



Instructor Guide

Millions Saved: Proven Successes in Global Health

Introduction

What is *Millions Saved*? This initiative is a compilation of 20 case studies that describe major successes in global health, each of which met the following selection criteria:

- large-scale (national, regional or global)
- having a duration of at least five years
- addressing a major health condition in the developing world
- using a cost-effective intervention; and
- having a major positive impact on health

For each of the cases, data exist – and are highlighted in the book – so that the change in health status can be attributed to the intervention or program, rather than to broad economic and social trends. In addition to the case studies, the book includes an introductory essay that draws out the common elements across the cases, which can be useful for design and evaluation of programs in the future.

In 2004, 17 original success cases were compiled in *Millions Saved: Proven Successes in Global Health* (Center for Global Development) written by Ruth Levine and the What Works Working Group (a panel of 15 eminent experts in global health, public policy and development economics), with Molly Kinder. An updated and expanded edition, *Case Studies in Global Health: Millions Saved* (Jones and Bartlett), was published in 2007 as a case book accompanying an undergraduate global health textbook by Richard Skolnik.

The authors of the original book collaborated with the Disease Control Priorities Project of the US National Institutes of Health, tapping into the expertise of more than 300 leading authorities on diseases, interventions and health systems. The *Millions Saved* initiative is housed at the Center for Global Development, a non-partisan think tank in Washington DC that focuses on the question of how the policies of rich countries affect the prospects of the developing world.

Instructor Guide Overview. This guide is intended to help instructors optimize the use of the *Millions Saved* case studies in the classroom. It is written for instructors leading introductory classes in international health, either at the undergraduate or graduate level. Little previous knowledge of global health issues is assumed, although a basic understanding

of key terms such as incidence, prevalence, infant and maternal mortality and burden of disease is needed.

In the guide, we identify *learning objectives* for each module, and suggest in-class *discussion questions* to spark a classroom conversation; we also provide *homework questions*, designed to stimulate thinking about the broader meaning of the case. In general, the discussion questions require no background reading other than the case write-up in the book. The homework questions do require limited additional research and reading, drawing on information resources that are easy to access on the Internet or in a university library. Some of that material can be accessed directly through the *Millions Saved* website. At the end of the guide, we suggest a couple of options for student research projects that would require several weeks' worth of effort. Each of them could be assigned as individual or team projects.

The cases in *Millions Saved* illustrate multiple important points that are relevant for students of international health. Annex 1 suggests the cases that represent the best examples to highlight specific dimensions, such as use of technology, or the importance of technical consensus.

Module 1. Understanding the Context

The cases described in *Millions Saved* are most meaningful if they are viewed within the context of the characteristics of the developing world, and global health trends and patterns. Before assigning cases for students to read, it is useful to:

- (a) make sure students understand the basic characteristics of the developing world;
- (b) review historical trends in health conditions over the past 50 years; and
- (c) highlight current health challenges facing the developing world.

A. Basic Features of the Developing World

Learning Objectives: To understand that low- and middle-income countries encompass the majority and fastest growing part of the world's population; to understand the large variation in income and basic indicators of human welfare among high-, middle- and low-income countries.

Materials to Discuss. Table 1 can be a useful way to organize a discussion about the basic differences between developing and developed countries. Students can quickly see the conditions confronting the majority of the world's population.

Indicator	Developed Countries	Developing Countries		Global Average
	High Income (annual per capita GDP > \$*9,076)	Middle Income (annual per capita GDP > \$*736- 9,075)	Low Income (annual per capita GDP > \$*735)	
Total population (million)	900	2,463	2,057	5,420
Population growth rate %)	0.6	0.8	1.8	1.5
Income growth over past 10 years (%)	19	32	16	
Female literacy rate (% of people over 15 years)	100	75	40.1	63.1
Children currently in school (% of those school age)	97	92	80	88
Access to improved water supply (% of households)	100	82	76	81
Infant mortality rate (per 1,000 live births)	5.4	30.2	78.6	55
Child mortality rate (per 1,000 live births)	7	37	121	81
Life expectancy at birth (years)	78.2	69.8	58.9	

Source: World Development Indicators 2004

Discussion Questions

1. What are some of the factors that account for the economic disparities we observe in the world?
 - Students can be encouraged to consider historical influences, resource endowments, geographic constraints and cultural traditions, among other factors.

