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# EXAMINING USAID'S ANTI-MALARIA POLICIES

## HEARING

BEFORE THE

FEDERAL FINANCIAL MANAGEMENT, GOVERNMENT INFORMATION, AND INTERNATIONAL SECURITY

OF THE

COMMITTEE ON
HOMELAND SECURITY AND
GOVERNMENTAL AFFAIRS
UNITED STATES SENATE

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# EXAMINING USAID'S ANTI-MALARIA POLICIES

**THURSDAY, MAY 12, 2005**

U.S. SENATE,
SUBCOMMITTEE ON FEDERAL FINANCIAL MANAGEMENT,
GOVERNMENT INFORMATION, AND INTERNATIONAL SECURITY,
OF THE COMMITTEE ON HOMELAND SECURITY
AND GOVERNMENTAL AFFAIRS,
*Washington, DC.*

The Subcommittee met, pursuant to notice, at 10:37 a.m., in room SD–562, Dirksen Senate Office Building, Hon. Tom Coburn, Chairman of the Subcommittee, presiding.

Present: Senators Coburn and Carper.

## OPENING STATEMENT OF SENATOR COBURN

Senator COBURN. The hearing will come to order. We do have some intervening business in the Judiciary Committee so this hearing may be interrupted for votes on judges coming out of the Judiciary Committee.

Good afternoon. Today's hearing will examine the U.S. Agency for International Development's efforts to control the spread of malaria throughout Africa. When I learned that funding for USAID's malaria program had increased from $14 million in 1998 to $90 million in 2005, I wasn't expecting to find that the number of deaths due to malaria had, in fact, increased by about 10 percent.

Not only hasn't the stated goal of reducing malaria by 50 percent been achieved, the actual number of deaths have increased. How can this be? That is what we hope to learn during the course of this hearing.

Recently, I have read reports on USAID's anti-malaria program. An author of one such paper, Dr. Bate, is testifying here today. In preparing for this hearing, I was struck by the lack of accountability and transparency on the part of USAID in providing a breakdown of how the agency allocates its malaria budget. For instance, how much money does the agency actually spend on interventions to prevent the further spread of the disease? How much funding goes to contractors? And, more to the point, why hasn't the agency provided this information when it was precisely asked to do so?

I intend to ask the Government Accountability Office to conduct an audit of USAID's malaria program because I believe the citizens of this country have a right to know how their tax dollars are being spent.

Malaria still claims a million victims annually, with over 90 percent of those deaths occurring in Africa. It is a preventable, treat-

able disease. An even more daunting statistic is that malaria kills a young African child every 30 seconds. USAID can't be proud of this track record.

Representatives of USAID have testified in the past that the agency supports the use of indoor residual spraying and insecticide-treated nets to prevent new infections. However, the fact is USAID has never been a strong proponent of these methods and did not push for the use of indoor residual spraying and insecticide-treated nets despite the fact that such interventions have proven to be successful when they were used by the agency in the 1950's and 1960's. Most recently, such interventions were very successful in reducing malaria in South Africa and Zambia.

Another disturbing issue is the resistance on the part of USAID to stop using ineffective drugs to combat malaria. The American Enterprise Institute's paper entitled: "The Blind Hydra," provides evidence from a project consultant to the World Relief project, Dr. P. Ernst. Dr. Ernst related that efforts to convince USAID and UNICEF to change the type of drug included in its drug kits distributed to First Aid posts have failed. He went on to say: "Even today, children in Chokwe receive ineffective medicine." That was in 2004. I believe this to be completely unacceptable since the cost for a full treatment, the smallest pack (young children) costs 90 cents and the largest pack (adults) costs $2.40.

This Subcommittee notes that there are important questions about the policy choices USAID has made. However, we are also deeply concerned about the failure of the agency to provide accurate information to the public about its activities. If the Congress and the public do not know what is being spent and for what purpose, how can results be assessed? With that in mind, we will explore those issues with our witnesses.

In conclusion, I would like to call your attention to several charts that are displayed in front of the dais.

The first chart,[1] entitled "Malaria: Preventable, Curable, Controllable, The Inexcusable Failure of Public Health." What this chart points out is that 2.5 billion people in 90 countries around the world are at risk for malaria. That is alarming, since we are talking about 40 percent of the world's population.

Malaria represents the most life-threatening infection in the world, 500 million acute illnesses every year, 90 percent of these are in sub-Saharan Africa. Malaria claims 3,000 people every day, and up to 90 percent of these deaths occur in pregnant women and children under the age of five. Malaria accounts for as much as 40 percent of public health expenditures, 30 to 50 percent of inpatient admissions, and up to 50 percent of outpatient visits. Children that survive can suffer brain damage, or experience cognitive learning deficits.

The next chart,[2] "Malaria Cases and Deaths—South Africa, 1971–2000," shows the dramatic rise in the number of deaths attributable to malaria when the government was pressured into stopping its program of spraying with DDT. South Africa had been

[1] The chart entitled "Malaria: Preventable, Curable, Controllable, The Inexcusable Failure of Public Health," appears in the Appendix on page 132.

[2] The chart entitled "Malaria Cases and Deaths—South Africa, 1971–2000," appears in the Appendix on page 133.

successful in controlling malaria for years with DDT. The chart shows the number of new cases and deaths increased dramatically when DDT was no longer being used.

The next chart,[1] "KwaZulu-Natal, South Africa: What can a little DDT and Coartem do?" This chart shows that when the government reinstated the use of effective drug therapy with Coartem (ACT drug) and the spraying of DDT, the number of cases fell dramatically.

The last chart,[2] "Number of Houses Sprayed Compared to Number of Cases of Malaria Above the Rate Expected if Spraying Had Continued" (data from the countries of the Americas) clearly illustrates that the resurgence of malaria is directly linked to DDT spraying (bar graph—as the number of sprayed houses decreased, the excess cases over the amount seen during spraying exponentially increased).

We will hold for Senator Carper's opening statement and I would like to recognize Senator Sam Brownback, who has a special interest in this area and also in terms of reform. We would like to ask our witnesses to limit their testimony to 5 minutes. Senator Brownback, it is a pleasure to have you before our Subcommittee. It is my hope through your interest and your initiative that some of these people in the future have a greater opportunity to be treated and their lives saved and the quality of their life improved. Senator Brownback.

## TESTIMONY OF HON. SAM BROWNBACK,[3] A U.S. SENATOR FROM THE STATE OF KANSAS

Senator BROWNBACK. Thank you, Dr. Coburn. I appreciate that. I appreciate you holding the hearing on this topic. It is one that is near and dear to my heart.

I have traveled to some of these regions. And it is one of those situations where you see somebody or a group suffering and dying and you look at the numbers and you have got basically, in some cases, 40- and 50-year-old technology that is cheap that can solve this and you go, absolutely, why? "Why is this taking place? And this shouldn't happen." You went through the numbers. This is a horrific situation and it is a real shame that the world has allowed this to happen.

We used to have malaria in the United States and in Southern Europe and we went aggressively about dealing with it and malaria is not there today, although some cases now start to come back in because of what is happening in other parts of the world.

We have a cure for this. We don't even really need to spend new money, just to take the money we are currently spending and spend it in places that actually cure people and you are going to save lives. So here is one case where we can save hundreds of thousands, if not millions, of lives, not spend new money, just spend the current money appropriately in the process. This just makes all the sense in the world.

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[1] The chart entitled "KwaZulu-Natal, South Africa: What can a little DDT and Coartem do?" appears in the Appendix on page 134.

[2] The chart entitled "Number of Houses Sprayed Compared to Number of Cases of Malaria Above the Rate Expected if Spraying Had Continued," appears in the Appendix on page 135.

[3] The prepared statement of Senator Brownback appears in the Appendix on page 39.

And then I ask myself, "well, why isn't it happening?" I traveled to Uganda. I have been in the Sudan. I met with officials from the U.N. I met with individuals from these countries. And the best that really I have concluded is we are spending most of our money on consultants and on meetings and not on getting actual care taken out in the field.

One scene I was in, in Northern Uganda, in the Gulu region, children come in every night, these "night commuters," they are called. There will be 500, 1,000, even more kids that will commute into a city, some of them walking five miles each way just so they don't get abducted at night by the Lord's Resistance Army. So their parents every night will send these kids from 3 to 12 years of age into this area. It is an incredible scene.

And they are not fed when they get there, but they are within a fenced area, a tin roof, cement floor, and they are cared for. But the walls aren't sprayed with DDT and mosquitoes lurk in the area. So while they may be protected from the Lord's Resistance Army, they are not from malaria. A simple application would take place that is not going to harm the environment, and save how many children from getting malaria? And you look at this and go, "why isn't this taking place?"

DDT has a bad name. It is associated with *The Silent Spring,* Rachel Carson's book. It certainly was overused in areas at prior times and did contribute to degradation in some bird species. But we are not talking about widespread use of DDT. We are talking about very targeted indoor spraying and some very targeted pools around where people are. So this is not the widespread aerial application that we have seen and done in North America and Europe. We are talking about a very targeted area. Yet the world community still seems to be very hesitant and would rather not take this no-risk action, would rather see the kids and mothers die. That is just a completely unacceptable answer to me. It should be unacceptable to us as a government.

So I have introduced S. 950, the Eliminate Neglected Disease Act of 2005. It directs interventions, directs the spending by our government to these effective means instead of conferences and consultants. Let us use these funds for applications in the field. We require accountability, transparency, scientific and clinical integrity, coordination, and priority setting.

It is a simple bill. It is sponsored by your colleague from Oklahoma, and by Senator Landrieu, both of whom are Africa hands, if I might say. Senator Inhofe has travelled to Africa perhaps more than any other U.S. Senator. Senator Landrieu heads a caucus on Uganda, has a deep heart for the region, and I do, as well.

I just would say in conclusion, Mr. Chairman and Senator Carper, that we will stand judged if we don't do something effective here, when we have the money, we have the ability, and then don't do something. This is wrong, what we are currently doing, and we do need to change this. I think if we really, even in this room, band together to do this, we will be able to get this changed and we will save hundreds of thousands of lives in the process, and probably not spend another dime. Thank you.

Senator COBURN. I would like to recognize my friend, Senator Carper, and if you have an opening statement, I would be happy

to have you give that now and then we will talk with Senator Brownback.

Senator CARPER. Rather than give my statement—I have just a short statement I want to give, but can we just go back and forth with the witness——

Senator COBURN. Sure.

Senator CARPER [continuing]. And he can be on to his next stop. Thanks. Good to see you, Sam.

Senator BROWNBACK. Good to see you.

Senator COBURN. Senator, let me ask you some questions. Some would say that by insisting that USAID money is spent on certain types of intervention, your bill hamstrings countries' malaria programs and tells governments what to do. How do you respond to that claim?

Senator BROWNBACK. The only government we tell to do anything is the U.S. Government. We direct funds towards actual treatment because, to date, when you have given broad authority, it has gone more towards conferences and meetings rather than actual application.

And in the countries that I have met with, what they desperately want are actual treatments out in the field. They want buildings sprayed with DDT, the inside of buildings. They want bed nets that have DDT in it or other effective treatments dispersed and distributed. That is what they want, as well.

So the only country we are directing what to do is the U.S. Government. And number two, from the countries that—primarily sub-Saharan Africa—that I have visited with, this is exactly what they want to see take place that is not taking place today.

Senator COBURN. How would you answer those who are concerned about DDT and its effect on aviary species in terms of how do you control the total limit and the exposure, even if you are doing isolated exposure? Does it not, in fact, have some impact?

Senator BROWNBACK. I don't think there is any record anywhere that says that it does. What we did in the United States when this was a problem, particularly with the bald eagle, which was the most known species, we had widespread application of this in agricultural settings using aerial application. Much of which then drifts into streams and rivers, then ingested in amphibian life that is taken up by the eagles and that is then where you see the egg shell much softer. My background is in agriculture. I have worked with these issues. I have regulated these things in the past in an agency I ran when I was State Secretary of Agriculture in Kansas. So you had an enormous build-up of this in a broad system where we had used it for decades.

Here, you are talking about somebody going in with a hand sprayer inside of a hut or a small building and spraying the walls once every 6 months. The ability of this to flow into the rivers and then build up in any quantity in the amphibian life is minimal to anything and certainly not anywhere comparable to what we did in the United States in the 1950's, and there is no track record at all that this hurts avian species at all anywhere.

Plus, you know, balance is back and forth. We can't find any risk there, and we will save hundreds of thousands of children in the process. That seems to me as absolutely worth doing.

Senator COBURN. In your queries on this program, have you been able to find out the number of people actually treated for malaria?

Senator BROWNBACK. I don't have that. By our programs actually treated?

Senator COBURN. No, by your inquiry into what is going on now. Anywhere, have you been able to find the data that would say the number of people who have actually been treated with medicines who have malaria, the number of facilities that have been sprayed with indoor spraying, the number of actually treated nets that have been given out? Anywhere, have you been able to find those numbers?

Senator BROWNBACK. No, I haven't. We did hold a hearing last year in Foreign Relations on this topic and had several experts in that gave broad estimates, but we don't—and that was global, but we do not have U.S. funded numbers, and to my knowledge, USAID has been unwilling to provide those or unable to provide those to date.

Senator COBURN. Senator Carper.

Senator CARPER. Again, welcome.

What do the folks at USAID say about what you are suggesting? Sort of play the devil's advocate and explain what their rationale is. Why do they agree or disagree with you? Where do they agree? Where do they disagree?

Senator BROWNBACK. I think you will have them up on the witness stand, and I have met with the head of USAID. I have met with individuals there. We have had them in to testify.

They generally don't disagree with the things that I am saying, but there is difficulty. You do get push-back on the use of DDT in any setting other than in bed nets and it is a harder route to go. We do get some resistance, and instead of pushing on through, it has been more, "let us just keep going pretty much the way we are going and we think we are going to get there."

My problem is, every day you don't get there, somebody else dies, thousands die. And number two, we are not getting there. The overall numbers show we are losing ground, not gaining ground. I think this is an emergency, that you really should move forward aggressively rather than timidly.

Senator CARPER. Who are the other players other than us, other than USAID? I guess World Bank is in it, but who are the other major players that are involved in this? How do their efforts complement ours or duplicate ours?

Senator BROWNBACK. There are several players. The U.N. has a program, and the Global Fund. We have bilateral efforts. And then I believe the Europeans have some efforts, but I am not that familiar with what they are doing.

Some of these are doing a good job of providing actual spraying of the new level of drugs. The older level of drugs, there has been a great resistance built up and a number of them aren't effective.

So you have a mixed bag of other players, some doing a pretty good job, the U.N. doing a horrible job, having set a target of reduction of malaria in half by 2010 and the number has actually gone up since they set that target.

Senator CARPER. Is there an effort underway to coordinate the efforts of these diverse parties to ensure that we are not duplicating one another but we are complementing one another's efforts?

Senator BROWNBACK. There is communication. I don't know, Senator Carper, if they have got a regularized system where, "we are going to work in this country and you are going to work in that country," but there is a clear communication. I don't know otherwise the degree of how much it is hard-wired within their system. That is a good question to ask and to have in the implementation.

Senator CARPER. I will probably ask it again, then. Thanks. It is good to be with you. Thanks for being here.

Senator BROWNBACK. Thanks.

Senator COBURN. Senator Brownback, thank you so much, first of all, for your caring and your interest in this subject, but thanks for coming to testify before us today. We will make sure you get the results of this hearing.

Senator BROWNBACK. And I would like to offer one of my great staff members, Katy French, to help you out in this process. She has been my lead person on this. She is excellent and——

Senator CARPER. What does Katy look like? [Laughter.]

Senator BROWNBACK. She is going to be the Staff Director here, I believe, in the next couple of days, and she is right behind me, does a great job on these topics, excellent.

Senator COBURN. Thank you very much.

Senator BROWNBACK. Thank you, Mr. Chairman.

Senator COBURN. Next, I would like to recognize Michael Miller, Deputy Assistant Administrator, Bureau of Global Health.

Senator CARPER. Mr. Chairman, before you do that, you were kind enough to ask me if I would like to give a statement——

Senator COBURN. Absolutely. Please do.

Senator CARPER [continuing]. And now that Senator Brownback has left, let me just mention a couple of things, if I could.

Senator COBURN. Absolutely.

## OPENING STATEMENT OF SENATOR CARPER

Senator CARPER. Thanks for holding the hearing and for the staff pulling folks together to let us hear from them.

As you all know, this hearing today focuses on an important issue. It is actually a life or death issue for a whole lot of people. Despite years of work that aimed at dramatically reducing malaria deaths, the toll this disease takes on communities in some parts of the world, at least, appears to be growing, as Senator Brownback has suggested.

With this in mind, we have a responsibility on the Subcommittee, and I think in the Congress, to examine how Federal agencies, especially USAID, have been spending our tax dollars dedicated to this war on malaria, and there are probably some steps that USAID can take that they are taking, Mr. Chairman, to improve its financial management and transparency. We just have to be careful, though, before quickly drawing too many conclusions about how USAID is addressing malaria and how it should address malaria in the future. The work that the USAID does or doesn't do will have a tremendous impact on the organizations it works with

on the ground and ultimately on with respect to the lives of millions of people.

The Global Fund to fight AIDS, tuberculosis, and malaria is currently spending hundreds of millions of dollars, I am told, to purchase bed nets and anti-malaria drugs to be distributed in the most vulnerable areas to prevent and treat malaria outbreaks. U.S. taxpayers, I believe, are paying for about one-third of that effort.

At the same time, the World Bank recently announced that they are prepared to spend about $1 billion on a similar effort on their own, and I suspect that the United States will be a major contributor to that effort, too.

And we are going to hear today from some true experts on malaria and other health issues in the developing world. I certainly look forward to hearing their views on the effectiveness of current U.S. and global efforts to fight malaria. Most importantly, I would like to hear about how USAID can best use its $80 million malaria budget to supplement the extensive work and to complement the extensive work that is being done by other organizations.

So again, I appreciate the opportunity to participate in this hearing and look forward to hearing from our witnesses. Thanks, Mr. Chairman.

Senator COBURN. Thank you, Senator Carper.

Mr. Miller, Deputy Assistant Administrator, Bureau of Global Health, USAID, first of all, welcome.

Mr. MILLER. Thank you.

Senator COBURN. We look forward to your testimony. Your written testimony will be made a part of the record and I would like for you to limit your oral comments, if you can, to 5 minutes. I would also say again we are close to a vote in the Judiciary Committee, and if I might be able to be excused and you take over for me so I can do that, I would appreciate that.

Senator CARPER. You bet. Or I could vote in the Judiciary Committee for you. [Laughter.]

Senator COBURN. I would like to do the vote.

Senator CARPER. You send me where I can do the most good. [Laughter.]

Senator COBURN. Mr. Miller, thank you.

## TESTIMONY OF MICHAEL MILLER,[1] DEPUTY ASSISTANT ADMINISTRATOR, BUREAU OF GLOBAL HEALTH, U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

Mr. MILLER. Thank you, Senator Coburn and Senator Carper. It is certainly a pleasure to be here and we thank you for the opportunity to come up and testify.

A couple of points that are not in my prepared statement are I would just say that no institution and no program is above examination and questioning and we do welcome that. I think a deliberative process is certainly going to produce better policy in the end than a process done in isolation.

It is kind of hard to follow up Senator Brownback as a witness. I have big shoes to fill in that respect. I had the pleasure when I was a Senate staffer to work with him at the staff level on Sudan

[1] The prepared statement of Mr. Miller appears in the Appendix on page 43.

and other Africa issues and I certainly admire his dedication and commitment to it, and his involvement on the issue of malaria and how to best pursue and treat malaria is certainly welcome.

My objective for this testimony is to describe the U.S.'s anti-malaria programs, to place them in a useful context for the Subcommittee, and describe where the world is, and not just the United States or USAID, but where the world is in terms of the fight.

The starting point for any consideration of malaria programs is the fact that malaria is overwhelmingly, not exclusively, but overwhelmingly a killer of African children. In fact, malaria is the number one killer of African children, claiming the lives of at least one million each and every year.

Between 80 and 90 percent of the deaths from malaria are in sub-Saharan Africa, and of those deaths, 80 to 90 percent, again, are children. The greatest tragedy, as you pointed out in your opening statement, sir, is that this death is largely preventable. The disease is curable. It is treatable.

The interesting thing to note is that where in most of the world we have successfully controlled or even virtually eliminated malaria as a public health threat, in Africa, it has persisted. The disease actually has even gotten worse. The burden that Africa is carrying in terms of a true disease burden from malaria is greater than it was two decades ago.

Why has malaria actually become more deadly in Africa when it has been effectively controlled or even eliminated in other regions? The answer is as significant as it is surprising. The effort to battle malaria in a comprehensive way and continent-wide is literally decades behind other regions. In the 1950's and 1960's in most other regions, including the Southern United States, a combination of insecticides and treatments was deployed with great effect. The results were positive and significant, but not in Africa.

In 1955, a World Health Organization panel of technical experts met in, ironically, Kampala, Uganda, and decided to exclude tropical Africa from the global malaria eradication program. The reasons cited were because of the intense and efficient transmission of the disease and because of a lack of infrastructure necessary to undertake such an intensive spraying effort. In short, Africa was left out because it was judged to be too difficult.

That decision essentially eliminated prevention from the anti-malaria efforts and relied solely on treatment. Even until just the past few years, the backbone of anti-malaria efforts in Africa was limited to treatment of the disease once the symptoms appeared. In retrospect, that was a fateful and tragic decision and Africans are still paying the price.

By the 1980's and into the 1990's, malaria infections in Africa began to soar. The reasons were treatment failure. Simply, the medicines that were deployed, Africa's only defense, started to lose their effectiveness against the malaria. Populations became increasingly vulnerable.

It wasn't until the early 1990's that an organized and dedicated effort to begin to introduce prevention measures on an appreciable scale in Africa, and funded largely by donors, did that begin. By

the time, the need for new treatments also became too hard to ignore.

By about 2000 or 2001, three new, highly efficacious prevention and treatment tools became available through American and other donor research. The first new tools, insecticide-treated nets, or ITNs, as a vehicle to get insecticide into people's homes, and I think it is worth pointing out here that with respect to indoor residual spraying and the use of insecticide-treated nets, the goal is absolutely the same, getting insecticide into the dwelling and as close to people as you can when they are sleeping and when the mosquito is preying on them.

The second is intermittent preventive treatment of pregnant women. That is a pretty simple procedure. It is usually two doses of anti-malarial drug before delivery and the protection it provides the child is tremendous, because a lot of times, if you can defend against malaria in the mother, you are going to defend the child, because the vulnerability of the child really begins before they are born. Malaria, it is a major contributor of low birthweight, and if a child is born underweight in Africa, you are essentially doomed.

The third is artemisinin combination therapies, and that is the combination drugs that are derived from the ancient Chinese medicine artemisinin. They are extremely effective and they are, in fact, the only thing that on a continent-wide scale, even though other treatments can be effective in some areas, on a continent-wide scale and in the future is going to provide the only chance we have to really plug that treatment failure that has accounted for the most deaths in Africa.

Are we at the point of success? How are we doing? Is what the United States doing worth pursuing, or should it be subject to change? I am just going to wrap up by giving four essential factors we need to consider.

First, the effort to address malaria in a meaningful way, incorporating prevention and treatment across sub-Saharan Africa is new. It is shameful that it started so late. Also, sub-Saharan Africa is not like other regions. The lack of infrastructure and the intensity of the epidemic are far more acute than in any other region. The factors cited in the 1955 decision are still basically true. What has changed is that the political will now exists to try to overcome them.

Second, the level of funding we are talking about for this overdue effort is only now coming online. Even in 2000 and 2001, the funds committed to fighting malaria by the United States and all other donors were a fraction of what it is now. The significant factors here are the increase in the U.S.'s bilateral funding, the advent of the Global Fund to fight AIDS, tuberculosis, and malaria, which brings significant funds online, particularly for commodities, and also, of course, the World Bank, which we know is on the verge of launching another anti-malaria program.

Third, the number of infections and consequently the deadliness of the disease have increased considerably in recent decades due to the treatment failure. This situation is a classic race against adaptation by the pathogen. ACTs are the only effective treatment in much of Africa now. The donors, producers, and affected countries

have not yet fulfilled the needs in terms of production or distribution.

Finally, data are lacking. We believe we understand the effectiveness of individual elements of our strategy, but the potential for new or improved interventions and increasing funding holds for the battle against malaria. What we do not have is data on the trends and deaths from malaria at the country level, the continent level, and certainly at the global level. The fielding of new or improved prevention and treatment tools on an appreciable scale and with significant funding to back them up is simply too recent to reasonably judge the overall effectiveness on a large scale.

The bottom line here is that for the first time, the tools, the political will, and the funding are in place in sufficient amounts, at sufficient levels to really have an effect. But any summary judgment of the progress or lack of progress is not supported by sufficient data at this time and is simply premature, in our view.

We, in the Administration, are happy to have the discussion and debate about priorities and proportions. Ultimately, the goal of the United States is to save the most lives. I think there is a common and universal agenda here. Thank you.

Senator COBURN. Mr. Miller, thank you very much.

Do we know throughout sub-Saharan Africa how many people have been treated, how many people have been prophylaxed with the net, how many people have had their domiciles sprayed? Do we know these numbers?

Mr. MILLER. Probably not with any precision. What we do know is—we can get number of treatments purchased. Now, tracing that treatment down to the individual and where that individual takes it and whether it is proven effective, we don't know.

Senator COBURN. What are the numbers of treatments purchased?

Mr. MILLER. For example——

Senator COBURN. Effective treatments purchased?

Mr. MILLER. Let us talk about ACTs. There are other treatments and some of them are still effective in some parts of Africa, but they simply will not be effective in the future.

Number of ACTs purchased, I think the most significant number to cite is that the Global Fund has purchased. The United States is a 33 percent contributor to the Global Fund over the history probably even more, and they have purchased or have dedicated funding through grants to purchase up to 145 million doses of ACTs now. I am certain that will increase, certainly as ACT's availability increases and the price drops and the ability to get it into markets and distributing, we are really at the beginning of that.

Senator COBURN. How much is price a factor in terms of supplying medicines for treatment?

Mr. MILLER. I think it is going to be a significant factor.

Senator COBURN. What is the cost of treatment for a child?

Mr. MILLER. For a child? For ACTs in a child, I think it is probably about $1.20 per treatment.

Senator COBURN. OK.

Mr. MILLER. It depends on where you are and how remote the person is.

Senator COBURN. OK, so let us say $1.20 per child, and that is available? The medicine is available worldwide?

Mr. MILLER. The medicine is available. I do not believe it is available to the extent that we need it. There is a shortfall in production capacity. In fact, USAID, one of the things we are doing is supporting the growing of Artemisia annua in Kenya and Tanzania. We believe that those crops will be able to produce effectively 40 million—the basis for 40 million new doses, and by the end of 2006, I think production will be up to the point where you actually can fill the need. I do not believe we are there yet, and as a consequence—yes.

Senator COBURN. Let us take $2 a dose. What is the population of the continent of Africa?

Mr. MILLER. Oh, goodness. I would just have to guess at about 700 million.

Senator COBURN. OK. At $2 a dose, that is $1.4 billion to treat everybody in Africa, and the Global Fund is going to spend what this year on treatment?

Mr. MILLER. Well, if you take just the raw numbers, sure. In the past 2 years, it has been over $900 million for malaria programs, of which about 50 percent are going to be for commodities.

Senator COBURN. So $450 million, which means we should have treated 225 million people.

Mr. MILLER. We certainly hope to achieve that kind of coverage. I have to emphasize that this really is a fairly new venture. A lot of these ACTs, we are not even to the point yet where we can actually produce enough of them—we, globally, can actually produce enough of them to fulfill the need. Certainly the funding mechanisms and the programs in place, they are only now coming online. Our goal is simply to get as many people covered and save as many lives as possible, but we are reasonably new with levels of funding with the medicines that we are talking about and the types of programs and the ability to procure them. It is——

Senator COBURN. Of your budget, what percentage of the $80 million is actually spent on treatment?

Mr. MILLER. If we take commodities—I should first say that I think it is important to start not with an examination of USAID's budget in isolation because, in fact, the United States and the Global Fund, of course, of which the United States is the largest contributor, and the World Bank, of which the United States is the single largest shareholder, do coordinate at the country level. There is, in fact, an agreement, if you will, the United States brings our strengths to the table, which are technical capacity, helping build the infrastructure necessary to get the commodities out to people.

The Global Fund, on the other hand, does some of that, but they also spend about 50 percent of their budget—of their malaria grants, excuse me—about 50 percent of the malaria grants are dedicated to commodities. The goal there is to simply fill in behind what we can provide on a technical capacity.

So having said that, the United States, if you break it down, it would probably be around 5 percent——

Senator COBURN. Five percent, $4 million?

Mr. MILLER [continuing]. Of our bilateral budget.

Senator COBURN. Four million dollars on treatment?

Mr. MILLER. Yes.

Senator COBURN. How much on prevention?

Mr. MILLER. Prevention?

Senator COBURN. Nets, spraying?

Mr. MILLER. Prevention would be about 30 percent, treatment about 34 percent, but that is not purchase of commodities.

Senator COBURN. OK. What is treatment besides purchase of commodities, in your viewpoint?

Mr. MILLER. Logistical support for drugs. Simply getting the drug to an African capital is not going to do it. There is training, application of drugs. There are skills that people need to understand how to identify and prescribe the appropriate drugs. There are protocols, because, if, in fact, ACTs—ACTs are not the only drug effective in an area. For example, Fancidar is still effective in adults. You wouldn't want to necessarily go to ACTs. They are ten times the price. So making a determination like that, that does take people and skills and time.

Senator COBURN. But that is not hard to do, because if you have a drug-resistance problem in an area, you are going to know it and you are not about to start treating with a non-drug-resistant therapy if you have drug-resistant disease in an area. So that is one or two tests. Once you identify that, you know that.

You have not collaborated with the Global Fund in the past. Is it not true that the MOA is brand new?

Mr. MILLER. I am sorry, MOA?

Senator COBURN. Yes. Is it not new? Is this not new? In other words, your collaboration with the Global Fund in the past, this is just beginning, is that right?

Mr. MILLER. Right. The Global Fund is new.

Senator COBURN. Well, the Global Fund has been around since I left Congress. It was started when I left, when President Bush came in and they set up this fund.

Mr. MILLER. Right.

Senator COBURN. So we are talking 2001 when this started, and 2002 when it got going.

Mr. MILLER. We are now seeing—just now, we are going through—as a Global Fund board member, we, the United States, are seeing consideration of the 2-year point of the first round of grants. So money was being—excuse me, votes were being taken by the board to dedicate funding to particular proposals 2 years ago. So I think it is fair to say that it is fairly new. And once a grant is made, that doesn't necessarily give you an indication how soon the money is going to be out there——

Senator COBURN. What percentage of the amount of grants that you give are consumed—in other words, the expenditure from that grant is consumed in other than prevention and treatment?

Mr. MILLER. I can't say. On a grant-by-grant basis, it is going to be different, and——

Senator COBURN. No, as a total. What do you think?

Mr. MILLER. As a total for treatment?

Senator COBURN. No. What percentage of the grant money that you give out of this $80 million—here is the grant money we are giving to implement . . .

First of all, the doctors in Africa that I have met—I have been there twice—could teach every doctor here about diagnosing malaria. I have seen two cases in 20 years in Oklahoma of malaria. So they know how to diagnose it. The question is, what is the resistance factor of the area that you are in? So they actually could train us.

But in terms of your grants that are given, what percentage are actually for treatment or prevention? Of the amount of money through this budget, how much goes to prevention——

Mr. MILLER. I see. Grants are typically not given for something as narrow as treatment. In fact, typically, grants are not made for something as narrow as malaria. They usually fall within a larger maternal and child health grant. In other words, it can be to help support ante-natal clinics and it is at the ante-natal clinic where you can actually get to the mother while she is pregnant and either provide preventative therapies, provide a net, provide some education. The grants typically go for something a little more broader than that. Is that your question?

Senator COBURN. Well, I am just trying to find out, because we have other parts of USAID that have grant money for that, as well. What you are saying is some of the grant money goes to areas of responsibility in other areas of USAID as supplement that? Is that what you are telling me?

Mr. MILLER. I am not sure I characterize it that way. Would say that grants typically will be for something in child and maternal health that is broader than just malaria or malaria treatment.

Senator COBURN. Well, I am way over my time. I will come back to you. I have to go for a vote in Judiciary. Senator Carper, if you would be so kind to handle the hearing, and I will be right back.

Senator CARPER [presiding.] Thanks, Mr. Chairman.

Mr. Miller, welcome. Thanks for being here and thanks for your stewardship.

I want to go back to a couple of earlier things that you said in your testimony, just ask you to clarify them for me. You spoke earlier of the success in much of the rest of the world in eradicating malaria but a lack of success in Africa. In fact, if anything, it is getting worse. Why, again, do you think we have been successful in the rest of the world and not in Africa and what lessons can we derive from our success in the rest of the world to make sure we are applying those lessons appropriately in Africa?

Mr. MILLER. I think the first thing to note is that we are starting pretty late in Africa, at least on an appreciable scale. What we did in the United States, what was undertaken in Southeast Asia, Central America, and South America in the 1950's and 1960's was very effective. Africa is just now coming online.

That is what I was trying to get to in my statement, which is the types of—the level of funding we are talking about, the degree to which we can introduce interventions into the areas that need it is relatively new. We are really just talking about since 2000 on an appreciable scale.

What we can learn from other regions that can be applied to Africa, you have to be careful. Africa is different for a number of reasons. It is not just that it was started late, which is a factor. You

also have new interventions that were not available then, ACTs, insecticide-treated nets, for example.

But also, Africa, the intensity of the epidemic in Africa is far beyond, at least continent-wide, is far beyond what it is or was in any other area. You have some areas of Africa that are what we call hyperendemic. In other words, you have transmission of malaria 7 to 12 months out of the year. There is literally no seasonal break and there is no escaping at night mosquitoes, either during the season where they are not breeding or just by changing localities.

The second thing to consider about hyperendemic areas is in some cases, 85 percent of the people living there are going to be infected with the plasmodia that causes malaria, 85 percent. That is a huge reservoir for transfer. Those people will probably not necessarily show symptoms. They have acquired immunity. Once you pass about 5 years of age, if you contacted malaria when you were a child and you lived through it, the chances are you probably will not die from it. So people actually acquire immunity over time. But just because they have that acquired immunity doesn't mean they won't get sick, and it certainly doesn't mean that they cannot be infected from one person to another. They effectively are a reservoir for the mosquito and it is very difficult to do that.

Finally, I would point out that in a lot of Africa, the infrastructure is acutely lacking, let us say. People live rural lives. I know in Ethiopia, for example, which is not typically a hyperendemic area, but just for illustration, 70 percent of the population lives 3 hours' walk from a road, not even from a paved road, not from a facility, but from a road. It just gives you an illustration, even in a very densely populated country like Ethiopia, that people live rural and sometimes very isolated lives in Africa. So it is very difficult.

That is not true in all of Africa. Certainly the South Africa example that was raised demonstrates that there is some applicability to the continent, depending on where it is, depending on the infrastructure and the effectiveness of services in that area. But it is going to be a harder nut to crack, frankly.

Senator CARPER. Thank you. Could we talk a little bit about the resistance of drugs, or the resistance, rather, of mosquitoes and the disease to drugs that we have, the failure of those drugs to be able to protect people today——

Mr. MILLER. Yes.

Senator CARPER [continuing]. And new medicines that are available that are being introduced.

Mr. MILLER. Right. The treatment failure, if you will, really is the cause of the increase in malaria infections in Africa in the 1980's and 1990's. Simply people had no protection.

ACTs are really the great hope of the future. I don't think there is any debating that. They are very effective——

Senator CARPER. Why do they call them ACTs?

Mr. MILLER. Well, they are in combination. The "C" is for combination. Artemisinin is a natural extract from what we call wormwood. It is an ancient therapy. It is very effective. The extract itself has—I don't think there is a question of shelf life there. But once they are put in combination to make them more effective, to

make the body absorb them better, whatever the combination does, you get about 18 months' shelf life. So it is a huge challenge.

Plus, as I mentioned answering Senator Coburn earlier, they are relatively new. The combinations are relatively new. I believe there are two companies that hold patents for ACTs now. Production is not to a level to meet worldwide need and, hence, USAID's support for actually growing of Artemisia annua to help meet that shortfall.

Senator CARPER. Would you talk a little bit about—you have already discussed this some and we have mentioned it in our statements, but talk with us, please, about how, on a relative scale, the magnitude of USAID's efforts in these areas with respect to other efforts in these areas.

Mr. MILLER. Sure. Bilaterally, we are by far the largest donor. We are at about $80 million a year. If you break down the Global Fund by year, you are going to get about $400-and-some-million per year, over $900 million total over the past 2 years. Of course, the United States, as you mentioned earlier, is the single largest contributor to the Global Fund, so a lot of that can be ascribed to us, the same with the World Bank.

There are other donors on a bilateral level. The U.K., I think the Nordic countries also have bilateral programs. All said and done, I think we put the total global anti-malaria funding at about $600 million a year.

Senator CARPER. So overall, $600 million. About $80 million is directly through your budget?

Mr. MILLER. Bilateral USAID, yes.

Senator CARPER. And then additional monies that we may put into the World Bank or the Global Fund——

Mr. MILLER. That is correct.

Senator CARPER [continuing]. Above and beyond that. Share with us again your thoughts on how USAID's efforts are complementary, or might be duplicative of other efforts. How do they complement or support each other?

Mr. MILLER. Thank you. I think the best way to imagine it is that, as I mentioned before, USAID does focus where we have our strengths, providing skills, providing infrastructure, if you will—I am not talking about buildings here, but providing infrastructure. We have presence in almost every country we are talking about. We can deploy skilled people for training, for running programs, providing grants. We have many other bilateral programs of which anti-malaria efforts can be effectively incorporated into, which is really one of the fundamental pieces of our strategy.

As I said before, it is really not—you are really not going to get an accurate picture if you just take USAID's budget and proportions of the spending per sector in isolation because they really are planned even down at the country level along with the other donors, multilateral institutions.

I think with respect to the question of priorities and spending on commodities and how the United States, bilaterally, we look to the multilateral agencies, of which we are a part, to really do the bulk of the commodities purchase, the United States and USAID in malaria programs or any other programs has never really emphasized commodity purchases outside emergency situations, and that is true here.

But the best way to think of that and put it in perspective is to think of an army being judged simply by the amount of bullets you have on hand. It is really not a fair judgment and you simply can't judge a single army if they are operating in coalition with each other. You really have to take a snapshot of the entire picture globally, especially if it is coordinated at the level we coordinate in countries.

Senator CARPER. My last question would be, someone described for me, they used an analogy. They said USAID's efforts are in part, if you will use the analogy of a toolbox, with tools in the toolbox to address a particular challenge. They said USAID's efforts are, in part, to put tools in the toolbox, but also to help those to whom the toolboxes are distributed, countries, to be able to better use the tools that USAID puts in the box, but also the tools that other entities put in the box to fight malaria. Is that a fair analogy?

Mr. MILLER. It is. Simply, we play to our strengths and we play in coordination with other teams, with other members of the team, yes. It is a fair characterization.

Senator CARPER. And how do we measure success with the approach you are talking?

Mr. MILLER. Ultimately, success is going to have to be measured in lives saved. That is a difficult question, number of lives saved, for a couple of reasons, if you would let me go into it. Identifying the number of deaths from malaria in rural Africa is going to be very hard. Survey-wise, every 5 years, we, USAID, sponsors what is called a demographic health survey. It is a comprehensive health survey of the entire country. It is the gold standard of health surveys for development global assistance. They are retrospective.

What happens is if someone who is conducting the survey goes out to an affected area and asks the mother, did you have a child that died in the past 5 years? What did they die from? What were the symptoms they were displaying? And from that, you simply have to deduce what this child—if they have a fever, which is what you are typically going to see, it could be pneumonia, it could be malaria, it could be a combination of things. It is hard to do with precision, to say what that person died from. We think we know. We think we have a level of confidence where we can say malaria infection rates and deaths are at about this level per year. That is probably not in dispute. But identifying on a scale of how many people are actually dying of malaria is very difficult.

The second thing I would note is one thing we found troubling is the statistic often quoted is that malaria deaths are increasing in Africa in recent years. We have heard that quoted. Actually, we do not use that statistic. We have actually tried—I have asked my staff to identify where did that originate, what is the data behind it, and does anybody else use that? We don't use that statistic. I am not here saying it is true or it is false, but the data set behind something that broad is simply we don't have it. We have to question whether that is reliable data to hang your hat on.

Senator CARPER. Thanks very much.

Mr. MILLER. You are welcome.

Senator COBURN [presiding]. Just another little round here if we can, for a minute. First of all, WHO says malaria is increasing.

Lancet articles say malaria is increasing. They are surveying the same way they did 10 years ago and the number of deaths of children is skyrocketing, and it isn't pneumonia that is causing them to die, it is malaria. That is not something that is hard to know because you are using the same study method to collect the data 10 years ago as you are today in terms of looking at deaths. So there is no question.

The other question I have for you: USAID doesn't normally provide treatment unless there is an emergency. The fact is, that with 3,000 children a day dying in Africa, I think that is an emergency. There was a malaria program by USAID before there was ever a Global Fund, true?

Mr. MILLER. That is correct.

Senator COBURN. And it was operating all this time that we are seeing this large increase. So the fact is we have been ineffective through USAID in abating this increase with the money that we have spent. Now, maybe again, your first testimony, the problem is too big. Maybe the resources aren't enough. I don't know that answer. That is one of the things that we want to try to help find out.

But what we do know is the numbers aren't lying, and I would like to ask you just a couple other questions. In your testimony, you gave us that insecticide-treated bed nets are the key to saving children's lives, and you write that "ITN coverage increased, for example, from zero to 21 percent in Ghana." But you omitted saying that 21 percent is the proportion of rural homes in Ghana using an untreated bed net. There is a big difference in terms of that prevention. So you are using a number that is on untreated as part of your statistics for treated. My question is, actually aren't only 5 percent of Ghana's homes covered with insecticide-treated bed nets, not 21 percent, as you state in your testimony?

Mr. MILLER. Sir, it is an important question and I would like to answer it truthfully and best I can with a level of precision. I honestly cannot say right now whether what you just said is correct.

Senator COBURN. This actually comes—your department is a coauthor on the World Malaria Report that was published only last week that made that very statement. So either what you are saying in that report is right or what you are saying in your testimony is right, and they can't both be right.

You can catch the frustration in my voice. It is not directed to you personally, and please don't take that.

Mr. MILLER. I understand.

Senator COBURN. When I know that 3,000 kids a day are dying and we are spending $80 million a year, which could save 40 million of them if the money was put there in terms of insecticide-treated bed nets and medicines, that, to me, is just incomprehensible, that we can say we have got to have all these other programs when, in fact, we could take 20 people and make tremendous delivery of goods tomorrow to those kids in those villages.

And so the statistics you quote are important, but they also have to be accurate, and I will be happy to let you answer that in writing for our Subcommittee.

Mr. MILLER. Thank you. We will, sir.

Senator COBURN. Do you have any other questions?

Senator CARPER. Just one more. USAID and, I believe, other Western donor organizations have been criticized for being reluctant or maybe even unwilling to fund the indoor spraying of insecticides in communities that are plagued by malaria. Is there any official USAID policy that you know about that prevents the agency from funding spraying projects where that is appropriate?

Mr. MILLER. Thank you, Senator. I maybe should have emphasized this more emphatically in my opening statement. The shared goal of prevention is to get insecticide into the home. That can either be through indoor residual spraying or it can be through insecticide-treated nets. We are open to debate about which is most cost effective in what areas. That is part of what we do with $80 million, is determine what is most cost effective.

We do emphasize insecticide-treated nets over indoor residual spraying. We do not have a prohibition on the use of insecticides in the homes, spraying of insecticides nor of DDT in particular, even though DDT is, in fact, just one insecticide we are talking about. There are 12 approved insecticides for indoor residual spraying. IRS is very effective. IRS has proven effective in South Africa, in areas where you have the infrastructure and the services to make the coverage. IRS is not the vehicle for insecticide of choice in all of Africa.

So no, sir, there is no prohibition on DDT or indoor residual spraying.

Senator CARPER. Thank you.

Senator COBURN. Let me follow up with that, because I think it is important. First of all, DDT is the most effective insecticide. It is also the cheapest insecticide. There is no question about that. Administrator Natsios told Senator Brownback that you will not use DDT. That is a quote from him.

I also have a quote from Zambian health officials that said USAID staff have repeatedly refused to fund DDT spraying and told them that they should not adopt effective drugs as part of the anti-malaria strategy. Can you explain this? Why would they say that?

Mr. MILLER. I cannot explain what someone in Zambia said. I will tell you, we do not support or peddle ineffective drugs, and we do, in fact, when, at a country level, it is determined that indoor residual spraying would be the most effective to save the most lives, we will support it——

Senator COBURN. Is that true in Zambia?

Mr. MILLER. We will support that. In fact, Zambia is one of the places we do support indoor residual spraying, yes.

Senator COBURN. Well, here is the Malaria Program Control Director for Zambia, and that is who gave us this information, and will you follow up with her and clarify that USAID supports ACT treatment and in Zambia—DDT spraying—and let this Subcommittee know the outcome of that conversation?

Mr. MILLER. We will.

Senator COBURN. And that is Naawa, and I will try to pronounce this name, it is S-i-p-i-l-a-n-y-a-m-b-e, the Malaria Control Program Director for Zambia.

I also would like to ask you to maintain your seat, if you would, because I would like to have you on the panel with our other

guests, and I also will, without objection from Senator Carper, would like to submit written questions for you to answer and give back to the Subcommittee. Rather than take your time up with it today, I have about 20 specific questions that I would like to get answers to——

Mr. MILLER. Absolutely.[1]

Senator COBURN [continuing]. And I would like that on a timely basis, if we can have that.

Mr. MILLER. We will do our best, sir.

Senator COBURN. Thank you.

Next, I would like to recognize Dr. Roger Bate, Resident Fellow, American Enterprise Institute, Director, Africa Fighting Malaria, U.S. and South Africa; and also Dr. Amir Attaran, Ph.D., Associate Professor and Canada Research Chair in Law, Population Health and Global Development Policy, University of Ottawa; and also recognize Dr. Carlos C. "Kent" Campbell, M.D., Program Director, Malaria Control and Evaluation Program in Africa.

We will start with Dr. Bate, if you would.

**TESTIMONY OF ROGER BATE, PH.D.,[2] RESIDENT FELLOW, AMERICAN ENTERPRISE INSTITUTE, AND U.S. DIRECTOR, AFRICA FIGHTING MALARIA**

Mr. BATE. Senator Coburn and Senator Carper, thank you very much for inviting me to testify today on behalf of Africa Fighting Malaria and the American Enterprise Institute.

Ninety years ago, a million Americans suffered from malaria and a Congressional committee held hearings to discuss policy options to eradicate it. This was achieved by the 1950's through the judicious use of window screens and DDT and, of course, increased wealth.

Today, malaria, as we have already heard, is a significant risk for perhaps two billion people, suppressing hope and economies alike, notably in Africa, but also, I should stress, given what has been said before, it is increasing in parts of Latin America and Asia, as well. I do not think it has been conquered around the world. And unfortunately, I think we are losing the war to combat malaria.

But there are bright spots. Southern African countries are enacting comprehensive malaria control programs which are grounded in the idea that success requires every tool that science has provided, much like the United States did to rid itself from malaria 50 years ago. Government and private entities in South Africa and Zambia, for example, are using a combination of low-level controlled indoor insecticide use, both DDT and other chemicals, bed nets for key staff, and prompt treatment of malaria cases to keep malaria incidence low, and the results are startling, 70 to 90 percent reductions in disease within a couple of years and even better reductions in mortality in some locations.

Unfortunately, the U.S. Government has not been directly involved with the two most successful strategies, indoor residual spraying and effective drugs, except perhaps in marginal ways at

[1] The questions and responses from Mr. Miller appears in the Appendix on page 136.
[2] The prepared statement of Mr. Bate appears in the Appendix on page 50.

best. I say perhaps because it is hard to know exactly what the $4 million USAID allocation in Zambia supports.

USAID releases data as reluctantly as if it were a national security outfit. We have to surmise a lot of information, unfortunately. We fought to get from FOIA requests, from interviews with people in the field, from pressure from friends within Congress to try to get as much information as possible, and there is an ongoing Government Accountability Office inquiry into USAID's malaria programs and I welcome its outcome. We need the information.

Despite the obvious benefits of comprehensive malaria control programs, by its own admission, as we have just heard, USAID typically does not purchase drugs or insecticides except in emergency situations. Yet USAID continues to say it supports comprehensive programs. This is a fiction.

Our estimation of the 2004 budget, and it is basically confirmed here today, is that less than 10 percent, perhaps as low as 5 percent of the budget is spent on actual commodities that save lives. The vast majority of the rest is spent in support and technical assistance. This is not comprehensive. It is, in fact, highly selective in favor of Western staff. It is likely that well over half the budget goes on salaries, staffing costs, and travel, perhaps even a lot in the United States.

From the information that is published, it appears that USAID coordinates randomly, perhaps occasionally in a more coordinated fashion, with other entities, and in many instances, technical assistance, which we have already heard today is its kind of backbone, its greatest skill, is provided where no commodities are, in fact, available.

But even if coordination were well managed, USAID rarely measure outcomes, and I am talking about the key outcome in particular here, reductions in morbidity and mortality. So we wouldn't know whether its programs are working very well anyway.

And by the way, given it has been mentioned today on several occasions, in my opinion, bed net distribution is not a good measure of outcome. And in many respects, in the written testimony from Mr. Miller, it is the main performance criteria given. It is not a good measure from personal experience, also, from looking at the data, because we are not always certain how many people regularly sleep under a bed net.

Imagine an August night in Washington, D.C., and your air conditioner is broken and you are trying to sleep under a stifling net. Bed net use data is extremely important to collect. I have spent many nights in the field where I have been incapable of sleeping under a net. It was just simply too hot. I wouldn't have had any sleep. I was offered some prophylactic drugs, as well, a belt and braces policy. Therefore, I could afford to take the risk. For everyone else living in Africa, that is not the case.

While we can quibble about the best interventions, and I am delighted to hear that there is greater interest in indoor residual spraying, there is no doubt in my mind that USAID fails badly in the transparency and accountability stakes, and that is the point that I think is most important to make today. USAID does not consistently measure anything useful. It does not measure real outcomes. It has not updated its Yellow Book since 2001, so we don't

know what USAID's contracts are for, with whom they are made, and for how much.

Of the few reports USAID does file, many are self-serving. That is not just according to me, that is from a Government Accountability Office inquiry in 2002 and its own internal review last year. And since it doesn't collect, as I have already mentioned, useful data, it is incapable of effectively evaluating its performance.

Since Anne Peterson, then Assistant Administrator for Global Health, first testified to a Congressional subcommittee about USAID's malaria program in September of last year, not a single program report, evaluation, or other document concerning the agency's malaria activities has been submitted to the agency's publicly available database. In that 8-month period, I notice some welcome rhetorical changes in favor of ACTs and spraying and saying the support of indoor residual spraying, but I have seen no change in action on the ground.

When I testified alongside Dr. Peterson last September, I suggested that if accountability and transparency were not delivered quickly, U.S. funding for their program should perhaps be reallocated to agencies that have a better chance of improving health. As we have heard today, too many children's lives from this disease are at stake for failure to continue.

I conclude the same way today, 8 months later, and with stronger emphasis. I think that USAID must rapidly increase its transparency. I would encourage it to follow the lesson from the Global Fund and establish a website, or even on its own website, which would hold all technical information for USAID. That would include contracts, grants, and corporate agreements, budgets, and implementation plans. Until it does that, and I think it should be given a time limit to do that, I think it should seriously consider its budget being reallocated elsewhere.

Thank you, Mr. Chairman.

Senator COBURN. Thank you, Dr. Bate.

We have a vote on. What we will do is recess the Subcommittee for the period of that vote and then we will return. I would ask your indulgence.

[Recess.]

Senator COBURN. The Subcommittee will come back to order.

Mr. Miller, it is my understanding that we did not advise you appropriately of what we would be requesting of you in terms of time commitment, and if you feel necessary to keep those commitments with other people, the Subcommittee will understand.

However, it is my understanding you are working on a transparent website so that people can look at USAID in this area in terms of your funding details, is that true, and when will that be available?

Mr. MILLER. Sorry, I had to consult with my staff. I am not aware of something exactly as you describe. I don't have any objection to it, and it is certainly something we will consider.

Senator COBURN. Well, what I would like to hear is, yes, we will do that and here is when we will have it done. People should be able to address USAID programs via a website to see what is happening and where. What I would like for you to give, first of all,

commit to do that, and second, give us some sort of time frame from your staff when that will be available.

Mr. MILLER. Sir, I could commit that we will do our best. In terms of a time frame, let us talk with your staff about what types of data and the depth of data we are talking about and come up with a reasonable time frame, mutually agreeable time frame, is that all right?

Senator COBURN. That is fine.

Mr. MILLER. Good. Happy to do it. Sir, I can stay, by the way.

Senator COBURN. OK. Next, we will recognize Dr. Attaran. Dr. Attaran, if you would, please.

**TESTIMONY OF AMIR ATTARAN,[1] ASSOCIATE FELLOW, ROYAL INSTITUTE OF INTERNATIONAL AFFAIRS, LONDON, ENGLAND, AND CANADA RESEARCH CHAIR, INSTITUTE OF POPULATION HEALTH AND FACULTY OF LAW, UNIVERSITY OF OTTAWA, CANADA**

Mr. ATTARAN. Thank you, Mr. Chairman, Doctor. My deepest thanks for your interest to discuss malaria today and USAID's response, which I view as inadequate.

I believe by now you are quite familiar with what malaria is. You know that it is killing a million kids and pregnant women a year, mainly in Africa, that it is pauperizing entire families and nations when it isn't killing them, that it is a threat—perhaps this is a new piece of information—to the American military. It did hospitalize a quarter of our troops in Liberia only a couple of years ago. And that prospects for a vaccine are a decade or longer in the future and have been that way for about the last 30 years. The vaccine is always 10 years away.

We also seem to have, I think, in this Subcommittee a certain amount of agreement on what the interventions are to prevent or to treat. There are basically three of them, insecticides, bed nets, and medicines. Everyone agrees on that. But what I see little agreement on is how USAID should spend their money in respect to those three. So let me sketch out these differences of views, such as they are.

My view is that Africans are very different from Americans. They are poor. They live on $2 a day, the vast majority of them. They are very poor. So when there is foreign aid money voted by the American government to spend, we should be spending it on the poor Africans. That is my hypothesis.

USAID fundamentally disagrees with that point of view. As you question them, you will find they spend most of their air money on Americans—American consultants, American experts, and very highly-paid American nonprofit organizations. It rarely is true that USAID is spending its money actually buying and supplying the weapons of combat—the medicines, the insecticides, the nets—that actually get to the patient and have an effect on malaria.

Instead of preference for these cozy deals with consultants, which, to steal a phrase from President Eisenhower, resembles to

[1] The prepared statement of Mr. Attaran with attachments appears in the Appendix on page 97.

me a "Foreign Aid Industrial Complex," really—USAID should make the provision of supplies and commodities.

Now, let me look at a few examples of that, and perhaps we can dive deeper into these in questions. USAID does tell the public that it "strongly supports ACT," but it also says that it typically doesn't buy commodities. For example, no malaria pills whatsoever, or very few in number.

If that is support, what would opposition look like? The medicines aren't being bought, and aren't being given to the patients. Compare that to when we do food aid as the United States: We actually provide the food. We provide the commodity. When we do malaria aid, we don't provide the commodities. That is wrong.

