing and clinical family planning programs should be expanded and more widely replicated.

- Improve Quality of Services. Greater attention must be given to improving the quality of services in large national family planning programs. USAID should refocus ongoing field research program operations to address quality of care issues.

- Increase Provision of Commodities. The needs for contraceptive supplies--and the associated cost--will increase enormously during the 1990s. Mauldin [1991] estimates that the cost of contraceptives for developing countries will increase from $399 million in 1990 to $627 million in 2000, an increase of $228 million annually. Over one-third of this increase ($78 million) would be in South Asia and another nearly 10 percent ($21 million) in East Asia. South Asian countries in particular (Afghanistan, Bangladesh, India, Nepal, Pakistan) may be unable to meet this large increase in cost.

Of the estimated $399 million spent in 1990 for contraceptive commodities for developing countries, about $330 million was spent by public sectors of which LDC governments spent $242 million

and donors provided $88 million [Mauldin, 1991]. Of the latter, $66 million (75 percent) was provided by USAID. To ensure adequate supplies, USAID should continue to provide large quantities of contraceptives, especially to the largest countries of the region, and USAID should work with other donors to develop new ways of providing contraceptive commodity assistance.

- Priority to Institutional Development and Local Capacity Building. USAID should give priority to long-term institutional development and local capacity building. As programs in large countries mature, there is the risk that the necessary qualified personnel will be "broad" but not sufficiently "deep" to respond effectively and efficiently to continued growth in family planning service needs. Greatly increased emphasis should be given to the development of the professional and management capacity of developing country institutions.

- Assistance in Policy Analysis and Policy Dialogue. A wide arsenal of policy tools are available to stimulate public and private sector leaders to actions that will accelerate the rates of increase in contraceptive use and of fertility decline. In the demographically more advanced countries (e.g., Thailand, Indonesia, Sri Lanka), this assistance can persuade leaders to "stay the course" and even increase overall investments in family planning. In countries where progress has slowed or stalled (e.g., Philippines), policy assistance can reinvigorate public and private support for family planning and reclaim lost ground. Obstacles to more efficient operational programs (e.g., method mix in Nepal) and to overcoming bureaucratic inertia (Pakistan) can be addressed effectively through application of policy analysis tools. Policy assistance can address the wide differences in political and financial commitment and program performance among the states of India. It can promote commitment to other crucial components for program success--e.g., quality of services, increased role and effectiveness of the private sector, and commitment to capacity-building and institutional development.

- Flexible and Pragmatic Country Programs. At the country level, USAID's population program strategy needs to be flexible and pragmatic rather than rigid and ideological.

- Promote Universal Basic Education. USAID should increase significantly its support--especially for policy analysis and capacity-building--for rapid expansion of basic education throughout this region. Among all government activities, none is more important to the success of family planning and fertility decline than achievement of widespread basic education, most especially for females. A recent World Bank study of the Indonesia family planning program concluded that investments in basic education provided very high returns in terms of their contributions to family planning and fertility decline. Unfortunately, some of the large countries in this region (Bangladesh, India, Pakistan) have made only slow progress toward achieving near-universal basic education.

Health Finance

As with many other issues in this region, the demographics are a dominant driving force, as illustrated by following:

- In 1990 the total population of these 14 countries was nearly 1.5 billion, and the population is projected to grow 35 percent to about 2 billion in 2005.
- The total urban population is projected to nearly double in size between 1990 and 2005--to about 720 million, growing at about 4 percent annually.
- The population age 15-49--arguably those most in need of health care for themselves and their children--is projected to increase 42 percent from 1990 to 2005, to over a billion (see Appendix Tables 31 through 36).
- The size and growth of the impoverished population, both urban and rural, is estimated to be over 500 million currently in South Asia alone [World Bank, 1990].

Additional important factors that cause finance to be a major topic for this region are the following:

- The growing role of insurance and worker benefit programs.
- The presence of large, costly, primarily government hospitals; their rapidly increasing costs; and the small share of the country's health needs that they meet.
- The physical infrastructure in these countries is aging rapidly due to poor maintenance; large investments will be required to improve existing infrastructure as well as add new infrastructure for growing populations in both urban and rural areas.
- Services provided by the government are generally not meeting the needs of the most vulnerable; up to 80 percent of government health budgets are for hospitals, mostly in large urban areas, primarily for services provided to the non-poor, while typically a large share of the poor have no access to public sector care and pay for virtually all of their own health care.

Spending on health care as a percentage of Gross National Product (GNP) and of total central government spending in Asia is very low. Table 13 shows that government health budgets in Asia are about 2.9 percent of central government expenditures in health compared to about 5.4 percent in Africa and 4.8 percent in Latin America. In the mid-1980s in Asia, these government funding levels were equivalent to about US $2.30 per person. Combined private and government health expenditures were about $13 in Asia, $12 in Africa and $69 in Latin America.

Table 13. Health Expenditures Per Capita.

	Per Capita Private and Government Health Expenditure (US Dollars)	Percent of Central Government Expenditure to Health (US Dollars)	Per Capita Central Government Expenditure on Health (US Dollars)	Percent of GDP to Health (Gov't and Private)	Number of Countries with Data
Asia	13	2.9	2.3	3.1	9
Africa	12	5.4	5.3	3.2	19
EMENA	51	2.1	13.4	5.7	11
Latin America	69	4.8	22.9	5.8	18
Industrial	1,312	11.6	447	11.3	20

Note: The last column refers to the number of countries with data for total expenditures and total as a percent of GDP.

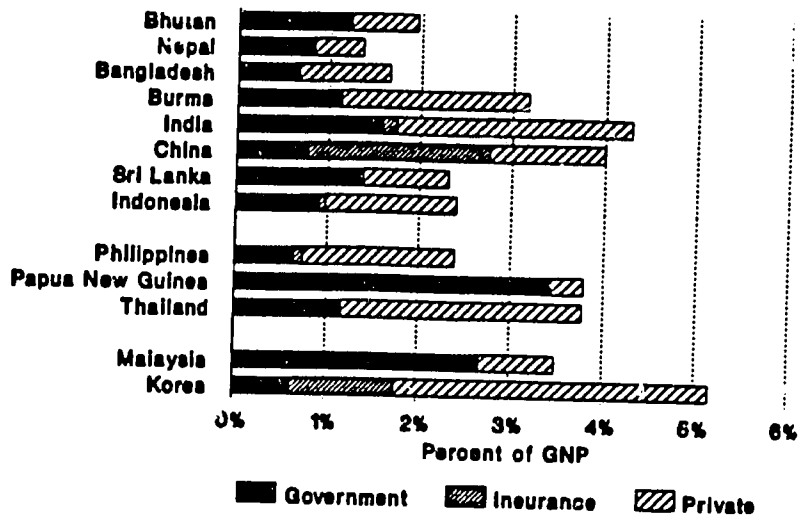
Source: Griffin, World Bank, 1990

Figure 16 shows private, government and insurance spending as a percentage of GNP for 13 Asian countries, including the six largest in our study. The countries are arranged in order of increasing income per capita, with a break between the low income and middle-income countries, and an additional break separating Korea and Malaysia from the other middle-income countries. Insurance spending is large in China and Korea; small in India, Indonesia and Philippines, and essentially nonexistent in the other countries. In most countries, more is spent on private care than by government.

Griffin [1990] states that a total government expenditure of less than 2 percent of GNP should be seen as a warning signal and an indication of the need for policy analysis and dialogue. Figure 16 shows that Nepal, Bangladesh and Indonesia all spend less than 1 percent, while India, Philippines, Burma (Myanmar) and Thailand all spend less than 2 percent. Estimated total health expenditures (government, insurance, private) as a percentage of GNP are small. Total expenditures as a percentage of GNP in all low income countries except India are less than 3 percent.

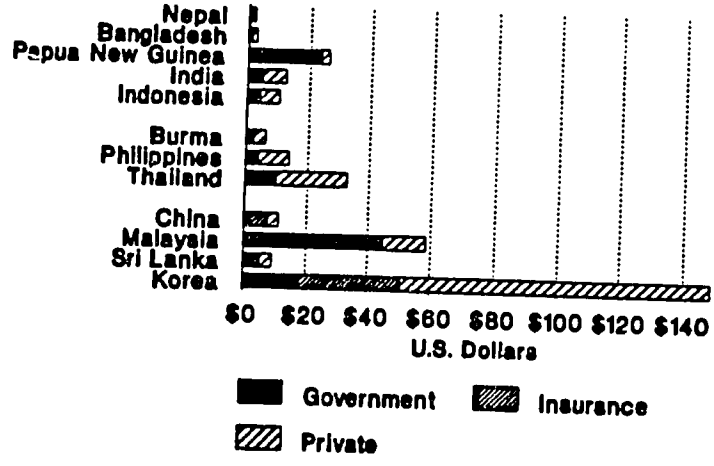
Per capita expenditures in dollar terms present a wide range of expenditures when comparing Asian countries. Figure 17 shows the total value of health care expenditures in each of these 12 countries. Low income countries spend $6 to $13 compared to Korea with $140 and Malaysia with $60. Bangladesh spends only $3 per person and Nepal $2. Total values for private health expenditures are only slightly more than public expenditures, amounting to less than $10 per capita in all countries except Korea and Thailand. This implies that the overall spending levels are low and that private sector spending is also low.

Figure 16. Total Health Expenditure by Source as a Percent of GNP, Most Recent Year.



Source: Griffin, World Bank, 1990

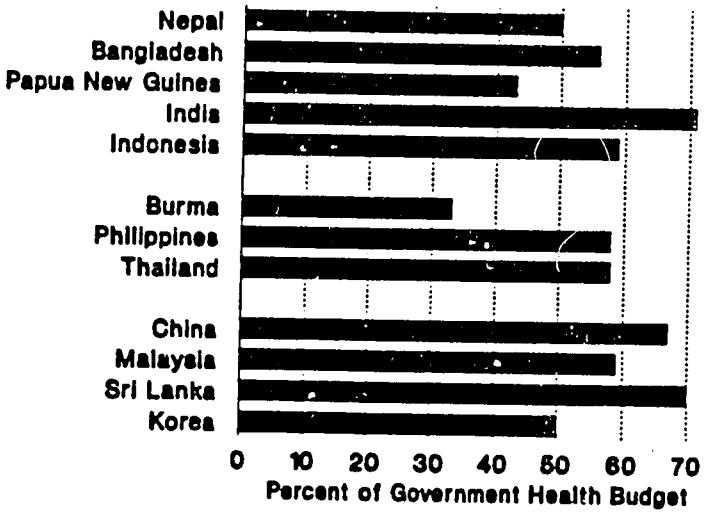
Figure 17. Total Health Expenditures in U.S. Dollars, Most Recent Year.



Source: Griffin, World Bank, 1990

Review of the distribution of financing within the sector shows, on Figure 18, that spending on hospitals as a percentage of total government health spending is 50 percent or higher in all countries except Papua New Guinea and Burma. India spends more than 70 percent on hospitals. This concentration of government resources on hospitals exacerbates the problem of low absolute levels of government health funding (see Figures 16 and 17). This allocation is further complicated by the pattern of treating numerous preventable conditions in hospitals. Griffin states that, conservatively speaking, more than half of the hospital care expense could be avoided completely if other health sector strategies were successful in eliminating the preventable conditions. However, the share of government budgets going to such efforts is not only verly low but may even be declining. A recent study in the Philippines shows taht over the 1981-90 period, while the shrae of the health budget of the Government of the Philippines going to hospitals remained roughly constant at about 60 percent, the share going to "administration " increased from about 10 percent to about 20 percent, while the shre going to "fiels services" declined from about 25 percent to about 15 over this 10-year period [Solon, et al., 1991].

Figure 18. Spending on Hospitals as a Percent of Government Spending, 1986/1987.



Source: Griffin, World Bank, 1990

Donor Implications

- The overall low levels and low percentages of GNP devoted to health have serious implications for donor and national policy analysis and dialogue to increase overall national allocations of public sector funding and for reallocation of funding from hospital care to preventive health care programs. Policy dialogue should include stimulation of private sector health services and expenditures while continuing to expand, not replace, public health expenditures.

- Further assistance is needed on cost recovery mechanisms and schemes.

- Technical assistance and operations research is needed to improve hospital management and efficiency.

- Privatization of hospitals and development of private and social insurance schemes and other health finance arrangements are crucial to the further development of private health care in Asia. Donors can provide a broad range of technical assistance alternatives from university-based experts (as was the case in the recent health officers conference in Indonesia) and from U.S. private insurance and consulting firms and HCFA (Health Care Finance Agency). Investments from private U.S. insurance companies may also be desirable for some countries.

- Exposure of national decision-makers to health care systems in the U.S. and other countries, particularly Canada and in Europe, is vital. Exposure to a variety of university and private sector experts and site visits to public and private health systems with broad exposure to a variety of financing systems perspectives and recent trends would allow them to develop a perspective of optimum functioning and respective roles of private and public sector systems. A broad range of issues discussed would include cost containment, quality assurance, managed care, Management Information Systems (MIS), and administrative systems.

- Developing country officials should be provided access to information on trends and literature covering the significant debates on US adoption, funding and management of national health care insurance and news of its recent endorsement by the American Medical Association; literature reporting the comparative administrative costs of private and public health care programs should be broadly shared with national decision-makers. Distribution of journal articles and working papers would broaden the information base for decision-makers.

The USAID-funded worldwide health care financing project is providing technical assistance to several Asian countries. Several models are being developed including the following:

- In Pakistan, technical assistance in social financing of health care for a population of 600,000.

- In India, a long-term advisor has been requested for cost recovery and overall health care financing.

- In Indonesia, a simulation model is being applied to analyze different health care financing schemes.

A USAID health care financing technical support project designed under the former ANEE bureau is available to provide technical support to private and public sector health systems in Asian countries. The private sector can access technical assistance through a consortium of private U.S. health sector firms and insurance companies. The public sector can access assistance through a PASA agreement with the Office of International Health for consultants from the HFCA.

A number of other donors are providing assistance on health sector financing to the public and private sectors in Asia. WHO and the World Bank have provided technical assistance to study health care financing issues in Indonesia and other countries, including hospital and pharmaceutical cost controls.

Other Health Issues in the Region

Nutrition

Nutritional status provides a vitally important composite indicator of health status, especially for children under 5 and for women of reproductive age. In Asia, individual health program indicators report improvements (such as increases in immunization levels, access and use of ORT, increase in attended births and declines in infant mortality) while nutritional status remains essentially static for a number of countries. The following are some of the nutrition status indicator data of concern:

- Prevalence of malnutrition among the under 5 population is greatest in the Asian countries, in both absolute and relative terms.
- Protein calorie malnutrition exists in 54 percent of the under 5 population, compared to 26 percent in Africa and 18 percent in Latin America.
- 115 million children under 5 in Asia are malnourished, compared to 22 million in Africa and 9 million in Latin America.
- The largest number and percentage of malnutrition cases in the under 5 population group exists in South Asia.
- Acute malnutrition at age 1 is over 40 percent higher in Asia than in Africa, and at age 3, almost 90 percent higher.
- Growth faltering is most acute *in utero* due to maternal malnutrition and at around 6 months due to faulty weaning practices.

Iron deficiency anemia remains a serious problem in Asia and especially in South Asia where the prevalence of maternal anemia is estimated to be 65 percent - the highest rate of any major world region [deMaeyer and Adiels-Tegman, 1985]. Infants, children and pregnant and lactating women are at the highest risk. The number of women with anemia in Asia is twice that of Africa and a higher percentage of women in South Asia (estimated to be 65 percent) are anemic than in Africa. Iron deficiency is associated with increased maternal mortality, impaired immune function, reduced work productivity, reproductive dysfunction and learning disabilities. It is estimated that 20 percent of all maternal deaths in India (when transfusions are not available) are directly attributable to anemia, and additional mortality due to hemorrhage is indirectly due to maternal anemia. Moderate anemia is associated with triple the risk of prematurity. In pre-school and school age children, iron deficiency interferes with cognitive function and is sufficiently severe to jeopardize educational attainment. Researchers in India showed that when 5 to 15-year old children received iron supplements, their test performances for IQ, memory, visual perceptual organization and clerical tasks improved over anemic children who had not received supplements.