2. “Human capital” is a term used to describe individuals’ stock of health and education that are associated with their ability to be productive workers. What can you say about the differences in “human capital” in high-, middle- and low-income countries? And how is human capital related to the patterns of income and poverty?
 - Students can be encouraged to think about both how human capital leads to economic growth and poverty reduction, and how slow economic growth and poverty reduce the opportunities for increases in human capital.

Homework Questions

1. How is the picture of the developing world influenced by China and India, each of which has more than a billion people? What happens to the averages for low-income countries if you separate out those very large countries?

2. Which low-income country has the lowest infant mortality? Which low-income country has the highest infant mortality? How might you explain that variation?

3. What is the correlation between infant mortality and per capita GDP? Prepare a graph and describe what you see. Speculate about the reasons behind the patterns observed.

B. Trends in Global Health

Learning Objectives: To understand overall trend toward lower mortality in developing countries, particularly from infectious diseases.

Materials to Discuss: Tremendous gains have occurred in health in developing countries during the past 50 years. As shown in Figure 1, child mortality rates in low and middle-income countries fell by more than 50 percent between 1950 and 2000. Similarly, the relative importance of infectious diseases as a cause of death has declined dramatically.

Discussion Questions

1. What could account for the improvements in health conditions in the developing world?
 - o Prompt students to consider improvements in living conditions, nutrition, access to health services, and medical advances.
2. What are the main ways in which economic development affects health?
 - o Students should be encouraged to consider both micro- (or household) and macro- (or national-) level dimensions of this relationship: At the micro-level, the role of increased household income that results in better nutrition and access to health services. At the macro-level, the ways in which a growing economy can permit the development of better delivery of health services.
 - o Students should be prompted to think about the ways in which economic development can have a *negative* impact on health – e.g., through the adoption of unhealthful behaviors, opening of markets to tobacco and low-nutrition foods, movement of people (and diseases) across borders, and other phenomena.

Homework Questions

1. What have the trends in life expectancy been between 1950 and 2000 in different regions of the world? What might explain the trend observed in sub-Saharan Africa?
2. Why do changes in life expectancy correlate so closely with changes in infant mortality?

C. Current Health Challenges

Learning Objectives: To understand the main causes of disease and disability in the developing world, and how they relate to the types of problems and programs described in the cases.

Material to Discuss: The types of health conditions described in *Millions Saved* account for 35-40 percent of the current burden of disease affecting low- and middle-income countries. This includes HIV/AIDS, tuberculosis, diarrheal disease, maternal conditions, tropical diseases, malnutrition and cardiovascular disease.¹ The cases have particular relevance for the world's least healthy citizens, in South Asia and sub-Saharan Africa.

Discussion Questions

1. Which is more important: diseases that affect children, or diseases that affect working age adults?
 - Students should be encouraged to explore the meaning of “important” – important for social welfare, for economic growth, on moral or ethical grounds, etc.
2. Do rich country governments have a responsibility to help poor countries achieve better health? Why or why not?
 - Encourage students to consider how they would respond to this question from their own political and ethical perspectives, and how they think national governments in wealthy countries act relative to the “right” approach. Are governments in high-income countries consistent in their policies? How have they responded to the AIDS crisis differently than other health problems in the developing world? Why?

Homework Questions

1. What are the five leading causes of death and disability in the developing world?
2. What proportion of the world's child deaths (under-five mortality) occur in developing countries?
3. What proportion of maternal deaths occur in developing countries?
4. Which regions of the developing world are the healthiest? Least healthy? What do you think explains this variation?

Module 2. Methods/Understanding the Criteria

Learning Objectives: To understand how “success” was defined, and how the cases were selected. This is important background for the reading of the cases.

Material to Discuss. See Annex 1 in *Millions Saved*.

¹ These conditions account for 35-40 percent of the developing world's disability-adjusted life years, a measure of disease burden that combines morbidity and mortality into a single metric. In the remainder of this chapter, the more intuitively understandable indicator, number of deaths, is used. However, the regional patterns described are similar for DALYs as for mortality.

Discussion Questions

1. Why did the authors choose to look only at programs that operated at a national, regional or global level? What are the challenges that programs face in “scaling up” pilot projects to a national scale?
2. The authors chose to examine programs that operated for at least five years, not necessarily those that are “financially sustainable.” What is the difference between duration and sustainability? How would it be possible to identify “financially sustainable” programs?
3. What is a DALY? How is it different from number of deaths? How is it measured? Is it easier or harder to interpret than mortality rate?
4. What is cost-effectiveness? Why is this a criterion that policymakers and program planners would care about?