So where does that USAID malaria money go if it is actually not going to the commodities? Well, for the most part, it is going to contractors, and the contracts are big and they are not terribly transparent. For example, USAID has a $65 million contract with an organization known as Net Mark. Net Mark sells, not gives, bed nets to the poorest people on earth in Africa. That is its mission. The $65 million is spent predominantly on marketing and not on actual, "Here, have a net for free" provision.

Net Mark is overseen by a contractor known as the Academy for Educational Development. It bills itself as a nonprofit, but last year, its CEO paid himself in excess of $400,000 in salary and benefits. That is more than President Bush collects.

Getting details beyond generalities such as these, further details, is next to impossible because USAID has not updated its contracts database to the public since 2001; basically Clinton-era contracts all what is available. USAID is not terribly cooperative in inquiries about its contracts, and it admits that contracts "are not reported or collected centrally in Washington."

Really, there is a lack of information about all sorts of contractual aspects of the USAID program. It was asked, Mr. Chairman, earlier, how many nets is USAID providing? And there was no answer to that question. Nobody knows.

So as I said, it is such that poor Africans aren't getting the commodities from USAID. They are not getting the basic tools. But unfortunately, a large network, this Foreign Aid Industrial Complex, of contracts is living on generous salaries and we don't really know how well they are accomplishing their work. That information is not available. How many pills or nets. It is not available.

I thank you for your patience and wish to be of service to you in getting to the bottom of this. Thank you, sir.

Senator COBURN. Dr. Campbell.

## TESTIMONY OF CARLOS C. "KENT" CAMPBELL, M.D.,[1] PROGRAM DIRECTOR, MALARIA CONTROL AND EVALUATION PROGRAM IN AFRICA

Dr. CAMPBELL. Thank you, Mr. Chairman, Dr. Chairman. It is a pleasure to be with you today. I have a written testimony that I would like to offer to be set into the record——

Senator COBURN. Without objection, it will be so done.

[1] The prepared statement of Dr. Campbell appears in the Appendix on page 126.

Dr. CAMPBELL [continuing]. And I would just like to make a few comments.

First is my role here today, both in terms of how I was invited and how I would like to be perceived. I am not here representing any institution nor to defend any institution. I am here and was invited to be here today to be a resource to this Subcommittee in this process in terms of I spent 30-some-odd years working exclusively in malaria and almost exclusively in Africa, beginning working in clinics in Western Kenya before HIV came in, continuing working in leadership positions with the Centers for Disease Control, with UNICEF, WHO, and now having the opportunity to work on what I think many of us believe to be the single big focus that we need in Africa right now, and that is rapid, well-demonstrated, well-documented progress to bringing malaria control to the capability of African nations to be able to manage that as a program activity.

I share with you, and I would reflect back 20-some-odd years ago when I first had my opportunity for Congressional testimony, working for the Centers for Disease Control and Prevention, it was virtually impossible to get an audience to speak about malaria. In fact, I had to spend most of my time convincing people there still was malaria in the world, and how wonderful it is to see the intensity of interest, the impatience, the desire on the part of the U.S. Congress to get it better, and I applaud you for leading in that direction, and Senator Brownback and others in this process. I think that is something that all of us on this panel share, though I will speak just for myself.

I think the second thing that I would like to say is that the malaria problem in Africa can be measured in terms of people, it can be measured in terms of suffering, it can be measured in terms of money. It can be measured in many ways. It absolutely needs to be measured and measured much better than we are doing at this point, and there is progress occurring on those fronts.

I think one of the things which many people find so tedious and many people see as potentially a waste of time and effort, but I would like to make just two key points which I have tried to elaborate in what I have written. There is a lot of money coming in to support malaria right now and the window of opportunity to make certain that is used well and documented well is probably much shorter than many of us want to believe. That money will go elsewhere if malaria does not produce, and malaria does not produce and document impact, not just in terms of where we went and who we were, but who got sick and who didn't die.

We all understand that it is hard, but it is vital and it will occur and it must occur, and we need your help in terms of pushing that forward.

I think the second thing that is the difficult part of this is that as more money is coming into many African countries right now, and this is what I spend my life doing, is that the capacity of national governments to receive and allocate that money to turn that program into—turn that money into saved lives is a huge challenge, is that these very systems, and we can talk about infrastructure, we can talk about capacity, all of these potentially murky top-

ics are vitally important. They are not more important than commodities.

But the challenge that we run into in many countries in Africa right now, and this is a big problem that the Global Fund is currently facing, is the capacity to do things that we take for granted—procurement, distribution—a number of these other things are vital issues that we as the leadership position which the U.S. Government can bring to these issues, we need to make sure that we have a balanced armamentarium as we move forward.

We must make certain, and we need more money for commodities. But to take current monies and push them toward the commodities and to take away the enormous, almost unique capacity which the U.S. agencies have in their academic institutions and other Federal institutions that know how to support governments to do these things is vitally important. Call that technical assistance, and yes, there are many egregious examples of technical assistance running amok. But there also are as many or more examples of where technical assistance has been well thought out, has supported the capacity of national governments to move forward in malaria and other issues.

And we need to make certain that the U.S. Government, which in many respects—or the United States, which in many respects has unique capacities to support those areas, can do that and do it better than we are doing it now. So I ask you to not move everything to commodities, but keep a balanced view.

The last thing I would want to say is that we must all keep in mind is that malaria in Africa will be controlled by Africa and not by us, and so the capacity of national governments to understand and to adapt systems right now which are stressed in many respects by the enormous and much greater infusion of HIV–AIDS money and resources coming in, these systems really have an enormously difficult time in terms of how they absorb these monies and move them forward, and that is not as simple as diagnosing and treating malaria. That is much more complicated, and it may be the Achilles heel of this whole process.

The U.S. Government can do a better job. The U.S. Government is not doing as bad a job as perhaps some people would like to believe. Single agencies have good pieces and bad pieces and pieces that all can be improved, and I think that at this point in time, as we look forward to legislation to suggest how we move forward, I would encourage us to make certain that we understand what is working well, and then off of that basis figure out how to make it better. Thank you very much.

Senator COBURN. Dr. Campbell, your points are well taken. The point is, when you can't find out what is being spent where and there are no measured outcomes on the basis of what the goals are. There is no way you can evaluate that. So there is no way you can make an assessment. That is what this hearing is all about.

What are the goals? How do you measure the goals? Where is the money being spent? How is it being spent? Are the contractors efficient? Are they doing what they are supposed to be doing? Is the money being spent inappropriately in terms of the domestic side of the issue?

When 50 percent of the money of this budget is spent in the country, and we don't know that for sure because I can't find out. I am going to find out, I will tell you that. I am going to find out where every penny that goes with this malaria program is spent, no matter what. So we are going to know, and we are not going to just know on malaria. We are going to know on every area. That is what this Subcommittee is going to be about the next 6 years if I am still the Chairman of this Subcommittee and we are going to have accountability.

And it is not to say that those people, Mr. Miller and his staff, don't care, aren't trying as hard as they can. The fact is, the only way you can be evaluated, it has a measurable outcome. And our outcome is based on lives saved and disease prevented. That is the outcome that we have got to be looking at.

Whether it is implementation, delivering the product, not just commodity product, but whether you are implementing it, if you haven't implemented that properly, you are not going to save the lives. So it is not just one or the other. It is measuring the outcome, how many lives are saved, and is it an emergency?

To me, there are not 3,000 children who die in the Southwest in this country every year from disease. So this is an important thing, and what we are asking is transparency on where the money, responsiveness to those people who also care so they can see where the money goes—so that they might be able to contribute a great idea, and the ability for Congress to look at where the money is spent to know whether or not we ought to put more money. How do we know we shouldn't be putting $200 million a year into the malaria program? We don't know that.

So the fact is, if there is resistance on the part of any agency in this government to cough up the numbers of where they are spending the money, that automatically sets an assumption that either there is something to hide or they are incompetent. There are only two answers. I don't believe they are incompetent. They may not know, and that is just as bad, because if they don't know where the money is going or what the purpose is for the money, then we are not doing our jobs in terms of oversight or looking at how we spend the money.

The hearts and intent of the people at USAID are good. There is no question about that. The goal is, how do we spend the money effectively. We are going to run a true $650 billion deficit this year. That is the real number, and I will be happy to go through that with anybody that wants to dispute that. But that is how much money we are going to borrow for the future, the kids that are here today that aren't getting malaria that are going to pay back. Any dollar that we don't spend well in saving a life from malaria, our grandchildren are going to pay back about $10 to pay for that because we are borrowing the money to do it. So it is implicit on us to be great about where we go.

Dr. CAMPBELL. Sir, I just would say, I couldn't agree with you more that, in fact, that level of attention to how well we do our job, all of us do our job, and that accountability and data are vital, I think all of us would support wholeheartedly. And how we do that and how we get to the end of that inquiry and make certain that

those 3,000 children benefit from that inquiry is something that all of us would like to help you do well.

Senator COBURN. Thank you. Let us start with Dr. Bate, and I presume Senator Carper is coming back. Can you give me an example of what you meant when you said USAID is not transparent. I believe that to be true, but give this Subcommittee an example of that.

Mr. BATE. Well, first, the Yellow Book, not updating its contract information, that makes it very difficult to know. I mean, that is a prime example of lack of transparency.

Senator COBURN. Can you think of a good reason why somebody wouldn't update that?

Mr. BATE. Again, I refer to your remarks, which is incompetence or something to hide. I doubt it is incompetence. Perhaps they don't want people to know how the money is being spent.

I think sometimes the information that is presented can be misleading. Mr. Miller, the testimony he gave on April 26, so 2½ weeks ago, discussed a contract or a grant to Technoserve, which he described as an East African agricultural concern in his testimony. It may well have operations in East Africa, but its headquarters is 49 Bay Street, Norwalk, Connecticut, and it received $8 million from USAID in 2003. I don't know what it got in 2004.

That is not to say they are not doing a good job, but that was not a competitive tender. We have no idea whether other organizations, perhaps in Southern Africa, where there is great competence in farming, could have helped in growing that at a lower cost. Perhaps it was done in an emergency setting to increase the production of what is an extremely important crop. I don't know that. But I do know that—you asked for an example. I think that is one. I am not saying it was willfully done to mislead, but it is misleading to say that a moderate-sized U.S. contractor is an East African agricultural concern.

Senator COBURN. Let me ask you, if you were in charge of $80 million for a malaria budget for Africa, where would you be spending the money?

Mr. BATE. In terms of the——

Senator COBURN. And I am going to ask you to answer that in a short period of time. I know that is a terrible question, but——

Mr. BATE. The short answer is I would be buying a lot more commodities than USAID is buying. The idea that they coordinate with other agencies and other forms on the ground may be true. We don't know because of transparency, lack thereof. But the examples I have seen, there are instances where they are providing technical assistance and the commodities are not available.

Second, I think that, to use the analogy that Mr. Miller gave, which I think is a good one, it would be to a certain extent like trying to fight the Iraq war, relying on the Royal Air Force for air cover. Now, the Royal Air Force is a marvelous organization and as a Brit, I am very proud of it, but it doesn't have the power that the U.S. Air Force does and I think we need U.S. purchases of commodities.

So is the budget allocation, I am not 100 percent certain what it should be, but I would say certainly 50 percent or more on commodities.

The technical assistance they can provide, I am sure, in many instances is very good. We simply do not know.

Senator COBURN. Dr. Attaran, you are an immunologist and you are the author of a very famous paper in the *Lancet* which revolutionized how USAID and others think about malaria treatment. Why is ACT better clinically, and whether the Coartem deal is a good deal for Africans and Americans and whether USAID has treated the pharmaceutical manufacturer of that appropriately.

Mr. ATTARAN. Thank you for the question, Mr. Chairman. Coartem is an example of a class of medicines known as artemisinin combination therapies, which we have been calling ACT. There are four approved ACTs and they are all good and they are all far superior to previous medicines, mainly for two reasons.

One, they achieve high cure rates. Chloroquine, which is an older medicine, as of about 2 years ago was failing to treat the patient successfully 79 percent of the time in Ethiopia. Seventy-nine percent of the time, you had drug resistance and, consequently, treatment failure. You don't get any treatment failure with ACTs. If it is the right ACT for that setting, you get cured. It works all the time.

Senator COBURN. And there is no potential for resistance development?

Mr. ATTARAN. Well, artemisinin is a herbal remedy from Chinese medicine, and they have been using it for 2,000 years and we haven't found resistance yet. Maybe the 2,001st year is going to be really bad——

Senator COBURN. Do we understand the mechanism of action? What does it do to the trophozoite?

Mr. ATTARAN. There are heated controversies about that. The leading theory is that it actually creates free radicals that destroy some of the internal contents of the parasite, but that is not settled conclusively right now. What we do know is that it does achieve these much better treatment rates than older medicines.

And it wasn't long ago, I would say only about a year and a half, 2 years ago, that we had USAID and UNICEF vigorously supporting the use of chloroquine in Ethiopia. There is a brilliant *New York Times* story about that, where USAID is quoted as saying that artemisinin in combination therapies, "aren't ready for prime time," which was scientifically, I think, an indefensible point of view.

That said, since ACT is better, how do we get enough of it, at what price? The prices that were told to you earlier are fairly accurate. Coartem, to take that as an example, because it is the number one listed product by WHO—it is the one that they put at the top of their priority list, and it is approved by them—sells for between 90 cents for a pediatric treatment to $2.40 for an adult treatment. It is sold under an agreement with WHO entered into by Novartis for absolutely no profit on Novartis's part.

You don't have to take my word for that. WHO did engage Deloitte and Touche to audit Novartis and, in fact, Deloitte and Touche returned and said that Novartis was making about an 80-cent loss. So they are in the red, actually, on the adult treatments. That was at a time before we saw a sudden spike in raw material

prices. It could even be more of a loss now, but I don't know and you would have to ask Novartis.

So WHO is satisfied that is a good deal. Global Fund is satisfied that is a good deal. What I am aware of is that when Novartis has made outreach to USAID, it has not been perfectly reciprocated, but that is, again, not the topic in which I can engage very deeply and I would encourage you to be in touch with Novartis and USAID.

Senator COBURN. When I was in Congress in the late 1990's, the idea of a Global Fund kind of synergized around myself and some other people, and I know many in this room were involved in that. Should Congress just strip away the USAID money and send it to the Global Fund?

Mr. ATTARAN. I think what is true is that the Global Fund has made very helpful and important and, I would say, impactful strides, measured as how many patients are going to get treatment and live, since last year when I published my highly critical article in the *Lancet* about them. That is a fantastic development and they deserve to be commended for this.

There are two options here for you, sir. One is to either try and reform USAID, and I think that the Brownback-Landrieu-Inhofe bill is a fantastic way of going about that, and then USAID perhaps could be effective on malaria in a way that it currently is not.

The alternative is to simply give the money to the Global Fund. Both agencies are obviously capable of doing a good job, and so what it turns on at the end of the day is whether you, sir, and your colleagues believe it is important to have an independent U.S. ability to execute in malaria and possibly the other diseases about which the Global Fund is concerned.

Senator COBURN. Senator Carper.

Senator CARPER. Thank you, Mr. Chairman.

I want to start off with Mr. Miller. Take 2 minutes if you want to rebut anything or respond to anything that has been said, just mostly the compliments that have been thrown your way. [Laughter.]

Mr. MILLER. Thank you, sir. I think I wouldn't know where to start. There is a lot out there. A lot of it has to do——

Senator CARPER. Just a couple of priorities. Don't do it all, just a couple of top priorities.

Mr. MILLER. Sure. I would start by emphasizing that there is agreement, and I am glad to hear Mr. Bate and Dr. Attaran mention that. There is a shared goal here of eliminating malaria. In fact, there is actually agreement on the effectiveness of interventions that IRS, ITNs, and ACTs have, this is what the United States and multilateral agencies, we are a part of, should and will support.

The debate is really about the proportions and the priorities they are in, and we are happy to have that debate, and Senator Coburn emphasized that greater transparency and accountability are called for. As I said in the beginning of my opening statement, no agency is beyond criticism and we certainly do welcome that dialogue and, of course, we will do the best we can. Again, our goal is to save the most lives possible and whatever we can do, if it can be dem-

onstrated that we are doing it wrong, we should do it a different way. I think President Bush would expect us to do that.

Senator CARPER. I say, everything I do, I can do better, and my suspicion is that is true about most of us and even agencies, as well.

To our other witnesses who joined us on the second panel, I apologize for missing the presentations of all of you but one. I want to start maybe with a question or two for Dr. Campbell, if I may.

We have heard some—and I approach these issues as a lay person, so this is a great opportunity for me to learn and to be educated and I think that is the purpose of these hearings anyway, so it is serving, at least with respect to this member, it is serving its purpose.

Dr. Campbell, there has been some discussion here today on the value of indoor spraying of insecticides and how effective that is and there seems to be agreement that can be pretty effective. Are there any parts of Africa where it is maybe not as appropriate to use sprayed insecticides on the inside of dwellings?

Dr. CAMPBELL. The answer is that as best we understand, and I think we understand this quite well, that indoor residual spraying with a range of insecticides can be highly effective in virtually anyplace in Africa except under some remote situations where the quality of housing surfaces is such that the insecticide doesn't adhere or vaporize from the surface as well.

But the fact of the matter is that its ability to kill mosquitoes after they bite and rest on it is essentially uniform in Africa. That is not the limiting factor. The limiting factor really has to do with the manpower, infrastructure that is required to deliver it and a variety of issues of that sort.

So I think that the debate, as we see it at this point, is not—I do not find the IRS debate as being the central most important issue in terms of moving forward on malaria control at this point. And second, I am committed, as are many of our colleagues, in not letting the controversies around DDT and IRS get in our way of moving forward. It has a role. National governments are dealing with it right now to understand the appropriate role. Largely, as WHO says, it is in more compact, urban areas, but there is good experience of using it in other areas, also.

Senator CARPER. Thank you. Did you say anything in your testimony about how one role of the USAID is to help countries in Africa to develop the capacity to better utilize—I talked about tools and toolboxes. It seems to me part of USAID's role is to put tools in the toolbox to combat malaria. But another part of their role is to help ensure that the rest of the tools that are placed in the toolbox by others are then better utilized, more effectively utilized by nations and so forth to combat the disease.

If you could just give us your thoughts, and maybe you already have and I missed it, on the effectiveness of USAID in coordinating this capacity building, folks within national governments and other folks that are putting tools in the toolbox, like the Global Fund and maybe the World Fund, World Ban.

Dr. CAMPBELL. In fact, I think one of the things that I would say is that I would probably defer those kind of observations and others. That is not an area in which I have a vast amount of experi-

ence and I don't think I am the best person to comment on that. I have worked with many organizations, but I would refer that to Mr. Miller and others, and you have got other experts——

Senator CARPER. Good. Let me just ask the same question of others. I already discussed this a little bit with Mr. Miller, so I am going to ask if you will hold off. Would you pronounce your last name for me, Doctor?

Mr. ATTARAN. Attaran.

Senator CARPER. Attaran, OK. And is your last name Bate?

Mr. BATE. No "s".

Senator CARPER. No "s". Where did you get that name?

Mr. BATE. Well, it is a long tradition of singular British men who do not have an "s" on the end of their name.

Senator CARPER. That is remarkable. [Laughter.]

Do you all have any thoughts on the question I just directed to Dr. Campbell? He has done something that few of us here do, and that is just admit we don't know and move on. We usually go ahead and answer the question anyway.

Mr. BATE. There is no doubt that coordination is a vital role that with good assistance the USAID can help with. There is, unfortunately, a paucity of data out there as to how that technical assistance works, and in some of the examples we had cited in my written testimony, there are some problems to the extent that technical assistance is provided where the commodities are not available.

So there is no doubt coordination can be improved, even if USAID does have great technical assistance, and because of the lack of transparency and accountability in reporting, we simply don't know.

Senator CARPER. All right. Dr. Attaran.

Mr. ATTARAN. Thank you, Senator. There is a fine line between technical assistance and meddling or backseat driving. Technical assistance is a good thing. One wants to make sure that the money that is given is being used in a proper way, that the people are using scientifically up-to-date strategies to control malaria. All of that is certainly true.

But when we end up with a program such as USAID's, where, for instance, "treatment" really is about giving a lot of advice on how countries should do treatment and yet no medicines or very few are purchased, we are backseat driving at that stage. We are telling other people how they should spend their money on medicines that are the ones we, as Americans, want them to use, and that is not helpful.

In fact, that is—in my experience in Africa, I have had formal experiences and I have also hitchhiked across Africa for months at a time——

Senator CARPER. Is it hard to get a ride there?

Mr. ATTARAN. There was a 4-day stop on the Equator which I am not proud of, sir.

Senator CARPER. That is a long time to wait.

Mr. ATTARAN. It really was. But in my formal and informal experiences both, I have found that there is a certain amount of resentment engendered by, if I can paraphrase it, that we are telling people to do a certain something and we are not helping them do it.

You are coming in and you are meddling. I have heard that said in all sorts of African contexts.

Senator CARPER. Thanks. Mr. Miller, just a quick comment if you have, just briefly in response to this again. I know you talked about it a little bit already. Is there anything else you want to add?

Mr. MILLER. Yes, sir. I would say we are not meddling. Certainly we don't design our programs from Washington to be impressed upon anybody. These are designed almost always with the cooperation of the host government or with NGOs or with other interested or affected people, and that is always the goal.

Senator CARPER. All right. Thanks. Dr. Attaran, do you have something else?

Mr. ATTARAN. If I could just add an analogy that I think might be of assistance to you, Senator, USAID does food aid and in the food aid context, bags of grain and buckets of oil, the actual commodities are delivered and people are grateful for that around the world.

Imagine we did food aid by actually recommending to people what their diet should be in a starvation situation, but we didn't provide them the grain and we didn't provide them the oil. "You really ought to eat some rice today," but they don't have any. "You really ought to have a bit of oil," but we don't give them any.

That is the analogy that illustrates how our technical assistance without the provision of commodities becomes misunderstood and our good intentions are misunderstood, which is to me quite a sad reality and, I think, one that we can fix.

Senator CARPER. All right. Thanks. One last question, Dr. Campbell, if I could. Let me just ask what your views are on the recommendations, I think made by Mr. Bate and I think his coauthor, that USAID should maybe concentrate its anti-malaria efforts in a smaller number or the most needy countries.

Dr. CAMPBELL. In terms of the—there are several recommendations out there right now and to the extent to which my view would apply to USAID is for others to interpret.

I think that we are in a situation in Africa right now where there is clearly progress in terms of one of the important ways of understanding and that is coverage in terms of the proportion of individuals who were sleeping last night under an insecticide-treated net, for example. There are some great examples of enormous progress.

Malawi just completed a national survey and the average was 38 percent of children under five sleeping under a bed net. That is not 60 percent, but 3 years ago, it was under 5 percent, and those are truly insecticide-treated nets. Those are not just nets. Yes, that is one country, but there are several other countries that are making dramatic progress.

I think one of the things that we have is that we have a lack of confidence on the part of ourselves and, quite honestly, there is a great deal of skepticism on the part of national leaders who are the ones who are going to ultimately decide the priority that malaria gets within their ministries of health that malaria can be programmed to impact.

You share this concern, too, and so I think that one of the challenges we have at this point is that making slow progress, incremental progress across all of Africa, is important. But unless we

have some dramatic examples of progress in the short haul, and I am talking in 3 to 5 years, our concern is, is that the edge on malaria as a doable, feasible entity is going to wane and we will have lost an enormous opportunity.

So the answer is, I think that we need a balance of investment across many countries, but we also need more attention to intensive multi-donor, not just single country, efforts in a few countries that actually can provide an example to other countries to say, wow, this is possible, because we do not have examples of success in Africa at this point in time, and until we begin to accumulate those very rapidly, I think that the confidence issue is going to become an increasing impediment.

So the answer is, yes, I think that we need some intensive investment with the Global Fund and with several other bilaterals to come together in a few countries and say, this needs to be done really well and documented to the n-th degree so that people can see it, understand it, and have confidence in it.

Senator CARPER. Thank you. Dr. Bate, a last word?

Mr. BATE. If I just may, I think there are examples of success in Africa and those examples are where people actually measure outcomes and they use interventions. I mentioned South Africa, and Zambia has already been mentioned. Northern Zambia is a great example of a rapid reduction of morbidity from malaria of 70 or 80 percent.

Senator Brownback said something which I think is very good, and I can say this as an outsider. The American people are the most generous on earth. If they are shown that malaria treatment, prevention will work, I am sure more money will be made available, and that is something we all want. And I think that if the only examples you have are provided by national governments in South Africa's case, or the private sector, that is a very—I think that is an indictment on the fact that no data has been collected. We need to collect data and we need to have that data presented transparently, and then I think the American people will spend even more money to malaria.

Senator CARPER. All right. Our thanks to all of you.

Senator COBURN. I just want to follow up with a couple of questions. Mr. Miller, do you know and do you have at your fingertips where the money is spent for the malaria program with USAID?

Mr. MILLER. At my fingertips, no, sir.

Senator COBURN. Do you know it? I mean, is it available to you?

Mr. MILLER. It will be—yes, it is available to me.

Senator COBURN. So it is not that the information isn't available. So my question is, since it is available to you, why isn't it available to us?

Mr. MILLER. It is the form in which the information is available, I think is important to remember. I would point out that most of what we do, most of what USAID funds in terms of anti-malaria programs—this is true of all health and development programs—is done through grants. We call them cooperative agreements, but they are, in fact, grants. They are not through contracts, so you are not going to get a contract-like response.

Senator COBURN. I don't need to have that. I just want to know where the grants are, who gets them, what time they got them,

what are the requirements of the grants, what is the performance evaluation of the grants. How do you measure whether somebody as a grantee did what you asked them to do? In other words, that is the data that I want to see, and it is not just USAID. I want to see that in the entire Federal Government. The American people deserve to see that and know that, and if that is available, I want this Subcommittee to have it.

Mr. MILLER. Sure. That type of accountability is stuff we do collect with every grantee. They have to go through audits. They have to have a performance appraisal——

Senator COBURN. Then I would assume you would make that available to the Subcommittee.

Mr. MILLER. We will make everything we can, sir.

Senator COBURN. I just have one other question. Dr. Attaran, would you comment on the World Bank situation now and what is going on in terms of the malaria?

Mr. ATTARAN. Yes, Mr. Chairman. The World Bank has, only a couple weeks ago, published a new malaria plan—it is not implemented, it isn't yet funded by their board—which has as its bottom line that they will commit between $500 million and $1 billion towards malaria. They very carefully are cagey about that. They say $500 million to $1 billion, together with their partners, and nowhere do they say what the World Bank's contribution will be. It is always, together with our partners. So we really don't know what they are committing.

But what I can tell you is that history is not on the side of children with malaria, because in 2000, the World Bank did promise to provide $300 to $500 million of its own money for malaria in Africa which initially it said it did, and then following an investigation that I conducted and published in the journal *Nature*, which you may be aware of, the World Bank admitted that, in fact, they had only spent $100 to $150 million, not the $300 to $500 million that they said. And similarly to USAID, the World Bank declined to explain how they spent it. So we don't even know where that $100 to $150 million has gone.

It is curious that this is a bank that doesn't know how much it has got in its accounts: "Maybe we spent $100 million, maybe we spent $150 million on malaria. We are really not sure and we please don't want any more questions on the situation." I am, of course, being summary in my assessment of the situation, but I think that is, frankly, accurate, and the editors at *Nature* agreed with that.

Senator COBURN. All right. I think our testimony is true that—and let me just, Mr. Miller, give you a chance. You do have a contract for $65 million for nets?

Mr. MILLER. I believe that is a grant, or a cooperative agreement.

Senator COBURN. You have a grant.

Mr. MILLER. A cooperative agreement, yes, sir.

Senator COBURN. Sixty-five million, and that is over how many years?

Mr. MILLER. Net Mark, is that per year, or is it 5 years? It is an 8-year grant.

Senator COBURN. An 8-year grant.

Mr. MILLER. Cooperative agreement.

Senator COBURN. And those grants are not—those nets are not given away, they are sold, is that correct?

Mr. MILLER. It can be both.

Senator COBURN. Do we know what percentage of that money——

Mr. MILLER. We can determine that. The way we determine——

Senator COBURN. You don't know that?

Mr. MILLER. No, sir, not on the spot.

Senator COBURN. Does somebody here know that?

Mr. MILLER. I think we can determine that. Do we know the percentage?

Mr. CARROLL. Ten percent, 15 percent are given away. The rest are sold. They're sold, I might add—prices that these nets are being sold for represent 50 percent reduced prices from what they were in the market 3 years ago. So this is moving nets through the commercial sector into retail shops and making them available at very low prices, along with nets going into antenatal clinics and making those available for free.

Senator COBURN. Here's the difference. What do the nets cost? What's the true cost of the net? If you're going to spend $65 million buying nets, I'll bet you they're the biggest net buyer on this side of the ocean. And if we're going to buy the nets there shouldn't be any profit in them. The nets ought to go to people at what they cost. Is that what they're doing, they're going at cost? The Africans are buying the nets at cost and that's around $4?

Mr. CARROLL. Three dollars, fifty cents, $4.

Senator COBURN. That's the cost that's paid to the manufacturer for the net and that's the cost that they're sold at?

Mr. MILLER. But I don't think nets always go at cost.

Senator COBURN. Why not?

Mr. MILLER. Some are free.

Senator COBURN. Other than the free ones, why would the nets not go for what they cost?

Mr. CARROLL. Senator, this is a program—again, this is an exercise where we are working in concert with other donors, UNICEF, for instance, World Health Organization, where we are looking at the full range of opportunities to get nets not just tomorrow or today, but in a sustained way to make sure that every kid and every pregnant woman has access to this lifesaving measure.

Our role in this case has been multifold. We have been working with textile industry across Africa to increase their ability to produce the nets so that we are creating more opportunities for nets to be flowing into African homes.

Senator COBURN. That's a great point, but here's my point. Is somebody making profit off the nets?

Mr. CARROLL. If there's a profit being made, it's a local retailer, it's an African retailer bringing food home to their family. This is building a local capacity to solve a local problem.

Senator COBURN. So somebody is going to spend——

Mr. CARROLL. Part of our role, our other role, which is equally important, is working in the communities to make sure that there are affordable nets free to those who cannot afford them. So we're working both sides of this. We can share with you data now that is coming in from Senegal and Ghana, for instance, that shows

when we take an approach that involves both making—strengthening local retail shops in villages to be able to sell these nets at these prices along with targeted subsidies and free nets, we're looking at the poorest of the poor households and the wealthiest households, all vulnerable to malaria, but all getting equal access and equal use of these nets in their homes. So we're getting very equitable distribution against a disease that is rampant in those countries.

Senator COBURN. I want to see the data. Since you seem to have a measurement on that, let's look at it.

Mr. CARROLL. We have that measurement and in fact that has been shared with panel members here.

Senator COBURN. One of the things that we will do—first of all, thank you all for spending the time to come. Thank you, Mr. Miller, for adjusting your schedule for us. I promise if we have you here again we will make sure you are well advised in advance in terms of your time requirement.

You will hear from the Subcommittee specific questions we would like for you to answer. We'd like those answered on a timely basis. This is the first hearing on this. I'm not through with this. We're going to talk to the Global Fund. We're going to find out what's happening. We're going to make sure—I'm very pleased that Mr. Miller is going to avail the Subcommittee of where the money is spent and how. I'm very pleased that we're going to have a transparent ability to get that over the Web. We'll talk about how fast that can be done. I would hope that would be a priority because with the information comes less criticism, not more. Part of the criticism of the malaria program today is because the information isn't available. So the assumption is that it's not being done right when in fact it may be done right.

So I want to thank each of you. You will have a follow-up letter from us. If we have not heard back from you—in other words, we're not going to have a hearing and expect something to come back, just like most hearings in Congress and then you never hear anything about it. You're going to hear back again from us. We're going to get the questions answered. And then if we don't have the questions answered, we'll be back here talking about it again.

Thank you all very much for being here. I thank you for your work, each of you, and the staff at USAID. I know you're committed to the same thing that everybody else in the room is, and that's eradication of malaria in Africa. Thank you very much.

The hearing is adjourned.

[Whereupon, at 12:45 p.m., the Subcommittee was adjourned.]

# APPENDIX

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**Testimony of U.S. Senator Sam Brownback**
**Hearing in the Subcommittee on Federal Financial Management, Government Information and International Security**
**U.S. Senate Committee on Homeland Security and Governmental Affairs**
**May 12, 2005**

**INTRODUCTION**

Mr. Chairman, I'd like to thank you for the opportunity to speak to the subcommittee today about a topic very close to my heart. I travel overseas with some regularity and I get to see some of the tragedies unfolding in countries such as Uganda, or Vietnam. Malaria is a tragedy on an epic scale, and the worst part is how unnecessary the death toll is.

Malaria is the most common life-threatening infection on earth, sickening 500 million people a year and killing 1-2 million a year. Most of these deaths are in tiny children and pregnant moms. The vast majority of these deaths are unnecessary. You see, malaria is a preventable disease. And even when prevention fails, it is a curable disease.

We are used to public debates about the cost of treatment for AIDS – is it $300 for a year's supply of medicines, or $2,000 a year? Do we use FDA-approved, branded drugs or unapproved, copycat drugs? Ultimately, with AIDS, we are tragically only delaying the inevitable death from this incurable disease. Yet, this Congress, and this Administration recognized the moral imperative to do so on a grand scale. You see, when we have the tools to address a problem affecting the poorest of the poor, we will be held accountable for our response to that problem.

AIDS is complicated and expensive to treat, and ultimately incurable. How much more are we accountable for lifesaving investments for a disease like malaria? To cure malaria – it costs at most $2. Give a child a few days of inexpensive medicine, and the child is cured. But you have to get treatment quickly if the medicine is going to work best. How much better to prevent the child from ever being infected? Prevention works. It can work. It has worked in large swaths of the globe for decades.

The world embarked on a global campaign to eradicate malaria decades ago, primarily using the combination of spraying insecticide in houses and effective medicines for people who get infected. We conquered malaria with this approach in the developed world and controlled the disease dramatically in the developing world. But then, DDT – the cheapest and most effective insecticide – got a bad rap, and drug resistance to the medicines started increasing. The world community turned its back on aggressive malaria control. Now malaria is the leading killer of children in Africa.

**A GLOBAL FAILURE**

The death toll is inexcusable for a controllable disease like malaria. The Congress authorized $15 billion over 5 years to control AIDS, malaria and tuberculosis. Very little of that has gone to malaria. The U.N. has an abysmal record of failure. The U.N. launched an initiative years ago to cut malaria rates in half by the year 2010. This goal was reasonable and realistic, given the world's past success. But you have to spend the money on actual tools – drugs that work, insecticides, bed-nets. Instead, money went to what seems like a lot of talk and the Roll Back Malaria turned out to be nothing more than a PR gimmick. Just last fall, UNICEF was handing out obsolete drugs in refugee camps in Darfur! Despite the talk from the U.N., malaria rates have increased since the Roll Back Malaria Partnership began, not declined. This failure is a global embarrassment.

**BILATERAL BLUNDERS**

Amid the finger-pointing, some are claiming that it's a funding problem. Last month, the World Health Organization blamed donors for not spending enough. I'm of the opinion that until we see results with the money we currently spend, more money will only exacerbate our failures. I am embarrassed to say that our own U.S. Agency for International Development is not measuring whether lives are being saved with its budget of $90 million. It simply is not measuring. Why? Because it doesn't actually buy items that reach communities on the ground. The agency refuses to buy drugs. Refuses to buy insecticide for spraying programs. Refuses to spend more than 5% of its budget on direct distribution of insecticide-treated bed-nets. And finding that out was not easy. The biggest failure of all is that the agency refuses to transparently disclose how it spends its money. My staff have been asking repeatedly for a detailed, itemized accounting of the $90M, and has been getting ad hoc responses with vague descriptions and math that doesn't add up. When I have asked which contractors are getting how much money, to do exactly what, in which countries, I have gotten no answers.

The documents we have received have been quickly-thrown-together emails to staff, requiring follow-up questions and endless clarifications. Why isn't this information published on a web site in a systematic way? Why aren't reports published each year that provide this information? I can't think of a better way to duck criticism for failing to have lifesaving programs than to simply claim effectiveness with absolutely no supporting documentation.

Unfortunately, the spin doesn't stop with the failure to disclose funding information. The agency actually defends its programmatic approaches using deceptive rhetoric and distorted science. After being challenged on its fuzzy science, USAID had to issue me an apology for exaggerating the cost of insecticide spraying in a letter defending their refusal to more broadly support these programs. I can't help but wonder - what is going on? I know we all want little kids to stop dying daily from this preventable, curable disease.

**NEXT STEPS**

I think the American people are ready to do more on malaria. They are the most generous people on earth. I go back to my home state and there is a willingness to reach out and support programs if the programs really save lives. But before we can responsibly spend more, we must reform existing programs

**S. 950 ELIMINATE NEGLECTED DISEASE ACT OF 2005**

That is why I have introduced the Eliminate Neglected Disease Act of 2005 with my colleagues Senators Landrieu and Inhofe. This bill calls for reform of our infectious disease programs in a number of ways:

1) ***Direct interventions***: Our bill requires funding of activities that have a direct impact on sick people or people at risk of becoming sick. For some programs, this will require a shift of priority in budgets from indirect support and advice-giving consultants to actually funding medical treatment, commodity procurement, and outbreak control programs.

2) ***Accountability***: Our bill requires Federal agencies working on infectious diseases to measure performance and prove that they are saving lives. The bill establishes mechanisms to revise or terminate contracts that fail to save lives.

3) ***Transparency***: Our bill requires that the agency systematically report on a web site how it spends its money. This approach is similar to the one taken by Geneva-based multilateral donor the Global Fund to Fight AIDS, TB and Malaria. All signed agreements are posted online, as well as progress reports documenting performance on required deliverables and indicators.

4) ***Scientific and Clinical Integrity:*** The bill provides that clinical, and public health programs are overseen by the agencies of the Federal government where the core competencies in clinical medicine and public health reside. For the malaria program - where the lack of clinical and scientific expertise has been particularly acute - a group of Federal and non-government medical and academic experts will provide scientific and medical oversight.

5) ***Coordination and Priority-setting***: Up to five Federal agencies are currently involved in international malaria and tuberculosis programs. The bill would provide for clearer lines of authority and coordination for these programs, and require a strategic planning process to ensure that programs operate according to a results-oriented 5-year plan. When the President wanted to roll out huge money - $15B – for AIDS, he targeted 14 focus countries. How much more should our much-smaller malaria program also target focus countries rather than spreading a few million over 30 countries? Priority-setting is critical. Some countries are ready to go with comprehensive malaria control programs, and we should start there.

**THE MORAL IMPERATIVE**

The world community conquered smallpox. We have nearly conquered polio and guinea worm. When we acted in concert, we stopped SARS in its tracks a few years ago. If these diseases were killing our own citizens at the rates they are killing people in poorer countries, we would put an end to it using the inexpensive, known methods, in short order. African children are just as precious as American and European children. To those who have been given much, much is expected. We will be held responsible for how we responded to this crisis. I hope my colleagues will join us in supporting this legislation.

I am happy to answer any questions and I thank you for your engagement on this issue.

**Michael Miller**
**Deputy Assistant Administrator for Global Health**
**U.S. Agency for International Development**

**Testimony before the**
**Subcommittee on Federal Financial Management,**
**Government Information and International Security**
**Committee on Homeland Security and Governmental Affairs**
**May 12, 2005**

## Malaria

Thank you, Chairman Coburn and Senator Carper. I appreciate the opportunity to testify here before you today.

The starting point for consideration of malaria programs is the fact that malaria is overwhelmingly – but not exclusively – a killer of African children. The greatest tragedy is that death from malaria is largely preventable if addressed in time and with basic interventions. That's also a call to action and a fact that does not weigh lightly on our hearts and minds.

In fact, malaria is the number one killer of African children, by most accounts, claiming the lives of at least one million each and every year. Between 80 and 90 percent of deaths from malaria are in sub-Saharan Africa, and of those deaths, about 80 to 90 percent are children under five years of age.

Remarkably, malaria is effectively eliminated in much of the world – with notable exceptions – but persists tenaciously in Africa. In fact, the disease has actually grown more deadly. Both in absolute terms and relative to the rest of the world, Africa is carrying a greater malaria burden and greater disease burden than it was two decades ago. Only in the past few years have we seen any clear indication that we might be turning the corner and making progress in some areas.

Why has malaria actually become more deadly in Africa when it has been effectively controlled or even eliminated as a health threat in most of the rest of the world? The answer is as significant to our considerations of where to go as it is surprising.

First, the effort to battle malaria in a comprehensive way and continent-wide is literally decades behind other regions. In the 1950s and 1960s, eradication of malaria was the number one global public health goal. In most other regions, including the Southern United States, the combination of insecticides and treatments was deployed on a massive scale across entire regions. The results were positive and significant. But not in Africa.

In 1955, a World Health Organization technical panel of the world's top malaria experts met in Kampala, Uganda. There, they decided to explicitly exclude tropical Africa from

the Global Malaria Eradication Program. The reasons were because of the intense and efficient transmission of the disease and because of the lack of infrastructure necessary to undertake such an intensive spraying effort. In short, Africa was left out because it was judged to be too difficult.

That decision essentially eliminated prevention and relied solely on treatment. Even until just the past few years, the backbone of the anti-malaria effort in Africa was limited to treatment of the disease once the symptoms appeared. While that response may have made sense in 1955 – and it may not have made that much sense even then – in retrospect it was a fateful and tragic decision that still has Africans paying a heavy price.

By the 1980s and into the 1990s, malaria infections and death rates were rising at alarming rates in Africa. The reason was treatment failure. Simply, as the disease adapted and evolved to the treatments, the drugs stopped offering the protection they once afforded. Populations in malarial areas became increasingly vulnerable.

It was not until the early 1990s that an organized and dedicated effort to introduce prevention measures on an appreciable scale began in Africa, funded largely by donors such as the United States. By this time the need for new treatments also became impossible to ignore.

Beginning in about 2000, three new, highly efficacious prevention and treatment tools became available through American and other donor research. Combined and fielded together, these measures represent the first truly comprehensive and globally-supported anti-malaria strategy to be deployed in the one place that needs it the most.

**Comprehensive Strategy**

USAID has in place a comprehensive strategy to battle malaria including, prevention, treatment, and malaria in pregnancy. This strategy also includes special efforts focusing on malaria in complex emergency settings. USAID programs for malaria control are based on a combination of internationally-agreed priority interventions and country-level needs for achieving the greatest public health benefit, most importantly, the reduction of most of the deaths.

The strategy contains three key components:

- Prompt and Effective Treatment with an effective anti-malarial drug within 24 hours of onset of fever;
- Prevention of malaria through the use of insecticide - treated mosquito nets (ITNs) targeted to young children and pregnant women, or spraying of homes' inside walls with insecticide; and
- Provision of Intermittent Preventive Therapy (IPT) for pregnant women as a part of standard ante-natal services.

Each of these interventions is backed by solid evidence of effectiveness under program conditions in reducing the sickness and death from malaria, especially in Africa.

**Prevention of Malaria**

The most effective way to prevent malaria is through the selective use of insecticides that kill the malaria-transmitting mosquito. Two options are available for getting insecticides into the homes of those most at risk: indoor residual spraying (IRS) and insecticide treated nets (ITNs). USAID supports the use of both IRS and ITNs. The real challenge is delivery of the insecticide to where it can do the most good to protect young children and pregnant women and thus to save as many lives as possible. That is, getting insecticide into the dwelling by the most available and efficient means. Both bed nets and spraying are very effective if used correctly; the choice of which intervention to use is determined by local conditions and needs.

**Indoor Residual Spraying**

IRS is the organized, timely spraying of an insecticide on the inside walls of houses. IRS is designed to interrupt malaria transmission by killing adult female mosquitoes when they enter houses and rest on the walls after feeding, but before they can transmit the infection to another person. Twelve insecticides are approved by the WHO for indoor spraying, one of which is DDT.

USAID supports IRS programs in several countries, including Eritrea, Zambia, Mozambique, Kyrgyzstan, Liberia, Angola and Burundi.

IRS is best suited for areas with sufficient infrastructure to support the necessary logistics -- such as in South Africa -- or in urban settings when local transmission of malaria is well documented, and in refugee camps. IRS spraying programs are maintained successfully and effectively in some southern African countries, especially where large populations are exposed to unstable malaria.

But these areas do not represent the extremely rural hyper-endemic parts of Africa where most malaria deaths occur. The challenge of spraying is greater in Africa's remote areas because those hard-to-reach areas must be treated and re-treated often.

**ITNs**

Soaking bed nets with insecticides is extremely effective in protecting people from malaria. By consistently sleeping under a treated bed net, sickness from malaria will decrease by 45 percent, premature births will be reduced by 42 percent, and all-cause child mortality will be cut by 17 to 63 percent.

ITNs are deployed now in the desperately poor rural areas of countries in Africa, where malaria-related mortality is highest. Evidence documenting how the use of bednets effectively protects against malaria is based on Centers for Disease Control and Prevention (CDC) field trials supported by USAID.

**Free Nets to Those Most in Need**

USAID promotes targeting free or heavily subsidized ITNs for the most vulnerable populations (pregnant women and children under five years) and the poorest populations – thus ensuring economics are not a barrier to net ownership.

The long-term sustainability of ITNs depends upon both the targeted distribution of subsidized ITNs and expanding commercial market distribution systems. Thus USAID supports expanding commercial market distribution, and developing new technologies -- especially in the area of long-lasting ITNs, and the expansion of ITN production capacity. Recent evidence clearly demonstrates that the combination of commercial marketing and targeted subsidies produces household coverage equally distributed across the socio-economic profile – from the poorest to the wealthiest families.

We have witnessed considerable progress in expanding coverage with bed nets in the past several years. For example, net coverage in Malawi (nationwide) increased from 13 percent in 2000, to 60 percent in 2005. ITN coverage also increased from 11 percent to 43 percent in Senegal, from nine percent to 40 percent in Zambia, and from zero percent to 21 percent in Ghana.

According to the World Malaria Report, the number of ITNs distributed has increased 10-fold during the past 3 years in more than 14 African countries. Much of the success in increasing net coverage for the most vulnerable is attributable to linking it directly to antenatal care and/or child immunization services, or national child immunization campaigns. In all these cases, surveys show a significant proportion of the nets being used by the primary target groups of children under five and pregnant women. In Tanzania, 53 percent of children under five years of age and 42 percent of pregnant women were using nets in 2003.

Even more promising are new technologies that now provide long-lasting nets that remove the necessity for retreatment. The increasing availability of long-lasting insecticide treated nets (LLINs) which have an effective lifespan of about four years without the need for retreatment, will remove this requirement altogether. The advent of LLINs makes nets even more cost-effective that before and will certainly account for more lives saved.

**Commercial Partnerships to Build Sustainability**

ITNs can be delivered through a variety of channels – public sector, NGOs, community groups, and the commercial sector – and are readily added to existing services, such as antenatal services, or immunization programs. USAID employs innovative models for

the delivery of highly subsidized or free ITNs in collaboration with national malaria control programs in Ghana, Senegal and Zambia, as well as UNICEF, the United Kingdom Department for International Development (DfID), the International Federation of the Red Cross (IFRC), NGOs and private sector partners such as ExxonMobil. With UNICEF this involves delivery of subsidized ITNs linked to routine immunization; with the Red Cross, ITNs are provided at no cost as part of targeted measles campaigns, and with ExxonMobil, the nets are delivered via a heavily subsidized voucher program through antenatal clinics.

USAID is also in partnership with 13 major commercial firms (representing over 80 percent of the global capacity to produce and distribute ITNs) in a consortium called NetMark. NetMark is an innovative program to share the risks of developing ITN markets, to identify and reduce barriers to effective engagement of the commercial sector, and to create demand, thereby expanding the availability of affordable nets. In five African nations, the program has helped eliminate taxes and tariffs. We believe this successful cooperation with the commercial sector for insecticide-treated netting will serve as a model for future cooperation with the commercial sector in other parts of the world and with other health related products.

**Prompt and Effective Treatment**

Only a limited number of alternatives to failed drugs are available now. Given the fact that malaria predominantly affects the world's poorest nations, necessary economic incentives for development and production are troublingly scarce. As a consequence, in many malarious areas, a majority of the population does not have ready access to malaria treatment and those drugs that are available may be of substandard quality.

Currently the best treatment on the market for drug-resistant malaria is artemisinin combination therapy (ACT). Based on a traditional Chinese herb, ACTs are extremely effective, yet far more expensive than previous treatments.

The United States, through USAID, is playing a leading role in ACT roll-out. Since 1998, we have supported safety and efficacy testing of artemisinin combination treatment (ACT) in Africa. ACT is a three-day treatment made from the extract of Artemisia annua, or wormwood, a plant that until recently grew only in Vietnam and China. USAID is working with the Global Fund to Fight AIDS, Tuberculosis and Malaria to make funding available for ACTs, and we are working with 25 countries in Africa to complete the regulatory and public health legwork to roll-out ACTs. USAID also supports the transport, ordering and stocking of ACTs in rural clinics, trains health-care workers and educates parents on the treatment.

Since 2001, 40 countries, including 20 African nations, have switched from old drugs to ACT. An estimated 15 million malaria cases were treated with the drug in 2003, and demand for ACT will rise to 150 million treatments by 2007. But supply of this drug is limited. This shortfall will change later this year, when, because of a USAID – World

Health Organization (WHO) partnership with agricultural producers in Africa makes African-grown artemisinin readily available on the market.

In January, USAID supported the planting of 450 hectares of *Artemisia annua* in Kenya. This month, another 450 hectares of the life-saving plant are taking root in Tanzania under a similar program. Diversifying the location where the plant is grown will allow more drugs to be dispatched around the world faster. Because of the rich soil and warm climate, the African plant may produce much more extract than its Asian sister, treating far more cases, providing an additional 20-40 million pediatric treatments by the end of 2005.

USAID is presently working with 25 Global Fund recipient countries to prepare detailed plans for the introduction of ACT over the next year. In addition, USAID works directly with pharmaceutical companies to upgrade their ACT production capacity in order to increase the pool of companies manufacturing WHO approved ACTs. By 2006 we expect that worldwide supplies of ACTs will be in line with demand. In the interim, strategic targeting of ACTs will be required to ensure that those countries with high levels of drug resistance have adequate drug supplies.

USAID also works to document and address drug resistance. In the Mekong region in Asia, USAID is instrumental in documenting the extent of the drug-resistant problem in the region as well as studying the factors – such as poor drug use and poor drug quality – that contribute to the emergence and spread of resistance. Documentation of changes in drug resistance, quality and use will enhance the ability of countries to evaluate their national malaria drug policy and to introduce changes from a more informed perspective. This information is critical for focusing interventions on priority areas in order to preserve the effectiveness of current antimalarial drugs that are safe and affordable. A similar regional effort is underway in the Amazon region of South America.

**Prevention of Malaria in Pregnancy**

Each year, more than 30 million African women are at risk for Plasmodium falciparum malaria infection during pregnancy. Infection during pregnancy leads to anemia in the mother and the presence of parasites in the placenta. The resulting impairment of fetal nutrition contributing to low birth weight (LBW) is a leading cause of young infant deaths and fetal underdevelopment in Africa. The prevalence and intensity of malaria infection during pregnancy is higher in women who are HIV-infected. Women with HIV infection are more likely to have symptomatic infections and to have an increased risk for malaria-associated adverse birth outcomes.

WHO recommends intermittent preventive treatment (IPT) using the antimalarial drug, sulfadoxine-pyrimethamine (SP) as the preferred approach to reduce the adverse consequences of malaria during pregnancy. Since more than 70 percent of pregnant women in Africa attend antenatal clinics, provision of safe and effective antimalarial drugs in treatment doses are easily linked to antenatal clinic visits. The potential of IPT to attain high levels of program coverage, and its benefit in reducing maternal anemia and

LBW, makes it a preferred strategy in sub-Saharan Africa. In HIV-negative pregnant women, two doses of IPT provide adequate protection, but a minimum of three doses appears to be necessary in HIV positive women.

USAID played a key role in supporting the original studies in Africa that documented the efficacy of IPT in preventing the impact of malaria on both HIV positive and HIV negative pregnant women and their babies. Many countries have already changed their policies to incorporate IPT. Currently, through a coalition of partners, USAID is assisting ministries of health in about 10 African countries to implement IPT and distribute ITNs as part of a package of health interventions at the antenatal clinic level. Over the last year this technical assistance contributed significantly to revision of outdated policies in Senegal, Ghana, Rwanda, and Zambia, and to increased implementation of revised policies in the Democratic Republic of Congo, Tanzania, and Kenya.

Thank you.

**Testimony by Roger Bate, Ph.D**
**US Director, Africa Fighting Malaria**
**Resident Fellow, American Enterprise Institute**

**Testimony before Subcommittee on Federal Financial Management, Government Information, and International Security (FFM)**
**Committee on Homeland Security and Government Affairs**
**United States Senate**
**May 12, 2005**

## The Blind Hydra - USAID policy fails to control Malaria

**Summary**

Although several papers in academic journals have discussed the efficacy of individual malaria programs, and other publications have analyzed the functioning of the United States Agency for International Development, this is the first comprehensive analysis of the Agency's overall approach to malaria control. USAID is found wanting: its lack of transparency makes detailed economic assessments of performance impossible; its organizational structure and methods of information management hinder opportunities for collaboration with other donors and prevent necessary assessments of ongoing programs; it avoids accountability for program performance by deflecting responsibility onto contractors; it fails to condition funding for these contractors on relevant outcome measurements; it has influenced the construction of a system wherein the vast majority of funding for malaria either never leaves the United States or funds the employment of US citizens; it ensures continued Congressional support by maintaining key beltway contractors who lobby for increased funding; it spends less than five percent of its malaria budget purchasing actual life-saving interventions; and lastly, it bases its choice of malaria interventions on extraneous political consideration, not on best practice, unnecessarily costing lives.

USAID should take several positive steps to improve overall performance. It should increase its transparency. Such a move will instigate necessary upgrades in organization and data management, improve the Agency's capacity to work with other donors and allow external experts to contribute useful suggestions for performance improvements. It should ensure that programs have the necessary funding and scope to achieve success—a sustainable reduction in the malaria burden—and measure their progress with appropriate interim results. At present, USAID spreads its funds too thinly to run such robust programs. By focusing on fewer countries, USAID could provide tangible results, lowering criticism of its performance and establish best practice models for other countries to follow, saving more lives. Where its comparative advantage lies in providing technical assistance, it must coordinate with other agencies that provide actual medical interventions (bed nets, insecticides, drugs) in order to ensure a robust effort. Lastly, it must not inhibit countries from using interventions that its staff opposes for reasons other than effectiveness in combating malaria.

If USAID cannot do this, Congress should distribute USAID's malaria budget to another agency.

## I. INTRODUCTION

In 1997, the United States Agency for International Development (USAID) joined several major international development organizations, including the World Bank and the World Health Organization (WHO), to form the Africa Initiative for Malaria Control (AIM) (Brundtland 2002). At the time, malaria mortality rates in Southern and Eastern Africa had doubled from their 1980s levels, and concern was growing over the disease's increasing human and economic toll (WHO 2003). AIM intended to counter that rise by morphing itself into a global initiative known as Roll Back Malaria (RBM). RBM's goal of halving malaria mortality by 2010 marked an ambitious new effort to fight the disease, and the over 90 public and private agencies that subsequently joined the fight were optimistic about the prospects for alleviating the disease burden. (Brundtland 2002).

Fast forward to 2005, and the hope for progress has not been realized. Instead of moving towards a fifty percent reduction, deaths due to malaria have further increased, possibly by as much as 10 percent (Attaran 2004). Put simply, so far Roll Back Malaria has failed (*Lancet* 2005).