The absolute number of malnourished individuals in Asia has increased with continued population growth. Studies in Bangladesh, Nepal, India and Pakistan reflect gender discrimination in food allocation,

health care and education. The long-term nutritional deprivation of infant, young and adolescent girls and adult women is described as systematic, pervasive, and especially prevalent in South Asia.

The prevalence of malnutrition in the Asian countries has remained critically acute, despite increased agricultural production, increases in overall GNP, improvements in child survival, and increased contraceptive prevalence. UNICEF data (Table 14), reporting the results of surveys in several Asian countries, show that in South Asia the percentage of children under age 5 suffering from moderate or severe malnutrition ranged from 40 percent in India to 60 percent in Bangladesh. USAID program planners recognize that nutrition interventions are broad based, with complex and multisectoral interventions. The difficulty of managing a broad range of interventions has led donors to return to more vertical interventions, i.e. breastfeeding promotion, growth monitoring and promotion, iron supplementation, micronutrient additions, and fortification programs.

Table 14. Percentage of Children Under Age 5 Suffering from Moderate and Severe Malnutrition, by Country.

Country	Year	Moderate	Severe	Total
Afghanistan	NA	NA	NA	
Bangladesh	'85-86	51.2%	9.2%	60.4%
Cambodia	NA	NA	NA	
Fiji	NA	NA	NA	
India	1982	34.8%	6.1%	40.9%
Indonesia	1987	50.0%	1.3%	51.3%
Laos	NA	NA	NA	
Mongolia	NA	NA	NA	
Nepal	1975	44.8%	5.1%	49.9%
Pakistan	'85-87	28.9%	19.5%	48.4%
Papua New Guinea	NA	NA	NA	
Philippines	1982	15.6%	1.6%	17.2%
Sri Lanka	1987	29.3%	8.5%	37.8%
Thailand	1987	39.0%	12.5%	51.5%

Source: UNICEF, "A Global, Regional and Country Assessment of Child Malnutrition," Staff Working Paper No. 7, no date.

The Background Paper on Nutrition Issues in ANE Region was prepared for the ANE Bureau in January, 1990 [Sanghri and Pyle]. It succinctly presents the Asian data on the status of malnutrition, identifies a three-part strategy, defines regional priorities, and outlines the program interventions, research, and food production increases needed. It presents technical background and program guidance

to support the ANE/TR/HPN draft strategy paper of January 1990. Additional documents, included in the annex of that paper, provide more complete technical documentation of nutrition data and issues.

The paper and its supporting documents present several options to USAID, while recognizing that the Agency and other donors have limited funding, nutrition staff and technical capability to manage separate comprehensive nutrition intervention programs. Viable alternatives for affecting nutrition status depend on the following approaches:

- Emphasize nutrition interventions as an essential component of a broad child survival program and broader health programs.

- If Child Survival programs will not absorb activities that emphasize nutrition, continue to support policy and program initiatives, economic and agricultural policy initiatives, and income-generating activities.

The authors add that monitoring nutritional status of children under 5 and women 15-49 as a composite indicator of progress in child survival and health status will provide a long-term indicator of overall results of multiple vertical interventions. Use of this indicator has implications for increased nutrition surveillance via small surveys or as potential additions to DHS or population surveys. USAID/Bangladesh has already started collecting such data routinely to measure the impact of their overall development assistance program.

Given the institutional limitations within USAID, recommendations for assistance to improve nutrition focus on specific interventions. They include the following:

- Focus limited nutrition inputs on proven, cost-effective approaches, especially on targeted nutrition messages for early child feeding and maternal nutrition during pregnancy and on product fortification, such as Vitamin A and iron for children and women.

- Develop low cost, labor-saving weaning foods.

- Support research and document the success of nutritional intervention effects on workforce productivity and its effects on reducing low birth weight and on improvement of adolescent female health status.

Priorities established for the region include the following:

- Support nutrition programming interventions that have proved to be effective:

  -- improve young child weaning practices
  -- develop new and expand existing micronutrient programming
  -- improve training and nutrition components of training curricula for health and social service personnel
  -- strengthen development policy-making capability of agricultural and macro-economists through training and education
  -- support research as a basis for interventions requiring more solid data bases.

- Focus on effective interventions to improve women's nutrition for their improved health status, improved productivity and decreased mortality.

- Focus on effective interventions to improve women's nutrition for increased birth weight, decreased IMR and improved early child nutrition status.

- Conduct operations research on the most effective interventions to reduce anemia in adolescent women and women of childbearing age.

- Improve country and USAID capability to identify linkages between macroeconomic and sector policies and household food security on worker productivity.

- Increase involvement of the private sector in nutrition, including mass communications of nutrition messages, fortification of foods, etc.

Other activities identified include the following:

- Conduct additional operations research to increase the effectiveness of interventions such as nutrition education and growth monitoring, to reduce constraints affecting women in effective infant feeding, and to improve early interventions to address growth faltering and effective nutrition education during pregnancy to decrease low birth weight.

- Improve targeting and results evaluation of PL480 food support.

- Increase access of girls and women to health, nutrition and education services.

Given the crucial role of iron in maternal and young child health, MCH programs should incorporate into their protocols for all pregnant and lactating women ferrous sulfate tablet supplementation, nutrition counselling and promotion of home gardens to increase home production and intake of iron rich foods. Mass media messages should be developed and promoted which encourage iron ingestion within dietary market basket limits.

Vitamin A is a particularly important nutrient. WHO estimates that over 1 million children in India and over 3 million worldwide are blind from Vitamin A deficiency. Prevalence of xerophthalmia ranges from 13 to 16 percent throughout much of India. National governments and ministries of health in Asia have expressed interest in Vitamin A programs, which provides an opportunity for donors to respond to their needs. The current USAID-funded Vitamin A project requires increased access and program development on an epidemiologically sound basis to increase assistance in Asia, especially in South Asia. It appears that a number of the countries and their USAID Missions do not yet recognize that they can incorporate a Vitamin A intervention into their population programs. For that reason the projects supported have not responded to many of the areas of highest epidemiological need but rather have responded to those countries that have initiated requests. Funding levels are comparatively high, with congressionally earmarked funds, so that only limited mission buy-ins are needed.

Donor support should continue to emphasize nutritional interventions, production, health education and promotion of natural sources of Vitamin A for the majority of the population. Although an approach that emphasizes the use of capsules is appropriate in some limited circumstances, this should not be the principal programmatic emphasis in most situations due to issues of logistics, cost and

sustainability. Operations research is needed on intervention designs for program implementation, including the development of mass media messages, health education, home gardens, and involvement of the private sector in prevention. Technical assistance and training for the revision of protocols for early detection and adequate treatment of xerophthalmia may be required as additional large numbers of personnel are included in Vitamin A diagnosis and early treatment.

Maternal Mortality

Maternal mortality is an extremely serious problem in much of Asia. WHO data (Table 15) suggest there are about 300,000 maternal deaths annually in Asia--60 percent of all maternal deaths in the world. South Asia has a particularly high maternal mortality ratio. Data reported in Table 16 show maternal mortality estimates of 874 in India and 600 in Bangladesh per 100,000 live births. These are somewhat higher than those reported for Addis Ababa and Tanzania, several times higher than reported for Lusaka, and 40 to 60 times higher than in the U.S.

Table 15. Annual Number of Maternal Deaths by Region, 1986.

Region	Deaths
DEVELOPING COUNTRIES	
Asia	308,000
Africa	150,000
Latin America	34,000
Oceania	2,000
DEVELOPED COUNTRIES	6,000
WORLD	500,000

Source: Jacobsen, June 1991, from WHO data

It is estimated that five countries in the region (Bangladesh, India, Nepal, Pakistan, and Sri Lanka) account for over 40 percent of all maternal deaths in the world. In absolute terms, South Asia has both the highest number of women of reproductive age and the highest number of maternal deaths. Table 17 shows that Asian women have a 1 in 54 lifetime risk of dying from pregnancy-related causes, compared to 1 in 21 for Africa and 1 in 6366 in the U.S. A study in Bangladesh reported that 46 percent of all deaths among women of childbearing age were associated with pregnancy. Table 16 shows the percentage of all maternal deaths due to five direct causes of maternal mortality. They are hemorrhage, sepsis, toxemia, abortion, and obstructed labor. These estimates suggest that these five together account for about 65 percent of all maternal deaths in India and 85 percent in Bangladesh.

Statistics from Guatemala and Bolivia, reported by the MotherCare project, indicate that as much as 50 percent of maternal mortality occurs within 48 hours of the birth event. The Mothercare project, which analyzed data in Bangladesh, Indonesia and India, identified similar levels. These findings are consistent with data that indicate a high (approximately 50 percent) perinatal mortality rate occurring within the first 48 hours of life. This has implications for focused interventions to reduce mortality and morbidity.

Table 16. Lifetime Risk of Dying from Pregnancy-Related Causes, By Region, 1987.

Region	Risk
Africa	1 in 21
Asia	1 in 54
South America	1 in 73
North America	1 in 6,366
Northern Europe	1 in 9,850

Source: Jacobson, 1991

Table 17. Share of Maternal Deaths from Direct Causes, Selected Countries[1].

	Maternal Mortality Rate (per 100,000 live births)	Hemorrhage	Sepsis	Toxemia	Abortion	Obstructed Labor
		(percent)				
India[2]	874	18	14	16	14	3
Bangladesh	600	22	3	19	31	9
Ethiopia[3]	566	6	2	6	25	4
Tanzania	378	18	15	3	17	—
Zambia[4]	118	17	15	20	17	—
United States	15	10	8	17	6	3

[1] Percentages do not add up to 100 due to exclusion of deaths from indirect causes.
[2] in Anantapur, India. [3] in Addis Ababa, Ethiopia. [4] in Lusaka, Zambia

Source: Jacobson, June 1991

Maternal morbidity is also high; studies in India indicate that there are 16 pregnancy-related illnesses for every maternal death. These illnesses affect the woman's health and productivity and the health of her children. Studies in Egypt, China and Nigeria have found pregnancy-related illnesses in up to 37 percent of women [Walsh et al.,1991].

Research indicates that the great majority of women in South Asia find delivery services by trained personnel inaccessible because of geographical and cultural factors. In many cases, no traditional birth attendant can be identified, and families deliver women without equipment or supervision; in some cases the women deliver alone. According to UNICEF estimates [1991], in South Asia the estimated percentage of births attended by trained health personnel ranges from about 5 to 8 percent in Afghanistan, Bangladesh, and Nepal, to a high of about 40 percent in Sri Lanka. Pakistan and India are reported as 24 and 33 percent, respectively. Conditions are only somewhat better in other parts of Asia: the estimates are 31 percent for Indonesia, 43 for Philippines, 50 for Papua New Guinea, and 70 percent for Thailand.

Program Implications

Interventions to decrease maternal mortality and morbidity should focus on early identification of high-risk events, coinciding in many cases with high gravida women, and of pregnancies of short birth intervals and rapid referral to facilities. The purpose of this rapid intervention is to prevent that high percentage of mortality within the 48-hour perinatal period. These interventions do not fully replace the integrated MCH programs aimed at improving maternal nutrition and reducing fertility. Probably the single most important intervention to reduce maternal and perinatal morbidity and mortality is family planning services that significantly reduce fertility--often reducing disproportionately the number of high-risk pregnancies [Walsh, et al].

The perinatal interventions identified by WHO, UNICEF, World Bank and the Mothercare project focus on high-parity older women and on adolescents and include use of WHO models for predicting risks, World Bank models for training of auxiliary nurse-midwives, UNICEF-supported development of maternity waiting homes and USAID-funded training of families and health workers and development of referral facilities for emergency care.

Considerations for USAID and Bureau expansion include the following:

- Technical Assistance:
  - -- Development of referral systems to intervene during high risk/emergency events; work with communities to establish maternity waiting homes and transport systems
  - -- Technical assistance to countries to develop and distribute norms, protocols and procedures for high-risk events and birth care
  - -- Training of families to recognize high-risk events, attend deliveries and transport women to hospitals in emergencies
  - -- Training of nurse auxiliaries, midwives, traditional birth attendants and general practitioners for emergency care
  - -- Establishment/improvement of facilities for blood bank, plasma expanders, and vacuum extractors for emergency treatment. (However, blood banks and plasma expanders are costly and are unlikely to be feasible in many locations.)

- Operations research:
  - -- Expansion of models for emergency care and family and health worker training
  - -- Diffusion of operations research results
  - -- Diffusion of protocols, procedures, operations and basic research findings to government and private/community groups to motivate widespread action and to improve the technical capabilities to address maternal mortality.

Tuberculosis

At the first meeting of the WHO Coordination, Advisory and Review Group in May 1991, estimates were presented that globally tuberculosis's annual toll is 2.9 million deaths and 8 million new cases. Table 18 presents disaggregated estimates by world region from survey data.

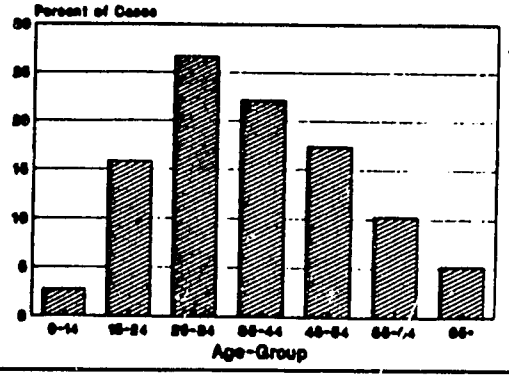
Table 18. Estimated Deaths From all Forms of Tuberculosis in Developing Countries, 1990.

Area	Estimated Number of Cases			Deaths
	Low	Midpoint	High	per 100,000
Sub-Saharan Africa	266,000	528,000	790,000	104
North Africa & Western Asia	33,000	99,000	166,000	37
Asia	771,000	1,709,000	2,646,000	58
South America	41,000	125,000	211,000	42
Central America & Caribbean	28,000	88,000	148,000	57
Total	1,139,000	2,549,000	3,961,000	61

Source: Murray, et al., 1990.

The estimated 2.6 million annual deaths from tuberculosis in developing countries (midpoint estimated, Table 18) represent about 7 percent of all deaths in those countries. Murray et al. calculate that about 25 percent of all preventable adult deaths in Asia are from TB. This is particularly onerous as the age distribution of TB affects disproportionately the productive adult age group of 15 to 54. About 75 percent of all TB cases occur in the 15 to 54 age group. Figure 19 shows the age distribution of smear-positive TB in Tanzania. Fatality rates for TB are in the 50 to 60 percent range in the absence of appropriate chemotherapy. Data from a 5-year study in Bangalore, India, showed that about 50 percent of bacteriologically-confirmed cases died within 5 years. Other data indicate even higher mortality rates for smear-positive cases.

Figure 19. The Age Distribution of Smear-Positive Tuberculosis Detected in Tanzania, 1985-1987.



TB prevention and treatment focus on the following three interventions:

1. BCG vaccinations. There is a great deal of debate about BCG effectiveness. Studies in India showed no effectiveness, and other estimates rate effectiveness at 0 to 80 percent in recent case-controlled trials [Murray et al., 1990]. Some researchers have concluded that BCG given at birth is effective after age 15, the age at which infection rates begin to rise significantly. Murray et al. state, however, that no evidence of this exists, especially in developing countries, and that consideration could be given to "indiscriminate revaccination" at older ages--for example, pregnant women at prenatal clinics or other contacts with health workers. Given that researchers anticipate that HIV infections will result in a considerable increase of TB in cases of symptomatic HIV infection, WHO's 1987 statement recommends withholding BCG, but no conclusive evidence regarding withholding BCG in asymptomatic HIV individuals is currently available. WHO recommends vaccination of infants and small children of women known or suspected of HIV infection.

