

GUIDE *to* GIVING



COPENHAGEN
CONSENSUS
CENTER

CONTENTS

Introduction	4	Combating Hunger	
		Micronutrient Supplements	13
About This Guide	6	Micronutrient Fortification & Biofortification	21
		Community NutritionPromotion	31

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Child Health

Expanding Vaccination Coverage 37

Deworming 43

Malaria Prevention and Treatment 49

Education and Empowerment

Lowering the Price of Schooling & Improving Girl's Schooling 55

Womens' Reproductive Role 63

About the Center 70

Introduction

Mankind's lot has improved in many measurable ways. In 1900 we lived for an average of 30 years; today we live for nearly 69. We lead healthier, more prosperous lives than we ever have before.

This does not, however, mean that everything is good enough. Although in many areas we are on the right track, too often today scarce resources are spent responding ineffectively to a few big issues that attract celebrity attention and devour much of the media's limited interest.

We hear relatively little about many major global problems that have reasonably cheap solutions. Despite our progress, today, one billion people lack clean drinking water. Two billion lack sanitation. Three billion lack basic micronutrients. One quarter of all deaths this year will be caused by infectious diseases that we could easily combat.

The think-tank the Copenhagen Consensus Center, based in Denmark, works to ensure that basic principles of economics are used to improve the allocation of aid and development money. We want to help ensure that progress in tackling global challenges is swift. We work with academics and Nobel Laureate economists to provide sound information for governments, philanthropists, and NGOs.

Fundamentally, the Center promotes the idea that careful use of economic science can help ensure that we achieve the most good for people and the planet. We commission

research that analyzes the optimal ways to combat the biggest problems facing the world.

What we advocate – prioritization – is not easy. It is much easier to declare that we want to tackle every major world problem. Unfortunately, doing so is just a dream. Even the wealthiest government or business has limited resources. A dollar spent in one place cannot be spent elsewhere. When we say that we want to do everything, we are deceiving ourselves – because that is not what happens in practice. A few big issues get the most air-time, attention, and money.

Our steadfast belief is that in a world fraught with competing causes for attention, we need to direct more resources to the areas where we could achieve the most. Our Center's flagship projects are our four-yearly analyses of global challenges. The first was held in 2004, and prompted *The Economist* to declare that the Copenhagen Consensus was “an outstanding, visionary idea”. The most recent Copenhagen Consensus was held in 2008, and produced pioneering economic research that will help shape policy debate and discussion for many years to come.

The Copenhagen Consensus Center is often asked by individuals: how can I make personal donations in line with the Center's research findings? The Giving Guide attempts to provide an answer to that question, and to make our economic research accessible for many more people.

Here, we outline in concrete terms why the Copenhagen Consensus Center recommends investment in particular areas, and explains what can be achieved. In telling personal stories alongside the research, we want to put a human face to the challenges that these initiatives help to address.

When the Copenhagen Consensus Center recently launched a series of research papers about responding to malnutrition in Nairobi, Kenya, I was inspired to meet the energetic, focused people who are striving to solve this challenge in sub-Saharan Africa. It is always eye-opening to sit down with people living in any underprivileged part of the world, and to ask them what investments or policy options they would like to see prioritized. More often than not, the problems at the forefront of their mind are not those that we hear a lot about in the media, but instead are in line with Copenhagen Consensus project findings. I find that greatly heartening.

I hope that you find the Copenhagen Consensus Guide to Giving thought-provoking and helpful. Helping somebody else is a laudable act. This guide is intended to assist in providing you with peace-of-mind that your donation is helping to do an extraordinary amount of good.




Bjørn Lomborg

Bjørn Lomborg, the director of the Copenhagen Consensus Center, is a global opinion leader. He is the author of the *Skeptical Environmentalist* and *Cool it*. He was named one of the 75 most influential people of the 21st Century by *Esquire* magazine, one of the 50 people who could save the planet by the *Guardian*, one of the top 100 public intellectuals by *Foreign Policy*, and one of the world's 100 most influential people by *Time*. He is the former director of Denmark's Environmental Assessment Institute, and an adjunct professor at Copenhagen Business School.

About This Guide

In the **Copenhagen Consensus Guide to Giving**, we hope to be able to provide some guidance for when you make decisions about how to make donations of any size designed to help the planet. We do not intend in any way to be the last word in your philanthropic decisions. There are many factors that influence all of us when we make decisions as important as how to make donations to good causes. But here, we will outline the areas where Copenhagen Consensus research suggests small amounts of money could make a significant difference.

So that we can better explain the different solutions, we have divided them into three chapters:

- Combating Hunger,
- Child Health,
- Education and Empowerment.

Where Does the Research Come From?

The Copenhagen Consensus Center's flagship projects are four-yearly analyses of solutions to global challenges. In Copenhagen Consensus 2008, the Copenhagen Consensus Center commissioned world-renowned experts to write research papers on the costs and benefits of a range of investments to help improve major world problems. Debate and discussion was encouraged through the addition of two sets of 'Alternative Perspective' research papers for each challenge, also written by international experts.

All of this research, in itself, provides a valuable contribution to international development and aid policy. But in line with the Copenhagen Consensus Center's advocacy for prioritization of scarce resources, the projects actually went a step further. We tested and debated the experts' recommendations, and identified the most attractive possibilities. This was achieved by gathering eight of the world's foremost economists – including four Nobel Laureates in 2004 and five Nobel Laureates in 2008. This Expert Panel engaged with all of the experts and came to their own conclusions about the merits of each suggested solution. They weighed up each proposed investment and compared it to the other options.

With a hypothetical limited budget in order to focus their decisions, the Expert Panel created a prioritized list, which identified what they found to be the best and worst investments. The highlighted recommendations below are those that we believe are relevant to philanthropists, and form the **Copenhagen Consensus Guide to Giving**:

INTERVENTION		CHALLENGE
1	Micronutrient Supplements For Children (Vitamin A And Zinc)	Malnutrition
2	The Doha Development Agenda	Trade
3	Micronutrient Fortification (Iron And Salt Iodization)	Malnutrition
4	Expanded Immunization Coverage For Children	Diseases
5	Biofortification	Malnutrition
6	Deworming And Other Nutrition Programs At School	Malnutrition & Education
7	Lowering The Price Of Schooling	Education
8	Increase And Improve Girls' Schooling	Women
9	Community-Based Nutrition Promotion	Malnutrition
10	Provide Support For Women's Reproductive Role	Women
11	Heart Attack Acute Management	Diseases
12	Malaria Prevention And Treatment	Diseases
13	Tuberculosis Case Finding And Treatment	Diseases
14	R&D In Low-Carbon Energy Technologies	Global Warming
15	Bio-Sand Filters For Household Water Treatment	Water
16	Rural Water Supply	Water
17	Conditional Cash Transfers	Education
18	Peace-Keeping In Post-Conflict Situations	Conflicts
19	HIV Combination Prevention	Diseases
20	Total Sanitation Campaign	Water
21	Improving Surgical Capacity At District Hospital Level	Diseases
22	Microfinance	Women
23	Improved Stove Intervention	Air Pollution
24	Large, Multipurpose Dam In Africa	Water
25	Inspection And Maintenance Of Diesel Vehicles	Air Pollution
26	Low Sulfur Diesel For Urban Road Vehicles	Air Pollution
27	Diesel Vehicle Particulate Control Technology	Air Pollution
28	Tobacco Tax	Diseases
29	R&D And Mitigation	Global Warming
30	Mitigation Only	Global Warming

Who Are the Expert Panel Members?



Jagdish Bhagwati is a University Professor at Columbia University and a Senior Fellow in International Economics at the Council on Foreign Relations. He has been Economic Policy Adviser to Arthur Dunkel, Director General of GATT, Special Adviser to the UN on Globalization, and External Adviser to the WTO.



Thomas Schelling is Distinguished University Professor, Emeritus at the University of Maryland. For twenty years he was the Lucius N. Littauer Professor of Political Economy at the John F. Kennedy School of Government. Professor Schelling was the co-recipient with Robert Aumann of the 2005 Nobel Memorial Prize in Economic Sciences.



Douglass North is the Spencer T. Olin Professor in Arts and Sciences at the Washington University in St. Louis and is the Bartlett Burnap Senior Fellow at the Hoover Institution at Stanford University. Professor North was the co-recipient with Robert Fogel of the 1993 Nobel Memorial Prize in Economic Sciences.



Nancy Stokey is the Frederick Henry Prince Distinguished Service Professor of Economics at the University of Chicago. Professor Stokey has published significant research in the areas of economic growth and development, as well as papers on economic history.



François Bourguignon is the Director of the Paris School of Economics and the former Chief Economist of the World Bank. Bourguignon is a specialist in the economics of development, public policy, economic growth, income distribution and redistribution, inequality and poverty measurements.



Vernon Smith is Professor of Economics at Chapman University's Argyros School of Business and Economics and School of Law in Orange, California, a research scholar at George Mason University Interdisciplinary Center for Economic Science, and a Fellow of the Mercatus Center. Professor Smith was the co-recipient with Daniel Kahneman of the 2002 Nobel Memorial Prize in Economic Sciences.



Finn Kydland is the Henley Professor of Economics at the University of California, Santa Barbara, and director of The Laboratory for Aggregate Economics and Finance. Professor Kydland was the co-recipient with Edward Prescott of the 2004 Nobel Memorial Prize in Economic Sciences.



Robert Mundell is a University Professor at Columbia University in New York. Professor Mundell has been an adviser to many international agencies and organizations and is known as the father of the theory of optimum currency areas. In 1999, Professor Mundell received the Nobel Prize in Economics.

Why did Economists Make the Selection?

Using Nobel Laureate-level economists to form the Copenhagen Consensus prioritized list was a deliberate and careful choice. Many environmentalist campaigners would tell you that any extra money should be dedicated to battling climate change. That's certainly the global challenge we hear the most about. But an expert in air pollution will tell you that clearing the skies of killer smog should be the top priority. Our expert may point out that air pollution is the biggest environmental killer in developing nations. Someone who has spent his life studying conflict will tell you of the potential benefits from reducing the risks of civil war. When it comes to setting economic priorities among such options, the best people to turn to are economists. Economists, who are experts in prioritization, are the obvious people to provide a global overview. They put each challenge on an equal footing. They focus on where limited funds could achieve the most good, by focusing on the costs and benefits of each proposed investment.

Why Are Some Recommendations 'Missing'?

You will note, when you look at the raw list of Copenhagen Consensus 2008 results, that we have not included two of the highly-recommended investments: the implementation of the Doha Round (ranked second) or the management of heart attack victims in underdeveloped nations (ranked eleventh). The reason for these omissions is that we believe that these interventions are more relevant to policy-makers than to philanthropists and donors.

It is worth, though, underscoring the importance of both of these investments.