Homework Questions

1. How do the criteria affect the types of programs and/or interventions that are highlighted in the book? If the duration criterion were shorter, how do you think that would have affected the selection? If the duration criterion were longer, how do you think that would have affected the selection?

Module 3. Exploring the Case Studies

Learning Objectives: To better understand, through case examples, key concepts in global health. To use the case examples provided in the book as a foundation for researching related examples and issues in the global health literature.

Case 1. Eradicating smallpox.

A massive global effort spearheaded by the World Health Organization eradicated smallpox in 1977, and inspired the creation of the Expanded Programme on Immunization that continues today.

Discussion Questions

1. Define eradication, extinction, elimination and control.
2. Describe the characteristics of smallpox that made it an appropriate candidate for eradication.
3. If polio is eradicated, should we destroy all polio virus samples? Why or why not?

4. Why didn't the World Health Organization immediately undertake a full-scale eradication program after endorsement by the World Health Assembly in 1965?
5. Could smallpox be eradicated today? Why or why not?

Homework Questions

1. Describe the characteristics of smallpox that made it an appropriate candidate for eradication.
2. Consider polio and guinea worm: Are these good candidates for eradication? Why or why not?

Case 2. Preventing HIV and sexually transmitted infections in Thailand

In Thailand, the government's "100 percent condom program" targeted at commercial sex workers and other high-risk groups helped prevent the spread of HIV/AIDS relatively early in the course of the epidemic. Thailand had 80 percent fewer new cases of HIV in 2001 than in 1991 and has averted nearly 200,000 new cases.

Discussion Questions

1. What are the characteristics of the high-risk population that permitted this intervention to work? What are the implications of this for replication in other settings?
2. A cost-effectiveness assessment was never done for this program. What should such an assessment have taken into account in terms of costs measured? Effectiveness? Comparison to other interventions?

Homework Questions

1. What are the current challenges facing the Thailand AIDS program?
2. Is Thailand a model for programs in other countries? Why or why not?
3. What are some of the other national experiences that have been cited in the popular press as "successes"? What evidence can you find in the scientific literature about the effectiveness of these programs?

Case 3. Controlling tuberculosis in China

To address the problem of tuberculosis patients' early dropout from treatment, a national TB program in China implemented a new approach called DOTS – directly observed therapy, short course - through which patients with tuberculosis are "watched" daily by a health worker for six months as they take their antibiotic treatment. The program helped to

reduce TB prevalence by 40 percent between 1990 and 2000 and dramatically improve the cure rate in half of China's provinces.

Discussion Questions

1. What are some of the factors that contribute to the high burden of tuberculosis in China?
 - o Encourage students to think about the effect of poverty, living conditions, access to medical services.
2. How might Russia and Eastern Europe benefit from the Chinese model?
3. Is directly-observed therapy coercive? Why or why not? Under what conditions does the State have the right to require individuals with communicable diseases to undergo treatment?

Homework Questions

1. What countries have the highest burden of multi-drug resistant TB? What do you think explains this pattern?
2. What has been the experience in China with the DOTS program since 2000? Is the success continuing, or is it faltering? What explains the recent experience?
3. In addition to the implementation of the DOTS program, what else should the Chinese government be doing to reduce the burden of TB? What information can you find regarding the use of these measures in China?

Module 4. Reducing Child Mortality through Vitamin A in Nepal

Capitalizing on the discovery that vitamin A supplementation could save child lives, the government of Nepal began the National Vitamin A Program in 1995 that has averted nearly 200,000 child deaths.

Discussion Questions

1. What are the pros and cons of supplementation, dietary intake, and fortification?
2. What are incentives? How were they used in this case to motivate certain behaviors?
3. The use of female community health volunteers is an innovation in health service delivery. Discuss some of the social and political reasons that made them a success in Nepal.

Homework Questions

1. Why do you think technical experts questioned the original observations about the impact of vitamin A on child mortality? Can you think of other instances in which

the scale-up of a successful health intervention was delayed because of similar obstacles?

2. Can vitamin A program in Nepal be replicated in other countries? What kinds of countries might see similar success? What countries might not?

Case 5. Eliminating polio in the Americas

Beginning in 1985, a region-wide polio elimination effort led by the Pan American Health Organization immunized almost every young child in the Americas, eliminating polio as a threat to public health in the Western Hemisphere in 1991.

