

Maternal Illiteracy and its Impact on Child Survival: An International Perspective

by

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Abstract

Maternal illiteracy is known to effect child survival. How closely maternal education and illiteracy rates affect child morbidity and mortality is explored in this study. Over 29,000 children die a day from preventable causes. More than a quarter of these deaths occur in the first twenty eight days of life. Child survival is a strategy to improve the health of children under age five. Exact mechanisms of how maternal education effects child health may be based on the age of young mothers and their lack of formal or non formal education. An analysis of infant and child mortality indicates that, on an average, an additional year of education for a mother results in a reduction of 9/1000 in the mortality rate of her children.

The impact of maternal illiteracy on child health is discussed with reference to illness management, health systems access, and psychosocial consequences. Community based training programs can empower a local community for effective change. Models of community programs are reviewed. Options on how to effectively train a non literate population in non formal methods are discussed. Increasingly, literacy is part of a variety of skills needed for an adult to function and succeed in society. The connection between literacy, health, and disease with child survival will gain more importance in the developing nations the next century. Healthy populations will survive disasters and epidemics. Healthy and literate populations will sustain a national economy.

One of the most effective ways to help girls in poor countries who are at risk of becoming pregnant at an early age is to focus on girls' education. Few programs in child survival look at maternal illiteracy. Mothers' risk factors, based on their age of child bearing or education level, need to be included in effective strategies for improving infant and child

survival rates. Recommendations for child survival programs and goals for public policy advocacy are proposed.

Maternal illiteracy has a direct bearing on child health and child survival rates. Although this has been vaguely acknowledged in several studies, few child health programs address this as a priority. Understanding the diversity of factors in maternal illiteracy is helpful in planning future child survival strategies. Solutions need to be proposed to see long term improvement for mothers and their children at risk.

Assessing available materials

A literature review was done, assessing over 33 child survival projects in Africa, Asia and Latin America. Material was also reviewed regarding literacy in health settings. The articles were searched by using Pub Med internet literature reviews and an Internet search of Web sites of organizations dedicated to child survival issues in developing countries.

Background

It is estimated that 29,000 children under the age of five die each day, most due to preventable causes (UNICEF, 2004). The cause of these deaths is due to diseases that cause acute respiratory infections, malaria, diarrhea, and infections (many that can be prevented with immunizations). More than a quarter of the mortalities occur in the first twenty eight days of life (US Coalition for Child Survival). Child survival is a strategy to improve the health of children under the age of five. Key indicators of measurement include the Infant Mortality Rate (children dying under age 1 yr), the Under Five Mortality Rate (children dying before age 5), Percentages of Low Birth Weight children, and the Percentage of 1 year old Children Immunized against 6 Key Diseases (TB, Diphtheria, Polio, Measles, Tetanus and Pertussis) (UNICEF, 2004). Child survival actions include providing immunizations, breast feeding promotion, vitamin A supplementation, newborn care, and the prevention and treatment of potentially fatal childhood diseases such as diarrhea, malaria, and pneumonia.

Over the last 30 years, UNICEF and national government plans have increased immunization rates from 5 to 70 percent (USAID, 2005). A major public health initiative has been the campaign to eradicate polio. Public-private partnerships began in 1996; the wild polio virus has now been contained to six nations (WHO, 2004). Incorporated with this data is the incidence of HIV/AIDS in each nation.

In order to be comprehensive in their approach, the United Nations established the Millennium Development Goals (MDG) to target key areas in the lives of millions of children. These goals address illness, poverty, malnutrition, safe water, primary education and sanitation. One goal is to reduce child mortality by two thirds by 2015, led by UNICEF and WHO towards the goal of "Health for All". Another goal is to ensure primary education (up to eighth grade) for boys as well as girls (Table 1).

GOALS	TARGETS, 2015
1. Eradicate extreme hunger and poverty	<p>Reduce by half the proportion of people living on less than a dollar a day</p> <hr/> <p>Reduce by half the proportion of people who suffer from hunger</p>
2. Achieve universal primary education	<p>Ensure that all boys and girls complete a full course of primary schooling</p>
3. Promote gender equality and empower women	<p>Eliminate gender disparity in primary and secondary education preferably by 2005, and at all levels by 2015</p>
4. Reduce child mortality	<p>Reduce by two thirds the mortality rate among children under five</p>
5. Improve maternal health	<p>Reduce by three quarters the maternal mortality ratio</p>
6. Combat HIV/AIDS, malaria and other diseases	<p>Halt and begin to reverse the spread of HIV/AIDS. Halt and begin to reverse the incidence of malaria and other major diseases</p>
7. Ensure environmental stability	<p>Reduce by half the proportion of people without sustainable access to safe drinking water</p> <hr/> <p>Achieve a significant improvement in the lives of at least 100 million slum dwellers by 2020</p> <hr/> <p>Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources</p>
8. Develop a global partnership for development	<p>Develop further an open trading and financial system that is rule-based, predictable and non-discriminatory and that includes a commitment to good governance, development and poverty reduction – nationally and internationally</p> <hr/> <p>Address the least developed countries' special needs, and the special needs of landlocked and Small Island Developing States</p> <hr/> <p>Deal comprehensively with developing countries' debt problems through national and international measures to make debt sustainable in the long term</p> <hr/> <p>In cooperation with the developing countries, develop decent and productive work for youth</p> <hr/> <p>In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries</p> <hr/> <p>In cooperation with the private sector, make available the benefits of new technologies – especially information and communications technologies</p>

Sources: Adapted from United Nations, Millennium Declaration, 2000 and other UN sources.

THE STATE OF THE WORLD'S CHILDREN 2006

Table 1 (UNICEF, 2005 p.2)

In developing countries, high rates of malaria, measles, HIV and other infectious diseases have taken a priority over programs for adolescent health needs and child survival programs (UNESCO, 2005). Some of this change in emphasis has been due to funding priorities.

Global health issues have taken precedent in the last few years due to international disasters such as the Tsunami of 2004, the HIV/AIDS epidemic and fear of global epidemics such as Avian bird flu. In contrast, the great need for education has not been visible. The Millennium Development Goals (MDG) lists universal primary education as one of their eight goals. It is projected that 115 million children could gain access to primary education by 2015 if goals were met (UNICEF, 2005) (Table 2).