Research for the Copenhagen Consensus Center by Kym Anderson showed that establishing significantly freer trade would help the world combat almost all of its biggest problems. For an astonishingly low cost, we could improve education and health conditions, make the poorest people richer, and help everybody become better able to tackle the future. A realistic Doha outcome could increase global income by more than \$3 trillion every year throughout this century. And about \$2.5 trillion annually would go to today's developing countries every year, or \$500 a year on average for each individual in the third world, almost half of whom now survive on less than \$2 a day.

Heart disease might not seem like a pressing issue for poor nations, but it represents more than a quarter of the death toll. Measures to reduce risk factors other than smoking—high intake of saturated animal fat, obesity, binge drinking

Which Organizations Should I Donate Money To?

of alcohol, physical inactivity, and low fruit and vegetable consumption—have had little success. Treating acute heart attacks with inexpensive drugs is, however, cost-effective, according to research for the Copenhagen Consensus Center by Dean Jamison. Spending \$200 million could avert several hundred thousand deaths with benefits 25 times higher than the costs. It is as simple as providing very cheap medicine to victims of heart attacks.

As well as summarizing each challenge and its solutions, and explaining where you can find the original research, the Copenhagen Consensus Guide to Giving provides a brief list of some inspiring organizations that are actively working in the area that we describe.

The Copenhagen Consensus Center does not intend to endorse any particular organization. We have not closely vetted the work that they do. We do think, however, that it is sensible to point to reputable organizations working in the areas where small donations could make a big difference. In some cases, the Copenhagen Consensus Center has cooperated in different ways with these organizations. In every case, we recommend that you conduct your own research before deciding where to make a donation.



COMBATING HUNGER

Micronutrient Supplements: Vitamin A and Zinc

The Challenge

Vitamin A and zinc are specific micronutrients that are both vital for child survival.

When a child does not get enough vitamin A, there is a higher risk of illness and death from common infections like diarrheal disease and measles. Vitamin A is also vital for eyesight: deficiency is the leading cause of preventable blindness in children. The World Health Organization estimates that 250,000 to 500,000 vitamin A-deficient children become blind every year. Half of them die within 12 months of losing their sight.

In pregnant women, lacking vitamin A can cause night blindness and can increase the risk of death.

Vitamin A occurs naturally in breast milk and in some fruits and vegetables, as well as in beef, pork, turkey, chicken and fish livers. Up to 250 million children worldwide do not get enough vitamin A in their diet. It is estimated that deficiency causes about six percent of under-five year-old deaths. Vitamin A deficiency is worst in South Asia and sub-Saharan Africa.

Zinc deficiency can impair the immune system and increase the risk of death from common childhood infections including diarrhoea, pneumonia, and malaria. It can also cause stunted growth, hair-loss, and lesions.

Zinc occurs naturally in many foods, but animal meat is an important source. Zinc is effective at treating acute cases

of diarrhoea. Currently 1.9 million children die annually because of diarrhoea.

More than one billion people are susceptible to zinc deficiency. Regions with high risk of zinc deficiency include South Asia, sub-Saharan Africa, and several countries in Latin America.

Zinc and vitamin A deficiency often occur together. Zinc is required to help transport vitamin A through the body. A deficiency in zinc limits the body's ability to move vitamin A stores from the liver to body tissues.

The Solution

Deficiencies in both vitamin A and zinc can be remedied with supplements.

Good progress has been made tackling vitamin A deficiency among children. Approximately 70% of children aged under-five in South Asia and sub-Saharan Africa are covered with two preventative, protective doses of vitamin A every year.

Despite this progress, this life-saving initiative needs to be extended until there is universal coverage. The millions of children who are still not reached are often the poorest and most vulnerable. Moreover, coverage varies a lot in many countries: during one half-year there may be high levels of supplementation, while in the next half-year, there may be none. And there are not enough successful programs designed to supply vitamin A to breastfeeding mothers. Programs only exist in two-thirds of high-risk countries, and most are limited in scope.

There is another challenge associated with extending vitamin A coverage. Since the 1990s, vitamin A supplements have been delivered with polio vaccinations on National Immunization Days in many countries. However, as the polio immunization days are phased out because of the success of that program, many nations face the challenge of maintaining the necessary high coverage of vitamin A twice a year.

Zinc supplements are effective in treating bad cases of diarrhea in malnourished children but their provision has not yet been widely adopted. Studies from India, Africa, South America and Southeast Asia show that children suffering from diarrhea get better faster after taking zinc supplements.

Providing micronutrients to infants and children seems to offer a cheap way to improve both physical and mental capacity.

These proposals offer an opportunity to do enormous good at very low cost.

Nancy Stokey.

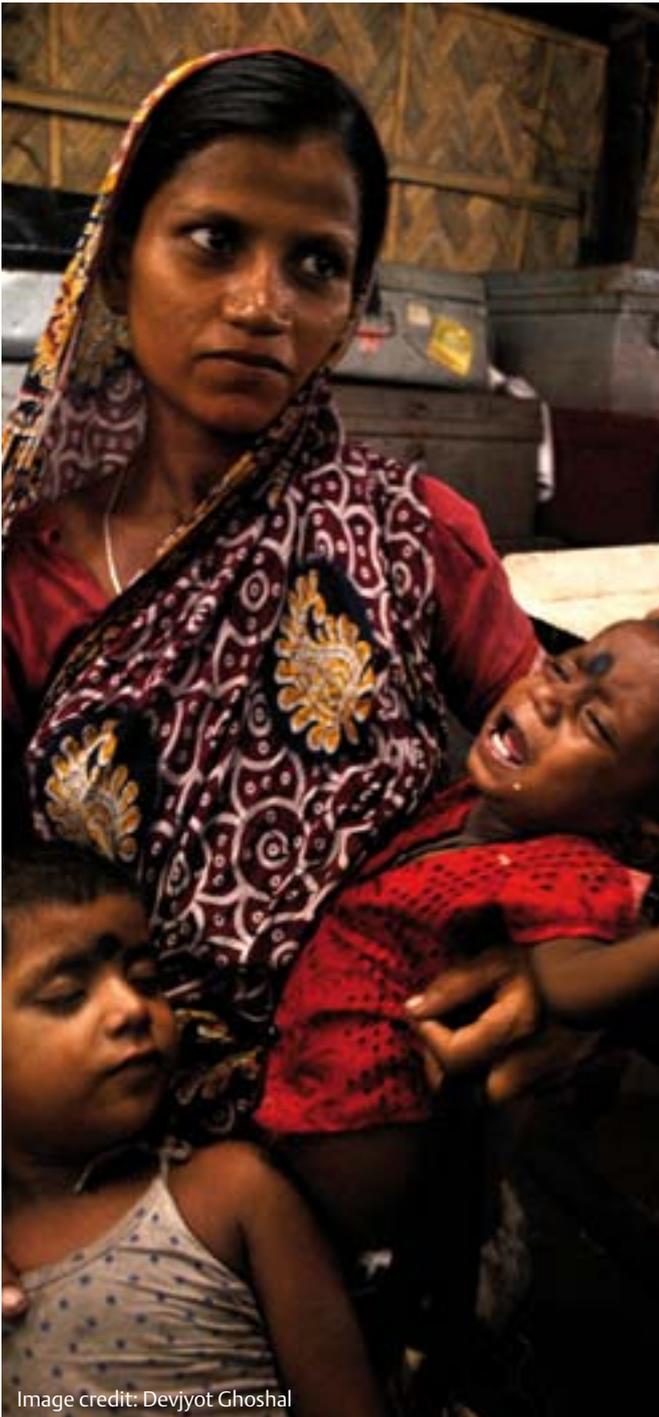


Image credit: Devjyot Ghoshal

Dulu Bibi's Story

On the eastern edge of Kolkata in India, twenty-five year-old mother-of-four Dulu Bibi worries about the cost of treating her two sick children.

Dulu's husband earns about 80-90 rupees (US\$1.90 or €1.40) a day. She finds feeding the family a huge challenge.

"Since my husband earns little money, and we have four children, food is a problem. We just don't have enough to eat" Mrs. Bibi says.

The children appear undernourished. Their very basic diet is unlikely to provide them with the essential micronutrients that children need to thrive.

Two of Dulu's children are suffering now from diarrhea. The three- and one-year-old boys are weak and feverish. They lack any appetite and cry a lot. Dulu must choose between food and medicine to treat the diarrhea. "If I have to spend 150-200 rupees (around US\$4 or €2.80) on medicine, then what will I eat and feed my children with?"

Her children often have diarrhea. "It comes and goes", she says.

There are medical centers close to where the family lives, but they are too expensive, so Dulu must travel for two hours, "which is difficult and also costs money", in order to reach affordable treatment at Calcutta Rescue.

There would be extraordinarily high benefits from providing micronutrients – particularly vitamin A and zinc – to undernourished children in South Asia and sub-Saharan Africa.

Finn Kydland.

The Research

In ‘Micronutrient Supplements for Child Survival’, a Best Practice Paper for the Copenhagen Consensus Center, Sue Horton et al. outline ways to make vitamin A coverage universal. Although it is often assumed that the children not reached by vitamin A supplementation live in remote areas, Horton et al. find that many live in or around big cities such as Nairobi and Delhi which have a weak urban health infrastructure.

They find that a Bangladeshi program provides a good model for how to achieve universal coverage. In this program, community groups and volunteers focused on reaching families with children who had not received supplements. Horton et al. also argue that there is a missed opportunity in many developing countries to

provide vitamin A to pregnant and recent mothers. They recommend that when newborn children receive their first immunization, mothers should also receive vitamin A supplements.

Horton et al. point out that only a very small number of countries have launched zinc policy initiatives or pilot programs. And there are no large-scale, comprehensive programs anywhere.

They outline the work that is required – including policy advocacy, technical assistance, capacity building, and additional financing – to support the international scale-up of zinc supplementation.

Horton et al. estimated the cost of delivering vitamin A and zinc supplements by region. The costs are very low, and vary based on personnel costs (see table below).

It is possible to put a monetary value on the benefits of increased vitamin A and zinc supplementation. The Copenhagen Consensus Center research shows that the benefits are very large. For treatment of pre-school aged children, each dollar spent on these initiatives results in around \$17 of benefits. In the worst-affected countries, the benefits of supplementation with vitamin A and zinc can be up to 100 times higher than the costs.

Estimates of total cost of supplementation per child per year

Region	Vitamin A coverage up to 80%	Vitamin A coverage 80-90%	Zinc coverage up to 40%
South Asia, Sub-Saharan Africa, East Asia	\$1.20	\$2.40	\$1.00
Central Asia	\$1.60	\$3.20	\$1.35
Latin America and the Caribbean	\$2.60	\$5.20	\$2.20

Kapil Tamang's Story

Five-year-old Kapil is not at school today. He is once again sick with diarrhea and stomach pain. He will go to church to pray with his mother for recovery.

Kapil has suffered from diarrhea numerous times, in some cases becoming so sick that he can't even walk.

Kapil's father, brother and mother work as laborers, but when Kapil is sick his mother Panchamaya has to stay home to take care of him. When stomach ailments hit the children – as they do several times a year – his mother, Panchamaya says they “can't go to school. They can't work. They can't even walk. They need complete rest.”