RBM's failure should be an embarrassment to its core members, WHO, UNICEF, and USAID among others. It has left a massive public health problem, one that claims over one million lives a year, unsolved. Although well intentioned international aid organizations have attempted to put a positive spin on RBM's lack of progress, donors are nevertheless faced with a vexing problem. Should they: continue investing resources in a losing battle? Commit even further now that the problem has worsened? Change tactics and maybe do more with current resources?

This paper analyzes the dilemma from the perspective of the US government, with particular emphasis on the role of USAID in efforts to battle malaria. There have been serious discussions in Washington about increasing malaria funding over and above the nearly five-fold increase from just under $14 million in 1998 to $80 million in 2004 (USAID 2004). It is, therefore, absolutely crucial that those funds be allocated correctly. As America's foreign aid agency and the prime administrator of US global health funding, USAID would be the obvious recipient of any future increases in the anti-malaria campaign. But is it the best choice?

To determine how the US should continue its efforts against malaria, and the role USAID should have in those efforts, this paper analyzes the Agency's past performance against the disease. Based on that assessment, as well as a close look at its current orientation, we forecast how well it will spend future, possibly increased, malaria funds. We then make a series of recommendations for how the Agency, and the US Government as a whole should proceed in its laudable efforts to fight malaria.

Though the focus here is USAID's malaria programs, many of the weaknesses highlighted apply to other aspects of the agency. Failures in the fight against malaria are a microcosm of more general Agency shortcomings. Thus, the conclusions drawn by the evidence from malaria programs should interest anyone concerned with American foreign aid.

## II. UNDER THE FEVER TREE

*The Scope of the Problem*
Describing the enormity of the worldwide malaria problem requires no hyperbole. According to the most recent estimates (Snow et. al. 2005), approximately 2.2 billion people are currently at risk of contracting the disease. Malaria causes at least one million deaths annually, and approximately 515 million cases of acute illness.

The malaria burden falls heaviest on Africa, where over ninety percent of the world's malaria deaths occur (WHO 2003). However, current research suggests that previous WHO estimates significantly underestimated malaria incidence outside of Africa, and that perhaps a quarter of all malaria cases occur in other regions (Korenromp 2005; Snow et. al. 2005).

Malaria preys most heavily upon pregnant women and young children. In Africa alone it kills a young child every thirty seconds, and often leaves survivors with significant brain damage and cognitive impairments. The disease debilitates those malaria sufferers that escape death and long term impairment for at least a week, and sometimes longer.

Malaria, through its harm to labor productivity and educational development, carries a high economic cost as well A recent paper in the *American Journal Of Tropical Medicine* estimated that malaria independently hindered economic growth in endemic countries by 1.3% per person per year, whereas no such correlation was observed for other tropical diseases (Sachs and Gallup 2001). The total annual cost of the disease in Africa could be as much as $12 billion. Furthermore, within endemic countries, the poor suffer at disproportionately high rates. A survey in Tanzania revealed that under-five mortality from malaria was 39% higher for the poorest citizens than the wealthiest, and a similar study in Zambia estimated higher prevalence rates among the most destitute (WHO 2003).

Though malaria currently affects predominantly tropical areas, which are also less developed economically, its reach has not always been so limited. Many temperate regions, including the United States contain the mosquito vectors capable of carrying malaria. Increased international trade and travel make these areas vulnerable to a recurrence. Though miniscule by comparison to malarious countries, the US has seen a steady increase in localized malaria outbreaks, due mainly to tourists returning and immigrants arriving from endemic areas.[1]

Despite its devastating toll, malaria remains a thoroughly preventable and curable disease. Spraying tiny amounts of insecticide on the inside walls of dwellings—known as indoor residual spraying (IRS)—is highly effective at repelling and killing the mosquitoes that transmit the disease. Insecticide treated bednets (ITNs) similarly provide a barrier between potential victims and mosquitoes during the night, which is the vector's most active period. If one does become infected, several drugs can cure the disease. Most effective, and least susceptible to resistant strains, are artemisinin-based

[1] For a detailed chronicle of malaria incidence in the US, see Roberts et al (forthcoming).

combination therapies (ACTs), which are derived from an ancient Chinese herbal remedy.

*The Battle*

Malaria is caused by the *Plasmodium* parasite and transmitted by female mosquitoes of the genus *Anopheles*. The connection between mosquitoes and malaria was not always known, however, and many believed that the disease was caused by the moisture loving *Acacia Xanthophloea* (dubbed the "Fever Tree") or by bad swamp air (Van Wyck 1984; Harrison 1978). Once the role of the mosquito was discovered in 1898, malaria control efforts focused on habitat reduction, known as environmental vector control. Chemical control methods, involving the use of available insecticides and larvicides, were also employed. Though advances in vector control and treatment with quinine yielded moderate success in some places, post-World War Two efforts that utilized the newly synthesized insecticide known as DDT affected the most dramatic reductions in malaria yet witnessed.

DDT was first used in 1939 as an agricultural insecticide in Switzerland, but its public health applications quickly became known after the Allies used it to control typhus epidemics during the war. Its subsequent employment in malaria control brought astounding success. Through massive DDT spraying programs, Sri Lanka (then called Ceylon) reduced its malaria cases from three million annually to 29 in less than twenty years (Harrison 1978). Complete eradication was quickly achieved in many areas, including most of Brazil, Southern Europe, and the United States. India and parts of Southern Africa also experienced dramatic reductions. The prevailing strategy , which relied primarily on the use of DDT spraying to combat malaria, required careful planning, a highly organized and well trained staff of sprayers, and constant vigilance against signs of recurrence.

Buoyed by the successful application of DDT to malaria control, in 1955 the WHO launched its Global Malaria Eradication Campaign. Supported by $1.2 billion in US bilateral assistance (a large amount of money today and a truly vast sum then), given from 1950-72, the WHO's campaign was a decisive endorsement of the unilateral 'vertical' approach to malaria control advocated most strongly by American epidemiologists like Fred Soper (Tren and Bate 2000).

But by the latter part of the 1960s, malaria began to creep back in countries that had used the vertical approach to affect dramatic reductions. Many countries, notably India, were simply unable to maintain the perpetual commitment to a highly organized spray program required for success (Harrison 1978). In addition, many parts of Africa, where poor infrastructure made it unsuitable for massive spraying campaigns, were so severely malarious that the region was deemed too daunting a task for eradication, and bypassed altogether (Nchinda 1998).

By 1969, after a formal reexamination of the malaria eradication strategy, the WHO endorsed a series of recommendations that would eventually lead to the phasing out of the vertical eradication approach (WHO 1969). The new strategy, which came to dominate the major global health agencies, emerged due to growing concern that a strictly one-dimensional approach (massive spraying with DDT) was inadequate to tackle

the malaria problem. It therefore emphasized the importance of strengthening basic health services, dealing with each region's unique socioeconomic and cultural situations, and focusing on malaria treatment, as opposed to strictly prevention. Known as the 'horizontal' approach, the new paradigm stressed control and containment of malaria, as opposed to complete eradication.

Despite the beginnings of this strategic reorientation, and growing concern over resistance to DDT and possible harmful effects from its use, as described in Rachel Carson's influential *Silent Spring*, vector control programs would remain an integral component of malaria campaigns for the next decade. Expert testimony at WHO meetings warned that no evidence of DDT's toxicity had ever been established and that "limiting the availability or use of DDT for the control of malaria and other vector-borne diseases in developing countries could lead to a public health disaster" (WHO 1970). A WHO technical report issued in 1971 similarly recognized DDT as the "major single factor that made the concept of time-limited eradication possible" and recommended the continued availability of insecticides, "particularly DDT" (WHO 1971). Even the US delegate, responding to concerns that the country's impending ban on DDT would harm developing nations' malaria control efforts, pledged not to limit its availability for public health purposes (WHO 1971, 386).

In practice, however, DDT and vector control methods, as well as the goal of eradication, would eventually lose out to the horizontal control and treatment approach. A dwindling supply of DDT had precipitated a steep price increase, prompting both the Nepalese and Indonesian delegates at the WHO to request purchasing assistance from wealthy nations on behalf of all developing countries (WHO 1975). No such assistance was forthcoming. In reality, the die had already been cast against vector control methods, and 1978 simply ushered in the formal reorientation of global malaria control to a horizontal approach. Despite subsequent protests from the Burmese and Comoros delegation that the WHO should not lose focus on vector control (WHO 1980), and the Mexican and Spanish delegations' insistence that eradication remain the goal of malaria control (WHO 1978, 491), the WHO and its key supporters (foremost among them USAID) disowned the methodologies that had been used to eradicate malaria in the developed world during the post-war era.

The WHO's actions echoed far beyond Geneva, as the new horizontal programmatic approach would form the basis of nearly every bilateral and multilateral malaria program. Vector control began to disappear from the vocabulary of public health officials. Dr. Jose Najera, Director of the Malaria Action Program, explained the new tactics best: "[Malaria control goals] would be accomplished mainly by the use of drugs for chemotherapy" (WHO 1983). Significantly, with the integration of malaria control into the primary health system established as the new paradigm, the disease nearly dropped from the radar of international health altogether. Indeed, with malaria safely eliminated from donor nations, Western countries seemed less interested in funding malaria specific activities, and both bilateral and multilateral interest funding for parasitic diseases dropped off during the seventies (WHO 1978, 488).

Renewed international interest in malaria did not materialize until the nineties[2]. An international treaty intent on banning persistent organic pollutants (POPs)[3] sparked heated debate among those concerned that it would sound the final death knell of the use of vector control in malaria control. Despite initially fierce opposition from environmental groups, health officials opposed to the proposed DDT ban were able to include an exemption for public health applications. Yet aside from slight alterations in rhetoric, donor agencies like USAID continued largely on the same horizontally integrated course with regards to malaria, and continued to deemphasize vector control and DDT.

Aside from the attention generated by the POPs treaty, the launch of the international Roll Back Malaria campaign in 1998 marked a revived international concern over the persistence of the malaria burden. Unable to ignore the rising malaria mortality rates battering developing countries, due in large part to increased chloroquine resistance, the WHO, UNICEF, and USAID, among others, spearheaded this new, ambitious effort to marshal resources and halve the global malaria burden by 2010. Though it offered a new organizational framework to deal with the malaria problem, RBM offered little innovation in strategy. Key objectives remained treatment oriented, with the significant addition of prevention through ITNs. ITNs, which were much more palatable to influential environmental groups and had a proven, if somewhat limited, effectiveness, had become increasingly popular during the 1990s among donors looking for a practical malaria control solution that could be integrated into a horizontal approach and would not generate the same controversy as vector control. Setting the goal that 60 percent of those at risk for malaria across the globe would be covered with these nets by 2010, RBM's architects—including USAID—hoped that significant ITN usage would be both realistic to implement and a major contributor to saving lives.

In addition to setting a new priority on malaria, RBM offered a formal confirmation of the consensus approach used by Western donors to coordinate and dominate international health strategies. As a partnership initiative, however, RBM merely cemented a strategy that key bilateral donors, such as USAID, had been espousing for years: community-based malaria programs integrated into the more general concerns of strengthening primary health care systems, building capacity, and developing sound management and drug policies. The latter had become especially crucial, as the drug of choice for the last half century, chloroquine, had become nearly useless due to high resistance, and the development of ACTs offered new hope for effective drug treatments.

Since its launch, RBM's progress in the fight against malaria has been disappointing. Deaths continue to rise, and a doubling of international resource commitment to the problem has proven ineffectual. Prospects for meeting the RBM goals and objectives by 2010 are dim at best. However, malaria remains a thoroughly preventable and treatable disease, and the means to make significant strides in eliminating its burden are available

[2] WHO Resolutions in 1989 and 1993 regarding malaria served mainly to reaffirm the malaria control strategy agreed upon in the late 1970s.

[3] The Stockholm Convention of May 23rd 2001 An agreement on persistent organic pollutants was first adopted by the UNEP Governing Council in May 1995 and endorsed by the WHO in 1997. It was finally signed by 91 countries and the European Commission on May 23rd 2001. See www.pops.int for the treaty's full text.

today. The establishment in 2002 of the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), a grant-making organization that serves as an international clearinghouse for direct disbursements of donated funds, offers a hopeful avenue for progress if monies are allocated better then in the recent past. In addition, bilateral organizations like USAID have similarly increased their resource commitments to battling the disease. In the next section of the paper, we will provide background on what USAID is, and how it has spent these funds.

## III. USAID

*Overview*

In 1961, Congress passed the Foreign Assistance Act, thereby creating a single agency, known as the United States Agency for International Development (USAID), to serve multiple development functions previously under the domain of separate organizations. The orientation of the new agency would be, as President Kennedy put it, "To prevent the social injustice and economic chaos upon which subversion and revolt feed".[4] The US thus hoped to conflate development aid and national security interests and use USAID as a 'soft' weapon in the Cold War.

A good deal of literature has chronicled the evolution of USAID through the Vietnam War, the humanitarian minded reforms of the 1970s and the reassertions of Cold War primacy characteristic of the Reagan era (Lebovic 1988; Ruttan 1996.). Despite attempts to divorce the Agency from national security considerations during the Carter administration, USAID remained more or less a tool to achieve US political objectives abroad throughout this time period (Ruttan 1996).

Delivery mechanisms of foreign aid did undergo some changes during the Cold War. The reforms of 1973, which established a "basic human needs" criterion in USAID's development mission, also marked a shift towards direct budgetary assistance to developing country governments. Interestingly, despite rhetoric suggesting a move away from such promotion of the public sector, the Reagan administration did little to change this model (Eberstadt 1988; Berrios 2000). Instead, it deemphasized the 'human needs' portion of USAID's mission—with the important exception of health care activities, which grew under Reagan—and reemphasized security related issues (Berrios 2000).

With the end of the Cold War arriving at the beginning of George H.W. Bush's first term, USAID faced a transitional period that led to major changes in how it implemented foreign aid. Since USAID's existence was largely predicated on the crucial role of foreign development assistance in winning the Cold War and protecting US security interests, many in Congress saw little further need for the Agency. Foreign aid spending during the 1990s steadily declined, and conservative Congressmen, foremost among them being Senator Jesse Helms (chairman of the Foreign Relations Committee) called for USAID's complete elimination. Helms, who famously described foreign aid as "throwing money down foreign rat holes", and his colleagues accepted a compromise: make USAID smaller, hold it accountable to the State Department and introduce private sector reforms (Berrios 2000).

The subsequent reforms enacted at USAID during the Clinton administration had the most immediate impact on the Agency's current malaria program, and indeed, on most of its development assistance. As part of the initiative to streamline government through privatization, and make the Agency acceptable to Congress, USAID became largely a contracting organization during the early part of the 1990s. Accordingly, USAID closed 29 missions between 1994 and 1998 and began the now dominant practice of targeting

[4] Remarks at the Eighth National Conference on International Economic and Social Development. June 16, 1961, Shoreham Hotel, Washington DC. http://www.jfklink.com/speeches/jfk/publicpapers/1961/jfk244_61.html

private US commercial firms and NGOs to carry out development work (Berrios 2000). From a political economy perspective, USAID supplanted its bygone national security constituency with an influential interest group of commercial supporters in order to ensure its continued existence. Unable to lobby for funds in Congress itself, the Agency actively beseeches its 'partners' to push for greater funding.

*The Contracting Dilemma*

Though USAID is not unique among government agencies in achieving its objectives primarily through contracting, it has drawn a great deal of criticism for its particular way of doing business. One major criticism is the Agency's preference for large, US based organizations with which it has long relationships. An analysis by Ruben Berrios in 2000 found that the contracting market structure was segmented and largely uncompetitive. Since a significant part of the supposed advantage of contracting lies in the competition for contracts, drawing from only a small pool of organizations seriously hampers the Agency and increases the possibility of rent-seeking. Berrios found that for-profit firms receive the most money from USAID, the geographic distribution of all contractors skews heavily towards the Washington DC area, and that some of the firms rely exclusively on USAID contracts to stay in business.

In line with criticisms that the USAID contracting process is tilted in favor of insiders, observers have noted that employees of USAID tend to move between agency and contracting jobs with great frequency (Stavrakis 1996; Berrios 2000; Dobbs 2001). The Research Triangle Institute, Chemonics and the Academy for Education Development are but a few of many examples of contractors actively courting former USAID employees (Stavrakis 1996; Dobbs 2001). Inside knowledge of the Agency is clearly valuable for procurement purposes. Indeed, a quick search of any international development job board shows that previous experience procuring USAID funding is a high demand skill.

*U.S. Preference*

Many other criticisms of the agency persist. Berg (1997) points out that consulting work typically performed by contractors, often disguised in the preferred euphemism of 'technical assistance', undermines the very local institutions and capacity that the aid is trying to build. Berrios (2000) notes that contractors are paid at US rates for work local organizations can do much more cheaply. Indeed, for years, USAID justified its own existence by stressing that foreign aid money benefited domestic economic interests through contracts to US organizations and commodity import programs for US products.

Although exact figures are unclear, USAID spends a significant percentage of international development funds on domestic goods and services. Data from USAID's Buy American Report, the best available assessment, indicates that over the last decade, between 70 and 80 percent of funding appropriations were directed to US sources (Tarnoff and Nowels 2004).[5] In gross terms, the Business Alliance for International

[5] It is unclear what allocations are included in this calculation, and even the Agency's budget office admits that data are incomplete. According to a senior budget officer at USAID, the Agency has ceased to even actively gather data on procurement of US and non-US sourced goods and services in recent years. He explains that gathering the data is difficult, and because the numbers have remained steady for the last decade (between 70 and 80 percent of procurement is for US-sourced goods and services), there is little desire to continually measure this statistic.

Economic Development estimated in 1996 that foreign aid sustained 200,000 domestic jobs.

USAID is not solely responsible for choosing mainly US based organizations to carry out development work. Under the act that created USAID in 1961, Congress included special guidelines to ensure that Agency funds financed goods and services of American origin.[6] The inclusion of these 'Buy American' provisions remains a source of contention for many aid specialists associated with USAID. However, the Agency relies on these provisions both to ensure that its constituency of USAID-dependent contractors continues to lobby for increased funding from Congress, and to appease Agency opponents in Congress with domestic interest arguments. As a result of the benefits USAID accrues by complying these provisions, USAID has refrained from advocating for changes to the Buy American guidelines, nor has it aggressively utilized the exceptions to these rules provided by law.[7]

Reluctance to challenge the status quo on use of American goods and services is typified by the behavior of former USAID Administrator Brian Atwood. After leaving the Agency, Atwood told the *Washington Post* that the Buy American procurement laws were "the biggest headache I had to deal with" at the Agency (Dobbs 2001). Yet during Atwood's tenure, in all of his appearances before Congress and statements to the press concerning his initiative to reform USAID (including its procurement policies), he made no mention of his Buy American migraine. In fact, in 1995 he boasted to a Senate subcommittee that he "introduced reforms to open up USAID's procurement to the best expertise in America", but omitted any reference to non-American sources.[8] During that same testimony, he blatantly endorsed the Buy-American policy, stating, "Foreign assistance is far from charity, it is an investment in American jobs, American business."[9]

Atwood's actions are unsurprising. The political capital bought with USAID's approval of the Buy American rules continues to override concerns over the tying of aid to US interests. Unlike President's Emergency Plan for AIDS Relief (PEPFAR) head Randall

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[6] These special guidelines served as extensions to the Buy American Act, a piece of legislation originally enacted in 1933 with the intent to give domestic producers preference in government purchases. The specific requirements of the Act have been updated periodically (Luckey 2003).

[7] There are three general conditions under which USAID contracting officers may bypass the Buy American restrictions on procurement of goods and services: 1)) If the required article is unavailable; 2) If unforeseen circumstances, such as emergency situations, necessitate non-US procurement; 3) If "it is necessary to promote efficiency in the use of United States foreign assistance resources, including to avoid impairment of foreign assistance objectives";
In addition, procurement may be opened to 'less developed countries' (geographic code 941) under these criteria: 1) when cost from the US is fifty percent more or higher 2) an "acute shortage" for the commodity exists in the US but not elsewhere 3) Persuasive political considerations 4) Procurement in the 'cooperating country' (i.e. the place where the good or service is used) would best promote the foreign assistance objectives 5) Other circumstances critical to projects success.
Finally, federal rules prohibit USAID from procuring goods and services from "foreign policy restricted countries". As of April 1, 2004, these include Cuba, Iran, Iraq, Laos, Libya, North Korea and Syria (China was removed in 2002).
(U.S Government. 2002[last revised]. "Chapter II: Agency for International Development" *Code of Federal Regulations,* Title 22, Volume 1, Parts 1 to 299)

[8] Senate Foreign Relations Subcommittee on International Relations, *Reorganization of US Foreign Affairs Agencies*, 104th Cong., 1st sess., 1995.

[9] Senate Foreign Relations Subcomittee, *Reorganization*.

Tobias, who bluntly announced before Congress his intention to waive Buy American requirements for anti-retroviral treatment[10], no USAID official has similarly conveyed to Congress its desire to sidestep these rules.

*Transparency and Criticism*
A final, but significant, criticism of USAID contracting policy concerns the transparency of the process. USAID policy forbids the disclosure of "proprietary" information related to its contracts, which keeps the financial details of the bidding process—including the identity of non-winning bidders, specific subcontracting arrangements, and even general budget documents—hidden from public view. In addition to such proprietary information, general facts about Agency policies and procedures are likewise off-limits to the general public. In response to a request for information regarding evaluation procedures, a USAID-Kenya employee explained the rules: "I'm unable to respond to your queries due to strict Agency policy of sharing USAID information with people or sources we are NOT familiar with".[11]

In addition to its internal informational controls, USAID disapproves of contractors who disagree with or criticize the Agency. Stavrakis (1996) notes that the Health Enterprise Institute (HEI), which depended solely on USAID for funding, ceased operations because "HEI bumped heads with AID and went out of business." For fear of losing future contracts, few employees of organizations receiving funding from USAID were willing to go on the record with their criticisms when interviewed by the authors. The same is true for USAID employees, who have been known to have career paths derailed after publicly criticizing their employer.[12] Thus, it continues to be extremely difficult for outsiders to know what USAID does, let alone offer suggestions for improvement.

*The importance of USAID in Global Health Policy*
Before examining how USAID uses its malaria funding, it is important to briefly note why the significance of its actions exceed the annual sum that Congress earmarks for malaria activities. The 'multiplier effect' of USAID policy and programming decisions can often be more substantial than the Agency's direct action.

Like many American agencies, USAID is a trendsetter. Though its leadership role is more subtle than in the days when US funding and expertise dominated the WHO's malaria eradication campaign, American contributions still constitute a quarter of the organization's budget (U.S. Dept of State 2003). Even more importantly, as the world's most powerful nation, US input continues to be the single most important unilateral influence on global health policy (Kickbusch 2002). Former WHO employee and current head of the Division of Global Health at Yale University, Ilona Kickbusch, claims that

[10] Senate Appropriations Subcommittee on Foreign Operations, *HIV-AIDS*, 108th Cong, 2nd sess., May 18, 2004.
[11] Personal correspondence, Tuesday, April 5, 2004.
[12] A recent example involves former Chief of Travel and Transportation Shirl Hendley, who raised the alarm in 2002 that USAID travel practices violated federal rules. After being ignored by top USAID officials, who benefited from the rules violations, she refused to stay quiet. She was subsequently reassigned because, according to her reassignment letter, "you have chosen to do what you believe is correct, even if it contradicts the instructions you have been given." An investigation spearheaded by Senator Charles Grassley (R-IA) vindicated Hendley and strongly rebuked top AID officials, including Administrator Andrew Natsios and now-retired Inspector General Everett Mosley.

US support for global health initiatives is so crucial that "many international documents read as if they have been written for members of the U.S. Congress rather than for the broader global health community" (134). As the development arm of the US government, whose financial and political support is crucial for global health programs, USAID thus has considerable input in designing policies and strategies for such initiatives.[13] In malaria policy, USAID was a key player in the design of the present RBM initiative and continues to exert its influence in policy formulation. Thus, strategic and operational improvements undertaken at USAID will upgrade the whole RBM movement.

In addition to its impact on global health agencies, USAID acts as a role model for private lending. Private donors to international causes—whose giving triples official US government assistance—look to USAID as the arbiter of what programs and interventions are acceptable to fund. Corporations, who value the good publicity generated from their charitable contributions, are wary of crossing swords with official US development policy. ExxonMobil, for instance, explicitly endorses RBM and funnels its $1.5 million contribution to the battle against malaria through USAID-affiliated ITN programs. Thus, the path that USAID chooses in its efforts to combat malaria has far greater consequences than its Congressional earmark.[14]

[13] Fear that the US will withdraw support for international health efforts over policy disagreements are grounded in reality. The US pulled $34 million from the UN Population Fund and redirected it to USAID after a dispute over proposed spending restrictions for abortions and abortion rights (Kickbusch 2002).
[14] See Congressional testimony by Roger Bate for more detail on this issue (http://wwwc.house.gov/international_relations/108/bat091404.htm)

## IV. SAVING LIVES, ONE CONSULTANT AT A TIME

The following section describes the organization, composition and results of USAID's malaria funding. It first bears noting that obtaining this information proved extremely challenging. Part of the difficulty stems from the Agency's ignorance of its fractured and disorganized malaria programs. The biggest obstacle, however, is USAID's unwillingness to share information with outsiders. The Agency's transparency deficiency is evident not only in its refusal to release details of the contracts it uses to allocate its $80 million malaria endowment, but also in the vague and ambiguous information it does provide. USAID's secretive behavior over information unrelated to national security leaves a strong impression that opacity is its intention.

A further complication attendant in researching USAID uses of funding is the Agency's well deserved reputation for skirting established regulatory guidelines and exploiting exemptions to Federal Acquisition Regulation (FAR) guidelines to its advantage. A veteran Department of Defense employee who came to work at USAID confided that he was "shocked" by the manner in which Agency employees used the FAR's emergency exceptions to avoid proper procedure in cases that clearly did not warrant special treatment. The lack of continuity between government policy and Agency practice is troublesome and difficult to elucidate in an atmosphere where employees do not feel comfortable openly criticizing the organization's actions.

Finally, some of the information gathered here came as a result of Congressional pressure on USAID to explain where its malaria money is being spent. The pressure began in February 2004 when Senators Judd Gregg and Russ Feingold, reacting to articles in the British medical journal *Lancet*[15] and the Wall Street Journal[16], called for an investigation into USAID's malaria funding upon learning that the Agency bucked its own policies by declining to back effectual drugs (i.e ACTs). In October, two Congressional hearings later, now retired assistant Administrator Anne Peterson was embarrassed by Senator Sam Brownback when she proved unable to account for how USAID spent the $80 million it received for malaria in 2004.[17]

As a result of the efforts of independent scientists and organizations, and the subsequent interest demonstrated by Congress, in December of 2004 USAID distributed, to those who had made inquiries, the most comprehensive breakdown to date of its malaria allocations.[18] The report, titled "USAID Malaria Programs 2004", offers only short, vague descriptions of line item activities, and does not identify the 'partners' (contractors and grantees) responsible for implementing enumerated programs. It also contains numerous errors and omissions. Most disturbingly, funding breakdowns contain mathematical errors. The stated subtotals do not sum to the total figure given for malaria spending.

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[15] Attaran et al, 2004. "Viewpoint: WHO, the Global Fund, and medical malpractice in malaria treatment", *The Lancet*, January 17, 363(9404):237.

[16] 2004. "Review and Outlook: WHO's Bad Medicine," *Wall Street Journal*, January 21.

[17] Testimony from that hearing can be found at http://foreign.senate.gov/hearings/2004/hrg041006p.html

[18] The report in question has not been made public, nor is it likely to be publicized any time soon.

***A Blind Hydra: The Organization and Process of USAID Funding***

The fractured and confusing organization of USAID's malaria efforts constitutes a key obstacle to focused and effective programming. USAID manages resource constraints by diffusing funds thinly across numerous countries, which hampers efforts to make significant strides in any one place. In addition, program structures skew heavily towards the near exclusive involvement of large US based NGOs and contractors, which leaves little hope for the sustainable outcomes and the building of local capacity that USAID claims to support. Finally, USAID sustains and compounds problems of disorganization by its lack of transparency.

*How USAID Receives and Distributes Funds Internally*

Each year, Congress earmarks a specific sum for USAID to spend on malaria. Reflecting greater concern with rising malaria mortality rates, that sum has increased from nearly $14 million in 1998 to $80 million in 2004, and now represents approximately six percent of the Agency's total 2004 budget request for Child Survival and Health (CSH) Programs[19]. USAID officials allocate funds to the central office and individual country and regional bureaus (see table 1 for funding breakdowns). Funds diverted to the central office in Washington, known as the global bureau, are ostensibly for activities beyond the scope of specific countries and for which individual bureaus have no incentive to invest. These include research, such as the $7,260,000 spent on malaria vaccine development in 2004, transnational policy reform, such as working on continental barriers to pharmaceutical imports, and provision of Washington-based 'backstoppers' in support of field programs.

**Table 1**

USAID Malaria Program Funding 2004 (in thousand $US)[20]

| **Region** | **Funding** | **Average Per Country/Regional office** |
|---|---|---|
| Africa | 40,710 | 1,800 |
| Asia Near East | 5550 | 925 |
| Europe and Eurasia | 1,000 | 1,000 |
| Latin America and Caribbean | 4,120 | 687 |
| **Total** | **51,380** | **1,500** |
| | | |
| **Bureau of Global Health** | **Funding** | |
| Global Leadership | 5,874 | n/a |
| Support to Field | 13,707 | n/a |
| Research | 10,577 | n/a |
| **Total** | **30,160** | n/a |
| | | |
| **Agency Total** | **(*SIC*) 79,530** | n/a |

[19] It is unclear whether USAID accounts for all its malaria funds in the CSH category

[20] The source of this information is "USAID Malaria Programs 2004". The report's mistakes in tabulation, inconsistencies in accounting methodology and vague descriptions made it impossible for us to calculate exact figures. Indeed, stated country and regional totals do not sum to corresponding subtotals, and neither method of calculation (summing stated country and regional totals or summing stated subtotals) yields a total figure equal to the stated $79,530,000. In addition to basic arithmetic weaknesses, the report omitted a monetary value for the procurement of bednets and medicine in Uganda and failed to specify which anti-malarial medication was purchased in Uganda and the DRC. Thus, numbers stated here are best approximations from flawed data.

**1All numbers are reproduced directly from "USAID Malaria Programs 2004". Arithmatic mistakes are preserved from the original, hence column sums do not equal Agency Total.**

The rest of the money goes to regional bureaus, which divide it between individual country missions. In 2004, Africa received the most malaria funding, with a total of $40,710,000. A small percentage of those funds go to regional offices (e.g. the African regional bureau, the West African region etc.), which are supposed to coordinate and strengthen regional programs, and occasionally operate in countries that do not house a USAID mission (e.g. Burkina Faso). USAID allocates funds to countries and regions after a discussion and negotiation process, in which each mission lobbies for funding in accordance with its stated strategic goals.

The distribution of funding by country breaks up rather evenly. In Africa, where malaria money is divided between 20 countries and 3 regional offices, funding for both averages $1.8 million.[21] For all the individual country and regional offices across the globe, the average allotment is an even smaller $1.5 million. Such a thin-but-wide disbursement strategy is highly dubious. It limits program options within each country and prevents large investments in successful programs. Diffuse funding does however support a large number of missions, and their well compensated staff, and gives a superficial indication of USAID's global pervasiveness with regard to malaria control.

*Methods of Funding*

After securing its annual funding, each mission (i.e. USAID country field office) must then budget its malaria monies. One option is to buy into existing contracts managed by the central USAID office. These contracts, known as Indefinite Quantity Contracts (IQCs), obligate the contractor to perform a specific scope of work for the global bureau in Washington, but also include a mechanism for individual country offices to purchase services[22].

Missions may also negotiate directly with eligible agencies. Such direct bilateral mechanisms are becoming increasingly popular with USAID missions that prefer the flexibility to set their own guidelines. Due to high management costs and personnel shortages at many missions, missions generally reserve bilateral contracts for projects with longer life spans, and buy-ins used for short term needs.

When a country, regional or global bureau negotiates funding with an outside agency, it must follow reasonably standard guidelines. Three types of funding agreements for these

[21] For the 23 African country and regional offices, mean=$1,791,739, Standard Deviation=$877,820, and median=$1,800,000.

[22] The initial contract specifies a minimum sum that USAID will purchase from the partner, a best guess of how much 'incremental funding' missions are expected to add, and a ceiling for such funding additions. Since buy-ins may potentially double or triple the value of a contract, these mechanisms are major incentives for contractors. From the perspective of missions, buying into IQCs carries the advantage of reducing the transaction and management costs associated with negotiating and overseeing new contracts. Because USAID does not release contracting details, it's impossible to determine exactly what percentage of these contracts are composed of country buy-ins. USAID staffers consulted for this article estimated figures ranging from 25 to 75 percent, though all note substantial heterogeneity.

transactions exist: grants, contracts, and cooperative agreements (CAs).[23] These three vary according to their level of specificity. Grants are made to an organization for a specific purpose and activity. They are the least prevalent funding mechanism. Contracts are more popular than grants and are generally also used for specific activities. These may be procurement related—as in a deal to buy a certain number of condoms from a producer—but are more often for a particular service, such as consulting with a local health ministry on a particular drug policy issue. Finally, the most pervasive type of agreement, CAs, are employed when USAID has specified a general area of work needed in a particular location(s), but not the intricacies of how the work will be undertaken.[24]

The types of programs funded under these three mechanisms can be further divided into two broad, permeable categories[25]: 1) direct Private Voluntary Organization (PVO) programs and 2) global technical projects[26]. The first consists of grants and contracts awarded to PVOs—non-profit organizations based almost exclusively in the US[27]—for various field projects. These are usually funded through specific contracts or grants, often with a specific mission. PVO programs, however, comprised only 24% of total USAID spending in 2003 (USAID 2005a).[28] USAID funnels much of the PVO award money to a few large agencies, such as AED and MSH.

The other general type of programming–global technical projects—usually involves more generalized work centered on cooperation with national and district level governments and government agencies. These programs aim to improve policies related to malaria

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[23] Acronyms at USAID can be quite confusing. The abbreviation 'CA' can refer either to a Cooperative Agreement, or to the partner in such a contract, known as a Cooperative Agency.

[24] Adding to the confusion are the means by which these agreements are procured. In one scenario, the relevant bureau issues a Request for Proposal (RFP), in which it specifies precisely what work it wants accomplished—and usually how it should be done—and judges the subsequent proposal submission according to several criteria. The winner of the competition generally receives a contract to provide what it promised in the proposal.

Alternatively, a bureau might issue a Request for Assistance (RFA) in which a particular problem or challenge is posed, and competing organizations propose a program that will provide a potential solution. Winners of RFAs can receive contracts or CAs, depending on the nature of the problem and solution. Finally, some funding agreements arise from unsolicited proposals. These proposals generally arise as a response to areas of need emphasized in each bureau's annual program statement and are not subject to the same rules of competition.

In addition, to these details, each contracting agreement must conform to a specific type and structure specified by the FAR. See Berrios (2000) for a comprehensive overview of cost structures, contract types and negotiation and competition rules used by USAID.

[25] Research activities, which consume 10.5 million—or 13 percent—of USAID's malaria budget are not included in this analysis.

[26] The categories 'Global Technical Project'—which refer to projects primarily involving consultations with national health bureaus—and 'Direct PVO programs'—which are generally field operations implemented directly by a PVO—are general categories. USAID does not always officially classify its programs according to these criteria, and does not keep official statistics on funding levels for either. Assertions made in this paper concerning relative funding levels for each category are based on consultations with USAID employees and reasonable inference from line item descriptions in "USAID Malaria Program 2004."

[27] As of February, 2005, USAID had 516 registered US PVOs, and 58 international PVOs. For most grant competitions, only US PVOs are eligible. However, international PVOs may be eligible as sub-grantees on a particular project.

[28] By law, USAID must fund PVOs at least the equivalent of 1995 levels, which constituted 15 percent of the agency's budget (GAO 2002: 7)

control activities and strengthen health and health management systems. Funded by either contracts or CAs—usually the latter—such programs typically consist of sending US consultants to advise health ministries on ways to implement better drug policies, improve human resources, increase efficiency through better management. Occasionally consultants oversee specific health projects and train selected workers. Depending on the activity, PVOs may execute global technical projects, as well.

*Organizational Problems: Data and Monitoring*
Data on USAID development contracts and projects is scant. According to a US General Accountability Office (2002) report, the Agency simply does not bother gathering such information: "USAID does not collect financial data that would allow a detailed funding analysis for any specific type of nongovernmental organizations except PVOs" (7). In addition, the report found more general accounting problems contributing to the information lapse: "The Agency's data on its use of PVOs and NGOs were not complete due to the disparate accounting systems and limitations in its data-coding procedures" (7). Existing information is "plagued by data entry flaws, and organizations are frequently categorized incorrectly" (7).

USAID's data shortfalls are widespread. According to the Agency's website, the number of evaluations submitted to its document repository for all projects has declined from 529 in 1994 to 135 in 2003 (USAID 2005b). The decline in evaluations stems primarily from an Agency rule change enacted during the reforms of the Clinton Administration that eliminated reporting obligations from recipients of USAID money (Weber 2004). Whereas previously USAID mandated that every program must generate a midterm and final report, the rule change allowed program managers the flexibility to negotiate the monitoring and evaluation components of each programs with funding recipients on a case by case basis. Originally intended to save needless paperwork and give program staff more flexibility, the relaxation of requirements has simply resulted in less information on program performance.

According to an internal review of USAID's evaluation experience by Janice Weber (2004), past recommendations for improving the evaluation system have been ignored by the Agency, and current evaluation practice is rife with impropriety. The report notes that the quality of current evaluations has deteriorated substantially due to "a system that only rewards success (thus, the overwhelming majority of self-graded, fully successful SOs [strategic objectives]), rather than rewarding an honest assessment" (14; parentheses preserved from source). Other critics have noted similar weaknesses. Clements' (1999) investigation of USAID program reports found favorable portrayals of failed projects, use of measurement criteria unrelated to program impacts, and whitewashing of legitimate concerns. Positive bias in evaluations and assessment is particularly problematic when reviews are conducted by, or with considerable input from, the partner carrying the particular project.

Further, according to Weber, Missions (USAID's field offices) have been known to deny country clearance to Global bureau evaluators in order to cover up program deficiencies or other problems. She also suggests that program officers or evaluators will even insert proprietary information into evaluations, or deceptively categorize them as 'assessments', in order to avoid submitting these documents to the public domain. Weber stresses that

her key recommendations (requiring submission of evaluations, withholding payment to partners/Missions who do not submit evaluations to the public domain, regularly using external evaluators, reemphasizing exchange of information with other agencies) are not new ideas, but ones that Senior Management has ignored for the past decade.

USAID's informational shortfalls are particularly disturbing considering the Agency's disparate structure. Without good centralized information sources, effective cooperation between USAID's many heads is nearly impossible. Multiple funding mechanisms increase the confusion and decrease the ability of well-intentioned employees and partners to make a comprehensive review of agency efforts. As documented by the US General Accountability Office (GAO) report, USAID's lack of data on the types of organizations it funds and the funding mechanism it employs makes it impossible for the agency to effectively evaluate what works best (GAO 2002:10, 20). The inability—as well as the unwillingness—to evaluate one's own performance seriously impairs the process of designing effective programs for the future. It also casts grave doubts on the Agency's ability to make effective use of additional funds.

In addition to undermining USAID's potential for effectively evaluating its use of funds, the combination of an unnecessarily complex organizational structure and inadequate information on internal activities hinders cooperation amongst USAID contracting partners and other development agencies. Without a centralized source of reasonably detailed information on existing activities, there is little hope that other organizations might fill in gaps left by USAID activities. This point is especially salient with regard to malaria, for which USAID takes a narrow approach to programming.

*Pathways to Unsustainable Outcomes*

Another problematic element of USAID's organizational structure concerns the nearly exclusive employment of US based organizations for its development work.[29] Utilizing primarily US and Western NGOs to carry out development work usually has a deleterious effect on prospects for sustainable capacity building.[30] When local organizations do not have stewardship over health projects, there is little chance that they will continue after the implementing NGO leaves. That's not surprising, considering that the incentive structure inherent in USAID's contracting model promotes dependence on outside institutions. Few organizations—both for profit and non-profit—can be expected to legitimately work towards creating an environment that no longer requires their existence. Yet so many USAID projects, like the recently minted $250 million grant given to North Carolina's Intrahealth and eight other US-based subcontractors for work on building health care capacity in developing countries[31], ask partner organizations to attain goals that would render these outfits obsolete. Especially in malaria programming, where USAID's stated strategy consists of "reducing the burden of malaria by helping

[29] See the Section 3 for more detail on the reasons behind USAID's procurement preferences.

[30] The potential for foreign aid to undermine local capacity has been noted by several economists, most notably P.T Bauer, see Reality and Rhetoric: Studies in the Economics of Development, Harvard University Press, 1984. Also, see The Elusive Quest for Growth, by William Easterly. Most recently, in a speech delivered at the World Bank, Francis Fukuyama criticized development aid that employed foreign agencies to spearhead delivery as undermining local capacity building.

[31] USAID has not yet officially announced the awarding of this grant, even though the Agency finalized the deal on September 30, 2004. As of April 2005, information on the project, including verification that it exists, is not posted anywhere on USAID's official website.

countries develop the *capacity* to more effectively prevent and appropriately treat malaria", the nearly exclusive use of US organizations is a recipe for failure (USAID 2005).

USAID has made some rhetorical commitments to integrating local institutions in its development work. Most notably, Vice President Al Gore's New Partnership Initiative (NPI), launched in 1995, suggested "enhancing the impact of the Mission's active involvement with local stakeholders (USAID 1997). However, as evidenced most clearly in the unchanged level of funding dedicated to US organizations (approximately 75 percent since 1995), application of that principle has been lacking. Snook (1999) quotes a USAID contractor and a USAID mission employee in Tanzania describing how NPI worked in the field:

> [According to the contractor], the effort to bring beneficiaries [i.e. locals] in as stakeholders and partners was not working because the 'partners' don't have time for all the endless meetings. Decisions were still made in advance. The 'partners' are invited in to rubber stamp the decision, to demonstrate "partnership"...[According to an official at the Tanzanian USAID mission,] 'The Tanzanians are brought in at the end to stand there and nod yes'. (97).

Such behavior can hardly be construed as strengthening local capacity.

Another indication that NPI is more rhetoric than action is the continued priority given to big contractors like Population Services International (PSI), Management Sciences for Health (MSH) and AED. Theses organizations typically have little connection to local civic groups within the community, and do not emphasize developing such relationships. Yet programs like the Child Survival and Health Grants Program (CSHGP), which funds NGOs who do work with local groups, have not seen funding increases despite the significant rise in USAID's health budget.

Reforming the near-exclusive use of large US and Western organizations will be difficult so long as the Agency's current funding structure remains in place. Further, the imperiled status of USAID during the 1990s seems to have made the Agency unhealthily fearful of juicy press accounts detailing how a local organization embezzled US aid dollars. As Hyden and Mease (1999: 222) describe, "USAID has been caught squarely in the accountability trap", meaning that the Agency would rather allocate its monies to US organizations likely to waste a good portion of it but steal none, rather than local institutions that are in a better position to effectively use resources but are more vulnerable to instances of fraud and embezzlement (Bate and Schwab 2005).

Despite these obstacles, recent developments offer hope for much needed change. With unprecedented fervor, the current administration has supported foreign aid projects, such as the $15 billion PEPFAR initiative, without appealing to arguments based on the benefits that will accrue to domestic interests. Further, threats from terrorism, and concerns over a tarnished American image abroad, have spurned a renewed interest in humanitarian projects abroad. Thus, the present political climate appears amenable to altering the practice of excluding local groups.

*Summary of Organizational Issues*
The complex layers of internal bureaucracy and varied types of funding mechanisms have engendered an incoherent and ineffective framework for operating a successful malaria program. Currently, the manner in which malaria funds are used by USAID suffers from weaknesses in both organization and process. The fractured geographical distribution of resources prevents USAID from accomplishing substantial work in any one country.

Scattered resource allocation likewise promotes diffuse accountability. Disseminating funding across wide breadths of countries and through multiple avenues of contracting agreements relieves individual USAID officials operating in various missions of the responsibility for general failures. Similarly, the Washington based malaria team, with little actual control over funding decisions, avoids overall culpability. No matter how well intentioned and talented these officials are, success rarely results from such an arrangement.

The combination of USAID's diffuse structure and inability to develop a comprehensive internal information network limits effective cooperation and hinders efficient program development. Informational deficiencies at the Agency are severe. Data regarding its own projects and financial commitments are grossly inadequate both for designing effective projects based on past experiences and managing existing ones. In addition, no one branch of USAID has full knowledge of activities occurring in other branches, which severely limits the potential for effective coordination with other aid agencies .

Finally, the predominance of US based organizations contracted as project implementers undermines the Agency's capacity building approach to health problems, particularly malaria. Sustainable results are difficult, if not impossible, to obtain when foreign organizations maintain primary stewardship of development projects. Thus far, scant evidence exists to suggest that USAID's rhetoric espousing the increased involvement of local institutions is being applied.

## V. *MONEY FOR MALARIA: HOW IS IT BEING USED?*

Thus far we've examined the historical arc of malaria control activities, the institutional history of USAID and its current structural organization. The recurrent themes of organizational weakness, lack of coordination, informational deficiencies, ineffective programming, unsustainable outcomes, poor leadership and slow, overly cautious and incomprehensible decision making overtly manifest themselves in USAID's malaria control program.

*Words, Not Butter (Medicine, Insecticides or Bednets)*

With regards to malaria control, the strategy USAID has adopted can best be described as an extreme capacity approach. According to the official USAID malaria website, the Agency is committed to fighting malaria by helping countries "build the capacity" to prevent and treat the disease (USAID 2005d). The phrasing is no accident; for the most part, USAID does not use its funds to help countries directly fight malaria.

Thanks to the recently issued "USAID Malaria Programs 2004",[32] for the first time it is now possible to determine how this capacity approach manifests itself in funding decisions. The results are striking. Of the $80 million Congress allocated to USAID to fight malaria in 2004, USAID used only approximately $4 million to purchase life saving interventions[33]. That's an estimated 5% of total malaria funding spent on the mechanisms proven to prevent and treat malaria: IRS chemicals and equipment, medicines and ITNs, with most going towards the latter. USAID did not spend any money on insecticides or ACTs.

Determining how USAID used the rest of the money is much more difficult. Besides the $10.5 million dedicated to researching and testing a malaria vaccine and new malaria drugs, USAID utilized the remaining funds mainly for activities such as "technical assistance", "strengthening capacity", "policy revision" and "social marketing of ITNs". Details of these funding allocations are absent since the report declines to provide adequate descriptions, or even the names of each activity's 'implementing partner'(i.e. contractor or grantee).

According to USAID officials consulted for this paper, phrases like "technical assistance" and "capacity building" refer mainly to hiring consultants, based predominately in the US, to advise government ministries on relevant policy and management issues. Sometimes, training of local staff plays an integral role in these activities.

Reports of spending in Ghana reflect typical allocation patterns. In that country, USAID allocated $200,000 for "direct technical assistance to [sic] Government of Ghana supporting transition of ACTs", including training local drug regulators. That sum was also used to "build capacity of local private sector drug manufacturers and strengthen drug quality monitoring." An additional $200,000 line item is allocated to another

[32] USAID produced this report after members or Congress and others pressured it for better accounting on malaria activities . USAID has distributed it only to those who have requested information on the agency's malaria funding; it is not available to the public. The working title appears to be "USAID Malaria Program 2004," and the report does not give an author, whether a person, department, or bureau.

[33] As described in the previous section (footnote?), arithmetic errors and omissions of data prevent precise reporting of figures. Numbers here are best approximations from flawed data supplied by USAID.

popular spending destination, "malaria in pregnancy." The description for this activity reads, "Provide direct support to policy revision that included introduction of intermittent preventive therapy [IPT] for pregnant woman during routine antenatal visits."[34] As in nearly every description in the USAID report, no indication of the manner of "support" (or "assistance", "strengthening" etc…) is provided. What is certain, however, is that USAID did not use the funds to buy the medicine that IPT uses to protect pregnant women from malaria.

Allocations to ITN-related activities represent another common destination for USAID funding. USAID and the rest of the RBM community have identified ITNs as the most crucial prevention mechanism for reducing the malaria burden.[35] USAID funds this intervention under the auspices of its Netmark Plus program, a "$65.4 million dollar project designed to reduce the impact of malaria in sub-Saharan Africa through the increased use and sustainable supply of insecticide treated mosquito nets (ITNs), and insecticide treatments kits for nets, through partnership and joint investment with more than 20 multinational and African commercial partners" (AED 2002)

Netmark is mainly an ITN-selling program. Therefore, it promotes the use, distribution, and retreatment of nets, but spends little money providing funding for their purchase by those at risk for malaria. That strategy, while offering hope for a sustainable impact, often results in inefficient allocation decisions by USAID. In Senegal, for example, a 2000 Netmark survey funded by USAID found that half of respondents who did not own a net cited the inability to afford one as their reason for non-ownership (AED 2001). Only 10% said that nets were not available or they did not know where to get them. Yet in 2004, USAID allocated funds to Senegal's malaria prevention effort in order to "expand delivery of ITNs through the commercial sector."[36]

Unsurprisingly, the Netmark team seems to have ignored its own research in Senegal. According to the survey, supply problems in that country were insignificant. Also, residents knew about the beneficial properties of ITNs, as 99 percent of respondents cited advantages to using one. But drawing the logical conclusion from this data—that Senegal already had adequate ITN distributional mechanisms and public awareness—would have refuted the need for Netmark operations in that country. Certainly, the administrators of the Netmark program had no incentive to point this out to its USAID backers. Nor could they legitimately be expected to refuse funding, though such a move would have certainly boosted their credibility. Rather, USAID simply failed to evaluate

[34] Ghana's "malaria in pregnancy" entry is more descriptive than many other countries. In Angola, $200,000 "supports efforts to improve the provision of malaria treatment and prevention measures through antenatal clinics including ITNs and Intermittent Preventive Therapy (IPT)." The report describes a $300,000 allocation in Mali only by "support IPT delivered through routine ante-natal care (ANC)." The report employs similar phrasing for the vast majority of countries with a "malaria in pregnancy" line-item.
[35] The ITN-centered approach to malaria control remains a contentious issue. Many malaria experts argue that IRS, the method used to eradicate malaria in the developed world, is the most effective prevention mechanism (see, for example, the testimony of Dr. Donald Roberts before a Senate subcommittee hearing on malaria in East Asia http://foreign.senate.gov/testimony/2004/RobertsTestimony041006.pdf ).
[36] USAID also spent an unspecified amount in Senegal on targeted subsidies for ITNs in collaboration with UNICEF. But, as with all countries in which USAID reports funding subsidies, the Agency gives no indications of the amount of funds dedicated to this purpose.

how it could most usefully employ its malaria funds, despite the existence of available data, and so allocated money to a program with marginal potential.

*Understanding the Consultation Approach*
USAID's emphasis on consultation, as opposed to medication and tools for prevention, results from an intentional effort to eliminate procurement of life-saving interventions from Agency funded programs. In the 2004 version of its guidelines for appropriate uses of health funds,[37] USAID urges its missions to fund programs that promote "Increased *access to* and *appropriate use of* ITNs and, where appropriate, IRS; Improved *use of* effective drugs for effective treatment" (43) [italics added]. The phrasing deliberately discourages the direct funding of programs that purchase *and* use ITNs, IRS, and medicine.

The rhetorical distinction between supporting the use of an intervention and actually supplying it becomes clear when the word choice for the Malaria Activities section is compared with the Family Planning Activities section, where allowable programs include "supporting the *purchase and supply* of contraceptives and related materials" (45) [emphasis added]. If USAID were truly committed to purchase and use of ITNs, IRS equipment and ACTs, it would employ similar phrasing.

In following such a strategy, the Agency is attempting to give malarious countries the necessary 'skills' to battle the disease, but declining to provide the necessary tools. Effectively combating malaria without tools is impossible, but some still assert that USAID should continue with its narrow approach and allow other agencies to supply the proper mechanisms. Before a Senate Subcommittee, former Assistant Administrator Anne Peterson testified, "With USAID providing critical technical "know how" and the Global Fund providing the resources for the procurement of key commodities for the prevention and control of malaria there is a growing optimism that malaria endemic countries can soon begin turning the tide against malaria."[38] But such a claim of careful coordination is an exaggeration.

Except in a few isolated instances, there is little evidence that the type of cooperation Peterson described occurs. The disorganized and decentralized nature of the Agency, as well as the political considerations governing many funding decisions and contracting methods, is antithetic to the notion that USAID might engage in full-scale global cooperation with other aid agencies. Barring a major overhaul that includes radical improvements in Agency transparency and data management, transforming USAID into a

[37] The document in question is titled "Guidance on the Definition and Use of the Child Survival and Health Programs Fund and the Global HIV/AID Initiative Account." It is updated annually to reflect changes to statutory spending guidelines and available at http://www.usaid.gov/policy/ads/200/200mab.pdf

[38] Subcomittee on East Asian and Pacific Affairs, *Neglected Diseases in East Asia: Are Public Health Programs Working?* 108th Cong, Sess. 2, October 6, 2004. http://foreign.senate.gov/testimony/2004/PetersonTestimony041006.pdf

collaborative program implementer at an international level is impractical in most circumstances.[39]

USAID activity in the Democratic Republic of the Congo (DRC) plainly illustrates the Agency's inability or unwillingness to coordinate with agencies who supply interventions (the case studies in Section VI also highlighted this weakness). USAID, which claims its "direct Technical Assistance to [*sic*] Government of DRC supports the transition to ACTs," prominently promotes its DRC program in the 'Success Stories' section of its website (USAID 2005c). However, despite claims that the Agency is "fully active" in coordination with Global Fund efforts in the DRC, USAID assistance with the DRC's transition to ACTs has not been complimented by Global Fund purchase of these drugs. Instead, the Global Fund's $54 million grant to the DRC largely overlaps other USAID efforts there: improving distribution of ITNs, training health care workers to diagnose malaria more effectively, support the structures for IPT, and improving management capacity (Global Fund 2005).

Another USAID explanation for not buying direct medical interventions is that the Agency avoids crowding out the private sector or other donors who will provide such interventions. Yet USAID applies this approach inconsistently. Their provision of advisory services also undermines local service providers. Indeed, some successful private sector responses to the malaria problem rely on contracting independently and for limited time with local African experts and not resorting to using USAID contractors (Sharp 2002)[40].

As described in the previous section, the aspect of malaria control that USAID has chosen to focus on, capacity building and technical assistance, constitutes the area least amenable to improvements through Agency funding. Its contractors, who enjoy the benefits of well paid and widely traveled consulting work, have no obvious incentive to build truly sustainable health networks free from dependence on their own input. Local organizations are much better suited to spearheading horizontal approaches to health problems due to their superior knowledge of local institutions, behaviors, cultures, and environments, as well as their considerable cost advantages. Further, it is inordinately difficult to scale up primary health interventions that do not have innately native stewardship. Yet even if Western NGOs can perform capacity building interventions adequately—and they occasionally do—their efforts are for naught without the proper tools (insecticides, ACTs, ITNs) with which to fight disease, and a contractual arrangement that allows successful programs sufficient time to achieve program goals.

USAID has been reluctant to offer a justification for its funding strategy. Some PVO employees and other critics have suggested that the Agency's unwillingness to purchase ITNs, insecticides and ACTs stems from the fact that US firms do not produce these products. The US is, however, replete with consulting and development NGOs eager to support the Agency as long as it funds their work.

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[39] USAID does indeed cooperate with other aid agencies, but such collaboration is generally not pragmatic, and instead is limited to policies and goals (e.g. formulation of the RBM initiative). For more extensive analysis of the coordination issue, see Snook (1999) and Hyden and Mease (1999).