Discussion Questions

1. What were the starting conditions in the region of the Americas that facilitated the achievement of polio elimination?
 - Encourage students to consider economic and social factors, health system infrastructure, transportation infrastructure and access to rural communities, technical capabilities, political commitment to improving health, common language and relatively well developed information systems, technical capabilities of PAHO.
2. In what ways did the polio elimination campaign strengthen the basic health system? How might you see polio eradication weakening the delivery of basic health services?
 - Encourage students to consider development of surveillance and other monitoring systems, training of health personnel, strengthening of management capabilities including the Inter-Agency Coordinating Committee, development of inter-country coordination mechanisms.
3. Which societies and groups will benefit most from polio eradication?
4. How might the polio eradication initiative contribute to the preparedness for and mitigation of avian influenza?

Homework Questions

1. Describe current challenges affecting the global campaign to eradicate polio, and outline the positions of both the proponents and the opponents to the campaign. Can lessons from the Latin America experience be “exported” to the global effort? Why or why not?
2. To estimate the costs and benefits of an elimination or eradication campaign, what are the factors you would have to consider to assess the costs? The benefits?

Case 6. Saving mothers' lives in Sri Lanka

Despite relatively low levels of national income and health spending, Sri Lanka's commitment to providing a range of "safe motherhood" services has led to a decline in maternal mortality from 486 deaths per 100,000 live births to 24 deaths per 100,000 live births over four decades. Similarly, the maternal mortality ratio in Honduras declined by 38 percent between 1990 and 1997 through a reorganization of health services, training of health workers and expanded community participation.

Discussion Questions

1. How was Sri Lanka's ability to reduce maternal deaths related to the underlying conditions of relatively good public education and a well developed health infrastructure?
2. How do you think conflict and civil unrest impact the health of women and families in Sri Lanka? What policy priorities would you pursue if you were the Health Minister? President?
3. If a country pursues a strategy of professionalizing midwifery as the "first line" support for prenatal care and delivery, what are the other elements of the health care delivery system that need to be in place?
 - o Prompt students to consider supervision, a functional referral network including transportation, and a functional logistics system to provide midwives with supplies.

Homework Questions

1. Looking at countries that have a similar per capita GDP to Sri Lanka, what can you say about health status (e.g., maternal and infant mortality)? What are the main causes of maternal death in one or more of those countries? Are there strategies that Sri Lanka has employed that would address those causes of death?
2. In Sri Lanka, the government's ability to track trends in maternal deaths through the vital registration system was important to the implementation of their program. What are some of the difficulties that poor countries face in developing such systems? What alternatives to vital registration are used to measure maternal mortality? What are the pros and cons of alternative approaches?

Case 7. Controlling onchocerciasis in sub-Saharan Africa

A multi-partner international effort begun in 1974 dramatically reduced the incidence and impact of the blinding parasitic disease, and increased the potential for economic development in large areas of rural West Africa. Transmission today has now been virtually halted in West Africa, and 18 million children born in the twenty-country area are now free of the threat of river blindness.

Discussion Questions

1. How did the development of ivermectin improve the chances for success of this program?
2. What are the replicable characteristics of this public-private partnership in West Africa? What other diseases might be pursued by this type of regional program? What are the political requirements to make this type of regional program work?
3. What are the pros and cons of depending on drug donations for the implementation of a key health program? How were the challenges managed in this case?

Homework Questions

1. What other diseases could the ComDT system be used to address?
2. Onchocerciasis control has had significant economic benefits by increasing the productivity of workers, and making large rural areas habitable and arable. What are some other tropical diseases whose control could yield large economic benefits?

Case 8. Preventing diarrheal deaths in Egypt

Using modern communication methods, a national diarrheal control program in Egypt increased the awareness and use of life saving oral rehydration therapy, helping to reduce infant diarrheal deaths by 82 percent between 1982 and 1987. In Bangladesh, a large national non-government organization undertook the largest nation-wide ORT program in history. 13 million mothers were taught by visiting female health workers to make oral rehydration therapy at home. Today the use rate of ORT in Bangladesh is 80 percent.

Discussion Questions

1. How might we better address the cause of diarrheal disease? What might be done, for example, regarding clean water and sanitation?
2. What are the cultural determinants of diarrheal disease in Egypt?
3. How did the program change the attitudes and behavior of health professionals, and why was this important, given that ORT is a home-based treatment?
4. In Bangladesh, a large non-governmental organization implemented the ORT program. What are the potential advantages and disadvantages of NGO involvement in health service delivery?