Kapil lives with his family in an illegal slum area called Paurakhi Basti, outside Kathmandu in Nepal. The settlement of more than 300 houses was formed by homeless people from different parts of the country.

The family built the hut they live in. It lacks electricity or safe water, and borders the smelly, polluted Bagmati river.

Kapil got sick most recently after eating wet beaten rice. Typically for families in poverty, their diet is low in vitamins but high in energy. Kapil and his mother pray that he will get well soon.



Image credit: Prakash Adhikari

How You Can Help

World Food Program – Nutrition:

The World Food Program is the United Nations' frontline agency in the fight against hunger. WFP is continually responding to emergencies.

But WFP also works to help prevent hunger in the future through programs that use food as a means to build assets, spread knowledge and nurture stronger, more dynamic communities. This helps communities become more food secure.

Treating micronutrient (vitamin and mineral) deficiencies is an area of emphasis. WFP is working on ways to meet the nutritional needs of specific groups – young children, pregnant and lactating women etc.

In 2010, WFP aims to bring food assistance to more than 90 million people in 73 countries.

Donations:

Donations can be made online or by check.

www.wfp.org

Gain – Global Alliance for Improved Nutrition:

The Global Alliance for Improved Nutrition (GAIN) is an alliance driven by the vision of a world without malnutrition. GAIN's mission is to reduce malnutrition through food fortification and other sustainable strategies aimed at improving the health and nutrition of populations at risk. GAIN provides technical assistance on the design, implementation and evaluation of nutrition programs. GAIN projects include population-based programs which deliver staple foods and condiments fortified with vitamins and minerals to large populations through a market-based approach. GAIN pays particular attention to vulnerable groups such as infants and mothers, and young children and women in general.

All GAIN projects are subject to performance measurement to ensure that they are efficient and cost-effective.

Donations:

It is not possible to make an individual donation to GAIN. However, the website highlights other ways of supporting its work and getting involved.

www.gainhealth.org



Where You Can Find Out More

More information about the research described here can be found in the following publications:

Micronutrient Supplements for Child Survival (Vitamin A and Zinc): Best Practice Paper. Sue Horton, France Begin, Alison Greig and Anand Lakshman. Published by the Copenhagen Consensus Center, 2009.

Available online at:
www.copenhagenconsensus.com/Research

Horton, S., H. Alderman, J.A. Rivera, 2009: Hunger and Malnutrition, in B. Lomborg (ed.), *Global Crises, Global Solutions*, second edition, Cambridge University Press, Cambridge and New York, 305–333.

Available for purchase online at:- www.cambridge.org/us/catalogue/catalogue.asp?isbn=9780521517218.

A draft version is available online at:- www.copenhagenconsensus.com/Default.aspx?ID=1322

IZiNCG:

IZiNCG is an international group whose primary objectives are to promote and assist efforts to reduce global zinc deficiency, with particular emphasis on the most vulnerable populations of low-income countries.

IZiNCG provides training and produces and distributes technical information and translations of research findings for program planning, implementation and evaluation of zinc intervention programs.

Donations:

To make donations, contact IZiNCG.

www.izincg.org



Image credit: Devjyot Ghoshal

Micronutrient Fortification & Biofortification

The Challenge

Undernutrition – when the human body does not get the nutrients it needs for health and survival – remains a major issue in developing countries, and is an underlying cause for between 3 and 5 million deaths each year. Eighty percent of the world’s undernourished children live in South Asia and sub-Saharan Africa.

Micronutrient deficiency is often called ‘hidden hunger’. It attracts less attention than the obvious starvation of people who are unable to get enough food to survive. It refers instead to the sickness that affects people who can only afford cheap, filling food that is deficient in essential vitamins and minerals.

A familiar example of micronutrient deficiency is in a family who can only afford to eat cheap rice, but not the fruit, vegetables and meat that would provide a balanced diet.

When people lack vital micronutrients, they can become weak, sick, and even die. It can affect the immune system and hold back learning and development in children.

Certain micronutrients – including iodine and iron – are very important for development.

Iodine deficiency is the primary cause of preventable mental retardation and brain damage. It is more prevalent in women than in men, and more common in pregnant women and adolescents. Because iodine can be found in seafood, deficiency occurs particularly in inland areas.

Severe iodine deficiency in pregnancy leads to serious and lasting effects for infants. Most children born to iodine-deficient mothers appear normal but have brain damage. The most extreme outcome is cretinism, where the child has almost no chance of a healthy, productive life. Deficiency during a pregnancy increases the risk of infant mortality, miscarriage, and stillbirth.

Iodine deficiency also leads to goiter, an unsightly swelling of the thyroid gland. Although goiters are usually painless, a large goiter can cause a cough and make it difficult to swallow or breathe.

An estimated 2 billion people worldwide have inadequate intake of iodine.

Iron deficiency affects mental ability. It interferes with normal brain development and learning. Children with adequate iron intake can interact better with others, have better cognition, perform better in school, and therefore have the potential for lives with higher incomes.

Iron deficiency in pregnant women is associated with increased risks in childbirth, causing more than 20 percent of maternal deaths in Asia and sub-Saharan Africa and more than 20 percent of the deaths in the first week of life.

Iron deficiency affects one-in-three of the world’s population.



Image credit: Devjyot Ghoshal

Samia Khatun's Story

When Samia Khatun first started suffering from a severe stiffness in her body at age 18, the hospital misdiagnosed her. Her family spent an entire month's earnings on medicine that did not make her any better.

"I wasn't able to eat properly," 21-year-old Samia says. "I couldn't swallow anything -- it hurt. Quite often, I would get nasal bleeding. I was weak." Six months ago, she was finally diagnosed with goiter by Calcutta Rescue, and treatment began.

Goiter is generally painless, but in many cases can affect working abilities and performance at school or work. It can cause symptoms such as constant coughing, poor memory, difficulty concentrating and the sensation that food is getting stuck in the upper throat.

Goiter is caused by iodine deficiency. It can be prevented simply by ensuring access to iodized salt, a preventive measure that remains lacking in a third of developing world households, but that costs just US\$0.05 or €0.03 a year per person.

Samia's mother hopes for a swift recovery so that Samia can be married off again. Her first husband abandoned her. Educated only until the third-grade, she has too little schooling to get a job and her illness has made her too weak to take up any job.

Samia's family of six live in a small brick house with no electricity or running water in Kamarhati, India. Like many others living on the banks of the Ganges river, Samia's father is a jute mill worker. The shut-down of a large number of factories has made this a less prosperous business; Samia's father now earns 300 rupees a day (US\$6.75 or €4.80). Samia's mother says, "With food prices rising so much, it is becoming a problem to get enough."

Even as Samia undergoes treatment for goiter, neither she nor her family understand or recognize the word 'iodized'. When asked what caused her illness, Samia responds:

"There is no real reason that I can think of. But the doctors said that the swelling in the neck had to do with some problems with eating. So it must be that."

Her family is upset that years of misdiagnoses wasted so much of their own money. The real reason for anger is that – despite the low cost – we still have not tackled this illness in so much of the developing world.

The Solution

A problem as widespread as micronutrient deficiency requires more than just one set of solutions or interventions to have an impact. Two solutions are presented here, which can be considered different ways of achieving the same objective:

- Micronutrient Fortification
- Biofortification

Micronutrient fortification means deliberately ensuring there are more essential vitamins and minerals in a food product. It is particularly relevant to the problems of iodine and iron deficiency, because these micronutrients can be cheaply and effectively added to basic food products like flour and salt.

Biofortification means developing nutrient-rich versions of the staple crops that poor communities already eat. It can involve 'genetic modification'.

Micronutrient fortification and biofortification are both food-based approaches, but the interventions are at very different stages: micronutrient fortification has been used with great success for decades (particularly in fortifying salt with iodine), while very few biofortified crops have been released.



Image credit: Joana Socias

I ranked all of the micronutrient solutions very highly because of their astonishing ability to deliver better health and cognitive ability to young children. Moreover, these nutrients positively interact with the development of immunity to many diseases.

Vernon L. Smith.

The Research

Micronutrient fortification of basic food items with iodine and iron is an incredibly cheap, simple intervention that saves lives.

Iodine deficiency has already been successfully tackled in many countries with the implementation of the Universal Salt Iodization program, where salt is fortified with iodine. Just one teaspoon of iodine, consumed in tiny amounts on a regular basis over a lifetime, is sufficient to prevent deficiency.

Thanks to this program, more than 60 nations have iodine coverage of more than 70% of the population. However, nearly one-third of households in the developing world still do not consume iodized salt. There are 41 million unprotected infants and newborns.

In 'Micronutrient Fortification', a Best Practice Paper for the Copenhagen Consensus Center, Sue Horton et al. suggest that the urgent tasks are reaching countries without national programs (this includes many nations of the former eastern Europe/USSR bloc, and sub-Saharan Africa), and increasing coverage to hard-to-reach populations in other nations.

Iron fortification of wheat and maize is a sustainable and cheap strategy to reduce iron deficiency. Currently only about a third of flour from large mills is fortified with iron; the goal is 80%. Even this will not be enough: wheat and maize flour from large mills reach a smaller proportion

of the world's population than salt does, so Horton et al. suggest that the fortification of other condiments and rice needs to be considered to reach more people.

Horton et al. estimated the costs and benefits of delivering vitamin A and zinc supplements by region. The costs are very low, and the benefits sizeable (see table below):

Getting these micronutrients to the hard-to-reach last 20% of the population is likely to be more expensive, but the benefits (from improved lives and incomes, and reduced costs on healthcare systems) could be proportionally higher.

Because biofortification works at the level of each individual crop plant, it can serve to reach rural populations not easily served by interventions such as supplementation (see Vitamin A and Zinc) and micronutrient fortification. About 75% of the poor live in rural areas, and have limited access to supplements. The Micronutrient Initiative expects that coverage of fortified foods in rural areas may not exceed one-third.

Research has been conducted into boosting the nutritional content of many different crops. For example, a high-zinc rice is being developed for release in Bangladesh. Orange sweet potatoes rich in pro-vitamins A have been released in Uganda. Research is currently under way to examine the feasibility of introducing nutrients into cassava, sorghum, banana and rice.

Samuel Nderitu's Story

This year the weather has been kind to Samuel Nderitu. For the last three years, his farm in a rural area north of Nairobi has lacked rain. This year is different.

He remains concerned, however: "This year we have got rain, but maybe next year we will fail to get it".

Samuel's farm is located at the border of the Nyeri district which has been severely affected by drought. He is a part-time farmer and part-time matatu (public bus) driver but is now entirely dependent on the farm, because the thirteen-year-old matatu has broken down.

"If the harvest fails, I cannot pay my children's school fees", he says. "And I really believe that I have to give a good education to my children".

Samuel farms entirely by hand. This year he is growing potatoes, maize and beans. He did not plant wheat because he did not have the funds to buy the required chemicals.

