

Health Psychology

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Most people do not live in the USA; most people do not live in so-called Western industrialized nations. In fact, 80% of the people on earth live in developing countries. They have the same daily health concerns that we in Western societies have: How can I find healthy but inexpensive food, get rid of this cough I cannot shake, stop feeling so stressed out, cut out my bad habits, and get treatment for my illness? However, their health problems are more likely to be deadly or disabling. Their stressors are more likely to be chronic ones added on to our usual acute life events and daily hassles – chronic ones being a shortage of water, no electricity, and no paid employment. Health services may be too distant, too ill-equipped with medicines and trained staff, and too unreliable to attract patients. Resources to help cope with problems are in short supply: subsistence farming provides barely enough food for the community’s needs, poor quality education and illiteracy impede understanding of prevention and cure, and lack of family funds means sick people cannot seek treatment in the distant capital city. Social support may be strong, so that sick people have someone to care for them at home and hungry families have someone from whom they can borrow food. Yet family support may also be strong for a husband who decides not to seek help for his wife while she bleeds excessively after a home delivery. Social norms support stigma against people with mental illness, HIV, tuberculosis, elephantiasis, epilepsy, and even childless women. It is a miracle, if one survives this gauntlet long enough to become afflicted with the diseases of old age such as a heart attack, for life expectancy in the least developed countries is 55 years.

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Current Content of Health Psychology

Health psychology is a relatively new field and international health psychology even newer. Anthropologists and cross-cultural psychologists have worked in Africa and Asia for many years, but I rarely find another health psychologist when I work in the poorest countries. With their skills they would have a great deal to offer. Health psychologists know not only about cultural differences but also about basic cognitive and social processes as they apply to health problems. They know how to use qualitative and quantitative methods to describe problems and evaluate solutions. Health psychologists generally are problem-focused: they study health problems where social-psychological and behavioral processes are part of the problem. Health psychologists are also solution-focused. They are not satisfied with simply describing and measuring stress and its effect on health; they also want to evaluate ways to reduce stress. They study diet and exercise and ways to enhance these and other lifestyles through health promotion. International health psychologists use the same problem- and solution-focused approach in developing countries. Working with a local team of experts who have identified the pressing local health problems, they examine sources of the problem and ways to tackle it. The problems are different in developing countries, but the steps taken to solve them may not be. If you cannot use public service television advertising to tell people about the benefits of breast feeding and bed nets, you can nonetheless train community health workers or teachers to provide lively entertainment-education on these topics to groups of people. Instead of tackling heart disease, stroke, and cancer, international health psychologists tackle diseases of children who die in large numbers or are left physically and mentally disabled by the age of 5. They also focus on women who are at greater risk than men of getting HIV, who die or are disabled as a result of giving birth, and who are the guardians of their family's health, yet have little decision-making power. Instead of working with hospitals where only a small minority of the population go for treatment, international health psychologists work with rural communities and village health workers to prevent death and disease.

Rationale for an International Focus

Why might psychologists want and need to become informed about international perspectives on health? First, we have come to realize that we can learn from problems and solutions being evaluated in other countries. We can learn how people from different cultures think about causes of illness and find strikingly similar ways of thinking in our own country. We can learn how strategies to change health behavior have succeeded or failed in other countries, for example with respect to abstinence and condom use, and adjust our own strategies accordingly. We can broaden our theories, for example theories of stress and coping or theories of behavior change, on the basis of research in developing countries. Second, psychologists have an important role to play in improving the health of people in developing countries.

As health psychologists with a population health perspective, we are welcomed by multi-disciplinary teams of researchers and health workers who attempt to resolve health problems through environmental, social, psychological, and medical changes. Prevention of illness is less expensive than cure, and psychologists are experts in preventive behaviors. Health workers, therefore, seek input from psychologists to help them promote a large array of good health behaviors. For example, hand-washing and home management of dehydration far exceed hospital or medical treatments of diarrhea. Behavior change in the use of treated mosquito bed nets are at the forefront of the fight against malaria, given that no vaccine is yet available. Abstinence and condom use are still the only ways to prevent HIV. Having a birth plan to give birth at a clinic rather than at home increases a woman's chance of surviving without disability – in many countries, delivering a baby is riskier than an abortion. Persuading mothers to breast feed their infants for 6 months and to serve animal source foods and vegetables to their young children are keys to overcoming the appalling levels of malnutrition. Psychologists may not study viruses and vaccines, but they know more than others about attitude and behavior change.

Furthermore, why might psychology students want to become informed about international perspectives on health? More and more young people are traveling out of curiosity about others and a desire for personal growth. They feel a sense of responsibility at least to be informed about the struggles of people who live in other countries. Some want to work abroad, after their degree, with Peace Corps or one of the many non-governmental organizations such as World Vision or Save the Children. Most are relatively naïve about the challenges they will encounter, but they are eager and well-intentioned. Other students are critical of these adventurers and accuse them of being “neocolonialists” and “cultural universalists.” My class always has a rousing debate on these two positions. Some students mistakenly think that American psychologists parachute themselves into remote places and start controlling people's health behaviors. The reality is that we are visiting experts who work alongside local people who want to change. Organizations are happy to have students, not because they have the skills to really make a difference, but because they are the international experts of the future. Their international perspective will help American donors set proper priorities for the fight against hunger, illiteracy, HIV, and malaria. They will understand that the usual strategies of funding hospitals and expensive equipment are not the best solutions. Students with a background in psychology will see first-hand that their skills in the area of environmental, social, and behavioral change are put to good use. As part of class preparation, students can be encouraged to Google organizations welcoming young volunteers and at the same time discover the common problems faced by people in places such as Africa and South Asia.