Figure 1.1: Meeting the MDGs would transform millions of children's lives in the next 10 years

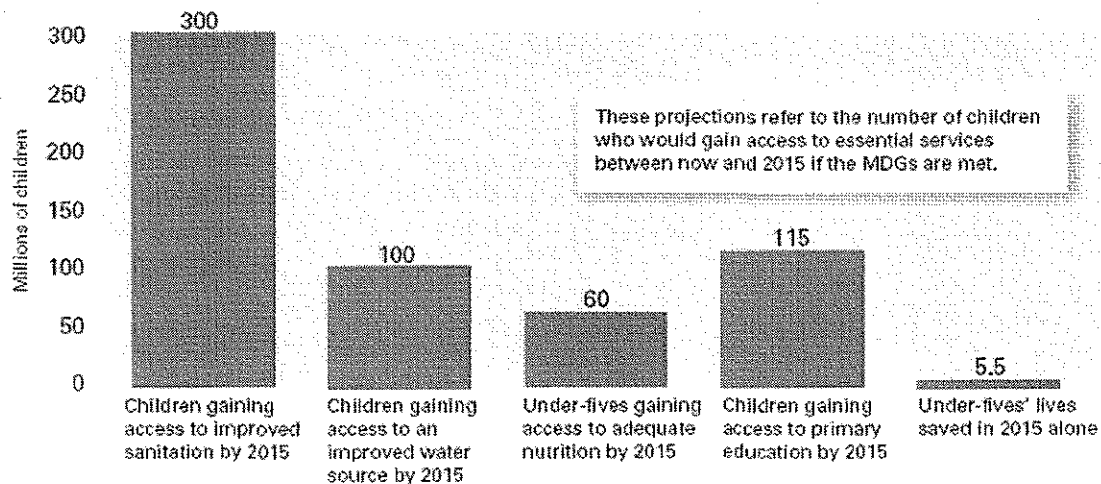


Table 2 (UNICEF, 2005, p.4)

The task force for the MDG education sector noted in their 2005 report that:

The urgency of the task force's work is brought into stark reality by the many countries will miss the 2005 Goal for Gender parity in primary education. If there is to be any chance of meeting the 2015 Goals, both developing country governments and the broader international community must dramatically step up the level and nature of financial, political, and technical commitments" (Birdsall, Levine & Ibrahim, 2005, p.2).

United Nations for Education, Science and Culture (UNESCO) has the charge for insuring education goals, including primary education, as well as non formal adult education and literacy programs. It has been lagging behind in international visibility and has even been considered "a failure because there were no binding agreements or commitments to provide funding, nor timetables for action at the last World Education Forum in April, 2000."

(Kickbusch, 2001, p.290)

For maternal illiteracy to be effectively addressed with child survival, WHO will need to join UNESCO's theme of "Education for All". It could benefit both groups. With strategies merged as "Health and Literacy for All", mothers in the developing world will live more promising lives for themselves as well as their children. Most child survival programs address a combination of plans to include immunizations, disease prevention and treatment, and nutrition support. Maternal mortality is addressed with increased monitoring at antenatal clinics and increased midwifery training. Within the year 2002, USAID contributed \$391 million to child survival programs (USAID, 2005).

There are an estimated 771 million illiterate adults in the world; approximately two-thirds of them are women (UNESCO, 2005). Various studies have demonstrated the association between poor literacy rates and poor health (Ohnishi, 2005). Literacy has been previously defined in a simple context of the ability to read, write and have basic numerical skills (Kickbusch, 2001). A working definition of literacy, in a 21st century approach, attempts to integrate a broad range of factors with modern technology. The Center for Literacy of Quebec (CLQ) defined literacy as:

Literacy involves a complex set of abilities to understand and use the dominant symbol system of a culture for a personal and community development. The need and demand for these abilities vary in different societies. In a technological society,

the concept is expanding to include the media and electronic text in addition to alphabets and numbers. Individuals must be given life-long learning opportunities to move along a continuum that includes reading, writing, critical understanding and the decision-making abilities they need in their communities (CLQ, 2000).

Increasingly, literacy is part of a variety of skills needed for an adult to function and succeed in society (Kickbusch, 2001). The connection between literacy, health, disease and child survival will gain more importance in developing nations the next century. No country has achieved continuous growth without achieving an adult literacy rate of at least forty percent (MDG, 2005). Healthy populations will survive disasters and epidemics. Healthy and literate populations will sustain an economy.

Maternal Illiteracy and Child Survival- Review of Published Studies

Female illiteracy is defined as the percentage of women aged 15 and over who cannot read and write (UN Development Program [UNDP], 2004). A mother's level of education correlates closely with a child's risk of death before age two (Kickbusch, 2001) (Table 3). Illiterate women have a higher risk of early marriage, pregnancy and child mortality (UNDP, 2004). Educated women are more likely to be able to earn a living and support their families. They are also more likely to postpone marriage, take better care of their families, and pursue education for their daughters (Table 4).