[40] See Sharp et. al. (2002) for details on an IRS spraying spearheaded by Konkola Copper Mines

An alternative explanation posits that funding large US firms to perform "technical assistance" and "capacity building" activities represents a safe and easy outlet for Agency funds. Unlike more concrete strategies, the sufficiently vague capacity approach has remained free from undesirable controversy generated by alternative methods like the utilization of insecticides and pharmaceutical purchases. Too disorganized to launch bold initiatives on its own, and too cowed by Congress to risk trusting its money to organizations whose employees do not speak English, USAID simply follows the path of least resistance when allocating its monies.

Evidence for the 'path of least resistance' hypothesis is apparent in the Agency's handling of ACT treatment. In internal e-mails obtained by Freedom of Information Act requests, former head of the malaria team at USAID, Mary Ettling, advocates a cautious approach to switching over to these drugs. In an e-mail describing a meeting with RBM officials, Ettling explains how she intervened so that the officials "appreciated the difficulties of a rapid switch to coartem".[41] She tells another colleague, "let's not argue for SP+ART [a type of ACT] just now,"[42] and later writes to a group of USAID officials, "neither would I suggest bashing ahead in the field with coartem"[43]. Another senior USAID malaria official, Dennis Carroll, told the *New York Times* in 2002 that coartem was "not ready for prime time."[44] USAID's reluctance to support ACTs infuriated many malaria experts, who argued that resistance levels to the alternative drugs advocated by the Agency were unacceptably high and that the safety and efficacy of ACTs was demonstrated clearly during the 1990s (Attaran et al. 2004).

Arguments that the Agency's undue preference for US-based procurement hampers best practice, and that USAID takes an overly cautious approach to public health in order to avoid controversy, both reflect poorly. Even if neither charge is completely true, they will continue to dog the Agency until it provides a convincing defense or changes its tactics. As yet, it has not.

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[41] December 19, 2001.
[42] April 5, 2001
[43] January 9, 2002.
[44] McNeil D. New drug for malaria pits US against Africa. *New York Times*, May 28, 2002.

## VI. NOTES FROM THE FIELD

For the bulk of its $80 million malaria endowment, USAID gives little indication of how exactly the money is spent and what outcomes this funding generates. From the nature of the work—technical assistance, capacity building, policy reviews—it can be safely assumed that a large portion goes to the salaries, living allowances and travel expenses of Western consultants. As explained in previous sections, such work rarely generates publicly available documents with detailed descriptions of program results, and, as per USAID policy, the public are not privy to any information that might be construed as "proprietary". These types of activities have benefited most from the Agency's augmented malaria budget in recent years.

In contrast, certain programs at USAID are subject to strenuous evaluation available for outside scrutiny. Despite the elimination of evaluation requirements, certain branches of USAID, usually those in charge of awarding grants or well-defined contracts, have maintained rigorous standards of evaluation and information sharing. These projects usually fall under the label of "direct PVO programs," and clearly demonstrate that effective data collection and transparency are feasible. However, despite a five-fold increase in the Agency's malaria budget since 1998, direct PVO programs like CSHGP have not seen significant increases in funding.

The following three case studies, drawn from publicly available evaluations, illustrate how USAID 's malaria strategy hinders effective programming. They do not represent a representative sample of malaria programs, but offer a more concrete illustration of the complications wrought by Agency weaknesses already discussed. These examples demonstrate how structural and strategic shortcomings hinder effective programming. Most importantly, the program summaries offer excellent insight into why increased Agency funding has not resulted in a decreased malaria burden, and why raising future funding levels is unlikely to produce excellent results without significant Agency reform.

1) THE BUNGOMA DISTRICT MALARIA INITIATIVE (BDMI), KENYA; 1998-2002

Operating in one of the world's most malarious areas with a $5 million budget, BDMI aimed "to reduce mortality and cases of severe illness due to malaria in Bungoma District" (Olenja et al. 2003: 6). Though typical in its indirect approach to fighting malaria, the program differed from many of USAID's global technical projects by working at a strictly district level, thus facilitating the incorporation of a strong monitoring and evaluation component. The Bungoma District Health Management Team (DHMT), representing Kenya's Ministry of Health, implemented the project, while American NGOs and CAs [cooperating agencies] provided "technical and logistical support"[45] (9).

In its design and implementation, BDMI shares several characteristics with other malaria projects: 1) it made no effort to measure whether the project made any progress towards its goal (reduction of deaths and severe illness due to malaria); 2) it instead measured several objectives (five in this case) loosely related to its goal; 3) it revised downward its targets for some of those objectives after the mid-term report revealed unsatisfactory progress; 4) it failed to meet many of these objectives (even downwardly revised ones); 5) US based NGOs providing technical assistance underperformed, due in large part to coordination problems; 6) it showed that the biggest obstacle to widespread use of an effective malaria intervention (in this case bednets) was financial; 7) it did not improve upon program weaknesses cited in the mid-term report; 8) despite unimpressive results, the final evaluation gave the program a positive assessment.

The program hoped to accomplish five objectives: improved management of fever and anemia (hallmarks of malaria) at health care facilities; improved management of fever and malaria at home; improved prevention and management of malaria in pregnancy; increased household use of insecticide treated materials; and effective collection and use of data. Regarding improved management of fever and anemia, the project scored some successes in training health care workers in diagnostic techniques and appropriate treatment courses.[46] However, of the four main indicators related to these two objectives, one target was not met (percentage of health care workers with training), and one (children with severe febrile disease correctly classified) was met only after revising the target downwards from 80 percent to 50 percent.

The connection between improving health care workers' skills in diagnosis and treatment according to specific guidelines and decreasing death and illness due to

[45] The NGOs and CAs that provided technical assistance were not named in the report, nor was the funding breakdown between USAID and the Kenyan government elucidated. Based on USAID funding methodology, it is reasonable to assume that USAID financed the NGOs, CAs, and certain activities of the DHMT.

[46] The training approach used is a widely used program referred to as Integrated Management of Childhood Illness (IMCI).

malaria is questionable when workers do not have the appropriate treatment medications. Like nearly all USAID programs, BDMI did not allocate funds for buying medications. As a result, in some health facilities an "irregular supply of drugs was experienced" (Olenja 2003). In addition, Olenja's final report noted that IMCI training "is very expensive" (27).

In its other objectives, BDMI fared even worse. Of the 11 combined indicators in these four categories, only two targets were achieved. Of these two, one (percentage of home-based caretakers who received educational messages) is barely relevant, and the other (an increase in the percentage of households with at least one ITN from 12 to 30) still remained at a low level. Perhaps most disturbingly, indicators of data collection activities in the district *decreased* during the project period.

Poor collaboration between the US based NGOs and CAs and the local DHMT hampered project implementation. Specifically, Olenja (2003) notes that "because a majority of the CAs were [*sic*] as not physically present in Kenya, planning and implementation of activities often presented a challenge" (38). In addition, "the coordinating agency [an international NGO] did not seem to have sufficient control over the CAs in the production of results" (39). Thus, the BDMI offers a clear example of the inherent problems that funding US based organizations pose. If contractors could not manage a presence in Kenya, which is stable, English speaking and well developed relative to other LDCs, there is little hope that they can be effective in more challenging venues. One wonders if USAID considers local presence at all when making contracting decisions.

Evaluation reports often include a substantial 'lessons learned' section, and Olenja's is no exception. But the prescient observations of evaluators are likely to fall upon deaf ears. Olenja's conclusions include such common sense but rarely heeded advice like, "Availability of nets is not necessarily equal to use. Financial access is a major factor in the use of nets." Yet USAID continues to ignore this commonly stated warning concerning the financial barrier to ITN access and continues to stress "social marketing" and "distribution networks." Nowhere was this folly more evident than in BDMI's complete failure to persuade pregnant women to sleep under ITNs. Olenja's explanation for the failure: "On discussion with the health providers and exit interviews with Ante Natal Clinic clients, the issue of cost was reported to stifle use of nets" (34).

Yet USAID, seemingly oblivious, has concentrated its 2004 malaria in pregnancy funding for another East African country, Tanzania, on marketing ITNs at ANCs and "a series of mass media TV, radio and billboard campaigns…to increase knowledge on malaria transmission, the toll of malaria on children and pregnant women and the protective efficacy of sleeping under ITNS"[47] These educational activities are important, but they cannot succeed without addressing the financial burden of ITN usage.

[47] Population Services International, *PSI/Tanzania,* February 28, 2005. (http://www.psi.org/where_we_work/tanzania.html)

Perhaps the report's most telling statement appears near the end: "For this end of project evaluation, it is more feasible to talk about trends, rather than impact" (43). The inability to detect a discernable impact at the conclusion of a multi-million dollar project should worry USAID officials and those with Congressional oversight.

Yet instead of offering legitimate critique, Olenja's report suffers from the same predilection afflicting many USAID-sponsored evaluations of its programs: it is unnecessarily complimentary when serious criticism is required. Despite the considerable failings of BDMI, the evaluation concludes with, "the overall impression is that the project has made notable contributions at policy and programmatic levels" (46). In measuring the success of a $5 million program, "notable contributions" is simply an inadequate yardstick.

2) THE STRENGTH PROJECT: SAVE THE CHILDREN, NORTHERN MOZAMBIQUE; September 30, 2000-September 30, 2003

The Strength Project operated in Mozambique on a $700,000 grant from USAID supplemented by $233,000 in matching funds from Save The Children (SC). The SC grant was awarded through the centrally funded Child Survival and Health Grants Program (CSHGP), a direct PVO program key to USAID fieldwork in several areas, including malaria.[48] As stated previously, CSHGP carries the distinction of requiring recipients of Agency money to submit detailed planning documents, implementation plans, progress reports and a comprehensive final evaluation spearheaded by a third party. Since the program is linked to the Child Survival and Resources Group (CORE), a consortium of American NGOs that share information and collaborate on strategy, key documents and information are widely accessible.

SC's Strength Project illustrates some major weaknesses endemic to many AID funded programs. Its limited funding and narrow capacity approach contributed greatly to its failure to make significant strides towards its main goal, namely "to sustainably reduce under five mortality and maternal mortality" (Utshudi 2003). Additionally, prospects for the sustainability of program accomplishments after the exit of SC are low. Finally, despite lackluster results based on monitoring objectives only loosely correlated with the goal of reducing mortality, the final evaluation report unjustifiably argued for the extension of the project to other areas of the country.

CSHGP almost always adopts a capacity approach to solving child survival problems, and the Strength Project is no exception. As per policy, USAID does not award CSHGP grants to proposals that include the funding of basic interventions to complement the capacity approach. Instead, the Agency favors a strict capacity approach that distributes program focus across a wide range of health problems, and thus handicaps most CSHGP programs before they even begin.

In the case of the Strength Project, the malaria control portion (15% of total project concentration) had only two objectives: that the percentage of mothers who seek care for feverous infants within 24 hours increase to 80 percent, and that "forty percent of children under five presented at health facilities will have two or more fever examination tasks completed" (11). The program largely failed to meet these two objectives. For the former objective, the percentage actually decreased from 57 percent to 40 percent in one district, though it increased from

[48] USAID's Child Survival and Health Grants Program (CSHGP) is a major way the Agency uses funds to fight deadly childhood maladies throughout the third world. In fiscal year 2004, USAID funded 71 such projects in 39 different countries at a total cost of $91,522,575. The 27 Private Voluntary Organizations (PVOs) who implemented these projects added $41,398,672 in matching funds. Grants typically last between two to five years and share the common overall goal of attempting to reduce child mortality. Since malaria constitutes a prime threat to children in many of the countries targeted by CSHGP, these grants represent one of the primary avenues for USAID to fight the disease 'on-the-ground'

66 percent to 80 percent in the other, and for the latter, program evaluators did not even bother to measure or write about it.

Of higher importance than the program's failure to achieve its malaria control objectives is the largely irrational and unexplained rationale that accomplishment of either objective might have a significant impact on deaths from malaria. Such knowledge activities have no chance of succeeding without accompanying interventions, as two explicit admissions of the Strength Project's final report demonstrate. In one, Utshudi et al. (2003) explain an "unexpected constraint" to malaria control: "Frequent stock outs and unreliable supply of essential drugs at community-based health facilities contributed to difficulties in ensuring timely and effective case management of malaria at home and at the health facilities" (21).

In the other, Utshudie et al. (2003) explain the outcome of ITN promotion efforts: "Mothers who were interviewed preferred using bednets because in the long run, it is more cost effective for malaria prevention in children and pregnant women. Unfortunately, due to the prevailing poverty in the project area, the cost to acquire ITNs is quite prohibitive" (25). According to a child survival specialist at SC, the only reason the Strength Project did not purchase and distribute bednets was due to severely limited funding for a large geographical area.[49]

Taken together, these revelations make a strong argument that capacity building and education alone hold little, if any, hope for achieving significant reductions to the malaria burden. Yet USAID continues to ignore the findings of its own reports and pushes impotent approaches to combating malaria.

The inherent difficulties of achieving sustainable outcomes in capacity building through the use of a US based NGO was also evident in the final evaluation. The report notes that "training alone, without the support from MOH [Ministry of Health] that carries out regular monitoring and follow up supervision of trained health workers, does not contribute to sustained effective delivery of quality services" (8). High staff turnover additionally hampered efforts to increase health care capacity in the region through training, a major project focus.[50] This turnover problem may result from health care workers leaving the program area for higher paid jobs after receiving training and indicates the inherent complications of a strict training approach to health programs.

Finally, like most projects, the Strength Project also failed to directly measure child mortality. Yet the evaluation, like most evaluations, provided unjustifiably positive conclusions. Out of 36 objectives (eighteen in each district), the project met an anemic seven targets. An alarming number of those missed targets also recorded *decreases* from baseline figures. Inexplicably, however, the final report recommends that the program's approach be "replicated in other parts of Mozambique" (40). Even more irrationally, USAID/Mozambique allocated

[49] Personal communication 6th January 2005.
[50] The report specifically notes that capacity building efforts "were not directed toward the equipment of health facilities but rather toward the strengthening of health worker knowledge and skills" (29).

bilateral funds to extend the project in other parts of the country shortly thereafter (Swedberg 2005).

3) World Relief Vurhonga II Project; Chokwe District, Mozambique; September 30, 1999-September 29, 2003.

Of all USAID programs that include malaria control as an integral component, World Relief's Vurhonga II stands sharply apart from the rest. Funded by a $1,000,000 USAID grant and $582,965 in private matching funds, the Vurhonga project defied many of the norms that prevent USAID projects from achieving child mortality goals. By utilizing a purely community based approach replete with 220 community Care Groups and 2,800 volunteers, the designers of the Vurhonga project allowed community groups stewardship over its health projects. By directly measuring mortality, the Vurhonga project offered actual evidence, as opposed to the usual anecdotal conjecture, that its approach was valid and worthy of extension. However, the structural deficiencies inherent in USAID programs—no funding for interventions, poor coordination, and a contracting process disinclined to reward real results—crippled the project's full potential and continues to prevent those working in the area from making a substantial impact on the malaria burden.

Using a 'care group', community empowerment methodology, World Relief documented dramatic reductions in child mortality—initial measurements put the decline at over 60 percent[51]—while achieving all correlated program targets (e.g. use of ITNs, immunizations, nutritional goals etc.). But despite demonstrated results, enthusiastic support from Mozambique's USAID mission, the Ministry of Health, district leaders, and program evaluators, USAID declined the project's 'cost-extension' application. UNICEF saved the program by providing emergency funding after the evaluator, veteran Johns Hopkins public health expert Carl Taylor, convened a meeting in Maputo to beseech donors for funds. A source close to the project acknowledged, "Had UNICEF not recognized the significance of the work, much of the staff and momentum would have been lost."

World Relief eventually received an "expanded impact grant" from USAID in 2004 to scale up the project, but a proposal for a similar project in Malawi, again supported by the local USAID mission, Ministry Of Health and local partners, was turned down.

[51] For fear of undermining the 'community empowerment' model, baseline data on births and deaths were gathered not by outsiders (as per standard scientific protocol), but by village workers. This aspect of data collection is a source of debate, as some (like Taylor) believe that the 'objectivity' justification for using outsiders is bunk. From Taylor's experience, outsiders are more apt to get untrue survey results due to cultural and linguistic communication barriers. Regardless, follow-up pregnancy histories (like those done by USAID in its Demographic Health Survey) are now being done by a follow-up team in order to confirm the mortality reduction results.

Taylor, however, after many years working with and around USAID, is critical. "What are [USAID application evaluators] looking at? I'm having trouble making sense of their priorities." He recalls surprise upon hearing that USAID was terminating support for the project he had just evaluated as an unqualified success. "The AID people in Mozambique said the decision had been made in Washington [not to extend funding] contrary to their opinion. It represented the kind of thing I see more and more with AID activities. The people in the field just don't have the [authority] to do what makes sense."

Aside from showcasing the inconsistencies apparent in USAID's funding process, Vurhonga demonstrates how USAID's misguided policies and poor organization hinder effective use of its own funds. Predictably, the project's 20% malaria focus contained no money to buy interventions like bed nets, drugs or IRS materials. Nor did the Agency coordinate with other donors to supply such tools to Chokwe (the program area). However, after a terrible flood struck the region in 2000, UNICEF, acting independently from USAID efforts, distributed free bed nets to everyone in Chokwe. With an actual intervention tool, the successful 'care group' mobilization approach influenced people to use the nets (85% reported usage rate for children under 5).

Similar luck did not strike the treatment aspect of the program. The malaria treatment protocol, which the program implemented with enormous success among the villages, was to bring a symptomatic child to a village First Aid post and treat the child with chloroquine, a drug weakened by widespread resistance throughout Mozambique. Despite excellent results in the area of education, the lack of an effective treatment drug and any prevention mechanism other than bednets dampened efforts to fight malaria in the region.

Indeed, program staff acknowledged that efforts to fight malaria did not contribute significantly to the observed decrease in mortality. With the added perspective of a follow-up study, an informed source confided that "mortality ascribed to malaria per verbal autopsy did not decrease as dramatically as we had anticipated considering marked improvements in bednet usage and rapid treatment seeking." The source also reported that chloroquine resistance was likely the culprit as "there were reports of children seeming to recover from malaria only to relapse and die later."

These suspicions were confirmed by project consultant Dr. P. Ernst, who is currently investigating the resistance problem in a follow up project and has identified a 50 percent resistance level in the program area[52]. Sadly, but not surprisingly, Ernst relates that efforts to convince USAID and UNICEF to persuade Mozambique's health ministry to change the type of

[52] Personal electronic communication, 21st January 2005.

drug included in the drug kits have failed due to cost concerns. Even today, children in Chokwe receive ineffective medicine.

The Vurhonga project is indeed remarkable. USAID's insistence on funding child survival projects that provide none of the tools to help children survive (i.e. ITNs, drugs, vaccines) would seem to have doomed this project to failure from the beginning. Despite these shortcomings, its incredibly successful methodology of using community volunteers to promote behavior change saved lives—even if the magnitude of success proved less than originally thought. However, despite its demonstrated, measured success, and unanimous support from every relevant local institution, USAID's central office did not see fit to extend the project initially.

More importantly, though, follow-up in Chokwe has demonstrated that the program could have had a more successful malaria control component. Had USAID funded effective drugs, the program could have distributed useful medicine, decreasing substantially the number of children who died from malaria and augmenting the successful health improvements in other areas like nutrition and diarrhea.

The underlying lesson of Vurhonga is that when USAID takes a horizontal approach to malaria, it must ensure that programs have sufficient funding for basic interventions. If the Agency does not want to buy bednets or drugs, or fund spraying, than it must make sure it actually coordinates with donors who do. Given the disorganization and politicized nature of USAID, such coordination is not likely to happen. In Chokwe, it took—literally—an act of God to align a USAID health capacity program with an agency willing to fund an actual intervention. Perhaps, if the Agency undergoes substantial reforms that improve transparency and organization and limits political considerations in health aid, USAID might effectively work in tandem with other global agencies.

*The Bottom Line: Why USAID Malaria efforts are Failing*

Seven years into Roll Back Malaria, no progress has been made. Indeed, Attaran (2004) estimates a possible 10% increase globally since the inception of RBM, despite the availability of numerous prevention and treatment mechanisms. RBM's chief architects, both multilateral—like the WHO—and bilateral—like USAID—are complicit in squandering unprecedented funding for anti-malaria efforts. USAID, in particular, has failed to use American taxpayer money effectively.

USAID programs are simply too narrow in their approach to the malaria problem. The strict capacity approach ignores the simple reality that knowledge and policy alone cannot kill the vectors that transmit the illness or the parasites that cause it.

Larger problems also hamper the Agency's ability to make good use of its funding. Deficiencies in data collection and organization prevent needed internal coordination of its efforts, as well as practical collaboration with other donors who might provide necessary interventions. Unnecessary secrecy surrounding the use of malaria funds and the contracting process obstruct outside experts from assisting monitoring efforts and offering constructive criticism. Additionally, lack of transparency fosters lapses in accountability, as does a funding strategy that disseminates responsibility for malaria funds so widely across the Agency. The geographically diffuse funding approach also thwarts a concentration of resources in one place sufficient to make a substantial impact.

Inherent weaknesses in USAID's incentive structures likewise discourage fiscal responsibility. The political economy of the Agency's survival depends largely on the US based contractors who benefit from USAID's funding endowment. Furthermore, USAID asks these contractors to create sustainable systems in other countries that would eliminate the purpose of their existence. Expecting any organization to implement its own demise is unrealistic. In practice, these organizations constantly seek to enlarge their share of USAID funding, as evidenced by the frequent exhortations in program evaluations to expand failed initiatives. As one senior PVO official explained the misbegotten process: "The nature of awards by USAID is predicated on a lot of 'wordsmithing' in the proposals and final reports"[53].

USAID continues to take the path of least resistance approach to the malaria problem. Its funding strategy appeases its US based constituents, and its refusal to fund comprehensive intervention packages avoids undesirable controversy. By keeping most of its money within the US, USAID avoids the risk of embarrassing accounts of occasional acts of fraud by local organizations. Though its programs keep its more powerful stakeholders happy, they do not reflect the most effective way to reduce the malaria burden for its rightfully intended beneficiaries.

[53] Personal Communication 28th December 2004

## VII. CONCLUSION

Malaria remains a major obstacle to development in many poor countries, especially those in sub-Saharan Africa. Over three thousand people, mainly children, die every day from this preventable disease. Most distressingly, malaria specific mortality rates continue to rise (Attaran 2004).

The world's wealthiest country, the United States, has funneled millions of dollars through its foreign aid agency, USAID, to fight this dreadful disease. However, funding is often poorly allocated. Despite the existence of proven mechanisms of prevention—IRS and ITNs—and effective treatments—ACTs—USAID spends less than five percent of its malaria budget purchasing these life-saving interventions. Instead, the Agency uses earmarked malaria funds for peripheral actions. These consist mainly of paying Washington-based contractors to consult with local health ministers on policy matters, give advice on management issues, train selected administrators and health care workers, and help run basic health education programs.

Some of these activities—commonly referred to as 'technical assistance' and 'capacity building'—are extremely important to ensuring that donor countries maintain adequate health systems. Insufficient capacity can stymie a recipient's ability to use life saving interventions. However, even the best policies and the strongest management systems cannot prevent a child from contracting malaria or cure his sickness. In order to properly deal with the problem, the physical tools to prevent and treat malaria must be either integrated into the malaria programs funded by USAID or provided by another organization in careful coordination with other Agency efforts. Short of that, even the most efficient policy program is doomed to failure.

*Prescriptions for Change*

With malaria rates continuing to rise in the face of increasing malaria budgets from the world's aid agencies, it's easy to be critical of USAID, the most influential bilateral institution in global health. Improving it, however, is a much greater, and ultimately more important, challenge. Yet despite the enormous difficulties of tackling any global health issue, let alone one as severe and widespread as malaria, USAID can make several changes that would greatly enhance its effectiveness, both with specific regard to malaria and general regard to its entire development operation.

1) Organization, Transparency and Accountability

There is no greater obstacle to improving one's practices than ignorance of them. USAID faces an immense problem in changing its gross opacity. The scattered and disorganized nature of its malaria programs hinders not only Agency employees, who have trouble navigating the inscrutable bureaucracy and finding necessary information, but also outsiders that could offer constructive guidance. In fact, given the stonewalling and defensive reactions to anyone—researchers, congressman, scientists—who seeks information about or suggests improvements to existing programs, the Agency seems to suffer from a self-inflicted, autarkic etiolation.

USAID can go a long way towards solving these problems with a simple move towards greater transparency. Instead of keeping the details of procurement operations, program budgets, performance evaluations and contracts secret, the Agency should make this information available to the public. By making the data available to, and understandable by, outsiders, USAID would ensure that its own staff had access to information that is currently scattered between central headquarters, country missions, PVOs and contractors. And with data on its programs readily available, outside experts and watchdogs could supplement internal control measures against inefficiency and waste, as well as generate critical analysis and suggestions for improvements.

Adopting such an approach would neither be pioneering nor difficult, but it is nevertheless essential. USAID need only copy an existing model and adapt it to its own needs. That model is the Global Fund to Fight AIDS, TB and Malaria's excellent website, which does everything from listing individual grant proposals and agreements to comprehensively organizing data on overall levels of funding. While isolated cases of fraud or waste, such as the millions dedicated to agencies controlled by Burma's repressive military junta, may cause temporary embarrassment to the Fund, these instances can be quickly corrected. Though GFATM's record on fixing these problems has been less than perfect, progress on some fronts, like pulling funding from Burma, discourage future mischief.

Making the procurement process more transparent will have the added benefit of opening up bidding to outsiders and smaller contractors, who have difficulty navigating an obscure and secretive process that currently favors large insiders/incumbents. For contracting to work properly, greater and more equitable competition is necessary. As it stands now, insider knowledge of the procurement system gives selected bidders a significant unfair advantage, and large firms simply outspend smaller ones when preparing proposals.

Contractors will certainly protest any moves to make the procurement process and their use of taxpayer funds more transparent, as will some Agency employees. They will argue that such information is private, or that instituting transparency will add another layer of bureaucratic interference. However, these arguments are meant to disguise their real intention to insulate themselves from legitimate criticism and competition that may negatively affect their livelihoods. Such opposition to transparency improvements must be ignored. If USAID and its contractors have nothing to hide, then the full details of their operations should no longer remain a secret. In fact, for the majority of USAID, PVO and contractor employees, many of whom are talented and committed to development work, greater visibility will mean better programs, better organization and better results.

2) Consolidate and Expand

USAID operates malaria programs in over thirty countries in the developing world. Funding averages just under $1.5 million per country, an amount insufficient to tackle a problem as large as malaria. With such limited resources for each country, there is little hope of making a realistic and lasting dent in malaria morbidity and mortality, which is surely the main justification for funding.

Since successfully fighting malaria requires comprehensive programming and a substantial resource commitment, USAID must distribute its malaria funds more wisely. Instead of operating a few limited programs in numerous countries, it must consolidate those resources and expand the scope of its programs in fewer countries. That means prioritizing funding by both the extent of a country's malaria funding and the likelihood that programs will succeed. Countries lacking the political will and local institutions must be bypassed for ones that have the right structures but are simply lacking the resources.

While pulling money from malaria programs in countries with serious health problems may seem heartless, there is little evidence that current programs save many lives. Unfortunately, funding is limited, and it needs to be concentrated where it can do the most good. Countries like Uganda, Ghana and Zambia, which have severe malaria problems, are committed to fighting the disease and would apply more resources well.

3) Expand Correctly: Interventions that Work

As has been shown throughout this paper, USAID malaria funding is one-sided: heavy on providing 'expertise', very light (only 5 percent of the total malaria budget) on providing life-saving interventions. Successfully reducing the malaria burden with such an approach is extremely difficult. For maximum effectiveness, malaria resources must comprise a combination of both know-how and tools, though always a critical minimum of the latter.

There is no reason why USAID cannot change its disjointed, ineffectual programming scheme. The first step, program consolidation, will ensure sufficient resources to fund comprehensive, effective programs. The next step is simply to fund these programs.

If USAID diverts its malaria resources to fewer countries, funding spraying programs, buying bednets and purchasing effective drugs should be the first priority. USAID should provide ACTs so mothers trained to recognize malaria symptoms in their children and seek treatment from trained nurses will receive an effective drug and not ineffective chloroquine. USAID should provide nets so that villagers who learn the benefits of sleeping under bednets can put their knowledge to use. USAID should provide funding so health ministers that want to eradicate malaria from their districts with IRS can buy necessary chemicals and equipment, and USAID should stop using inaccurate environmental opposition to IRS to thwart these ministers. USAID must

adopt, rather than shun, these common sense approaches to malaria funding, if Agency officials are serious about stemming the malaria pandemic.

Global health programs are complex and difficult. Consequently, the recommendations provided here are strategic guides, and not hard and fast rules. If, for example, USAID can upgrade its organizational systems well enough to collaborate effectively with other agencies, situations may arise where providing only technical assistance is appropriate. However, in these cases, the Agency must ensure that its efforts are integrated into initiatives that utilize all the tools necessary for success.

4) Involvement of Local Institutions

Given the vast sums that USAID invests in capacity building, technical assistance and training, USAID should carry out these activities in an efficient, sustainable fashion. Unfortunately, due to the Agency's funding structure, this is not the case.

Unlike, for example, the GFATM, USAID funnels its money primarily to US based contractors, and uses US citizens (USAID mission personnel) to administer and monitor the programs locally. Such a system ensures that project ownership ultimately belongs to US based interests, even if they involve indigenous organizations. When USAID imposes aid in such a manner, especially when the goal is to build local capacity, it will rarely achieve sustainability. Since local institutions must comply with decisions coming from the US in order to maintain funding, they become dependent yes-men to their USAID patron (Snook 1999). Once funding and guidance dry up, they are unable to stand alone and quickly collapse.

Even when US personnel on the ground act with noble intentions, USAID's funding structure creates ineffective and unsustainable outcomes. At its simplest level, the incentives governing contractors clash with the very notion of sustainable, locally generated outcomes. Asking a technical advisor on health policy to help craft an entirely self-sufficient health ministry is a bit like asking an employee to train his lower-cost replacement. Individuals may be altruistic enough to be exceptions, but entire organizations are unlikely to eliminate the need for their own existence.

The development literature has long made these incentive and dependence arguments, but USAID continues to structure its funding in the least productive manner possible. Other aid agencies, like GFATM and Canada's IDRC, provide funds directly to developing country organizations and researchers. Such a model is especially appropriate to USAID's capacity building approach. A further advantage of direct grants is that they reduce the probability that aid projects will contribute to 'brain drain' problems in critical sectors of LDCs. Frequently, and especially in the health sector, the most well-educated local experts leave their critical government and private sector

jobs to work for international NGOs. In addition, training programs run by such agencies often collapse when they leave because newly skilled workers use their newfound abilities to migrate out of rural areas, or even out of the country altogether.

Instead of empowering US contractors to build capacity in other countries, USAID should empower indigenous organizations to build capacity in their own countries. By increasing direct grants to these groups, capacity building efforts in the health sector have a much greater chance of succeeding, and staying successful.

Thus far, we have directed suggestions for reform primarily at USAID itself. To be fair, however, many of the Agency's shortcomings result from larger US government policies and the Agency's role as a vehicle for advancing US interests abroad. In addition to the four specific suggestions outlined above, The US needs to change its development policy if malaria programs, and indeed any global health and development projects, are to succeed in assisting developing nations. These changes include separating foreign policy goals from global health programs and providing the necessary political support to relieve the Agency from its dependence on US contractors and overly cautious decision making.

President Bush has already articulated some needed change. In his 2003 State of the Union Address, the President announced $10 billion of new funding to fight AIDS and asserted that, "The qualities of courage and compassion that we strive for in America also determine our conduct abroad. The American flag stands for more than our power and our interests." Yet instead of altering USAID's mission in line with such a principle, he set up a separate organization to administer those funds.

The creation of PEPFAR implicitly acknowledged that USAID lacks the flexibility and expertise to implement health projects. Indeed, the Department of Health and Human Services, including the Center for Disease Control, has superior medical know-how, with fewer strategic and procurement restrictions. Thus, even if USAID can make the necessary transparency and accountability improvements, health programs may never reach their full potential under USAID. Consequently, if US policy makers are intent on preserving USAID under its present "foreign aid in the national interest" orientation in order to carry out other development objectives (i.e. reconstructing Iraq and Afghanistan, democracy and governance programs etc…), they should seriously consider transferring responsibility for global health programs to another agency.

The bottom line is that USAID cannot realistically hope to offer much help to developing nations if it continues to preoccupy itself with funding US organizations and adopting only the most conservative, least controversial, often least effective, strategies. Its informational deficiencies, organizational problems and insular disposition cast serious doubt on the agency's ability to make good use of its resources. The combination of these factors has led to a watered-down, ineffective malaria program lacking in transparency and organization.

Though the scope of this paper is limited to malaria programs, and some of the problems highlighted in this paper are specific to that effort, many are symptomatic of larger shortcomings. These failings jeopardize the efficacy of all aspects of USAID's development mission, weaken American foreign policy capacity and misuse tax dollars. And as a major donor and leading trendsetter, USAID policies influence the actions of public and private givers across the globe. For the benefit of both donor and recipient, reforms at USAID are urgently needed.

**Glossary of Malaria and USAID-related Acronyms and Organizations**

**ACT** Artemisinin-based Combination Therapy. Medication with low resistance levels used for treating malaria.

**AED** Academy for Educational Development. Non-profit focused on improving health, education, and economic opportunities in the US and developing countries.

**AIM** Africa Initiative for Malaria Control. Initial effort by USAID, World Bank, and WHO to fight malaria, which eventually became Roll Back Malaria.

**ANC** Ante-Natal Care. Care of pregnant women including counseling, risk assessment, and general health care.

**BDMI** Bungoma District Malaria Initiative. USAID-funded, district-level initiative to fight malaria, led by Kenya's Ministry of Health with support from NGOs and cooperating agencies.

**CA** Cooperative Agreement or Cooperative Agency. Agreement involving a general area of work, or Agency performing a general assignment.

**CORE** Child Survival and Resources Group. An association of international NGOs that promotes the health of women and children in developing countries.

**CSH** Child Survival and Health

**CSHGP** Child Survival and Health Grants Program. Supports U.S. non-profit, NGOs and local partners to implement maternal and child health, family planning, HIV/AIDS and infectious disease programs.

**DDT** Dichloro-diphenyl-trichloroethane. First used in 1939 as an agricultural insecticide and later to prevent malaria and typhus.

**DHMI** Defense Healthcare Management Institute

**FAR** Federal Acquisition Regulation. Regulation for all federal agencies in their acquisition of supplies and services with appropriated funds.

**GFATM** Global Fund to Fight AIDS, Tuberculosis, and Malaria. Partnership between governments, civil society, and the private sector to fight AIDS, TB, and malaria.

**IQC** Indefinite Quantity Contracts. Contractor performs a specific scope of work for USAID, and individual country missions are able to make additional purchases of that contractor's service, as well.

**IDRC** International Development Research Center. Canadian public corporation that works with researchers from the developing world on health and poverty issues.

**IMCI** Integrated Management of Childhood Illnesses. WHO and UNICEF's approach to child health that focuses on the well-being of the whole child.

**IPT** Intermittent Preventive Therapy. Effective intervention to protect both a woman and her newborn from malarial infection.

**IRS** Indoor Residual Spraying. Reduces transmission of malaria by reducing the survival of malaria vectors entering houses or sleeping units.

**ITN** Insecticide Treated Bednets. Effective vector control when coverage rates are high and a large proportion of human-biting takes place at night.

**LDC** Less Developed Country

**MOH** Ministry of Health

**MSH** Management Sciences for Health. A private non-profit that works with its worldwide partners to improve the management of and access to health services.

**NPI** New Partnership Initiative. USAID's channeling of development funds through NGOs to promote economic growth and bolster democracy.

**PEPFAR** The President's Emergency Plan for AIDS Relief. A five-year, $15 initiative for HIV/AIDS prevention, treatment, and care, headed by the Office of the Global AIDS Coordinator in the US Department of State.

**PSI** Population Services International. Washington D.C. based non-profit that deploys commercial marketing strategies to promote health products and services to low-income people.

**PVO** Private Voluntary Organization. Private US organization registered with USAID to receive grants for development projects.

**RBM** Roll Back Malaria. Initiative by USAID, World Bank, and WHO to fight malaria.

**RFA** Request for Assistance. A bureau poses a problem or challenge, and competing organizations propose a program that will provide a solution.

**RFP** Request for Proposal. A bureau specifies what work it wants accomplished and judges the subsequent proposal submissions.

**SC** Save the Children. Independent organization that is a member of the International Save the Children Alliance, comprising 27 national Save the Children organizations.

**SO** Strategic Objectives

**SP+ART** Type of ACT medication.

**UNICEF** The United Nations Children's Fund. Works for child welfare and protection in over 157 countries. The majority of UNICEF's budget, which reached $1.6 billion in 2003, is provided by donor governments

**USAID** United States' Agency for International Development. US bilateral foreign assistance organization working in support of US foreign policy goals.

**WHO** World Health Organization.

**World Relief --** Baltimore-based, international humanitarian organization founded by the National Association of Evangelicals. It now works in over 20 countries, with the stated focus of helping the Church to reach the poor and suffering.

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**Professor Amir Attaran**
**Associate Fellow, Royal Institute of International Affairs, London, England; and Canada Research Chair, Institute of Population Health and Faculty of Law, University of Ottawa, Canada**

**Testimony before the Subcommittee on Federal Financial Management, Government Information, and International Security: Senate Committee on Homeland Security and Governmental Affairs "Examining USAID's Anti-Malaria Policies" – 12 May 2005**

**Honorable Members of the Senate —**
My deepest thanks for your compassionate interest to discuss malaria, and USAID's inadequate and unhelpful responses to it.

I believe that, by now, all of you are well acquainted with malaria—the fact that it is transmitted by mosquitoes; that it kills mainly children and young adult women; that it kills over 1 million victims each year, especially in tropical Africa and Asia; that it pauperizes whole families and sometimes countries (when not killing them, that is); that it is a threat to the American military, and hospitalized a quarter of our Marines in Liberia two years ago; and that there is today no vaccine to prevent it, though a vaccine has been said to be "ten years away" for at least the last 30 years.

Indeed malaria remains the number one killer disease of children in Africa—well ahead of AIDS, and equal to seven Boeing 747s loaded with kids, *crashing every day*. Waiting for a vaccine far in the future is just inhumane. For now, the leading options to control malaria are:

> (1) *kill the mosquitoes* with insecticides that are sprayed indoors in homes, whether on walls of the home or on bed-nets, or by draining the wetlands where mosquitoes breed (note that it is a thing of the past to spray big quantities of insecticides outdoors); or
>
> (2) *cure the patients* using medicines for severe clinical malaria and which, if they are the newest and best medicines called "artemisinin combination therapies" (ACT), also break the chain of transmission from the infected person to the next victim.

Those are the three main interventions to prevent or to cure—insecticides, bednets, medicines—and everyone agrees on this. But everyone does <u>not</u> agree on whether USAID should spend its money buying these things for poor people, so let me sketch out different views.

I believe that Africans, most of whom are different from Americans and live on under $2 a day, are poor. So when there is foreign aid money to spend, it should be spent on the poor foreigners—the Africans. But USAID disagrees with that. As you question them, you will discover they spend most of their malaria money on American consultants, American experts, and very highly paid American "non-profit" organizations. Curiously, USAID very rarely spends its money on the actual weapons of combat—the pills, the insecticides—that can really prevent or

treat malaria. Instead USAID prefers cozy and not very transparent deals with its contractors—deals so cozy that, to steal a phrase from President Dwight Eisenhower, they make up a "Foreign Aid Industrial Complex" which Senator Brownback's bill can break.

Let me give you some examples, and perhaps dive deeper into these during questions:

1. USAID tells the public it "strongly support[s]" the use of ACT medicines as the best to cure malaria.[1] But under pressure, it admitted that it "typically does not purchase drugs or medicines other than in exceptional or emergency circumstances for any of [its] programs"—not a single pill for a single patient, anywhere.[2] Yet even though they don't pay the medicine bill USAID often meddles in African countries affairs, as it did in telling Zambia to "go slow" and not use ACT, but to use a different medicine (called SP) that scientists know is inadequate and quickly leads to large scale childhood death.[3]

   If this is USAID's idea of "strong support", what would opposition look like? We see this same refusal to buy and supply also with insecticides like DDT—USAID says they support insecticide spraying, but they don't actually supply the goods, and have even blocked others who want to spend their own money on DDT.[4]

2. So where does the money go, if not to giving poor people the tools to survive malaria? Mostly to American contractors. For example, USAID has a $65 million project called NetMark, but instead of using that money to *give* away bednets to the poor as the Red Cross does, NetMark advertises and *sells* bednets to them.[5] NetMark is overseen by a USAID contractor called the Academy for Educational Development, which although a non-profit organization has some pretty hefty salaries and operating costs: their CEO paid himself $400,000 in salary and benefits in 2003—more than President Bush.[6] Getting transparent glimpses into this and other USAID contracts is almost impossible, since USAID had not published a list of its contracts since 2001, is not cooperative, and admits that details of many contracts "are not reported or collected centrally" in Washington.[2]

   The situation is so untransparent that if NetMark is good value—and I think giving away the nets probably is better value—nobody knows, because USAID doesn't keep even the most rudimentary details about its contracts where people can see them.

So as I said: poor Africans don't get even basic tools against malaria, while Americans get untransparent contracts for questionable work. Meanwhile the malaria deaths in Africa are increasing—soaring, actually. I thank you, and hope to be of service answering your questions.

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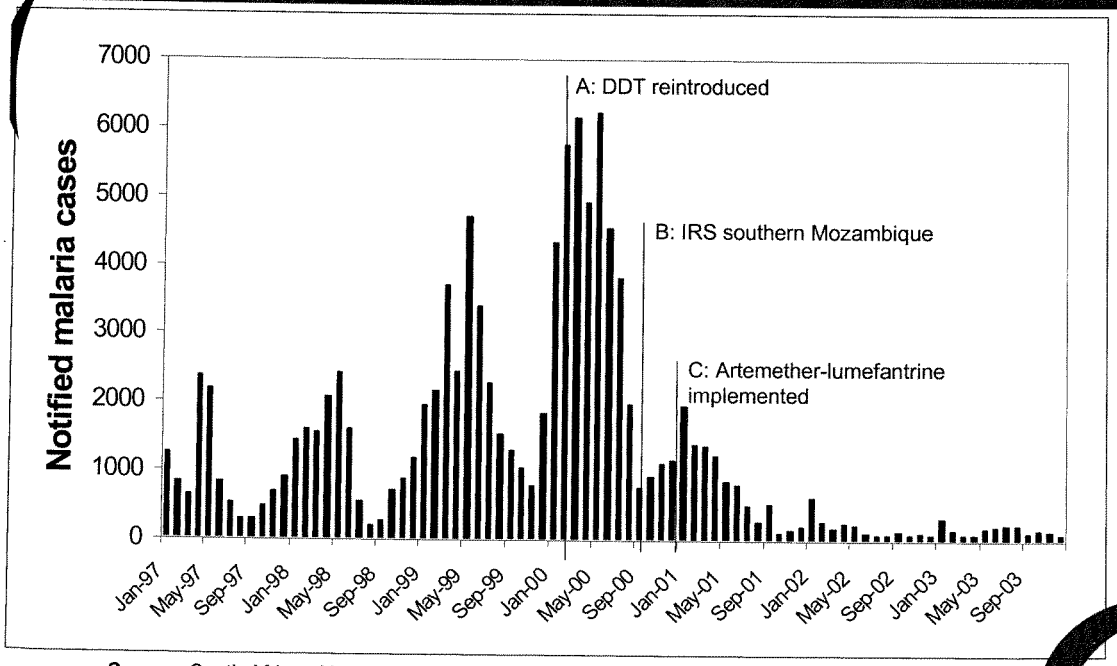
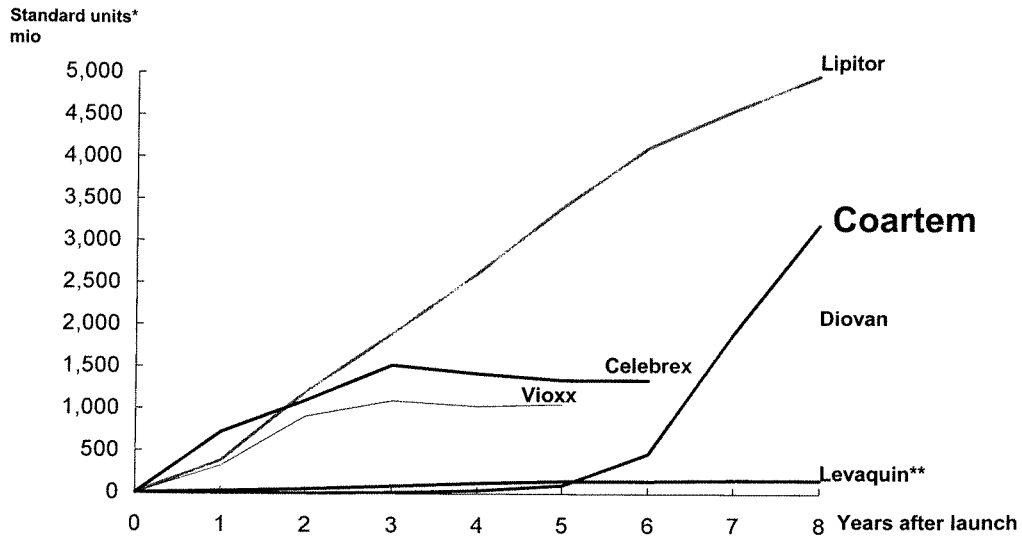
[1] Tom Masland, "Malaria Malpractice: Doctors accuse Western health officials of pushing cheap drugs instead of a more effective alternative", Newsweek, 24 May 2004.
[2] Email from Dennis Carroll, USAID, to this author, 4 June 2004.
[3] Email from Mary Ettling, USAID, to USAID Zambia team, 4 May 2001 (obtained under FOIA).
[4] Tina Rosenberg, "What the World Needs Now Is DDT" New York Times, 11 April 2004.
[5] See "What is NetMark?": http://www.netmarkafrica.org/whatisnetmark/index.html#what
[6] See Statement 14 of the IRS Form 990 filed by AED, available at www.guidestar.org.

## How DDT and Coartem stopped malaria in KwaZulu Natal, South Africa




**Source:** South African National Department of Health, Notification Data

# ovartis' expected pace of non-profit Coartem scale-up exceeds ven the most major pharmaceutical blockbusters




* US, Japan, top 5 EU ** US only

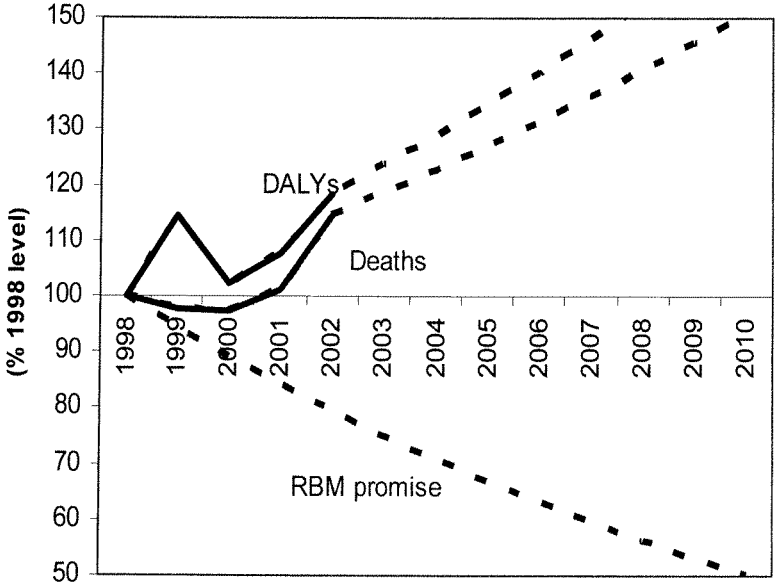
Source: IMS data



NOVARTIS

# "Roll Back, Malaria"

Trends for malaria deaths and DALYs, using WHO's own data



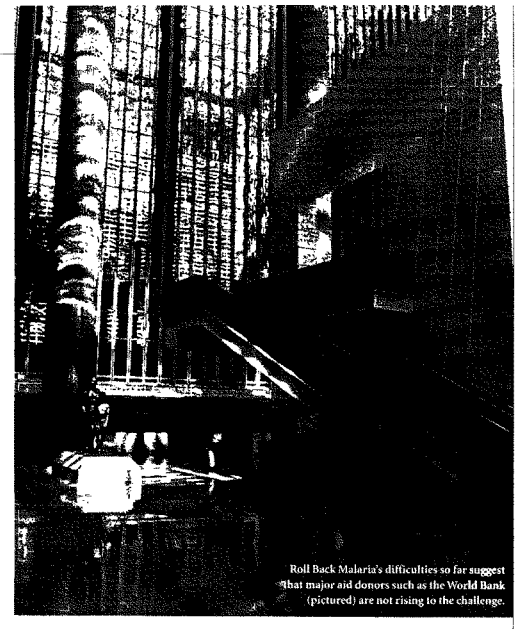

In 1998, the heads of WHO, UNDP, UNICEF and the World Bank launched the Roll Back Malaria partnership with the promise to reduce malaria death and disability by 50% by 2010.

USAID has funded and chaired the Roll Back Malaria board and had substantial influence over it.

**Far from halving as promised, both malaria deaths and disability have increased since.**

# Where did it all go wrong?

**International agencies have failed to meet their own malaria performance targets and should be held to account, says Amir Attaran.**



Roll Back Malaria's difficulties so far suggest that major aid donors such as the World Bank (pictured) are not rising to the challenge.

PHOTO: D. BOCK/SOCIAL COMMUNICATIONS

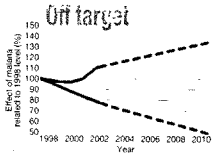
In May 1998, the director-general of the World Health Organization (WHO) announced a United Nations-led campaign to Roll Back Malaria (RBM), pledging to halve malaria deaths by 2010. Today, RBM is at the halfway point and the WHO's own statistics show deaths have actually increased (see graph, right). For the several hundred thousand children who died in the interim, RBM is not just a failure but a fatal betrayal by the United Nations.

How did this happen? The fundamental reason is political: the WHO launched RBM to create an advocacy splash, but has subsequently failed to ensure adequate funding.

The world's foreign-aid donors — powerful developed countries and the World Bank — have behaved with their usual parsimony, but the WHO has not been vocal enough to hold them to account. Aid funding for malaria control has barely grown. No wonder the *British Medical Journal* recently called RBM "a failing global health campaign"[1]. Without large increases in foreign aid, the least-developed countries that are most severely affected by malaria can do little. They have an average public-health expenditure of barely US$6 per person annually[2].

This figure would be more had African governments honoured their promise at a conference in Abuja, Nigeria, in 2001 to spend 15% of their budgets on health. But even if they had, the vast majority of malaria control in the poorest countries would still need to be paid for out of foreign aid.

So how much foreign aid is available to control malaria? The WHO's most recent estimate was that "approximately US$200 million was earmarked for malaria control worldwide" in 2002, including both domestic and foreign-aid budgets[3]. This is roughly consistent with an estimate for 2000 by myself and Vasant Narasimhan[4] of $100 million, which counted only the foreign-aid budget.




Most recently, the Global Fund to Fight AIDS, Tuberculosis and Malaria gave cause for optimism by pledging $895 million over two years, rising perhaps to $1.8 billion over five years[5]. At an average rate of $360 million annually, assuming full disbursement, this will be the largest increase in malaria-control funding for decades[6].

But making significant progress will require billions of dollars annually, not millions. There is a precedent: malaria-control funding in the 1960s did reach such levels[7]. RBM has said that Africa needs $1 billion annually[3]. A more careful peer-reviewed estimate is that at least $1.6 billion is needed just for malaria medicines in Africa alone[8].

Add in the cost of disease prevention — such as bednets and insecticides — training and staff costs, and the fact that many of the world's malaria fatalities occur outside Africa[9], and a fair guess for the worldwide price tag must be at least $5 billion annually.

Thus, even with the advent of the Global Fund, there is far too little foreign aid to combat malaria. This suggests that a more deliberate, more aggressive strategy to drive up donor aid is needed. To start with, it would be desirable to audit routinely how much each donor spends on malaria control, so that progress — or lack of it — can be tracked.

## Tied up in red tape

At the moment, attempts to obtain foreign-aid figures are hampered by bureaucracy and poor availability of accurate, up-to-date data. Of 23 developed countries I surveyed in 2002, 13 seemed unable or unwilling to disclose their malaria-control funding, even after nine months and several reminders[4].

For this article, I surveyed three major aid donors: the World Bank, the US Agency for International Development (USAID) and



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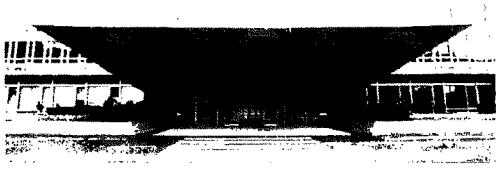

P. VIROT/WHO

The World Health Organization has pledged to halve malaria deaths by 2010 — but it has yet to make much progress.

the United Nations Children's Fund (UNICEF). The World Bank is the world's top donor of foreign aid, USAID is the foreign-aid agency of the world's only superpower, and UNICEF is the world's top child-health agency. How much does each spend on malaria?

A World Bank announcement on Africa Malaria Day in April 2000 pledged between $300 million and $500 million towards the eradication of malaria in Africa. In an earlier study, I estimated that the bank earmarked $44 million of loans for malaria control aid in 2002 (ref. 4). For this article, the bank declined to supply me directly with data, but in a statement to *Nature* it claimed to have earmarked loans totalling between $100 million and $150 million for malaria control since 2000. Beyond that, it is difficult to know how much else the bank is spending on malaria. Its statement points to "non-earmarked monies" that may indirectly affect malaria (for example debt cancellation), but which it says are "difficult to quantify" because the bank does not track disease-specific details.

Whereas the World Bank supports a country's overall malaria-control budget, UNICEF and USAID tend to support discrete projects on the ground. Although RBM acknowledges that prompt and effective treatment are essential to reduce malaria deaths, neither UNICEF nor USAID buys more than a tiny quantity of malaria medicines.

In personal correspondence, USAID said that it spends about 34% of its $65.6-million annual budget for malaria on treatment. But it adds that it "typically does not purchase ... [malaria] medicines other than in exceptional or emergency circumstances", and that the quantities are "not large". It states that, instead, its strategy is "building the systems to procure, manage, and use the drugs".

## Obsolete medicines

UNICEF does routinely buy and supply antimalarials, but the amounts are trivial: just $3.7-million worth in 2003. Worse, most of that was spent on obsolete drugs that, because of resistance, usually do not work. Examples are chloroquine in Kenya and sulphadoxine-pyrimethamine in Burundi, which are so ineffective neither government sanctions their use. UNICEF spent only $1 million on more effective drugs, the artemisinin combination therapies, even though these are the RBM-endorsed standard.

A similar picture emerges for buying and supplying bednets and insecticides. UNICEF spent $17.3 million on these in 2003. USAID could not provide breakdowns for spending on each, although it spent $8.4 million in 2003 on a partnership with private contractor NetMark, which sells (not gives) bednets to impoverished Africans, a practice that is controversial.

UNICEF says that it also invests "notable sums" in programmes that strengthen healthcare delivery in general and which may benefit malaria control in the long run, such as the training of healthcare workers and education campaigns. But it provided no figures for what proportion of this investment directly relates to malaria control.