Homework Questions

1. ORT is a treatment for the major life-threatening complication of childhood diarrhea, but it does not prevent diarrhea. Is there evidence that the

Government of Egypt and/or its development partners, such as USAID, took steps to address the underlying risk factors for childhood diarrhea?

2. ORT used “social marketing” methods. Are social marketing and public-private sector partnerships effective modes of intervention to decrease the incidence of and morbidity/mortality due to diarrheal disease? What other health interventions have used such methods? What type of communications, health service delivery and other infrastructure needs to be in place for them to be most effective?

Case 9. Improving health in Mexico. (Mexico’s PROGRESA/Oportunidades)

Since 1997, Mexico’s PROGRESA program (now known as “Oportunidades”) has provided a comprehensive package of nutritional interventions to rural communities through a conditional cash grants program, resulting in lowered rates of illness and malnutrition and increased school enrollment.

Discussion Questions

1. Why were the cash grants given to mothers? Do you think this was a good idea or a bad one? What might have been the positive and negative consequences of this choice?
2. PROGRESA established a type of entitlement program that now accounts for a relatively large share of the government’s expenditures. What are the factors that designers should have taken into consideration regarding the sustainability of the program over time?

Homework Questions

1. What are examples of other conditional cash transfer programs? Why do you think they are more popular in Latin America than in other regions?
2. What are the pre-conditions for a successful conditional cash transfer program?
3. Consider the compact of co-responsibility between the government and recipients. What is needed to make the compact work?

Case 10. Controlling trachoma in Morocco

Since 1997, the incidence in Morocco of trachoma, the leading preventable cause of blindness, has been cut by more than 90 percent among children under 10 through a combined strategy of surgery, antibiotics, face washing and environmental controls.

Discussion Questions

1. Trachoma was eliminated in the US before the advent of antibiotics to treat the disease. What are the factors that contributed to its decline in the US? What

does this tell us about the measures that should be taken in developing countries still affected by trachoma?

2. What do you think motivated Pfizer to donate antibiotics to treat trachoma? What are your views about the behavior of for-profit multinational pharmaceutical companies, and does this case alter your view?
3. How might trachoma control in Morocco strengthen health service delivery for other diseases? In general?

Homework Questions

1. What are the major causes of blindness in the developing world? What is the burden of blindness worldwide, and which regions are most affected? What are the economic and social consequences of blindness for developing nations?
2. What are the factors that a Minister of Health should take into account when deciding whether to take part in a global program such as the International Trachoma Initiative?
3. Could this program be successfully implemented in Uganda or Ethiopia in your opinion? Why, Why not?

Case 11. Reducing guinea worm in sub-Saharan Africa

A multi-partner eradication effort focused on behavior change reduced prevalence of guinea worm by 99 percent in 20 endemic African and Asian countries. Since the start of the campaign in 1986, the number of cases has fallen from 3.5 million to less than 35,000 in 2003.

Discussion Questions

1. The fundamental intervention for guinea worm is behavior change. What does the guinea worm example tell us about the components of successful behavior change programs for other public health problems? Why did behavioral change work in guinea worm disease control? Can you think of another disease where behavior change can mitigate the public health impact so it is no longer a public health problem?
2. Why is it important in the guinea worm case – and for other similar parasitic diseases – to use DALYs instead of mortality as the indicator of severity of the problem?
 - o Encourage students to think about the need to incorporate the toll of morbidity into the estimate of the burden of disease for ailments like guinea worm.

Homework Questions

1. Conflict in sub-Saharan African countries has impeded progress of the guinea worm control campaign. What are some strategies that can or have been used to pursue public health goals in the face of civil strife?
2. When will guinea worm disease be eradicated? What is hampering eradication efforts? Is control enough for guinea worm disease?
3. What are the economic benefits of controlling parasitic disease? What evidence can you find in the literature that demonstrates the economic importance of parasites (hint: look at the historical experience of hookworm in the Southeast US).

Case 12. Controlling Chagas disease in the southern cone of South America

Through surveillance, environmental vector control and house spraying, a regional initiative launched in 1991 has decreased the incidence of Chagas disease by 94 percent in seven countries in the southern cone of Latin America. Disease transmission has now been halted in Uruguay, Chile and large parts of Brazil and Paraguay.

Discussion Questions

1. Why was a regional approach so important in the control of Chagas disease? What other diseases can be controlled only with a regional effort?
2. Do you think the 7 Governments involved would have initiated the program in 1991 without PAHO? Beyond PAHO's leverage, what aspects of this disease encouraged a regional effort?
3. The development of a new pesticide represented a turning point in the battle against Chagas. What were the benefits to the program of the new pesticide?