The family eats 3 times a day, mainly ugali [a local bread made of maize flour], githeri [a local dish made of cooked maize and beans] and potatoes. They must store food because of the uncertainty of what the weather will do next year.

Samuel is aware of genetically modified crops, which could possibly help to improve his harvest,



Image credit: Joana Socias

and also supply valuable extra micronutrients such as iron, zinc, and pro-vitamin A in energy-rich staples.

"I would use them, but I need to get education about it," he says. "I would try because crop failure is not good and I rely on the crops to feed my family".

Funding research to accelerate the development of biofortified crops looks very worthwhile.

Nancy Stokey.

In ‘Biofortification’, a Best Practice Paper for the Copenhagen Consensus Center, J.V. Meenakshi found that for a biofortification strategy to be successful and cost-effective, three issues must be addressed. First, plant breeders must succeed in finding crop-lines with high micronutrient content that can be bred into local varieties. Second, the nutritional effectiveness of a biofortified crop must be established. Third, both farmers and consumers must accept the new variety and make it an important part of what they produce and consume so that it becomes a cost-effective intervention.

Meenakshi notes that this third issue is currently the biggest factor for the success of this intervention. The greater the share of a country’s food supply that is biofortified, the higher the magnitude of improvements. But this depends on acceptance from farmers and consumers of changes to crops. However, in contrast to Europe where opposition to modified foods appears entrenched, consumer attitudes are not as negative in the developing countries that could benefit most from biofortification.

The one-time cost of a biofortified crop variety can yield benefits to the local population, year after year. There are virtually no recurring costs, except those involved in maintenance breeding. These of course vary, and are estimated at about \$100,000 per year in Bangladesh and \$2 million per year in India. In comparison, both micronutrient fortification and supplementation involve recurring costs.

The benefits from biofortification vary, depending on the crop used and how it is improved. Research, though, shows that this is a very effective investment. Meenakshi examined the costs and benefits of providing zinc-dense rice to Bangladesh, iron-dense beans to Rwanda, and pro-vitamin A maize to Kenya, and found that benefits were between 20 and 200 times higher than the costs, when all of the effects on a community’s health were taken into account.

The ability of biofortification to make a substantial impact varies depending on coverage, which depends on factors like whether there is well-developed infrastructure to support seed dissemination. In most cases, though, it appears highly cost-effective and can reach a broad coverage helping disadvantaged communities obtain more diverse, nutritious diets.

Estimates of Annual Costs and Benefits of Scaling Up Micronutrient Fortification to Reach 80% of Population with Salt and 50% with Flour for South Asia and Sub-Saharan Africa

Initiative	People Affected (millions)	Solution Cost Per Person Per Year	Cost Per Year (millions)	Benefits Per Year (millions)
Salt Iodization	380	\$0.05	\$19	\$570
Flour Iron Fortification	1,390	\$0.12	\$167	\$1336

How You Can Help

The International Council for the Control of Iodine Deficiency Disorders:

The International Council for the Control of Iodine Deficiency Disorders (ICCIDD) is the only international organization specifically constituted to promote optimal iodine nutrition and the elimination of iodine deficiency disorders (IDD).

ICCIDD's global network consists of over 600 specialists from more than 100 countries, including scientists in the medical and nutrition fields, public health workers, development managers, salt producers, and many others involved in fields related to iodine nutrition. All of them are committed to assisting governments and international agencies in developing national programs for the virtual elimination of IDD as a public health problem.

ICCIDD is a nonprofit, nongovernmental organization with official consultant status with WHO and the UN system, and a founding member of the Network for Sustained Elimination of IDD.

Donation:

Individual donations can be made by check. For further information about donations, contact ICCIDD by mail or phone.

www.iccidd.org

HarvestPlus:

HarvestPlus seeks to reduce hidden hunger and provide micronutrients to billions of people directly through the staple foods that they eat. HarvestPlus uses a novel process called biofortification to breed higher levels of micronutrients directly into key staple foods.

HarvestPlus focuses on three critical micronutrients that are recognized by the World Health Organization (WHO) as most limiting in diets: iron, zinc, and vitamin A. HarvestPlus envisions that in fifteen years, millions of people suffering from micronutrient malnutrition will be eating new biofortified crop varieties.

Within the next decade HarvestPlus is planning to test and release new varieties of nutrient-dense staple crops that will improve the well-being of millions in Africa, Asia and Latin America.

Donation:

To make contributions, contact HarvestPlus by mail or phone.

www.harvestplus.org



Image credit: Devjyot Ghoshal

Where You Can Find Out More

More information about the research described here can be found in the following publications:

Horton, S., V. Mannar, A. Wesley, 2009: Micronutrient Fortification (Iron and Salt Iodization), Best Practice Paper series, Copenhagen Consensus Center, Copenhagen.

Available online at:- www.copenhagenconsensus.com/Research.aspx

J.V. Meenakshi, 2009: Biofortification, Best Practice Paper series, Copenhagen Consensus Center, Copenhagen.

Available online at:- www.copenhagenconsensus.com/Research.aspx

Horton, S., H. Alderman, J.A. Rivera, 2009: Hunger and Malnutrition, in B. Lomborg (ed.), Global Crises, Global Solutions, second edition, Cambridge University Press, Cambridge and New York, 305–333.

Available for purchase online at:- www.cambridge.org/us/catalogue/catalogue.asp?isbn=9780521517218.

A draft version is available online at:- www.copenhagenconsensus.com/Default.aspx?ID=1322



Image credit: Prakash Adhikari

Community Nutrition Promotion

The Challenge

Proper nutrition is important for a child's health, learning, and development. Proper nutrition also benefits families and the entire community in the long run. The key periods where a child is most vulnerable is before birth, and during lactation and weaning. Growth and mental problems caused by undernutrition before the age of two are extremely difficult, if not impossible, to reverse.

The Solution

While specific nutrition interventions (like micronutrient supplementation, micronutrient fortification and biofortification) can transform lives and improve the health of entire populations, their obvious limitation is that with each intervention, only a small part of the overall problem is being addressed: Vitamin A supplements solve the specific problem of vitamin A deficiency, iodization of salt solves the specific problem of iodine deficiency, and so forth.

To make further progress, households will need to change their food practices. This means behavioral change, which is considerably more complex than micronutrient supplements or fortification.

A key opportunity to try to encourage these changes comes during pregnancy. Undernutrition in infants is extremely difficult, if not impossible, to reverse. The

key messages to impart to pregnant women are about improving diet, breastfeeding, complementary feeding of infants and young children, and identifying inadequate growth and weight gain in babies.

Delivering these messages effectively requires one-on-one discussion, typically with the mother. Weighing the mother-to-be, and weighing and measuring the baby, are important tools with which to frame the educational messages. Such educational sessions can also be used to provide micronutrient supplements and a deworming intervention.

Education is difficult, and changing behavior even more so. Nevertheless, the potential benefits are large. Nancy Stokey.

The Research

In ‘Hunger and Malnutrition’, a chapter for ‘Global Crises, Global Solutions (second edition)’, Sue Horton et al. find that nutrition education is an order of magnitude more expensive than the nutritional interventions examined above, but its cost-effectiveness is on par with many other attractive health investments.

There are three major types of interventions:

- Incorporation of nutrition education into existing Child Health Days;
- Community nutrition promotion using volunteers;
- Nutrition education as part of the lowest tier of the health care system.

The appropriate intervention depends on the level of development of a country and the current level of development of health services. Cost-effectiveness is typically higher when interventions are “packaged” with other interventions and the costs of personnel time are spread over multiple interventions.

Good program design is absolutely essential in community nutrition programs. Immunization, micronutrient fortification and supplementation programs can fail – but this is the exception rather than the rule. However, there are various behavior-change programs that have shown little

or even no effect, and are therefore poor investments.

More than 60 countries have at least one Child Health Day. In many nations, this involves providing vitamin A supplements, immunizations and deworming. In nations with less availability of primary health care facilities, this outreach format is likely to be particularly appropriate.

In middle income countries and urban areas, coverage by existing primary health facilities tends to be better. In such cases, it can be cost-effective to add a health facility-based nutrition education program that includes complementary feeding demonstrations, growth monitoring sessions and nutrition messages, and motivation for staff by using an accreditation process combined with training.

Horton et al. estimated the costs and benefits of scaling up community-based nutrition promotion:

Estimates of Annual Costs and Benefits of Scaling Up Community-Based Nutrition Promotion

People Affected (millions)	Solution Cost Per Person Per Year	Cost Per Year (millions)	Benefits Per Year (millions)
114	\$7	\$798	\$10,000



Image credit: Karl Mueller

How You Can Help

Academy for Educational Development:

AED is a nonprofit organization working globally to improve education, health, civil society and economic development.

In collaboration with local and national partners, AED fosters sustainable results through practical, comprehensive approaches to social and economic challenges. AED implements more than 250 programs serving people in all 50 U.S. states and more than 150 countries.

AED's Global Health, Population & Nutrition Center currently manages more than 15 large-scale international nutrition-related programs.

AED strives to improve the delivery of health services to children and mothers and the practice of healthy behaviors.

Donations:

Donations can be made online or by mail, and can be directed to specific projects.

www.aed.org

SurfAid International:

SurfAid International is a nonprofit organization dedicated to the alleviation of human suffering through community-based health and nutrition programs.

Drastic improvements in child mortality and illness can come from simple behaviors in the home - things like mosquito nets, hand-washing, exclusive breastfeeding and giving children with diarrhea more to eat and drink.

SurfAid established Mother's Care Groups, a proven approach that drives lasting behavior change in the home, using peer-to-peer teaching networks to create healthy new social norms.

Care Groups are up and running in 53 Mentawai and Nias Island villages, serving 35,000 people.

SurfAid's evolution of Care Groups promises to create a vehicle for dramatic change that can scale up to save vast numbers of children from unnecessary death and suffering.

Change created via the Care Group process is self-reinforcing and establishes new cultural norms; follow-on studies have documented that behavior change is durable.

Donations:

Donations can be made online.

www.surfaid.org

Helen Keller International:

Helen Keller International (HKI) is an international non-governmental organization devoted to preventing blindness and reducing malnutrition in the world.

Helen Keller International implements Infant and Young Child Feeding (IYCF) programs to promote optimal breastfeeding and the timely introduction of nutritionally dense complementary foods to ensure optimal growth, development and disease resistance.

HKI's Infant and Young Child Feeding programs raise awareness among health workers in local communities so they understand the importance of early initiation and exclusive breastfeeding of newborns during the first 6 months of life.

HKI also works with government and local agencies to create materials to train health workers and promote positive nutrition behaviors in local communities.

Helen Keller International is committed to preventing malnutrition worldwide, and the Infant and Young Child Feeding approach is an important strategy to help accomplish that goal.

Donations:

Donations can be made online.

www.hki.org



Image credit: Joana Socias

Where You Can Find Out More

More information about the research described here can be found in the following publications:

Horton, S., H. Alderman, J.A. Rivera, 2009: Hunger and Malnutrition, in B. Lomborg (ed.), *Global Crises, Global Solutions*, second edition, Cambridge University Press, Cambridge and New York, 305–333.