2. Chemoprophylaxis. Case detection includes active versus passive detection strategies and the choice of diagnostic technologies. Treatment can focus on the treatment of all "converters". Research is needed to determine the effectiveness of chemoprophylaxis in subjects with both HIV and TB infections and without clinical or bacteriological symptoms of TB.

3. Case Finding and Treatment. This intervention is likely to be more effective than chemoprophylaxis of converters. A possible exception is perhaps with children under 5 exposed to an adult with active smear-positive TB. It is estimated that 10 to 14 cases result from 1 untreated case per year. Active case finding is not feasible except in health units.

The most effective factor for improvement in case finding is a high cure rate of diagnosed cases and a good relationship between the treatment staff and the clients. Public education can improve awareness of symptoms and encourage patients to seek care. WHO recommends that treatment be given free of charge. Different treatment regimes are being studied to determine the effectiveness of a longer (12-month) regime with less expensive drugs compared to an 8-month regime with a more expensive drug regimen. There is a clear consensus that the duration of treatment adversely affects compliance. This would be especially true in LDCs where access to health centers is difficult. The cost-effectiveness of treatment favors short-term therapy and demonstrates that tuberculosis chemotherapy is an "excellent investment" relative to virtually any health intervention, as shown in Table 19.

Table 19. Budgeted Costs for Tuberculosis Chemotherapy, Tanzania, 1986.

Cost category	STD	Short	Retreatment
Diagnosis			
Slides/reagents	$2.10	$2.10	
Sputum container	$1.95	$1.95	
Bacteriological			
Monitoring	$0.81	$0.81	
Culture	$1.50	$1.50	$1.50
Sensitivity			$3.90
Drugs	$17.00	$40.00	$65.00
Administration	$2.85	$2.85	$2.85
Labor costs and hospitalization	$67.65	$90.20	$169.12
Transport	$20.35	$20.35	$20.35
Training	$2.37	$2.37	$2.37
Supervision	$2.90	$2.90	$2.90
Capital 20 % depreciation	$3.22	$3.22	$3.22
Total cost per case	$122.70	$168.25	$271.21

Notes: 1) Labour costs and hospitalization include the salaries and wages of all staff working on tuberculosis control and the cost of hospitalizing all tuberculosis patients. As more disaggregated information was not available, the costs in this category have been distributed according to the hospitalization rate for each type of treatment (60 % standard, 80 % short-course, 100 % retreatment). This underestimates the cost per case treated for standard chemotherapy and overestimates the cost per case treated for short-course and retreatment because all staff costs are included in this category.
2) Drug costs are based on 1986 prices and 1986 exchange rates. Since that date the price has declined but the value of the US dollar has also declined.
3) Transport costs include 25 % of the entire purchase cost of all vehicles and operating expenses. The assumption that vehicles will last only 4 years on average may be overly conservative.

Implications for Donor Support

Donor support is required for prevention through BCG and treatment through early and intensive chemoprophylaxis. WHO has targeted treatment levels to be achieved at 85 percent and case findings to increase to 70 percent and 60 to 85 percent for low and middle income countries, respectively. It is estimated that the total global increased cost of treating all new cases of TB with a well-managed chemotherapy program would be less than $700 million per year.

Funding for research on the epidemiology of the disease is needed to provide government decision-makers with data on incidence and mortality rates as well as distribution by age, sex and relevant social and economic characteristics. Increased incidence of HIV and its effects on TB mortality also need additional research. Data on the costs and effectiveness of varying treatment regimes would also assist decision-makers. Research on pharmaceutical and treatment regimes to increase effectiveness and decrease costs is identified as a crucial need. Research on new vaccine development may be needed but would be ethically and technically difficult.

Operations research and technical assistance to develop the most appropriate supervision and compliance regimes and diagnostic strategies are needed. This may be particularly needed in Asia where health worker access to women is constrained by cultural factors. Technical assistance is needed in training health professionals and community workers and in developing, testing and distributing of educational materials and mass media messages for health education and promotion of behavior changes.

Malaria

Although in both relative and absolute terms, Africa is the region most seriously affected by malaria, malaria is an important health problem in many parts of Asia. An estimated 96 percent of the population in South Asia is exposed to malaria risk [Griffin, 1990]. During the early 1970s, the Asia region--and India in particular--experienced a malaria resurgence. Then, from 1975 to the mid-1980s the annual number of malaria cases reported in India declined from over 6 million to less than 2 million, with

some gradual increase in the number of reported cases over the 1987-89 period (the most recently available data are for 1989) [WHO, 1991].

According to Najera, et al. [1991], the following Asian countries experienced marked increases in malaria prevalence over the 3 decades, 1960-1988: Afghanistan, Bangladesh, Bhutan, Laos, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vanuatu and Vietnam (although some of these countries reported declines near the end of this period). Najera et al attribute much of the increase to efforts to extend exploitation of natural resources through deforestation and/or manual mining of precious metals and gems. This is because people were placed at greater risk and the number of breeding sites increased. In some countries, important contributing factors were civil war and other conflicts and the mass movement of refugees.

In 1989, 5.2 million clinical cases were reported to WHO from all regions of the world combined, excluding Africa. WHO estimates that this is about one-quarter of all cases outside of Africa. Of the 5.2 million reported cases in 1989 (excluding Africa), 39 percent were in India and about one-quarter were from Thailand, Sri Lanka, Afghanistan, Vietnam, China and Myanmar (in descending order).

Reported malaria cases in India increased from 1.66 million in 1987 to 2.02 million in 1989. Reported cases in Pakistan doubled from 1988 to 1989 to over 100,000; they increased in Bangladesh from 33,000 in 1988 to 51,000 in 1989. Reported cases in Nepal declined from 42,300 in 1985 to 22,300 in 1989. They declined in Sri Lanka from 677,000 in 1987 to 259,000 in 1989. In Afghanistan reported cases declined from 428,000 in 1987 to 257,000 in 1989, but reporting is gravely incomplete due to the war situation. WHO assumes that in Afghanistan the malaria situation is actually worsening in rural areas rather than improving.

In East and Southeast Asia, Indonesia showed a reduction from 32,000 cases reported in 1988 to 19,700 in 1989 (but reports include only Java and Bali and not the highly endemic islands such as Timor and Irian Jaya). In Philippines, reported cases decreased from 155,000 in 1988 to 116,000 in 1989. Overall, the number of reported cases in Thailand has been decreasing; however, incidence has increased markedly in the provinces bordering Cambodia and Myanmar. Mongolia and most of Oceania continue to be free from indigenous malaria.

Health consequences are generally more severe for children than for adults. In some infected areas, children up to 5 years of age have high mortality rates caused by malaria. Pregnant women are also at greater risk of malaria infection with consequent risk of adverse pregnancy outcomes (including low birth weights); they are also at risk of malaria-induced death [Najera et al., 1991].

Given the increasing parasite resistance to antimalarial drugs, treatment of malaria in the future is likely to be more difficult and less effective thereby increasing both morbidity and mortality. Although new drugs and new drug combinations are being investigated, alternative first or second line drugs or a vaccine are, even under optimistic scenarios, several years away [Najera, et al., 1991].

Policy and Program Priorities

- In areas where organized malaria control activities have been carried out for many years (this applies to much of malaria-endemic Asia), control activities should be reassessed. Control programs should be redesigned based on epidemiological analysis; in many

countries, organizational and administrative changes should also be made. USAID can reorient priorities based on Agency-wide assessments. Vector control (spraying/environmental engineering) may be decreased in some countries in favor of focussed treatment in health services and in communities.

- Operations research is needed in the following areas:

  -- To field test new tools for malaria prevention/control, such as impregnated bednet, and subsequently to utilize research results for program management.

  -- To identify ways to improve the organization and management of control operations.

  -- To determine the cost-effectiveness of drugs for use in control and treatment, by assessing the status of resistance to various drug choices in relevant geographic regions. Drug treatment-resistant malaria is a growing problem, especially in parts of Thailand, Cambodia and Laos, and to a lesser extent in parts of India, Indonesia, Nepal, Pakistan the Philippines and Sri Lanka. Some of the newest drugs are fast becoming ineffective; recent data from Thailand show that up to half the cases in some areas no longer respond therapeutically to mefloquine.

  -- Insecticide resistance and safety: USAID should encourage the use of scientifically applied tests on the dangers and effectiveness of specific insecticides before countries make decisions to purchase large quantities. Resistance has often been associated with the excessive and frequently indiscriminate use of pesticides for crop protection. Moreover, improper use of insecticides can also endanger human health. Earlier generations of pesticides (e.g., DDT, Malathion) were, generally speaking, "forgiving" to humans if misused. That is, the health consequences of mishandling or misuse were generally not serious. However, many of the newer pesticides are expensive and are also very dangerous to humans if improperly handled. USAID could support training of trainers on the proper methods to use with the newer insecticides as well as development of management information systems for use in procurement and logistics related to distribution, use and surveillance.

- Environmental Concerns: Agricultural and irrigation development projects often result in the spread of malaria. The USAID project planning process should explicitly assess the environmental health effects of proposed projects including likely increases in malaria. USAID should work closely with WHO's PEEM (Panel of Experts on Environmental Management for Vector Control) to support actions to prevent increased exposures to malaria. USAID should also support collaboration with relevant international development agencies such as the International Rice Research Institute (IRRI) in the Philippines. If implications for malaria transmission are specifically assessed at the project design stage, it may be possible to undertake cost-effective preemptive actions to minimize the adverse malaria consequences. If this is not specifically addressed "up front", it may later be very costly and/or environmentally damaging to ameliorate the increased malaria risks.

- Increased exposure to malaria often becomes a tremendous problem consequent to migration and dislocations such as among the large Afghani refugee population in Pakistan and the refugees on the Thailand-Cambodia border. USAID service delivery programs for these populations should include focussed malaria detection and prompt treatment. Resettlement activities should include efforts to relocate populations in malaria free zones and environmental management to prevent major transmission and the provision of care management services when it occurs.

- Finally, USAID should support the training of a cadre of epidemiologically skillful malariologists and program managers to promote more cost-effective control and treatment programs.

Tobacco

Smoking may emerge as the most significant long-term epidemic of the next decade and beyond. It is calculated that during the 1990s about 50 million Chinese alone will die of cancers and other diseases attributed to smoking [Ravenholt, 1990]. Approximately 5 trillion cigarettes are produced globally each year, with 44 percent of the consumption of this product in Asia. Consumption is increasing 2.7 percent globally per year, and even more rapidly in developing countries. Appendix Table 36 shows Asia and Pacific region adult per capita cigarette consumption, with the mean increase in cigarette consumption from 1970 to 1985 from 923 to 1150 cigarettes, suggesting that per capita consumption in Asia may have increased 25 percent over this 15-year period.

Males smoke considerably more than females, and almost half of the world's men smoke, compared to 10 percent of the world's women. Prevalence of smoking among males in South and Southeast Asia is particularly high, with Bangladesh at 70 percent, Indonesia at 61 percent, and India at 52 percent; the rates of female smoking for these countries are 36 percent, 20 percent, and 3 percent, respectively. Developing countries as a whole have an estimated 54 percent male smoking rate and an 8 percent rate for females [Stanley, 1989]. This is expected to change, however, as cigarette advertising, especially in developing countries, focuses on recruiting large numbers of new female smokers.

National and international committees have concluded that tobacco use is a major cause of disability and premature death. Oral cancer is a significant problem in South Asia, and 90 percent of oral cancers in South Asia have been associated with tobacco chewing and smoking habits. In general, the most crucial factor in the incidence of tobacco-related cancer is the duration of smoking rather than level of daily consumption. This has programmatic implications for donors and national governments, indicating the need to mount early prevention efforts. This is even more important given the documented evidence of the addicting qualities of nicotine and comparatively higher level of effort needed to achieve smoking cessation.

In addition to lung and oral cancers, other lung conditions are also recognized as smoking related. Centers for Disease Control research in the US population shows that approximately 75 percent of deaths from chronic bronchitis and emphysema are related to smoking. Although recognizing the additional difficulty in mounting programs for smoking cessation compared to smoking prevention, research has found that there are benefits from smoking cessation at any stage of bronchitis [Stanley, 1989]. Passive

smoking increases the risk of lung cancer by 25 to 35 percent. Children of parents who smoke have an increased incidence of bronchitis and pneumonia.

In developing countries, negative tradeoffs at the household level have been identified by the World Bank. Their calculations for Bangladesh report that the smoking of only five cigarettes per day could result in a monthly dietary deficiency of approximately 8000 calories. In less-developed countries, this calorie loss would seriously endanger the survival of a large proportion of poor households [Stanley, 1989]. At the macro level, environmental consequences of smoking include deforestation through the aggressive use of large quantities of firewood for curing the tobacco; economic waste is also incurred through the creation of large deficit balances of payments for tobacco purchases.

Opportunities exist for international agencies and governments to implement anti-tobacco activities to prevent cancer in Asia. This could prevent a large number of deaths and avoid the associated high costs of treatment. There are a number of private associations and several public health ministries in Asia that have developed policies on, and activities for, the regulation of advertising and the regulation of smoking in public places and have mounted anti-smoking campaigns and developed health education messages. The majority of efforts are aimed at aggressively preventing the spread of tobacco use, particularly in the large and rapidly growing adolescent and adult population. Special efforts should be mounted to prevent the spread of tobacco use among women.

The faster rates of population growth and comparatively larger populations make Asia the next popular target for foreign tobacco manufacturers. With notably few exceptions (i.e., India and China), marketing restrictions, public health regulations and an antipathetic public and political climate toward tobacco barely exist in most LDCs.

WHO, the APHA and a number of US and international agencies are actively assisting developing countries and sharing the lessons learned from relatively successful anti-smoking campaigns in Europe and the US. Issues of proposed trade sanctions against Asian countries limiting US tobacco imports have been discussed at the international level. Low-cost national anti-smoking campaigns are calculated to cost 0.01 percent of GNP and could reduce the number of new smokers by 50 percent [Stanley, 1989].

WHO leadership in preventing tobacco abuse has received increased funding in the past 2 years, and has focused on providing a forum for countries to collectively debate, and collectively adopt, resolutions for national action and legislation. Regional anti-tobacco charters and policies adopted in May 1990 to take action to encourage bans on tobacco advertising are shared by anti-tobacco advocates and Ministries in Asia and worldwide. Their Plan for Tobacco and Health (1988-1995) and direct support to countries - with consultants in China, Mongolia and other countries on policy development and in India on research - have already been implemented. They play a recognized coordinating role for information, promotion of legislation, research and the development of alternative crops, education campaigns and direct technical assistance.

Implications for Donors

Increased funding should be provided to the WHO SEA office for the expansion of their coordination, research and legislation promotion activities. A major role could be encouraged for the private sector to promote anti-smoking policies and practices in work places and among employees. Incentive programs related to insurance benefits, health education programs, workplace smoking

restrictions, etc., could be offered. The linking of developing country private sector companies with strong anti-smoking program track records and Asian countries for exchange of information could be supported. Resources are needed to strengthen communication among diverse associations and agents involved in anti-smoking activities in Asia. Increased support to demographic research may be needed to support policy development and to increase the recognition of the need for government anti-smoking legislation and private sector regulations.

Support is needed for mass media message design and public education programs. Operations research on the effectiveness of anti-smoking campaigns and health education programs currently being developed and used in Asia will require additional funding and technical assistance. Technical assistance and training of health personnel for health education and role modeling will be needed. Materials and curriculum that have been developed for physicians in the US who act as change agents could be reviewed for adaptation to use in Asia. Donor policies that support the production of tobacco should be reviewed and considered for revision. This is an opportunity for donors to become involved in policy development. Alternative cash crop assistance could be introduced gradually.

Hepatitis B Prevention

In Southern Asia where Hepatitis B virus infection is highly endemic, 70 to 95 percent of the adult population is reported to have the antibody or to have been infected, usually during infancy or early childhood. Most infants exposed to the virus become infected while less than 10 percent of adults exposed become infected. It is significant that a Hepatitis B carrier is 200 times more likely to develop primary liver cancer. This has implications for curative care, especially in developing countries.