Health is highly valued by people everywhere. Along with education, health is recognized as one of the most important resources a people and a nation can possess. Goals set by the international community toward which all international experts are now working, called the Millennium Development Goals, consist largely of improved health (compare with the US *Healthy People* Initiatives). Among the eight goals, to be reached by the year 2015, are reducing hunger, child deaths, women's

deaths during delivery, and infectious diseases such as HIV and malaria. To accomplish these are goals that include clean sources of water, proper waste disposal, use of skilled birth attendants, use of condoms and other forms of contraception, and gender equality in education. Although some but not all of the goals will be met on time, by some but not all regions of the world, their ratification by all countries belonging to the United Nations provides an incentive to work cooperatively. Students can find online the site for the Millennium Development Goals and how much progress has been made in sub-Saharan Africa, South Asia, and Latin America.

In this chapter, I provide lesson plans for three international topics that might be used in a course on health psychology. Rather than describe exotic cross-cultural examples of how a remote tribe in Africa conducts trepanation to reduce pain or a how Western surgeons fly to Asia to perform cataract surgery, small examples that add one unusual twist to an otherwise smooth-flowing lecture, I have selected three Millennium Development Goals.

1. Reducing the number of women who die delivering. Why is it riskier to deliver than to abort? Why do young women find it difficult to live healthy lives? This is one of the most popular topics among my students because they note striking contrasts with their own life, yet they strongly identify with the issues.
2. Environmental health including sources of clean water, waste disposal, and personal hygiene. Water shortage is a worldwide obsession and a looming problem for the USA. Why is water in developing countries unclean, and what are the consequences for health? This is a story of health behavior change in particular as it relates to waste disposal, hand-washing and face-washing at the family level. It extends to the use of mosquito nets and condoms. Psychologists are famous for their theories of behavior change but most theories have not worked well in developing countries. Why not? There is ample scholarly space for insightful and creative students to answer this question.
3. Eliminating child hunger and its disabling effects on physical growth and cognitive development. While nine to ten million children under 5 years die each year from preventable causes, another 200 million are unable to reach their psychological potential because they lack food and stimulation. As psychologists, we grasp the tragedy of such waste. One-third of children in developing countries are short for their age, meaning they have suffered long-term hunger. A similar proportion of American children are overweight. Two lectures, back to back, on obesity and hunger provide an instructive contrast.

Other topics might fit your course and inclinations as well. These include HIV and AIDS, particularly in South Africa where school programs imported from the USA and modified for the African context have been evaluated (Gallant and Maticka-Tyndale 2004). New programs to promote condom use in the community are currently being created and evaluated (Jewkes et al. 2006, 2008). It is also connected there with alcohol abuse, intimate partner violence, and coercive sex. Patient–Practitioner interactions and quality of care can also be studied in developing country settings. Shared decision making, privacy, and adherence are dilemmas in

family planning clinics, health posts, and hospitals (Abdel-Tawab and Roter 2002; Hadley and Roques 2007). Health psychology students would enjoy arguing about the social, cultural, and ethical issues involved. Even where shared decision making and privacy are not cultural norms, women may still want both. Finally, alcohol and tobacco abuse are increasing in developing countries. In the USA, health education in schools target youth and environmental restrictions regulate where and to whom these items can be sold. Health psychology students might consider whether these strategies would be successful in Papua New Guinea, India, or China.

Where in the world is Papua New Guinea? Where are all these 50 least developed countries? You can find a list of them along with some facts and figures at the UNICEF web site (<http://www.unicef.org>). My students get the latest .pdf copies of the tables at the back of the UNICEF document called *The State of the World's Children*. There are statistics on the proportion of children who die before their fifth birthday. This is the most telling indicator of a nation's overall health: If you cannot keep your children alive, then those who survive must also be doing poorly and their mothers must be in poor physical and mental health as well. There are also figures on how long people can expect to live, maternal mortality, malnutrition, literacy, HIV prevalence among young people, condom use, immunization, how much donor money goes into the country (called Official Development Assistance or ODA), and funds spent on health. This and more information is available about each country, about regions such as sub-Saharan Africa and Latin America, and about groupings of countries such as the 50 least developed countries and 39 industrialized countries. You can also see how each indicator is defined and its source of data. One instructive group assignment for students is to give them a list of indicators, then let them pick a country in sub-Saharan Africa, South Asia, and Latin America for which they find the indicator data. In the end, the instructor creates a composite table in full view of all, fielding figures from the three groups and inserting them into the table. The three columns of figures for, say, Ethiopia, Bangladesh, and Nicaragua may be compared with each other and with a fourth column of figures for the USA. Students can then decide which countries need the most work and in what areas of health.

Other sites with useful information are the World Health Organization (<http://www.who.int>) and UNAIDS (HIV and AIDS <http://www.unaids.org/en/issues>). Along with UNICEF, these organizations have teams of experts providing guidelines on the best practices known to date. Research is constantly updating these guidelines, and psychologists contribute in important ways to this research. Incidentally, this research is rarely published in mainstream American psychology journals, although there is recent interest in doing so. It is published in international journals such as the *Bulletin for the World Health Organization*, *Social Science and Medicine*, and *The Lancet*. International health psychologists collaborate with other health disciplines, such as medical anthropologists, epidemiologists, nutritionists, health programmers, and public health specialists. They all speak the same "jargon" and read the same documents to coordinate. Students introduced to international health psychology should be socialized into this team effort at a local and a global level.