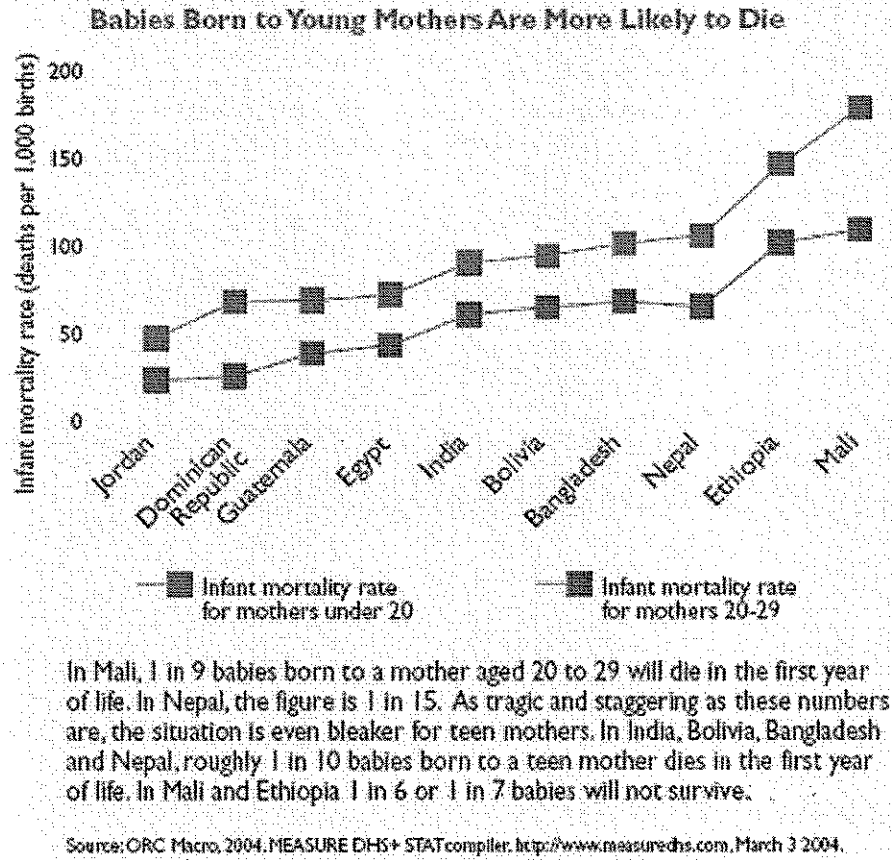
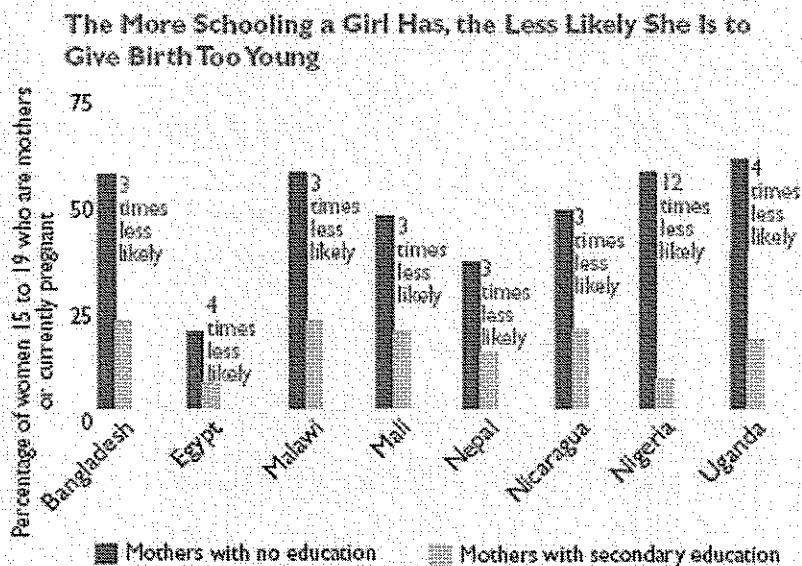


Table 3 (Save the Children, 2004, p.13)



In Bangladesh, Malawi and Uganda over half of 15- to 19-year-olds with no primary education are mothers, while only about 1 in 5 women with secondary education has given birth or is pregnant. Even in countries like Egypt, where births to adolescents are lower overall, girls with secondary schooling are much less likely to become young mothers. About 1 in 6 girls without a primary education is a mother, compared to less than 1 in 20 with secondary education.

Sources: Demographic and Health Surveys, reported in Westoff, DHS Comparative Reports No. 5. (2003)

Table 4 (Save the Children, 2004, p.22)

In a literature review article by Kickbusch, fifty developing countries were examined, evaluating ten variables and their relationship to life expectancy at birth. These included the gross national product averages, female illiteracy rates, male illiteracy rate, percentage of urban population, access to safe water, hospital beds per population, physicians per population, energy consumption per capita, number of family planning programs and the amount of oral rehydration solution packets per 100 episodes of diarrhea. From these ten factors, female literacy was found to have the largest contribution with increasing the life expectancy of a child. It may be easy to understand how family planning (the second most

vital factor) lowers birth rates, but a mother's literacy has a surprising impact. (Kickbusch, 2001)

In India, young mothers are common, with some districts accounting for 50% of girls married before age 15. Low levels of female literacy expose girls to pregnancy in their teenage years. Teenage mothers have an increased maternal mortality, increased birth rate, and increased prematurity compared to older (>20 yrs) mothers. Also, women who were literate had half of the number of children compared to women who were illiterate (Hao, 1990).

A study from Nicaragua looked at the relationship between intelligence and maternal illiteracy. Literacy programs had a strong effect on women of low intelligence, but a minimal effect on women with high intelligence. The study provided evidence that education for mothers of low intelligence may have the greatest effect on child health statistics (Sandiford, Cassell, Sanchez & Coldham, 1997). Babies born to teenage mothers in Nigeria, compared to mothers over 20 years old, had a higher infant mortality rate. The rate for teenage mothers was 121 infant deaths per thousand live births compared with 79 for older mothers. (Nte, Ekanem, Gbaraba, Oruamabo, 1997).

The lack of female education also has a direct bearing on several factors: reproductive behavior, fertility, morbidity, and child mortality (National Institute of Population Research and Training [NIPORT], 2003). Education for women helps the health of their children, but also for themselves. Young people (age 15 – 24 years) who completed primary school are less than half as likely to contract the HIV virus compared to those that have little or no schooling (MDG, 2005). Low levels of maternal education were evaluated in relationship to child mortality with data from the Indian Family Health Survey in the US. Twenty-two outcomes

were investigated, representing child mortality and morbidity, clinical management of illnesses, utilization of services and health behaviors. Maternal education was the most significant correlate in each of the outcomes. Even in minimal low levels of education, child survival prospects and health related behaviors increased (Basu, 2005). Studies from Ghana, Nigeria, Uganda and Pakistan all report similar findings (Bour, 2003) (Caldwell et al, 1982) (Kuharuza et al 2001) (Greenspan, 1992) (Table 5).

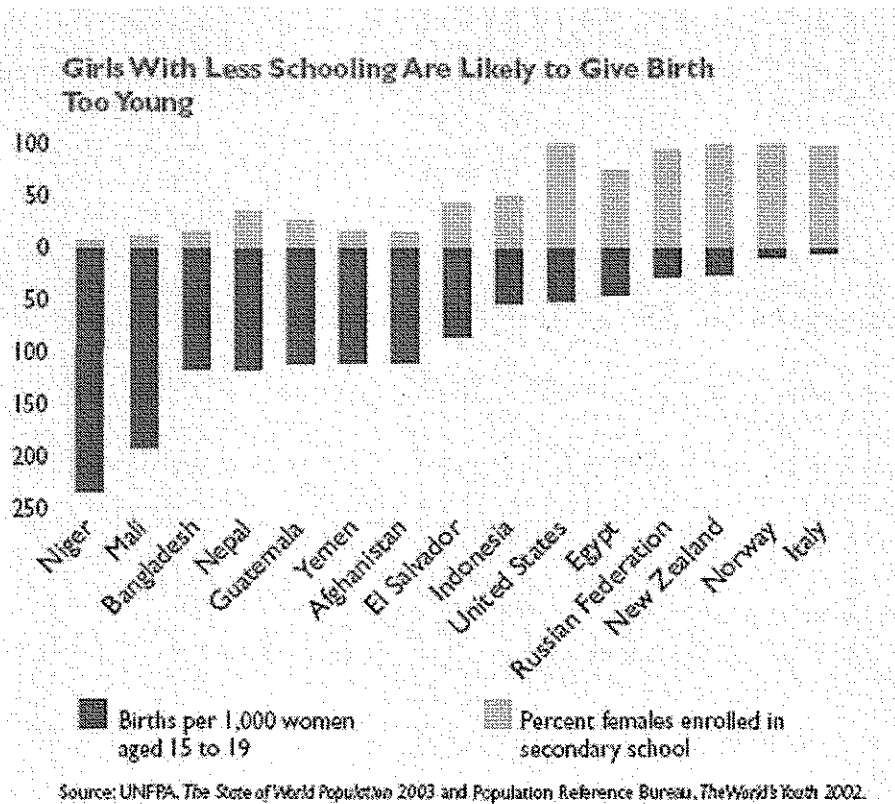


Table 5 (Save the Children, 2004, p.16)