There is no standard treatment. Prevention strategies include immunizations, improvements in water and sanitation at the broad level and improved sterilization of medical and dental equipment at the individual level. Vaccination programs should not automatically supersede funding to improve water and sanitation conditions. Research suggests that three out of 100 persons infected with Hepatitis B will die in adulthood, with loss of economic productivity and considerable economic and health consequences for their families.

The International Task Force on Hepatitis B has recommended that Hepatitis B vaccine be added to the childhood vaccination schedule with a series of three doses. The schedule recommended is at 0-7 days, 4-12 weeks later and the third dose at 2-12 weeks after the second dose. In the recent past the cost of the three-dose regime dropping significantly from approximately $100 to $3.

The technical and political commitment to a vaccine that can prevent deaths from a virus some 40-50 years later will require some additional policy and resource allocation decisions. The Ministry of Health of Mongolia will begin vaccination of infants as part of a WHO-sponsored programs; 21 countries have a policy or plan to included Hepatitis B in their childhood immunization programs, 25 more have initiated pilot programs. The extent to which donor support will be mobilized for extended funding for program implementation and research and the issue of national capability for sustainability of Hepatitis B vaccine after donor support declines could not be assessed by the authors. It is possible that the REACH project and other researchers have addressed the issues of cost and the sustainability of Hepatitis B vaccination programs.

Pharmaceuticals

In Asia, billions of dollars are spent on pharmaceuticals by government and private sectors - as much as 30 percent of the Ministry of Health (MOH) budgets in some countries. Data show that private sector expenditures account for two to eight times as much as public expenditures. Despite these large sums, it is reported that in a number of Asian countries less than 30 percent of the population has regular access to essential drugs. Inadequate supply and underuse of vaccines and pharmaceuticals are responsible for far more deaths than over-prescription.

Currently, MOH use of pharmaceuticals does not meet their stated public health priorities. This is seen in study results that indicate that most drugs are used to treat adult discomfort, and only 25 percent of pharmaceutical value (including vaccines) is used for child survival conditions. In addition to the absolute low levels and percentages of funding for vaccines and appropriate child survival and MCH pharmaceuticals, WHO studies report that inefficiencies in procurement and prescribing allow only 30 to 50 percent efficiency for the value of each dollar spent. This represents a significant area for management improvement.

Recognizing the need to carry out further operations research, rationalize drug allocation policy decisions and improve therapeutic and managerial efficiencies in procurement, distribution and prescribing behavior, WHO, USAID, FDA, other donors, ministries of health, the International Network for the Rational Use of Drugs, and other groups have established activities in operations research, drug systems management and cost recovery, policy dialogue, and training.

USAID-funded technical assistance has supported development of pharmaceutical management systems in Indonesia, Nepal and other countries. Technical assistance has helped MOHs systematically analyze drug expenditures, improve procurement and distribution systems, develop treatment regimes, and develop concise indicators for quality pharmaceutical management.

WHO software models for pharmaceutical registration have been developed to reduce wastage in procurement, storage and distribution. A USAID grant to WHO's Division of Drug Management and Policies helps support the evaluation and revision of guidelines for small regulatory control bodies and revision of the WHO certification evaluation scheme. The US Pharmacopeia has established an extensive electronic database that can be used and adapted for pharmaceutical registration and quality assurance. Additional funding to INHRUD would support the operations research and criteria development for rational drug use, including the development of an indicators manual.

Programmatic Implications

Asian governments, particularly Nepal and Indonesia, and the donor community have developed several approaches to rationalize drug use with activities in operations research, policy analysis and dialogue, information exchange, technical assistance in drug procurement/management systems for improved efficiencies, criteria development, and training and training materials development. Further assistance to Asian countries for improved policy development to support resource allocation and regulatory capability for pharmaceutical procurement, distribution, use and manufacturing is warranted.

For donor assistance to countries, the following were identified as potential areas for support:

- Policy development assistance in the areas of quality assurance, enforcement of regulations on production, registration and importation, treatment regimes, etc.

- Policy analysis assistance to assess the cost effectiveness of continued pharmaceutical production by para-statals.

- Operations research on the rational use, prescribing behavior and effectiveness of alternative treatment protocols; effectiveness of logistics and MIS systems; use of the private sector for distribution (especially to rural areas); and cost recovery for pharmaceutical outlets. Linking operations research with wide distribution of research findings is needed.

- Training of national staff is needed for increased inspectorate and regulatory enforcement of already established country regulations regarding manufacturing quality and purity.

- Management systems strengthening is needed at the national level. This would include hardware for improved registration, procurement management, inventory management, and training of staff.

With the vast majority of pharmaceuticals in the private sector, training of clinicians through professional associations may be expanded. Long-range efforts to study and change (perhaps through media messages) public expectations of pharmaceutical use could be researched. Although the percentage of USAID funding for pharmaceuticals is low, the potential for increases, for example, for the purchase of Hepatitis B vaccine, could indicate the need for some management strengthening of internal procurement procedures and MIS tracking.

Environmental Health Issues

Environmental health quality in Asia is poor because of lack of access to safe water and adequate sanitation, increased industrialization and urbanization, increased motor vehicle traffic, and pesticide use. This has lead to health risks from diarrheal diseases, poisoning, respiratory conditions, injuries, hearing loss, and mental health problems.

Table 20 shows WHO estimates of the number of people exposed to selected environmental hazards: 1.25 billion are exposed to particulate matter in daily peaks above WHO maximum safe levels, 1.7 billion are exposed to disease due to the lack of basic sanitation, and 1.1 billion lack safe water. Asia's rapid urbanization and future megacities of more than 15 million people make the populations of this region, particularly in South Asia, especially vulnerable to these and other environmental hazards.

Data presented at the USAID S&T Environmental Health Workshop organized by RTI suggest that probably in developing countries the principal water- related diseases cause 5.5 million deaths per year [Wyatt and Brantly, 1991]. The ANE Environmental Strategy paper (June 1990), the series of some 20 background papers on Environmental and Natural Resources in ANE, and the report on

Environmental Aspects of Rapid Urbanization in Asia all contain extensive data on health and the broader developmental impacts of environmental issues.

Table 20. Approximate Number of People Exposed to Selected Environmental Hazards.

Exposure Type	Million Exposed
Sulphur Dioxide in outdoor air, daily peaks above WHO maximum	975
Suspended particulate matter in outside air, daily peaks above WHO maximum	1250
Extreme indoor air pollution from biomass stoves	400
Lack of safe drinking water	1100
Lack of basic sanitation	1700

Source: Kjellstrom, 1991

The changing population structure and changes in risk factors will affect an individual's risk of developing the diseases associated with rapid urbanization and industrialization. A crucial aspect of these "emerging risks" (especially for donors) is the potential of preventive actions. Table 21 outlines options for exposure controls for specific environmental risks; for example, factory design and ventilation for control of industry air pollution situations, and the use of less toxic chemicals and protective gear for pesticide exposure. Aggressive multiple control measures would result in significant declines in mortality from hazards; examples would be the stricter enforcement of air pollution standards, redesign of chimneys and auto exhaust systems to address respiratory and cardiovascular risks, and seat belt use, lower speed limits and auto inspections to lower auto injury and mortality.

WHO data show that, although in developing countries increased use of pesticides has been accompanied by an increase in pesticide poisoning, this is not the case in developed countries because of more efficient human exposure controls. Control options listed in Appendix Table 37 address both controls that reduce pesticide, air pollution and other exposures/risks while existing technologies are maintained and those controls that call for health-based considerations in the technology as it is being constructed. This will be advantageous for developing countries that are forced to balance health, economic and industrialization considerations.

Adequate Shelter and Essential Urban Services

The Problem

There are two basic housing- or shelter-related needs. The first is having adequate or appropriate shelter to be protected, at a minimum, from the elements. The second is to have access to basic services.

In many developing country environments--especially in Asia, a major obstacle to obtaining low cost housing is availability of land. Land costs are rising, and it is often difficult, especially for the poor, to obtain secure tenure and home ownership. In many areas governments have already invested heavily in providing basic services through the public sector. With increasing pressures on limited public sector funds, many governments are seeking ways to hold down additional investments in infrastructure and services, through full or partial cost recovery. This is typically occurring in the context of continued rapid urban population growth--much of it in poor neighborhoods. Often it is expensive to extend services into these neighborhoods, yet their residents are least able to pay for the services.

Table 21. Options for USAID's Environmental Health Strategy.

	Give Increased Effort in Traditional Areas	Develop a New Focus on Selected Emerging Areas	Offer a Broad-Based Menu
Sustained Effort In:	Water Supply and Sanitation Vector-Borne Disease Control	Water Supply and Sanitation Vector-Borne Disease Control	Water Supply and Sanitation Vector-Borne Disease Control
Increased Effort In:	Solid Waste Wastewater Management Housing & Shelter	Solid Waste Wastewater Management Housing & Shelter	Solid Waste Wastewater Management Housing & Shelter
Add New Effort In:		Air Pollution Toxic, Hazardous & Radiological Wastes	Air Pollution Toxic, Hazardous & Radiological Wastes Occupational Health Injury Control

Source: Wyatt and Brantly, 1991

Assistance Needs

USAID should continue to take a system-wide approach to addressing problems of shelter and public services in developing countries. USAID should assist governments to design efficient and equitable cost-recovery policies and programs. Effective cost-recovery programs will have the added benefit of reducing the incentive to migrate to urban locations, thereby, over the long-run, ameliorating somewhat the adverse financial, environmental and health consequences of rapid urban growth. However, these cost-recovery policies and programs must be directed to the entire urban population, not just to those neighborhoods that are currently unserved or underserved. If they are not, they will fail both to generate significant additional financial resources and to deliver basic services to the urban poor.

USAID should assist governments to increase social sector expenditures for human resource development of the urban poor by providing basic services in education, health, nutrition, and family planning. Both governments and international donors should view these as investments that can be expected to yield high returns in economic and human development.

There is an emerging environmental crisis in many towns and cities. This poses serious health risks from pathogens, indoor air pollution, substandard housing and hazards associated with industrialization. Gastroenteric and respiratory diseases and chronic bronchitis will become increasingly widespread. USAID should assist LDC municipal and national governments to identify and implement policies and programs to ameliorate these increasing health hazards.

The World Bank's World Development Report 1990 concludes that sustainable progress in reducing poverty requires a strategy with two equally important components. The first is to promote the productive use of the poor's most abundant asset: labor. The second is to provide basic social services to the poor, especially basic education, health care, nutrition and family planning services. Providing basic services to the urban poor must be a top priority for governments and donors.

Emergency Health Care Development

A very brief review of Emergency Health Care (EHC) issues and future needs was made. The upcoming United Nation's Decade for International Disaster Reduction is planned to highlight the need for countries to address emergency health care systems. The first International Conference on Emergency Health Care brought together some 400 public and private health planners to discuss epidemiologic, technical, financial and administrative aspects. The conference was sponsored by the USPHS, WHO/PAHO, UNICEF, US DHHS, the U.S. Department of Transportation, the USAID/OFDA, Medical Care Development and Partners of the Americas.

The Conference adopted a Call to Action and defined Emergency Health Care as being part of the primary health care system that responds to emergencies and the local development of everyday EHC capability. Little is known about the epidemiology of emergencies, EHC systems currently being developed, service problems, and environmental barriers. EHC needs are more similar by size of city and level of urbanization even in different Asian countries than are cities and rural areas in a given country.

Experts at the conference stated that private entrepreneurs are actively approaching countries to assist them in designing city-specific models. The assistance is often based on models from developed countries. Nearly 100 different EHC models currently exist, and entrepreneurs are diligently offering their models in developing countries.

The MOHs have not yet established policies to regulate the development of EHC systems, such as communications and referrals, regulations for personnel training and certification, protocols for treatment and referral, and systems to link EHC to primary care and hospital units. This lack of regulatory policy has generally resulted in an increasing number and variety of EHC systems in a number of major cities, with concomitant poor potential for future coordination at national levels, and little ability to oversee and regulate the quality of emergency medical services.

The financial implications for the development and maintenance of EHC systems are significant, especially if high levels of technological equipment and training of personnel are anticipated. The issue of whether the responsibility for funding EHC and broader emergency health systems will reside with the MOH/public sector or whether private EHC systems will be the rule with the MOH assuming a policy and regulatory monitoring role has not yet been decided in many countries.

There is currently no known clearinghouse of information on EHC at the international level for the exchange of information on EHC systems that are developing very rapidly. The World Bank and other donors have not yet established a policy on EHC development. The authors were not able to establish the level of involvement of the WHO SEA office in EHC development.

Implications for Donor Support

- Donors could follow the first International EHC Conference with technical assistance to EHC public and private sector planners. The following issues could be explored: (1) issues of policy and regulation of EHC systems and personnel training, (2) financial structures and the role of private sector in EHC, (3) the integration of EHC with emergency preparedness systems, and (4) long-term financial and sustainability implications of investment in EHC systems.

- Donor support to an international EHC clearinghouse function, perhaps within the WHO Asia Office of Emergency Preparedness, may be considered, especially during the early stages of EHC development in Asia.

Summary of Suggested Generic Programmatic Issues

The Setting During the Next Decade and Beyond

The demands on health care systems and associated costs will inevitably rise significantly throughout this region during the next decade and beyond. One important reason is that populations will continue to grow rapidly. In addition, profound demographic, epidemiological, economic and social changes will occur that will collectively result in increased and more costly demands on health care systems. The populations are "aging", they are rapidly urbanizing, disease patterns are in transition, and incomes are rising for very large numbers of Asians.

At the same time, the Asia region will continue to be home to the world's largest concentrations of people living in absolute poverty. Infant mortality and fertility are still high throughout most of this region--and quite high in some large areas--and they will remain unacceptably high throughout this decade despite considerable improvements in health conditions and substantial reductions in infant mortality and fertility in recent years and even under quite optimistic assumptions about the pace with which mortality and fertility will continue to fall over this next decade.

As Jamison and Mosley note, most of these countries will not have the opportunity ("luxury") of addressing pre- and post-epidemiological transition problems sequentially as was (in general) the experience of western countries. They will have to address both types of health problems simultaneously. For most of these countries, the infectious and parasitic diseases of childhood must remain a priority at the same time the chronic diseases among adults--and especially among older adults--are emerging as a serious problem [Jamison and Mosley, 1991; 1991 forthcoming].

This will place unprecidented burdens and pressures on health care systems and decision-makers in Asia with increasing competition for scarce health care resources. International assistance agencies, in turn, must make ever better informed and wiser choices in the provision of assistance.

USAID Priorities for the Region

Child survival and family planning assistance to reduce infant, child and maternal mortality and fertility to low levels throughout this region should continue to be USAID's top priority in this region. This remains a great unfinished task despite some remarkable accomplishments in recent years. USAID has played a key leadership role through its Child Survival Program and other health assistance activities. It is critically important that USAID continue to provide leadership to this effort. USAID's priority goals for this region during the 1990s should be as follows:

- Reaffirm the pre-eminence of child survival and fertility reduction programs and increase assistance to these efforts.
- Increase support to interventions to reduce maternal mortality.
- In addition, USAID should significantly increase support to HIV/AIDS prevention and

control for the demographically large high-risk sub-populations in the region.

Health financing should continue to be a sector-wide emphasis in USAID's assistance. Health services, which have long coped with inadequate financial and human resources, will experience increasing demands and competition among programs for scarce resources. USAID should increase its assistance to development of more efficient and effective financing of health services including assistance to the following:

- Support and promote policy reform inititives that increase incentives for increased private sector provision of health care services and improve cost-effectiveness and equity in delivery of public sector services.
- Mobilize private sector service provision and financing.
- Increase the efficiency of public and private sector financing (as measured by impacts on infant/child/maternal mortality and fertility).
- Increase total financial resources in the sector.