Reducing the Number of Women Who Die Delivering

Why is it riskier to deliver than to abort? Why do young women find it difficult to live healthy lives? Women in the USA live longer than men but have more health complaints. If they want to have a career and family, there are resources to support their choices: husbands can support them during delivery, maternity leave gives them time off, and day care centers provide quality care in the early years. Women may feel stressed but they actually thrive with multiple roles.

Women in developing countries have a hard life. Over 500,000 mothers die giving birth each year. Many more are disabled because they get infections, lose blood, or rupture the birth passage. You might be reluctant to get pregnant under such dangerous conditions, but young and uneducated women do not have much say. Maternal mortality is a health event with the greatest disparity between developing and industrialized countries: in the USA, only 1 of 4,800 women will die during her reproductive years, and at the time of delivery only 11 of 100,000 will die from complications. In the 50 least developed countries, 1 of 24 women will die during these years, and 870 of 100,000 will die delivering her baby. Sub-Saharan Africa has a worse record than South Asia, and both are considerably worse than Latin America (see the Lancet 2005 series on maternal mortality, e.g., Campbell & Graham 2005; Filippi, Ronsmans, & Campbell et al. 2005; Ronsmans and Graham 2005). Reasons for the deaths will be presented shortly, along with some surprising new research findings. But first let students imagine they are collecting the data to calculate these figures.

Imagine we are the researchers collecting data on women who die during delivery. In the USA, we would go to a hospital or the death registry. However, most developing countries do not yet have registration of births and deaths. Furthermore, most women do not deliver babies in hospitals or clinics; they deliver at home. So we go door-to-door, using what is called “the sisterhood method” along with a verbal autopsy. We interview women between 15 and 49 years and ask about their adult sisters’ survival. For those sisters who died, time of death along with details of the circumstances and symptoms prior to death is recorded. If the death occurred during pregnancy, delivery or up to 42 days after delivery, from causes related to or aggravated by the pregnancy, it is a case of maternal mortality. Obviously, a much more reliable method is possible when health researchers set up a demographic surveillance site as they did in Matlab, Bangladesh in the 1960s. Each year they visit households, asking about births, pregnancies, deaths, health, and illness. The following year, outcomes of the pregnancy will be recorded. If the mother has died, the child commonly dies shortly thereafter because a child cannot survive for long without a mother’s care and breast milk.

Why do so many women die? Some reasons can be gleaned from the conditions of young women before they become pregnant. Others arise during pregnancy and delivery. The first set of causes include early marriage; parents arrange for their daughters to get married in their late teens perhaps to avoid her getting pregnant out of wedlock or to have one less person to feed. Usually, they arrange an early marriage simply because everyone else in the village does and questions will be asked if a girl of 20 is still not married. Young brides and their families want children immediately

because motherhood is a girl's primary role and confers status. Young bodies, especially bodies that are short due to malnutrition, do not have a fully developed birth canal; the fetus is likely to be either too large for the birth canal or low birth-weight. Young girls who live in an area across mid-Africa have likely undergone a procedure called genital cutting which produces inflexible scar tissue; this further impedes smooth passage of the fetus leading to the rupture of the birth canal. If the woman is young and lacks primary school education, she may be unaware of these risks. She has simply followed the wishes of her family and the practices of her community. If she has not completed fifth grade, she is not sufficiently literate to read about alternative available practices. Health psychologists study the cultural, social, and behavioral practices that prepare girls for safe motherhood.

Childbirth is a natural phenomenon, but still things can go wrong during the growth and delivery of a fetus. In the USA, pregnancy is a time for joy and for preparation. Part of the preparation entails prenatal visits to an obstetrician to check on the mother's weight gain and blood pressure and to check on the fetus' vital signs. In the least developed countries, particularly those in Africa and South Asia, only 60% seek prenatal (known as antenatal) care. The others claim that because they did not experience a problem, they did not need to go. The purpose of antenatal care, however, is prevention. For example, if it looks like the baby is too large for the mother's pelvic gap, a cesarean section may be planned. To prevent malaria during pregnancy, she may be given anti-malarial pills; if she is anemic (and most are), she may be given iron and folic acid supplements. Many of these services are provided free of charge by government clinics. So health psychologists may try to create pictorial leaflets with messages that motivate pregnant women, without scaring them, to seek antenatal care. Our involvement with screening programs for cancer gives us a sense of how difficult it is to motivate women who fear bad news.

Antenatal screening, unfortunately, is not a reliable predictor of who will encounter serious problems. Most common causes of maternal death and disability cannot be detected early and thereby prevented. Because of these limitations, concerted effort now focuses on the need to encourage mothers to seek a skilled doctor, nurse, or midwife to deliver their newborn and to train these professionals in a few essential emergency obstetric procedures. But delivery practices are difficult to change. Most mothers (over 60%) in the least developed countries deliver at home with the help of a traditional birth attendant or female relative, who perform deliveries on a regular basis but know little about cleanliness and less about what to do when the mother starts to bleed. She has no medicines to stop the pain or the bleeding. The family is left on their own to cope with the crisis.

The common reasons for women dying are excessive bleeding in the 24 h after delivery, and infection of the genital tract due to unclean hands and instruments being inserted. Neither can be predicted from an antenatal visit, but both are preventable if the woman goes to a nearby clinic or hospital. Another preventable cause of deaths is obstructed labor due to a small birth passage, to scar tissue from genital cutting, or to awkward positioning of the fetus. Antenatal care would have alerted the mother of potential problems associated with these conditions, perhaps to prepare for a cesarean section delivery.