Save The Children, a non profit US based NGO, developed a Motherhood Risk Ranking based on UNICEF and UNESCO data. They compiled the statistics of "Early Marriage" (Percent of women aged 15 -19 ever married) "Early Motherhood" (Births per 1000 women aged 15 – 19) and "Risk to Babies" (Infant deaths per 1000 births, mothers

under 20). In the 2004 data, the list of twenty countries in the highest ranking of risk were also in the highest thirty countries ranking in female illiteracy. This review of statistics presents a causal relationship with risks of young motherhood and the high incidence of female illiteracy in these nations (Save the Children, 2004).

Data from health studies has compared the maternal illiteracy rate with child and infant mortality, and found a positive relationship (Basu, 2005). This significant factor of maternal illiteracy may be based on a number of synergetic issues: 1) the age of the women giving birth, 2) failure to complete primary or secondary schooling, 3) low income living environments, or 4) a generalized lack of health knowledge. (Sandiford et al, 1997) Although this data is significant, most child health programs worldwide have not incorporated maternal literacy training in their programs. Each year, millions of dollars are poured into child survival programs in developing nations. One wonders why few are looking at this prime factor.

Evaluating Maternal Education

An analysis of infant and child mortality indicates that, on an average, an additional year of education for a mother results in a reduction of 9/1000 in the mortality rate of her children (Cochrane et al 1982). Is the mother's general education or her health knowledge the key factor in child survival? Children born to uneducated mothers are nearly twice as likely to die before age 5 as those born to mothers who completed primary school (Bicego and Ahmad, 1996). General education could benefit the mother in increased intelligence, better employment opportunity, greater sustainability in life skills, and increased confidence. Education could affect the ability of the mother to understand when to have clinic follow up appointments, medication instructions, nutrition information and milestone steps of child

development. Educated mothers are fifty percent more likely to immunize their children (MDG, 2005). Medication errors occur frequently in an educated population, often near 10 %. In patients that have low literacy skills, prescription information is five times more likely to be misinterpreted or misunderstood (Knopper, 2000).

Illiteracy and navigating the Health System

The question of how literacy rates affect a person's health was reviewed in the US in 1998, when death rates for chronic disease, communicable diseases and injuries were all inversely related to educational level (Neilson – Bohlman et al, 2004). A study of cancer patients found that lower literacy patients were more likely to present with advanced cancer and less likely to have received prior physicals and screening (Fernandez, 2005). Compared to higher literacy groups, patients who could not read or write have the greatest "illness related dysfunction" in their lives (Hartsell, 2005). As an example, an observational study of 408 diabetic patients with low literacy scores were found to have the lowest rates in of glycemic control and higher rates of retinopathy than other diabetic patients in general (Fernandez, 2005).

WHO's Adolescent Health Program supports a social and promotional strategy, rather than a pure medical approach. Interventions are needed to reach adolescent mothers where they live, study and play (UNESCO, 2005). Health education programs need to have more life planning curriculums that are interactive rather than lecture based; they also need to be focused on self esteem, exploring attitudes and values in the community (UNESCO, 2005). If health education materials are in written form only, the illiterate population will not know how to access community resources. As an example, illiterate mothers and their infants living in the garbage dump area of Manila, the Philippines had a high rate of tuberculosis (TB), but

no knowledge of how to access the local city health services. Trained community health care workers began initial home visits, built relationships with families, and discussed the importance of testing and evaluation for TB. Unable to have a clinic at the squatter area, the health workers then accompanied the residents in public buses to government clinics across town, enabling the mothers and their infants to access evaluation tests and treatment (Ditto, 1989).

Psychosocial Consequences of Illiteracy

Lack of education and illiteracy has physical, psychological and emotional effects. Some of these may be due to the economic causes, but can have significant consequences in behavior. One significant emotional cost is shame and embarrassment due to a lack of reading or education (Hartsell, 2005). Patients do not want to easily admit a lack of ability to understand instructions or explanations. This in turn creates more emotional duress. Social disparities in women's health may shape behaviors in the next generation. As one disadvantaged generation is educated and services made available, social needs may be reduced in their children. Literacy, especially in mothers, leads to an enhanced quality of life for their families and improved long term outcomes for their children (UNESCO, 2005) (Table 6).

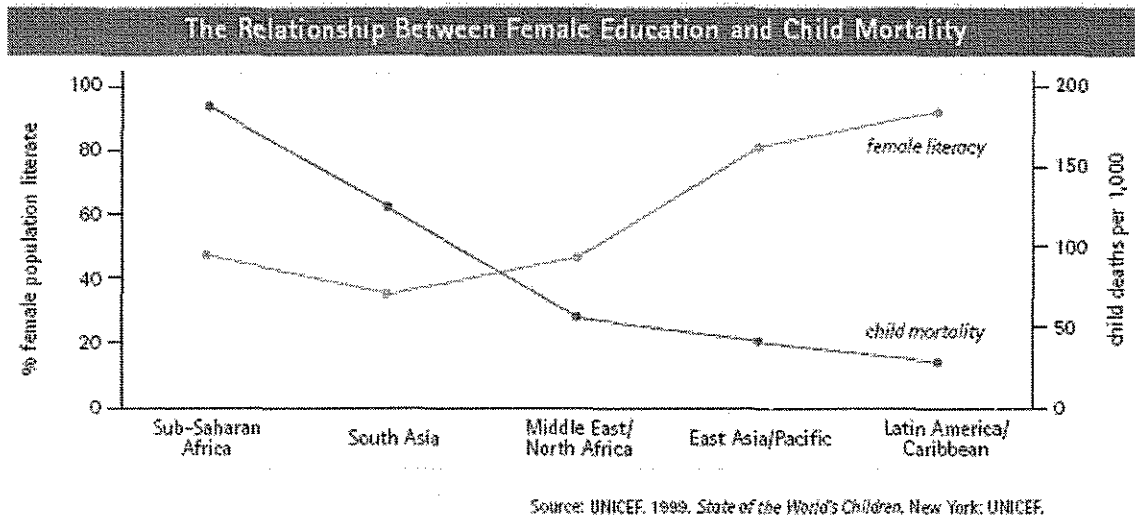


Table 6 (Save the Children, 2001, p.9)