USAID should be alert to other health needs of growing importance in the region, and should seek opportunities to provide technical assistance to address emerging priorities.

Table 22 presents the recommendations for international health assistance that have emerged from the recent global review sponsored by the World Bank under the leadership of Jamison and Mosley [1991 forthcoming]. These recommendations, summarized below, are consistent with those given above.

- Service delivery: Continued priority on child survival and family planning--with selected additional highly cost-effective interventions against TB, worms, and STDs, plus cancer pain control--and sharply reduced support for hospital facilities.
- Policy improvement: Reduce use of low cost-effectiveness services; implement policies to limit and control use of tobacco and alcohol and reduce occupational and transport injuries.
- Research: Substantially increase research resources, especially to finance/assist (a) country- and locale-specific epidemiological and operational analyses ("essential national health research"), (b) cost-effectiveness analyses of numerous interventions in different environments, and (c) epidemiological/operations research on cardiovascular diseases, STDs, chronic obstructive pulmonary disease (COPD), injury and mental disorders.

Jamison and Mosley concluded that in general interventions affecting children tend to be substantially more cost-effective than interventions affecting adults. In fact, many potential interventions for adults are so costly that the objective of public policy should be to discourage their use. However, some interventions for adults are highly cost-effective and should be provided. These include blood

Table 22. Directions for International Aid, as Suggested by Jamison and Mosley.

Objective	Modality of Assistance: Program Implementation	Modality of Assistance: Capacity Strengthening
1. Service Delivery	(i) Continue strong emphasis on most immunization and family planning programs. (ii) Enhance emphasis on: • Measles immunization • Case management of ARI • Control of Vitamin A deficiency • Tuberculosis chemotherapy • Anthelminitic chemoprophylaxis • STD Control • Cancer pain control (iii) Increase selectivity in delivery of ORT and BCG in low risk environments. (iv) Sharply reduce support for hospital facilities per se.	(i) Develop drug logistic capacity to support implementation priorities. (ii) Pre- and in-service training of providers to effectively manage priority procedures. (iii) Development of capacity to deliver inexpensive rehabilitative services. (iv) Reduce emphasis on general institutional development in favor of the strengthening of very specific capacities.
2. Policy Improvement	(i) Implement full range of policies to limit use of tobacco. (ii) Implement policies to track and reduce use of procedures of low cost effectiveness. (iii) Implement policies, including control of alcohol use, to reduce occupational and transport injuries.	(i) Develop instruments for effecting sustainable increases in resource flows to the health sector. (ii) Develop staff and institutional capacity for formulating and implementing policies involving taxation, regulation, and communication, as well as direct investment.
3. Undertaking Research	(i) Substantially increase aid resources for research. (ii) Finance and assist in the conduct of exemplary ENHR programs. (iii) Increase epidemiological/ operations research on: • Cardiovascular disease • STDs • COPD • Injury • Mental disorders (iv) Assess intervention cost-effectiveness in different environments; a particular priority is assessment of cost-effectiveness of immunization program options.	(i) Develop national and international capacity for conduct of essential national health research (ENHR). (ii) Develop and adequately finance international and national capacity for research on cardio-vascular diseases in developing countries; also, perhaps, for other non-communicable diseases and injury. (iii) Maintain and extend capacity for monitoring epidemiological trends and interventions efficacy in well-documented population groups such as the Matlab population in Bangladesh.

Source: Jamison and Mosley, 1991 (forthcoming)

screening for HIV, leprosy rehabilitation and chemotherapy, TB passive case finding and short-course chemotherapy, antismoking campaigns plus tobacco taxes, cataract surgery plus spectacles, management of STDs, and use of condoms to prevent HIV transmission. However, they stress that the careful analyses need to determine the cost-effectiveness of specific interventions are severely constrained by the paucity of data relating to the impact and cost of interventions [Jamison and Mosley, 1991 forthcoming].

Jamison and Mosley and their team also stress the importance of providing significant assistance to specific types of capacity development. For each of the above 3 areas, Table 22 lists their recommendations for technical assistance and support of training to strengthen developing country capacities. According to Jamison and Mosley [1991: 19], development of specific technical capabilities in the following fields within individual developing countries is essential:

1. Demographic analysis
2. Epidemiological surveillance
3. Economic and financial analysis
4. Health technology assessment and control
5. Environmental monitoring and control
6. Occupational safety

Other Important Programmatic Themes, Issues and Needs

The following outlines several issues important for USAID programming of health and family planning assistance to this region during the 1990s.

- Preventative programs for people most in need should have highest priority.
  - -- Reaffirm commitment to preventive programs as the top public health priority.
  - -- Reaffirm commitment to improving the health of the poor (who constitute one-third to one-half of the population of 1.5 billion in this region).
- Give priority to addressing the most basic and pressing public health needs--particularly the following:
  - -- reducing infant and child mortality and morbidity
  - -- reducing maternal mortality and morbidity, and
  - -- providing ready access for all couples to family planning services.
- Policy actions. Give priority to formulating and assisting policies and programs to mobilize resources widely from within both public and private sectors, to maximize total resources committed to improving basic health and reducing birth rates and to deliver services efficiently and cost-effectively in response to growing health care demands in other areas.
- Rapid urbanization, which is occurring in most countries in the region, will require

program decision-makers to respond to urban crowding and changing child care patterns, dietary practices and related factors.

- Program modes, mechanisms and continuing assistance.

  -- Seek new or improved mechanisms for broadening support and improving assistance to priority health and family planning programs. An example is the recent Title 3 legislation which authorizes use of PL480 funds to support child survival assistance activities through indigenous PVOs. This may be an excellent opportunity to significantly increase and broaden child survival programs in Asian countries in which infant and child mortality and morbidity are still quite high.

  -- As some of the countries in this region continue to experience rapid economic growth and rapid mortality and fertility decline (e.g., Thailand), USAID should continue to provide modest levels of assistance in health and family planning to those countries--e.g., to enable public and private sector leaders to participate in international conferences, research networks, USAID-sponsored training programs, etc.

  -- USAID should continue to provide assistance for development of institutional and professional capabilities in those rapidly maturing countries (e.g., Thailand, Indonesia) where capabilities are often "broad but not deep." This assistance would have the additional benefit of enabling key technical and policy leaders in those countries to stay abreast of new developments elsewhere in the region and the world (including the U.S.) and of making the reasons for their own successes more readily accessible to decision-makers in other countries in the region.

- Education and Information. Appropriate public health practices require a knowledgeable and informed population. Key components must include the following:

  -- Public health education through better IE&C. Improvements are needed in use of a variety of media for promoting improved health practices including breastfeeding, contraception for proper child-spacing and fertility control, proper childcare practices including preventive behaviors, knowledge of good nutrition practices, and basic hygiene.

  -- Basic education for all. Perhaps the most essential condition for achieving large and sustained improvements in health and family well-being is basic education. Basic education, especially for females, must receive higher priority from both governments in this region and from donors.

- Macro Issues.

  -- Move toward establishing new donor-recipient relationships to emphasize technical and financial assistance that includes significant scientific and technical exchanges and collaboration.

Policies and programs for the 1990s should be formulated within the context of a longer time frame. Economic, social, technical and professional systems and structures (e.g., medical systems and professional associations) are developing rapidly in many countries in the region. Many of these will have lasting impacts on the types of service systems and infrastructure that will be developed, on the types of technologies adopted and types of services offered, and ultimately on the cost-effectiveness and efficiency of the health care system. Thus, USAID assistance should be informed by and should influence insofar as possible the needs and resources of the 1990s, but it should also be informed by and attempt to influence the essential features of the larger environment that will emerge during the 1990s and the dominant features of the decades that follow.

- -- USAID should encourage national and international policies that (a) promote broad-based economic growth and (b) give priority to investments in human development, especially through provision of basic services including health care, nutrition interventions, family planning and basic education.

- Data. There are three key components, as follows:

  - -- Determine Needs: Identify priority data needed for designing, monitoring and evaluating the impact of health policies and programs.

  - -- Collection: Additional resources should be committed, selectively, to the collection of data on health status indicators and trends, suitable for cross-country comparisons and analysis. For example, among the countries in this region, DHS data are available only for Indonesia, Sri Lanka and Thailand. These are among the most advanced countries in the region. Comparable data are also needed for other large countries in the region.

  - -- Use existing data better: Improve and increase significantly the use of existing data for policy analysis and decision-making.

- Sustainability. Program sustainability should be built into the initial phases of every new service delivery-oriented project.

- Evaluation. Greater emphasis should be given to impact evaluation of program interventions in health and family planning. One important component should be assistance to develop and sustain evaluation capabilities in collaborating countries and institutions.

Throughout their analysis, Jamison and Mosley emphasize that to achieve national and global health objectives it is essential that there be broad and unequivocal commitment to informed policymaking; to broad participation in the goal-setting and policymaking process; to decision-making about resource allocation based on considerations of efficiency and equity; to use of sound, widely-applied, cost-effectiveness analysis; and to full use of all available public policy instruments.

> In the health sector, in a very direct way, unnecessary death, disability and illness occur if resources are committed to one intervention when another has higher health gains per unit of expenditure. The human cost of uneconomic resource allocation is very real and very large. Perhaps even more than in other sectors, the imperative exists for

policymakers in the health sector to undertake constant assessment of intervention cost-effectiveness [Jamison and Mosley, 1991: 21]

Probably the most important advance in policy formulation that could come from a disease-control strategic approach is a willingness to consider a range of options available to governments beyond the direct provision of health services. Particularly important ... is the judicious use of regulation, legislation, taxation and subsidies to promote or discourage enterprises, activities, or behaviors which may have health consequences. Also, the importance of mass communication for social mobilization to promote health cannot be over-emphasized [Jamison and Mosley, 1991: 21]

Countries Potentially Receiving New or Reactivated USAID Assistance

There are a few Asian countries with which USAID might initiate or reactivate assistance during the next few years. These include Cambodia, Laos, Mongolia, Myanmar, and Vietnam. Two have quite small populations: Laos (4 million) and Mongolia (2.2 million). Cambodia's population is 7-8 million. Myanmar's population is a little over 40 million, and Vietnam's is about 65 million.

Of these five countries, Cambodia and Laos are definitely still primarily in the pre-epidemiological transition condition. All demographic and health indicators are poor: infant mortality rates exceed 100 per 1000 live births in both countries. In addition, both countries are still predominantly rural: an estimated 88 percent in Cambodia and 81 percent in Laos. Any USAID assistance should concentrate primarily on child survival and family planning in these 2 countries.

Data for Mongolia, Myanmar and Vietnam indicate that health conditions are better in these 3 countries than in Cambodia and Laos. For all 3 countries, infant mortality rates are estimated to be in the range of 60-70 per thousand live births. Their total fertility rates are estimated to be in the range of about 4 to 5. These countries have begun to experience post-epidemiological transition health problems, yet large proportions of their populations still suffer from the pre-epidemiological transition problems associated with high fertility and high infant, child and maternal mortality and morbidity. UNICEF [1991] data indicate that immunization levels in Myanmar are low relatively to most Asian countries while levels in Vietnam are comparable to other Asian countries (i.e., moderately high). Immunization levels in Mongolia are high, in general (see Appendix Tables 23-26).

Therefore, assistance for child survival and family planning are also needed and appropriate for these 3 countries--and especially for Myanmar and Vietnam--and should receive top priority from USAID. In addition, both Myanmar and Vietnam should be considered "demographically significant" countries. The population of Vietnam is similar in size to that of the Philippines (exceeded only by China, India, Indonesia, Bangladesh and Pakistan) and, though somewhat smaller, the size of Myanmar's population is 2-to-3 times those of Afghanistan, Nepal and Sri Lanka.

However, sizable proportions of the populations of these 3 countries will increasingly suffer from chronic diseases associated with increasingly older age structures, development and urbanization during the 1990s and beyond. Their national decision-makers will likely feel compelled to respond to the associated health care demands. In Mongolia, over half the population already resides in urban areas (see Appendix Table 20). Vietnam and Myanmar are estimated to be 22-25 percent urban [UNICEF, 1991]. Therefore, these 3 countries should also be considered candidates for whatever assistance USAID might provide during the years ahead that is responsive to emerging post-epidemiological transition needs.

APPENDICES

Appendix A. Bibliography

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Appendix B. List of Persons Contacted

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Appendix C. Appendix Tables

Appendix Table 1. Estimated and Projected Total Populations (000), 1975-2005.

Country	1975	1980	1985	1990	1995	2000	2005
Afghanistan	15,378	16,063	14,519	16,557	23,122	26,511	29,589
Bangladesh	76,582	88,219	101,147	115,593	132,219	150,589	170,138
Cambodia	7,098	6,400	7,284	8,246	9,205	10,046	10,784
Fiji	576	634	699	764	824	883	942
India	620,701	688,856	789,183	853,094	946,716	1,041,543	1,134,690
Indonesia	135,666	150,958	167,332	184,283	201,797	218,661	233,389
Laos	3,024	3,205	3,594	4,139	4,788	5,463	6,163
Mongolia	1,447	1,663	1,909	2,190	2,503	2,847	3,215
Nepal	13,000	14,856	16,915	19,143	21,521	24,084	26,575
Pakistan	74,734	85,299	103,233	122,626	141,522	162,409	183,640
Papua New Guinea	2,729	3,086	3,460	3,874	4,341	4,845	5,346
Philippines	42,565	48,317	55,121	62,413	69,935	77,473	84,922
Sri Lanka	13,603	14,819	16,110	17,217	18,338	19,416	20,434
Thailand	41,359	46,718	51,604	55,702	59,605	63,670	67,724
Total	1,048,462	1,169,095	1,312,110	1,465,841	1,636,436	1,808,440	1,977,551

Source: UN, median projection, 1990.

Appendix Table 2. Estimated and Projected Annual Population Growth Rates (percent), 1975-2005.

Country	1975-80	1980-85	1985-90	1990-95	1995-00	2000-05
Afghanistan	0.87%	-2.02%	2.63%	6.68%	2.74%	2.20%
Bangladesh	2.83%	2.74%	2.67%	2.69%	2.60%	2.44%
Cambodia	-2.07%	2.59%	2.48%	2.20%	1.75%	1.42%
Fiji	1.92%	1.95%	1.78%	1.51%	1.38%	1.29%
India	2.08%	2.21%	2.07%	2.08%	1.91%	1.71%
Indonesia	2.14%	2.06%	1.93%	1.82%	1.61%	1.30%
Laos	1.16%	2.29%	2.82%	2.91%	2.64%	2.41%
Mongolia	2.78%	2.76%	2.75%	2.67%	2.58%	2.43%
Nepal	2.67%	2.59%	2.47%	2.34%	2.25%	1.97%
Pakistan	2.64%	3.82%	3.44%	2.87%	2.75%	2.46%
Papua New Guinea	2.46%	2.29%	2.26%	2.28%	2.20%	1.97%
Philippines	2.54%	2.63%	2.48%	2.28%	2.05%	1.84%
Sri Lanka	1.71%	1.67%	1.33%	1.26%	1.14%	1.02%
Thailand	2.44%	1.99%	1.53%	1.35%	1.32%	1.23%
Total	2.18%	2.31%	2.22%	2.20%	2.00%	1.79%

Source: Computed from UN median projection, 1990.

Appendix Table 3. Estimated and Projected Total Populations (000), by Country Groups, 1975-2005.

Country Group	1975	1980	1985	1990	1995	2000	2005
Ph., S.L., Th.	97,527	109,854	122,835	135,332	147,878	160,559	173,080
Indonesia	135,666	150,958	167,332	184,283	201,797	218,661	233,389
India	620,701	688,856	769,183	853,094	946,716	1,041,543	1,134,690
Mainland Asia	179,694	204,439	235,814	273,919	318,384	363,593	409,942
Other	14,874	14,988	16,948	19,213	21,661	24,084	26,450
Total	1,048,462	1,169,095	1,312,110	1,465,841	1,636,436	1,808,440	1,977,551

Source: UN median projection, 1990.