Health psychologists and other social scientists are helping to reduce maternal mortality in several ways. The first is to show mothers the benefits of delivering at a clinic or hospital. If women will not go to clinics to deliver, then they need to seek a nontraditional skilled midwife. You may have to convince not only the young mother, but also her parents, in-laws, and husband. Furthermore, health education, along with pictures, warns women of conditions that are life-threatening, for which she should seek emergency obstetric care. At the same time, pregnant women are counseled on how to complete an advanced birth plan and to save some money for emergency transport to a clinic. Countries such as Sri Lanka and Honduras have reduced their deaths greatly in recent years and so stand as good models for us to study.

Another strategy to reduce maternal deaths is through family planning and the use of modern contraception. Women often continue to have children simply because they live in a culture that encourages having many children and they assume that their husbands want more children. Almost half of pregnancies (40%) globally are unwanted, meaning that the woman was not wanting or trying to get pregnant. Often she is too young or unmarried, perhaps pregnant through rape, or already has more children than she can care for. Some 22% of pregnancies result in induced abortion: safe abortions have little risk, but unsafe abortions often end in death and account for one-third of maternal deaths. Thus, two common strategies for reducing maternal deaths are contraception and safe abortion.

One of the surprising research findings is that the most popular form of contraception worldwide is sterilization. Sterilization has such a bad reputation in the USA that few would choose it willingly. Yet in both India and China, 34% of women undergo a simple sterilization procedure to stop having more children. The intra-uterine device (IUD) comes next with again high use in Korea and China. China's one-child policy has successfully reduced its population growth but countries in Africa have no popular support for such policies. Overall, India and Bangladesh have close to 60% use of modern contraception. Latin America 70%. Sub-Saharan Africa has the lowest use at 23%. Education importantly increases the chances that both husband and wife will want to use contraception. Counseling women and particularly couples on the need to space or stop children is the preferred strategy, but some countries also insert contraception episodes into television soap operas to raise awareness and create a social norm and demand.

Students may be unused to considering family planning as both an individual choice and a social responsibility. Yet in places where responsibility to and for your extended family is strong, neither marriage partner nor family size is solely an individual choice. Students tend to think that lifestyle and other health behaviors are under personal control. Yet there are many examples where governments, for the protection of all, have regulated safety. Most of us must wear seat belts while driving in a vehicle. When seat belts were encouraged but voluntary, most people did not wear them and so killed or maimed themselves and their children unnecessarily. Once laws were passed requiring seat belt use, almost everyone buckled up and subsequently their attitudes changed in favor of seat belts. This is a good example of how governments can regulate health behaviors for the good of all, and let supportive attitudes follow in their wake. Another example is smoking: governments

regulate the age when one can purchase cigarettes and places where you cannot smoke – the latter being an example of social responsibility. The age of alcohol purchase was raised in the USA as a result of alcohol abuse and drunk driving by high school and college students. The people of China and India have social norms about limiting one's family size; in many African countries, the norm is to have many children. In the USA, there is no strong prescriptive norm: some have no children, some have the usual two, and some have more.

A new and interesting research topic concerns HIV, pregnancy, and transmission to the newborn. Women between the ages of 18 and 24 are more than twice as likely as young men to become HIV-positive. Pregnancy increases her chances of becoming HIV-positive as does having an older male partner or husband (who had premarital or extramarital sexual experience). So for a number of biological and social reasons, pregnant women have additional risks due to potential HIV infection. A newborn child has a 35% chance of becoming infected, mostly during delivery and partly from breast milk. This is known as vertical transmission of HIV. Drugs given to mothers at the time of delivery prevent vertical transmission. However, expectant mothers need to first find out whether or not they are HIV-positive. They need to go to a clinic that provides voluntary counseling and testing (known as VCT). Antenatal clinics in high HIV countries now offer this service as standard care. So, persuading pregnant women to attend an antenatal clinic is the first step. Then convincing her to accept testing is the second step. On average about 70% do accept, with a range of 33–100%. The reasons why they are reluctant to get tested include cost (though the cost is usually subsidized by the organization or government running it), fear of emotional trauma, fear of losing her husband or partner, and fear of social stigma. The fear factor may explain why some women agree to get tested but do not return for the test results, and why so few notify their partners of their status. Women who deliver at home have an extra responsibility to take the medication themselves at the right time. Health psychologists may have a special role to play evaluating women's fears and training counselors to be client-focused and sensitive. Thailand and Uganda have the best records for tackling their HIV problems through open dialog and easy access to services. We might learn from them something to apply at home and elsewhere (see Glick 2005, for more details).

Environmental Health Including Sources of Clean Water, Waste Disposal, and Personal Hygiene

Why is water in developing countries unclean, and what are the consequences for health? We have all become aware of the viruses, bacteria, and parasites that lurk in our homes, hospitals, and outdoor environments, and the need to wash our hands. In a spirit of international solidarity, the Centers for Disease Control and Prevention (CDC) dispatch experts to solve mysterious outbreaks of SARS, avian influenza, West Nile virus, and nipah virus. Their goals are to track down the environmental culprit and the unhygienic modes of transmission. New and reemerging infections

arrive on our shores and we naively send them onwards. Recall the American groom who boarded a plane to his honeymoon destination, knowingly coughing with highly infectious tuberculosis. Surprisingly, personal rather than industrial behavior has been the main culprit in most developing countries (e.g., Biran et al. 2005; Stanton et al. 1987).