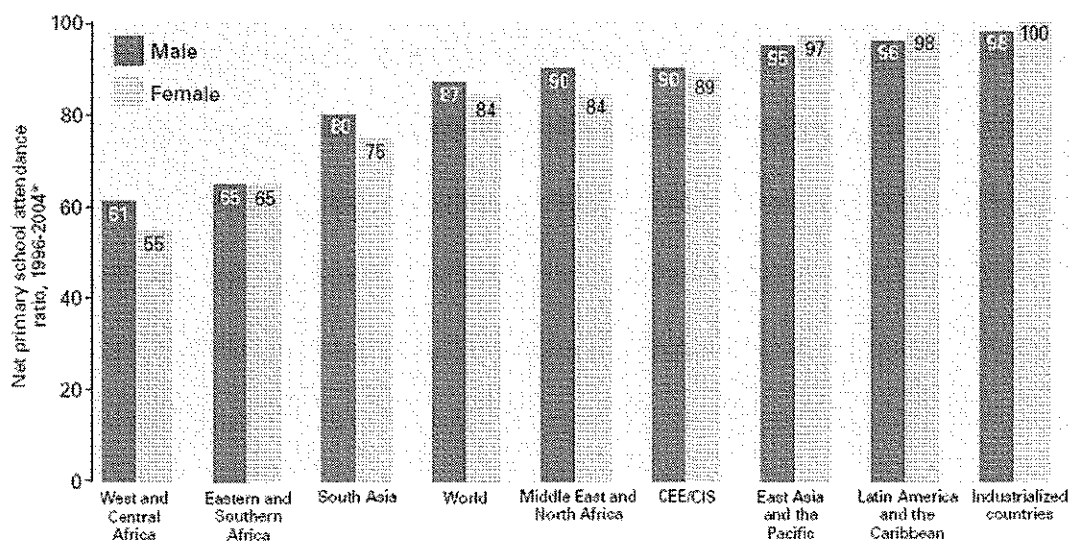
Cultural backgrounds can affect health and literacy status. Minorities may not have access to schools or facilities. In the Banaue province of the northern Philippines, tribal families in mountain villages could not access the schools that were in the larger towns. Irregular public buses were the only transport available, and children had no place to sleep in the town at night. Children said they were ostracized by other students for their different appearance in colored skin as well as dress. When the children did not go to school, families were able to use their labor in the rice fields. As a result, few tribal children attended school, and the illiteracy rates were high (Ditto, 1989). In most developing nations, school is not free, and parents have to pay tuition fees for their children to enroll. Low income populations will have lower enrollments in the school system due to the financial burden. The social fabric of the maternal illiterate finds an increased incidence of smoking, alcohol and drug use and depressive symptoms (Kahn, Wilson, Wise, 2005).

Young Girls, Rural Environments and Illiteracy

Traditional lifestyles may prevent learning more about resources. In Banaue, young adolescent girls of child bearing age not surprised to have swollen necks, seen as normal growth. The indigenous people of the region, the Ifugao tribe, had an increased incidence of thyroid goiters in women, caused by an iodine deficiency in the soil. The iodine deficiency in child bearing women produced birth defects known as cretinism and deafness. Injections of oil based iodine, given to adolescent teenagers, once every 3 years, prevented this problem from reoccurring (Ditto, 1990).

In Nepal, demographics show that 40% of girls get married before they reach 15 years of age. Marriage of 10 – 12 year olds is common (Pennells, 1998). With few exceptions, marriage ends all schooling. This helps promote an illiteracy cycle through generations. Daughters are expected to be married; daughters are not expected to be schooled. Maternal illiteracy is more of a factor compared to paternal illiteracy in determining if their daughters should be schooled. When parents have these negative attitudes towards girls' education, maternal illiteracy will continue (Pennells, 1998).

Understanding cultural barriers against girls' education is important. In a rural society, an educated girl may be perceived as difficult to be married. Some schools are not girl friendly, with efforts and attentions towards boy students. In rural settings, primary schools may not have running water or toilet facilities (Pennells, 1998). In the rural culture, a girl child may be seen as a laborer; class times may conflict with household chores or sibling daycare duties. All of these factors lead to less time for girls to attend school and leave them deficient in education and literacy skills at an early age (Aras, 1992) (Pennells 1998) (Table 7).

Figure 2.6: In several regions, girls are more likely to miss out on primary school than boys

*Data refer to the most recent year available during the period specified.

Source: United Nations Children's Fund, *Levels, Trends and Determinants of Primary School Participation and Gender Parity*, Working Paper, 2005.

Table 7 (UNICEF, 2005, p.19)

After a woman has children in a rural setting, literary and non formal education models are often not seen as an effective investment for the family. Programs have been criticized in the past as non relevant, poorly taught, few materials and poor physical environments for learning (Pennells 1998).

Cultural and social changes continue to evolve as attitudes change regarding sexual activity outside of marriage, especially in urban areas. The media and the press worldwide exert increasing influence for relaxed attitudes regarding sexual activity. In low income situations, sex may be exchanged for material needs. Adolescents do not have the knowledge about their bodies, sexuality nor contraception that is adequate in many environments. Countries need to consider strategies that help support and improve adolescent health and pregnancy prevention. Supporting school enrollment for girls is vital, and pregnant girls

should be allowed to continue their education. It is beneficial to encourage governmental programs and policies, working with national leadership in the Ministries of Education and Health, provincial health officers, local school superintendents and teachers to support such matters.

One of the most effective ways to improve maternal illiteracy is to focus on girls in economically deprived countries who are at a risk at becoming young mothers. There is strong evidence that adolescent girls who remain in school are less likely to have children at a young age. For example, in Nigeria, research showed that only 7 percent of women with seven years of schooling gave birth before age 20, compared to 43 percent of those with no education (Caldwell, 1982). In Pakistan, 16 percent of women with seven years of education gave birth before age 20, compared to 54 percent with no education (Chandrashekar, Rao, Nair, Kutty, 1998). If pregnant students drop out of school, they are more likely to have a lower paying job, become separated or divorced compared to women who finish school (Singh & Wulf, 1990). Preventive strategies, especially in adolescent female health, need to be implemented for long term gains.