Homework Questions

1. In what way does the Chagas case demonstrate the fragility of "success"? What are the technical, political and financial inputs is needed to maintain vigilance in control of a disease like Chagas?
2. Because the vector for Chagas thrives in traditional housing materials, it is a disease of poverty. Should the governments of the region have focused on poverty reduction in affected areas rather than the control of a specific disease? Why or why not?

Case 13. Reducing fertility in Bangladesh

In Bangladesh, strong leadership of the family planning program, a sustained outreach strategy and a focus on access to services brought about increases in contraceptive prevalence from 3 to 54 percent (and corresponding decreases in fertility from 7 to 3.4

children per woman) over two decades, far in excess of what would have been predicted based on changes in economic and social conditions alone.

Discussion Questions

1. What are the ways that high fertility can affect the prospects for economic development and poverty reduction?
 - Prompt students to think about micro- and macro-level impacts of high fertility and high rates of population growth.
 - At the micro level, suggest women's labor force participation, impact on health and consumption
 - At the macro level, suggest impacts on size and structure of the labor force, tax base, demands on health and education budgets, migration
2. Will delay of age of marriage and/or birth spacing guarantee fertility reduction? Why? Why not?
3. What sorts of questions can be answered using longitudinal data collection such as is possible in the Matlab setting? Are there other ways to answer such questions?
 - Encourage students to consider the ability to answer questions about how specific outreach or other service delivery approaches affects demand for and use of services; long-term trends in family formation, fertility and women's labor market participation; and so forth
 - Prompt students to consider cross-sectional surveys. These will not provide data of comparable utility, so students should be encouraged to think about the advantages and disadvantages of this data source.

Homework Questions

1. What are the global and regional trends in fertility over the past 30 years (present in graphic form)? What are the five low-income countries with the highest fertility now; what are the five low-income countries with the lowest fertility. How can these differences be explained?
2. Is the reduction in fertility better or comparable to other population/reproductive health programs? How does the annual rate of fertility reduction for Bangladesh over the last 25 years compare to Kenya? India?
3. Some have said, "Development is the best contraceptive." What is meant by that statement? What is the evidence in favor of and against that argument?

Case 14. Curbing tobacco use in Poland

Starting in the early 1990's, the transition to a market economy and a more open society paved the way for health advocates to implement strong tobacco controls in Poland, a country that had the highest rates of tobacco consumption in the world. A combination of health education and stringent tobacco control legislation has averted 10,000 deaths a year,

has led to a thirty percent reduction in the incidence of lung cancer among men aged 20 to 44, and has helped boost the life expectancy of men by four years. In South Africa, an increase on cigarette taxes and strict tobacco controls passed by the post-apartheid government led to a 30 percent decline in cigarette consumption.

Discussion Questions

1. How did advocates and scientists in Poland and South Africa take advantage of a political transition to advance their cause?
2. Do you think that the transition to democracy in both countries was necessary for the successful control efforts? What does this suggestion about the relationship between democracy and health? Can you think of examples that contradict your answer?
 - o Encourage students to consider successful health programs in non-democratic countries, such as the two China cases or Cuba's successful health system.
3. How might programs focus on youth and smoking in Poland? What social, behavioral, and epidemiological trends should be monitored to track program impact over the long-term?

Homework Questions

1. What are the factors that account for the growing smoking problem in the developing world? What are the economic consequences of this phenomenon?
2. Describe and discuss the changes in smoking behavior in China, and the potential health consequences. If you were an anti-tobacco advocate in China, what would you focus on?

Case 15. Preventing iodine deficiency disease in China

China's introduction of iodized salt in 1995 reduced the incidence of goiter among children, from 20 to 9 percent and created a sustainable system of private provision of fortified salt. A national IDD control program in Madagascar led to an increase in proportion of households with iodized salt from zero in 1995 to more than 98 percent four years later.

Discussion Questions

1. What factors are required to successfully deliver a micronutrient at a population level?
2. What are the economic consequences of a high prevalence of iodine deficiency? How do those compare to the costs of an effective intervention to prevent the disease?