In the USA, we take clean water for granted. We turn on the tap and drink. We have as much water as we want to bathe. We have flush toilets at home and in public places. In fact, each person uses about 375 gallons of water a day for personal consumption, the highest in the world. However, because of our profligate practices, we will soon have to start worrying about water. Elsewhere in the world, water has always been a problem – finding enough water, finding clean water, and finding water to keep clean. Unclean water, unclean disposal of waste (personal waste), and unclean hygienic practices are the cause of much ill health in developing countries. Most of this illness could be prevented through health behaviors that create and sustain a clean environment. The United Nations declared 2005–2015 as the decade for action on Water for Life. The Millennium Development Goal #7 aims to cut in half the number of people without safe water and proper disposal facilities for waste. Currently, 80% of people in developing countries use clean water but only 50% use toilets or latrines.

Why is water in developing countries unclean and what are the health consequences? The most common reason is that people and animals defecate on the ground or in the streams, and this top water is used for drinking. So two strategies are pursued: persuading people to use latrines and having hand-drillers put a pipe down to raise water from a lower water table. The former requires a change in health behavior and the latter requires technical skill and materials. Ethiopia has one of the lowest percentages of people using safe water and latrines: only 22% drink safe water and 13% use latrines. When we lived in Ethiopia, we boiled our water before drinking but of course no one else did. Most rural people defecated on the ground either in the bushes or around their home. Children's feces are particularly contaminated. So a government needs to ensure that water is brought up from a deeper level and attached to a hand pump. Cities generally provided the infrastructure for clean water and latrines, but rural people had neither.

Viruses, bacteria, and parasites are too small to see without a lens. Without an education, people tend not to know about these microbes. Still, people like to explain their misfortunes, so a number of interesting causal attributions get passed down the generations: Diarrhea comes from the eruption of baby teeth; hepatitis if you urinate at night facing the moon; malaria from morning mists; a cough and cold from cold weather. More serious illnesses come from the evil eye of a person or supernatural spirits that inhabit streams, animals, and trees. These are regarded as traditional beliefs, but their similarity around the world suggests that they arise not from a particular culture but from a universal need to understand uncontrolled causes of ill health. Beliefs may arise from noticed correlations. For example, baby teeth tend to erupt at an age when children start crawling, and crawlers pick up contaminated soil on their fingers and then suck them. Likewise, malaria comes from mosquitoes which propagate on stagnant waters, from which mist coincidentally arises in the

early morning. We all have health beliefs. It is difficult to break the transmission of such beliefs, as we know from the “cold” belief and from other false HIV beliefs. Do we need to change such beliefs to change the health behaviors that stop the transmission of microbes?

What are the microbes and what health behaviors are needed to prevent their disabling effects? The most common is rotavirus, causing diarrhea; also *Escherichia coli* bacteria and cholera. There are the common cold viruses which may lead to pneumonia and other more serious respiratory illnesses. Anemia is largely caused by hookworms, which thrive in contaminated soil. Malaria is caused by the Plasmodium parasite transmitted by the female anopheles mosquito. Trachoma, an eye infection, is caused by a bacteria carried by flies. We still have viral diarrhea and the common cold and cough in the USA, but no one dies from them except perhaps the frail elderly. We used to have malaria and trachoma but we succeeded in quarantining patients and controlling the mosquitoes and flies that carry them. However, infections such as these cause death, malnutrition and debilitating illness in Africa and Asia. Over six million children each year die from diarrhea and pneumonia; many more are left weak and malnourished from repeated bouts of these illnesses. Millions suffer from recurring episodes of malaria and are unable to work while the fever rages; but pregnant women and children are most likely to die especially from a cerebral form of malaria or anemia. Trachoma is active in 84 million people and is already responsible for blindness in 1.3 million people. Primary prevention of diarrhea, respiratory illness, and trachoma can be largely accomplished if everyone used a latrine and washed their hands and face, known as sanitation and personal hygiene. Prevention of malaria requires the use of insecticide-treated nets at home (Lindblade et al 2004). These are health behaviors that stop infections from being transmitted from one person to another or from an insect to a person. (As an aside, secondary prevention is the second line of action once the person has the illness and needs to prevent adverse consequences: Prevention of death from diarrhea, which is due to dehydration, requires oral rehydration sachets and zinc to replenish lost water and nutrients; unfortunately uninformed mothers withhold food and fluid in the hopes of stopping water loss. Prevention of death from pneumonia requires recognition of the signs in a young child and obtaining antibiotics from a health clinic. Antibiotic creams are also used to prevent blindness from untreated trachoma. Secondary prevention is costly; it is also ineffective in the long-term because a month or year later the microbes are back). Sanitation, personal hygiene and using bed nets are, therefore, the new health behaviors people need to adopt to prevent the misery of these illnesses.

Surprising research findings demonstrate that providing information about the real causes is insufficient to change people’s habits, and secondly that behavior change may precede rather than follow belief and attitude change. Psychologists are expert at belief, attitude, and behavior change; we have a number of well-tested theories to take to the field. But we were not in the field when well-meaning programmers popularized what is called “behavior change communication.” It refers to the use of communication to inform people and thereby persuade them to change their health behaviors. The strategy relied solely on the use of information to change beliefs and attitudes. However, what is known as the KAP Gap appeared again and

again, demonstrating the wide gap between Knowledge (K), Attitude (A), and Practice (P). Changing people's knowledge and attitudes about microbes, water, and latrines did not change their behavior (e.g., Bilqis et al. 1994; Stanton et al. 1987). Health education by itself is rarely sufficient, because most people do not use the systematic route to persuasion (Glanz et al. 2002; Petty and Cacioppo 1986). Well-reasoned arguments and cognitive elaborations do not always guide one's behavior. Too much theory testing has been conducted with college students, who are unsurprisingly cognitive. We might learn more about the heuristic route, if we tested our theories in rural areas of developing countries. Here, habits are learned young and overlearned through practice. What can our theories of behavior change tell us about how to change health behaviors and sustain the change?