Program Interventions

In order to incorporate maternal illiteracy factors into child health programs, several factors need to be considered, including analyzing local data and developing evidence-based literacy interventions. Evidence-based public health interventions involve analyzing local data, reviewing published studies, assessing available materials, making planned interventions and evaluating the outcomes (Levandowski, Sharma, Lane, Webster, Nestor & Cibula, 2006).

Organizing and developing a coalition of community based members allows a process when they can have a sense of ownership in the process (Mobilizing for Action through Planning and Partnerships, [MAPP], 2004). In planning for a community based training program, priority should be given to a grassroots organization, rather than a top down model. Efforts should be made to not politicize the planning, and to integrate gender awareness in every step. As the community structure builds its capacity, it is important to establish respectful and regular government communications. MAPP is a community-wide strategic planning tool for improving community health. Community participation leads to collective thinking and, ultimately, results in effective, sustainable solutions to complex problems.

Although the MAPP model was developed by the US based National Association of County and City Health Officials, it has merit for international community applications. Broad community participation is essential because a wide range of organizations and individuals contribute to the public's health. Public, private and voluntary organizations can join community members and local associations in the planning of health services, including maternal illiteracy and child mortality strategies. The MAPP process brings these diverse interests together to collaboratively determine the most effective way to conduct public health activities (MAPP, 2004). Using the MAPP model, a coalition can help define what resources are in the community. This is the first step of organizing for success, and developing a partnership with the community. Once the coalition has developed into visioning what they may want for their community, planning would progress into the Four MAPP assessments: 1) Preparing for Community themes and Strengths assessment 2) Implement information gathering activities, then 3) compile the results of the Assessment and 4) Ensure that community involvement and empowerment is sustained (MAPP,2004). In

internationally funded projects, local assessments can be assisted by international coordinators and a project evaluation team. Coalition groups can form community mapping projects to assess need areas, and how to meet with mothers and their children in home studies or clinic visits. Using focus groups and interviews, ideas and areas of interest can be gathered regarding non formal education and literacy meetings, ideas and beliefs on pregnancy prevention methods, market cooking classes and child health learning teams. After completing the assessment, coalitions could follow the MAPP model and identify strategic issues, formulate goals and strategies, and work in the community as well as with the local public health system to evaluate, plan and implement a plan of action. (MAPP, 2004)

Grassroots planning requires as much inclusion in the community as possible, getting the lowest tier of community members involved: mothers, fathers, grandparents, extended family, school teachers, community health workers, local government agencies, business owners and civic representatives including volunteer and religious groups.

Reviewing Published Data

An analysis of the community's epidemiological data should include data on adult literacy, maternal education and infant and child mortality rates. An analysis of 16 reports from Asia, Africa, Latin America, and the Middle East found maternal education was positively associated with the nutrition status of their children. The impact of the father's education level on a child's survival is, at the most, one half of the mother's education. Income alone does not explain this impact (Cochrane et al, 1982).

Attendance at well run antenatal care programs is associated with lower child and maternal mortalities (Chandrashekar et al, 1998). If young pregnant women have access to appropriate antenatal care, and literacy training, their chances of delivering a healthy baby

greatly improve to those similar to those women in their culture that are older (Singh & Wulf, 1990). In northern Nigeria, women ages 13 – 16 who were pregnant and received prenatal vitamins and nutritional supplements had reduced rates of obstructed labor (Singh & Wulf, 1990). Family Health International's study from Chile, Egypt, Honduras, Sweden and Thailand found that the number of prenatal visits had a significant effect on the health of the mother and chances of having a healthy baby (Senderowitz, 1995). Attendance at high quality antenatal programs is associated with lower child and maternal mortalities (Chandrashekar et al, 1998).

Is health illiteracy the real problem?

Health literacy, to enhance the standard literacy definitions, looks at the ability to use cognitive and social skills to "determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote health and maintain good health" (Nutbeam, 1998, p. 357). Another definition by Kickbusch (1997, p.266) states: "Health literacy implies the achievement of a level of knowledge, person skills, and confidence to take action to improve personal and community health by changing personal lifestyles and living conditions." This definition has had a broader interpretation to go beyond reading pamphlets and making clinic follow up appointments. By improving people's access to health information and their ability to use the information, health literacy is a critical component to empowerment.

Health literacy, by itself, is dependent on a general platform of literacy. Poor literacy can affect people's health by direct means, limiting their personal, social and cultural development, as well as hindering the development of health literacy skills (Nutbeam, 1998). As an example, in an HIV-AIDS clinic, lower health literacy was associated with poorer

knowledge of the patients own health status, disease and treatment knowledge (Kalichman & Rompa, 2000). Limited health literacy is highly associated with poor health status; a lack of literacy skills predicts deficient health more than education, income, ethnic background, or any other socio-demographic factor (Weiss, 2001).

Health literacy is directly related to health education. Failures in health education may be a factor in health illiteracy, but not all health training is done in the formal setting (Kickbusch, 1997). Studies have shown that health care providers need to provide material that is easy to read, with a literacy level that is equal to the population of consumers (Levandowski et al, 2006). Material must also be culturally appropriate to the population. Even in the United States, reading comprehension is about 4 years below a person's highest grade completed. Among US high school graduates, about 15% read at or below a 6th grade level (National Work Group on Literacy and Health, 1998). Low literacy has been associated with self perception of poor health by patients and a barrier to care (Baker, Parker, Williams, Clark & Nurss, 1997).

Save The Children has made maternal literacy an important factor in their training programs. In Nepal, they have made the use of illustrations in clean birthing kits more than written instructions due to the assessment of women being trained had poor reading skills (USAID, 2001). To understand the depth of the illiteracy in a clinic setting, maternal age and education data needs to be included in clinic data.

Training Health teams

How does the health system incorporate literacy training as a strategy? Building a strong and broad coalition is important. Stakeholders for a community based program include those outside of the standard health care provider model. Stakeholders for training can

include local, regional and national government, society groups, teacher groups, NGOs, advocacy groups and the private sector (business and education). Non formal educators can include local businessmen and women, those with agriculturally based occupations as well as civic and social organizational leaders. As an example, hairdressers and grocery clerks could be mobilized to encourage infant mortality messages, literacy workshops and regular immunization schedules.