Appendix Table 4. Estimated and Projected Annual Population Growth Rates (percent), by Country Groups, 1975-2005.

Country Group	1975-80	1980-85	1985-90	1990-95	1995-00	2000-05
Ph., S.L., Th.	2.38%	2.23%	1.94%	1.77%	1.65%	1.50%
Indonesia	2.14%	2.06%	1.93%	1.82%	1.61%	1.30%
India	2.08%	2.21%	2.07%	2.08%	1.91%	1.71%
Mainland Asia	2.58%	2.86%	3.00%	3.01%	2.66%	2.40%
Other	0.15%	2.46%	2.51%	2.40%	2.12%	1.87%
Total	2.18%	2.31%	2.22%	2.20%	2.00%	1.79%

Source: Calculated from UN median projection, 1990.

Appendix Table 5. Number of Children Under Age 5, By Country, 1975-2005, in Thousands.

Country	1975	1980	1985	1990	1995	2000	2005
Afghanistan	2761	2650	2393	2963	4176	4690	4464
Bangladesh	14249	16211	17855	19017	21303	23228	24619
Cambodia	1026	359	1259	1360	1377	1271	1180
Fiji	77	88	99	94	90	92	92
India	93693	96705	109505	114364	124814	126880	126240
Indonesia	22231	22374	22400	22791	23571	23186	21402
Laos	500	532	621	737	854	888	921
Mongolia	248	273	305	341	376	410	440
Nepal	2306	2421	2883	3081	3255	3466	3421
Pakistan	12886	14476	20283	23040	24427	24762	25221
Papua New Guinea	440	434	541	589	649	692	693
Philippines	6416	7701	8600	9192	9540	9672	9668
Sri Lanka	1773	1853	1996	1815	1785	1736	1678
Thailand	6937	6344	6400	5664	5530	5805	5940
Total	165543	172471	195140	205048	221747	226778	225979

Source: UN, 1990, median projection.

Appendix Table 6. Estimated and Projected Number of Women of Reproductive Age (Ages 15-44) (000), 1975-2005.

Country	1975	1980	1985	1990	1995	2000	2005
Afghanistan	3,157	3,326	3,051	3,451	5,178	5,572	6,115
Bangladesh	14,777	17,297	20,317	24,382	28,997	33,894	38,511
Cambodia	1,558	1,674	1,914	2,066	1,947	2,188	2,452
Fiji	135	149	165	181	199	219	229
India	128,916	145,063	163,700	184,732	205,906	230,475	253,949
Indonesia	29,563	33,138	37,783	43,451	49,083	53,902	57,735
Laos	651	689	765	866	987	1,139	1,330
Mongolia	307	356	414	481	554	636	725
Nepal	2,678	3,275	3,596	4,014	4,495	5,139	5,860
Pakistan	14,776	17,162	20,940	24,483	27,784	33,766	40,556
Papua New Guinea	547	630	722	839	941	1,077	1,227
Philippines	9,323	10,754	12,433	14,247	16,244	18,286	20,268
Sri Lanka	2,935	3,485	3,858	4,171	4,473	4,800	4,954
Thailand	8,708	10,471	12,206	13,944	15,474	16,615	17,103
Total	218,031	247,469	281,864	321,308	362,262	407,736	451,014

Source: UN median projection, 1990.

Appendix Table 7. Estimated and Projected Annual Growth Rate (percent), Women Ages 15-44, 1975-2005.

Country	1975-80	1980-85	1985-90	1990-95	1995-00	2000-05
Afghanistan	1.04%	-1.73%	2.46%	8.12%	1.47%	1.86%
Bangladesh	3.15%	3.22%	3.65%	3.47%	3.12%	2.55%
Cambodia	1.44%	2.68%	1.53%	-1.19%	2.33%	2.20%
Fiji	1.97%	2.04%	1.85%	1.90%	1.92%	0.89%
India	2.36%	2.42%	2.42%	2.17%	2.25%	1.94%
Indonesia	2.28%	2.62%	2.80%	2.44%	1.87%	1.37%
Laos	1.13%	2.09%	2.48%	2.62%	2.86%	3.10%
Mongolia	2.96%	3.02%	3.00%	2.83%	2.76%	2.62%
Nepal	4.02%	1.87%	2.20%	2.26%	2.68%	2.63%
Pakistan	2.99%	3.98%	3.13%	2.53%	3.90%	3.66%
Papua New Guinea	2.83%	2.73%	3.00%	2.29%	2.70%	2.61%
Philippines	2.86%	2.90%	2.72%	2.62%	2.37%	2.06%
Sri Lanka	3.44%	2.03%	1.56%	1.40%	1.41%	0.63%
Thailand	3.69%	3.07%	2.66%	2.08%	1.46%	0.55%
Total	2.53%	2.60%	2.62%	2.40%	2.37%	2.02%

Source: Calculated from UN median projection, 1990.

Appendix Table 8. Estimated and Projected Number of Women of Reproductive Age (Ages 15-44) (000), by Country Group, 1975-2005.

Country	1975	1980	1985	1990	1995	2000	2005
Ph., S.L., Th.	20,966	24,710	28,497	32,362	36,191	39,729	42,325
Indonesia	29,563	33,138	37,783	43,451	49,083	53,902	57,735
India	128,916	145,063	163,700	184,732	205,906	230,475	253,949
Mainland Asia	35,388	41,060	47,904	56,330	66,454	78,371	91,042
Other	3,198	3,498	3,980	4,433	4,628	5,259	5,963
Total	218,031	247,469	281,864	321,308	362,262	407,736	451,014

Source: UN median projection, 1990.

Appendix Table 9. Estimated and Projected Annual Growth Rate (percent), Women Ages 15-44, by Country Group, 1975-2005.

Country	1975-80	1980-85	1985-90	1990-95	1995-00	2000-05
Ph., S.L., Th.	3.29%	2.85%	2.54%	2.24%	1.87%	1.27%
Indonesia	2.28%	2.62%	2.80%	2.44%	1.87%	1.37%
India	2.36%	2.42%	2.42%	2.17%	2.25%	1.94%
Mainland Asia	2.97%	3.08%	3.24%	3.31%	3.30%	3.00%
Other	1.79%	2.58%	2.16%	0.86%	2.56%	2.51%
Total	2.53%	2.60%	2.62%	2.40%	2.37%	2.02%

Source: Calculated from UN median projection, 1990.

Appendix Table 10. Estimated and Projected Number of Women Ages 15-19 (000), 1975-2005.

Country	1975	1980	1985	1990	1995	2000	2005
Afghanistan	714	801	760	847	992	1,040	1,329
Bangladesh	3,972	4,550	5,314	6,351	7,178	7,865	8,501
Cambodia	377	405	456	381	166	571	623
Fiji	36	36	36	37	43	46	44
India	30,270	34,066	37,909	41,805	43,704	50,197	53,109
Indonesia	7,213	7,853	9,083	10,264	10,403	10,580	10,826
Laos	158	165	181	204	234	281	338
Mongolia	74	87	100	116	129	145	163
Nepal	574	715	786	931	1,060	1,281	1,391
Pakistan	3,943	4,532	5,301	5,654	6,349	9,239	10,586
Papua New Guinea	133	140	184	208	219	251	277
Philippines	2,461	2,702	2,906	3,173	3,605	4,058	4,366
Sri Lanka	763	791	813	812	883	960	876
Thailand	2,276	2,601	2,972	3,015	3,029	3,070	2,730
Total	52,964	59,444	66,801	73,598	77,994	89,584	95,159

Source: UN median projection, 1990.

Appendix Table 11. Estimated and Projected Annual Growth Rate (percent) of Women Ages 15-19, 1975-2005.

Country	1975-80	1980-85	1985-90	1990-95	1995-00	2000-05
Afghanistan	2.30%	-1.05%	2.17%	3.16%	0.95%	4.90%
Bangladesh	2.72%	3.10%	3.57%	2.45%	1.83%	1.56%
Cambodia	1.43%	2.37%	-3.59%	-16.62%	24.71%	1.74%
Fiji	0.00%	0.00%	0.55%	3.01%	1.35%	-0.89%
India	2.36%	2.14%	1.86%	0.98%	2.77%	1.13%
Indonesia	1.70%	2.91%	2.44%	0.27%	0.34%	0.46%
Laos	0.87%	1.85%	2.39%	2.74%	3.66%	3.69%
Mongolia	3.24%	2.79%	2.97%	2.12%	2.34%	2.34%
Nepal	4.39%	1.89%	3.39%	2.60%	3.79%	1.65%
Pakistan	2.78%	3.13%	1.29%	2.32%	7.50%	2.72%
Papua New Guinea	1.03%	5.47%	2.45%	1.03%	2.73%	1.97%
Philippines	1.87%	1.46%	1.76%	2.55%	2.37%	1.46%
Sri Lanka	0.72%	0.55%	-0.02%	1.68%	1.67%	-1.83%
Thailand	2.67%	2.67%	0.29%	0.09%	0.27%	-2.35%
Total	2.31%	2.33%	1.94%	1.16%	2.77%	1.21%

Source: Calculated from UN median projection, 1990.

Appendix Table 12. Estimated and Projected Number of Women Ages 15-19 (000), by Country Groups, 1975-2005.

Country	1975	1980	1985	1990	1995	2000	2005
Ph., S.L., Th.	5,500	6,094	6,691	7,000	7,517	8,088	7,972
Indonesia	7,213	7,853	9,083	10,264	10,403	10,580	10,826
India	30,270	34,066	37,909	41,605	43,704	50,197	53,109
Mainland Asia	9,203	10,598	12,161	13,783	15,579	19,425	21,807
Other	778	833	957	946	791	1,294	1,445
Total	52,964	59,444	66,801	73,598	77,994	89,584	95,159

Source: Calculated from UN median projection, 1990.

Appendix Table 13. Estimated and Projected Annual Growth Rate (percent) of Women Ages 15-19, by Country Group, 1975-2005.

Country	1975-80	1980-85	1985-90	1990-95	1995-00	2000-05
Ph., S.L., Th.	2.05%	1.87%	0.90%	1.43%	1.46%	-0.29%
Indonesia	1.70%	2.91%	2.44%	0.27%	0.34%	0.46%
India	2.36%	2.14%	1.86%	0.98%	2.77%	1.13%
Mainland Asia	2.82%	2.75%	2.50%	2.45%	4.41%	2.31%
Other	1.37%	2.78%	-0.23%	-3.58%	9.84%	2.21%
Total	2.31%	2.33%	1.94%	1.16%	2.77%	1.21%

Source: Calculated from UN median projection, 1990.

Appendix Table 14. Estimated Total Annual Births, by Country, 1975-2004.

Country	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04
Afghanistan	798,601	747,730	766,023	1,031,654	1,168,857	1,093,950
Bangladesh	3,889,304	4,241,798	4,573,214	5,030,584	5,401,633	5,628,758
Cambodia	202,470	311,311	321,471	318,481	288,765	263,499
Fiji	18,937	20,528	20,189	19,056	19,118	19,163
India	22,720,814	25,296,977	25,956,432	27,897,055	28,034,452	27,529,347
Indonesia	5,073,245	5,060,811	5,028,095	5,134,864	5,003,450	4,565,705
Laos	140,464	153,317	174,379	197,287	201,945	205,780
Mongolia	60,956	67,154	73,987	80,720	87,205	92,749
Nepal	621,233	681,531	713,948	738,052	773,005	749,753
Pakistan	3,784,780	4,741,580	5,296,394	5,533,901	5,501,151	5,536,784
Papua New Guinea	115,137	115,864	125,411	136,780	145,139	144,203
Philippines	1,654,052	1,841,196	1,951,064	2,011,690	2,026,860	2,005,578
Sri Lanka	405,013	415,995	374,929	367,994	354,888	342,710
Thailand	1,391,617	1,366,676	1,196,462	1,153,070	1,201,931	1,221 964
Total	40,876,623	45,062,468	46,571,998	49,651,188	50,209,399	49,399,544

Source: Computed from UN median population projection, 1990.

Appendix Table 15. Estimated and Projected Population Ages 65 and Over (000), 1975-2005.

Country	1975	1980	1985	1990	1995	2000	2005
Afghanistan	363	407	387	461	611	728	880
Bangladesh	2,756	3,008	3,119	3,354	3,757	4,313	5,007
Cambodia	201	160	192	239	292	348	401
Fiji	15	18	21	24	29	36	46
India	23,749	27,895	32,697	38,403	45,335	53,510	62,271
Indonesia	4,321	5,047	6,021	7,241	8,972	11,102	13,524
Laos	81	90	104	122	143	165	193
Mongolia	42	49	58	69	83	101	123
Nepal	427	448	509	593	698	830	990
Pakistan	2,215	2,460	2,858	3,323	3,983	4,722	5,597
Papua New Guinea	85	48	73	93	114	124	144
Philippines	1,151	1,644	1,873	2,115	2,442	2,841	3,405
Sri Lanka	554	643	755	890	1,078	1,260	1,445
Thailand	1,237	1,650	1,878	2,176	2,626	3,173	3,822
Total	37,197	43,567	50,545	59,103	70,163	83,253	97,848

Source: UN median population projection, 1990.

Appendix Table 16. Estimated and Projected Annual Growth Rate (percent), Population Ages 65 and Over, 1975-2005.

Country	1975-80	1980-85	1985-90	1990-95	1995-00	2000-05
Afghanistan	2.29%	-1.01%	3.50%	5.63%	3.50%	3.79%
Bangladesh	1.75%	0.72%	1.45%	2.27%	2.76%	2.98%
Cambodia	-4.56%	3.65%	4.38%	4.01%	3.51%	2.84%
Fiji	3.65%	3.08%	2.67%	3.78%	4.32%	4.90%
India	3.22%	3.18%	3.22%	3.32%	3.32%	3.03%
Indonesia	3.11%	3.53%	3.69%	4.29%	4.26%	3.95%
Laos	2.11%	2.89%	3.19%	3.18%	2.86%	3.13%
Mongolia	3.08%	3.37%	3.47%	3.69%	3.93%	3.94%
Nepal	0.96%	2.55%	3.05%	3.26%	3.46%	3.53%
Pakistan	2.10%	3.00%	3.01%	3.62%	3.40%	3.40%
Papua New Guinea	-11.43%	8.39%	4.84%	4.07%	1.68%	2.99%
Philippines	7.13%	2.61%	2.43%	2.88%	3.03%	3.62%
Sri Lanka	2.98%	3.21%	3.29%	3.83%	3.12%	2.74%
Thailand	5.76%	2.59%	2.95%	3.76%	3.78%	3.72%
Total	3.16%	2.97%	3.13%	3.43%	3.42%	3.23%

Source: Calculated from UN median projection, 1990.

Appendix Table 17. Estimated and Projected Population Ages 65 and Over (000), by Country Group, 1975-2005.

Country	1975	1980	1985	1990	1995	2000	2005
Ph., S.L., Th.	2,942	3,937	4,506	5,181	6,146	7,274	8,672
Indonesia	4,321	5,047	6,021	7,241	8,972	11,102	13,524
India	23,749	27,895	32,697	38,403	45,335	53,510	62,271
Mainland Asia	5,761	6,323	6,873	7,731	9,049	10,593	12,474
Other	424	365	448	547	661	774	907
Total	37,197	43,567	50,545	59,103	70,163	83,253	97,848

Source: UN median population projection, 1990.

Appendix Table 18. Estimated and Projected Annual Growth Rate (percent), Population Ages 65 and Over, by Country Group, 1975-2005.

Country	1975-80	1980-85	1985-90	1990-95	1995-00	2000-05
Ph., S.L., Th.	5.83%	2.70%	2.79%	3.12%	3.37%	3.52%
Indonesia	3.11%	3.53%	3.69%	4.29%	4.26%	3.95%
India	3.22%	3.18%	3.22%	3.32%	3.32%	3.03%
Mainland Asia	1.86%	1.67%	2.35%	3.15%	3.15%	3.27%
Other	-3.00%	4.10%	3.99%	3.79%	3.16%	3.17%
Total	3.16%	2.97%	3.13%	3.43%	3.42%	3.23%

Source: Calculated from UN median projection, 1990.