Available for purchase online at:- www.cambridge.org/us/catalogue/catalogue.asp?isbn=9780521517218.

A draft version is available online at:- www.copenhagenconsensus.com/Default.aspx?ID=1322.

CHILD HEALTH

Expanding Vaccination Coverage

The Challenge

Vaccination may be the most effective public health intervention of all time. But incomplete vaccination coverage is responsible for large numbers of preventable child deaths every year. According to UNICEF, a quarter of the world's children – about 26 million infants – are not immunized against the worst diseases.

The three vaccine-preventable diseases responsible for the most child deaths are pneumococcal disease, rotavirus infection, and Hib infection (see graphic, right).

Pneumococcal disease and Hib infection (or Haemophilus influenzae type b) are both serious diseases and are caused by bacteria which can attack different parts of the body. In the lungs, infection can cause bacterial pneumonia; in the bloodstream it can cause bacteremia; in the brain it can cause meningitis. Either disease can cause death or leave a child with severe neurological conditions such as deafness, blindness, or intellectual impairment.

Rotavirus infection is a viral infection of the intestine, and can cause fever, vomiting, and severe diarrhea. It spreads very easily from one child to another. It can cause malnutrition, leaving lasting impacts on a child's life.

The Solution

Vaccination is the most effective way of protecting children against pneumococcal disease, Hib infection and Rotavirus infection.

When the World Health Organization's Expanded Program on Immunization was launched in 1974, less than 5% of the world's children were immunized during their first year of life against major killer diseases. The program helped countries establish the infrastructure needed to introduce and deliver a standard vaccine package. Now, nearly 79% of children receive life-saving vaccinations. However, coverage is widely incomplete.

Disease	Number of deaths in children under the age of five, 2002
Pneumococcal Disease	716,000
Rotavirus Infection	402,000
Hib Infection	386,000

The Research

Decision-makers commonly use a cost-effectiveness test when they decide whether to finance a health-care initiative.

In 'The Economic Case for Expanding Vaccination Coverage of Children', a Best Practice Paper for the Copenhagen Consensus Center, David Bloom et al. argue that these economic evaluations have traditionally been too narrow. They write that decision-makers traditionally consider only some categories of vaccine effects, while disregarding others, and fail to take into account changes in vaccine costs that can be achieved by combining several vaccines into a single delivery system.

The authors argue that this narrow perspective could mean that the benefits of vaccination have been underestimated, the costs have been overestimated, and the wrong decisions made on whether to finance vaccination.

Bloom et al. use the Hib vaccine as an example to outline this case. The vaccine has been introduced into national vaccination schedules in most countries worldwide, but with global coverage of just 26%, it has the lowest coverage of all of the World Health Organization's Expanded Program on Immunization vaccines.

When vaccines can be combined and provided together, costs are dramatically reduced. This has not factored in traditional cost-effectiveness studies. Unlike vaccines against pneumococcal disease and rotavirus infection, the

Hib vaccine can be combined with the DTP vaccine (which protects against diphtheria, tetanus, and pertussis) and delivered in a single injection. The combined DTP and Hib vaccination could prevent 703,000 deaths annually.

Economic analyses of the benefits and costs of vaccination programs usually focus on health improvements, reductions in health care costs, and the reduced time parents must spend taking care of sick children. Bloom et al. argue that this offers an incomplete understanding of vaccine-related benefits.

They point out that children who are healthy are more likely to attend school and to attain high education levels; adults who are physically healthy and well educated can work more and more productively.

Vaccination effects can also change behavior. For instance, in areas with many child deaths, couples may choose to have more children so that enough offspring survive to support the family. As Hib vaccination reduces the level of child deaths, parents have fewer children and 'invest' more in each child, improving the results in nutrition, health and education. These improvements, in turn, will see a child become a more productive adult.

There are also the so-called 'herd effects' – the reduction in an unvaccinated person's risk of contracting a disease due to the vaccination of another person.



Image credit: Chris Zahniser

Many bacterial infections, including Hib infection, are treated using antibiotics. Vaccinations can therefore reduce the level of antibiotic resistance, saving governments, medical institutions, and communities money that would otherwise have been spent on treating antibiotic resistant strains of illnesses.

Understanding the links between vaccination programs, health, education, and labor productivity has implications for all vaccines, not just the Hib vaccine.

It is important to draw attention to the non-health benefits of vaccination, including effects on educational attainment and labor productivity. Only when all benefits of vaccinations for the health, education, and economy

of a country are considered simultaneously with the cost of vaccine delivery will policy makers have sufficient information to take the right decisions on expanding vaccination programs.

A single visit to schools enables this relatively low-cost program to yield immense long-term benefits.

Vernon Smith.

How You Can Help

UNICEF:

UNICEF is a global leader in vaccine supply, reaching 40 per cent of the world's children. Immunization is a central part of UNICEF's commitment to protecting the world's most vulnerable children.

UNICEF work in several areas of immunization to ensure every child's right to be protected against preventable diseases and to meet the Millennium Development Goals of reducing child mortality, improving maternal health and reversing the spread of killer diseases. The key areas include expanding immunization coverage, strengthening cold chain and logistics, eradicating polio, vaccination in hard-to-reach communities, reducing measles mortality, securing vaccine supply etc. UNICEF is working together with governments, WHO, health workers and community leaders to improve the condition of vaccination.

Donation:

Donations can be made online and can be directed to a specific area.

www.unicef.org/

PATH:

PATH is an international nonprofit organization that creates sustainable, culturally relevant solutions, enabling communities worldwide to break longstanding cycles of poor health. By collaborating with diverse public- and private-sector partners, they help provide appropriate health technologies and vital strategies that change the way people think and act.

PATH partners with governments to get decision-makers the information and resources they need to prioritize immunization—and to build strong, resilient immunization systems that reach even the most remote villages.

There are still many diseases for which vaccines are not available, and market forces alone are not always strong enough to drive the development of vaccines—especially for diseases that mainly affect poor countries. PATH engages the private sector to advance vaccine development and provides resources, know-how, and experience working in developing-country communities.

PATH's work reaches more than 70 countries and responds to the spectrum of global health needs.

Donation:

Donations can be made online and can be directed into three different projects.

www.path.org/



Image credit: Joana Socias

Where You Can Find Out More

More information about the research described here can be found in the following publications:

Bärnighausen, T., D.E. Bloom, D. Canning, A. Friedman, O. Levine, J. O'Brien, L. Privor-Dumm, D. Walker, 2009: The Economic Case for Expanding Vaccination Coverage of Children, Best Practice Paper series, Copenhagen Consensus Center, Copenhagen.

Available online at:- www.copenhagenconsensus.com/Research.aspx

Jamison, D., P. Jha, D.E. Bloom, 2009: Disease Control, in B. Lomborg (ed.), Global Crises, Global Solutions, second edition, Cambridge University Press, Cambridge and New York, 305–333.

Available for purchase online at:- www.cambridge.org/us/catalogue/catalogue.asp?isbn=9780521517218.

A draft version is available online at:- www.copenhagenconsensus.com/Default.aspx?ID=1322

Sabin Vaccine Institute:

The Sabin Vaccine Institute is a nonprofit organization dedicated to reducing needless human suffering caused by infectious and neglected tropical diseases. Innovative vaccine research and development are used to develop treatments and vaccines for the world's poor and establish networks to ensure these treatments are effectively and efficiently delivered.

Sabin advocates and mobilizes resources to ensure that urgently needed treatments and essential medicines for the seven most common neglected tropical diseases are delivered to the world's poorest.

To achieve this, Sabin established public private partnerships on the ground in Africa, Asia, and the Americas and works together with the World Health Organization and its regional offices.

Donations:

Donations can be made online.

www.sabin.org



Image credit: Julien Harneis

Deworming

The Challenge

When a child is infected by parasitic worms, the worms live and grow inside the stomach and intestines. The worms can drain essential nutrients that the child eats, causing malnutrition. As the body tries to fight off the infection, appetite and metabolism are affected. Over time, the infection can cause organ damage and internal bleeding.

Intestinal worms are the most common infection affecting people living in poor communities. There are around 2.3 billion people affected – that is nearly half of the population of the world’s poorest countries. Sub-Saharan Africa, South and Southeast Asia, the Pacific Islands, and parts of Latin America are most heavily affected.

Infection affects both children and adults. In adults, infection with worms damages health and limits access to work. In the hundreds of millions of children who are infected with intestinal worms such as roundworm, hookworm, and whipworm, the effects can be particularly damaging. That is because infection and malnutrition can hinder a child’s learning and development, as well as making a child weak and sick.

In 1993, the World Bank concluded that worm infections caused the greatest burden of infectious diseases in children between 5 and 14 years in poor countries.

Worms are passed on from one person to another through contaminated food and water, and through contact with infected feces and urine. This means that infection can be rife in crowded communities with poor sanitation.

The Solution

There is one single-dose drug that treats all of the main species of intestinal worms. Treatment is safe and inexpensive. The World Health Organization recommends twice-yearly treatments for pre-school children, women of childbearing age (including pregnant women and recent mothers) and adults who are at high risk.

Children with worms tend to live in poor environments where diets are often lacking, and there are other problems. This means that removing the worms is only one step in improving a child’s growth, health, and development. Deworming often needs to be supplemented with supplementary food and the delivery of targeted micronutrients, as well as catch-up education lessons.



The Research

In 'Deworming', a Best Practice Paper for the Copenhagen Consensus Center, Andrew Hall and Sue Horton recommend treating children when they are in school. They point out that infections are worst in children aged between 5 and 15, and schools provide a suitable place for the delivery and administration of treatment.

The financial costs of deworming schoolchildren are very small: the cost of delivering one round of treatment as part of a Child Health Day is about (US\$) 15 cents when administered in school, and (US\$) 25 cents for preschool children.

Hall and Horton recommend changing the World Health Organization guidelines to make deworming more effective (see tables below).

If implemented, the recommendations would lead to a lower overall cost (US\$224 million annually to reach every developing country, compared to US\$276 million annually), and would mean more of the spending would reach individuals who are infected by worms (74% of spending, compared to 61%), and more would be spent treating individuals who are infected with more than ten worms (31% of spending, compared to 21%).

It is possible to put a monetary value on the benefits. These benefits include the reduction in anemia and malnutrition, reduced pressure on the healthcare system,

The cost is extremely low and leads to benefit-cost ratios (BCRs) that are really huge. Moreover, it is important to stress that experimentation with these interventions has been conducted in a very rigorous way so that estimates of BCRs can be considered to be reasonably precise.

François Bourguignon.

improved school participation and school achievement, and future increased productivity in working-age adults.

The research by Horton and Hall shows that the benefits are very large. For treatment of pre-school aged children, each dollar spent results in about \$6 of benefits. In countries where many people are infected, the benefits of deworming can be up to 60 times higher than the costs.