Our theories tell us that changing behavior requires an antecedent such as motivation and a reminder cue to trigger the new behavior, lots of rehearsal of the new behavior so that it becomes perfected and automatic, and pleasant consequences. Absence of debilitating illness ought to be pleasant enough, but it is not a concrete and immediate consequence – no one notices its absence. As an assignment, students may be encouraged to search through their known theories to line them up in the before, during, and after categories (of ABC where A=antecedent, B=behavior, and C=consequences). We have so much to learn about applying theories of behavior change to serious health behaviors in developing countries. We are still learning from our mistakes.

I find that the best way to present this information to students is through case studies. There are generally one or two research articles on a specific program to change health behaviors and whether or not they were successful. Students like to dissect and evaluate the program. Each can be analyzed in terms of theories of behavior change and the ABC elements. The Antecedent element may come in the form of self-determination theory (intrinsic and extrinsic motivation) and the health belief model which argues for a reminder cue in the environment. The Behavior element is implemented through the development and rehearsal of new behavior skills with the help of a model, derived from social learning and social cognitive theory. The Consequence element may entail self-efficacy, self-reward, or a positive health outcome. If you use the Communication framework, students can analyze who was the sender, who the receiver, and what was the message; but then they will want to know if the resultant cognitive/attitude change translated into behavior change. To examine its sustainability, students may need to know more about social norms and social support. In this regard, a new model of community readiness, pioneered in the USA, is now being applied to norm change in developing countries (e.g., McCoy et al. 2007).

Case 1: Hand-washing. Steve Luby from the CDC has worked in Pakistan and Bangladesh to increase hand-washing and thereby reduce childhood diarrhea and pneumonia. He has had some success on both counts (Luby et al. 2004). In Bangladesh, people had an intrinsic motivation and sufficient knowledge: the motivation was for appearance and to reduce germs. But they were not in the habit of washing. We decided to increase hand-washing at two key points – after defecation and before eating – by posting visual reminder cues at these two locations. We also encouraged

families to have a water bucket with soap just inside the door of their home and beside the latrine. A few village sessions were given in which one person from each family was coached while washing their hands with soap and water; that person then took responsibility for ensuring that the family washed their hands. Curtis and Cairncross (2003) have reviewed this extensive literature which is now very relevant to North Americans. Women are generally better at this than men but we all need notices posted in critical places to remind us. The most successful programs target the whole village, to get community acceptance and instill hand-washing as a social norm, and also individual families, who may need help fitting the new habit into their family's schedule of activities.

One benefit to targeting women is their influence on children. In a Bangladeshi project, we added hand-washing to a child feeding program (Aboud et al. 2008). We encouraged hand-washing and self-feeding at the same time with the phrase, "First you wash your hands, then you touch the food." In weekly group sessions, the peer educator washed all the children's hands before giving them some food. According to mothers' recall, that was one of the most memorable behavioral messages of the 5-week program, and raised pre-meal hand-washing from 2 to 62% 6 months later. Save the Children USA, in Bangladesh, helps to develop the habit early by having children wash their hands when they arrive at preschool and at mid-morning. Daycares in the USA also have to be conscientious about hygiene because children pass germs to each other in group settings.

Case 2: Face-washing. One of the cornerstones of the Global Elimination of Trachoma by 2020 (GET 2020) includes face-washing (Mecaskey et al. 2003). Flies carrying trachoma seek the moisture in children's eyes, so eyelids need to be washed regularly. Tanzania is a water-poor country so the goal of a long-standing project was not only to promote washing children's faces but also helping families overcome the water shortage which they said stood in the way of daily hygiene (Lynch et al. 1994; McCauley et al. 1990). The social norm implicitly understood by everyone was that precious water and time would be wasted on a child's face. No woman wanted to be criticized for being wasteful. Furthermore, her action might be interpreted as vanity, provoking the evil eye from an envious neighbor. The researchers, therefore, tried to build a community consensus by demonstrating that 30 people could wash their faces with water from a small gourd. Peer educators from the village visited individual families to help them identify reusable water for face-washing (clean water is not necessary) and a convenient time and to reward improvements. In the end, one village received eye ointment only and their levels of trachoma initially dropped but rose again 1 year later. Two villages with the behavior change strategy had more clean faces and less trachoma, but still not enough to eliminate trachoma entirely. A fourth village with the behavior change strategy showed no change at all: some women persisted in shaming mothers who washed their children's faces so the stubborn social norm proved to be an obstacle. Recent studies find that mass antibiotic treatment for whole villages succeed in reducing trachoma but not in eliminating it. Consequently without face-washing, a resurgence follows.

Case 3: Latrine use. Eliminating animal and human feces from around the house and water sources would go a long way to preventing illness and death. Building

latrines may go part way toward solving the problem; any family with a shovel and some local material can build themselves a latrine. But latrines have to be used; some villages and schools like to keep their donor-supplied latrines spotless and unused. One latrine promotion program was tried in rural Ethiopia, where only 7% of the people use latrines. Community leaders and health workers constructed demonstration latrines for families to view and copy (O'Loughlin et al. 2006). Within 6 months, 50% of households had built and 45% used their latrine. Social pressure is usually applied when the community gets involved. In Bangladesh, community groups made a map of where every family defecated and this was discussed by the community at-large, who then made a decision to ban open defecation in their village (Kar 2005). People who could not find the intrinsic motivation to comply presumably found the extrinsic motivation after being subjected to shame. The combination of latrines, social pressure, and accompanying information seems to have led to change in most of these studies. Knowledge and attitudes by themselves work too slowly and are infrequently translated into behavior. Instead, one might conclude that it is sometimes more effective to change the behavior of a critical mass of people whose behavior then sets a new social norm.