Appendix Table 19. Rural, Urban and Total Population (000) Country, 1975, 1990 and 2005.

Country	1975			1990			2005		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Afghanistan	13338	2040	15378	13536	3021	16557	22220	7369	29589
Bangladesh	69474	7108	76582	96588	19005	115593	124947	45191	170138
Cambodia	6367	731	7098	7287	959	8246	8973	1811	10784
Fiji	364	212	576	464	300	764	514	428	942
India	488429	132272	620701	622825	230269	853094	730611	404079	1134690
Indonesia	109407	26259	135666	127990	56293	184283	131172	102217	233389
Laos	2680	344	3024	3369	770	4139	4390	1773	6163
Mongolia	743	704	1447	1045	1145	2190	1370	1845	3215
Nepal	12371	629	13000	17306	1837	19143	22036	4539	26575
Pakistan	55001	19733	74734	83376	39250	122626	107505	76135	183640
Papua New Guinea	2403	326	2729	3261	613	3874	4108	1238	5346
Philippines	27429	15136	42565	35811	26602	62413	40653	44269	84922
Sri Lanka	10605	2998	13303	13538	3679	17217	14927	5507	20434
Thailand	35076	6283	41359	43093	12609	55702	45182	22542	67724
Total	833687	214775	1048462	1069489	396352	1465841	1258608	718943	1977551

Source: UN median population projection, 1990

Appendix Table 20. Percent Urban, by Country, 1975, 1990 and 2005.

Country	1975	1990	2005
Afghanistan	13.3%	18.2%	24.9%
Bangladesh	9.3%	16.4%	26.6%
Cambodia	10.3%	11.6%	16.8%
Fiji	36.8%	39.3%	45.4%
India	21.3%	27.0%	35.6%
Indonesia	19.4%	30.5%	43.8%
Laos	11.4%	18.6%	28.8%
Mongolia	48.7%	52.3%	57.4%
Nepal	4.8%	9.6%	17.1%
Pakistan	26.4%	32.0%	41.5%
Papua New Guinea	11.9%	15.8%	23.2%
Philippines	35.6%	42.6%	52.1%
Sri Lanka	22.0%	21.4%	27.0%
Thailand	15.2%	22.6%	33.3%
Total	20.5%	27.0%	36.4%

Source: UN median population projection, 1990

Appendix Table 21. Mean Annual Rural, Urban and Total Population Growth Rate by Country, 1975-1990 and 1990-2005.

Country	1975-1990 Rural	1975-1990 Urban	1975-1990 Total	1990-2005 Rural	1990-2005 Urban	1990-2005 Total
Afghanistan	0.10%	2.62%	0.49%	3.30%	5.94%	3.87%
Bangladesh	2.20%	6.56%	2.74%	1.72%	5.77%	2.58%
Cambodia	0.90%	1.81%	1.00%	1.39%	4.24%	1.79%
Fiji	1.62%	2.31%	1.88%	0.68%	2.37%	1.40%
India	1.62%	3.70%	2.12%	1.06%	3.75%	1.90%
Indonesia	1.05%	5.08%	2.04%	0.16%	3.98%	1.57%
Laos	1.53%	5.37%	2.09%	1.76%	5.56%	2.65%
Mongolia	2.27%	3.24%	2.76%	1.81%	3.18%	2.56%
Nepal	2.24%	7.15%	2.58%	1.61%	6.03%	2.19%
Pakistan	2.77%	4.58%	3.30%	1.69%	4.42%	2.69%
Papua New Guinea	2.04%	4.21%	2.34%	1.54%	4.69%	2.15%
Philippines	1.78%	3.76%	2.55%	0.85%	3.40%	2.05%
Sri Lanka	1.63%	1.36%	1.57%	0.65%	2.69%	1.14%
Thailand	1.37%	4.64%	1.98%	0.32%	3.87%	1.30%
Total	1.66%	4.06%	2.23%	1.09%	3.97%	2.00%

Source: Calculated from UN median population projection

Appendix Table 22. Estimated and Projected Infant Mortality Rate, 1975-2005.

Country	1975-80	1980-85	1985-90	1990-95	1995-00	2000-05
Afghanistan	183	183	172	162	152	142
Bangladesh	137	128	119	108	96	85
Cambodia	263	160	130	116	102	90
Fiji	42	29	30	21	21	21
India	126	110	99	88	77	67
Indonesia	105	90	75	65	57	51
Laos	135	123	110	97	85	74
Mongolia	89	77	68	59	53	45
Nepal	147	139	128	118	109	99
Pakistan	130	120	109	98	88	79
Papua New Guinea	[illegible]	74	59	53	48	42
Philippines	54	51	45	40	35	29
Sri Lanka	44	35	28	24	21	18
Thailand	56	37	28	24	21	18
Total	121	107	97	87	77	68

Infant Mortality Rate is Number of Deaths of Children Under One Year of Age per 1000 Live Births.

Source: Calculated from UN median projection, 1990.

Appendix Table 23. BCG Immunization Coverage (Percent of Target Population), by Country, 1985-1990.

Country	1985	1986	1987	1988	1989	1990
Afghanistan	17.0%	18.0%	27.0%	40.0%	38.0%	30.0%
Bangladesh	3.0%	5.0%	14.0%	26.0%	60.0%	86.0%
Cambodia	0.0%	0.0%	0.0%	0.0%	0.0%	90.0%
Fiji	100.0%	96.0%	99.0%	100.0%	100.0%	99.0%
India	24.0%	29.0%	46.0%	72.0%	80.0%	80.0%
Indonesia	68.0%	67.0%	68.0%	81.0%	81.0%	99.0%
Laos	0.0%	0.0%	10.0%	0.0%	0.0%	29.0%
Mongolia	0.0%	0.0%	52.0%	0.0%	0.0%	92.0%
Nepal	67.0%	67.0%	78.0%	85.0%	88.0%	88.0%
Pakistan	41.0%	69.0%	72.0%	88.0%	78.0%	87.0%
Papua New Guinea	73.0%	76.0%	74.0%	73.0%	82.0%	87.0%
Philippines	76.0%	72.0%	92.0%	85.0%	96.0%	97.0%
Sri Lanka	74.0%	76.0%	76.0%	85.0%	97.0%	89.0%
Thailand	80.0%	95.0%	61.0%	79.1%	98.0%	90.0%
Total	33.5%	39.7%	50.9%	70.1%	77.9%	84.1%

Sources: ISTI/CIHI Database, UNICEF,and Ross

Appendix Table 24. DPT3 Immunization Coverage (Percent of Target Population), by Country, 1985-1990.

Country	1985	1986	1987	1988	1989	1990
Afghanistan	15.0%	11.0%	25.0%	35.0%	33.0%	25.0%
Bangladesh	3.0%	5.0%	9.0%	16.0%	54.0%	62.0%
Cambodia	45.0%	53.0%	58.0%	74.0%	79.0%	22.0%
Fiji	72.0%	71.0%	90.0%	98.0%	98.0%	98.0%
India	45.0%	53.0%	58.0%	74.0%	79.0%	92.0%
Indonesia	16.0%	48.0%	48.0%	71.0%	71.0%	71.0%
Laos	0.0%	5.0%	10.0%	15.0%	21.0%	17.0%
Mongolia	80.0%	81.0%	82.0%	83.0%	84.0%	84.0%
Nepal	32.0%	38.0%	46.0%	65.0%	71.0%	85.0%
Pakistan	30.0%	56.0%	62.0%	85.0%	71.0%	83.0%
Papua New Guinea	40.0%	44.0%	45.0%	44.0%	53.0%	53.0%
Philippines	59.0%	55.0%	73.0%	79.0%	86.0%	89.0%
Sri Lanka	65.0%	77.0%	77.0%	68.0%	87.0%	89.0%
Thailand	62.0%	71.0%	48.0%	70.4%	84.0%	92.0%
Total	36.6%	48.0%	52.4%	68.4%	74.3%	83.7%

Sources: ISTI/CIHI Database, UNICEF, and Ross

Appendix Table 25. Polio Immunization Coverage (Percent of Target Population), by Country, 1985-1990.

Country	1985	1986	1987	1988	1989	1990
Afghanistan	15.0%	11.0%	25.0%	35.0%	33.0%	25.0%
Bangladesh	2.0%	4.0%	8.0%	16.0%	30.0%	62.0%
Cambodia	0.0%	0.0%	0.0%	0.0%	22.0%	22.0%
Fiji	68.0%	73.0%	91.0%	100.0%	98.0%	96.0%
India	35.0%	45.0%	50.0%	63.0%	74.0%	93.0%
Indonesia	14.0%	46.0%	45.0%	73.0%	74.0%	97.0%
Laos	0.0%	5.0%	11.0%	17.0%	22.0%	25.0%
Mongolia	86.0%	86.0%	86.0%	86.0%	85.0%	85.0%
Nepal	20.0%	34.0%	40.0%	64.0%	71.0%	84.0%
Pakistan	30.0%	56.0%	62.0%	85.0%	63.0%	83.0%
Papua New Guinea	34.0%	42.0%	46.0%	44.0%	52.0%	52.0%
Philippines	61.0%	55.0%	73.0%	78.0%	85.0%	88.0%
Sri Lanka	65.0%	77.0%	78.0%	69.0%	87.0%	87.0%
Thailand	61.0%	70.0%	47.0%	69.8%	84.0%	92.0%
Total	30.3%	42.8%	47.0%	62.0%	68.2%	87.0%

Source: ISTI/CIHI Database, UNICEF, and Ross

Appendix Table 26. Measles Immunization Coverage (Percent of Target Population), by Country, 1985-1990.

Country	1985	1986	1987	1988	1989	1990
Afghanistan	14.0%	14.0%	31.0%	34.0%	22.0%	20.0%
Bangladesh	1.0%	3.0%	6.0%	13.0%	30.0%	54.0%
Cambodia	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%
Fiji	57.0%	61.0%	64.0%	69.0%	76.0%	84.0%
India	0.0%	1.0%	17.0%	45.0%	56.0%	87.0%
Indonesia	38.0%	67.0%	68.0%	81.0%	81.0%	91.0%
Laos	0.0%	4.0%	6.0%	8.0%	10.0%	13.0%
Mongolia	0.0%	10.0%	29.0%	48.0%	67.0%	86.0%
Nepal	46.0%	66.0%	0.0%	50.0%	58.0%	71.0%
Pakistan	41.0%	69.0%	72.0%	88.0%	78.0%	87.0%
Papua New Guinea	26.0%	33.0%	37.0%	42.0%	52.0%	52.0%
Philippines	55.0%	53.0%	68.0%	77.0%	83.0%	85.0%
Sri Lanka	20.0%	47.0%	60.0%	55.0%	81.0%	81.0%
Thailand	26.0%	45.0%	34.0%	55.5%	66.0%	80.0%
Total	13.2%	21.3%	30.8%	52.0%	59.4%	81.9%

Sources: ISTI/CIHI Database, UNICEF, and Ross

Appendix Table 27. Tetanus Immunization Coverage (Percent of Target Population), by Country, 1985-1990.

Country	1985	1986	1987	1988	1989	1990
Afghanistan	11.0%	14.0%	6.0%	9.0%	20.0%	3.0%
Bangladesh	3.0%	5.0%	7.0%	12.0%	25.0%	74.0%
Cambodia	0.0%	0.0%	0.0%	0.0%	0.0%	22.0%
Fiji	52.0%	0.0%	0.0%	0.0%	0.0%	0.0%
India	37.0%	40.0%	47.0%	61.0%	67.0%	49.0%
Indonesia	25.0%	26.0%	27.0%	29.0%	41.0%	41.0%
Laos	0.0%	6.0%	0.0%	0.0%	4.0%	14.0%
Mongolia	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Nepal	10.0%	14.0%	15.0%	29.0%	29.0%	26.0%
Pakistan	9.0%	17.0%	27.0%	22.0%	32.0%	70.0%
Papua New Guinea	21.0%	17.0%	17.0%	52.0%	100.0%	55.0%
Philippines	49.0%	49.0%	49.0%	37.0%	44.0%	47.0%
Sri Lanka	36.0%	44.0%	51.0%	42.0%	39.0%	39.0%
Thailand	44.0%	53.0%	38.0%	55.5%	70.0%	70.0%
Total	31.6%	35.2%	40.6%	49.7%	58.5%	57.4%

Source: ISTI/CIHI Database, UNICEF, and Ross

Appendix Table 28. Reported Mean Number of Annual Diarrhea Episodes per Child Under Age 5, by Country, 1985-1990.

Country	1985	1986	1987	1988	1989	1990
Afghanistan	NA	NA	NA	NA	NA	2.7
Bangladesh	NA	3.8	5.2	NA	2.3	2.3
Cambodia	NA	NA	NA	NA	NA	NA
Fiji	2.2	2.4	NA	2.5	NA	2.5
India	2.7	2.7	1.8	2.7	1.9	1.7
Indonesia	1.9	2.1	1.7	1.9	0.9	0.9
Laos	NA	NA	NA	NA	NA	3.4
Mongolia	NA	NA	NA	NA	NA	3.4
Nepal	6.1	5.4	NA	NA	3.3	3.3
Pakistan	4.6	2.2	3.0	2.5	NA	2.5
Papua New Guinea	2.5	NA	2.3	2.5	NA	NA
Philippines	2.8	3.0	2.8	NA	NA	NA
Sri Lanka	1.0	1.5	NA	NA	NA	1.5
Thailand	1.9	1.9	2.1	NA	2.0	2.0

Source: ISTI/CIHI Database; WHO (1990) data

Appendix Table 29. Breastfeeding Trends and Differentials, for Indonesia, Sri Lanka and Thailand, 1975/76 to 1987.

Country and Variables	Ever Breastfed		Median		N°	
	WFS	DHS	WFS	DHS	WFS	DHS
Indonesia	1976-1987					
Residence						
Urban	93.1	93.0	16.8	22.4	634	859
Rural	97.2	96.7	26.4	26.2	3283	1854
Age						
15-24	96.9	95.2	23.7	23.7	1593	1032
25-34	97.0	95.8	24.3	24.7	1576	1297
35-49	94.8	95.4	30.4	28.6	743	383
Education						
No formal education	97.4	97.3	26.0	21.3	2026	440
1 - 3 years	95.3	96.0	28.2	27.2	694	506
4 - 6 years	97.2	95.4	24.2	25.1	892	1245
7 +	91.4	93.7	12.9	22.3	305	521
Employment Status						
Not working	96.9	95.2	24.7	24.4	3006	1767
Working	95.4	96.0	25.5	25.2	911	946
All	96.5	95.5	24.8	24.5	3917	2712
Sri Lanka	1975-1987					
Residence						
Urban	93.6	97.9	12.3	13.9	172	309
Rural	95.7	98.2	19.8	21.7	239	2028
Age						
15-24	96.1	99.3	21.1	19.0	621	651
25-34	95.5	97.6	21.8	20.8	1437	1295
35-49	94.7	97.9	24.4	26.1	634	391
Education						
No formal education	93.2	98.5	28.1	25.1	502	219
1 - 3 years	95.8	97.5	22.8	24.2	445	273
4 - 6	96.2	97.2	23.4	20.9	751	554
7 +	96.6	98.6	17.2	20.0	838	1292
Employment Status						
Not working	96.1	98.3	22.4	21.4	2095	2013
Working	93.4	97.3	21.2	17.9	597	323
All	95.5	98.1	22.1	20.9	2692	2337
Thailand	1975-1987					
Residence						
Urban	71.2	88.8	3.7	5.6	239	381
Rural	93.5	96.4	21.6	15.9	1615	1778
Age						
15-24	90.7	95.1	17.7	15.5	583	817
25-34	90.3	95.2	20.4	12.9	836	1062
35-49	91.0	94.7	23.2	16.4	434	280
Education						
No formal education	91.2	93.1	20.6	15.4	312	205
1-3 years	92.4	93.4	23.5	15.8	110	83
4-6	92.6	96.5	20.8	17.3	1309	1492
7+	66.7	91.1	6.8	7.6	123	379
Employment Status						
Not working	94.3	94.2	21.5	16.3	1477	1062
Working	76.2	96.0	11.0	13.7	377	1091
All	90.6	95.1	20.4	15.0	1854	2159

Source: DHS data, reported in Sharma, et al., 1991.