3. If the fortified salt is produced by commercial suppliers, what is the role of the government in an iodized salt program?
 - o Encourage students to think about the need for standard-setting, regulation and enforcement; data collection and surveillance; and health education/health communications

Homework Questions

1. Can other nutritional disorders be prevented through food fortification? What are the characteristics of the appropriate foods?
2. The universality of salt makes iodine fortification effective. List three other candidates of “universal foods” that could be fortified with other micronutrients such as vitamin A, zinc, iron, and/or folic acid.
3. Where are the other areas of the world in which iodine deficiency disorder is prevalent? Why do you think salt fortification is not used in those regions?

Case 16. Preventing Neural Tube Defects in Chile

Through a successful partnership between the flour industry and the national government, Chile began fortifying wheat flour with folic acid in 2002. This intervention has prevented life-threatening neural tube defects in infants and saved the health system millions of dollars in treatment costs.

Discussion Questions

1. Characterize the public-private partnership that was key to the success of Chile’s fortification intervention.
2. Is Chile’s fortification experience replicable in Africa? Why or why not?
3. There are different types of evaluation discussed in the chapter. Explain the differences between each, and the questions each are meant to address.

Homework Questions

1. Chile’s leadership in the region has influenced adoption of health interventions outside its borders. Can you identify other instances where the leadership of a country has inspired public health improvements in a region or around the world?
2. Neural tube defects affect a fairly small portion of the population compared to diseases like malaria and TB. What are some of the reasons a Minister of Health might choose to address NTDs? Can you think of other diseases with a similar profile?

Case 17. Eliminating measles in southern Africa

Measles vaccination campaigns in seven African countries nearly eliminated measles as a cause of childhood death in southern Africa, and has helped reduce the number of measles cases from 60,000 in 1996 to just 117 four years later.

Discussion Questions

1. What were the starting conditions in the seven countries that facilitated the success observed? Are these same conditions present throughout the sub-Saharan African region?
2. In 2003, 610,000 children died from measles. Why? If a good vaccine exists, what are the factors that limit immunization in many countries in Africa and South Asia?
3. How did the polio eradication campaign stimulate progress on control of measles?
4. Why does Nigeria have such high rates of measles mortality? Consider 5-8 reasons.

Homework Questions

1. Is measles a good candidate for eradication? Why or why not?
2. What measles immunization priorities should be considered in conflict and humanitarian emergency situations? What different priorities might be pursued in the emergency, recovery and development stages?
3. The measles vaccine is off-patent, produced in mass quantities by developing country manufacturers in India and elsewhere, and very inexpensive. However, it requires storage and transport in refrigerated containers, which is both logistically difficult and costly. Efforts are now underway to develop a heat-stable measles vaccine – one that would not require a “cold chain” to maintain its effectiveness. Is this a good idea? How should developing country governments and donors figure out how much they should pay for such a product?

Case 18. Preventing dental caries in Jamaica

Between 1987 and 1995 Jamaica’s National Salt Fluoridation Program demonstrated up to an 87 percent decrease in dental caries in school children and has been regarded as a model for micronutrient interventions.

Discussion Questions

1. What are the economic and social consequences of dental caries? Why might Jamaican children have particularly high prevalence of dental problems (before the salt fortification)?
2. Are dental caries and dental health a global public health issue? Should dental health be a priority?
3. Why was water fluoridation not the right approach in Jamaica, as it is in the US? What would have been the consequences had the authorities chosen to fluoridate the water?
 - o Encourage students to consider how improvements would have been seen only among children with access to publicly provided water – typically from better off families.

Homework Questions

1. What are the arguments against community-level fortification interventions such as salt fluoridation? Do you agree or disagree with those arguments? What do you think it would take to convince those who believe that fluoridation of water or salt is a bad idea?
2. What are two other developing countries that have tried community-level fluoridation? What have been the results of these programs?
3. If you were the Health Minister in Ethiopia, what proportion of your annual budget would you spend on dental health? Why?

Case 19. Treating Cataracts in India

An intensified cataract surgery program implemented in seven Indian states from 1994 to 2001, which was catalyzed by technical and operational innovations developed by a nongovernmental organization, saved more than 300,000 people per year from a lifetime of blindness.

Discussion Questions

1. Why were management and training such important parts of the cataract program in India?
2. What were three of the most important contributions of the Aravind Eye Hospital to the design and implementation of the cataract surgery program?
3. What do you think the World Bank provided in this program, beyond the financing?

Homework Questions

1. Are there other types of surgery that are “low-cost” and can be implemented at scale, the way cataract surgery is?
2. What are the types of costs and benefits that should be taken into account for an economic analysis of the value of the cataract surgery program?