There is no quick fix for the health problems associated with lack of latrine use. You cannot stop babies from sucking their fingers; you cannot force everyone to wear shoes to protect them from hookworm. There would have to be constant hand- and face-washing. That is why 100% latrine use is essential. Malaria also relies on behavior change, though a vaccine in the foreseeable future might obviate the need for nets. Social marketing in Malawi raised people's awareness of affordable bed nets but could not raise ownership and use above 20%. However, in Kenya, an organization called Population Services International (PSI) started a subsidized program in rural child health clinics. Two years later the Kenyan government distributed free nets to all children less than 5 years. Without going through a complicated explanation of why children more than adults needed the nets, distributors realized that giving the nets to children ensured that they were seen as child protection. Within 2 years, the percentage of children less than 5 years sleeping under nets rose from 7 to 67% (Noor et al. 2007). Is this sustainable? Students can look up "Kenya bed nets" on the internet to find out.

Case 4: Abstinence and condom use. To prevent infection by the Human immunodeficiency virus also requires health behavior change. Because this is a topic already covered from an American perspective, students will know that abstinence and condom use are the preventive measures to be taken by youth. Many American researchers are transporting ideas and behavior change strategies between the USA and Africa. Simply providing knowledge to African students is insufficient according to a review of these studies (Gallant and Maticka-Tyndale 2004). For example, Bonita Stanton et al. (1998) found that abstinence was sustained for girls; for boys neither abstinence nor condom use was sustained. William R. Brieger et al. (2001) found that peer educators who met youth in bars to promote condom use convinced school-going youth to use condoms, but did not manage to convert out-of-school youth. For the former, behavior change preceded and exceeded attitude and knowledge change. Because HIV infections are increasing most rapidly among youth aged 15–24,

and because the development of Africa depends on its youth, social scientists are looking for behavior change strategies with hard evidence for their effectiveness (Jewkes et al. 2006, 2008).

You can see from the above presentation that behavior change has not been a resounding success in developing countries. Yet most health experts believe that it is essential for cost-effective prevention of illness where vaccines are not an option. I have outlined four cases where health would be immensely improved if psychologists identified a successful behavior change strategy for sustained change. This is the new frontier for future research. It is also important in the next and final topic to be covered, namely feeding children.

Eliminating Child Hunger and Its Disabling Effects on Physical Growth and Cognitive Development

While nine to ten million children less than 5 years die each year from preventable causes, another 200 million are unable to reach their psychological potential because they lack food and stimulation. The causes and solutions are multileveled: growing more food and not losing half of it from field to home, distributing food more evenly in communities and families, and understanding that small bodies and small brains need more rather than less.

One-third of children less than 5 years are short for their age, meaning they have suffered long-term hunger. Most of these children live in developing countries, particularly in South Asia and sub-Saharan Africa. In fact, in some countries such as India, Bangladesh, Ethiopia, Niger, and Zambia, 50% of children are stunted. Stunting, or being short for your age, is now known to be the central indicator of long-term malnutrition. Although famine and hunger grab headlines, chronically under-fed children go unrecognized by journalists and even by their mothers. Their mothers think they look about right for their age, whereas we might simply underestimate their age and think they look a few years younger than they are. Many of these children were born low birth weight (less than 2,500 g) because they did not receive sufficient nutrients in utero. Many continued to receive insufficient breast milk, if their mothers did not exclusively breast feed for 6 months. However, the major source of malnutrition is insufficient and low-quality food after 6 months of age, especially between 6 and 24 months when children need energy foods and micronutrients such as zinc and vitamin A (Black et al. 2008). Bouts of diarrhea and respiratory illness leave young children further weakened because foods were withheld during illness or not added during recovery. Malnutrition is, therefore, a problem that requires coordinated research by psychologists, nutritionists, and agricultural experts (WHO, 2003).

We now know from neuroscience and nutrition research that the consequences of early malnutrition are long-lasting. Malnourished children have less resistance to infection, partly because they lack vitamin A and zinc. They have less energy to

play and explore their world, because they lack iron in their diets and lose what they have to hookworm infection. Many still do not receive iodine from salt fortification. Iodine and iron are essential nutrients for cognitive and language development. Even breast milk with its long-chain fatty acids allows for better brain development. So there is a great deal of evidence that daily good nutrition in the early years is important for psychological development. It is also important for school achievement and later productivity.

Malnourished children also often receive less stimulating talk from parents. Opportunities for stimulation in the home can be measured with the HOME Inventory, which in modified form has been used around the world (Bradley et al. 1996). Children need to hear language directed at them in response to their signals and sounds; children need to play with objects (not ready-made toys, but blocks to stack and things to push and pull); they need playmates for pretend play and games. One study in Jamaica gave prominence to the need for psychosocial stimulation in the early years: stunted children under 2 years who received stimulation at home from a “play leader” for 2 years, with or without extra food, did better on cognitive and language tests several years later than those who received extra food alone. Here we see that nutrition alone is insufficient; the brain needs early stimulation along with food. Possibly the stimulation kept children mentally and physically active, which in turn led them to demand more food.