This all raises hard questions about legitimacy. The World Bank has said malaria slows economic growth in African countries by 1.3% per year. Over 35 years, this equates to a 32% reduction in GDP, worth in the range of $100 billion[10]. If the bank fails to fulfil its own pledge on malaria control in Africa, while observing that its economies are so severely affected by the disease, is it actually doing international development? And if UNICEF, USAID and the World Bank cannot provide detailed audits of their malaria spending, is that a transparent use of taxpayers' money?

One lesson is clear: congresses, national parliaments and ultimately the public need to 'take back malaria'. Imagine if the managers of a project in a private company consistently missed their performance targets by a large margin. The company would be in trouble, and it would sack the managers.

Exactly the same should be true of the public agencies and officials who have for six years missed their performance target to reduce and ultimately halve malaria deaths. I suggest that legislators hold hearings into why the agencies have failed to roll back malaria, and take the necessary action. If that sounds harsh, weigh it against the number of children whose lives were tragically lost in the interim to a preventable, curable disease. ■

I. BERRY/MAGNUM PHOTOS

Under pressure: sub-Saharan Africa bears the brunt of malaria's scourge.

**Amir Attaran is associate professor of population health and law at the University of Ottawa, Canada, and associate fellow at the Royal Institute of International Affairs, UK.**

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Viewpoint

# WHO, the Global Fund, and medical malpractice in malaria treatment

*Amir Attaran, Karen I Barnes, Christopher Curtis, Umberto d'Alessandro, Caterina I Fanello, Mary R Galinski, Gilbert Kokwaro, Sornchai Looareesuwan, Michael Makanga, Theonest K Mutabingwa, Ambrose Talisuna, Jean François Trape, William M Watkins*

In 1998, WHO launched a new, high profile campaign to Roll Back Malaria, with the stated goal to halve malaria deaths worldwide by 2010.[1] Achieving that goal requires preventive interventions (eg, insecticide-treated bednets, household insecticide spraying), but the main difference between life and death for malaria patients hinges on appropriate treatments. Simply, each malaria case must be promptly and accurately diagnosed, and treated with an effective malaria drug.

However, with nearly half the time to the 2010 deadline now past, progress on effective treatment is so inadequate that Roll Back Malaria is failing to reach its targets. Far from being on track to halve malaria deaths, WHO acknowledges that "RBM [Roll Back Malaria] is acting against a background of increasing malaria burden".[2]

Of the several reasons that could cause malaria deaths to increase, one stands out most prominently: drug resistance in the deadly species of malaria, *Plasmodium falciparum*. WHO now writes of "global malaria control . . . being threatened on an unprecedented scale" by continued use of outdated drugs such as chloroquine, which is ineffective in most parts of Africa, and sulfadoxine-pyrimethamine, which is becoming so.[3] For example, in East Africa, surveillance and clinical trial data show that up to 64% of patients given chloroquine and 45% given sulfadoxine-pyrimethamine will fail treatment, and those figures are climbing.[4,5]

When treatment failure becomes so frequent, malaria deaths rise greatly, especially in children. In West Africa (Senegal), results of a 12-year community-based study[6] showed that the onset of chloroquine resistance at least doubled childhood malaria death risk, and in some sites, increased it up to 11-fold in the youngest children. In East and southern Africa, the proportion of children dying from malaria doubled as chloroquine and later sulfadoxine-pyrimethamine resistance took hold from the 1980s to the 1990s, even as deaths from other causes declined.[7] Elsewhere in Africa, chloroquine resistance increased the proportion of admissions to hospital and deaths from malaria by two-fold to four-fold.[8]

These links between drug resistance, treatment failure, and finally death are not controversial. WHO concurs that chloroquine resistance is a "very likely" reason why childhood malaria deaths in Africa are increasing, and that chloroquine "has become useless in most malaria-endemic areas".[3,9] WHO further agrees that resistance to sulfadoxine-pyrimethamine, which is often the replacement for chloroquine, "is also widespread and its use [too] will soon have to be discontinued".[3] That is borne out in Kenya, where a decision 5 years ago (1998) to switch from chloroquine to sulfadoxine-pyrimethamine treatment is already faltering because sulfadoxine-pyrimethamine treatment failure quickly reached dangerous levels.[4,10]

The demise of chloroquine and sulfadoxine-pyrimethamine leave artemisinin-class combination therapies (ACT) as the best treatment option. The main reason for treating malaria with combination therapy is the same as for AIDS, tuberculosis, and leprosy, in which it is standard practice: patients given two (or more) robust and highly effective drugs are less likely to encounter drug resistance and fail treatment—which brings both clinical and public-health benefits. These benefits have now been shown in a large meta-analysis[11] of nearly 6000 patients, which shows that combining existing malaria drugs with an artemisinin both reduces patients' risk of treatment failure (by 75%), while lessening the pool of infectious parasites (gametocytes) that transmit the disease to others. In studies done on nearly every continent,[12-19] ACT successfully treats 90% or more of patients. That level of success can probably be maintained for a very long time, since artemisinins have been used as Chinese traditional medicines for 2000 years, with no observed resistance.[20,21]

The superiority of ACT is now so established that of the five treatments WHO recommends for drug resistant *P falciparum* malaria, four are ACTs (the other is a "short-term solution" for countries that cannot use ACT immediately).[3] ACT is now the preferred policy for WHO and the Roll Back Malaria campaign as a whole:

> "Recently WHO has formulated policy that elevates combination drug therapy to preferred first therapy for all malaria infections in areas where *P falciparum* is the predominant infecting species of malaria. Combination therapy (CT) with formulations containing an artemisinin compound (ACT) is the policy standard . . ."[22]

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**Royal Institute of International Affairs, London, UK** (A Attaran LLB); **Division of Pharmacology, University of Cape Town, Republic of South Africa** (K I Barnes MD); **Department of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, UK** (C Curtis PhD, C I Fanello PhD); **Department of Parasitology, Prince Leopold Institute of Tropical Medicine, Antwerp, Belgium** (U D'Alessandro MD); **Malaria Foundation International, Atlanta, GA, USA** (M R Galinski PhD); **Faculty of Pharmacy, University of Nairobi, Kenya** (G Kokwaro PhD); **Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand** (S Looareesuwan MD); **Kenya Medical Research Institute-Wellcome Trust Research Programme, Kenya** (M Makanga MBChB); **East African Network for Monitoring Antimalarial Treatment (EANMAT), Tanga, Tanzania** (T K Mutabingwa MD); **Epidemiological Surveillance Division, Ministry of Health, Kampala, Uganda** (A Talisuna PhD); **Institut de Recherche pour le Développement, Dakar, Sénégal** (J-F Trape MD); **Department of Pharmacology and Therapeutics, University of Liverpool, UK** (W M Watkins PhD)

**Correspondence to:** Dr Amir Attaran (e-mail: aattaran@riia.org)

| | Parasitological failure (%) | | Clinical failure (%) | |
|---|---|---|---|---|
| | Chloroquine | Sulfadoxine-pyrimethamine | Chloroquine | Sulfadoxine-pyrimethamine |
| Ethiopia | 88 (82–94) | .. | 79 (51–93) | .. |
| Kenya | 71* | 23 (13–38) | 64 (32–87) | 8 (0–52) |
| Senegal | 42 (24–59) | 0 | 13 (10–16) | .. |
| Uganda | 41 (10–96) | 17 (0–73) | 28 (9–89) | 10 (0–25) |

Data are median (range). See reference 24 for original data sources and methods, which vary. *Range not available.

**Parasitological and clinical failure rates for *P falciparum* malaria in some African countries, 1996–2002**

However, WHO violates its own policy standard regularly. Most African countries reluctantly cling to chloroquine, sulfadoxine-pyrimethamine, or the insignificantly better combination of chloroquine and sulfadoxine-pyrimethamine, because ACT is ten times more expensive and, therefore, unaffordable to them.[2,23] When those same countries seek financial aid from the Global Fund for AIDS, Tuberculosis, and Malaria (GFATM) to purchase ACT, they are forcefully pressured out of it by governments such as the USA, whose aid officials say that ACT is too expensive and "not ready for prime time".[24] WHO acquiesces to this pressure to cut costs, and despite a policy that names ACT as the gold standard of treatment, WHO signs its approval when GFATM funds cheap but ineffective chloroquine or sulfadoxine-pyrimethamine to treat *P falciparum* malaria.

This series of errors is illustrated by several projects currently supported by GFATM. Although GFATM claims it supports only projects that use "proven and effective interventions" and "interventions that work", in Africa in 2003, it allocated more funds to purchasing of chloroquine and sulfadoxine-pyrimethamine than to ACT.[25] In January, 2003 (funding round 2), Africa was allocated US$16·1 million for ACT, $27·7 million for chloroquine, and $10·8 million for sulfadoxine-pyrimethamine (round 2). The corresponding amounts for October, 2003 (funding round 3), were $2·2 million, $2·4 million, and $0·5 million.[26]

These budgetary differences are not insignificant. The unit price differences between chloroquine ($0·13), sulfadoxine-pyrimethamine ($0·14), and ACT ($1·00–3·00) mean that patients given chloroquine and sulfadoxine-pyrimethamine will outnumber those given ACT by at least ten to one.[2] Since GFATM plans this budget for countries where chloroquine and sulfadoxine-pyrimethamine resistance in *P falciparum* is well advanced (table), many patients with malaria will fail treatment—and sometimes die.[27]

Senegal has switched in 2003 from chloroquine to combination therapy for malaria treatment, but until this change GFATM agreed to continue chloroquine treatment, despite the known increase in child mortality (two-fold to 11-fold) that it causes.[8] In Kenya, GFATM rejected the government's request to finance ACT, but later agreed to finance sulfadoxine-pyrimethamine, despite evidence that sulfadoxine-pyrimethamine treatment failure exceeds 50% in some districts (eg, Kibwezi).[4,28] In Ethiopia and Uganda, GFATM agreed to finance the combination treatment of chloroquine and sulfadoxine-pyrimethamine—a pairing that WHO describes as "not recommended"—while falsely insisting that its action is "consistent with current treatment guidelines of WHO".[29,30]

These are very obvious errors of scientific and medical judgment; and although WHO might be expected to spearhead a corrective intervention, the evidence suggests that it instead exacerbated the errors. In Kenya, Ethiopia, and Uganda, WHO's country representatives reviewed the funding proposals in which inappropriate drugs were sought—and signed their approval. Those signatures follow a declaration that WHO "has participated throughout the . . . process" of developing the proposal to GFATM, and that it "reviewed the final proposal and [is] happy to support it".[31-33]

These decisions are indefensible. For WHO and GFATM to provide chloroquine and sulfadoxine-pyrimethamine treatments in the countries we cite as examples at least wastes precious international aid money, and at most, kills patients who have malaria. If one takes the measured increase in childhood malaria mortality that follows *P falciparum* drug resistance (two-fold to 11-fold) and extrapolates it to populations in which GFATM is funding chloroquine or sulfadoxine-pyrimethamine despite resistance (more than 100 million people in the four countries we name), then at least tens of thousands of children die every year as a direct result. Those patients who survive will often become much sicker and require retreatment, at some further expense of time and money. We do not exaggerate to state that, based on the outcomes, there is no ethical or legal difference that separates them from conduct otherwise condemned as medical malpractice (compare the case in which a doctor or pharmacist who, like these institutions, knowingly furnished treatments that failed perhaps 80% of the time, while withholding the alternatives as "too expensive").

These problems might be discounted as aberrations, but for the evidence that they recur systematically. In addition to the four countries we name here, a WHO memorandum names five others where GFATM funded chloroquine and where, less than 2 years later, governments must already re-evaluate and move toward ACT.[7] Accordingly, there is often a disconnection between official policy, which favours ACT, and the reality created by WHO and GFATM, who routinely approve and finance inferior drugs. It is essential to understand why this has happened to repair the situation.

To begin with, WHO has failed to define the medical norms for malaria treatment. Although there are carefully crafted WHO model treatment guidelines for HIV/AIDS and tuberculosis (the latter are in their third edition), to date for malaria, recommendations are found only in scattered WHO reports, rather than in official, comprehensive WHO malaria treatment guidelines.[34,35] The lack of any such norms handicaps poor countries, who naturally hesitate to change their treatment policies and request funding for ACT when that displeases the powerful donor governments who warn them—usually in private—that ACT is too expensive.[2,24] The same lack of norms also causes WHO to miss opportunities to intervene and recommend ACT. That is probably why WHO country representatives, poorly informed by Geneva, gave approval to GFATM applications for ineffective drugs that violate WHO policy.

In theory, the GFATM's Technical Review Panel should block proposals like this, but as the evidence shows, it often approves ineffective drugs for funding. For example, the panel approved Uganda's GFATM proposal with praise for "strategies based on best practices", when in fact the malaria treatment proposed (chloroquine and sulfadoxine-pyrimethamine) is very plainly "not recommended" by WHO's experts.[29,36] Such decisions seem puzzling, until one realises that the Technical Review Panel is not actually a "technical" review panel. The four malaria reviewers on the Technical Review Panel are selected by a points-based system, in which "technical knowledge . . . and ability to judge whether proposals are . . . scientifically sound" count for only 22% of that decision.[37] By contrast, "familiarity

with international processes and . . . partnerships" and "familiarity with multisectoral approaches" count for twice as much (44%), even though it is hard to know what those criteria really mean.

The evidence therefore shows that the current practices of WHO and GFATM are not adequate to safeguard the best interests of patients with malaria. We offer several recommendations for improvement.

Above all, WHO should publish malaria treatment guidelines that countries can depend on as authoritative norms. Those guidelines should consolidate and broaden the knowledge in various WHO reports, in a single, systematic presentation that is reviewed every year, and that addresses clinical algorithms, diagnostic methods, malaria case definitions, standard treatment regimens, definitions of cure, and so on.[39,18] WHO can do this for malaria by copying its own actions on HIV/AIDS: first, WHO convened treatment specialists to debate and write the AIDS treatment guidelines, and second, it set the campaign goal of treating 3 million AIDS patients in developing countries by 2005.[34,39] Importantly, that is the opposite sequence to Roll Back Malaria, which, in 2003 still does not have the treatment guidelines to reach the 1998 pledge of halving malaria mortality in this decade.

Next, once they exist, WHO treatment guidelines should be used to judge each proposal for malaria treatment, so that only effective drugs receive GFATM funding. Although this recommendation seems obvious, neither WHO nor GFATM believe it is within their mandate. Both agencies emphasise their roles as mere advisers or funders, while emphasising that selection of malaria treatments is properly done by countries—who, in our experience, are often pressurised by aid donors.[24] The fact that neither agency believes it has the obligation to intervene and ensure that lives and money are not wasted is proof that a new entity is necessary.

We recommend that a new review committee be created, which is composed of independent malaria treatment experts, convened by WHO, and tasked by GFATM to review each proposal seeking finance for malaria drugs. This Green Light Committee (so called because it controls the green light that lets a drug be financed and supplied) has an exact precedent in tuberculosis. In 2000, outside experts created a Green Light Committee, with WHO support, to review countries' proposals to fund drugs for multidrug-resistant tuberculosis.[40] Later, this Green Light Committee and the GFATM integrated their procedures, and today, countries wanting drugs for multidrug-resistant tuberculosis submit applications to both the Green Light Committee and GFATM in a single envelope, so that the technical and financial decisions affecting treatment happen together. The need for a similar malaria Green Light Committee is undeniable, since multidrug resistance in malaria is much more common than in tuberculosis.

Once the WHO treatment guidelines exist and the malaria Green Light Committee is operational, its first task should be to retrospectively review all GFATM-funded countries in view of the guidelines. To let the full (usually 5 year) duration of financing run without updating the standard of care, where justified by the evidence, would be unethical. This retrospective review will be easiest for countries where GFATM funding has been approved but not yet disbursed (eg, Uganda), although it should also be done for countries where disbursement is underway. If a retrospective review finds that a country cannot use chloroquine or sulfadoxine-pyrimethamine safely, and instead requires costlier ACT, then GFATM should entertain a supplemental funding proposal.

Finally, to ensure equally wrong-headed decisions do not affect any intervention or disease again, GFATM should return to its original principles—and make the technical review panel a truly technical entity. Panelists should be selected on the basis of 100% technical and scientific knowledge, not 22%, as is true now.

None of these recommendations imply new implementation challenges for WHO and GFATM. Most have clear precedents in the HIV/AIDS or tuberculosis field, which means that equal treatment for malaria must be possible.

The scientific community must now watch future developments closely, because numerous earlier warnings have been ignored. In 1999, several authors wrote in *The Lancet* to warn of an impending "malaria disaster", which is now apparent in rising malaria deaths.[20] In 2000, one of the authors (AA) reported that aid agencies were funding ineffective malaria drugs, but the agencies denied that accusation and forcefully opposed a proposal to link technical review to funding decisions.[21,42] Similarly, our recommendation to create a malaria Green Light Committee has not been answered, either affirmatively or negatively, by WHO and GFATM in several months. Rather, WHO has reiterated its earlier policy statements favouring ACT—the same statements that were not heeded through these many errors—and established a new unit responsible for addressing tuberculosis and HIV drug resistance—but not malaria.[2,43]

The weight of evidence leads us to conclude that a crisis exists, characterised by institutional inadequacies that result in good policies for malaria control not being fulfilled. Although the inadequacies are easily rectified, a risk exists that if WHO and GFATM do not act with celerity, the reputations of both will be tainted such that rich governments lose confidence and cease funding them. That would deal a tragic blow not only to malaria treatment, but also to the spectrum of efforts against malaria, tuberculosis, and AIDS, which require and deserve billions of dollars wisely spent. The evidence now proves that money is often unwisely spent—very dangerous evidence indeed—and no delay is tolerable in fixing that.

*Conflict of interest statement*

A Attaran advises Novartis on its not-for-profit partnership with WHO for the joint distribution of ACT (Coartem) in developing countries.
K Barnes is a recipient of grants from WHO and GFATM for malaria research, monitoring, and evaluation of ACT in South Africa. C Curtis is the recipient of research grants from WHO in which ACT is used.
U d'Alessandro advises GlaxoSmithKline on development and safety of malaria drugs and vaccines. M Galinski is president of Malaria Foundation International, which has received funding for advocacy of Roll Back Malaria. G Kokwaro advises the not-for-profit Medicines for Malaria Venture on development of new drugs, including ACT.
S Looareesuwan is coordinator of WHO's SEAMEO TROPMED Network, and director for Thailand. T Mutabingwa and W Watkins are Chairman and member of the secretariat, respectively, for the East African Network for Monitoring Antimalarial Treatment, which has effectively supported studies using ACT. W Watkins advises GlaxoSmithKline on development of new malaria drugs, including ACT. Most of the authors have participated in WHO-organised expert consultations or conferences at some time. All authors write in their personal capacity and do not represent the views of any institution or company.

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The New York Times

# Malaria, the Terrorist's Friend

By AMIR ATTARAN
Published: September 25, 2003

CAMBRIDGE, Mass. — When the United States Marine Corps went ashore in Liberia in August, it discovered an enemy that had no ties to the various factions in the civil war there. More than 50 of the 225 service members, roughly a quarter, who landed in Liberia last month were hospitalized because of a longtime scourge of mankind: malaria.

This figure reveals a troubling gap in the military's preparations for dealing with unrest and terrorism overseas. Existing medicines for malaria are so ineffective or have such unpleasant side effects that they offer little real protection, yet many of the places terrorists could hide are rife with the disease.

The Department of Defense knows that malaria — which causes fever, and if untreated, anemia and death — is a threat. In Liberia, the marines were armed with the best malaria medicines, mosquito repellents and antimosquito suits that the Pentagon's money could buy. Since the Vietnam War, when malaria was the most common cause of hospitalization after combat wounds, commanders have known that soldiers in the tropics are vulnerable. A malaria epidemic during the Somalia deployment in the early 1990's reinforced this lesson. Yet little has been done despite scientists' warnings and abundant evidence that existing medicines are near the end of their useful life because drug-resistant strains of malaria have emerged.

Although the Army has the world's most successful malaria drug laboratory — the Walter Reed Army Institute of Research has discovered three of the five most effective drugs since World War II — the Department of Defense allocates it only $8 million a year. Other contributions raise the institute's budget to $13 million.

These sums are woefully inadequate. If a terrorist group had a weapon that would hospitalize 25 percent of American soldiers within weeks, wouldn't the Pentagon spend more than $8 million a year to defend against it?

The malaria cases in Liberia provide a lesson to any budding terrorist: base yourself in a tropical country with lots of deadly Plasmodium falciparum malaria. If you recruit locals to your cause, their acquired immunity will keep them relatively safe. And if America sends troops, they'll soon be too incapacitated to do much.

In a world where terrorists are as mobile as the soldiers pursuing them, America can

hardly afford to declare some places off limits. Yet our troops' vulnerability to malaria is so great, as the Liberia deployment proves, that we may have to do just that, even when they are protected by the latest technology.

What is needed is a crash program of malaria drug development. The announcement this week by the Bill and Melinda Gates Foundation that it was awarding grants of $168 million for vaccine and drug research and malaria prevention programs in Africa is welcome news. But the United States must do more. Instead of $8 million a year, Congress should appropriate $200 million for a partnership between the Army's labs, other government labs and the pharmaceutical industry. This is reasonable and commensurate with what the administration is spending on preparedness for other biological threats, like smallpox and the ebola virus.

There is also a humanitarian bonus. Not only would these new medicines improve America's military preparedness, but they would also probably help the one million or more people worldwide who are killed by malaria every year.

The choice is to spend a few million out of a Pentagon budget measured in the hundreds of billions, or to cede a huge swath of the tropics to terrorists proliferating under the protection of mosquitoes and microbes mightier than American troops.

*Amir Attaran, an immunologist, is a fellow at the Royal Institute of International Affairs and the Africa Fighting Malaria Foundation.*

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The New York Times

April 11, 2004

# What the World Needs Now Is DDT

By TINA ROSENBERG

Above left: With equipment provided by Unicef, a 1960 DDT team prepared to go house to house in Masuleh, Iran. Center: DDT was an insecticide of choice in the United States. Then, in 1962, came Rachel Carson's "Silent Spring." Right: A female mosquito, needing blood to nourish her eggs, sucks away with her probiscus.

The year 2000 was a time of plague for the South African town of Ndumo, on the border of Mozambique. That March, while the world was focused on AIDS, more than 7,000 people came to the local health clinic with malaria. The South African Defense Force was called in, and soldiers set up tents outside the clinic to treat the sick. At the district hospital 30 miles away in Mosvold, the wards filled with patients suffering with the headache, weakness and fever of malaria -- 2,303 patients that month. "I thought we were going to get buried in malaria," said Hervey Vaughan Williams, the hospital's medical manager.

Today, malaria has all but vanished in Ndumo. In March 2003, the clinic treated nine malaria cases; Mosvold Hospital, only three.

As malaria surges once again in Africa, victories are few. But South Africa is beating the disease with a simple remedy: spraying the inside walls of houses in affected regions once a year. Several insecticides can be used, but South Africa has chosen the most effective one. It lasts twice as long as the alternatives. It repels mosquitoes in addition to killing them, which delays the onset of pesticide-resistance. It costs a quarter as much as the next cheapest insecticide. It is DDT.

KwaZulu-Natal, the province of South Africa where Ndumo and Mosvold are located, sprayed with

DDT until 1996, then stopped, in part under pressure from other nations, and switched to another insecticide. But mosquitoes proved to be resistant to the new insecticide, and malaria cases soared. Since DDT was brought back in 2000, malaria is once again under control. To South Africans, DDT is their best defense against a killer disease.

To Americans, DDT is simply a killer. Ask Americans over 40 to name the most dangerous chemical they know, and chances are that they will say DDT. Dichloro-diphenyl-trichloroethane was banned in the United States in 1972. The chemical was once sprayed in huge quantities over cities and fields of cotton and other crops. Its persistence in the ecosystem, where it builds up to kill birds and fish, has become a symbol of the dangers of playing God with nature, an icon of human arrogance. Countries throughout the world have signed a treaty promising to phase out its use.

Yet what really merits outrage about DDT today is not that South Africa still uses it, as do about five other countries for routine malaria control and about 10 more for emergencies. It is that dozens more do not. Malaria is a disease Westerners no longer have to think about. Independent malariologists believe it kills two million people a year, mainly children under 5 and 90 percent of them in Africa. Until it was overtaken by AIDS in 1999, it was Africa's leading killer. One in 20 African children dies of malaria, and many of those who survive are brain-damaged. Each year, 300 to 500 million people worldwide get malaria. During the rainy season in some parts of Africa, entire villages of people lie in bed, shivering with fever, too weak to stand or eat. Many spend a good part of the year incapacitated, which cripples African economies. A commission of the World Health Organization found that malaria alone shrinks the economy in countries where it is most endemic by 20 percent over 15 years. There is currently no vaccine. While travelers to malarial regions can take prophylactic medicines, these drugs are too toxic for long-term use for residents.

Yet DDT, the very insecticide that eradicated malaria in developed nations, has been essentially deactivated as a malaria-control tool today. The paradox is that sprayed in tiny quantities inside houses -- the only way anyone proposes to use it today -- DDT is most likely not harmful to people or the environment. Certainly, the possible harm from DDT is vastly outweighed by its ability to save children's lives.

o one concerned about the environmental damage of DDT set out to kill African children. But various factors, chiefly the persistence of DDT's toxic image in the West and the disproportionate weight that American decisions carry worldwide, have conspired to make it essentially unavailable to most malarial nations. With the exception of South Africa and a few others, African countries

depend heavily on donors to pay for malaria control. But at the moment, there is only one country in the world getting donor money to finance the use of DDT: Eritrea, which gets money for its program from the World Bank with the understanding that it will look for alternatives. Major donors, including the United States Agency for International Development, or Usaid, have not financed any use of DDT, and global health institutions like W.H.O. and its malaria program, Roll Back Malaria, actively discourage countries from using it.

Part of the reason for DDT's marginalization is that its delivery method, house spraying, doesn't work everywhere. Insecticide sprayed inside houses repels mosquitoes -- and kills those that do make it indoors and perch on walls -- for several months. Since most mosquitoes bite at night, when people are likely to be indoors, the spray reduces the number of times people are bitten. If around 80 percent of houses are covered, spraying protects everyone, as the bites that take place will be from mosquitoes less likely to have bitten an infected person. But house spraying is only effective against mosquitoes that bite indoors -- not all do. It also requires a government capable of organizing, training and equipping sprayers, which is beyond the reach of some countries.

Even when spraying is possible, though, developed nations don't want to pay for it. Instead, the malaria establishment in developed nations promotes the use of insecticide-treated nets that people can buy to hang over their beds. Treated bed nets are indeed a useful tool for controlling malaria. But they have significant limitations, and one reason malaria has surged is that they have essentially become the only tool promoted by Western donors. "I cannot envision the possibility of rolling back malaria without the power of DDT," said Renato Gusm-o, who headed antimalaria programs at the Pan American Health Organization, or P.A.H.O., the branch of W.H.O. that covers the Americas. "Impregnated bed nets are an auxiliary. In tropical Africa, if you don't use DDT, forget it."

The other reason DDT has fallen into disuse is wealthy countries' fear of a double standard. "For us to be buying and using in another country something we don't allow in our own country raises the specter of preferential treatment," said E. Anne Peterson, the assistant administrator for global health at Usaid. "We certainly have to think about 'What would the American people think and want?' and 'What would Africans think if we're going to do to them what we wouldn't do to our own people?'"

Given the malignant history of American companies employing dangerous drugs and pesticides overseas that they would not or could not use at home, it is understandable why Washington officials say it would be hypocritical to finance DDT in poor nations. But children sick with malaria might perceive a more deadly hypocrisy in our failure to do so: America and Europe used DDT irresponsibly to wipe out malaria. Once we discovered it was harming the ecosystem, we made even its safe use impossible for far poorer and sicker nations.

Today, westerners with no memory of malaria often assume it has always been only a tropical disease. But malaria was once found as far north as Boston and Montreal. Oliver Cromwell died of malaria, and Shakespeare alludes to it (as "ague") in eight plays. Malaria no longer afflicts the United States, Canada and Northern Europe in part because of changes in living habits -- the shift to cities, better sanitation, window screens. But another major reason was DDT, sprayed from airplanes over American cities and towns while children played outside.

In Southern Europe, Latin America and Asia, DDT played an even more prominent role in controlling malaria. A malaria-eradication campaign with DDT began nearly worldwide in the 1950's. When it started, India was losing 800,000 people every year to malaria. By the late 1960's, deaths in India were approaching zero. In Sri Lanka, then called Ceylon, 2.8 million cases of malaria

per year fell to 17. In 1970, the National Academy of Sciences wrote in a report that "to only a few chemicals does man owe as great a debt as to DDT" and credited the insecticide, perhaps with some exaggeration, with saving half a billion lives.

From the 1940's to the late 1960's, indoor house spraying with DDT was tested all over Africa. It was least effective in the lowland savannas of West Africa, but even partly successful programs provided considerable health improvements. And in other parts of Africa, DDT reduced the infant mortality rate by half and in some places wiped out malaria completely.

Still, DDT was falling out of favor even before the 1962 publication of "Silent Spring," Rachel Carson's book that described the dumping of DDT and other pesticides on American towns and farms and detailed the destruction they caused. DDT had not been sold as a way to control malaria but to eradicate it, so the world would never have to think about malaria again. But eradication failed -- it is now considered biologically impossible -- and because DDT had not lived up to its billing, disillusion set in. At the same time, DDT's indiscriminate use was provoking the development of resistance among mosquitoes, and many countries were shifting to decentralized health systems, which meant they were no longer able to organize nationwide house spraying.

The move away from DDT in the 60's and 70's led to a resurgence of malaria in various countries -- Sri Lanka, Madagascar, Swaziland, South Africa and Belize, to cite a few; those countries that then returned to DDT saw their epidemics controlled. In Mexico in the 1980's, malaria cases rose and fell with the quantity of DDT sprayed. Donald Roberts, a professor at the Uniformed Services University of the Health Sciences in Bethesda, Md., has argued that when Latin America stopped using DDT in the 1980's, malaria immediately rose, leading to more than a million extra cases a year. The one country that continued to beat malaria was Ecuador, the one country that kept using DDT.

In the few countries where it is used today, DDT is no longer sprayed from airplanes, and no country admits to using it as an insecticide for crops -- although there are probably cases where it is diverted for agricultural use. Its only legitimate use is inside houses. Roberts said that the quantities used for house spraying are so small that Guyana, to take one example, could protect every single citizen of its malarious zones with the same amount of DDT once used to spray 1,000 acres of cotton. "The negative environmental effects of DDT use that led to its banning were due to massive, widespread agricultural use," says a fact sheet published by Usaid (no fan of the chemical). "Spraying limited amounts of DDT inside houses is considered unlikely to have major negative environmental impact."

What about DDT's impact on the people inside the houses? The most serious evidence of DDT's harm to humans are a few studies showing that higher levels of DDE (the form DDT takes when it metabolizes) in a mother's blood is associated with premature birth and shorter duration of breast-feeding. But other studies have found no such associations. There was suspicion that DDT causes breast cancer, but study after study has found no connection. In general, DDT is feared for its effect on the environment, not on humans. It has been used on such a huge scale over the last 50 years that it is reasonable to think that if it had any serious effect on human health, we would know it by now.

Rereading "Silent Spring," I was again impressed by the book's many virtues. It was serialized in The New Yorker in June 1962 and published in book form that September -- a time when Americans were living in the golden glow of postwar progress and science was revered. "Silent Spring" for the first time caused Americans to question the scientists and officials who had been

assuring them that no harm would result from the rain of pesticides falling on their farms, parks and backyards. Carson detailed how DDT travels up the food chain in greater and greater concentrations, how robins died when they ate earthworms exposed to DDT, how DDT doomed eagle young to an early death, how salmon died because DDT had killed the stream insects they ate, how fiddler crabs collapsed in convulsions in tidal marshes sprayed with DDT.

"Silent Spring" changed the relationship many Americans had with their government and introduced the concept of ecology and the interconnectedness of systems into the national debate. Rachel Carson started the environmental movement. Few books have done more to change the world.

But this time around, I was also struck by something that did not occur to me when I first read the book in the early 1980's. In her 297 pages, Rachel Carson never mentioned the fact that by the time she was writing, DDT was responsible for saving tens of millions of lives, perhaps hundreds of millions.

DDT killed bald eagles because of its persistence in the environment. "Silent Spring" is now killing African children because of its persistence in the public mind. Public opinion is so firm on DDT that even officials who know it can be employed safely dare not recommend its use. "The significant issue is whether or not it can be used even in ways that are probably not causing environmental, animal or human damage when there is a general feeling by the public and environmental community that this is a nasty product," said David Brandling-Bennett, the former deputy director of P.A.H.O. Anne Peterson, the Usaid official, explained that part of the reason her agency doesn't finance DDT is that doing so would require a battle for public opinion. "You'd have to explain to everybody why this is really O.K. and safe every time you do it," she said -- so you go with the alternative that everyone is comfortable with.

"Why it can't be dealt with rationally, as you'd deal with any other insecticide, I don't know," said Janet Hemingway, director of the Liverpool School of Tropical Medicine. "People get upset about DDT and merrily go and recommend an insecticide that is much more toxic."

Because the ban on DDT became the midwife to the environmental movement, the debate about it, even today, is bizarrely polarized. Most environmental groups don't object to DDT where it is used appropriately and is necessary to fight malaria. But liberals still tend to consider it a symbol of the Frankenstein effects of unbridled faith in technology. For conservatives, whose Web sites foam at the mouth about the hypocrisy of environmentalists, DDT continues to represent the victory of overzealous regulators and Luddites who misread and distort science.

So far, conservatives have not been able to budge Usaid, even though they have managed to remake the agency's overseas AIDS programs to promote abstinence and discredit condom use. But malaria is not part of the public debate as AIDS is, and DDT does not have the same cultural urgency for the religious right that abstinence does.

William Ruckelshaus, the head of the newly created Environmental Protection Agency, banned DDT in 1972. It remains one of the most controversial decisions the E.P.A. has ever taken. Ruckelshaus was under a storm of pressure to ban DDT. But Judge Edmund Sweeney, who ran the E.P.A.'s hearings on DDT, concluded that DDT was not hazardous to humans and could be used in ways that did not harm wildlife. Ruckelshaus banned it anyway, for all but emergencies.

Ruckelshaus made the right decision -- for the United States. At the time, DDT was mainly sprayed on crops, mostly cotton, a use far riskier than indoor house spraying. There was no malaria in the

United States -- in part thanks to DDT -- so there were no public health benefits from its use. "But if I were a decision maker in Sri Lanka, where the benefits from use outweigh the risks, I would decide differently," Ruckleshaus told me recently. "It's not up to us to balance risks and benefits for other people. There's arrogance in the idea that everybody's going to do what we do. We're not making these decisions for the rest of the world, are we?"

n fact, we are -- the central reason that African nations who need DDT do not use it today. Washington is the major donor to W.H.O. and Roll Back Malaria, and most of the rest of the financing for those groups comes from Europe, where DDT is also banned. There is no law that says if America cannot use DDT then neither can Mozambique, but that's how it works. The ban in America and other wealthy countries has, first of all, turned poor nations' agricultural sectors against DDT for economic reasons. A shipment of Zimbabwean tobacco, for example, was blocked from entering the United States market because it contained traces of DDT, turning Zimbabwe's powerful tobacco farmers into an effective anti-DDT lobby. From a health point of view, of course, American outrage would have been more appropriate if traces of tobacco had been found in their DDT than the other way around.

Then there are chemical companies. "I get asked all the time -- are you being paid by chemical companies?" said Thomas DeGregori, a professor of economics at the University of Houston and an advocate for DDT. The question is amusing, because the corporate interests in this issue are actually on the other side. DDT is no longer on patent, and it is known to be made only in India and China -- and the price has soared since the rich-country ban put manufacturers out of business, making it harder for poor countries to buy. Janet Hemingway of the Liverpool School, who advises African governments, said that she and the officials she works with are often lobbied by chemical companies selling more expensive insecticides, telling her about DDT's evils. "Clearly, they'd like to see DDT banned -- it cuts into their markets," she said.

But more important to DDT's demise has been pressure from the international malaria establishment. Sometimes it is direct. Mexico gave up DDT, for example, because the North American Free Trade Agreement obligated it to. Donald Roberts, who was working in Belize in the early 1990's, said that Usaid told the country to stop using DDT or it would lose foreign assistance. (Belize did, and malaria rates soared.)

In May 2001, 91 countries and the European Community signed a treaty in Stockholm on 12 persistent organic pollutants, the "dirty dozen." It banned nine outright. For DDT, the treaty allowed its use in indoor spraying for public health purposes, but called for its gradual phase-out. DDT's exemption, which had been opposed by environmental groups but supported by malariologists, did allow countries dependent on DDT to continue to use it for the present. But Stockholm's guiding principle -- phase it out -- is one more factor that discourages donors from financing DDT.

Brian Sharp, who is leading South Africa's house-spraying program, said that some international research agencies will not finance studies in any way associated with DDT. Roll Back Malaria sees its mosquito-control strategy as promoting bed nets, period. Its 2003 Africa report hardly mentions house spraying. The Global Fund to Fight AIDS, Tuberculosis and Malaria -- which uses guidelines set by W.H.O. -- currently finances no DDT. Vinand Nantulya, senior adviser to the fund's executive director, said that the fund might theoretically supply DDT to a country that requests it -- but none have. This is no surprise: these countries work closely with W.H.O. and advisers from Usaid to formulate their proposals to the Global Fund, and they are unlikely to ask for things that stand a low chance of approval. Many African scientists and health officials report being told by donors, "You'll have trouble getting money for this" or "Donors believe this has unacceptable

environmental effects." The balance of power is so tilted toward the donors in these relationships that poor countries will go quite far out of their way to not offend. DDT is controversial; better not to ask.

In 1999, the Pan American Health Organization recommended that Ecuador use DDT to control malaria in the wake of El Nino. The World Bank said no. In a document explaining its decision, the bank said, "Because of the controversial issues surrounding DDT, the World Bank's malaria team discourages the habitual use of DDT for malaria control." Renato Gusm-o of P.A.H.O. said that the bank's environmental group told him it was fighting for the elimination of DDT and could not allow the bank to finance DDT while advocating a ban.

In many countries, decisions about DDT are made by environmental ministries, with little input from health officials. When Colombia banned DDT in the early 1990's, for example, "people in public health found out when they read about it in the newspaper," Gusm-o said. Malaria cases more than doubled. The 1980's and 1990's also saw the rise of environmental units within the health institutions and donors like the World Bank. These watchdog units were much needed and in general have been a crucial tool to protect the environment. But they look at only the risks, not the benefits. Walter Vergara, the World Bank official who headed the unit that dismissed DDT in Ecuador, defended the decision to me: "DDT has an awful impact on the biosystem and is being eliminated by the world community. There are alternatives. We're not the only species on the planet."

Said David Brandling-Bennett, the former deputy director: "My experience at P.A.H.O. was that the malaria community eventually gave in to heavy pressure from environmental groups, including within the organization. There was a fairly heavy debate in P.A.H.O. a few years back about whether we should use DDT where it is effective. But the overwhelming perception of DDT as the nastiest kid on the block just made it very difficult to argue for continuing. Really, the malaria community retreated."

When Lee Jong-Wook became head of W.H.O. last year, he wrote an article for The Lancet, the British medical journal, setting out his vision. Lee wrote about AIDS, about SARS, about strengthening public health systems. He did not mention malaria.

Probably the worst thing that ever happened to malaria in poor nations was its eradication in rich ones. That has made one of Africa's leading killers shockingly invisible. "'Silent Spring' had a clear message about things at home Americans could see and touch and feel," said Brooks B. Yeager, vice president of the Global Threats Program for the World Wildlife Fund. "Americans who live on the Carolina coast know the brown pelicans have come back" since DDT spraying was halted. "Malaria is a long way away. You have to read about it or see in person its devastation, and not many Americans have the opportunity to do it."

Lawrence Barat, the World Bank's adviser on malaria control, said, "When I tell people I work on malaria, sometimes I get, 'Gee, I didn't know it still existed.'"

One of the most depressing aspects of talking about malaria is that you get to hear the phrase "the powerful AIDS lobby," a term no one but a malariologist would use. AIDS in the third world is still criminally underfinanced, but at least it gets some money and a lot of attention. Malaria gets AIDS's dregs. AIDS was a sudden plague, very visible in its choice of victims, and it has a vocal constituency in rich countries. Even in Africa, malaria gets nowhere near the attention of AIDS. It

has always been around, and it kills not middle-class adults but rural 4-year-olds, who don't have much of a lobby.

Malaria's status can be read in the aid figures. By the 1990's, it was almost completely ignored, and Africa's malaria-control programs disintegrated. In some countries, the entire federal antimalaria program employed only two or three people. When developed nations got together to begin Roll Back Malaria in 1998, they pledged money to meet its goal of cutting the death toll from malaria in half by 2010, but have then proceeded to donate peanuts. In 2000, according to Amir Attaran, a Massachusetts-based fellow of the Royal Institute for International Affairs, the 23 richest countries in the world plus the World Bank together provided $100 million to fight malaria -- less than a tenth of the annual sum necessary to meet Roll Back Malaria's goals.

The AIDS epidemic has begun to excite a broader interest in third-world diseases, and malaria has benefited, especially from the establishment of the Global Fund, which has approved $499 million for malaria -- although it has only actually disbursed a tenth of that amount. Usaid, which in 1998 gave just $12 million to fight malaria, now gives $80 million a year, a notable advance.

But money is still very short. One illustration of donor stinginess is the fact that the world today employs malaria cures that don't work. As resistant strains of malaria have evolved, chloroquine, the most popular remedy, fails up to 80 percent of the time, and a newer treatment, Fansidar, is not much better and is getting worse. They are still in use because they are cheap; chloroquine costs only pennies per dose, a cost most African families can handle themselves. New, effective drugs are available, but they cost a minimum of 40 cents for a child's treatment and $1.50 for an adult's, which means that African governments -- and therefore donors -- will have to pay. Only a handful of Africa's 42 malaria-endemic countries have switched; one is South Africa, where the new drugs have been partly responsible for the country's recent success. Those prices may not seem like much to cure malaria, especially when contrasted with the hundreds of dollars a year for life needed to treat AIDS. But 40 cents a child is apparently too much for donors to provide.

The lack of political interest in malaria has been a very important factor in the decline of house spraying and rise of bed nets. Bed nets follow the fashion in development assistance today: bypass the government and work through private sector, nongovernmental groups and with the affected people themselves. People can buy nets in a store for $2 to $10, or their subsidized or even free distribution can be integrated into other health programs, like vaccination days.

Bed nets are an exciting and important form of mosquito control. But they have major drawbacks. Even a few dollars is still too much money. People surveyed in rural Africa about what they would like to buy listed a bed net as only the sixth product on their wish list. The first three were a bicycle, a radio and, most heartbreakingly, a plastic bucket. The price is also kept artificially high because most countries, shamefully, still tax bed nets. And until nets with long-lasting insecticide can be widely distributed, bed nets need regular retreatment. It is insecticide that protects, not the net, and the insecticide wears off without people knowing it.

Both bed nets and house spraying can be effective, and studies comparing costs differ on which is cheaper. For the world malaria establishment, however, one huge difference is that with house spraying, the central government -- and therefore donors -- bear the cost. Financing repeated rounds of spraying, donors argue, is not sustainable. "But 'sustainable' is what you choose to sustain," Amir Attaran fumed. "Nobody demands my garbage collection in Cambridge, Mass., be sustainable. The garbageman comes once a week, and it is accepted that society pays for that."

Mozambique is now doing house spraying successfully and cheaply without a national army of sprayers and a fleet of S.U.V.'s. Mozambique hires a few people in each community and gives them two weeks of training and the materials they need. Those sprayers then walk from house to house, spraying each one twice a year. "It helps save on transport costs, and the fact that sprayers come from the community makes it a lot more credible in terms of people accepting what is done in their households," said Jotham Mthembu, KwaZulu-Natal's malaria control program manager, who also advises the program in neighboring Mozambique. Mozambique, because it depends on Western donors, uses a more expensive insecticide. But if it used DDT, it could protect people for $1.70 per person per year.

There are other ways to control mosquitoes. Parts of India, for example, are having success stocking mosquito-breeding ponds with guppies, who eat mosquito larvae. But India's ingenious strategy would not work in Africa, where mosquitoes breed in cattle hoofprints during the rainy season.

Malaria must be more than simply a line item in the health budget. Malaria kills tourism and foreign investment. It greatly reduces human intelligence and productivity and lessens agricultural yields. Against these costs, a nation's business sectors and economic ministries should willingly join the fight -- and donors must begin to think of malaria control as an unusually cost-effective antipoverty program.

South Africa's success is inspiring another look at DDT around the continent. Uganda, Kenya and other places are now examining whether it could work in their nations. If it could, donors should encourage it. DDT is a victim of its success, having so thoroughly eliminated malaria in wealthy nations that we forget why we once needed it. But malaria kills Africans today. Those worried about the arrogance of playing God should realize that we have forged an instrument of salvation, and we choose to hide it under our robes.

*Tina Rosenberg writes editorials for The New York Times. Her last article for the magazine was about global corruption.*

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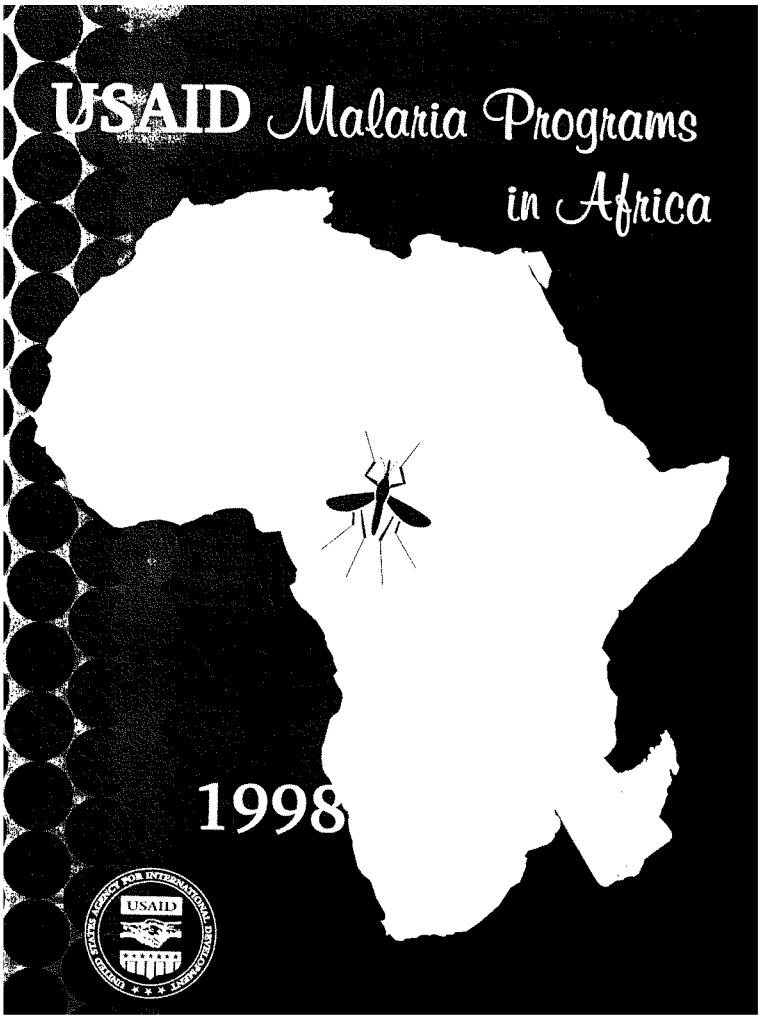
USAID Malaria Programs in Africa
1998
USAID

## USAID Funding for Malaria Programs FY 1998 to FY 2003
(in U.S. dollars)

| Country | FY 1998 | FY 1999 | FY 2000 | FY 2001 | FY 2002 | FY 2003 |
|---|---|---|---|---|---|---|
| Angola | | | 1,075,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Benin | 500,000 | 500,000 | 830,000 | 828,000 | 1,500,000 | 1,000,000 |
| Burundi | | | | | | 400,000 |
| DR Congo | | | 400,000 | 998,000 | 1,300,000 | 1,100,000 |
| Eritrea | 400,000 | 100,000 | 385,000 | 499,000 | 600,000 | 600,000 |
| Ethiopia | 650,000 | 500,000 | 500,000 | 499,000 | 1,100,000 | 900,000 |
| Ghana | 200,000 | 500,000 | 500,000 | 599,000 | 900,000 | 1,000,000 |
| Kenya | 138,000 | 1,000,000 | 695,000 | 698,000 | 1,200,000 | 1,200,000 |
| Liberia | | | | | | 300,000 |
| Madagascar | | | | | 300,000 | 600,000 |
| Malawi | 500,000 | 500,000 | 956,000 | 1,347,000 | 1,800,000 | 1,500,000 |
| Mali | | | | | 800,000 | 1,000,000 |
| Mozambique | 734,000 | | 800,000 | 1,497,000 | 600,000 | 500,000 |
| Nigeria | | | 1,450,000 | 2,495,000 | 2,900,000 | 3,000,000 |
| Rwanda | | 300,000 | 300,000 | 299,000 | 600,000 | 750,000 |
| Senegal | | | 160,000 | 2,494,000 | 2,500,000 | 2,500,000 |
| Sudan | | | | | | 300,000 |
| Tanzania | | 340,000 | | | 600,000 | 400,000 |
| Uganda | | | 860,000 | 2,993,000 | 3,000,000 | 3,000,000 |
| Zambia | 1,000,000 | 1,000,000 | 1,935,000 | 3,991,000 | 4,000,000 | 4,000,000 |
| WARP | 500,000 | 500,000 | 500,000 | 499,000 | 800,000 | 800,000 |
| REDSO/ESA | 250,000 | 400,000 | 500,000 | 499,000 | 1,100,000 | 1,200,000 |
| AFR/SD | 3,184,000 | 3,048,000 | 5,020,000 | 4,772,000 | 4,807,000 | 3,660,000 |
| **Total Bureau for Africa** | ***8,056,000*** | ***8,688,000*** | ***16,866,000*** | ***26,007,000*** | ***31,407,000*** | ***30,710,000*** |
| **Total Bureau for Asia and the Near East** | 50,000 | 1,075,000 | 1,166,000 | 3,100,000 | 3,762,000 | 7,764,000 |
| **Total Bureau for Europe and Eurasia** | | | 195,000 | | 1,000,000 | 1,000,000 |
| **Total Bureau for Latin America and the Caribbean** | 2,120,000 | 1,800,000 | 1,236,000 | 3,127,000 | 4,115,000 | 4,120,000 |
| **Total Bureau for Global Health** | 3,600,000 | 2,539,000 | 8,575,000 | 15,354,000 | 18,343,000 | 21,994,000 |
| **Total Bureau for Humanitarian Assistance** | | | 1,820,000 | 1,803,000 | 2,373,000 | |
| **Total Global Fund for AIDS,Tuberculosis, and Malaria** | | | | | 5,000,000 | |
| **TOTAL** | **13,826,000** | **14,102,000** | **29,858,000** | **49,391,000** | **66,000,000** | **65,588,000** |

**Note:** In FY 1998, the funding is all infectious disease (ID) directive; in FY 1999, FY 2000, and FY 2001, it is both ID and child survival funding; FY 2002 and FY 2003 include additional FREEDOM Support Act funding in Europe and Eurasia.

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# World Health Organization

*Report for the Review of Collaborating Partner Product Pricing*

*Summary Document*

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## INTRODUCTION

The World Health Organization ("WHO"), has entered into a Memorandum of Understanding "MOU" on May 23, 2001 with Novartis Pharma AG ("Novartis") whereby Novartis has agreed to furnish the anti-malarial drug Coartem® "the Product" to WHO for redistribution to public sector agencies in the developing world. In this endeavour, WHO is anxious to ensure that the costs charged for the Product to the public sector agencies are kept to the minimum. In accordance with Art 6.3 of the MOU WHO, through the Office of Internal Audit and Oversight, sought to confirm compliance with certain contractual obligations relating to Product pricing, notably that the price charged does not exceed Novartis' costs as outlined in Annex 4 of the MOU and therefore commissioned a review of which this report contains a summary of the work performed and the principal findings.

## THE SCOPE OF THE REVIEW

This engagement was undertaken in accordance with the International Standard on Auditing applicable to agreed-upon procedures engagements. Both WHO and Novartis representatives agreed the procedures to be performed as part of the review and this report presents the factual findings as a result the procedures performed.

The fieldwork was performed during October and November including visits to Novartis' offices in Bâle, with some supporting information being provided by their Toll Manufacturing site in Beijing, China.

### WORK PERFORMED

The assumptions, terms and conditions governing the production and availability of the Product are summarized in the MOU and are the responsibility of two parties to the MOU. The procedures were agreed with the WHO and Novartis and were performed solely to assist in evaluating the validity of the specified elements of the data reported and made available by the parties under the terms of the MOU and are summarized and itemised as follows:

1. We met with Novartis Finance and Standard Cost Management representatives to obtain an understanding of the overall approach adopted by Novartis in the determination of the costs for the products.
2. We obtained and checked the mathematical accuracy of the underlying schedules, information models (i.e. bills of materials) and analysis, provided by Novartis, supporting the calculation of the costs involved in the production of the WHO (as per Annex 4 of the MOU) for:
    a. Costs of all active substances
    b. Costs of formulation
    c. Costs of packaging
    d. Royalties payable to third parties.
3. On a test basis, we have agreed the "net total costs" to the underlying manufacturing standard cost records (i.e. for the July 3rd, 2002 and November 8th 2002 standard cost calculations as per the bills of materials etc.) supporting the direct and indirect cost "charges" for the

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Product (based on the Nopas 148421 Coartem Tab 20/120 30 (6x4) I05) as accounted for within Novartis' underlying information systems

4. On a test basis, we have agreed the "elements used" in the calculations to the underlying detailed information and cost allocations reported by the applicable production units. We also identified where the application of "inter-company charges" or a form of "tax" was included in the costs.
5. We obtained and checked the mathematical accuracy and the breakdown of the financial results supporting the "actual" costs for the components for each of the above mentioned categories of cost (i.e. active substances, formulation, packaging and royalties) relating to the production of the Product.
6. We obtained and checked the mathematical accuracy and the breakdown of the financial information supporting the "actual" costs for the components for each of the above mentioned categories of cost relating to the production of the Product under the Toll Manufacturing agreement in China.
7. Specifically in relation to the "royalties", we reviewed extracts of the License & Development Agreement, i.e. the "royalty agreement" between CIBA-GEIGY Ltd (now Novartis Pharma AG) and the representatives of the CITIC Technology Inc of the People's Republic of China signed on September 20th 1994, covering the Product
8. We compared key trends (historic and projected) in the costs of the elements of the Product, through comparing the last two standard cost calculations to determine if there were any significant changes in the cost structure in addition to comparing the standard cost calculation with that of Riamet© (i.e. the commercial version of the Product) based on information supplied by Novartis.

## PRINCIPAL FINDINGS

Neither WHO nor Novartis was able to provide reliable information concerning the determination of the "baseline" product pricing structure that was used to fix the original Product supply price, per the MOU, of US$ 2.40.

Therefore, the determination of the cost for the standard reference pack for Coartem®, i.e. the NOPAS 148421 Coartem Tab 20/120 30 (6x4), was based on the standard cost information provided by Novartis. The accumulation of the related costs has been calculated as US$ 3.25 as of July 2002 and US$ 3.20 based on the standard cost for November 2002 i.e. the cost to be applied for 2003, resulting in a difference per pack in favour of WHO

We report our findings below:

a) With respect to item 1, we found that the practices adopted by Novartis reflected normal business practices and that the individual components of the cost records were supported by plausible explanations without exception.

b) With respect to item 2, we found the cost records were supported by detailed standard cost calculations without exception. On a test basis, we have agreed the "production elements" information in the pricing calculations to the underlying detail reported by Novartis without exception.