Appendix Table 30. USAID Child Survival Program Funding ($000), FY 1990

COUNTRY	PROJECT TITLE	CSF	HE	ARDN	DFA	ESF
AFGHANISTAN	**Health Sector Support:** Management Sciences for Health provides training and medical supplies cross-border to health care units which support immunization and primary care services to Afghan mothers and children.	0	946	0	0	1525
	PVO Support: Expands child survival and health program activities through grants to U.S. and local private voluntary organizations for services within Afghanistan.	0	1378	0	0	0
BANGLADESH	**Family Planning and Health Services:** As part of the Social Marketing Program, working with the Ministry of Health and Family Planning (MOHFP), the project promotes ORS marketing through maternal and child health programs and 100,000 outlets nationwide. The Reach Project assists MOHFP and the Ministry of Local Government to expand immunization in the urban slums.	3000	2500	0	0	0
INDIA	**Child Survival Health Support:** A USAID grant supports UNICEF and local organizations to assist the Ministry of Health in major expansion of child survival initiatives by promoting ORT, immunization and the control of acute respiratory infections.	2000	0	0	0	0
	Private and Voluntary Organizations for Health II: Assists local private and voluntary organizations expand health and child survival services.	1200	720	0	0	0
	Quality Control for Health Technologies: Supports creation of an independent biological testing laboratory to improve the quality of preventive health care by ensuring safe and effective vaccines are delivered to children and mothers.	0	3400	0	0	0
	FY 90 Child Survival Grant to World Vision Relief and Development: Promotes expanded immunization coverage to pregnant women and children under five in villages and hamlets in northern Maharashtra State.	550	0	0	0	0
INDONESIA	**PVO Co-Financing II:** Supports U.S. and local private voluntary organizations to integrate nutrition and other child survival activities with their Title II food distribution programs.	0	657	0	0	0
	Health Sector Financing: Collects and analyzes health expenditure data for policy reform to reduce health care costs.	0	491	0	0	0
	FY 90 Vitamin A Grant to Helen Keller International: Promotes vitamin A capsule distribution and vitamin A awareness in support of a new national control and prevention of vitamin A deficiency program.	0	0	508	0	0
	FY 90 Child Survival and Vitamin A Grant to Project HOPE: Initiated a new project to expand child survival services including vitamin A education and distribution.	300	0	50	0	0
	FY 90 Child Survival Grant to Program for Appropriate Technology in Health (PATH): Works through a model immunization program in Lombok Island to introduce appropriate health technologies to improve maternal and child survival services. Focuses on Hepatitis B.	800	0	0	0	0
NEPAL	**Child Survival and Family Planning Services:** Stresses activities which will provide higher quality and greater impact for rural services in maternal and child health and family planning.	0	1562	0	0	0
	PVO Co-Financing II: Provides U.S. and local private and voluntary agencies with support for health and child survival activities.	0	30	9	0	0
	FY 90 Child Survival Grant to Adventist Development Relief Agency: Provides child survival services through a new project initiated this year.	575	0	0	0	0

CSF: Child Survival Fund; HE: Health; ARDN: Agriculture, Rural Development and Nutrition; DFA: Development Fund for Africa; ESF: Economic Support Fund; All numbers are in thousands of dollars.

Excludes some funding (amounts unknown) provided through regional Technical Services in Vitamin A and Medical Supplies and Equipment activities.

Appendix Table 30. USAID Child Survival Program Funding ($000), FY 1990 (cont.)

COUNTRY	PROJECT TITLE	CSF	HE	ARDN	DFA	ESF
PAKISTAN	**NWFP Area Development:** Promotes health education and child survival message campaigns in Gadooo-Amazai area.	0	0	0	0	52
	FY 90 Child Survival Grant to Adventist Development Relief Agency: Expands health services delivery using mobile teams to reach villages with immunizations for women and children and trains community health workers and traditional birth attendants to support child survival activities.	400	0	0	0	0
	FY 90 Child Survival Grant to World Vision Relief and Development: Strengthens preventative health care services in 27 villages focusing on immunization, ORS preparation and use and training mothers on appropriate weaning and feeding practices.	550	0	0	0	0
PHILIPPINES	**Targeted Child Survival Program:** Administered through the Department of Health, provides decentralized support for the control of diarrheal disease, immunization, breastfeeding, growth monitoring, maternal health, vitamin A supplementation, high risk birth management and acute respiratory infections.	5000	7879	0	0	0
	PVO Co-Financing III: Expands child survival and health program activities through grants to U.S. and local private voluntary organizations.	0	67	0	0	0
	Enterprise in Community Development: Focuses on primary health care, including child survival programs implemented by local communities.	0	0	72	0	0
PAPUA NEW GUINEA	**FY 90 Child Survival Grant to Project Concern International:** Trains village birth attendants and maternal child health mobile teams in delivery and promotion of child survival interventions on the northeast coast of Papua New Guinea.	800	0	0	0	0
SOUTH PACIFIC REGIONAL	**OPG: PVO Co-Financing:** Provides U.S. and local private voluntary agencies with grant support to expand child survival and health activities.	0	0	46	0	0
	Project Development and Implementation Support: Provides technical assistance for design and evaluation of health and child survival projects.	0	154	0	0	0
	PNG Child Survival Support: Assists the Foundation for the People of the South Pacific to train community health nurses in Vanuatu in expanding health care services to include immunization, the control of diarrheal diseases and improved weaning practices.	0	1100	0	0	0
SRI LANKA	**PVO Co-Financing II:** Strengthens private organizations' ability to contribute to expanding health services through the many pluralistic institutions in Sri Lanka.	0	65	0	0	0
REGIONAL	**Laos Prosthetics:** Supports U.S. PVO and local NGO activities to address the needs of civilian victims of civil strife, including children, through provision of prosthetic devices to the handicapped.	0	10	0	0	850
	ASEAN Human Resources Development: Enhances regional cooperation in health and child survival through the building of institutions and the development of human resources.	0	255	0	0	0
Asia Regional Total		15175	21075	613	0	2427

CSF: Child Survival Fund; HE: Health; ARDN: Agriculture, Rural Development and Nutrition; DFA: Development Fund for Africa; ESF: Economic Support Fund; All numbers are in thousands of dollars.

Excludes some funding (amounts unknown) provided through regional Technical Services in Vitamin A and Medical Supplies and Equipment activities.

Appendix Table 31. Estimated and Projected Population Age 15-49 (000) by Country, 1975-2005.

Country	1975	1980	1985	1990	1995	2000	2005
Afghanistan	7152	7533	6929	7839	11548	12362	13763
Bangladesh	33042	38434	45004	53843	64112	75187	86669
Cambodia	3413	3629	4146	4489	4350	4947	5548
Fiji	292	323	359	396	439	487	520
India	294060	331918	374569	422266	471272	529036	585273
Indonesia	63887	71944	82206	94261	106334	118290	128810
Laos	1439	1519	1685	1902	2163	2500	2921
Mongolia	668	777	904	1055	1221	1406	1611
Nepal	6024	7124	7923	8942	10134	11683	13340
Pakistan	33324	39039	47428	55450	63139	77169	92129
Papua New Guinea	1276	1443	1665	1902	2170	2444	2768
Philippines	20283	22958	26711	30699	35271	40267	45188
Sri Lanka	6555	7646	8363	9038	9840	10612	11161
Thailand	18772	22865	26739	30425	34001	37224	38977
Total	490187	557152	634631	722507	815994	923614	1028678

Source: UN median population projection, 1990

Appendix Table 32. Estimated and Projected Growth Rates (percent) of Population Age 15-49, by Country, 1975-2005.

Country	1975-80	1980-85	1985-90	1990-95	1995-00	2000-05
Afghanistan	1.04%	-1.67%	2.47%	7.75%	1.36%	2.15%
Bangladesh	3.02%	3.16%	3.59%	3.49%	3.19%	2.84%
Cambodia	1.23%	2.66%	1.59%	-0.63%	2.57%	2.29%
Fiji	2.02%	2.11%	1.96%	2.06%	2.08%	1.31%
India	2.42%	2.42%	2.40%	2.20%	2.31%	2.02%
Indonesia	2.38%	2.67%	2.74%	2.41%	2.13%	1.70%
Laos	1.08%	2.07%	2.42%	2.57%	2.90%	3.11%
Mongolia	3.02%	3.03%	3.09%	2.92%	2.82%	2.72%
Nepal	3.35%	2.13%	2.42%	2.50%	2.84%	2.65%
Pakistan	3.17%	3.89%	3.13%	2.60%	4.01%	3.54%
Papua New Guinea	2.46%	2.86%	2.66%	2.64%	2.38%	2.49%
Philippines	2.48%	3.03%	2.78%	2.78%	2.65%	2.31%
Sri Lanka	3.08%	1.79%	1.55%	1.70%	1.51%	1.01%
Thailand	3.94%	3.13%	2.58%	2.22%	1.81%	0.92%
Total	2.56%	2.60%	2.59%	2.43%	2.48%	2.15%

Source: Calculated from UN median projection, 1990

Appendix Table 33. Estimated and Projected Population Age 15-49 (000), by Country Group, 1975-2005.

Country	1975	1980	1985	1990	1995	2000	2005
Ph., S.L., Th.	45610	53469	61813	70162	79112	88103	95326
Indonesia	63887	71944	82206	94261	106334	118290	128810
India	294060	331918	374569	422266	471272	529036	585273
Mainland Asia	79542	92130	107284	126074	148933	176401	205901
Other	7088	7691	8759	9744	10343	11784	13368
Total	490187	557152	634631	722507	815994	923614	1028678

Source: UN median projection, 1990

Appendix Table 34. Estimated and Projected Growth Rates (percent) of Population Age 15-49, by Country Group, 1975-2005.

Country	1975-80	1980-85	1985-90	1990-95	1995-00	2000-05
Ph., S.L., Th.	3.18%	2.90%	2.53%	2.40%	2.15%	1.58%
Indonesia	2.38%	2.67%	2.74%	2.41%	2.13%	1.70%
India	2.42%	2.42%	2.40%	2.20%	2.31%	2.02%
Mainland Asia	2.94%	3.05%	3.23%	3.33%	3.39%	3.09%
Other	1.63%	2.60%	2.13%	1.19%	2.61%	2.52%
Total	2.56%	2.60%	2.59%	2.43%	2.48%	2.15%

Source: Calculated from UN median projection, 1990

Appendix Table 35. Trends in Contraceptive Prevalence Rate: Percent using Modern Methods, 1968-1989.

Country	1968	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89
Emergent: 0-7% CPR (modern methods)																						
Afganistan						1																
Pakistan								4										7				
Launch: 8-15% CPR																						
Cambodia																						
Laos																						
Nepal									2					7					15			
P.New Guinea																						
Growth: 16-34% CPR																						
Mongolia																						
Philippines	2					11					16					17			20		22	
Bangladesh									5			9		11		16		18				23
Consolidation: 35-49% CPR																						
Fiji							41															
Sri Lanka								19		20					30					41		
India			10										28		28						40	
Indonesia									23			24						37		44		
Mature: 50% and over CPR																						
Thailand			14			23		31				48		56			62			64		

Source: Population Council Family Planning and Child Survival Data Bank.

Appendix Table 36. Apparent Adult Per Capita Cigarette Consumption, 1970 and 1985.

	1970	1985	% change
AFRICA			
Algeria	890	1590	+79
Angola	500	530	+6
Benin	850	740	-13
Cameroon	250	610	+144
Cape Verde	210	210	0
Cent.Af.Rep	240	280	+17
Congo	500	920	+84
Côte d'Ivoire	720	710	-1
Egypt	630	1860	+195
Ethiopia	60	60	0
Ghana	340	380	+12
Guinea-Bissau	20	30	+50
Kenya	430	550	+28
Liberia	390	450	+15
Libya	2560	2850	+11
Madagascar	240	450	+88
Malawi	190	390	+105
Mauritius	1260	1700	+35
Morocco	690	1070	+55
Mozambique	500	430	-14
Niger	100	100	0
Nigeria	280	370	+32
Reunion	1620	940	-42
Senegal	700	610	-13
Sierra Leone	420	830	+98
Tanzania	350	330	-6
Togo	480	460	-4
Tunisia	1230	1470	+20
Sudan	190	130	-16
Uganda	290	260	-10
Zaire	330	210	-36
Zambia	500	400	-20
Zimbabwe	1060	500	-53
MEAN	576	679	+18
ASIA/PACIFIC			
Afghanistan	15	50	+233
Bangladesh	190	270	+42
China	1200	1590	+33
Fiji	1320	1600	+21
India	190	160	-16
Indonesia	480	1050	+119
Iran	780	620	-21
Iraq	1330	980	-26
Jordan	1280	1700	+33
Korea PDR	1200	1180	-2
(cont.)			
Korea Rep.	2140	2660	+24
Lao PDR	210	490	+133
Lebanon	2890	2880	-10
Malaysia	1440	2256	+57
Myanmar	95	150	+58
Nepal	170	150	-12
Pakistan	630	660	+5
Philippines	1120	1910	+71
Sri Lanka	420	500	+19
Syrian Arab R	760	2050	+170
Thailand	760	900	+18
Turkey	1790	1970	+10
Vietnam	830	670	-19
MEAN	923	1150	+25
LATIN AMERICA			
Argentina	1730	1780	+3
Barbados	1150	1380	+20
Bolivia	300	330	+10
Brazil	1310	1700	+30
Chile	1080	1000	-7
Colombia	1670	1920	+15
Costa Rica	1680	1340	-20
Cuba	4000	3920	-2
Dominican Rep.	1100	980	-11
Ecuador	700	880	+26
El Salvador	950	750	-21
Guadeloupe	1090	1080	-1
Guatemala	740	550	-26
Guyana	1350	1000	-26
Haiti	540	240	-55
Honduras	940	1010	+7
Jamaica	1790	1190	-34
Nicaragua	1250	1380	+10
Paraguay	960	1000	+4
Peru	390	350	-10
Suriname	1040	1660	+60
Trinidad & Tobago	1900	1600	-16
Uruguay	1540	1760	+14
Venezuela	1980	1890	-4
MEAN	1299	1279	-2

Source: Chapman and Lene, 1990

Appendix Table 37. Examples of Environmental Exposure Situations, Their Health Effects and Exposure Control Options.

Exposure Route	Health Effects	Control Options
Air		
Indoor air pollution from stoves	Lung diseases	Improved stoves, chimneys, ventilation
Outdoor air pollution from industry, e.g. lead smelters	Lead poisoning	Factory design, ventilation, cyclones, filters
Water		
Faecal pollution of rural drinking water	Diarrhoeal diseases Parasitic diseases	Improved latrines, protection of water sources
Pollution by household sewage water	Diarrhoeal diseases Parasitic diseases	"Safe" positioning of sewage outfalls, improved treatment of sewage
Water discharge from mines and metal refineries	Metal poisoning (e.g. arsenic, cadmium)	Treatment in sedimentation dams, outfall positioning
Food		
Shellfish contamination by sewage	Hepatitis	Outfall positioning, sewage treatment
Toxic chemical contamination during industrial food manufacture	e.g. PCB-poisoning; Toxic oil syndrome	Improved training of food factory supervisors and improved quality control
Workplace		
Organic solvent exposures	Brain and liver damage	Choose less toxic solvents; ventilation
Construction industry safety hazards	Injuries	Worker involvement in safety development; guardrails, safety belts
Pesticides exposure	Poisoning	Choose less toxic pesticides; use less pesticides; protective gear

Source: Kjellstrom, forthcoming in Jamison and Mosley, 1991