Current World Health Organization Recommendations

Country where more than 20% of the population is infected	Treatment once a year
Country where more than 50% of the population is infected	Treatment twice a year

Copenhagen Consensus Center Research Recommendations

Country where more than 40% of the population is infected	Treatment once a year
Country where more than 60% of the population is infected	Treatment twice a year
Country where more than 80% of the population is infected	Treatment three times a year

Ruthimitu Primary School's Story

Ruthimitu Primary School in Nairobi, Kenya, is overcrowded and surrounded by rubbish and the stench of human waste. The school cannot afford its electricity bills.

There is no concrete, so in the rainy season the school-grounds are full of slippery mud. The boy's toilets sank into the mud fifteen months ago. There is no running water and no basin for the children to wash their hands. Each child is asked to bring a jerry can of water from home every day.

Deputy headmistress Ester purchased soap herself for cleaning. She earns about 3,250 Kenyan Shillings (US\$40 or €29) a week.

The poor hygiene of the school stimulates the transmission of parasitic worms. Ester notices that worm infections reduce the concentration of some children. "It affects their performance and also sometimes their self-esteem."

Twice a year, the school participates in a deworming program arranged by the Nairobi City Council.

"The nurses come and we give them a room," Ester says, "One class after the other, the kids go and are checked. They look at their nails, eyes and



Image credit: Joana Socias

head." They provide medication and, later, send representatives back to check that the school's children were treated.

School-based treatment is an effective way to address large infections among children. "I cannot see any other way to do it," Ester says, "It has to be done through the school. If it was done in health centers, it would not be as effective as most of the parents refuse to visit them as they cannot afford it".

How You Can Help

Save the Children:

Save the Children is a leading independent organization creating lasting change in the lives of children in need in the United States and around the world. Save the Children acknowledges worms and malnutrition as an important challenge and has created donation projects that help children suffering from malnourishment caused by parasites. For a US\$30 gift (€21) the donor can help deliver deworming and other micronutrients to 30 children.

Donations:

Donations can be made online.

www.savethechildren.org

Deworm the World:

Deworm the World brings together partner organizations and individuals around the world committed to improving children's health and education by massively expanding deworming programs. Rather than setting up a new organization, Deworm the World links education groups to funders and provides the information they need to implement deworming and to raise the profile of this neglected issue.

Deworm the World is working to implement school-based deworming wherever it is needed worldwide. Mass deworming programs based in schools are recommended by the World Health Organization (WHO) and cost just pennies per child.

Donations:

Donations can be made online or by check.

www.dewormtheworld.org

Where You Can Find Out More

More information about the research described here can be found in the following publications:

Hall, A. and S. Horton, Deworming, Best Practice Paper series, Copenhagen Consensus Center, 2009. Available online at:- www.copenhagenconsensus.com/Research.aspx

Horton, S., H. Alderman, J.A. Rivera, 2009: Hunger and Malnutrition, in B. Lomborg (ed.), *Global Crises, Global Solutions*, second edition, Cambridge University Press, Cambridge and New York, 305—333.

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Available for purchase online at:- www.cambridge.org/us/catalogue/catalogue.asp?isbn=9780521517218.

A draft version is available online at:- www.copenhagenconsensus.com/Default.aspx?ID=1322.

The Carter Center:

The Carter Center is a charitable organization, financed by private donations from individuals, foundations, corporations, and international development assistance agencies.

The Center fights six preventable diseases—Guinea worm, river blindness, trachoma, schistosomiasis, lymphatic filariasis, and malaria—by using health education and simple, low-cost methods.

These efforts have brought to resource-limited countries better disease surveillance and health care delivery systems. Because communities often are burdened by several diseases, the Center is also pioneering new public health approaches to efficiently and effectively treat multiple diseases at once.

Donations:

Donations can be made online, and can be directed to specific causes.

www.cartercenter.org



Image credit: Julien Harneis

Malaria Prevention and Treatment

Malaria is a largely preventable disease that can be brought under control with counter-measures, but control has slipped away from the public health reach in Africa. Since interventions began there have been substantial world-wide reductions in mortality because of immunization service. This progress contrasts with deaths from malaria inside Africa which have more than tripled because of the limited use of indoor residual spraying that has been part of the acute management programs applied elsewhere.

Vernon Smith.

The Challenge

In Africa a child dies every 45 seconds of Malaria. The disease accounts for 20% of all childhood deaths and is one of the leading killers of children aged under five. In addition to claiming one million lives a year, the disease deepens and reinforces poverty in some of the poorest areas of the world.

Malaria is a disease caused by parasites that are transmitted to people through the bites of infected mosquitoes. Malaria afflicts as many as half a billion people in Africa, Asia and Latin America. Until as recently as 60 years ago, malaria was also a problem in Europe and North America. Simple public health measures eliminated the disease there.

An estimated 3 billion people, almost half of the world's population, live in areas where malaria transmission occurs. Warm, humid climates provide ideal conditions for mosquitoes to develop and survive. Regions with high average temperatures support the development of the malaria parasite in mosquitoes.

Transmission is more intense in Africa where mosquitoes have longer lives and bite humans rather than other animals. More than 85 percent of the world's malaria deaths are in Africa.

According to the Roll Back Malaria initiative, malaria costs Africa at least US\$ 12 billion in direct losses and much more than that in lost economic growth each year.



The Solution and Research

Malaria is preventable and curable. Many lives can be saved by preventing transmission of malaria in the first place. This involves expanding coverage of insecticide-treated bed nets, expanding use of intermittent preventive treatment for pregnant women; and the use of indoor residual spraying with DDT.

If malaria is not treated within 24 hours, it can progress to severe illness often leading to death. Early diagnosis and treatment of malaria can be crucial. As malaria becomes increasingly resistant to standard inexpensive drugs, it is important to finance Artemisinin Combination Therapies (ACTs).

Artemisinin is about 10 times more expensive than the mainstay treatment, chloroquine, which is becoming less effective. The design of instruments for financing a rapid transition to effective new treatments such as ACTs is a high priority.

The Affordable Medicines Facility – malaria (AMFm) is a particularly attractive financing mechanism for committing resources to malaria control. Under this scheme, the Global Fund to Fight Aids, Tuberculosis and Malaria reduces the manufacturer sales price of ACTs to public, private and not-for-profit sector buyers.

In ‘Disease Control’, a research paper for the Copenhagen Consensus 2008 project, Dean Jamison et al. concluded that spending \$0.5 billion on expanding the provision of

insecticide-treated bed-nets and on the provision of ACTs would avert 500,000 mostly child deaths annually. Taking into account the reduced costs for the health system, increased health and productivity, the benefits would be in the region of twenty-times higher than the costs.

Priscilla Muthoni's Story

20-year-old Priscilla is sitting on a bench outside the Thika District Hospital in Kabati, Kenya, with her 10-month-old daughter. She has travelled an hour to get here.

“The baby was vomiting and had fever for the last couple of days. Also she coughs a lot” Priscilla says.

“I thought her problem was that she was getting her teeth, but in a nearer clinic they told me that she could have malaria”.

The diagnosis confirmed, Priscilla discovers that the hospital's pharmacy is out of stock of three of the five drugs she has been prescribed for her daughter for malaria and other issues. She is told to purchase the drugs from a private pharmacy. Priscilla does not have enough money, so she plans to wash clothes to raise the money over the next three days.

Priscilla's husband has a casual job but she complains that he spends half of his money drinking local brews. She says that he is often drunk when he gets home.

Malaria can be a life-threatening disease, and is especially serious in children aged under five. It is caused by parasites that are passed on to people through bites of infected mosquitoes. Warm, humid climates provide ideal conditions for mosquitoes to develop and survive. Kabati is an ideal breeding ground for mosquitoes during the rainy season. The intense rain and high average temperatures support the development of the malaria parasite in mosquitoes.

Priscilla, her two daughters and her husband live in a one-room house, no bigger than 15 square meters, made of iron sheets and wooden walls. There is one bed, one small sofa, one table and two chairs. There is no electricity.



Image credit: Joana Socias

The bed has a mosquito net but it has holes so they don't use it. She says that when her husband is drunk, he sleeps there and she and the baby sleep on the floor on some sacks, because he vomits over the bed. Their other daughter sleeps on the small sofa.

When she sleeps on the floor, she covers herself with a sheet but she says she can see and hear mosquitoes coming through holes in the walls.

Early diagnosis and treatment of malaria reduces the disease and can prevent deaths. Many lives could be saved by preventing transmission of malaria by expanding coverage of insecticide-treated bed nets, by expanding use of intermittent preventive treatment for pregnant women; and by use of indoor residual spraying with DDT.

A Copenhagen Consensus researcher pays for the drugs for Priscilla's child. The cost? Just 340 Kenyan shillings (US\$4.20 or €3).

How You Can Help

Nets for Life:

NetsforLife empowers communities to eliminate malaria by providing life-saving prevention training and long-lasting insecticide-treated nets.

In partnership with corporations, foundations, NGOs and faith-based organizations, NetsforLife implements integrated malaria-prevention programs in 17 countries in sub-Saharan Africa.

NetsforLife accesses remote communities—those typically unreached by national health programs—by utilizing a vibrant network of local churches, faith-based groups and NGOs.

NetsforLife has mobilized thousands of community volunteers to distribute nets and teach their neighbors how to prevent and treat malaria. More than 18 million people have benefited from NetsforLife to date.

Donations:

Donations can be made online.

www.netsforlifeafrica.org

Malaria Consortium:

Malaria Consortium works in partnership with communities, government and non-government agencies, and local and international organizations. Together, they seek to provide groups most at risk with better access to prevention and treatment of malaria.

Malaria Consortium works to increase coverage of effective malaria prevention tools. As a prevention measure, MC distributes long-lasting insecticidal nets (LLINs) to those who need them and trains people to use them properly.

Malaria Consortium is also engaged in improving access to diagnosis and effective treatment of malaria, particularly among rural populations.

Donations:

Donations can be made online.

www.malariaconsortium.org

PATH:

PATH Malaria Vaccine Initiative (MVI) is dedicated to accelerating the development of malaria vaccines and ensuring their availability and accessibility in the developing world.

Contributions to this work are used for vaccine development projects but also to address commercialization and policy barriers to malaria vaccine development and to further communications and advocacy.

PATH is an international, nonprofit organization that creates sustainable, culturally relevant solutions, enabling communities worldwide to break longstanding cycles of poor health.

Donations:

Donations can be made online or by check.

www.malariavaccine.org



Image credit: James Gathany

Where You Can Find Out More

More information about the research described here can be found in the following publications:

Jamison, D., P. Jha, D.E. Bloom, 2009: Disease Control, in B. Lomborg (ed.), *Global Crises, Global Solutions*, second edition, Cambridge University Press, Cambridge and New York, 305–333.

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A draft version is available online at:- www.copenhagenconsensus.com/Default.aspx?ID=1322

EDUCATION & EMPOWERMENT

Lowering the Price of Schooling and Improving Girl's Schooling

The Challenge

We know that education can provide a pathway out of poverty. Without it, children are more likely to become criminals, abuse drugs and suffer from chronic illness. Hundreds of studies show a link between how long children spend in school and how much they earn as grown-ups.