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c) With respect to item 3, we found the information concerning production costs and packaging used to be consistent with the data used in items 1 and 2.

d) With respect to item 4, we found the amounts arriving at the "Total Production Costs" to be as per the summary calculation mentioned above.

e) With respect to item 5, we found the mathematical accuracy of the underlying supporting Product standard cost schedules to be correct. We compared the costs, for all material items included in the calculations to supporting corroborative information (e.g. copies of supplier invoices etc.). On a test basis we found that the independently available information to be consistent with the costs recorded.

f) With respect to item 6, we reviewed the listing and the mathematical accuracy of the underlying supporting Product standard cost schedules provided by Beijing Novartis Pharma Ltd. We compared the costs, for all material items included in the calculations to supporting corroborative information (e.g. copies of supplier invoices etc.) We have confirmed that the reported total production costs as per the latest standard cost calculation. (Note: As we did not visit the Beijing Novartis Pharma Ltd facility we were unable to confirm that the extract of the standard costs provided by Beijing Novartis Pharma Ltd were in agreement with the underlying accounting records).

g) With respect to item 7, we found the amounts in the agreement agreed to the calculation of the royalties for the year was based on the "Net sales of the Product sold". We also reviewed a copy of the invoice for the royalties paid for 2001, which was in accordance with an extract of the underlying accounting records.

h) With respect to item 8, we found the comparison of the standard cost records (extract of the underlying accounting records) supporting the detailed cost calculation of Riamet©, (i.e. the commercial version of the Product) as of July 2002 were only marginally higher than the equivalent standard pack size for the Product.

## LIMITATIONS

There were no factors that came to our attention that led us to believe that full disclosure, under the terms of the MOU, was not complied with by Novartis in supporting this review.

Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

As the services provided under this engagement did not constitute an audit *per se* this report does not constitute the issuance of any formal expression of a conclusion or any form of assurance with respect to the financial data or statements or the internal controls of Novartis.

This report is issued solely for the purpose set forth in the first paragraph of this document, titled "Introduction".

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## APPENDIX 1 : Information Received

The following is a list of the information obtained in the connection with this review.

| Document Name | Source |
|---|---|
| Memorandum of Understanding, i.e. the "agreement" between Novartis Pharma AG) and the representatives of WHO signed on May 23rd 2001, covering the Product | WHO |
| Extracts of the License & Development Agreement, i.e. the "royalty agreement" between CIBA-GEIGY Ltd (now Novartis Pharma AG) and the representatives of the CITIC Technology Inc of the People's Republic of China signed on September 20th 1994, covering the Product | Novartis Pharma AG |
| Royalty Payment Summary – CITIC Technology | Novartis Pharma AG (Systems printscreen extract) |
| Royalty Payment Invoice – CITIC Technology | Novartis Pharma AG |
| Novartis Coartem/Riamet Net Sales for 2001 | Novartis Pharma AG (Excel spreadsheet) |
| Novartis Coartem/Riamet Sales to WHO for 2001 | Novartis Pharma AG (Excel spreadsheet) |
| Novartis Coartem Sales to WHO for period up to Sept 2002 | Novartis Pharma AG (Excel spreadsheet) |
| Analysis Cost Calculation – NOPAS 148421 Coartem Tab 20/120 30 (6x4) (value 1000 packs/720'000 tablets) | Novartis Pharma AG |
| Analysis Cost Calculation – NOPAS 132195 Coartem Tab 20/120 U17 (2x8) (value 1000 packs/16 tablets per pack) | Novartis Pharma AG |
| Novartis Pharma AG Basel Income Statement LE3 2002 | Novartis Pharma AG |
| Bill of materials/Standard Cost Calculation July 2002– NOPAS 148421 Coartem Tab 20/120 30 (6x4) (value 1000 packs/720'000 tablets) | Novartis Pharma AG |
| Bill of materials/Standard Cost Calculation November 2002– NOPAS 148421 Coartem Tab 20/120 30 (6x4) (value 1000 packs/720'000 tablets) | Novartis Pharma AG |
| Bill of materials/Standard Cost Calculation July 2002– NOPAS 146687 Riamet Tab 20/120 30 (3x8) | Novartis Pharma AG |
| Summary of Material Costs - Beijing | Novartis Beijing – Excel sheet |
| Bill of Material - Beijing (Coartem Tab 20/120 30 (6x4) WHO) | Novartis Beijing |
| Bill of Material/price list update - Beijing | Novartis Beijing – Excel sheet 8/11/02 |
| Sample Copy of sample Invoice for purchase of Artemether | Supplier Beijing |
| Sample Copy of sample Invoice for purchase of Lumefantrine (dated 24/5/02) | Orgamol SA |
| Copies of Invoices for IC sales of Coartem (Novartis Beijing Pharma Ltd to Novartis Pharma AG | Novartis Beijing |
| Copies of Invoices for sales of Coartem (Novartis Pharma AG to WHO Agents) | Novartis Beijing |
| Copies of freight documents supporting invoices for sales of Coartem (Novartis Pharma AG to WHO Agents) | WHO |
| | |

**Statement by**

**Carlos C. (Kent) Campbell MD MPH**

**Program Director**
**MACEPA (Malaria Control & Evaluation Program in Africa)**

**before**

**Subcommittee on Federal Financial Management,**
**Government Information, and International Security**

**United States Senate**

**May 12, 2005**

I want to express my appreciation to the Subcommittee on Federal Financial Management, Government Information, and International Security for the opportunity to provide testimony on the critical inputs that are currently required to make progress in controlling the health toll of malaria, particularly in Africa.

Having said this, I must also express my concern that, while are currently experiencing a golden moment when critical attention and crucial support for malaria control in Africa is increasing, we may find that in five years national leaders and international donors question the soundness of investing in malaria control due to lack of dramatic, well-documented progress. It is within our grasp, yet we are arguably not capitalizing on the opportunity.

Recently a Minister of Health in Africa said to me pointedly, "Don't tell us what to do, help us do it"! He voiced an important challenge to us all.

**Malaria control: we know what to do**

Malaria is the leading killer of children in Africa, accounting for approximately 20 percent of deaths in children under the age of five. I am sure you have all heard the appalling statistic, "a child dies in Africa every thirty seconds because of malaria." It is true. Africa's malaria burden is worsening, and many factors, including expanding drug resistance, faltering health services, and the growing impact of HIV/AIDS on health services, contribute to malaria's growing toll on the continent's health and economic potential.

Malaria strains health systems, particularly in Africa, where it accounts for between 30 and 50 percent of hospital admissions and up to 50 percent of outpatient visits in high-transmission areas. Malaria costs Africa more than US$12 billion annually. It has slowed economic growth in African countries by 1.3 percent per year, the compounded effects of which are a gross domestic product level up to 32 percent lower than it would have been if malaria been eliminated in1960.

During the past decade several interventions have proven highly effective in reducing malaria burden. These interventions include: (1) use of insecticide treated nets (ITNs), especially for infants and pregnant women; (2) intermittent preventive treatment in pregnant women; and (3) prompt and effective case management, particularly among children who have fallen ill from the disease.

Indoor residual spraying (IRS) has been used to control transmission in several southern Africa settings characterized by low intensity seasonal risk. The World Health Organization (WHO) has advocated IRS use where public health infrastructure is adequately developed and financed.

**Seizing the moment: demonstrating the impact of malaria control in Africa**

In Africa it is time for focused support to national governments to rapidly raise malaria program coverage to benefit minimally 80% of vulnerable populations. The global community has the tools to accomplish this in short order. What are required are global leadership and commitment, effective management and monitoring support to countries to assure that critical resources, such as the Global Fund, are employed effectively. The potential health and economic benefits will accrue rapidly and will be enormous.

During the past 5 years there has been a dramatic infusion of financial support for national malaria control programming and the procurement of insecticide treated nets and malaria drugs. The Global Fund alone has allocated over $300 million for programming just in Africa. Further, national governments are beginning to prioritize malaria control in national budgets.

The concern is that national expansion of malaria programming in Africa has been sluggish despite highly effective tools and substantial funding. Recent surveys indicate that current national coverage levels in Africa for each of the interventions range from 5 to 40 percent.

The key requirements for scaling up coverage of malaria control programs include:

- A durable political commitment to malaria control in African nations
- Effective national coordination of program partners and management of programming
- Adequate supplies and health sector staffing
- A sustainable financial base for funding malaria control programs

There are controversial issues in malaria control (e.g., which drugs to use where, what means of using insecticides, etc.). Most of these controversies are fueled by the widespread inaction and lack of measured progress to date rather than specific controversy over the potential effectiveness of the use of the available tools. In reality, the controversies in the press about these tools undermine the credibility of the feasibility of bringing malaria under control.

**The opportunity to get malaria control right and the critical role for the U.S. government**

Based on my 30 years experience working on malaria in Africa with various agencies, and currently having the unique opportunity to work with countries committed to making dramatic progress in malaria programming at the national scale, I suggest several priorities for the organization and content of U.S. government support:.

Building national success stories is a critical investment
In Africa we do not have well-documented examples of successful national malaria control programming. Malaria, while historically an enormous health and economic drain on African countries, is only beginning to be prioritized in national planning and budgeting. One point of view is that the focus of advocacy in the next few years should be to assure that there are several well documented, national scope programming success examples to dispel the sense that malaria control is not possible. This implies focusing some resources on a limited number of countries. Further, investment in quality documentation of the health and economic impact of malaria control is vital.

More resources to support malaria control are critical
Malaria control at the national scale costs money. The commodities (nets, drugs, insecticides) costs alone are increasing dramatically. Much attention has been paid to addressing the costs of the newest anti-malarial drugs and a coordinated global effort is urgently required to assure that countries will have effective drugs to combat malaria. The resources channeled by the Global Fund are covering a major amount of the needed monies, but more is required. It is critically important to assure the continued and increased funding of the Global Fund and to assure parallel national support to optimize the effectiveness of these funds.

Money is not enough for dramatic progress
A critical factor in determining the capacity of a national government to scale up malaria program coverage is the national human and institutional capacity to manage malaria programming. National governments affected by malaria require assistance in strengthening of basic systems such as procurement, financial management, monitoring, and evaluation. While we may be skeptical about funding to develop national capacity, the fact is that this is vital, it is time consuming, and it requires risk taking on the part of donors because it relinquishes control. Strategic technical assistance in management systems to strengthen national institutional capacity can work (for example: U.S. academic institution support to Zambia Malaria Control Program and UNICEF support to develop community capacity to treat malaria in Mozambique).

Malaria will be controlled by national governments
Malaria control is replete with pilot projects, district level trials and other sub-national efforts. These have created a better understanding of how to control malaria. It is now time for truly national scale implementation, whereby malaria is fully integrated into national health planning and financing mechanisms. Donors must adapt their funding mechanisms to support national capacity development and transfer defined authority to national governments and institutions. In particular, it will be important to assure that highly effective models are developed for donors to support national program implementation capacity. This implies a more balanced partnership between donors and national governments than has existed historically in malaria programming.

The U.S. government and institutions can be leaders in supporting malaria control in Africa
The enormous wealth of the United States and the technical resources in the U.S. government agencies and private and academic institutions are far superior to any other bilateral donors in health. Certainly there are many easily identified shortcomings in how well our resources have been harnessed to support developing countries. Malaria control in Africa represents an enormous opportunity for the US to do the right thing right. This requires some reforms, strengthening of what works, and balanced investments. USAID has too many mandates and administrative constraints to nimbly address this changing opportunity for supporting malaria control.

The U.S. government should not divert current investments in supporting the programmatic capacity of national governments - additional money is required. The U.S. should authorize increased funding for malaria commodities, and most of these should be channeled through a neutral organization such as the Global Fund. With equal commitment, the U.S. government should strengthen its support to national institutions and personnel. The range of partners involved in this support must be broadened to involve U.S. universities and schools of public health, building on highly effective models such as instituted by the CDC Malaria Branch in recent years. Without this program support there is near certainty that more money will not result in stronger programs and thus fewer deaths.

It is important to appreciate that the U.S. government contribution to the Global Fund and its bilateral malaria program are not inherently separate investments. There is, in fact, a real opportunity to forge a strategic alliance between the Global Fund and the U.S. bilateral malaria program. Through both USAID and CDC, the U.S. has a strong comparative advantage to build capacity and strengthen national governments to deliver effective services. No other bilateral program in the world can draw on the wealth of expertise that is available to the U.S. government bilateral assistance program.

Pending legislation to strengthen the U.S. government role in malaria control needs to be carefully reconsidered

Several of the structural changes to support malaria control proposed in The Elimination of Neglected Diseases Bill (S.950) have merit. The appointment of a malaria coordinator, the creation of a Malaria Scientific Review Board, the identification of CDC as key agency on public health initiatives, the requirement for a strategic plan, and the emphasis on reduction in disease burden are potentially major advances. However, some the proposed components should be completely revamped or eliminated, and this could result in a truly landmark legislation to support U.S. global health leadership.

The current bill language emphasizes procurement of specific commodities, and is highly prescriptive in placing emphasis on specific interventions, e.g. indoor residual spraying or ITNs. The requirement for 28% of funding to be applied to indoor residual spraying is potentially a self-defeating and limiting approach. The discussion should not focus on DDT or the enforce IRS. It could appear that the U.S. is dictating to countries what their national policy shall be. Second, and more importantly, while the U.S. might provide indoor residual spraying materials, who will provide the infrastructure support required to deliver indoor residual spraying? This stipulation might preclude the most malarious areas of Africa from accessing malaria control support. Just as has been learned in HIV/AIDS program support in Africa, the approach must be driven by the host country to be effective.

The exclusion of chloroquine and sulfadoxine-pyrimethamine (S/P) from the procurement list is ill-advised. Chloroquine is still the therapy of choice for *P. vivax,* and S/P is still highly efficacious in West Africa and the drug of choice in most of Africa for IPT during pregnancy (per WHO policy guidelines).

The limitation on technical assistance to countries is also an unfortunate approach, in that countries are, in fact, most in need of assistance to use effectively the money that is pouring in at this time. Yes, some technical assistance has been a waste of time and money. However, when a critical technical capacity such as program monitoring or procurement systems for drugs or nets can be linked to a national institution in the form of a person or training, experience demonstrates that national programs benefit. Key U.S. agencies such as CDC have some of the finest programming expertise globally and legislation and appropriations would hopefully foster making that U.S. resource more available to malaria-endemic countries.

**Conclusion**

Malaria control in Africa is the lowest hanging public health fruit of our generation. With additional resources and concerted support of national capacity in malaria-plagued countries to effectively program those resources, dramatic reductions in childhood deaths could be achieved in as little as 2-3 years. The tools to accomplish this are available and resources are currently increasing to give confidence that progress is possible. The U.S. Government must exert leadership both in terms of financing and technical assistance. More inclusive involvement of public- and private-sector institutions and better coordination of U.S. government contributions with those of other major funders is urgently needed.

Thank you for your time and attention.

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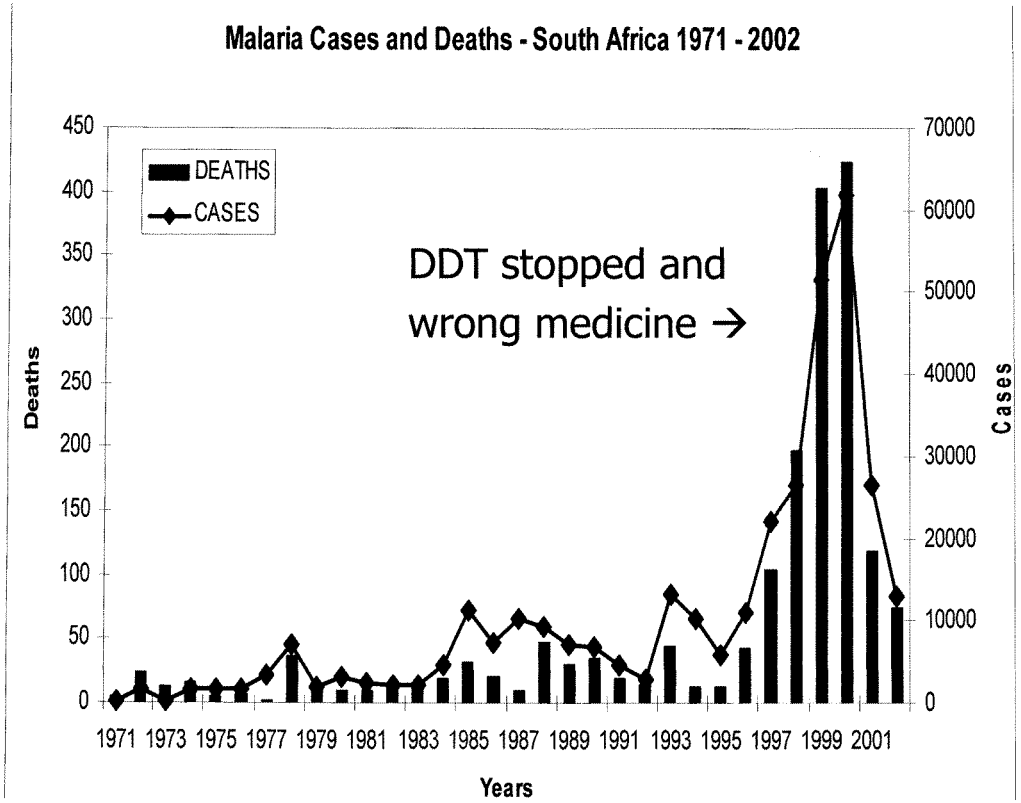
# Malaria: Preventable, Curable, Controllable

## *The Inexcusable Failure of Public Health:*

- 2.5 billion people are at risk in 90 countries across the world, effectively 40% of the world's population.
- The most common life-threatening infection in the world: 500 million acute illness every year, 90% of which are in sub-Saharan Africa.
- More than 3,000 people die of malaria every day, and up to 90% of malaria deaths occur in children under five and pregnant women.
- Recent research suggests that the figure is up to 2.7 million deaths a year.
- Malaria accounts for as much as 40% of public health expenditure, 30-50% of inpatient admissions, and up to 50% of outpatient visits.
- Children who do not die can suffer brain damage, or experience cognitive and learning deficits.


Malaria Cases and Deaths - South Africa 1971 - 2002
DEATHS
CASES
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wrong medicine →
Deaths
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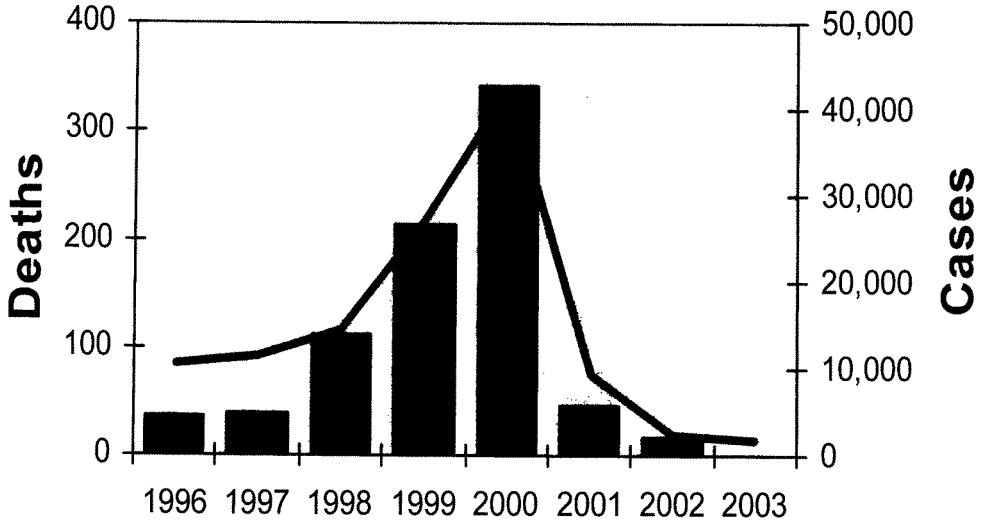
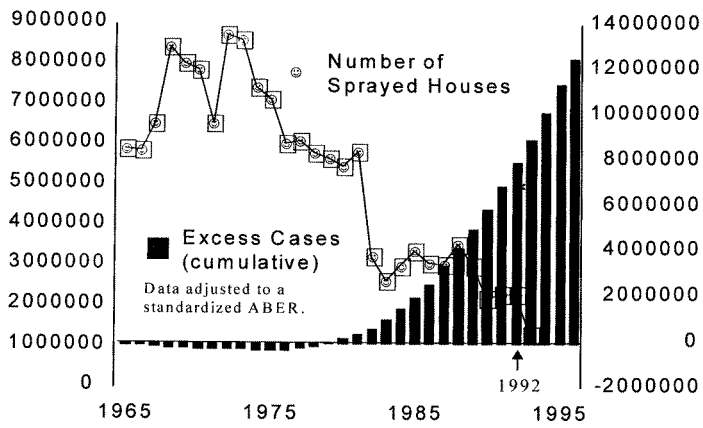
1971 1973 1975 1977 1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001

KwaZulu-Natal, South Africa:
What can a little DDT and Coartem do?



## Number of Houses Sprayed Compared to Number of Cases of Malaria Above the Rate Expected if Spraying Had Continued

*(data from countries of the Americas)*




Dr. Don Roberts, Uniformed Services University for Health Sciences

From: French, Katy (Brownback)
Sent: Friday, April 01, 2005 10:40 AM
To: Barbara Bennett ( [redacted] ); 'Liner, David([redacted]; 'Munson, Lester([redacted], 'Williams, Susan([redacted] ' [redacted]v'
Subject: USAID IRS cost data refuted by study author

Hi friends - thanks so much for sending over Administrator Natsios' response of 3/15 to the conversation he and Sen. Brownback had re: the importance of increasing support of indoor residual spraying to control malaria. We are disappointed to see that his argument seems to be based on the analysis attached to the letter, which is confusing at best:

1) The analysis assumes equal effectiveness of ITNs and IRS, and under such a presumption, cost would then be the only salient factor. But decades of history and peer-reviewed studies suggest otherwise - IRS with DDT has worked dramatically everywhere it has ever been tried, including at least half a dozen countries in Africa. Nets, independent of IRS, achieve smaller reductions in morbidity/mortality, and only with household coverage rates that far exceed the coverage USAID-funded programs seem to achieve (at least from the sparse and anecdotal performance data available on USAID programs).

2) The cost data in the document are cited from Brian Sharp's studies. He disputes your cost calculations and his reaction is attached below.

Before you publicize this cost analysis further, would it be possible for Kent Hill, Brian Sharp and I to have a conference call, so that any confusion might be resolved? I really appreciate your time, guys. I know this is a tough issue. Thank you!

**********

-----Original Message-----
From: Brian Sharp [ [redacted]
Sent: Wednesday, March 30, 2005 9:36 AM
To:
Subject: RE: PDF Letter from USAID

In regard to the USAID document, they quote the Conteh, Sharp et al Mozambique paper as reference saying rural IRS costs about 3x urban and quote figures as high as $9-18 per person. We found the economic cost of spraying to be $2.16 per person in the peri urban area and $3.48 in the rural area. I don't know

how they got their figures but should not be quoting us if they don't use our data correctly. Both costs are still in the $4-6 they quote for ITN's. This I think is the major error in this whole piece and a lot then stems from this. These figures from Conteh, Sharp et al are for bendiocarb which has to be sprayed twice a year and although still cost effective in relation to ITN's, the price to spray with DDT drops to $1.50 in the rural area and $0.74 in the peri urban area, these data are in the same paper.

Very best regards

Brian

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**From:** Greene, Richard S(GH/HIDN) [[redacted]]
**Sent:** Tuesday, April 19, 2005 12:49 PM
**To:** French, Katy (Brownback)
**Cc:** Koek, Irene M([redacted]); Munson, Lester([redacted]); Bennett, Barbara([redacted]); Liner, David([redacted]); Williams, Susan([redacted]); Fox, Edward([redacted]); Miller, Michael([redacted])
**Subject:** USAID IRS Cost Data

Dear Katy,

Thank you for your email bringing to our attention the error related to the cost data in Administrator Natsios' letter to Senator Brownback on IRS and ITNs. As mentioned in our phone call the other day, we've looked into the question you raised and gone back through the calculations and the source documents. My apologies for taking so long to get back to you, but one of our key people who worked on the calculations has been traveling in Africa.

You and Brian Sharp are correct that the direct reference to the data from Brian and Conteh's article was incorrect and that the article cited did not include the cost differentials noted in our letter. I hope you and Brian accept our very sincere apologies. Unfortunately, somewhere in the editing, a very important phrase was not included in the footnote. The footnote should have read: "*extrapolated from USAID's further analysis of the cost data included in* L. Conteh, Sharp B. et. al..."

Our letter said that the costs for IRS would increase about three times in rural areas vs. costs in urban areas. The Conteh, Sharp article analyzed costs including all inputs (personnel, vehicles, training, insecticide etc.) for delivering IRS in an urban and a rural setting. We did several different calculations and extrapolations starting with their data, and came up with changes in cost estimates varying from about two times more to almost four times more for progressively more rural and less densely populated areas.

Our objective is to implement malaria prevention activities at scale – i.e. nationwide and including rural areas where the majority of the malaria deaths occur. Because the areas examined in the Conteh, Sharp article are relatively closer to the provincial capital than many other regions in Mozambique, we wanted to further analyze the cost data to get a sense of how the costs would change for larger and more remote rural areas. We looked at the costs for all the inputs included

in the article -- it was clear that a number of the inputs were more sensitive to changes in the larger distances that would be found in rural areas.

We took the unit cost data in the article one step further, and calculated the proportional change in cost per person for the inputs between urban and rural areas and applied those changes to other, more rural provinces in Mozambique than the one examined in the article. Through this series of calculations, we arrived at a number of different estimates of the increase from urban to rural areas, generally between two and four times, with the average being close to 3 times. These were all rough estimates, and all extrapolations incorporating different variables such as greater distances and variations in population size in urban and "near-rural" areas – which we believe was important for getting a sense of the costs of IRS in different settings.

(We should also note that according to WHO guidelines for IRS, DDT spraying in northern Mozambique would likely require two rounds of spraying per year, further increasing costs by another two times for those areas. Not everyone agrees with this recommendation - Brian believes that once per year would suffice, based on his experience in South Africa- but if borne out in the field, this would also significantly increase costs.)

One can easily argue with the specific numbers in a case like this – that is rough extrapolations based on data from a study in only two areas. (The $9-$18 estimate referenced in the letter was purely a multiplication of the $3-$6 per person estimate for urban areas by our "three-times more" average estimate of change). Better and more definitive estimates of cost are definitely needed particularly for more rural settings. As a consequence, last fall we asked Brian and Christian Lengeler to do an in-depth study and comparison of the costs for IRS and ITNs. The contract for this study is about to be signed, and when completed will give us all a more comparable set of data to work from. The base data included in the Conteh, Sharp article is the best cost data that exists for IRS, however there is no data for large-scale control program costs in more remote rural areas. That is some of the information we hope to get out of this study we've commissioned.

The basic point in Administrator Natsios's letter and attachment is still valid – that IRS would be more difficult and more expensive to implement in rural areas, and in particular in remote rural areas, than in urban and peri-urban areas. Equally important, we need to use a combination of interventions rather than rely on a single method. The cost is only part of the issue, and is not the only salient factor – more important is the feasibility of delivering the intervention. In rural areas where the majority of malaria deaths are, IRS is more difficult to deliver on a sustained basis than are ITNs. To quote Christian Lengeler and Brian Sharp:

*"Both IRS and ITNs offer a proven intervention methodology that is highly cost-effective in preventing and reducing malaria transmission. Choosing between IRS and ITNs is largely a matter of operational feasibility and availability of local resources."*

(Lengeler, C and Sharp, B. Indoor Residual Spraying and Insecticide-Treated Nets, in Reducing Malaria's Burden: Evidence of Effectiveness for Decision Makers. Global Health Council, 2003. Washington, DC.)

We would strongly agree that IRS is a good prevention intervention, and one that should be used where it makes sense. ITNs are also a good prevention intervention, and can more easily get to the more rural areas where prevention interventions are necessary. We would however disagree with your statement that nets achieve smaller reductions in morbidity and mortality – that is not what the extensive research data show, and that is not what experience has shown.

We are available to meet and discuss this or any other related issues with you.

Again, please accept our apologies for the error in our paper as described above.

Regards,

Richard

March 15, 2005

*The Administrator*

The Honorable Sam Brownback
United States Senate
Washington, DC 20510

Dear Senator Brownback:

I would like to follow-up on our recent conversation about malaria and the best means to prevent it. The U.S. Agency for International Development (USAID) is deeply committed to fighting this deadly disease, and to using all the tools we have at our disposal to save the greatest number of lives as quickly as possible.

The issues you raised concerning indoor residual spraying (IRS) and the use of insecticide treated nets (ITNs) to prevent malaria are very serious ones, and I have asked for an examination of the data. The enclosed document briefly summarizes key pieces of information and documented evidence around the effectiveness and appropriate uses of these two interventions.

USAID's position is that, in order to save the most lives, we must target our interventions to the needs and requirements of the local setting. USAID supports the use of both ITNs and IRS, but gives priority to ITNs because they can be most quickly and cost-effectively deployed in rural sub-Saharan Africa, where the burden of malaria is highest. USAID is committed to the goal set by African Heads of State in Abuja in 2000 of covering 60 percent of the population of Africa with ITNs. This view is also shared by the World Health Organization, the Centers for Disease Control and Prevention, UNICEF, other bilateral donors, and leading non-governmental organizations (NGOs).

While ITNs can be distributed through NGOs, the commercial sector, or through government channels, IRS has heavy logistical requirements, including the need to mount massive spray operations (with hundreds of sprayers and supervisors) on a semi-annual basis, that must reach a high proportion of

U.S. Agency for International [illegible]
[illegible] Pennsylvania Avenue, [illegible]
Washington, DC 20523
www.usaid.gov

households to have an impact. As such, it is far less feasible to implement in rural settings. We do believe that IRS is an important intervention – particularly in areas of seasonal malaria, in emergency settings and in urban areas, where logistics requirements can more easily and affordably be addressed. In addition, the cost per person for implementing IRS and ITNs in urban and peri-urban areas is roughly similar at about $3-6 per person. In rural areas, however, the cost of IRS escalates to about $9-18 per person, while the cost of delivering ITNs increases only slightly.

I believe the rationale for ITNs being the basis of our strategy to combat malaria is strong. Still, USAID must continue to seek every option to improve our effectiveness, including the possible expansion of the use of IRS. In addition to the analysis of the data surrounding our strategy, I have directed our staff to simplify environmental assessments for IRS programs, issue clear guidance to field staff, and offer technical assistance to countries to include IRS in Global Fund proposals in an effort to reduce any possible unnecessary barriers to its use in fighting malaria.

I hope you will find the enclosed summary useful. Thank you for your commitment to this very important issue.

Sincerely,

Andrew Natsios

Andrew S. Natsios

Enclosure: summary

March 2005

**Prevention of malaria: Indoor Residual Spraying (IRS) and insecticide treated Netting (ITN)**

**Summary:** IRS and ITNs have comparable impact on reduction of malaria if they are deployed correctly and consistently. Ultimately, the decision about which of these two interventions is most appropriate should be determined by local circumstances. IRS is best suited for areas with lower levels of seasonal malaria transmission (especially in southern Africa and the Horn of Africa), in epidemic-prone areas, in urban settings, and in refugee camps. Since IRS has greater infrastructure requirements, it is a less feasible intervention for rural areas of sub-Saharan Africa, where the burden of malaria is greatest. For that reason, USAID, other donors, and leading technical agencies have given priority to the distribution of ITNs as the most feasible method for saving lives from malaria – especially in sub-Saharan Africa. USAID does support the use of IRS where appropriate, and is taking steps to reduce barriers to the use of IRS in country programs.

**A majority of the 1-2 million annual malaria deaths are among infants in rural sub-Saharan Africa.** Infant mortality rates in rural sub-Saharan Africa are 50 percent higher than in urban areas; from what we know of malaria transmission dynamics, malaria is likely to be the main reason for that difference. Therefore the main results in reducing mortality from malaria will be obtained by focusing control efforts on rural areas.

**IRS and ITNs are effective in preventing malaria.** Both IRS and ITNs are equally effective in preventing malaria if applied appropriately and consistently. The clearest evidence exists for ITNs based on a series of randomized control trials conducted in Africa. In these trials, ITNs reduced *overall child mortality* by about 20 percent and reduced the number of episodes of clinical malaria by about half. While there has not been the same kind of randomized control trial conducted for IRS, large-scale IRS programs led to the decline in malaria in Asia, Latin America, and Europe; in sub-Saharan Africa, a small number of moderate-scale IRS trials conducted in the mid-fifties consistently documented a substantial impact of IRS on reducing transmission of malaria.

**IRS has a rapid and reliable short term impact; however, it requires substantial infrastructure and planning capacity.** The infrastructure requirements include large numbers of trained staff, the ability to plan and carry out regular spray operations, (typically twice a year) and appropriate coverage of a high proportion of households to achieve impact. Spray operations require sufficient numbers of spray teams to cover the target area, reliable transport, and a strong command and control capacity. ***As such, IRS is a far less feasible intervention to implement among large, dispersed populations in rural areas with poor or no infrastructure.*** This barrier is especially real in highly-endemic malarious countries in tropical Africa (between the Sahara and the Zambezi River), where entire populations would need to be regularly reached with highly organized spray teams. However, public health experts generally agree that IRS is best suited for use in areas of seasonal malaria, epidemic-prone malaria, urban or peri-urban settings, and refugee or internally displaced persons camps.

**ITNs also have a rapid and reliable impact, but do not have the same infrastructure requirements.** ITNs can be delivered through a variety of channels – public sector, non-governmental organizations (NGOs), community groups, and the commercial sector – and can be readily added to existing services, such as antenatal services, or immunization programs. As a consequence, ITNs are a very practical and effective means for reaching and protecting the large and dispersed populations of highly-endemic malaria countries, and have been demonstrated to be highly deployable in rural Africa. While most ITNs currently in use do require retreatment, this can be provided through the same channels used in delivering the nets. Also, the increasing availability of long-lasting insecticide treated nets (LLINs), which have an effective lifespan of about four years without the need for retreatment, will remove this requirement altogether. Prices of LLINs are declining, and a number of donors are taking steps to quickly expand the use of LLINs.

**ITNs have a real cost effectiveness advantage in underdeveloped, rural settings.** In urban and peri-urban areas, the cost per person of delivery of IRS and ITNs is about equal – about $3-$6 per person.[1] However, in rural areas, the costs of delivering IRS increases about three times,[2] while the

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[1] "Indoor Residual Spraying and Insecticide-Treated Nets", Christian Lengeler and Brian Sharp, in Reducing Malaria's Burden, Global Health Council, 2003.

[2] L. Conteh, Sharp B., et. al. "The cost and cost-effectiveness of malaria vector control by residual insecticide house-spraying in southern Mozambique: a rural and urban analysis" Tropical Medicine and

costs for delivering ITNs stays relatively constant, or increases only slightly to an average of $4-6 per person.

**USAID believes that the best way to prevent malaria and save lives at this point in time is through giving high priority to ITNs in most of Africa, but also supporting IRS where it is most appropriate.** International consensus is clear that ITNs should be the priority for malaria prevention in Africa under present circumstances. A declaration by the African Heads of State in Abuja in 2000 identified coverage of ITNs as one of three priority goals for addressing malaria in Africa. While there are a few experts who take a minority view and believe that IRS should be the primary prevention intervention, malaria experts in the World Health Organization, the Centers for Disease Control and Prevention, UNICEF, the World Bank, major NGOs such as World Vision and the Red Cross, and other bilateral donors such as the Department for International Development (DfID – UK) and Canadian International Development Agency (CIDA) all agree that ITNs are the best option for preventing malaria in much of Africa. These experts – and USAID – also agree that IRS as well as ITNs should be part of the array of options available to countries.

**ITNs are being used in increasing numbers.** Recent data from several countries show dramatic increases in use of ITNs: ITN coverage increased from 11 percent to 43 percent in Senegal, 9 percent to 40 percent in Zambia, 0 percent to 21 percent in Ghana, and within the past year, 10 percent of households in Nigeria have an ITN. In Tanzania and Malawi, UNICEF also has reported dramatic increases in ITN coverage. In all these cases, surveys point to a significant proportion of the nets being used by the primary target groups of children under five and pregnant women. The data also show equity in coverage across socio-economic strata.

**USAID is increasing its attention to IRS to complement ITNs.** USAID is taking steps to make it easier for field offices to support IRS programs where appropriate. These include issuing clear guidance to remind our field offices that USAID supports IRS, simplifying environmental assessments (which has already been done for ITN programs), and offering technical assistance to countries to include IRS in Global Fund to Fight AIDS, TB and Malaria (GFATM) grant proposals.

**The environmental concerns that surrounded earlier extensive agricultural use of DDT are not a factor with IRS.** A major misconception is that the rationale for ITNs was based on a lingering environmentally centered concern over DDT or other insecticide use. Several key environmental groups were supporters of the exemption in the POPS treaty for the use of DDT to control vector-borne diseases, particularly malaria. It is also important to note that DDT is not the only insecticide used in IRS programs. Twelve insecticides – including DDT – have been approved for use in IRS programs by WHO. Experts recommend rotating insecticides to avoid developing resistance.

July 12, 2005

Answers for Questions for the Record Submitted to
USAID Deputy Assistant Administrator Michael Miller
By Senator Tom Coburn on May 12, 2005

**Question 1**

*Senator Coburn: Please provide a line-by-line itemization of the USAID funds spent on malaria, by country, for each year of FY 2000-2005. This itemization should include the following information:*

*A. A listing of every grant, contract, cooperative agreement, or other procurement of $500 or more, whether disbursed out of USAID headquarters or country missions;*

**Answer**: Please see the attached table, "FY 2004 Malaria Obligations by Partners, Country, and Operating Unit."

*B. For each procurement listed under (A) (and for the sub-recipients of funds under each), please provide in electronic or hard-copy:*

*a. The recipient individual or organization's name and location(s);*

**Answer**: Please see "USAID Malaria Activities – List of Partners and Contracts."

*b. The dollar amount and duration of funding specified in the terms of the agreement;*

**Answer**: Please see the attached table, "FY 2004 Malaria Obligations by Partners, Country and Operating Unit," also referred to in the answer to *A*, above. This chart includes all recipient organizations for FY 2004, and funding information. As I mentioned during the hearing, it is important to note that most USAID malaria activities are implemented under integrated child and maternal health programs. The percentage of malaria funds in these integrated programs varies based on country needs and available funding. Therefore, the chart shows yearly *obligations* for malaria-specific activities within the larger, comprehensive maternal and child health programs. The total 'ceiling' for the program is for all activities, including malaria, but does not necessarily reflect the total amount obligated for all activities – simply what would be allowable. As a rule, USAID obligates funds one year at a time, even within multi-year programs, as reflected in this table. Some programs listed in the table will show high total funding because they are worldwide or multiple-country programs. For example, the worldwide ceiling on USAID's Interagency Agreement with CDC is $100 million, which includes funding for malaria, tuberculosis, HIV/AIDS, child health, population, and other infectious diseases.

*c. The activities or commodities to be procured under the terms of agreement;*

*d. A list of all deliverables, outcome and performance measures or milestones specified in the terms of agreement (or other documents associated with the procurement);*

*e. An indication of whether the terms of the agreement have been fulfilled, whether the agreement is still operative (i.e., the terms have not been completed), or whether the terms of the agreement were not met;*

**Answer to B (c) through (e)**: USAID staff will consult directly with your subcommittee staff regarding how the Agency will provide this information in a manner and form that is useful to you.

*f. Copies of all performance appraisals and program audits (see Hearing transcript, Miller statement, p.86).*

**Answer**: Please again refer to the attached table, "FY 2004 Malaria Obligations by Partners, Country, and Operating Unit" which specifically identifies all programs that have undergone evaluations. Normally, USAID conducts evaluations toward the end of the life of the project, thus fewer evaluations are listed now than will actually be performed for all listed grants or contracts.

USAID staff have requested copies of all evaluations from USAID's Center for Development Information and Evaluation (CDIE) Office and from the relevant USAID Missions. Additionally, every USAID funded grant or contract in excess of $500,000 is required to pay for an independent audit on an annual basis, pursuant to OMB circular A-133. The audit reports are submitted to the USAID's Office of Acquisitions and Assistance (OAA) for review of any material findings. OAA tracks and ensures resolution of all material findings.

USAID will provide the evaluations to your subcommittee staff as soon as they are available. Because we expect the amount of documentation for the audits to be considerable, as with the information requested in response to (a) through (e), above, USAID staff will consult directly with your subcommittee staff regarding how the Agency will provide this information in a manner and form that is useful to you.

*g. The name of the USAID staff responsible for oversight and monitoring of this procurement.*

**Answer**: As agreed in consultations with your subcommittee staff, my response to question 15 (previously submitted) provides information on USAID staff oversight of malaria programs.

**Question 2**

*Senator Coburn: For each of FY 2000-2005, what was the dollar amount and percentage of the total USAID malaria budget spent supporting Indoor Residual Spraying programs (direct or indirect support)? Of those, what percentage of the*

*funding supported direct IRS interventions (insecticide or equipment purchase, sprayer training and salaries)?*

**Answer**: For FY 2004, USAID staff estimate that $800,000 to $900,000 was spent directly on training of spray team personnel, purchase of spraying equipment and protective clothing, logistic support, supervision, and monitoring and evaluation of spray operations. The reason for the aggregate estimation is because it is not possible to disaggregate exact figures from the overall training, logistics, and monitoring and evaluation totals.

**Question 3**

Senator Coburn: *For each of FY 2000-2005, what was the dollar amount and percentage of the total USAID malaria budget spent on the purchase of anti-malaria medicines? Of that amount, what percentage purchased artemisinin-based combination therapy (ACT)?*

**Answer**: For FY 2004, a total of $809,836, or approximately one percent of the total USAID malaria budget, was spent on purchasing antimalarial drugs, including artemisinin-based combination therapy (ACT), sulfadoxine-pyrimethamine, and other antimalarial drugs. Of this amount, $421,317, or fifty-two percent, was used to purchase ACTs. In addition, USAID spent approximately $1,200,000 for the agricultural production of *Artemisia annua* in Tanzania and Kenya, which is expected to produce 40,000,000 pediatric doses of an ACT.

**Question 4**

Senator Coburn: *For each of FY 2000-2005, what was the dollar amount and percentage of the total USAID malaria budget spent on the purchase of bed-nets? Of that amount, what percentage purchased insecticide-treated nets (ITNs)? For these fiscal years, how much money was spent on programs to re-treat ITNs? How does the agency measure the re-treatment rate of the nets placed using USAID funds?*

**Answer**: For FY 2004, a total of $4,751,548, or six percent of the total USAID malaria budget, was spent on the purchase of bed nets. All bed nets purchased with USAID funds are insecticide treated (ITNs). Of the total spent on bed nets, $3,858,793, or eighty-one percent, was spent on long-lasting ITNs, and $892,755, or nineteen percent, was spent on standard ITNs.

In FY 2004, $512,296 was spent on insecticide re-treatment kits. Over and above this amount, another portion of the total USAID malaria funding spent on training, information, education & communication, and logistics was used to support re-treatment programs. However, it is not possible to disaggregate precise ITN-related training figures from the total training figures.

Information on re-treatment rates of bed nets purchased with USAID funds is collected though large-scale household surveys, such as the Demographic and Health Survey (DHS), the UNICEF Multiple Indicator Survey (MICS), and the NetMark bed net survey. These questionnaires include standardized questions about bed net re-treatment, including, "Since the ITN was first obtained, has it been re-treated?" "When was it treated last?" "How many times has it been re-treated?" Who did the last re-treatment?" and "Where was it re-treated?"

**Question 5**

*Senator Coburn: For each of FY 2000-2005, what was the dollar amount and percentage of the total USAID malaria budget spent on Technical Assistance, conferences and consultants, including travel costs associated with each?*

**Answer**:

Technical Assistance: In FY 2004, USAID spent a total of $22,718,811, or 28 percent of the total USAID malaria budget, providing technical assistance in a variety of areas: (1) training; (2) policy and guideline development; (3) logistics and pharmaceutical management; and (4) health systems strengthening and health care financing.

- Training: In FY 04, a total of $9,465,355, or twelve percent of the total malaria budget, was spent training health care workers to enhance their ability to provide quality malaria services. This category includes in-service training and continuing education through workshops, distance learning, on-the-job training, mentoring, etc; support for building skills in specific areas, such as improved laboratory skills, etc; and curriculum development and training of trainers.
- Policy and guideline development: A total of $5,819,496, or seven percent of the total malaria budget, was spent on policy and guideline development, to ensure that ministries of health have internationally-accepted malaria prevention and treatment policies and that their health workers have clear guidelines and standards to enable them to implement those policies.
- Logistics and pharmaceutical management: A total of $4,140,575, or five percent of the total malaria budget, was spent on logistics and pharmaceutical management. This includes the design, development and implementation of improved systems for forecasting, procurement, storage, distribution, and performance monitoring of antimalarial drugs, ITNs, and other supplies. It also includes establishing management and supply systems for malaria diagnostics, medical equipment, and other commodities and supplies needed to provide care and treatment of malaria and related infections.
- Strengthening health systems/health care financing: A total of $3,293,385, or four percent of the total malaria budget, was spent on health systems strengthening and health care financing. Examples include developing and/or establishing community-based health care financing programs, national health accounts, franchising schemes to provide free or discounted malaria drugs, and quality assurance programs, etc.

Conferences: A total of $1,074,074, or one percent of the total malaria budget, was spent on malaria-related conferences. This figure does not include workshops or training courses.

Other Funds: The remainder of the FY 04 malaria budget was distributed between purchasing of commodities, $6,240,040, or eight percent; information, education and communication, $8,585,865, or eleven percent; monitoring/evaluation and reporting, $5,551,330, or seven percent; administrative and indirect costs, $22,791,123, or twenty-nine percent; research, $7,189,380, or nine percent; and other costs $3,994,100, or approximately five percent.

Consultants: A total of $13,104,708, or sixteen percent of the overall malaria budget was spent on consultants. This includes money used to hire US-based, international, and local consultants, as well as indirect costs and travel costs. Of this amount, $3,489,364, or twenty-seven percent, was spent on US-based consultants; $4,542,533, or thirty-five percent, on hiring international consultants; and $5,102,477, or thirty-nine percent, on hiring locally-based (in-country) consultants.

**Question 7 (revised)**

*Senator Coburn: On. P. 4 of your testimony, you state that "In Tanzania, 53 percent of children under five years of age and 42 percent of pregnant women were using nets in 2003." How did USAID arrive at these figures?*

**Answer**: These figures come from a presentation made by Karen Kramer, National Coordinator of the Nets Unit, Tanzania National Malaria Control Programme. It was presented at the Roll Back Malaria Working Group Meeting on Insecticide-Treated Netting (ITN) held in Nairobi, Kenya in February 2005. USAID staff attended the presentation. USAID has requested a copy of the original presentation and I will forward it to your staff when I receive it.

I note that similar figures to those given above are reported on page 126 of the 2003 World Health Organization Regional Office for Africa publication, "Malaria Control in the African Region." An RBM baseline survey conducted in 7 districts in Tanzania during 2001 showed that 46 percent of children under five and 36 percent of pregnant women were sleeping under bed nets. A nationwide DHS survey in Tanzania is scheduled to finish later this month and by October, up-to-date nationwide data should be available on bed net coverage.

July 1, 2005

Answers for Questions for the Record Submitted to
USAID Deputy Assistant Administrator Michael Miller
By Senator Tom Coburn on May 12, 2005

**Question 6.**

*Senator Coburn: In your testimony, see pp. 2-3, you noted that one of the three legs of USAID's anti- malaria policy relies, in large part, on the dissemination of insecticide treated nets (ITNs) targeted for use by young children and pregnant women. Clearly, USAID believes that the targeted distribution of ITNs to young children and pregnant women helps protect these populations from malarial infection. However, it is my understanding that almost all the evidence supporting this proposition has been taken from trials in which there was community- wide distributions of ITNs (e.g., the 4 large WHO trials summarized in Lengeler's Cochrane Review and the more recent CDC trial in Kenya (2003 Amer J Trop Med Hyg 68 special issue 4). There seems to be good evidence that ITNs not only protect persons who sleep under them, but when used on a community-wide basis, ITNs substantially reduce the infective biting mosquito population in the community.*

*Could you provide us with references to peer reviewed journal articles in which the targeting of ITN distribution to young children and pregnant women NOT living in communities participating in high-bed-net-coverage trials or campaigns was effective in reducing malaria rates in a country or community? Also, please provide citations for all journal articles that USAID has cited in public statements or publications to support targeted ITN distribution.*

**Answer**: The Global Health Bureau staff and I are not aware of studies demonstrating reduced malaria rates where ITN distribution was targeted solely at young children and pregnant women – i.e. not community-wide. Below is a list of peer reviewed journal articles that document the effectiveness of ITN programs in reducing malaria in vulnerable populations. This list of articles includes all previously-cited material in USAID statements or publications.

Abdulla S, Schellenberg JA, Nathan R, Mukasa O, Marchant T, Smith T, Tanner M, Lengeler C, 2001. Impact on malaria morbidity of a programme supplying insecticide treated nets in children aged under 2 years in Tanzania: a community cross sectional study. *BMJ* 322: 270-273.

D'Alessandro U, 2001. Insecticide-treated bed nets to prevent malaria. *BMJ* 322: 249-250.

D'Alessandro U, Olaleye BO, McGuire W, Langerock P, Bennett S, Aikins MK, Thomson MC, Cham BA, Greenwood BM, 1995. Mortality and morbidity from malaria

in Gambian children after introduction of an impregnated bednet programme. *Lancet* 345: 479-83.

Binka FN, Kubaje A, Adjuik M, Williams LA, Lengeler C, Maue GH, Armah GE, Kajihara B, Adiamah JH, Smith PG, 1996. Impact of permethrin-impregnated bednets on child mortality in Kassena-Nankana district, Ghana: a randomized controlled trial. *Trop Med Int Health* 1: 147-54

Nevill CG, Some ES, Mung'ala VO, Mutemi W, New L, Marsh, K, Lengler C, Snow RW, 1996. Insecticide-treated bednets reduce mortality and severe morbidity from malaria among children on the Kenyan coast. *Trop Med Int Health* 1: 139-46.

Marchant T, Schellenberg JA, Edgar T, Nathan R, Abdulla S, Mukasa O, Mponda H, Lengeler C, 2002. Socially marketed insecticide-treated nets improve malaria and anemia in pregnancy in southern Tanzania. *Trop Med Int Health* 7: 149-158.

Abdulla S, Gemperli A, Mukasa O, Armstrong-Schellenberg JR, Lengeler C, Vounatsou P, Smith T, 2005. Spatial effects of the social marketing of insecticide-treated nets on malaria morbidity. *Trop Med Int Health.* 10: 11-18.

Rowland M, Webster J, Saleh P, Chandramohan D, Freeman T, Pearcy B, Durrani N, Rab A, Mohammed N, 2002. Prevention of malaria in Afghanistan through social marketing of insecticide-treated nets: evaluation of coverage and effectiveness by cross-sectional surveys and passive surveillance. *Trop Med Int Health.* 7: 813-22.

Schellenberg JR, Abdulla S, Nathan R, Mukasa O, Marchant TJ, Kikumbih N, Musha AK, Mponda H, Minja H, Mshinda H, Tanner M, Lengeler C, 2001. Effect of large-scale social marketing of insecticide-treated nets on child survival in rural Tanzania. *Lancet.* 357: 1241-7.

**Question 7.**

*Senator Coburn: On. P. 4 of your testimony, you state that "In Tanzania, 53 percent of children under five years of age and 42 percent of pregnant women were using nets in 2003." How did USAID arrive at these figures?*

**Answer**: These figures are from a presentation made by Karen Kramer, National Coordinator of the Nets Unit, Tanzania National Malaria Control Programme. It was presented at the Roll Back Malaria Working Group Meeting on Insecticide-Treated Netting (ITN) held in Nairobi, Kenya, in February 2005.

**Question 8.**

*Senator Coburn: Referring to the pp. 43-44 of the attached transcript, have you been able to determine the correct ITN coverage in Ghana? Your written testimony cited 21% as the coverage level. I suspect this figure is coming from the World Malaria Report*

*published a few weeks ago, with USAID as a co-author. However, the report is clear that this 21% coverage figure is for untreated nets, not ITNs. If this discrepancy cannot be reconciled, please specify whether your testimony or the World Malaria Report is correct, providing evidence to support your analysis.*

**Answer**: The reference in my testimony came from the "NetMark 2004 Survey on Insecticide-Treated Nets (ITNs) in Ghana," a household survey conducted in August 2004 by the Academy for Educational Development in approximately 300 households in each of five different sites. That survey found that 21 percent of households owned a net that had been treated, and 19 percent of households owned a net that had been treated within the preceding 12 months (either purchased pre-treated in the past 12 months, treated within the past 12 months, or a long-lasting insecticide-treated net).

According to the 2005 World Malaria Report, which uses data from a nationwide population-based survey conducted in Ghana in 2003, 17.6 percent of households had at least one mosquito net and 3.2 percent had an insecticide-treated net. The differences in coverage from these two sources are likely due to increased ITN promotion and distribution between the dates of the two surveys.

**Question 9**.

*Senator Coburn: Fortunately, you stated at our hearing that USAID is now providing support to IRS programs in Zambia. Please provide details of that funding, including whether the support is direct or indirect. In the past, USAID may have sent a different message in that country. Referring to pp. 46-47 of the transcript, you promised to contact Naawa Sipilanyambe, the Malaria control Program Director for Zambia to investigate her claims that USAID officials in Zambia discouraged the Zambian National Malaria Control program from switching from ineffective to effective drugs and refused to entertain requests for funding of a proposed country-wide expansion of the successful indoor residual spraying demonstration program (funded by the copper mining industry in that country). What was the result of your investigation and what steps have you taken to correct any inappropriate communications from your staff?*

**Answer**: In Zambia, USAID directly assisted with the implementation of the indoor residual spraying (IRS) program through a contract. This contract included direct technical support and training in effective implementation of the IRS program, in collaboration with private sector (particularly the Zambian copper mines), local governments, and the Environmental Council of Zambia.

USAID staff recently spoke with Dr. Sipilanyambe and other officials from the National Malaria Control Programme in Zambia to investigate the allegations you mention. Dr. Sipilanyambe and her colleagues are drafting a letter responding to these issues, clarifying their position. USAID has not yet received this letter.

USAID's policy is to support only effective antimalarial treatments. USAID works with counterparts at the country level to help national programs move from ineffective front-line treatments to effective front-line treatments. In the mid-1990s (before artemisinin-based combination therapies were available for use in Africa) USAID and the Centers for Disease Control and Prevention (CDC) were actively involved trying to help the Zambian National Malaria Control Program move from chloroquine, which was no longer effective, to adopt sulfadoxine-pyrimethamine (SP), which was effective at the time, as their first-line treatment.

The Zambian Ministry of Health was not prepared at that time to make any such change in their first-line treatment policy, but did agree to make SP available at peripheral health facilities for patient who failed to respond to chloroquine. (Reference: Barat L, Himonga B, Nkunika S, Ettling M, Ruebush TK, Kapelwa W, Bloland PB, 1998. A systematic approach to the development of a rational malaria treatment policy in Zambia. *Trop Med Int Health* 3: 535-42.)

Not until 2003, years after USAID and CDC first pressed the issue, did the Zambian Ministry of Health drop chloroquine as their first-line drug. In 2004, they adopted artemether-lumefantrine (Coartem®), an ACT, as their first-line treatment. By that time, SP itself was no longer fully effective in Zambia, and the advent of the Global Fund made purchase of ACTs a realistic option.