Educators should be a vital partner in supporting literacy movements, especially to those in the community outside of the formal school system. Resources could include the national provincial education system and its leadership, as well as local teachers. Non formal methods of education are the most appropriate for adult learners. Focus groups, community workshops, and reading groups are examples of local advocacy based activities. As parents are involved in learning how to read, then reading to their children, they will increase their own literacy (Cross, 2001). Training should initially be limited to a small amount of information at one time, then progressed. Simple methods of training include using the "teach- back method" of communication, getting the person to repeat back to you what has been told (AMA, 2002).

In the health care setting, clinic and health care stations need to consider strategies for effectively reaching the illiterate mother. Young mother are at higher risks for complications with pregnancy and higher infant mortality. Adolescent health needs to be provided in a more comprehensive manner, to include pregnancy prevention methods and antenatal care. Interventions for infant and child health will require an evaluation of training materials and communication messages to the mothers. Focus groups of mothers from the local community

can review materials and give feedback to the clarity and appropriateness of how each message is communicated.

Eighty percent of the world's population lives in an oral and visual culture. This large population learns through listening, and watching rather than reading or writing (Kickbusch, 2001). In working with an illiterate/partially illiterate population, written material should be simple, easy to read and clear. It should contain a lot of visual information including illustrations, photos and drawings. All materials written or drawn need to be reviewed for cultural appropriateness and sensitivity. Materials need to be developed in multiple presentations (posters, TV, radio, face-to-face and at community based health fairs). Using community gatherings for dramas, song contests, story presentations, group discussions and TV or radio education spots are other suggestions to communicate health messages in a non written form for illiterates. Studies show radio is especially effective in retaining literacy skill, as well as increasing health communication competencies (Pennells, 1998).

In order to see effective programs developed for illiterate mothers, priority must be placed on training health care personnel, and regularly updating their skills. By using regular training and periodic supervision, well motivated and skilled health care personnel can provide high quality health care. Graeff described the steps of health communication methodology to assess, plan, train, monitor and maintain program personnel. Graeff then applies these steps in a developing world context, applying health education to child survival programs (Graeff, 1993). Program emphasis is on behavioral assessment, then behavioral change. Behavioral assessment involves understanding what behaviors the audience is already performing, what may compete with these behaviors, and what events have influenced the behavior. Behavioral change involves selecting the most ideal behaviors to

target for the highest health impact. Skills training models are described in non written and verbal techniques with instructions, demonstrations, practice, feedback, and continued homework practice and feedback (Graeff, 1993).

In Paraguay, a community based antenatal program was structured to provide literacy training with each antenatal clinic visit. Booklets with visual images about maternal health were provided. In three visits, mothers could recall and explain in their own words the health care messages. This study demonstrated that women of limited educational experience could make positive gains in maternal health literacy in a community based program (Ohnishi, 2005).

Yajima, Takano, Nakamura & Watanabe described the positive contribution of community participation in increasing the health literacy of women. By increasing local participation through community social networks, health literacy is improved. (Yajima, Takano, Nakamura & Watanabe, 2001). Adult literacy and education is effective with three key strategies: 1) Develop policy research and advocacy for non formal adult learning, 2) build strategic part and collaborate with local coalitions and 3) Work for capacity building and leadership development for long term sustainability (Pennells,1998). Long term goals should be to increase the impact and the efficiency of women's literacy initiatives. Literacy planning at local and district levels, as well as with governmental leaders can make this a priority for national focus. Governments should also be encouraged to provide literary materials for continued learning. Exposing children to reading books early in life increases early literacy development. Book sharing and reading during a child's early stages of development has been shown to be a key factor in later school success (Jones, Franco, Metcalf & Popp, 2000). Other programs have advocated early childhood development

programs, citing improved primary school scores with those that attend (Pennell, 1998) (Table 8).

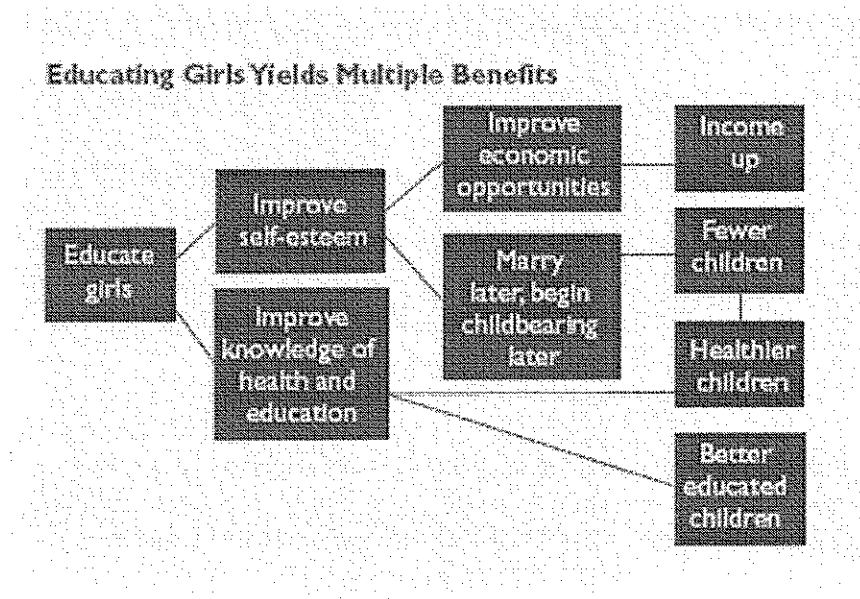


Table 8 (Save the Children, 2004, p.2)

Evaluating the outcomes

The evaluation of training mothers with literacy is based on the concepts that if mothers have a higher literacy level, their children will live longer. Statistically, significant associations have been found with maternal illiteracy and under five mortality, infant (< 1 year) mortality, and low MUAC (mid upper arm circumference) (NIPORT 2003).

Renkert and Nutbeam wrote that knowledge not only transforms, but also empowers women and improves self esteem (Renkert & Nutbeam, 2001). Mobilizing resources for social networking increases the maternal health knowledge scores. Communities where there is active participation and higher social capital will yield better health status (Kawachi, Kennedy, Lochner, Prothrow –Stish, 1997). The process for a community coalition is to

focus on a needs assessment of the community. After the assessment is completed, the target topic of maternal illiteracy and child survival can be defined to the specific populations of young, unmarried or married mothers and those mothers that did not complete school. A key input for guidance would be assistance from child survival leadership from non governmental organizations and program goals, objectives and logic model could be established. The process would be completed with the actual implementation of the health care messages, literacy training and evaluation. Key outcomes would include improved literacy rates, infant mortality rates and child survival rates in the population served.