Of about 112 million children born annually in developing countries, nearly one-quarter will not complete primary school.

Although steady progress has been made over the past 50 years toward increasing education and literacy worldwide, we are still a considerable distance from the United Nation's Millennium Development Goal that every child should be given at least a primary education by 2015.

Significant gender gaps in schooling enrollments persist in particular regions and at particular levels of education. This is especially true for parts of South Asia and poorer countries in sub-Saharan Africa.

The Solution

A relatively large amount of money is spent each year in an effort to get more – and better – education to children in the developing world. A lot of this money could be better spent. Experience shows that merely building more schools is not the best approach. Indonesia doubled its number of schools in six years, leading only to a three percent rise in the amount of time spent at school. In much of the world, schools already exist where most children live. New ones can divert them from other schools.

Many attempts to increase the *quality* of education go wrong because there is still no agreement on what constitutes 'quality'. What one study finds critically important proves unimportant or even detrimental in another.

A focus on girls' schooling, as well as general schooling, is clearly justified by economic fundamentals.

Vernon Smith.

The Research

Five grades are sufficient for a child to attain literacy in most nations. While a quarter of children in developing nations do not complete their first five years at school, more than half of these children *did start*. Peter Orazem, Paul Glewwe and Harry Patrinos suggest in the Copenhagen Consensus Center Best Practice Paper, ‘Lowering the Price of Schooling’, that the best – and most cost-effective – way to boost schooling is to focus on eliminating grade school drop-outs in developing nations, ahead of trying to attract children who have never attended school.

In developing countries, girls, rural children, and children from the poorest households are the least likely to complete primary school. There is significant evidence that developing country parents, when facing high fees and cost of schooling will under-invest in their children’s schooling.

Even though only 18% of developing countries officially charge tuition, 84% charge some type of formal or informal fee for children to attend primary school. These fees include charges for uniforms or school supplies, mandatory payments to parent-teacher associations, as well as formal or informal tuition and other fees. The costs can be a large fraction of the household income, and parents can pull their children out of school to send them to work instead.

Orazem et al. recommend four cost-effective strategies to lower the costs parents face when sending their children to school.

The first strategy involves the elimination of primary school tuition. In Uganda, enrollments increased 60% following

the elimination of school fees. Although the children who entered school after the fee reduction were more likely to drop out before completing the primary cycle, they finished in sufficient numbers to justify the expense (of US\$2,703 to \$3,675 or €1,933 to €2,628 per child).

The second strategy involves the use of grants that promise private school operators a fee for schooling girls in poor neighborhoods. In Pakistan a program based on this approach resulted in large increases in schooling in urban areas but more modest gains in rural areas.

The third strategy involves providing tutors for poor children. In Asian countries, tutors are commonly used to supplement schooling, but poor households cannot afford them. In many countries, there is a ready supply of educated young women who represent a potential supply of tutors that can be hired at modest cost. The benefits in improved cognitive attainment can be substantial.

The fourth strategy involves providing government vouchers that would allow poor children to attend private secondary schools. The Colombian government offered poor families vouchers that would allow their children to attend private secondary schools that had excess capacity. Evaluations of the program found that voucher recipients completed school in greater proportions and scored higher on standardized tests.

Reducing fees is much less expensive than bricks and mortar expansions and has a much larger effect. Targeting children who are at risk of dropping out is the most effective



Image credit: Pierre Holtz

George Kuria's Story

George Kuria – or Kuria as everyone calls him – dreams of becoming a lawyer. “I want to defend people”, the boy from the town of Dagoretti, north of Nairobi, says. Today, however, the dream seems far away: the thirteen year-old dropped out of school one year ago.

“The deputy of the school chased me away because my mother had not paid [the 200 Kenyan Shilling (US\$2.50 or €1.75) fee for every three-month term]. That happened so many times, I decided to leave.”

In Kenya primary education is free, but the government does not cover expenses such as uniform, books and food. The extra expenses can be a large fraction of a poor household's income. Kuria's mother Ester has no regular job, while her boyfriend earns about 3,000 Kenyan shillings (US\$37 or €26) each month. Kuria and his younger sister often go hungry at home.

When Kuria ran away, he found work as a dishwasher at a restaurant. “We were allowed to sleep in a dark room attached to the restaurant. We were not paid for the job. It was just the food, but I was very happy that way.”

When Kuria contracted scabies, he was chased away from the restaurant. Now he collects scrap



Image credit: Joana Socias

metal. He believes he must do it to bring money home for his family, which his mother uses to buy flour.

Kuria hopes to return to school, although he doesn't have a school uniform. His mother says that “he has seen that life out there is not easy and now he wants to go back to school”. She says that if she earned more, she would send him back to classes.

“Going to school will change his life,” she says. “But right now we don't have money.”

way of moving toward the United Nations Millennium Development Goal on schooling.

In 'Women and Development', a Challenge paper for the Copenhagen Consensus 2008 project, Elizabeth King, Stephan Klasen, and Maria Porter, looked specifically at ways to increase girls' schooling.

King et al. recommend a system whereby mothers are paid if their school-age daughters attend school regularly from the 3rd to the 9th grade. This is known as Conditional Cash Transfer (CCT). A Bangladeshi program in which households

receive stipends for direct and indirect schooling costs of girls, and similar ones in Pakistan and Cambodia, have been found to increase enrollment rates significantly.

King's recommended path would both increase girls' enrollment and also put money into women's hands – important because studies show that money given to women is more likely to provide positive nutritional and health benefits for their children than money given to men. It also provides the women with greater bargaining power in their own households.

The annual cost per pupil is estimated by King et al. to be US\$32 (or €29). Covering every eligible girl in sub-Saharan Africa and South Asia for a year would cost \$6 billion (or €4.2 billion). Benefits from increased future wages and the reduction in healthcare use would be between three and 26 times higher.

Estimated Cost of Ensuring Primary School Drop-Outs Complete Primary School, By Region

Region	Rural Children (millions)	Cost per child per year	Total Rural Expense (million \$/yr)	Urban Children (millions)	Cost per child per year	Total Urban expense (million \$/yr)
East-South Africa	2.9	\$140	\$1002	0.6	\$140	\$195
West Middle Africa	2.6	\$140	\$918	1.1	\$140	\$388
East Asia	0.8	\$300	\$570	0.3	\$150	\$103
South Asia	4.3	\$200	\$3219	1.2	\$150	\$433
Latin America	0.6	\$200	\$287	0.8	\$200	\$393
Total	11.1		\$5996	3.9		\$1512

How You Can Help

Pratham:

Pratham is a charity organization formed as a partnership between the Indian government, the corporate sector and citizens. Pratham's direct urban programs, including pre-schools, community libraries and remedial learning programs reach hundreds of thousands of children every year. In 2007, Pratham launched the Read India campaign, an effort to reach the 100 million children in India who cannot read, write or do basic math.

To support newly literate children across India, Pratham Books has developed and published over 130 titles and printed over 3 million children's books in local Indian languages.

Donations:

Donations can be made online via Pratham's US or UK websites. Single and monthly contributions are possible.

www.pratham.org/

www.prathamusa.org

www.pratham.org.uk

Oxfam:

An active member of the Global Campaign for Education, Oxfam works with community groups, local non-governmental organizations, and other allies, to help local, national, regional and international efforts to improve education.

Working this way, Oxfam tries to influence funding and push for better access to schools – particularly to ensure that girls benefit as much as boys.

Getting education for all means influencing decision-makers, and changing policies too. Oxfam lobbies and campaigns for leaders to deliver aid to train 2 million new teachers for poor countries – a move that would help a whole generation learn the skills they need to beat poverty.

Donations:

Donations can be made online through regional Oxfam websites to specific education projects.

www.oxfam.org

UNICEF:

UNICEF works tirelessly to ensure that every child -- regardless of gender, ethnicity, socioeconomic background or circumstances -- has access to a quality education. UNICEF focuses on gender equality and works towards eliminating disparities of all kinds.

These inequalities condemn millions of children, particularly girls, to a life without quality education -- and, as a result, to a life of missed opportunities. UNICEF therefore gives special attention to girls, the largest group excluded from education.

Unicef works with a broad range of local, national and international partners.

Donations:

Donations can be made online, and can be directed to specific projects.

www.unicef.org

Where You Can Find Out More

More information about the research described here can be found in the following publications:

Orazem, P.F., P. Glewwe, H. Patrinos, Lowering the Price of Schooling, Best Practice Paper series, Copenhagen Consensus Center, 2009.

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Orazem, P.F., 2009: The Benefits and Costs of Alternative Strategies to Improve Educational Outcomes, in B. Lomborg (ed.), Global Crises, Global Solutions, second edition, Cambridge University Press, Cambridge and New York, 180—214.

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A draft version is available online at:- www.copenhagenconsensus.com/Default.aspx?ID=1322

King, E.M., S. Klasen, M. Porter: Women and Development, in B. Lomborg (ed.), Global Crises, Global Solutions, second edition, Cambridge University Press, Cambridge and New York, 585—637.

Available for purchase online at:- www.cambridge.org/us/catalogue/catalogue.asp?isbn=9780521517218.

A draft version is available online at:- www.copenhagenconsensus.com/Default.aspx?ID=1322



Image credit: Katie Coolbaugh

Supporting Womens' Reproductive Role

The Challenge

In many developing countries, women still face disproportionate risks to their health during pregnancy and childbirth. Many do not have control over their bodies because they lack access to family planning services and contraceptives.

In 2008, every day about 1000 women died due to complications during birth, infections and unsafe abortions. Out of the 1000, 570 live in sub-Saharan Africa, 300 in South Asia and just five in high-income countries. According to the World Health Organization, the risk of a woman in a developing country dying from a pregnancy-related cause during her lifetime is about 36 times higher than that of a woman living in a developed country.

Teenage pregnancy rates remain high in developing countries, especially in Africa. Childbearing at a young age increases the risks of complications for both mother and child. For many girls, an early marriage or unwanted pregnancy means cutting their education short.

Greater access to family planning services and contraceptives is crucial to women's empowerment.

Nearly two in ten women in developing countries report that they would like to stop having more children. In sub-Saharan Africa, where contraceptive use is lower than elsewhere, around a quarter of women say their need for family planning is not met.

These programs have several different kinds of benefits, and taken together they make this a worthwhile program.

Nancy Stokey.

Loltong Village's Story

Although guidebooks describe Loltong Village, Vanuatu, as the 'principal administrative center' of Pentecost Island, the seaside township has no government buildings, and just one truck that is owned by the son of Chief Richard.

Depending on who you ask, the population is anywhere from 100 to 300. There is running water in the village, but this does not reach individual homes. Chief Richard's house has solar panels, but the battery is dry and there has been no power for some time. There is a "bakery" in a dirt-floor hut with a wood-fire oven that makes and sells bread daily, and a small store supplied by a ship that comes once a week. Locals wish that the ship could bring more basic items, such as better soap.