**Question 10.**

Senator Coburn: *In the question and answer period of the hearing (see transcript at pp. 55-56) you indicated that USAID would make every effort to publish all malaria grant-contracting information on a public accessible website. Although it is not sufficient, the Global Fund's web site provides a minimum standard for transparency and would be relatively quick to imitate by posting electronic scans of al procurement vehicles (grants, contracts, including personal service contracts, and cooperative agreements) and their quarterly progress reports on agreed upon deliverables, and allowing them to be sorted by country. The Global Fund's site makes it clear that at least this minimum standard of public aforementioned webpage as a template, how long will it take USAID to create a similar webpage? Given that a first step of scanning grants, contracts and cooperative agreements is simply a matter of administrative staff time, do we have USAID's pledge that this first step could be completed within 3 months?*

**Answer**: I reaffirm my commitment to expand and update our website to add additional information you have requested. To this end, USAID staff is in the process of issuing and compiling the results of extensive questionnaires and surveys of both our USAID Missions and the grantees in the field. Once completed, these data will serve two key purposes: they will be both the basis for the answers to your questions for the record, numbers one through five, which are forthcoming, as well as an effective template to standardize and institutionalize the collection of this type of information on a continuing basis. Additionally, we are in the process of making the necessary determinations of

what kind of information collected on this assistance – if any – is proprietary or otherwise cannot be posted publicly.

This project is progressing very well, and I am confident we can develop the type of public database that you have requested and within a timeframe that meets your expectations. I am grateful for your patience and for your subcommittee staff's willingness to consult with us.

**Question 11.**

*Senator Coburn: Referring to pp. 90-91 of the transcript, data coming out of Senegal and Ghana is noted in the context of the distribution of nets. Please provide that data to the Subcommittee. Furthermore, provide the most complete data available on the cost distribution for ITNs that are paid for by USAID in Ghana and Senegal. What percentage of USAID-funded ITNs reach end users at no charge in these two countries?*

**Answer**: The data from surveys in Senegal and Ghana are attached.

Regarding USAID's purchases under the NetMark program (our primary tool for expanding access and use of ITNs in both countries), the bulk of nets are purchased and sold by African distributors, and many of the nets are made by African manufacturers. NetMark purchased 39,531 nets as "seed product" in Ghana, and 54,497 nets as "seed product" in Senegal under a matching investment program with the commercial partners. This "seed" allowed commercial distributors to get their operations up and running.

The prices for the nets range from $2.10 to $4.25 each in Ghana, and from $2.25 to $6.40 each in Senegal, depending on the size and style of the net itself. USAID supports the distribution of free or highly-subsidized nets, depending on factors such as national policy, the needs in-country, the activities of other donors, and especially the economic needs of the target groups. Given all these factors, in the cases of Senegal and Ghana USAID does not currently directly support the distribution of free bednets.

**Question 12.**

*Senator Coburn: Even with the unprecedented amount of funding going to combat global AIDS under the President's Emergency Plan for AIDS Relief, President Bush recognized the necessity and importance of targeting 14 (now 15) key focus countries for funding. In contrast, USAID has spread its much-smaller malaria budget thin across over 30 countries rather than funding larger-scale interventions in a few countries. On what scientific or evidentiary basis has USAID concluded that this approach saves more lives?*

*These data should include statistics with respect to the programmatic effects on rates of morbidity and mortality in each country receiving USAID's malaria funds, the amount USAID funding received in each country and the time frame over which the data was collected. For technical assistance programs, these data should focus on the statistical impact of the assisted parties/programs on the malaria epidemic in their countries.*

**Answer**: I am unaware of any scientific study that has concluded whether concentrating interventions in a smaller number of countries would save more lives then a more diffuse distribution across more countries of the same amount of interventions – be it for HIV/AIDS programs, malaria programs, or development assistance. USAID's malaria efforts to-date are almost entirely part of broader, comprehensive maternal and child health programs. These programs are the building blocks of development assistance in all recipient countries, hence the breadth of their distribution.

We do know that each of the specific interventions we support is or can be life-saving at an individual level. We also know that they are scalable – that the more of them we make available, the more effective the overall program will be. We also know that some interventions, particularly the concentration of ITNs and dwellings successfully targeted for IRS, can produce an overall effect for the community that is greater than the sum of the individual interventions – the so-called "halo effect." What we cannot say is that we would be able to save more lives by concentrating all resources and interventions in fewer, select countries than we do with our current distribution of those same resources.

Fortunately, we will be able to gain some additional insights on this critical question of scale and concentration of interventions in coming years as we begin to implement President Bush's historic proposal to cut in half the number of deaths due to malaria in selected countries in Africa. By the end of the third year of implementation, we expect to have greater insights understanding of critical questions about effectiveness, efficacy, planning and scale of all interventions and treatments, including some of those we discussed during the hearing.

**Question 13**.

*Senator Coburn: According to an article written by Richard Tren entitled: "USAID's Troubling Malaria Effort," USAID was putting pressure on the Malagasy government to hand over a large chunk of funds to one of its contractors, Population Service International (PSI). PSI is a U.S.-based multi-million dollar contractor which spends USAID money in poor countries in an attempt to control malaria and other diseases. Tren claims that USAID funds PSI to sell the nets to the impoverished (70% of Madagascar's population lives on less than a dollar a day) Malagasy at 200% of what it would cost the government to do. Is this claim true and if so, what is the scientific, peer-reviewed evidence that social marketing of bed-nets saves more lives than free distribution of the same nets?*

**Answer**: This claim is false. USAID did not pressure the Malagasy government to fund Population Services International (PSI). I am not aware of details or calculations leading to the allegation that nets would be sold by PSI in Madagascar for "twice the price." The "twice the price" language most likely refers to the common practice of "cross-subsidization," in which full market-price ITNs are sold in urban shops to those who can afford them, and the proceeds of those sales are then used to subsidize free or very low-cost ITNs for the rural poor. Segmenting the market in this manner increases the

efficiency of subsidies, ensuring that more of the donor funds are directed to those in greatest need, the rural poor. This market segmentation also ensures that operating costs are available to sustain the ITN supply process, giving greater sustainability for the long-term.

**Question 14.**

*Senator Coburn: I have been told that the more widespread dissemination of ITNs in Senegal is due to the elimination of taxes and tariffs on ITNs. Does USAID concur with that assessment? If true, would that not support the proposition that lower prices are the greatest spur to more people having and using ITNs? Taking that analysis one step further, wouldn't the distribution of free nets produce even greater positive results? The Global Fund to Fight HIV/AIDS, TB and malaria requires grant recipients to agree that no taxes or tariffs will be charged on commodities donated through Global Fund grant funds. Would it not be good policy for the United States to predicate ITN funding on the recipient country's waiving of tariffs and sales taxes on all ITNs*

**Answer**: Yes, we at USAID concur with your statement that elimination of tariffs leads to greater ITN availability. The elimination of taxes and tariffs is one of several factors that play a role in lowering the price of ITNs, but I don't know of any conclusive findings that it is the primary or largest factor.

ITNs in Senegal now cost almost $3 less than *untreated nets* did in 2001 because of increased competition and a greater number of ITN brands available in the market as a result of the elimination of taxes and tariffs. The drop in ITN price ranges from $1 per net to almost $20 per net in countries where USAID supports ITN programs.

| | **Untreated Net 2001** | **ITN 2004** | **Difference in Price** |
|---|---|---|---|
| Ethiopia | $6.40 | $2.54 | $3.86 |
| Ghana | $7.14 | $4.78 | $2.36 |
| Nigeria | $3.64 | $2.75 | $0.89 |
| Senegal | $8.00 | $5.29 | $2.71 |
| Uganda | $14.29 | $4.50 | $9.79 |
| Zambia | $5.39 | $4.57 | $0.82 |
| Zimbabwe | $27.29 | $7.95 | $19.34 |

Sources: 2001 Prices: Simon, J. Larson, B. Rosen, S. Zusman, 2001. 2004 Prices: USAID NetMark Africa Regional Malaria Program.

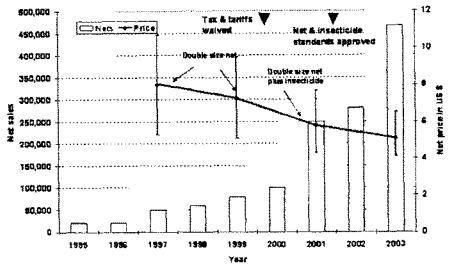
Additionally, the removal of taxes and tariffs demonstrated the commitment of the Government of Senegal to malaria control and were a key part of the Abuja Declaration signed by more than 30 sub-Saharan African nations. Unfortunately, only about half of those countries have acted to date.

Experience in many countries shows that the removal of taxes and tariffs leads to increased commercial imports, lower ITN prices, and greater availability and sales of

ITNs, thus greatly benefiting the public health of those countries. Solid data exists from a number of countries (e.g., Ghana, Uganda).

## Trends in net sales and prices Uganda

Source: USAID Uganda




**Impact of 50% Tariff and 15% Value Added Taxes on Consumer Prices for Conical Family Net with Treatment**

| Costs | Rates | Conical- Family Prices with taxes and tariffs | Prices without taxes or tariffs |
|---|---|---|---|
| Total CIF for ITN | US$ | 2.72 | 2.72 |
| Tariff | +50% | 1.36 | |
| Clearing and other taxes | +8.5% | .35 | |
| Financing costs | +15% | .66 | .41 |
| **Price in Warehouse** | | **$5.09** | **3.13** |
| Local assembly cost | | .15 | .15 |
| Price to distributor | | $5.24 | 3.28 |
| Distributor margin | 25% | $1.31 | .82 |
| Wholesalers Markup | 10% | $.65 | .41 |
| **Price to retailer** | | **$7.20** | **4.51** |
| Retailer Markup | 20% | $1.44 | .90 |
| VAT | 15% | $1.30 | |
| **Price to customer** | | **$9.94** | **5.41** |

While the elimination of tariffs on ITNs is clearly the most desirable condition under which to implement a program, and the United States should continue to press for tariff-free and tax-free assistance, a strict conditionality may not be the best policy in all cases. Certainly, the prospect of ending an existing, effective program, and thus reducing the coverage level in that country, is not a desirable outcome.

**Question 15.**

*Senator Coburn: Even TA contracts require competent oversight and valuation. It is important that agency staff who oversee technical assistance grants, contracts or cooperative agreements have a core competency in the substance of the activities funded by the mechanisms. I am concerned that although USAID may fund TA for IRS programs it does so relying blindly on the expertise of its TA contractors, without the in-house expertise to evaluate the performance of those contractors. Please provide the names and credentials of all USAID staff with direct responsibility for oversight and evaluation of IRS-related TA projects? Of those how may have experience and/or direct raining in how to run an IRS program on the ground.*

**Answer**: USAID staff responsible for overseeing grants, contracts and cooperative agreements have training in project management rules and regulations, as well as the technical expertise to effectively oversee and direct the programs. Our staff overseeing the programs from Washington has extensive experience in combating malaria. Unfortunately, our malaria team leader, who is an internationally known and respected malariologist, and who managed and implemented indoor residual spraying programs in Asia for five years, was forced to retire in March of this year due to serious illness.

Other members of our malaria team include:

- a malariologist who is a physician-epidemiologist with over 30 years of experience implementing and researching malaria programs with CDC;
- an infectious disease and public health specialist with a PhD in tropical infectious diseases, and over 20 years of experience in developing countries;
- an international health specialist with a PhD in International Health and over eight years of field experience;
- an ScD in Health Economics and Epidemiology with at least 10 years experience in overseeing malaria programs.

IRS programs are implemented through a variety of agreements at the country level, and overseen by technical staff, many of whom have extensive experience in anti-malaria programs. In Washington and in the field, USAID staff also work closely with international experts in malaria vector control and indoor residual spraying experts outside of USAID and our body of contractors and implementers.

## USAID Funding of Malaria Programs FYs 2000- 2005

**All Appropriations ($ millions)**

| | FY 2000 | FY 2001 | FY 2002 | FY 2003 | FY 2004 | FY 2005* |
|---|---|---|---|---|---|---|
| **Asia and the Near East Bureau (ANE)** | | | | | | |
| Afghanistan | - | - | - | 3,974 | 400 | 1,000 |
| Burma | - | - | - | 500 | 100 | 200 |
| Cambodia | - | - | 800 | 1,000 | 1,400 | 1,400 |
| India | - | - | - | - | 400 | 900 |
| Indonesia | - | - | 600 | 600 | 700 | 700 |
| Nepal | 475 | 458 | 600 | 600 | 700 | 700 |
| Philippines | 450 | 280 | 400 | - | - | |
| ANE Regional | 241 | 2,362 | 1,362 | 1,088 | 1,850 | 1,895 |
| **Sub-Total** | **1,166** | **3,100** | **3,762** | **7,762** | **5,550** | 6,795 |
| **Latin America and Caribbean Bureau (LAC)** | | | | | | |
| Amazon Initiative | | 1,972 | 2,295 | 2,300 | 1,155 | 2,115 |
| Bolivia | 240 | 180 | 600 | 600 | 600 | 750 |
| Haiti | - | - | - | - | 680 | 725 |
| Honduras | 150 | 177 | 220 | 220 | 285 | 340 |
| Peru | 790 | 798 | 1,000 | 1,000 | 800 | 800 |
| LAC regional | 56 | - | - | - | 600 | 200 |
| **Sub-Total** | **1,236** | **3,127** | **4,115** | **4,120** | **4,120** | 4,930 |
| **Europe and Eurasia** | | | | | | |
| Central Asia | 195 | - | 961 | 792 | - | |
| **Africa** | | | | | | |
| Angola | 1,075 | 1,000 | 1,000 | 1,000 | 1,000 | 1,350 |
| Benin | 830 | 828 | 1,500 | 1,000 | 2,000 | 2,000 |
| Burundi | - | - | - | 400 | 500 | 500 |
| DRCongo | 400 | 998 | 1,300 | 1,100 | 2,900 | 2,900 |
| Eritrea | 385 | 499 | 600 | 600 | 600 | 800 |
| Ethiopia | 500 | 499 | 1,100 | 900 | 2,000 | 2,000 |
| Ghana | 500 | 599 | 900 | 1,000 | 1,000 | 1,300 |
| Guinea | | | | | | 300 |
| Kenya | 695 | 698 | 1,200 | 1,200 | 1,200 | 1,200 |
| Liberia | - | - | - | 300 | 300 | 450 |
| Madagascar | - | - | 300 | 600 | 2,000 | 2,300 |
| Malawi | 956 | 1,347 | 1,800 | 1,500 | 1,500 | 2,125 |
| Mali | - | - | 800 | 1,000 | 1,800 | 2,425 |
| Mozambique | 800 | 1,497 | 600 | 500 | 1,500 | 2,100 |
| Nigeria | 1,450 | 2,495 | 2,900 | 3,000 | 2,400 | 2,900 |
| Rwanda | 300 | 299 | 600 | 750 | 1,000 | 1,000 |
| Senegal | 160 | 2,494 | 2,500 | 2,500 | 2,500 | 2,500 |
| Sudan | - | - | - | 300 | 2,000 | 2,500 |
| Tanzania | - | - | 600 | 400 | 1,300 | 1,700 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Uganda | 860 | 2,993 | 3,000 | 3,000 | 3,000 | 3,000 |
| Zambia | 1,935 | 3,991 | 4,000 | 4,000 | 4,000 | 4,000 |
| West Africa Regional | 500 | 499 | 800 | 800 | 1,500 | 1,650 |
| ESA Regional | 500 | 499 | 1,100 | 1,200 | 2,000 | 2,100 |
| AFR regional | 5,020 | 4,772 | 4,807 | 3,660 | 2,610 | 2,809 |
| **Sub-Total** | **16,866** | **26,007** | **31,407** | **30,710** | **40,610** | 45,909 |
| **Bureau for Global Health** | 8,575 | 15,354 | 18,343 | 21,990 | 29,350 | 31,149 |
| **Bureau for Democracy, Conflict, and Humanitarian Assistance** | 1,820 | 1,803 | 2,373 | - | - | |
| **Program for Policy, Program and Coordination** | | | | | | 497 |
| **Total - All Accounts** | **29,858** | **49,391** | **60,961** | **65,374** | **79,630** | 89,430 |
| of which, Child Survial and Health Programs Fund | 29,663 | 49,391 | 60,000 | 64,582 | 79,530 | 89,430 |

* FY05 budget still being finalized

## FY 2004 Malaria Obligations by Partners, Country and Operating Unit

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
|---|---|---|---|---|---|---|---|
| *Most of the projects listed below are a duration of five or more years. The dollar figures reflect the total ceiling for the life of the agreement.* | | | | | | | |
| ** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS. | | | | | | | |
| Abt Associates | For prof | AFR | East/Southern Africa Regional | | 95 | | $98,000** 09/30/2006 |
| Abt Associates | | AFR | Mali | | 200 | | $2,336 09/30/2006 |
| Abt Associates | | AFR | Uganda | Yes | 110 | | $98,000** 09/30/2006 |
| Abt Associates | | AFR | Zambia | | 1,100 | | $98,000** 09/30/2006 |
| **Abt Associates** | | | | | | **1,505** | |
| Academy for Educational Development | PVO | AFR | AFR Regional (Wash) | | 210 | | $65,422** 9/29/2007 |
| Academy for Educational Development | | AFR | East/Southern Africa Regional | | 450 | | $65,422** 9/29/2007 |
| Academy for Educational Development | | AFR | Ethiopia | | 700 | | $65,422** 9/29/2007 |
| Academy for Educational Development | | AFR | Ghana | | 800 | | $23,000 05/30/2009 |
| Academy for Educational Development | | AFR | Mali | | 640 | | $65,422** 9/29/2007 |
| Academy for Educational Development | | AFR | Nigeria | | 1,000 | | $65,422** 9/29/2007 |
| Academy for Educational Development | | AFR | Senegal | | 350 | | $1,950 09/30/2006 |
| Academy for Educational Development | | AFR | Tanzania | | 270 | | $22,275 08/30/2009 |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
|---|---|---|---|---|---|---|---|
| *Most of the projects listed below are a duration of five or more years. The dollar figures reflect the total ceiling for the life of the agreement.* | | | | | | | |
| ** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS. | | | | | | | |
| Academy for Educational Development | | AFR | Uganda | | 450 | | $65,422** 9/29/2007 |
| Academy for Educational Development | | AFR | West Africa Regional | | 350 | | $65,422** 9/29/2007 |
| Academy for Educational Development | | AFR | Zambia | | 300 | | $65,422** 9/29/2007 |
| Academy for Educational Development | | Global | GH Bureau | | 4,000 | | $65,422** 9/29/2007 |
| **Academy for Educational Development** | | | | | | **9,520** | |
| Africare | | AFR | Benin | | 222 | | 9/30/2005 |
| Africare | | AFR | Senegal | | 150 | | $1,105 06/30/2006 |
| **Africare** | **PVO** | | | | | **372** | |
| **American Refugee Committee** | **NGO** | **ANE** | **ANE Regional** | | **100** | **100** | **$3,190 03/31/2008** |
| **Armed Forces Research Institute of Medical Sciences** | **USG** | **ANE** | **Nepal** | | **50** | **50** | |
| Boston University | | AFR | Zambia | | 150 | | $15,014 09/14/2008 |
| Boston University | | ANE | India | | 50 | | $50 09/14/2008 |
| **Boston University** | **UNIV** | | | | | **200** | |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
|---|---|---|---|---|---|---|---|
| *Most of the projects listed below are a duration of five or more years. The dollar figures reflect the total ceiling for the life of the agreement.* | | | | | | | |
| *** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS.* | | | | | | | |
| Catholic Relief Services | | AFR | Ethiopia | | 39 | | $6,603 08/31/2007 |
| Catholic Relief Services | | AFR | DR Congo | Yes | 700 | | $8,623 09/30/2007 |
| **Catholic Relief Services** | **PVO** | **AFR** | | | | **739** | |
| Centers for Disease Control | | AFR | AFR Regional (Wash) | | 1,300 | | $100,000** 09/30/2009 |
| Centers for Disease Control | | AFR | DR Congo | | 100 | | $100,000** 09/30/2009 |
| Centers for Disease Control | | AFR | East/Southern Africa Regional | | 175 | | $175 09/30/2009 |
| Centers for Disease Control | | AFR | Malawi | | 500 | | $100,000** 09/30/2009 |
| Centers for Disease Control | | AFR | Sudan | | 100 | | $100,000** 09/30/2009 |
| Centers for Disease Control | | AFR | Uganda | | 420 | | $100,000** 09/30/2009 |
| Centers for Disease Control | | AFR | West Africa Regional | | 90 | | $100,000** 09/30/2009 |
| Centers for Disease Control | | Global | GH Bureau | | 2,470 | | $100,000** 09/30/2009 |
| Centers for Disease Control | | LAC | Amazon region | | 200 | | $100,000** 09/30/2009 |
| **Centers for Disease Control** | **USG** | | | | | **5,355** | |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
|---|---|---|---|---|---|---|---|
| **Most of the projects listed below are a duration of five or more years. The dollar figures reflect the total ceiling for the life of the agreement.* | | | | | | | |
| *** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS.* | | | | | | | |
| **Cercle Level Health Program** | **NGO** | **AFR** | **Mali** | | **50** | **50** | **$23,996 06/30/2008** |
| **Chemonics** | **Priv** | **AFR** | **Madagascar** | | **500** | **500** | **$16,556 09/30/2008** |
| **Commonwealth Regional Health Secretariat** | **Gov** | **AFR** | **East/Southern Africa Regional** | | **130** | **130** | **$3,369 09/30/2005** |
| **Christian's Children Fund** | **NGO** | **AFR** | **Senegal** | | **112** | **112** | **$748 06/30/2006** |
| Development Associates | | AFR | Senegal | | 550 | | $9,624 08/15/2006 |
| Development Associates | | AFR | Uganda | | 20 | | $1,943 03/24/2005 |
| **Development Associates** | **Priv** | | | | | **570** | |
| Engender Health | | AFR | Tanzania | | 100 | | $4,151 |
| Engender Health | | AFR | West Africa Regional | | 659 | | 7/15/2008 |
| **Engender Health** | **NGO** | | | | | **759** | |
| **Essential Services for Health** | **NGO** | **AFR** | **Ethiopia** | | **500** | **500** | **$17,907 09/30/2008** |
| Futures Group | | AFR | Nigeria | | 200 | | $19,200** 07/08/2009 |
| Futures Group | | LAC | Peru | | 60 | | $19,200** 07/08/2009 |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
|---|---|---|---|---|---|---|---|
| *Most of the projects listed below are a duration of five or more years. The dollar figures reflect the total ceiling for the life of the agreement.* | | | | | | | |
| ** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS. | | | | | | | |
| **Futures Group** | **Priv** | | | | | **260** | |
| **Helen Keller International** | **PVO** | **AFR** | **Mali** | | **100** | **100** | |
| **Initiatives, Inc** | **Priv** | **Global** | **GH Bureau** | | **400** | **400** | |
| **Interchurch Medical Association** | **PVO** | **AFR** | **DR Congo** | **Yes** | **1,600** | **1,600** | **$27,000 05/15/2006** |
| **International Medical Corps** | **PVO** | **AFR** | **Burundi** | | **500** | **500** | **$500 09/30/2005** |
| **International Rescue Committee** | **PVO** | **Global** | **GH Bureau** | | **50** | **50** | |
| **INTRAH** | **Univ** | **AFR** | **Rwanda** | | **400** | **400** | **424,000 01/13/2010** |
| JHPIEGO | | AFR | East/Southern Africa Regional | | 100 | | $75,000** 07/26/2009 |
| JHPIEGO | | AFR | Kenya | | 200 | | $75,000** 07/26/2009 |
| JHPIEGO | | AFR | Madagascar | | 225 | | $75,000** 07/26/2009 |
| JHPIEGO | | AFR | Rwanda | | 120 | | $75,000** 07/26/2009 |
| JHPIEGO | | AFR | Tanzania | | 300 | | $75,000** 07/26/2009 |
| JHPIEGO | | AFR | West Africa Regional | | 125 | | $75,000** 07/26/2009 |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
|---|---|---|---|---|---|---|---|
| **Most of the projects listed below are a duration of five or more years. The dollar figures reflect the total ceiling for the life of the agreement.* | | | | | | | |
| *** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS.* | | | | | | | |
| JHPIEGO | | Global | GH Bureau | | 950 | | $75,000** 07/26/2009 |
| **JHPIEGO** | **Univ** | | | | | **2,020** | |
| John Snow Inc. | | AFR | Ethiopia | | 100 | | |
| John Snow Inc. | | AFR | Sudan | | 2,000 | | $29,988 04/22/2009 |
| John Snow Inc. | | AFR | Uganda | | 530 | | $88,768 09/30/2007 |
| John Snow Inc. | | ANE | Nepal | | 200 | | |
| John Snow Inc. | | LAC | Bolivia | | 200 | | $16,000 09/30/2009 |
| **John Snow Inc.** | **Priv** | | | | | **3,030** | |
| Johns Hopkins Univ/Center for Communication Programs | | AFR | Uganda | | 200 | | 7/7/2007 |
| Johns Hopkins Univ/Center for Communication Programs | | AFR | Zambia | | 1,090 | | |
| **Johns Hopkins Univ/Center for Communication Programs** | **Univ** | | | | | **1,290** | |
| **Jorge Scientific** | **Priv** | **Global** | **GH Bureau** | | **300** | **300** | **22000 04/30/2005** |
| **HCP** | **NGO** | **AFR** | **Ethiopia** | | **100** | **100** | |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
|---|---|---|---|---|---|---|---|
| *Most of the projects listed below are a duration of five or more years. The dollar figures reflect the total ceiling for the life of the agreement.* | | | | | | | |
| ** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS. | | | | | | | |
| **Kenan Institute** | **NGO** | **ANE** | **ANE Regional** | | **564** | **564** | **$18,010 10/06/2006** |
| MACRO | | AFR | Tanzania | | 100 | | $70,000** 09/29/2008 |
| MACRO | | ANE | Cambodia | | 60 | | $70,000** 09/29/2008 |
| MACRO | | LAC | LAC Regional | | 30 | | $70,000** 09/29/2008 |
| MACRO | | Global | GH Bureau | | 400 | | $70,000** 09/29/2008 |
| **MACRO** | **Priv** | | | | | **590** | |
| **Malaria Vaccine Initiative/PATH** | **NGO** | **Global** | **GH Bureau** | | **1,500** | **1,500** | **$8,000** |
| Management Sciences for Health | | AFR | Angola | Yes | 150 | | $5,500 09/30/2005 |
| Management Sciences for Health | | AFR | DR Congo | | 200 | | $200 09/30/2005 |
| Management Sciences for Health | | AFR | Ghana | | 150 | | $162,045** 09/30/2008 |
| Management Sciences for Health | | AFR | East/Southern Africa Regional | | 375 | | $162,045** 09/30/2008 |
| Management Sciences for Health | | AFR | Kenya | | 200 | | $162,045** 09/30/2008 |
| Management Sciences for Health | | AFR | Madagascar | | 100 | | $162,045** 09/30/2008 |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
|---|---|---|---|---|---|---|---|
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| *** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS.* | | | | | | | |
| Management Sciences for Health | | AFR | Malawi | | 800 | | $162,045** 09/30/2008 |
| Management Sciences for Health | | AFR | Mali | | 100 | | $100 09/30/2005 |
| Management Sciences for Health | | AFR | Senegal | | 297 | | $3,371 09/03/2006 |
| Management Sciences for Health | | AFR | West Africa Regional | | 192 | | $162,045** 09/30/2008 |
| Management Sciences for Health | | ANE | ANE Regional | | 200 | | $162,045** 09/30/2008 |
| Management Sciences for Health | | Global | GH Bureau | | 2,600 | | $162,045** 09/30/2008 |
| Management Sciences for Health | | LAC | LAC regional | | 30 | | $162,045** 09/30/2008 |
| Management Sciences for Health | | LAC | Amazon region | | 65 | | $162,045** 09/30/2008 |
| Management Sciences for Health | | LAC | Haiti | | 660 | | $162,045** 09/30/2008 |
| **Management Sciences for Health** | **NGO** | | | | | **6,119** | |
| **Management Systems International** | **Priv** | **AFR** | **Uganda** | | **170** | **170** | **$4,386 03/06/2008** |
| **Maxygen** | **Priv** | **Global** | **GH Bureau** | **Yes** | **1,212** | **1,212** | **$4,909 09/19/2005** |
| **Medicines for Malaria Venture** | **NGO** | **Global** | **GH Bureau** | | **1,500** | **1,500** | **$8,000 09/09/2008** |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

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| ** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS.* | | | | | | | |
| MENTOR | | AFR | Angola | | 350 | | $933 12/31/2006 |
| MENTOR | | AFR | Liberia | | 300 | | |
| **MENTOR** | **NGO** | | | | | **650** | |
| Ministry of Health | | AFR | Kenya | | 400 | | |
| Ministry of Health | | AFR | Mali | | 122 | | |
| Ministry of Health | | AFR | Tanzania | | 200 | | |
| Ministry of Health | | ANE | Afghanistan | | 400 | | |
| Ministry of Health | | LAC | Honduras | | 285 | | |
| Ministry of Health | | LAC | Peru | | 540 | | $25,066 09/30/2006 |
| **Ministry of Health** | **Gov** | | | | | **1,947** | |
| **Naval Medical Research Unit (NAMRU)** | **USG** | **ANE** | **Indonesia** | | **700** | **700** | **$4,000 09/30/2005** |
| **Navy Medical Research Center** | **USG** | **Global** | **GH Bureau** | **Yes** | **1,000** | **1,000** | **$5,000** |
| New Bilateral (TBD) | | AFR | Ethiopia | | 519 | | |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
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| **Most of the projects listed below are a duration of five or more years. The dollar figures reflect the total ceiling for the life of the agreement.* | | | | | | | |
| *** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS.* | | | | | | | |
| New Bilateral (TBD) | | AFR | Madagascar | | 500 | | |
| New Bilateral (TBD) | | AFR | Mozambique | | 400 | | |
| **New Bilateral (TBD)** | **TBD** | | | | | **1,419** | |
| **PACT** | **PVO** | **AFR** | **Tanzania** | | **200** | **200** | |
| **Partners for Development** | **NGO** | **ANE** | **Cambodia** | | **350** | **350** | |
| Partnership for Child Health | | AFR | Senegal | | 485 | | $3,036 09/30/2006 |
| Partnership for Child Health | | Global | GH Bureau | | 300 | | $101,500 |
| **Partnership for Child Health** | **Priv** | | | | | **785** | |
| Pathfinder | | AFR | Mozambique | | 40 | | $1,500 03/30/2008 |
| Pathfinder | | AFR | Nigeria | | 700 | | $95,000** 05/27/2009 |
| Pathfinder | | LAC | Peru | | 200 | | $95,000** 05/27/2009 |
| **Pathfinder** | **NGO** | | | | | **940** | |
| **Plan International** | **PVO** | **AFR** | **Senegal** | | **113** | **113** | **$10,500 06/30/2006** |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
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| **Most of the projects listed below are a duration of five or more years. The dollar figures reflect the total ceiling for the life of the agreement.* | | | | | | | |
| *** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS.* | | | | | | | |
| Population Services International | | AFR | Angola | | 450 | | $9,712 09/30/2007 |
| Population Services International | | AFR | Benin | | 222 | | $5,000 09/30/2005 |
| Population Services International | | AFR | Kenya | Yes | 400 | | |
| Population Services International | | AFR | Madagascar | | 350 | | |
| Population Services International | | AFR | Malawi | Yes | 200 | | $6,770 |
| Population Services International | | AFR | Mali | Yes | 400 | | $12,415 12/31/2006 |
| Population Services International | | AFR | Mozambique | | 160 | | $444 01/09/2006 |
| Population Services International | | AFR | Nigeria | | 500 | | $4,291 11/07/2009 |
| Population Services International | | AFR | Rwanda | | 300 | | |
| Population Services International | | AFR | Uganda | | 1,000 | | $6,400 09/30/2005 |
| Population Services International | | AFR | Zambia | | 1,000 | | $24,000 09/30/2010 |
| Population Services International | | ANE | Afghanistan | | 200 | | |
| Population Services International | | ANE | Cambodia | | 300 | | $14,033 09/30/2005 |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
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| *Most of the projects listed below are a duration of five or more years. The dollar figures reflect the total ceiling for the life of the agreement.* | | | | | | | |
| ** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS. | | | | | | | |
| Population Services International | | ANE | Indonesia | | 300 | | |
| **Population Services International** | **NGO** | | | | | **5,782** | |
| **PROCOSI** | **NGO** | **LAC** | **Bolivia** | | **200** | **200** | **09/30/2009** |
| **Project Hope** | **PVO** | **AFR** | **Mozambique** | | **100** | **100** | **$1,106 03/31/2008** |
| **PROSIN** | **NGO** | **LAC** | **Bolivia** | | **150** | **150** | **$9,000 09/30/2009** |
| **PVO Grants - Child Survival/Health Grants** | **PVO** | **Global** | **GH Bureau** | | **3,000** | **3,000** | |
| **Regional Center for Quality in Health Care** | **NGO** | **AFR** | **East/Southern Africa Regional** | | **225** | **225** | **9/30/2005** |
| Research Triangle Institute | | AFR | Benin | | 76 | | 6/30/2005 |
| Research Triangle Institute | | AFR | Eritrea | | 485 | | $2,966** 09/30/2006 |
| Research Triangle Institute | | ANE | Nepal | | 400 | | $2,966** 09/30/2006 |
| Research Triangle Institute | | Global | GH Bureau | | 595 | | $2,966** 09/30/2006 |

## FY 2004 Malaria Obligations by Partners, Country and Operating Unit

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
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| *Most of the projects listed below are a duration of five or more years. The dollar figures reflect the total ceiling for the life of the agreement. | | | | | | | |
| ** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS. | | | | | | | |
| **Research Triangle Institute** | **Priv** | | | | | **1,556** | |
| **REST** | **NGO** | **AFR** | **Ethiopia** | | **43** | **43** | **$661** |
| **Roll Back Malaria Secretariat** | **Int** | **Global** | **GH Bureau** | | **750** | **750** | |
| **Save the Children** | **PVO** | **AFR** | **Mozambique** | | **400** | **400** | **$5,705 01/31/2008** |
| **Technoserve** | **NGO** | **Global** | **GH Bureau** | | **1,156** | **1,156** | |
| **Tulane University** | **UNIV** | **AFR** | **DR Congo** | | **150** | **150** | **$3,329 09/30/2005** |
| **UNICEF** | **Int** | **AFR** | **Benin** | | **450** | **450** | **09/30/2006** |
| University Research Corporation | | AFR | Benin | | 769 | | $4,000 01/10/2006 |
| University Research Corporation | | AFR | Eritrea | | 115 | | $6,200 09/30/2006 |
| University Research Corporation | | ANE | Cambodia | | 100 | | $8,318 09/30/2007 |
| **University Research Corporation** | **Priv** | | | | | **984** | |
| **US Peace Corps** | **GOV** | **AFR** | **Benin** | | **1** | **1** | |
| US Pharmacopea | | AFR | Madagascar | | 250 | | $9,576 09/30/2006 |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

| Partner | Org. Type | Region | Country | External Evaluation Available | FY 2004 Malaria Funding $(000) | Total by Organization $(000) | Dollar amount and project end date $(000)* |
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| *Most of the projects listed below are a duration of five or more years. The dollar figures reflect the total ceiling for the life of the agreement.* | | | | | | | |
| ** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS. | | | | | | | |
| US Pharmacopea | | AFR | Senegal | | 100 | | $450 09/30/2010 |
| US Pharmacopea | | Global | GH Bureau | | 250 | | $2,450** 09/30/2010 |
| US Pharmacopea | | ANE | ANE Regional | | 250 | | $2,450** 09/30/2010 |
| US Pharmacopea | | LAC | Amazon region | | 65 | | $2,450** 09/30/2010 |
| **US Pharmacopea** | **NGO** | | | | | **915** | |
| USAID Admin & Staffing | | AFR | AFR Regional (Wash) | | 100 | | |
| USAID Admin & Staffing | | AFR | Angola | | 50 | | |
| USAID Admin & Staffing | | AFR | Benin | | 47 | | |
| USAID Admin & Staffing | | AFR | DR Congo | | 150 | | |
| USAID Admin & Staffing | | AFR | East/Southern Africa Regional | | 200 | | |
| USAID Admin & Staffing | | AFR | Mali | | 88 | | |
| USAID Admin & Staffing | | AFR | Senegal | | 113 | | |
| USAID Admin & Staffing | | AFR | Tanzania | | 130 | | |

**FY 2004 Malaria Obligations by Partners, Country and Operating Unit**

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| *** These projects provide services to USAID missions worldwide and include funding in multiple health areas including maternal health, child health, TB, malaria and other infectious diseases, reproductive health, and HIV/AIDS.* | | | | | | | |
| USAID Admin & Staffing | | AFR | Uganda | | 100 | | |
| USAID Admin & Staffing | | AFR | Zambia | | 260 | | |
| USAID Admin & Staffing | | ANE | Cambodia | | 70 | | |
| USAID Admin & Staffing | | ANE | Nepal | | 50 | | |
| USAID Admin & Staffing | | Global | GH Bureau | | 1,156 | | |
| USAID Admin & Staffing | | LAC | LAC Regional | | 220 | | |
| USAID Admin & Staffing | | LAC | Haiti | | 20 | | |
| USAID Admin & Staffing | | LAC | Amazon Region | | 42 | | |
| **USAID Admin & Staffing** | **USAID** | | | | | **2,796** | |
| **Walter Reed Army Institute of Research** | **USG** | **Global** | **GH Bureau** | **Yes** | **1,801** | **1,801** | **$8,000** |
| **WHO/Tropical Disease Research Programme** | **Int** | **Global** | **GH Bureau** | | **1,200** | **1,200** | |
| World Health Organization | | AFR | AFR Regional (Wash) | | 1,000 | | $7,489 09/30/2009 |
| World Health Organization | | AFR | DR Congo | | 100 | | $130,000** 09/30/2009 |

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| World Health Organization | | AFR | East/Southern Africa Regional | | 250 | | $130,000** 09/30/2009 |
| World Health Organization | | AFR | Ghana | | 50 | | $130,000** 09/30/2009 |
| World Health Organization | | AFR | Madagascar | | 75 | | $130,000** 09/30/2009 |
| World Health Organization | | AFR | Mali | | 100 | | $130,000** 09/30/2009 |
| World Health Organization | | AFR | Rwanda | | 180 | | $130,000** 09/30/2009 |
| World Health Organization | | AFR | Senegal | | 230 | | $1,030 9/30/2006 |
| World Health Organization | | AFR | West Africa Regional | | 85 | | 9/7/2005 |
| World Health Organization | | ANE | ANE Regional | | 630 | | $130,000** 09/30/2009 |
| World Health Organization | | ANE | Afghanistan | | 200 | | $130,000** 09/30/2009 |
| World Health Organization | | ANE | Cambodia | | 520 | | $130,000** 09/30/2009 |
| World Health Organization | | ANE | India | | 350 | | $350 09/30/2009 |
| World Health Organization | | E&E | Central Asia | | 152 | | $130,000** 09/30/2009 |
| World Health Organization | | Global | GH Bureau | | 2,510 | | $130,000** 09/30/2009 |

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| World Health Organization | | LAC | Amazon Region | | 800 | | 9/30/2007 |
| World Health Organization | | LAC | LAC Regional | | 320 | | $130,000** 09/30/2009 |
| **World Health Organization** | **Int** | | | | | **7,552** | |
| **World Vision** | **PVO** | **AFR** | **Mozambique** | | **400** | **400** | **$5,700 01/31/2008** |
| **TOTAL** | | | | | **79,882** | **79,882** | |

## USAID MALARIA ACTIVITIES -List of Partners and Contacts

**Abt Associates, Inc.**
Bethesda One
4800 Montgomery Lane, Suite 600
Bethesda, MD 20814-5341
Telephone: (301) 913-0500
Fax: (301) 652-3618
http://www.abtassoc.com

**Academy for Educational Development (AED)**
1825 Connecticut Avenue, NW
Washington, DC 20009-5721
Telephone: (202) 884-8000
Fax: (202) 884-8400
http://www.aed.org
http://www.fanta.org
http://www.linkagesproject.org

**Africare**
440 R Street, NW
Washington, DC 20001
Telephone: (202) 462-3614
Fax: (202) 387-1034
http://www.africare.org

**American Refugee Committee**
430 Oak Grove Street
Suite 204
Minneapolis, MN 55403
Tel: (612) 872-7060
Fax: (612) 607-6499
Email: archq@archq.org

**Armed Forces Research Institute of Medical Sciences**
U.S. Army Medical Component
315/6 Rajvithi Road, Bangkok 10400, THAILAND
AFRIMS Telephone : (66-2) 644-4888
AFRIMS Fax : (66-2) 247-6030
AFRIMS E-mail: afrims@afrims.org
AFRIMS Website:
http://www.AFRIMS.org/

**Boston University School of Public Health,**

**Center for International Health**
715 Albany St.
Boston, MA 02118
Telephone: (617) 414-1260
http://www.international-health.org

**Catholic Relief Services (CRS)**
209 W. Fayette Street
Baltimore, MD 21201-3443
Telephone: (410) 625-2220
Fax: (410) 234-3178

**CARE**
151 Ellis Street
Atlanta, GA 30303
404-681-2552
Fax: 404-589-2651
E-mail: info@care.org

**Centers for Disease Control & Prevention (CDC)** *(CDC/InfoTech)*
1600 Clifton Road, NE, MS C-08
Atlanta, GA 30333
Telephone: (404) 639-2234
Fax: (404) 639-2230
http://www.cdc.gov

Office of Global Health
**Centers for Disease Control & Prevention (CDC)**
4770 Buford Highway, NE
Atlanta, GA 30341
Telephone: (770) 488-5212 *(Environmental Health)*
Telephone: (770) 488-1195 *(TAACS)*
Fax: (770) 488-1004 *(Environmental Health)*
Fax: (770) 488-1318 *(TAACS)*
http://www.cdc.gov

Division of Reproductive Health
**Centers for Disease Control & Prevention (CDC)** *(Measure/CDC)*

**USAID MALARIA ACTIVITIES -List of Partners and Contacts**

4770 Buford Highway, NE, MS K-22
Atlanta, GA 30341
Telephone: (770) 488-6200
Fax: (770) 488-6242
http://www.cdc.gov

**The Centre for Development and Population Activities (CEDPA)**
1400 16th Street, NW, Suite 200
Washington, DC 20036
Telephone: (202) 667-1142
Fax: (202) 332-4496
http://www.cedpa.org

**Chemonics**
1133 20th St. NW
Washington, DC 20036
Hours: M-F, 9:00 am - 6:00 pm EST
Tel: 202-955-3300
Fax: 202-955-3400

**Christian Children's Fund**
2821 Emerywood Parkway
Richmond VA 23294 USA.
1-800-776-6767

**Development Associates, Inc. (DAI)**
1730 North Lynn Street
Arlington, VA 22209
Telephone: (703) 276-0677
Fax: (703) 276-0432

**EngenderHealth**
440 Ninth Avenue
New York, NY 10001
Telephone: (212) 561-8000
Fax: (212) 779-9489
www.avsc.org

**The Futures Group International**
1050 17th Street, NW, Suite 1000
Washington, DC 20036
Telephone: (202) 775-9680
Fax: (202) 775-9694
http://www.tfgi.com/

Institute for Reproductive Health
**Georgetown University Medical Center**
4301 Connecticut Ave, NW, Suite 310
Washington, DC 20008
Telephone: (202) 687-1392
Fax: (202) 687-6846
http://www.georgetown.edu

**Helen Keller International (HKI)**
90 Washington Street, 15th Floor
New York, NY 10006-2214
Telephone: (212) 943-0890
Fax: (212) 943-1220
http://www.hki.org

**International Medical Corps**
1919 Santa Monica Blvd.
Suite 300
Santa Monica, CA 90404
PHONE 310-826-7800
FAX 310-442-6622

**International Rescue Committee**
122 East 42nd Street, 12th Floor
New York, NY 10168-1289
Telephone: (212) 551-3000
Fax: (212) 551-3186

**Initiatives Inc.**
376 Boyston Street
Suite 4c
Boston, MA 02116
6173262.0293
www.initiativesinc.com
initiatives@att.net

**JHPIEGO**
Brown's Wharf
1615 Thames Street, Suite 200
Baltimore, MD 21231-3492
Telephone: (410) 614-2288 *(Maternal & Neonatal Health)*
Telephone: (410) 955-8558 *(Training in Reproductive Health)*

Fax: (410) 614-6643 *(Maternal & Neonatal Health)*
Fax: (410) 614-3458 *(Training in Reproductive Health)*
http://www.mnh.jhpiego.org *(Maternal & Neonatal Health)*
http://www.jhpiego.jhu.edu/ *(Training in Reproductive Health)*

**John Snow, Inc. (JSI)**
1616 North Fort Myer Drive, 11th Floor
Arlington, VA 22209
Telephone: (703) 528-7474
Fax: (703) 528-7480
http://deliver.jsi.com/
http://www.mothercare.jsi.com/

Department of International Health
Johns Hopkins School of Public Health
**Johns Hopkins University (JHU)**
615 North Wolfe Street
Baltimore, MD 21205-2179
Telephone: (410) 955-3934 *(CHR: FHACS)*
Telephone: (410) 955-2061 *(Micronutrients for Health)*
Fax: (410) 955-7159 *(CHR: FHACS)*
Fax: 410-955-0196 *(Micronutrients for Health)*
http://ih.jhsph.edu/chr/fhacs/fhacs.htm *(CHR: FHACS)*
http://www.childhealthresearch.org *(CHR: FHACS)*
http://www.jhu.edu/www/research/ *(Micronutrients for Health)*
Center for Communication Programs
Johns Hopkins School of Public Health
**Johns Hopkins University (JHU)**
*(HCP and INFO)*
111 Market Place, Suite 310
Baltimore, MD 21202-4024
Telephone: (410) 659-6300
Fax: (410) 659-6266
http://www.jhuccp.org

Institute for International Programs
**Johns Hopkins University (JHU)**
*(HCS Fellows)*
103 East Mount Royal Avenue, Suite 2B
Baltimore, MD 21202
Telephone: (410) 659-4108
Fax: (410) 659-4118
http://ih.jhsph.edu/hcsfp

**Jorge Scientific Corporation**
600 13th Street N.W., Suite 700
Washington, DC 20005
Telephone: (202) 393-9001
Fax: (202) 939-9018
http://www.phnip.com

**Kenan Institute**
1300 Pennsylvania Avenue, NW Suite 370
Washington, DC 20004, U.S.A.
Tel. (202) 289-6282
Fax. (202) 331-4119
Email: KenanUNC@kenan.org

**Macro International, Inc. (ORC Macro)**
11785 Beltsville Drive, Suite 300
Calverton, MD 20705-3119
Telephone: (301) 572-0200
Fax: (301) 572-0999
http://www.macroint.com/

**Management Sciences for Health (MSH)**
Washington DC Office
4301 N Fairfax Dr., Suite 400
Arlington, VA 22203
Telephone: (703) 524-6575
Fax: (703) 524-7898
http://www.msh.org

**Management Sciences for Health (MSH)**
MSH Headquarters

**USAID MALARIA ACTIVITIES -List of Partners and Contacts**

891 Centre Street
Boston, MA 02130
Telephone: (617) 524-7766
Fax: (617) 524-1363
http://www.msh.org

**Management Systems International**
600 Water Street, S.W.
Washington, D.C. 20024
phone 202-484-7170
fax 202-488-0754

**Maxygen - Corporate Headquarters**
301 Galveston Drive
Redwood City, CA 94063
Phone: 650-298-5300
Fax: 650-364-2715

**US Naval Medical Research Unit 2 - (US NAMRU-2)**
Komplek P2M/PLP Litbangkes
Jl. Percetakan Negara 29
Jakarta 10560 - INDONESIA
Phone : +62-21-4214457
Fax : +62-21-4244507

**Naval Medical Research Center**
503 Robert Grant Avenue
Silver Spring, Maryland 20910

**Pact Tanzania**
1387C Msasani
P.O. Box 6348
Dar es Salaam
Tanzania
Telephone: 255 22 2600305/6
Fax: 255 22 2600310
E-mail: pact @pacttz.org

**Partners for Development**
1320 Fenwick Lane, Suite 406
Silver Spring, MD 20910

**Pathfinder International**
9 Galen Street, Suite 217
Watertown, MA 02472
Email: information@pathfind.org
Call:(617)-924-7200
Fax: (617) 924-3833

**Plan, International Headquarters,**
Chobham House, Christchurch Way
Woking, Surrey GU21 6JG
United Kingdom
Tel (+44)1483 755 155,
Fax (+44)1483 756 505

**Triumph Technologies, Inc.**
5203 Leesburg Pike, Suite 1100
Falls Church, VA 22041
Telephone: (703) 820-7251
Fax: (703) 824-5210
http://www.triumph-tech.com

**Partners For Development (PFD)**
1616 N. Fort Meyer Drive, 11th Floor
Arlington VA 22209
Telephone: (703) 528-8336
Fax: (703) 528-7408
http://www.partnersfordevelopment.org

BASICS
**The Partnership for Child Health Care,**
**Inc.**
4245 N Fairfax Drive, Suite 850
Arlington, VA 22203
Telephone: (703) 312-6800
Fax: (703) 312-6900
http://www.basics.org

**Pact, Inc.**
1200 18th Street NW
Suite 350
Washington, DC 20036
Telephone: (202) 466-5666
Fax: (202) 226-5669

**PATH**
1455 N.W. Leary Way
Seattle, WA 98107-5138
Telephone (206) 285-3500

Fax: (206) 285-6619
jmaynard@path.org
http://www.path.org

**Pathfinder International**
9 Galen Street, Suite 217
Watertown, MA 02472
Telephone: (617) 924-7200
Fax: (617) 924-3833
http://www.pathfind.org

**PLAN International USA, Inc. (Childreach)**
3260 Wilson Blvd. Suite 11
Arlington VA 22201
Telephone: (703) 807-0190
Fax: (703) 807-0627
http://www.childreach.org

**Population Services International (PSI)**
1120 19th Street, NW, Suite 600
Washington, DC 20036
Telephone: (202) 785-0072
Fax: (202) 785-0120
http://www.psiwash.org

**Project HOPE**
International Headquarters
255 Carter Hall Lane
Millwood, Virginia 22646
Telephone: 540.837.2100
Fax: 540.837.1813
webmaster@projecthope.org

**Research Triangle Institute**
PO Box 12194
Research Triangle Park, NC 27709-2194
E-mail: listen@rti.org
Telephone: 919-485-2666

**Save the Children**
1620 I Street, NW, Suite 900
Washington, DC 20006
Telephone: (202) 955-0070
Fax: (202) 955-1105
http://www.savethechildren.org

**TechnoServe Headquarters**
49 Day Street
Norwalk, CT 06854, USA
Tel: (203) 852-0377
Fax: (203) 838-6717
E-mail: TechnoServe@tns.org

**Tulane University**
New Orleans, LA 70118
(504)865-5000

**UNICEF**
3 United Nations Plaza
New York, NY 10017
Telephone: (212) 824-6313
Fax: (212) 824-6460
http://www.unicef.org

**Carolina Population Center**
**University of North Carolina**
***(MEASURE Evaluation)***
211 W. Cameron Ave
Chapel Hill, NC 27516-3997
Telephone: (919) 966-7482
Fax: (919) 966-2391
http://www.cpc.unc.edu/measure

**University Research Corporation**
7200 Wisconsin Avenue, Suite 500
Bethesda, MD 20814-4204
Telephone: (301) 654-8338
Fax: (301) 941-8427
http://www.urc-chs.com

**U.S. Pharmacopeia Convention, Inc.**
12601 Twinbrook Parkway
Rockville, MD 20852
Telephone: (301) 816-8161
Fax: (301) 816-8374
http://www.usp.org/

**U.S. Peace Corps**
Paul D. Coverdell Peace Corps
Headquarters
1111 20th Street, NW

**USAID MALARIA ACTIVITIES -List of Partners and Contacts**

Washington, D.C. 20526

**Walter Reed Army Institute of Research**
503 Robert Grant Ave
Silver Spring, MD. 20910

Department of Child and Adolescent Health
and Development (CAH)
**World Health Organization**
*(Child Health Research)*
1211 Geneva 27, Switzerland
Telephone: 41-22-791-266
Fax: 41-22-791-4853
http://www.who.int/chd
http://www.childhealthresearch.org
Children's Vaccine Initiative

**World Health Organization**
***(Children's Vaccination)***
1211 Geneva 27, Switzerland
Telephone: 41-22-791-4511
Fax: 41-22-791-4888
http://www.who.ch

General Management
**World Health Organization**
*(Infectious Diseases)*
1211 Geneva 27, Geneva
Telephone: 41-22-791-2363
Fax: 41-22-791-4751
http://www.who.ch

**World Health Organization**
*(NMH Reproductive Health)*
1211 Geneva 27, Switzerland
Telephone: 41-22-791-3380
Fax: 41-22-791-4171
http://www.who.ch

Health Technologies/Vaccines and Biologics
**World Health Organization** *(Polio)*
Telephone: 41-22-791-4419
Fax: 41-22-791-4193
http://www.who.ch/

Department of Reproductive Health and Research
**World Health Organization**
*(Research and Training in RH)*
1211 Geneva 27
Switzerland
Telephone: 41-22-791-3380
Fax: 41-22-791-4171
http://www.who.int/hrp/

Evidence and Information for Policy Cluster
**World Health Organization**
*(WHO/SHS)*
1211 Geneva 27, Switzerland
Telephone: 41-22-791-2527
Fax: 41-22-791-0746
http://www.who.ch

**World Health Organisation - Regional Office for Africa**
Cite du Djoue,
P.O.Box 06 Brazzaville, Congo
Tel: + (47 241) 39100 / + 242 8 39100
Fax: + (47 241) 39503 / + 242 8 39503

**The World Health Organization Regional Office for the Western Pacific (WPRO)**
P.O. Box 2932
1000 Manila
Philippines
Telephone: (00632) 528.80.01
Fax: (00632) 521.10.36 or 536.02.79
Telex: 27652-63260-40365
Telegraph: UNISANTE MANILA
Email: postmaster@wpro.who.int

**World Health Organization**
Regional Office for South-East Asia
World Health House

Indraprastha Estate
Mahatma Gandhi Marg
New Delhi 110 002, India

**World Health Organization**
**Eastern Mediterranean Regional Office**
Abdul Razzak Al Sanhouri Street,
P.O.Box 7608,
Nasr City, Cairo 11371, Egypt
Telephone: (202) 670 25 35
Facsimile: (202) 670 24 92 or 670 24 94

**World Vision Relief and Development, Inc.**
220 I Street, NE, Suite 270
Washington, DC 20002
Telephone: (202) 547-3743
Fax: (202) 547-4834
http://www.worldvision.org

# SENEGAL

**Exchange rate**
Source: www.oanda.com, average annual rate for cash
2004: 549.24 CFA = 1 US$
2000: 742.52 CFA = 1 US$

**Cost of nets owned – Senegal 2004**
Among all nets

| | | Sites | | | | | | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Dakar | Thies | St Louis | Kaolack | Tambacounda | Urban Dakar | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **CFA** | | | | | | | | | | | | | | |
| Mean* | 2756 | 3510 | 3155 | 3587 | 3505 | 1601 | 4457 | 2836 | 2718 | 2176 | 2633 | 2804 | 2781 | 3501 |
| Standard deviation | 1676 | 1335 | 1434 | 1401 | 1901 | 1149 | 1586 | 1860 | 1583 | 1518 | 1586 | 1683 | 1445 | 1883 |
| Median* | 3000 | 3500 | 3000 | 3500 | 3500 | 1000 | 5000 | 2875 | 3000 | 1500 | 2500 | 3000 | 3000 | 3500 |
| **US$** | | | | | | | | | | | | | | |
| Mean* | 5.02 | 6.39 | 5.74 | 6.53 | 6.38 | 2.92 | 8.12 | 5.16 | 4.95 | 3.96 | 4.79 | 5.11 | 5.06 | 6.37 |
| Standard deviation | 3.05 | 2.43 | 2.61 | 2.55 | 3.46 | 2.09 | 2.89 | 3.39 | 2.88 | 2.76 | 2.89 | 3.06 | 2.63 | 3.43 |
| Median* | 5.46 | 6.37 | 5.46 | 6.37 | 6.37 | 1.82 | 9.10 | 5.23 | 5.46 | 2.73 | 4.55 | 5.46 | 5.46 | 6.37 |
| % Paid | 69.1 | 58.9 | 62.9 | 68.4 | 58.6 | 79.9 | 53.8 | 60.6 | 73.9 | 80.7 | 72.0 | 71.6 | 62.6 | 60.1 |
| % Barter | .0 | .5 | .0 | .0 | .0 | .0 | 0 | .0 | .1 | .0 | .0 | .2 | .0 | .0 |
| % Free | 2.5 | 1.6 | 4.5 | 2.5 | 1.8 | 2.2 | 1.9 | 3.3 | 2.0 | .7 | 3.0 | 2.1 | 3.0 | 3.4 |
| % Don't know cost | 28.4 | 38.9 | 32.6 | 29.1 | 39.6 | 17.9 | 44.2 | 36.1 | 24.0 | 18.7 | 25.0 | 26.1 | 34.4 | 36.5 |
| BASE | 2579 | 185 | 334 | 746 | 457 | 857 | 52 | 931 | 1648 | 461 | 540 | 517 | 532 | 529 |

*Based on price reported by 1782 respondents; excludes free nets

**Cost of nets owned – Senegal 2000**
Among all nets

| | | Sites | | | | | | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Dakar | Thies | St Louis | Kaolack | Tambacounda | Urban Dakar | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **CFA** | | | | | | | | | | | | | | |
| Mean* | 4164 | 3442 | 3622 | 4265 | 3770 | 4464 | 3688 | 3452 | 4480 | 4460 | 4802 | 4245 | 3546 | 3442 |
| Standard deviation* | 1809 | 1873 | 1519 | 2128 | 1466 | 1349 | 2086 | 1473 | 1857 | 1810 | 1887 | 2008 | 1312 | 1523 |
| Median* | 4000 | 3000 | 3500 | 4000 | 3000 | 4500 | 3500 | 3000 | 4500 | 4000 | 5000 | 4000 | 3000 | 3000 |
| **US$** | | | | | | | | | | | | | | |
| Mean* | 5.61 | 4.64 | 4.88 | 5.74 | 5.08 | 6.01 | 4.97 | 4.65 | 6.03 | 6.01 | 6.47 | 5.72 | 4.78 | 4.64 |
| Standard deviation* | 2.44 | 2.52 | 2.05 | 2.87 | 1.97 | 1.82 | 2.81 | 1.98 | 2.50 | 2.44 | 2.54 | 2.70 | 1.77 | 2.05 |
| Median* | 5.39 | 4.04 | 4.71 | 5.39 | 4.04 | 6.06 | 4.71 | 4.04 | 6.06 | 5.39 | 6.73 | 5.39 | 4.04 | 4.04 |
| % Paid | 54.5 | 49.1 | 41.5 | 58.1 | 47.5 | 58.6 | 33.3 | 53.2 | 55.2 | 51.4 | 60.6 | 42.3 | 57.9 | 60.0 |
| % Barter | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| % Free | 11.2 | 15.1 | 33.8 | 9.4 | 18.8 | 1.6 | 25.0 | 17.6 | 8.3 | 6.3 | 10.0 | 13.8 | 12.1 | 15.7 |
| % Don't know cost | 34.2 | 35.8 | 24.6 | 32.5 | 33.8 | 39.8 | 41.7 | 29.3 | 36.5 | 42.4 | 29.4 | 43.9 | 29.9 | 24.3 |
| BASE | 649 | 53 | 65 | 265 | 80 | 186 | 24 | 205 | 444 | 144 | 160 | 123 | 107 | 115 |

*Based on price reported by 354 respondents; excludes free nets

NOTE: To appreciate the true magnitude of price decrease from 2000 to 2004, it is necessary to use the local currency figures; the strengthening of the CFA against the US$ masks the change is comparing US$ figures.