A series of papers published in the *Lancet* (Engle, Black, Behrman et al. 2007; Grantham-McGregor et al. 2007; Walker, Wachs, Meeks Gardner et al. 2007) uses figures on stunting and poverty to estimate that over 200 million children or approximately 40% of children less than 5 years do not reach their mental potential. The relation between stunting and poor development is so strong that they decided to include all stunted children in this group – 30% of less than 5 years. To that they added children who were not stunted but lived in extreme poverty, i.e., they lived on less than US\$1 per day. Only half of these poor children were stunted. Including the other half raised the numbers with poor development to 40%. Their inability to reach their developmental potential is largely determined by malnutrition and inadequate stimulation, which in turns leads to poor school achievement, and early drop-out. The economic prospects of these children are not likely to lift them out of daily wage work or subsistence farming.

Two new areas of research are being conducted in the USA as well as in developing countries. One concerns teaching mothers to be more responsive when feeding and stimulating their children. A second is school feeding. Both emphasize the need for food and stimulation, which separately and together contribute to child health and development.

What happens to a child in the first 3 years sets the stage for many years to come. Extensive research on secure attachment in the USA demonstrates the profound and long-term impact of early security. We know that children are born with certain biological tendencies (e.g., temperament) and needs (e.g., for warmth, tactile stimulation, and food). Research has shown that as obvious as these needs are not all children receive them in a responsive manner (Eshel et al. 2006). Kangaroo care is the method for maintaining skin-to-skin contact between a mother and newborn to

respond to needs for warmth. This is particularly important in places where newborns die because mothers are unaware of newborns' needs for warmth and breast milk. Kangaroo care is promoted in the USA for low birthweight babies, but universally encouraged in countries where over 40% of newborns are under 2,500 g.

Likewise stimulation must be responsive to the child's needs. Young children usually signal their need for stimulation by crying, waving, looking, smiling, and vocalizing; they also signal the desire for a reduction in stimulation by looking away. Children whose signals are answered learn to continue this kind of mutual communication which eventually becomes shared conversation. Children whose signals are not answered stop signaling but remain distressed. Although responsive stimulation and responsive language has been studied extensively in the USA, the American size does not fit all. Akhtar and Gernsbacher (2008) argue convincingly that the distal form of communication studied in middle class families, namely looking ("gaze") is uncommon in developing countries and even in the USA. This is because tactile stimulation is more common. Likewise others have shown that the American context in which responsive stimulation and language is studied, namely mother-child play, rarely occurs in developing countries (Vandermaas-Peeler 2002). Play is seen as a child activity; adults are unlikely to play with child toys or is this necessary. So we need to select other contexts to study. One of these is reading or looking at pictures. The concept of dialogic reading, namely having a dyadic conversation about the story book, has been successfully exported from the USA and adapted to other countries. Even if mothers are illiterate, they may talk in a responsive manner with their child about pictures. It even works well when adapted to the preschool setting where the teacher can generate a responsive discussion with a group of children as he/she reads the story.

The other context for responsive stimulation and language is mealtime. A new field of responsive complementary feeding is documenting the lack of responsive feeding in many countries around the world. This leads to malnutrition in developing countries. Surprisingly, we see that the same problem leads to obesity in the USA. The underlying theme might be that children stop noticing their bodily cues of hunger and satiety if caregivers feed them in an unresponsive manner. It is not that the child's body tells it exactly what to eat and how much, but good eating habits should start early and require mother-child coordination. In some countries, mothers are highly controlling and insist on feeding quickly and forcefully without consideration of the child's slower pace and desire to self-feed. These mothers may encounter frequent refusals despite the malnourished state of the child (e.g., Aboud et al. 2008). In other countries, mothers are uninvolved and let children fend for themselves, or are permissive and give children whatever they demand. None of these styles is responsive. This research sheds light on the style of feeding, which in combination with the quality of foods, can lead to malnutrition or obesity.

In addition to responsive feeding and stimulation in the home, researchers are evaluating the benefits of providing food in a setting where children's brains are expected to be active, namely at school. School feeding was common in the USA during the 1930s depression and is still common in poor districts. It is now sponsored by the World Food Program in developing countries where some 18 million

children receive a daily meal at school (http://www.wpf.org/food_aid/school_feeding). Education researchers examine whether it increases enrolment and attendance – it does. Nutritionists study the kinds of foods that will improve weight and height. Psychologists question whether students’ benefit in terms of school achievement as well as broader social and cognitive skills. Studies in Jamaica, South Africa, and Kenya along with many others have now been conducted. In a nutshell, they tell us that animal source foods, such as meat or fish, have a stronger impact than a vegetable-based meal, and the impact is greatest on arithmetic and nonverbal analytic reasoning skills (Neumann et al. 2007). Meat also results in students who are more active, take leadership roles, and initiate peer interactions. Furthermore, the impact on mental outcomes is greatest for younger children in the early school years. Finally, in line with the theme of this section, the impact is greater if food is combined with a stimulating educational program.

Future Research

This final section brings us full circle. Education is known to be important along with the nutrition necessary for young brains to process information and learn. However, nutrition must start early at birth to prepare the child’s physical, mental, and social health. Nutrition is cumulative in that the body cannot fully catch up if given food at 5 years but not earlier. However, the effects of responsive feeding behavior and food on children’s long-term development are still being explored. More needs to be done to examine how nutrition and stimulation combine to promote all aspects of health – physical, mental, and social – in the preschool and school years. Nutrition and education are also important for maternal health. But future research here needs to examine how to change delivery practices and their effects on mothers’ and newborns’ survival. Similarly, ongoing research is examining ways to change other health behaviors and sustain these behaviors. In particular, behaviors that prevent debilitating diseases are at the forefront of international research. American researchers from many disciplines are contributing to these exciting new developments, bringing ideas from the USA to developing countries and returning with strategies to improve our own lives.

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