Ten years ago, researchers estimate that one-quarter of women had "an unmet need for contraception". This situation is improving, thanks in part to Vanuatu's work with NGOs and changes in policy. The government provides free vasectomies and uses NGOs to train student nurses in family planning counseling. Fertility rates in Vanuatu, and some other Pacific Island nations, remain high.

At Loltong Village, there is a local dispensary where the nurse assists the community with family planning.

Nurse Philip Rone invites women to come with their husbands to discuss their family planning needs. "[The husband] must be fully agreed". The couple pays 200 vatu (about \$US2) for the first visit and after that there is no charge. He provides birth control pills in 3-month supplies.

Philip says that the Department of Health is "preaching" to limit the number of children to four per family. This is "not a law or a policy," but more like a recommendation.

The dispensary is also where women go for pre-natal and post-natal care when they are expecting to give birth. When a woman thinks she is pregnant, she visits the dispensary. The nurse helps to determine a due date. The nurse then sees her about once a month. When the baby is due, she comes to the dispensary to deliver and stays 5 days after the delivery, or longer if there are problems. It costs the family 3000 vatu (about US\$30 or €23) to have a baby there. The woman's family provides the food while she is hospitalized.

"If there's a problem", reports dispensary nurse Philip Rone, "I have a stretcher. We carry her on the stretcher to a boat or car." The woman is taken to the Health Center at Abwatora, about two-and-a-half kilometers (1.5 miles) away.

The most typical problem he encounters with births is difficulty in expelling the placenta. "I can't deal with it here because we run short of gas. The drugs [for the injection he would give] have to be in the refrigerator. The gas bottle has to go to [the city of Luganville in] Santo to be refilled. There is a problem with finance."

The dispensary has a gas-powered refrigerator but the large gas bottle has been empty for some time and thus has had no refrigeration for some time.



Image credit: Katie Coolbaugh

The Solution

To delay marriage and childbearing allows girls to have more education and perhaps better job prospects later in life. These benefits are worth ten-times the cost of providing family planning services and maternal care.

Family planning services, modern contraceptive methods and maternal health care help empower women and save lives.

In some areas, health centers are needed to provide prenatal care. Routine prenatal care includes screening and treatment of syphilis, immunization, prevention and treatment of anemia – or prevention and treatment of malaria.

During pregnancy, malnutrition affects the mother's and child's health. Malnourished women are more likely to have infants of low birth-weight which increases the risk of disease and death in infants. Multivitamins, macronutrient supplements and iron and folic acid are effective in combating many health issues and can lower the risk of low birth-weight. Research has shown that maternal health programs can be more cost-effective if nutritional supplementation is included.

During childbirth, even minor complications can pose great risks and emergency care may be needed. Ensuring that skilled professionals provide delivery services can lower these risks.

After birth, routine examinations need to be provided for new mothers and their infants.

The Research

The benefits of fewer unwanted pregnancies, fewer abortions and other indirect impacts of contraception on women's and children's health are substantial, according to Elizabeth King, Stephan Klasen, and Maria Porter, authors of the 'Women and Development' paper for Copenhagen Consensus 2008.

King et al examine the impact of family planning services, emergency contraception, and support for safe births. Women who give birth in their 20s rather than in their teens are less likely to have complications during pregnancy and delivery.

King et al estimate that spending \$3.9 billion (€2.8 billion) on family planning and maternal health initiatives such as providing emergency contraception in sub-Saharan Africa and South Asia could avert 1.4 million infant deaths and 142,000 pregnancy-related deaths.

Fully meeting women's need for family planning would prevent 52 million pregnancies each year, 22 million induced abortions, and 142,000 pregnancy-related deaths. And 505,000 children would not be orphaned because their mothers died while giving birth.

In the Copenhagen Consensus 2008 'Women and Development' Perspective Paper, Aysit Tansel points out that women with fewer children have better chances at participating in the labor market and can work more hours. As a result, their children enjoy more schooling, better nutrition, and health care.



Image credit: Katie Coolbaugh

Where You Can Find Out More

More information about the research described here can be found in the following publications:

King, E.M., S. Klasen, M. Porter: Women and Development, in B. Lomborg (ed.), *Global Crises, Global Solutions*, second edition, Cambridge University Press, Cambridge and New York, 585–637.

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Available for purchase online at:- www.cambridge.org/us/catalogue/catalogue.asp?isbn=9780521517218.

A draft version is available online at:- www.copenhagenconsensus.com/Default.aspx?ID=1322

How You Can Help

CARE:

CARE tackles underlying causes of poverty so that people can become self-sufficient. Recognizing that women and children suffer disproportionately from poverty, CARE places special emphasis on working with women to create permanent social change.

CARE's health projects focus on mothers and children, who often are the most vulnerable to disease and malnutrition. CARE is particularly interested in increasing the capacity of local partners to deliver quality health services. This includes training local health volunteers as counselors, mentors and monitors of community health. CARE is focused on interventions ranging from nutrition and education to birth spacing and clinical services. Reproductive health projects encompass family planning, prenatal care, labor and delivery services, and the prevention, detection and treatment of STDs, including HIV/AIDS.

Donations:

Donations can be made online, by mail, or by phone. Single and monthly contributions can be made.

www.care.org

HealthRight International:

HealthRight International is a global health and human rights organization working to build lasting access to health for excluded communities.

HealthRight works closely with communities and establishes local partnerships to deliver health services. At the same time, HealthRight provides training and equipment and improves systems to enable its partners to deliver services on their own. The goal is to create lasting change that supports access to health while strengthening human rights.

HealthRight projects address women's health, including women's right to information and equal access to protection and quality care, including safe and effective maternal and neonatal care.

HealthRight has worked in over 30 countries, with current projects in Asia, Africa, Eastern Europe and the United States.

Donations:

Donations can be made online, by phone or mail. Single and monthly contributions are possible.

www.healthright.org

Jhpiego:

Jhpiego works with front-line health workers by designing and implementing effective, low-cost, solutions to strengthen the delivery of health care services. By putting evidence-based health innovations into everyday practice, Jhpiego works to break down barriers to high-quality health care for the world's most vulnerable populations.

Jhpiego is working to improve the health of mothers and children in countries with limited resources and high rates of maternal and newborn mortality. Jhpiego programs and activities focus on promoting healthy pregnancies, safe childbirth and immediate and continuing care for mothers, babies and children.

The Jhpiego model is based on developing strong partnerships with communities, governments and organizations to build sustainable local health care systems.

Donations:

Donations can be made online or by mail.

www.jhpiego.org



About the Copenhagen Consensus Center

The Copenhagen Consensus Center is a think-tank based in Denmark that informs governments, philanthropists and the public about the best ways to spend aid and development money. We commission research that identifies the best spending priorities in any given area. In particular we focus on the international community's effort to solve the world's biggest challenges and on how to do this in the most cost-efficient manner. We create processes, roundtable discussions, debate meetings, conferences, publications and ideas. Through our network of influential policy-makers and international academia, we aim to continuously promote, organize and develop the Copenhagen Consensus methodology and to create awareness of the best solutions to the world's biggest challenges.

The Center promotes the use of fact-based economic science – especially the principle of prioritization – to make sure that with limited resources, we achieve the most 'good' for people and the planet.

A Simple Idea

The idea is simple, yet often neglected; when financial resources are limited, it is necessary to prioritize the effort. Every day, policymakers and business leaders at all levels prioritize by investing in one project instead of another. However, crucial decisions about environmental and humanitarian spending are often based on one-sided information or even media attention, instead of being grounded in a rational assessment of costs and benefits. The Copenhagen Consensus approach improves knowledge and gives an overview of research and facts within a given problem, which means that the prioritization is based on evidence.

The Copenhagen Consensus Approach

The Copenhagen Consensus approach is driven by the simple idea that resources should be spent where they do most good. To identify the most effective spending we carry out cost-benefit analyses of solutions to the world's major challenges in order to evaluate the potential of each solution to mitigate the negative consequences of a specific problem. The overall aim is to improve the foundation for the prioritization of investments done by policy-makers, NGOs and philanthropists around the world. For this process, extensive economic analyses in form of a line of challenge papers of highest academic standards are conducted by top-level economic experts and evaluated by a selected expert panel of leading economists – including Nobel Laureates. Each paper rigorously examines different solutions to tackling one global challenge.

Why cost-benefit analysis?

The benefit/cost ratio – benefits divided by costs – tells us the potential outcome and how it relates to the expense of implementing it. The benefit/cost ratio allows us to assess competing solutions to one problem, or to compare different solutions to different problems such as HIV/AIDS and climate change. The approach provides a highly useful and easily accessible overview for decision-makers when making crucial budget allocation decisions. It is a transparent and practical way to show whether spending is worthwhile or not. It lets us avoid the fear and media hype that often dictate the way we see the world. Carefully examining where an investment would have the biggest rewards provides a principled basis upon which important decisions can be made.

Past Projects

Key projects, in addition to Copenhagen Consensus 2008, have been:

Copenhagen Consensus 2004:

Copenhagen Consensus 2004 was the very first Copenhagen Consensus project. The basic idea was to improve prioritization of the numerous problems the world faces, by gathering some of the world's greatest economists to a meeting where some of the biggest challenges in the world would be assessed. This was done by gathering existing knowledge about a number of the most pressing challenges and utilizing the minds of some of the best economists in the world to prioritize possible solutions.

Consulta de San José 2007:

The Consulta de San José was a Copenhagen Consensus exercise for Latin America and the Caribbean which took place in San José, Costa Rica, October 2007 in cooperation with the Inter-American Development Bank. Examining issues from the challenge of employment and social security to poverty and inequality to fiscal issue, CCC gathered a group of highly esteemed economists, including Nobel Laureate Finn E. Kydland to help answer the question: *If Latin America were willing to spend, say, \$10 billion more over the next five years on improving welfare, which projects would have the greatest benefits?* The Expert Panel found that the solutions of 'Early Childhood Development', 'Improving Fiscal Rules', and 'Increasing Investment in Infrastructure', were the top three solutions to tackle some of Latin America's most pressing problems.

Copenhagen Consensus – A United Nation Perspective:

CCUNP took place in New York from the 27th to 28th of October 2006 at UNICEF House, New York. The meeting brought together 24 UN ambassadors and focused on the issue of prioritizing limited resources in the global effort to mitigate the negative consequences of ten global challenges such as HIV/AIDS, malaria, hunger and climate change.

Copenhagen Consensus on Climate:

In September 2009, the Copenhagen Consensus Center assembled an Expert Panel of five world-class economists to consider economic research on climate change policy. The Expert Panel – including three Nobel Laureates – met and formed conclusions about which solution to global warming was the most promising. After deliberations into the best responses to global warming, the Expert Panel concluded that greater resources should be spent on research into climate engineering and green energy.

GUIDE *to* GIVING

How to take the
Copenhagen Consensus
Center's recommendations
and put them into action to
achieve the most good with
your donation.