Case 20. Preventing Hib disease in Chile and The Gambia

A national Hib vaccination program in Chile reduced prevalence of Hib disease by 90 percent in the early 1990s. In 1997, The Gambia introduced Hib vaccines into their national immunization program and has virtually eliminated the disease from the country.

Discussion Questions

1. In Chile, why was it important that the technical personnel had the relevant data about the potential benefits of Hib vaccination at the time of the meningitis outbreak, even though the meningitis could not be prevented by the vaccine?
2. What were some of the real-world features of The Gambia that helped to make the case that delivery of Hib vaccine can be done in an African setting?
3. If you were a Minister of Health, what would you need to know prior to making a decision to include Hib in your country’s immunization schedule? Should Hib vaccine be added to the six routine childhood immunizations worldwide?

Homework Questions

1. What are the immunization rates in Latin America? Which countries have the highest rates? Which countries have the lowest rates? What are some of the factors that account for the relatively good performance of the immunization program in Latin America, compared to the countries of South Asia and sub-Saharan Africa?
2. How widely has Hib been introduced in developing countries? What are some of the concerns that have been voiced about its introduction?

Module 4. Term Projects

These are multi-week projects that lend themselves to either individual or team work. We invite instructors to share the best products with us so we can post them on our website!

A. Find your own “success”

Learning Objectives: To understand how to judge success according to fixed criteria.

Activity:

Step 1: Student identifies a potential “success case” by reviewing either popular or technical literature – a quick web search on “developing country health success” will yield a large number of candidates.

Step 2: Student conducts literature search in technical literature to see if the documentation exists to support the “success” claims, based on *Millions Saved* criteria of scale, cost-effectiveness, duration, impact and importance.

Step 3: Student prepares case write-up or presentation based on literature review. The write-up or presentation should focus primarily on whether the case does or does not meet the criteria, and what evidence exists to support that conclusion.

B. What are the future successes?

Step 1: Student selects one of the several large-scale initiatives currently underway to improve global health. These include the Global Fund to Fight AIDS, TB and Malaria, the Global Alliance for Vaccines and Immunization, the Global Alliance for Improved Nutrition, the national-level delivery of AIDS treatment in Brazil or Botswana, the President’s Emergency Program for AIDS Relief, and others.

Step 2: Student reviews available information on the web. Student identifies, contacts and interviews at least one expert about the initiative.

Step 3: Student prepares write-up indicating whether and why the initiative is likely to succeed, based on the lessons from *Millions Saved*. Student provides no more than five recommendations about how to strengthen the initiative.

Annex 1. Selected Examples for Different Cross-cutting Themes, by Type of Health Condition Addressed

Cross-cutting theme	Vaccine-preventable disease	Parasitic diseases	Other infectious disease	Nutrition and other child health	Reproductive health	Cardiovascular and other non-communicable disease
All	Smallpox Polio Measles Hib disease	Guinea worm Trachoma Onchocerciasis Chagas disease	HIV/AIDS Tuberculosis	Diarrheal disease Iodine-deficiency disease Dental caries Poor child health among the vulnerable populations (PROGRESA) Vitamin A deficiency	Maternal mortality High fertility	Tobacco-related diseases Neural tube defects Cataracts
Predictable funding		Onchocerciasis			Maternal mortality	Neural tube defects
Political leadership	Smallpox Polio	Guinea worm	HIV/AIDS		High fertility	Tobacco-related diseases Neural tube defects
Technological innovation, within effective delivery system	Hib disease	Onchocerciasis		Vitamin A deficiency		Cataracts
Technical consensus	Hib disease	Trachoma	Tuberculosis			Tobacco-related diseases Neural tube defects
Good management	Polio	Onchocerciasis	Tuberculosis		Maternal mortality	Cataracts
Effective use of information	Hib disease				Maternal mortality Family planning	Tobacco-related diseases Cataracts
Strong health communications to the public		Guinea worm	HIV/AIDS	Diarrheal disease Vitamin A deficiency	Family planning	Tobacco-related diseases
NGOs and/or community participation		Guinea worm		Diarrheal disease Poor child health among the vulnerable populations (PROGRESA) Vitamin A deficiency		Tobacco-related diseases Cataracts
Demand-side approach				Poor child health among the vulnerable populations (PROGRESA) Vitamin A deficiency		
Health system strengthening	Polio			Vitamin A deficiency	Maternal mortality	
Legal and regulatory strengthening			HIV/AIDS	Iodine deficiency disease		Tobacco-related diseases Neural tube defects