In Manila, a project was started with a community coalition for clean water in the squatter zone of Balut, where water was carried into the housing area and sold per bucket. The process of deciding where and how water could be brought into the community was decided by an elected group of men and women in the community who met weekly to discuss the issues of not just clean water, but the impact that the water supply would have to the community.

They discussed key questions for the context of the problem. What would the men do that sold water for employment? How would the water be kept safe and clean, and the pipes in working order? Whose house would be closest to the water supply? How would we get the funding for the pipes, electricity for the pumps, and cement for the pump platforms? With assistance from a community development mission worker, David Anderson, city water and electrical leaders became interested in helping the coalition make plans. Monies were collected from the squatter homes to help pay for cement, and donations were given from a local university to buy the needed equipment.

The water project became a training opportunity in the making, using the topic of water to provide health education messages regarding skin diseases and washing, drinking safe water to prevent diarrhea, and drinking water to prevent dehydration. Training was done with posters, discussion groups, drawings, dramas and participation from school age children. Teams of local men and women helped install the pipes, mix the concrete, and wire the pumps for electricity. After the successful installation of the water pipes was complete, the coalition was motivated to work on another project.

The coalition selected immunization of children for measles. Measles would kill 30 – 40 children each spring in the community of 40,000. Many mothers were illiterate and had no knowledge of how to access the health clinics a distance away from the dump, and did not take their children for care. Grandmothers became involved, wanting to help their grandchildren. A measles vaccination clinic was initiated by the coalition, inviting primary health workers to train local members how to conduct an immunization clinic. Goals were set for the training times and the program developed into the highlight of the community's social events. After several meetings of planning, immunizations began in July. Vaccinations were held once a month, vaccinating all children under the age of five that had a birthday within the past six months.

The following April saw only eight children die of measles, and the following year, only one fatality. Child mortality had been decreased due to educating the mothers and providing clean water and access to immunizations. The local health department had been a part of the immunization clinic, and was encouraged with the community involvement. Afterwards, they built a clinic to provide services to the squatter area, working with coalition leaders (Ditto, 1989).

Recommendations for Child Survival Projects

1) Be an advocate for girls' education. Help girls attend school, and stay in school. Build effective community coalitions that will support girls' education in their communities.

Support local coalitions to develop plans for supporting and negotiating with local leaders and family leaders to allow girls to attend school and stay in school. Education helps girls become better mothers and increase the child survival rate. Provide ways for pregnant girls to attend school and not drop out.

2) In child survival programs, target services to first time mothers and newly married girls. Require that data be collected in all health clinics regarding the mother's age and education status to assess risk factors. This will help in documentation, and allow high risk identification of mothers that may have a death of a child under the age of five. Newly married girls need support for delaying pregnancy. First time mothers need mentoring and training support, especially for the first year as new skills are developed. Provide more frequent clinic visits and informal education settings for first time mothers to help decrease the incidence of the most common preventable childhood diseases. Provide training materials for the illiterate in non written form.

3) Support non formal educational opportunities for women. Target training opportunities for women that are out of school. Develop models that can be easily adapted in different settings, i.e., market sites and home venues. Use training to improve health literacy as well as general literacy skills. When adolescent girls have options to earn income, they have more options to stay out of poverty.

4) Support efforts to change cultural hardships for women. Promote opportunities for girls to delay marriage and continue primary education. Support community coalitions to

discuss options and provide community dialogue for change. Collaborate with government and non government organizations to support new opportunities for girls and women.

5) Advocate increasing the age of marriage. Increasing the age of marriage will increase the age of pregnancy and increase child survival rates (UNICEF, 2004). Support grassroots organizations and coalitions that can promote laws increasing the age of marriage. Work as an advocate to the government to encourage government policy or laws to increase the age of marriage.

Advocacy Roles in Public Policy

The issue of supporting maternal literacy and child survival topics in the US government requires lobbying the Senate and House of Representatives. In a survey conducted by Lake, Snell and Perry for the US Coalition for Child Survival (Lake, Snell & Perry, 2004) congressional staffers were interviewed for their knowledge and opinion of international child survival needs. After several topics were discussed and definitions of child health defined, conclusions were made as to the best effect method of lobbying the political parties.

Republican staffers seemed to be engaged in topics like child survival for the first time. With President Bush's focus on HIV/AIDS in Africa, Republicans are now involved in new issues that they need and want to learn more about. Democrats, who have been long term supporters of child survival, need to be updated on the issues; they need relevant facts and success stories to keep engaged (Lake et al.2004).

Focused goals for public policy advocacy

1. Keep the message clear that a large number of children are dying from preventable causes. These include child survival messages and the need to support maternal literacy in development of USAID programs worldwide.

2. Encourage congressional representatives to fund global education, especially towards girls, in order to decrease maternal illiteracy. Use messages selectively when lobbying political leaders and their staff. Republicans may understand the benefits of supporting and working in child survival better in the perspective of national security. Democrats need to know that funding levels have been stagnant over the last several years, and need renewed support (Lake et al.).

3. Collaborate with other organizations and advocacy groups. The US Coalition for Child Survival is a group organized to lobby and support for the needs of child survival in the United States. Non governmental organizations such as World Vision, Save the Children, Oxfam, Global Health Council, The Core Group, and the Bill and Linda Gates Foundation are key groups to support in their efforts to publicize and support programs to decrease maternal illiteracy in their child survival projects. National legislators need effective lobbying in order to be equipped to communicate with the USAID and the United Nations' UNESCO and UNICEF programs. Working with educators, it is important to place illiteracy as the greatest need in a national educational platform for each nation studied. Industries with an international portfolio can also be lobby to support such issues as well.

4. Establish relationships and build partnerships with local institutions and groups. Assess the ability for each group to invest and have ownership. Continue to help define empowerment for women, including non formal methods of education to help mothers become better educated in general, but also to increase a woman's household income and improve the quality of care for their children, helping to increase child survival.

Conclusions

In order to see long term improvements in child mortality, maternal education must be included as part of any child survival program. The need for connecting the issues of maternal illiteracy and child health is vital to see lasting changes in the future lives of populations served. Child health projects need to advocate, train and support the ability of women to be able to read and write. General literacy has a significant impact on child survival. Health literacy, as an outcome of general literacy, will improve outcomes in clinic settings, but general literacy still will have the greatest impact for the lives of the next generations. Child survival programs need to be built with local coalitions of community members, insuring that grassroots planning completes an effective assessment, facilitates clear goals and objectives, designs an effective program, and oversees implementation, quality program monitoring and evaluation.

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