**Cost of *commercial* nets owned – Senegal 2004**

Among all nets acquired from commercial sources (market. kiosk/ street vendor. itinerant vendor, pharmacy/ drug store, general shop, textile shop, wholesaler, tailor, petrol station, employer)

| | | Sites | | | | | | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Dakar | Thies | St Louis | Kaolack | Tambacounda | Urban Dakar | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **CFA** | | | | | | | | | | | | | | |
| Mean* | 3703 | 4345 | 3639 | 4001 | 3721 | 2895 | 5068 | 3678 | 3713 | 3237 | 3495 | 4080 | 3562 | 4131 |
| Standard deviation | 1594 | 1099 | 1248 | 1561 | 2004 | 1500 | 622 | 1655 | 1571 | 1809 | 1436 | 1724 | 1148 | 1472 |
| Median* | 3500 | 4800 | 3500 | 3750 | 3500 | 3000 | 5000 | 3500 | 3500 | 3000 | 3500 | 4000 | 3500 | 4000 |
| **US$** | | | | | | | | | | | | | | |
| Mean* | 6.74 | 7.91 | 6.63 | 7.28 | 6.78 | 5.27 | 9.23 | 6.70 | 6.76 | 5.89 | 6.36 | 7.43 | 6.49 | 7.52 |
| Standard deviation | 2.90 | 2.00 | 2.27 | 2.84 | 3.65 | 2.73 | 1.13 | 3.01 | 2.86 | 3.29 | 2.62 | 3.14 | 2.09 | 2.68 |
| Median* | 6.37 | 8.74 | 6.37 | 6.83 | 6.37 | 5.46 | 9.10 | 6.37 | 6.37 | 5.46 | 6.37 | 7.28 | 6.37 | 7.28 |
| % Paid | 73.4 | 70.6 | 71.9 | 77.9 | 54.0 | 82.3 | 65.5 | 67.5 | 76.1 | 82.4 | 72.5 | 75.9 | 64.0 | 71.4 |
| % Free | .3 | .0 | .0 | .0 | 1.0 | .8 | .0 | .5 | .2 | .8 | 0 | 0 | .9 | .0 |
| % Don't know cost | 26.3 | 29.4 | 28.1 | 22.1 | 45.0 | 16.9 | 34.5 | 32.0 | 23.7 | 16.8 | 27.5 | 24.1 | 35.1 | 28.6 |
| BASE | 640 | 68 | 89 | 253 | 100 | 130 | 29 | 197 | 443 | 125 | 138 | 133 | 111 | 133 |

*Based on price reported by 476 respondents; excludes free nets

**Cost of *NON-commercial* nets owned – Senegal 2004**

Among all nets acquired from non-commercial sources (clinic, project, women's group, government, school)

| | | Sites | | | | | | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Dakar | Thies | St Louis | Kaolack | Tambacounda | Urban Dakar | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **CFA** | | | | | | | | | | | | | | |
| Mean* | 2339 | 2784 | 2916 | 3223 | 3478 | 1328 | 2688 | 2521 | 2252 | 1693 | 2278 | 2222 | 2477 | 3220 |
| Standard deviation | 1546 | 995 | 1509 | 1173 | 1940 | 815 | 1787 | 1856 | 1363 | 1060 | 1546 | 1329 | 1392 | 2004 |
| Median* | 2000 | 2500 | 3000 | 3500 | 3500 | 1000 | 2000 | 2500 | 1500 | 1000 | 1500 | 1500 | 2500 | 3375 |
| **US$** | | | | | | | | | | | | | | |
| Mean* | 4.26 | 5.07 | 5.31 | 5.87 | 6.33 | 2.42 | 4.89 | 4.59 | 4.10 | 3.08 | 4.15 | 4.05 | 4.51 | 5.86 |
| Standard deviation | 2.81 | 1.81 | 2.75 | 2.14 | 3.53 | 1.48 | 3.25 | 3.38 | 2.48 | 1.93 | 2.82 | 2.42 | 2.53 | 3.65 |
| Median* | 3.64 | 4.55 | 5.46 | 6.37 | 6.37 | 1.82 | 3.64 | 4.55 | 2.73 | 1.82 | 2.73 | 2.73 | 4.55 | 6.14 |
| % Paid | 83.1 | 66.7 | 78.9 | 78.8 | 86.5 | 87.6 | 57.1 | 76.0 | 86.9 | 90.2 | 87.3 | 83.8 | 80.6 | 72.9 |
| % Barter | .1 | 1.1 | .0 | .0 | .0 | .0 | .0 | .0 | .1 | .0 | .0 | .3 | .0 | .0 |
| % Free | 3.4 | 2.2 | 8.8 | 5.0 | .5 | 2.3 | 7.1 | 4.0 | 3.1 | .7 | 4.9 | 3.3 | 3.6 | 4.6 |
| % Don't know cost | 13.4 | 30.0 | 12.3 | 16.2 | 13.1 | 10.1 | 35.7 | 20.0 | 9.8 | 9.1 | 7.8 | 12.5 | 15.9 | 22.5 |
| BASE | 1487 | 90 | 171 | 358 | 222 | 646 | 14 | 530 | 957 | 287 | 308 | 303 | 309 | 280 |

*Based on price reported by 1236 respondents; excludes free nets

**Cost of nets from clinics – Senegal 2004**

Among all nets acquired from clinics (64% of all nets owned)

| | Total | Sites | | | | | Urban/Rural | | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St Louis | Kaolack | Tambacounda | Urban Dakar | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **CFA** | | | | | | | | | | | | | | |
| Mean* | 2196 | 2769 | 2667 | 3066 | 3451 | 1332 | 2357 | 2280 | 2162 | 1613 | 2097 | 2079 | 2454 | 3040 |
| Standard deviation | 1507 | 999 | 1460 | 1128 | 2046 | 830 | 1645 | 1881 | 1325 | 991 | 1498 | 1194 | 1349 | 2210 |
| Median* | 1500 | 3000 | 3000 | 3500 | 3500 | 1000 | 2000 | 2000 | 1500 | 1000 | 1250 | 1500 | 2500 | 3000 |
| **US$** | | | | | | | | | | | | | | |
| Mean* | 4.00 | 5.04 | 4.86 | 5.58 | 6.28 | 2.42 | 4.29 | 4.15 | 3.94 | 2.94 | 3.82 | 3.79 | 4.47 | 5.53 |
| Standard deviation | 2.74 | 1.82 | 2.66 | 2.05 | 3.72 | 1.51 | 2.99 | 3.42 | 2.41 | 1.80 | 2.73 | 2.17 | 2.46 | 4.02 |
| Median* | 2.73 | 5.46 | 5.46 | 6.37 | 6.37 | 1.82 | 3.64 | 3.64 | 2.73 | 1.82 | 2.28 | 2.73 | 4.55 | 5.46 |
| % Paid | 85.5 | 71.6 | 86.4 | 82.5 | 85.8 | 88.3 | 77.8 | 76.1 | 90.0 | 93.8 | 90.0 | 85.7 | 81.5 | 74.5 |
| % Barter | .1 | 1.4 | .0 | .0 | .0 | .0 | .0 | .0 | .1 | .0 | .0 | .4 | .0 | .0 |
| % Free | 2.4 | 1.4 | 5.8 | 2.4 | .6 | 2.4 | .0 | 3.6 | 1.8 | .0 | 3.5 | 2.3 | 2.4 | 3.6 |
| % Don't know cost | 12.1 | 25.7 | 7.8 | 15.1 | 13.6 | 9.3 | 22.2 | 20.3 | 8.1 | 6.2 | 6.5 | 11.6 | 16.1 | 21.9 |
| BASE | 1185 | 74 | 103 | 252 | 176 | 580 | 9 | 385 | 800 | 226 | 260 | 258 | 249 | 192 |

*Based on price reported by 1013 respondents; excludes free nets

**Cost of nets from markets –Senegal 2004**

Among all nets acquired from markets (16% of all nets owned)

| | Total | Sites | | | | | Urban/Rural | | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St Louis | Kaolack | Tambacounda | Urban Dakar | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **CFA** | | | | | | | | | | | | | | |
| Mean* | 3572 | 4153 | 3111 | 4180 | 3578 | 2582 | 5000 | 3188 | 3677 | 3063 | 3833 | 4167 | 3060 | 3695 |
| Standard deviation | 1614 | 912 | 652 | 1430 | 2132 | 1441 | 0 | 1576 | 1612 | 1506 | 1365 | 2001 | 1176 | 1415 |
| Median* | 3500 | 4000 | 3000 | 4000 | 3000 | 2875 | 5000 | 3000 | 3500 | 3000 | 3500 | 4000 | 3000 | 3750 |
| **US$** | | | | | | | | | | | | | | |
| Mean* | 6.50 | 7.56 | 5.66 | 7.61 | 6.51 | 4.70 | 9.10 | 5.80 | 6.69 | 5.58 | 6.98 | 7.59 | 5.57 | 6.73 |
| Standard deviation | 2.94 | 1.66 | 1.19 | 2.60 | 3.88 | 2.62 | .00 | 2.87 | 2.94 | 2.74 | 2.48 | 3.64 | 2.14 | 2.58 |
| Median* | 6.37 | 7.28 | 5.46 | 7.28 | 5.46 | 5.23 | 9.10 | 5.46 | 6.37 | 5.46 | 6.37 | 7.28 | 5.46 | 6.83 |
| % Paid | 71.1 | 75.0 | 71.1 | 74.3 | 50.0 | 86.5 | 66.7 | 62.5 | 73.9 | 80.0 | 71.3 | 80.0 | 53.8 | 64.0 |
| % Free | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| % Don't know cost | 28.9 | 25.0 | 28.9 | 25.7 | 50.0 | 13.5 | 33.3 | 37.5 | 26.1 | 20.0 | 28.8 | 20.0 | 46.2 | 36.0 |
| BASE | 360 | 24 | 38 | 144 | 80 | 74 | 6 | 88 | 272 | 90 | 80 | 75 | 65 | 50 |

*Based on price reported by 256 respondents; excludes free nets

**Source of nets – Senegal 2004**

Among all nets owned, where respondent knew source of net

| Senegal 2004 | Total | Sites (city plus surrounding rural areas) | | | | | Urban/Rural | | Urban Dakar | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St Louis | Kaolack | Tamba counda | Urban | Rural | | 1 Low | 2 | 3 | 4 | 5 High |
| **COMMERCIAL** | **35.6** | **48.0** | **41.0** | **45.9** | **41.4** | **19.8** | **34.6** | **36.1** | **72.0** | **33.1** | **35.7** | **34.8** | **34.3** | **39.9** |
| Market | 15.6 | 13.9 | 13.1 | 21.8 | 21.1 | 9.2 | 10.9 | 18.2 | 12.0 | 21.0 | 16.7 | 16.1 | 13.8 | 10.7 |
| Kiosk/ Street vendor | .4 | .0 | .0 | .9 | .0 | .4 | .1 | .5 | .0 | .5 | .4 | 1.1 | .0 | .0 |
| Itinerant vendor | 3.2 | 3.5 | 3.1 | 6.5 | .8 | 1.5 | 1.5 | 4.1 | .0 | 3.7 | 5.0 | 3.2 | 1.9 | 1.9 |
| Pharmacy/ Drug store | 4.8 | 20.8 | 11.0 | 2.7 | 3.2 | 1.6 | 8.5 | 2.8 | 46.0 | .2 | 1.3 | 3.7 | 6.0 | 12.7 |
| General shop | .6 | .0 | .3 | .5 | .3 | 1.0 | .4 | .7 | .0 | 1.2 | .8 | .6 | .0 | .2 |
| Textile shop | .9 | .0 | .3 | 1.2 | .0 | 1.5 | .9 | .9 | .0 | .9 | .8 | 1.9 | .6 | .2 |
| Wholesaler | .3 | .0 | .7 | .0 | .0 | .6 | .6 | .1 | .0 | .2 | .6 | .2 | .0 | .4 |
| Supermarket | .0 | .0 | .0 | .0 | .3 | .0 | .1 | .0 | .0 | .0 | .0 | .0 | .2 | .0 |
| Minimart | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| Tailor | 1.4 | 1.2 | .7 | 3.8 | .8 | .1 | .1 | 2.1 | .0 | .9 | 2.3 | 1.5 | 1.1 | 1.3 |
| Petrol station | .1 | .0 | .0 | .3 | .0 | .1 | .4 | .0 | .0 | .0 | .4 | .2 | .0 | .0 |
| Mothercare/ Baby shop | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| Gift | 7.9 | 8.7 | 10.3 | 7.7 | 15.0 | 3.6 | 10.4 | 6.5 | 14.0 | 4.0 | 6.9 | 6.2 | 10.6 | 11.4 |
| Employer | .4 | .0 | 1.4 | .6 | .0 | .1 | .9 | .1 | .0 | .5 | .4 | .0 | .0 | 1.1 |
| **NON-COMMERCIAL** | **64.4** | **52.0** | **59.0** | **54.1** | **58.6** | **80.2** | **65.4** | **63.9** | **28.0** | **66.9** | **64.3** | **65.2** | **65.7** | **60.1** |
| Clinic | 51.3 | 42.8 | 35.5 | 38.1 | 46.4 | 72.0 | 47.5 | 53.4 | 18.0 | 52.7 | 54.3 | 55.5 | 53.0 | 41.2 |
| Project | 8.0 | 4.0 | 12.4 | 12.2 | 8.7 | 3.4 | 9.7 | 7.0 | 2.0 | 8.6 | 6.9 | 6.0 | 7.4 | 10.9 |
| School | .4 | 1.2 | .0 | .0 | .3 | .7 | .6 | .3 | .0 | .5 | .0 | .2 | 1.1 | .2 |
| Women's group | 4.4 | 4.0 | 11.0 | 3.3 | 3.2 | 3.5 | 7.5 | 2.7 | 8.0 | 4.7 | 2.7 | 2.8 | 4.3 | 7.5 |
| Other non-commercial | .3 | .0 | .0 | .5 | .0 | .6 | .0 | .5 | .0 | .5 | .4 | .6 | .0 | .2 |
| BASE | 2309 | 173 | 290 | 662 | 379 | 805 | 811 | 1498 | 50 | 429 | 479 | 465 | 470 | 466 |

**Price of nets, by source – Senegal 2004**

Among all nets owned

| | CFA | | | US$ | | | BASE for Mean and Median | % Paid | % Free | % Don't know cost | TOTAL Number of nets |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Standard Deviation | Median | Mean | Standard Deviation | Median | | | | | |
| Market | 3572 | 1614 | 3500 | 6.50 | 2.94 | 6.37 | 256 | 71.1 | 0 | 28.9 | 360 |
| Kiosk/ Street vendor | 3689 | 310 | 3500 | 6.72 | 0.56 | 6.37 | 9 | 100.0 | .0 | .0 | 9 |
| Itinerant vendor | 3586 | 1829 | 3500 | 6.53 | 3.33 | 6.37 | 66 | 90.4 | .0 | 9.6 | 73 |
| Pharmacy/ Drug store | 4480 | 1117 | 4500 | 8.16 | 2.03 | 8.19 | 79 | 71.2 | .0 | 28.8 | 111 |
| General shop | 3188 | 1335 | 3000 | 5.80 | 2.43 | 5.46 | 8 | 61.5 | 7.7 | 30.8 | 13 |
| Textile shop | 3891 | 880 | 4000 | 7.08 | 1.60 | 7.28 | 16 | 76.2 | .0 | 23.8 | 21 |
| Wholesaler | 2600 | 1140 | 3000 | 4.73 | 2.08 | 5.46 | 5 | 71.4 | .0 | 28.6 | 7 |
| Tailor | 3674 | 2118 | 3500 | 6.69 | 3.86 | 6.37 | 23 | 69.7 | .0 | 30.3 | 33 |
| Petrol station | 2500 | 0 | 2500 | 4.55 | 0.00 | 4.55 | 2 | 66.7 | .0 | 33.3 | 3 |
| Employer | 2000 | 548 | 2000 | 3.64 | 1.00 | 3.64 | 6 | 66.7 | .0 | 33.3 | 9 |
| Clinic | 2196 | 1507 | 1500 | 4.00 | 2.74 | 2.73 | 1013 | 85.5 | 2.4 | 12.1 | 1185 |
| Project | 2928 | 1376 | 3000 | 5.33 | 2.51 | 5.46 | 121 | 65.8 | 11.4 | 22.8 | 184 |
| School | 1167 | 408 | 1000 | 2.12 | 0.74 | 1.82 | 6 | 66.7 | .0 | 33.3 | 9 |
| Women's group | 3316 | 1730 | 3500 | 6.04 | 3.15 | 6.37 | 87 | 86.1 | 2.0 | 11.9 | 101 |
| Other non-commercial | 1813 | 1163 | 1000 | 3.30 | 2.12 | 1.82 | 8 | 100.0 | .0 | .0 | 8 |

# GHANA

**Exchange rate**
Source: www.oanda.com, average annual rate for cash
2004: 9271.80 cedis = 1 US$

**Cost of nets owned – Ghana 2004**
Among all nets

| | Total | Site (city plus surrounding rural areas) | | | | | Urban Accra only | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Accra | Keta | Kumasi | Wa | Tamale | | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **cedis** | | | | | | | | | | | | | | |
| Mean* | 32341 | 39022 | 39368 | 34961 | 28483 | 19608 | 48524 | 37449 | 27970 | 26923 | 31768 | 32706 | 32984 | 38140 |
| Standard deviation | 20021 | 22967 | 20479 | 16884 | 15481 | 15747 | 28920 | 20944 | 18115 | 17682 | 19565 | 20963 | 18565 | 21939 |
| Median* | 30000 | 35000 | 35000 | 30000 | 25000 | 15000 | 35000 | 35000 | 25000 | 25000 | 30000 | 30000 | 30000 | 35000 |
| **US$** | | | | | | | | | | | | | | |
| Mean* | 3.49 | 4.21 | 4.25 | 3.77 | 3.07 | 2.11 | 5.23 | 4.04 | 3.02 | 2.90 | 3.43 | 3.53 | 3.56 | 4.11 |
| Standard deviation | 2.16 | 2.48 | 2.21 | 1.82 | 1.67 | 1.70 | 3.12 | 2.26 | 1.95 | 1.91 | 2.11 | 2.26 | 2.00 | 2.37 |
| Median* | 3.24 | 3.77 | 3.77 | 3.24 | 2.70 | 1.62 | 3.77 | 3.77 | 2.70 | 2.70 | 3.24 | 3.24 | 3.24 | 3.77 |
| % Paid | 74.9 | 69.2 | 68.4 | 76.6 | 79.7 | 86.5 | 70.0 | 72.8 | 76.7 | 84.6 | 80.6 | 69.6 | 71.8 | 68.4 |
| % Free | 1.4 | .0 | .8 | 1.3 | 2.0 | 2.6 | .0 | 1.0 | 1.6 | 1.2 | 2.6 | .6 | 2.6 | .0 |
| % Don't know cost | 23.8 | 30.8 | 30.7 | 22.1 | 18.3 | 11.0 | 30.0 | 26.1 | 21.6 | 14.2 | 16.8 | 29.7 | 25.6 | 31.6 |
| BASE | 808 | 65 | 358 | 77 | 153 | 155 | 30 | 383 | 425 | 162 | 155 | 158 | 156 | 177 |

*Based on price reported by 605 respondents; excludes free nets

**Cost of *commercial* nets owned – Ghana 2004**

Among all nets acquired from commercial sources (market, kiosk/ street vendor, itinerant vendor, pharmacy/ drug store, general shop, textile shop, wholesaler, tailor, petrol station, employer)

| | | Sites | | | | | | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Accra | Keta | Kumasi | Wa | Tamale | Urban Accra only | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **cedis** | | | | | | | | | | | | | | |
| Mean* | 36982 | 44115 | 39704 | 33591 | 32406 | 25091 | 52077 | 41367 | 31853 | 32239 | 39879 | 36172 | 36644 | 40712 |
| Standard deviation | 20094 | 24770 | 20891 | 18316 | 14300 | 13343 | 32702 | 20727 | 18082 | 17182 | 19252 | 20036 | 19805 | 23445 |
| Median* | 35000 | 35000 | 35000 | 30000 | 30000 | 25000 | 36000 | 40000 | 30000 | 30000 | 35000 | 35000 | 30000 | 35000 |
| **US$** | | | | | | | | | | | | | | |
| Mean* | 3.99 | 4.76 | 4.28 | 3.62 | 3.50 | 2.71 | 5.62 | 4.46 | 3.44 | 3.48 | 4.30 | 3.90 | 3.95 | 4.39 |
| Standard deviation | 2.17 | 2.67 | 2.25 | 1.98 | 1.54 | 1.44 | 3.53 | 2.24 | 1.95 | 1.85 | 2.08 | 2.16 | 2.14 | 2.53 |
| Median* | 3.77 | 3.77 | 3.77 | 3.24 | 3.24 | 2.70 | 3.88 | 4.31 | 3.24 | 3.24 | 3.77 | 3.77 | 3.24 | 3.77 |
| % Paid | 74.7 | 74.3 | 71.4 | 77.8 | 80.3 | 86.8 | 76.5 | 75.6 | 73.6 | 83.3 | 81.5 | 69.2 | 72.7 | 68.8 |
| % Free | .2 | .0 | .0 | .0 | 1.6 | .0 | .0 | .0 | .5 | 1.1 | .0 | .0 | .0 | .0 |
| % Don't know cost | 25.1 | 23.5 | 28.6 | 22.2 | 18.3 | 13.5 | 23.5 | 24.4 | 25.8 | 15.9 | 18.5 | 30.8 | 26.4 | 31.3 |
| BASE | 459 | 34 | 283 | 45 | 60 | 37 | 17 | 246 | 213 | 88 | 81 | 107 | 87 | 96 |

*Based on price reported by 343 respondents

**Cost of *NON-commercial* nets owned – Ghana 2004**

Among all nets acquired from non-commercial sources (clinic, project, women's group, government, school)

| | | Sites | | | | | | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Accra | Keta | Kumasi | Wa | Tamale | Urban Accra only | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **cedis** | | | | | | | | | | | | | | |
| Mean* | 26014 | 32053 | 38375 | 37750 | 25792 | 17817 | 42750 | 29258 | 24242 | 20492 | 22263 | 26147 | 27978 | 34593 |
| Standard deviation | 18309 | 18668 | 19133 | 13325 | 15880 | 16114 | 22244 | 19356 | 17520 | 16192 | 15706 | 21689 | 16191 | 19637 |
| Median* | 25000 | 25000 | 35000 | 35000 | 25000 | 10000 | 35000 | 30000 | 23000 | 20000 | 25000 | 21000 | 25000 | 30000 |
| **US$** | | | | | | | | | | | | | | |
| Mean* | 2.81 | 3.46 | 4.14 | 4.07 | 2.78 | 1.92 | 4.61 | 3.16 | 2.61 | 2.21 | 2.40 | 2.82 | 3.02 | 3.73 |
| Standard deviation | 1.97 | 2.01 | 2.06 | 1.44 | 1.71 | 1.74 | 2.40 | 2.09 | 1.89 | 1.75 | 1.69 | 2.34 | 1.75 | 2.12 |
| Median* | 2.70 | 2.70 | 3.77 | 3.77 | 2.70 | 1.08 | 3.77 | 3.24 | 2.48 | 2.16 | 2.70 | 2.26 | 2.70 | 3.24 |
| % Paid | 87.8 | 90.5 | 80.0 | 87.0 | 86.7 | 91.8 | 88.9 | 84.8 | 89.6 | 96.9 | 93.4 | 89.5 | 80.4 | 79.4 |
| % Free | 2.4 | .0 | .0 | 4.3 | 2.4 | 3.6 | .0 | 1.0 | 3.3 | 1.6 | 1.6 | 2.6 | 7.1 | .0 |
| % Don't know cost | 9.8 | 9.5 | 20.0 | 8.7 | 10.8 | 4.5 | 11.1 | 14.3 | 7.1 | 1.6 | 4.9 | 7.9 | 12.5 | 20.6 |
| BASE | 287 | 21 | 50 | 23 | 83 | 110 | 9 | 105 | 182 | 64 | 61 | 38 | 56 | 68 |

*Based on price reported by 252 respondents; excludes free nets

**Cost of nets from clinics – Ghana 2004**

Among all nets acquired from clinics (35% of all nets owned)

| | | Sites | | | | | | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Accra | Keta | Kumasi | Wa | Tamale | Urban Accra only | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **cedis** | | | | | | | | | | | | | | |
| Mean* | 25863 | 31889 | 41448 | 38158 | 26129 | 17817 | 42750 | 29115 | 24267 | 19871 | 22571 | 26594 | 27884 | 34646 |
| Standard deviation | 18653 | 19195 | 20705 | 13562 | 15905 | 16114 | 22244 | 20283 | 17647 | 16529 | 15673 | 21926 | 16422 | 20739 |
| Median* | 25000 | 25000 | 40000 | 35000 | 25000 | 10000 | 35000 | 30000 | 23000 | 18000 | 25000 | 21000 | 25000 | 30000 |
| **US$** | | | | | | | | | | | | | | |
| Mean* | 2.79 | 3.44 | 4.47 | 4.12 | 2.82 | 1.92 | 4.61 | 3.14 | 2.62 | 2.14 | 2.43 | 2.87 | 3.01 | 3.74 |
| Standard deviation | 2.01 | 2.07 | 2.23 | 1.46 | 1.72 | 1.74 | 2.40 | 2.19 | 1.90 | 1.78 | 1.69 | 2.36 | 1.77 | 2.24 |
| Median* | 2.70 | 2.70 | 4.31 | 3.77 | 2.70 | 1.08 | 3.77 | 3.24 | 2.48 | 1.94 | 2.70 | 2.26 | 2.70 | 3.24 |
| % Paid | 89.4 | 90.0 | 85.3 | 90.5 | 86.4 | 92.7 | 88.9 | 87.6 | 90.3 | 98.3 | 94.9 | 88.9 | 84.3 | 80.0 |
| % Free | 1.9 | .0 | .0 | .0 | 2.5 | 2.8 | .0 | 1.1 | 2.3 | .0 | .0 | 2.8 | 7.8 | .0 |
| % Don't know cost | 8.7 | 10.0 | 14.7 | 9.5 | 11.1 | 4.6 | 11.1 | 11.2 | 7.4 | 1.7 | 5.1 | 8.3 | 7.8 | 20.0 |
| BASE | 265 | 20 | 34 | 21 | 81 | 109 | 9 | 89 | 176 | 59 | 59 | 36 | 51 | 60 |

*Based on price reported by 237 respondents; excludes free nets

**Cost of nets from markets – Ghana 2004**

Among all nets acquired from markets (50% of all nets owned)

| | | Sites | | | | | | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Accra | Keta | Kumasi | Wa | Tamale | Urban Accra only | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **cedis** | | | | | | | | | | | | | | |
| Mean* | 35308 | 33111 | 38728 | 28359 | 29748 | 24941 | 25200 | 39211 | 30520 | 33273 | 39200 | 35795 | 35467 | 31955 |
| Standard deviation | 18771 | 10465 | 20503 | 14852 | 12296 | 14729 | 11946 | 19496 | 16707 | 17001 | 18823 | 19879 | 19069 | 18859 |
| Median* | 35000 | 35000 | 35000 | 30000 | 30000 | 20000 | 30000 | 35000 | 30000 | 30000 | 35000 | 35000 | 30000 | 30000 |
| **US$** | | | | | | | | | | | | | | |
| Mean* | 3.81 | 3.57 | 4.18 | 3.06 | 3.21 | 2.69 | 2.72 | 4.23 | 3.29 | 3.59 | 4.23 | 3.86 | 3.83 | 3.45 |
| Standard deviation | 2.02 | 1.13 | 2.21 | 1.60 | 1.33 | 1.59 | 1.29 | 2.10 | 1.80 | 1.83 | 2.03 | 2.14 | 2.06 | 2.03 |
| Median* | 3.77 | 3.77 | 3.77 | 3.24 | 3.24 | 2.16 | 3.24 | 3.77 | 3.24 | 3.24 | 3.77 | 3.77 | 3.24 | 3.24 |
| % Paid | 74.4 | 72.0 | 71.2 | 81.8 | 81.6 | 89.5 | 62.5 | 76.2 | 72.3 | 83.8 | 82.2 | 67.0 | 74.0 | 66.7 |
| % Free | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| % Don't know cost | 25.6 | 28.0 | 28.8 | 18.2 | 18.4 | 10.5 | 37.5 | 23.8 | 27.7 | 16.2 | 17.8 | 33.0 | 26.0 | 33.3 |
| BASE | 383 | 25 | 257 | 33 | 49 | 19 | 8 | 206 | 177 | 74 | 73 | 97 | 73 | 66 |

*Based on price reported by 285 respondents; excludes free nets

**Source of nets – Ghana 2004**

Among total number of nets owned, where respondent knew source of net

| | | Site (city plus surrounding rural areas) | | | | | Urban | Location | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Accra | Keta | Kumasi | Wa | Tamale | Accra only | All Urban | All Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **COMMERCIAL** | **62.7** | **65.0** | **85.3** | **66.7** | **44.3** | **27.6** | **67.9** | **70.8** | **55.5** | **59.5** | **58.5** | **74.3** | **61.9** | **59.8** |
| Market | 49.8 | 41.7 | 75.8 | 47.8 | 32.9 | 12.5 | 28.6 | 57.2 | 43.3 | 46.8 | 49.7 | 65.5 | 49.7 | 39.1 |
| Kiosk/ Street vendor | 1.1 | .0 | .0 | 2.8 | 2.7 | 1.3 | .0 | .0 | 1.9 | 3.2 | 2.1 | .0 | .0 | .0 |
| Itinerant vendor | 2.6 | 1.7 | 2.1 | 2.9 | 2.0 | 4.6 | 3.6 | 1.4 | 3.7 | 5.7 | 2.0 | 2.7 | 2.0 | .6 |
| Pharmacy/ Drug store | 3.5 | 8.3 | 3.5 | 8.7 | .7 | 2.0 | 17.9 | 4.2 | 2.9 | .0 | .7 | 2.7 | 3.4 | 10.1 |
| General shop | 1.0 | .0 | .3 | 1.4 | 2.0 | 2.0 | .0 | 2.2 | .0 | .0 | .0 | .7 | 3.4 | 1.2 |
| Textile shop | .1 | 1.7 | .0 | .0 | .0 | .0 | 3.6 | .3 | .0 | .0 | .0 | .0 | .0 | .6 |
| Supermarket | .1 | .0 | .0 | .0 | .0 | .7 | .0 | .3 | .0 | .0 | .0 | .7 | .0 | .0 |
| Tailor | .7 | .0 | 1.5 | .0 | .0 | .0 | .0 | 1.4 | .0 | .0 | .0 | .0 | .7 | 2.4 |
| Petrol station | .8 | 3.3 | .3 | 1.4 | .0 | 1.3 | 7.1 | 1.4 | .2 | .0 | .7 | .0 | .0 | 3.0 |
| Gift | 2.6 | 6.7 | 1.8 | 1.4 | 3.4 | 2.6 | 7.1 | 2.5 | 2.7 | 2.5 | 3.4 | 2.0 | 2.0 | 3.0 |
| Employer | .4 | 1.7 | .0 | .0 | .7 | 7 | .0 | .0 | .7 | 1.3 | .0 | .0 | .7 | .0 |
| **NON-COMMERCIAL** | **37.3** | **35.0** | **14.7** | **33.3** | **55.7** | **72.4** | **32.1** | **29.2** | **44.5** | **40.5** | **41.5** | **25.7** | **38.1** | **40.2** |
| Clinic | 34.5 | 33.3 | 10.0 | 30.4 | 54.4 | 71.7 | 32.1 | 24.7 | 43.0 | 37.3 | 40.1 | 24.3 | 34.7 | 35.5 |
| Project | 2.0 | .0 | 3.8 | 1.4 | .0 | 7 | .0 | 3.6 | .5 | 1.3 | .7 | .7 | 3.4 | 3.6 |
| Women's group | .4 | .0 | .0 | 1.4 | 1.3 | 0 | .0 | .0 | .7 | 1.3 | .7 | .0 | .0 | .0 |
| Other non-commercial source | .5 | 1.7 | .9 | .0 | .0 | .0 | .0 | .8 | .2 | .6 | .0 | .7 | .0 | 1.2 |
| BASE | 769 | 60 | 339 | 69 | 149 | 152 | 28 | 360 | 409 | 158 | 147 | 148 | 147 | 169 |

**Price of nets, by source – Ghana 2004**

Among all nets owned

| | CFA | | | US$ | | | BASE for Mean and Median | % Paid | % Free | % Don't know cost | TOTAL Number of nets |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Standard Deviation | Median | Mean | Standard Deviation | Median | | | | | |
| Market | 35308 | 18771 | 35000 | 3.81 | 2.02 | 3.77 | 285 | 74.4 | .0 | 25.6 | 383 |
| Kiosk | 26667 | 2887 | 25000 | 2.88 | 0.31 | 2.70 | 3 | 60.0 | .0 | 40.0 | 5 |
| Street vendor | 17500 | 17678 | 17500 | 1.89 | 1.91 | 1.89 | 2 | 66.7 | .0 | 33.3 | 3 |
| Itinerant vendor | 35368 | 17799 | 30000 | 3.81 | 1.92 | 3.24 | 19 | 95.0 | .0 | 5.0 | 20 |
| Pharmacy/ Drug store | 58565 | 24196 | 65000 | 6.32 | 2.61 | 7.01 | 23 | 85.2 | .0 | 14.8 | 27 |
| General shop | 45000 | 13693 | 45000 | 4.85 | 1.48 | 4.85 | 5 | 62.5 | .0 | 37.5 | 8 |
| Tailor | . | . | . | . | . | . | 0 | .0 | .0 | 100.0 | 5 |
| Petrol station | 54200 | 30277 | 50000 | 5.85 | 3.27 | 5.39 | 5 | 83.3 | .0 | 16.7 | 6 |
| Employer | 6000 | . | 6000 | 0.65 | . | 0.65 | 1 | 33.3 | 33.3 | 33.3 | 3 |
| Clinic | 25863 | 18653 | 25000 | 2.79 | 2.01 | 2.70 | 237 | 89.4 | 1.9 | 8.7 | 265 |
| Project | 29800 | 11802 | 30000 | 3.21 | 1.27 | 3.24 | 10 | 66.7 | 13.3 | 20.0 | 15 |
| Women's group | 19333 | 12897 | 23000 | 2.09 | 1.39 | 2.48 | 3 | 100.0 | .0 | .0 | 3 |
| Other non-commercial | 35000 | 0 | 35000 | 3.77 | 0.00 | 3.77 | 2 | 50.0 | .0 | 50.0 | 4 |

# GHANA
## COVERAGE, APPROPRIATE USE, AWARENESS, AND EXPOSURE INDICATORS
## NETMARK HOUSEHOLD SURVEY, 2004
## REVISED 3/18/05

**LIST OF TABLES**

1. Percent of households owning mosquito nets and insecticide-treated nets, by site, urban/rural, SES

2. Number of mosquito nets owned, by site, urban/rural, SES

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4. Proportions of nets treated (among nets owned), by site, urban/rural, SES

5. Source of nets owned, by site, urban/rural, SES

6. Awareness of nets and insecticide treated mosquito nets, by site, urban/rural, SES

7. Percent who have heard information about ITNs in past 12 months, by site, urban/rural, SES

8. Percent of vulnerable groups (children under 5, WRA, pregnant women) sleeping under nets/ITNs the previous night, by site, urban/rural, SES
   a) among all households
   b) among net-owning households

**Table1: Percent of households owning mosquito nets and insecticide-treated nets**
Among all households

| | Total | Sites (city plus surrounding rural areas) | | | | | Urban Accra only | Urban/Rural | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Accra | Keta | Kumasi | Wa | Tamale | | All Urban | All Rural | 1 Low | 2 | 3 | 4 | 5 High |
| Own net | 38.1 | 17.3 | 63.8 | 18.7 | 44.8 | 46.2 | 20.0 | 39.1 | 37.5 | 42.7 | 37.8 | 34.1 | 36.7 | 39.3 |
| Own ever-treated net | 20.9 | 10.3 | 19.6 | 10.0 | 29.4 | 35.5 | 13.3 | 19.0 | 22.2 | 20.9 | 21.3 | 14.2 | 20.0 | 28.3 |
| Own ITN (12 mo.) | 18.9 | 8.6 | 18.3 | 9.3 | 24.7 | 33.8 | 13.3 | 16.7 | 20.4 | 19.5 | 19.6 | 12.3 | 17.7 | 25.7 |
| BASE | 1500 | 301 | 301 | 300 | 299 | 299 | 120 | 599 | 901 | 302 | 296 | 302 | 300 | 300 |

**Table 2: Number of mosquito nets owned**
Among households owning each type of mosquito net

| | | Total | Sites (city plus surrounding rural areas) | | | | | Urban Accra only | Urban/Rural | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Accra | Keta | Kumasi | Wa | Tamale | | All Urban | All Rural | 1 Low | 2 | 3 | 4 | 5 High |
| Nets | Mean | 1.5 | 1.3 | 2.0 | 1.4 | 1.1 | 1.1 | 1.3 | 1.7 | 1.3 | 1.3 | 1.4 | 1.6 | 1.5 | 1.5 |
| | BASE | 572 | 52 | 192 | 56 | 134 | 138 | 24 | 234 | 338 | 129 | 112 | 103 | 110 | 118 |
| Ever-treated nets | Mean | 1.2 | 1.2 | 1.4 | 1.3 | 1.0 | 1.1 | 1.2 | 1.3 | 1.1 | 1.0 | 1.1 | 1.1 | 1.2 | 1.3 |
| | BASE | 314 | 31 | 59 | 30 | 88 | 106 | 16 | 114 | 200 | 63 | 63 | 43 | 60 | 85 |
| ITN (12 mo.) | Mean | 1.1 | 1.1 | 1.3 | 1.3 | 1.0 | 1.1 | 1.1 | 1.2 | 1.1 | 1.0 | 1.1 | 1.1 | 1.2 | 1.2 |
| | BASE | 284 | 26 | 55 | 28 | 74 | 101 | 16 | 100 | 184 | 59 | 58 | 37 | 53 | 77 |

**Table 3: Ownership of baby nets (non-hanging)**
Among all households

| | Total | Sites (city plus surrounding rural areas) | | | | | Urban Accra only | Urban/Rural | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Accra | Keta | Kumasi | Wa | Tamale | | All Urban | All Rural | 1 Low | 2 | 3 | 4 | 5 High |
| Own a baby net | 24.5 | 29.6 | 25.6 | 38.7 | 15.4 | 13.0 | 31.7 | 25.9 | 23.5 | 11.9 | 17.6 | 23.5 | 33.0 | 36.3 |
| BASE | 1500 | 301 | 301 | 300 | 299 | 299 | 120 | 599 | 901 | 302 | 296 | 302 | 300 | 300 |
| Average number of baby nets owned | 1.1 | 1.2 | 1.1 | 1.1 | 1.0 | 1.1 | 1.2 | 1.1 | 1.1 | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 |
| BASE | 367 | 89 | 77 | 116 | 46 | 39 | 38 | 155 | 212 | 36 | 52 | 71 | 99 | 109 |
| Own only a baby net (no hanging net) | 14.3 | 24.3 | 6.3 | 29.3 | 5.7 | 6.0 | 25.8 | 14.4 | 14.3 | 6.6 | 9.8 | 15.2 | 19.3 | 20.7 |
| BASE | 1500 | 301 | 301 | 300 | 299 | 299 | 120 | 599 | 901 | 302 | 296 | 302 | 300 | 300 |

**Table 4: Proportions of nets treated**
Among total number of nets owned

| | Total | Sites (city plus surrounding rural areas) | | | | | Urban Accra Only | Urban/Rural | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Accra | Keta | Kumasi | Wa | Tamale | | All Urban | All Rural | 1 Low | 2 | 3 | 4 | 5 High |
| Bought pretreated ("pretreated") | 37.1 | 55.4 | 17.4 | 40.3 | 51.0 | 61.2 | 63.3 | 32.4 | 41.3 | 32.5 | 37.8 | 27.9 | 33.5 | 51.7 |
| Treated since purchase ("post-treated") | 19.3 | 9.2 | 10.7 | 19.5 | 29.6 | 33.3 | 10.0 | 15.9 | 22.4 | 18.5 | 17.5 | 11.4 | 22.2 | 26.1 |
| Ever treated | 44.9 | 56.9 | 23.2 | 49.4 | 60.1 | 72.9 | 63.3 | 37.9 | 51.3 | 40.1 | 45.8 | 30.4 | 44.9 | 61.6 |
| Currently treated (12 mo.) | 39.9 | 43.1 | 20.4 | 46.8 | 50.3 | 69.7 | 60.0 | 32.4 | 46.6 | 37.7 | 41.3 | 25.3 | 39.7 | 53.7 |
| BASE | 808 | 65 | 358 | 77 | 153 | 155 | 30 | 383 | 425 | 162 | 155 | 158 | 156 | 177 |

**Table 5: Source of nets**
Among total number of nets owned, where respondent knew source of net

| | Total | Site (city plus surrounding rural areas) | | | | | Urban Accra only | Location | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Accra | Keta | Kumasi | Wa | Tamale | | All Urban | All Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **COMMERCIAL** | **62.7** | **65.0** | **85.3** | **66.7** | **44.3** | **27.6** | **67.9** | **70.8** | **55.5** | **59.5** | **58.5** | **74.3** | **61.9** | **59.8** |
| Market | 49.8 | 41.7 | 75.8 | 47.8 | 32.9 | 12.5 | 28.6 | 57.2 | 43.3 | 46.8 | 49.7 | 65.5 | 49.7 | 39.1 |
| Kiosk/ Street vendor | 1.1 | .0 | .0 | 2.8 | 2.7 | 1.3 | .0 | .0 | 1.9 | 3.2 | 2.1 | .0 | .0 | .0 |
| Itinerant vendor | 2.6 | 1.7 | 2.1 | 2.9 | 2.0 | 4.6 | 3.6 | 1.4 | 3.7 | 5.7 | 2.0 | 2.7 | 2.0 | .6 |
| Pharmacy/ Drug store | 3.5 | 8.3 | 3.5 | 8.7 | .7 | 2.0 | 17.9 | 4.2 | 2.9 | .0 | .7 | 2.7 | 3.4 | 10.1 |
| General shop | 1.0 | .0 | .3 | 1.4 | 2.0 | 2.0 | .0 | 2.2 | .0 | .0 | .0 | .7 | 3.4 | 1.2 |
| Textile shop | .1 | 1.7 | .0 | .0 | .0 | .0 | 3.6 | .3 | .0 | .0 | .0 | .0 | .0 | .6 |
| Supermarket | .1 | .0 | .0 | .0 | .0 | .7 | .0 | .3 | .0 | .0 | .0 | .7 | .0 | .0 |
| Tailor | .7 | .0 | 1.5 | .0 | .0 | .0 | .0 | 1.4 | .0 | .0 | .0 | .0 | .7 | 2.4 |
| Petrol station | .8 | 3.3 | .3 | 1.4 | .0 | 1.3 | 7.1 | 1.4 | .2 | .0 | .7 | .0 | .0 | 3.0 |
| Gift | 2.6 | 6.7 | 1.8 | 1.4 | 3.4 | 2.6 | 7.1 | 2.5 | 2.7 | 2.5 | 3.4 | 2.0 | 2.0 | 3.0 |
| Employer | .4 | 1.7 | .0 | .0 | .7 | .7 | .0 | .0 | .7 | 1.3 | .0 | .0 | .7 | .0 |
| **NON-COMMERCIAL** | **37.3** | **35.0** | **14.7** | **33.3** | **55.7** | **72.4** | **32.1** | **29.2** | **44.5** | **40.5** | **41.5** | **25.7** | **38.1** | **40.2** |
| Clinic | 34.5 | 33.3 | 10.0 | 30.4 | 54.4 | 71.7 | 32.1 | 24.7 | 43.0 | 37.3 | 40.1 | 24.3 | 34.7 | 35.5 |
| Project | 2.0 | .0 | 3.8 | 1.4 | .0 | .7 | .0 | 3.6 | .5 | 1.3 | .7 | .7 | 3.4 | 3.6 |
| Women's group | .4 | .0 | .0 | 1.4 | 1.3 | .0 | .0 | .0 | .7 | 1.3 | .7 | .0 | .0 | .0 |
| Other non-commercial source | .5 | 1.7 | .9 | .0 | .0 | .0 | .0 | .8 | .2 | .6 | .0 | .7 | .0 | 1.2 |
| BASE | 769 | 60 | 339 | 69 | 149 | 152 | 28 | 360 | 409 | 158 | 147 | 148 | 147 | 169 |

**Table 6: Awareness of nets and insecticide treated mosquito nets**
Among all respondents

| | Total | Sites (city plus surrounding rural areas) | | | | | Urban Accra Only | Urban/Rural | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Accra | Keta | Kumasi | Wa | Tamale | | All Urban | All Rural | 1 Low | 2 | 3 | 4 | 5 High |
| No | 8.6 | 5.6 | 6.6 | 11.3 | 12.7 | 6.7 | 3.3 | 8.0 | 9.0 | 15.2 | 9.8 | 8.9 | 5.7 | 3.3 |
| Yes | 91.4 | 94.4 | 93.4 | 88.7 | 87.3 | 93.3 | 96.7 | 92.0 | 91.0 | 84.8 | 90.2 | 91.1 | 94.3 | 96.7 |
| BASE | 1500 | 301 | 301 | 300 | 299 | 299 | 120 | 599 | 901 | 302 | 296 | 302 | 300 | 300 |

**Table 7: Seen or heard anything about mosquito nets treated with insecticide in past 12 months**
Among all respondents

| | Total | Sites (city plus surrounding rural areas) | | | | | Urban Accra only | Urban/Rural | | Net Ownership | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Accra | Keta | Kumasi | Wa | Tamale | | All Urban | All Rural | Non-Owners | Owners | 1 Low | 2 | 3 | 4 | 5 High |
| No | 10.5 | 8.6 | 8.0 | 12.3 | 16.4 | 7.0 | 1.7 | 8.7 | 11.7 | 13.9 | 4.9 | 18.2 | 11.5 | 12.6 | 6.3 | 3.7 |
| Yes | 89.5 | 91.4 | 92.0 | 87.7 | 83.6 | 93.0 | 98.3 | 91.3 | 88.3 | 86.1 | 95.1 | 81.8 | 88.5 | 87.4 | 93.7 | 96.3 |
| BASE | 1500 | 301 | 301 | 300 | 299 | 299 | 120 | 599 | 901 | 928 | 572 | 302 | 296 | 302 | 300 | 300 |

**Table 8a: Proportions of vulnerable groups who slept under a net and under ITN last night**
Among persons most vulnerable to severe malaria in **ALL** households

| | | Site | | | | | Location | | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Accra | Keta | Kumasi | Wa | Tamale | Urban Capital | Total Urban | Total Rural | 1 low | 2 | 3 | 4 | 5 high |
| **Children <5** | | | | | | | | | | | | | | |
| Hanging net | 25.3 | 9.8 | 46.9 | 12.3 | 27.8 | 32.6 | 11.4 | 26.3 | 24.7 | 29.0 | 26.3 | 19.8 | 26.8 | 24.3 |
| Hanging or baby net | 30.1 | 17.0 | 50.4 | 20.4 | 30.4 | 34.5 | 19.8 | 30.9 | 29.6 | 30.8 | 30.1 | 23.3 | 33.6 | 33.1 |
| ITN (12 mo.) | 12.6 | 4.5 | 13.7 | 6.3 | 15.3 | 23.8 | 7.2 | 10.2 | 14.0 | 13.0 | 13.9 | 5.9 | 14.8 | 15.7 |
| ITN (6 mo.) | 10.3 | 3.3 | 11.8 | 5.8 | 13.2 | 18.0 | 4.8 | 8.4 | 11.5 | 11.2 | 9.3 | 4.7 | 13.1 | 13.6 |
| **BASE** | 2008 | 400 | 373 | 446 | 378 | 411 | 167 | 753 | 1255 | 445 | 418 | 404 | 366 | 375 |
| **WRA / Females 15-49** | | | | | | | | | | | | | | |
| Any net | 23.4 | 8.1 | 47.1 | 10.3 | 23.6 | 30.6 | 8.4 | 24.2 | 22.7 | 28.4 | 24.4 | 20.9 | 22.0 | 21.6 |
| ITN (12 mo.) | 10.9 | 3.6 | 11.9 | 5.3 | 12.7 | 22.7 | 4.7 | 8.7 | 12.5 | 12.1 | 12.2 | 5.9 | 11.2 | 12.8 |
| ITN (6 mo.) | 8.7 | 2.6 | 9.7 | 4.8 | 10.7 | 17.2 | 3.7 | 6.9 | 10.1 | 10.1 | 8.1 | 4.4 | 10.0 | 10.9 |
| **BASE** | 2071 | 422 | 403 | 456 | 411 | 379 | 190 | 875 | 1196 | 388 | 418 | 407 | 419 | 439 |
| **Pregnant women** | | | | | | | | | | | | | | |
| Any net | 21.0 | 14.3 | 29.4 | 13.0 | 20.0 | 29.2 | .0 | 22.2 | 20.0 | 25.0 | 37.5 | 11.1 | 13.0 | 26.3 |
| ITN (12 mo.) | 7.6 | 4.8 | 5.9 | 8.7 | 0.0 | 16.7 | 0.0 | 4.4 | 10.0 | 10.0 | 25.0 | 0.0 | 0.0 | 10.5 |
| ITN (6 mo.) | 5.7 | 4.8 | 5.9 | 8.7 | 0.0 | 8.3 | 0.0 | 4.4 | 6.7 | 5.0 | 18.8 | 0.0 | 0.0 | 10.5 |
| **BASE** | 105 | 21 | 17 | 23 | 20 | 24 | 9 | 45 | 60 | 20 | 16 | 27 | 23 | 19 |

**Table 8b: Proportions of vulnerable groups who slept under a net and under ITN last night**
Among persons most vulnerable to severe malaria in **net-owning** households

| | | Site | | | | | Location | | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Accra | Keta | Kumasi | Wa | Tamale | Urban Capital | Total Urban | Total Rural | 1 low | 2 | 3 | 4 | 5 high |
| **Children <5** | | | | | | | | | | | | | | |
| Hanging net | 68.1 | 56.5 | 76.4 | 66.3 | 60.7 | 69 8 | 55.9 | 70.2 | 66.8 | 67.9 | 73.3 | 62.0 | 72.1 | 64.5 |
| Hanging or baby net | 70.9 | 62.3 | 78.6 | 68.7 | 63.6 | 72.4 | 61.8 | 73.0 | 69.6 | 68.9 | 74.7 | 64.3 | 76.5 | 70.2 |
| **BASE** | 746 | 69 | 229 | 83 | 173 | 192 | 34 | 282 | 464 | 190 | 150 | 129 | 136 | 141 |
| **WRA / Females 15-49** | | | | | | | | | | | | | | |
| Any net | 61.7 | 45.9 | 68.8 | 58.0 | 55.7 | 64.8 | 36.4 | 61.1 | 62.2 | 63.6 | 68.0 | 62.5 | 61.3 | 54.3 |
| **BASE** | 784 | 74 | 276 | 81 | 174 | 179 | 44 | 347 | 437 | 173 | 150 | 136 | 150 | 175 |
| **Pregnant women** | | | | | | | | | | | | | | |
| Any net | 68.8 | * | * | * | * | * | * | * | * | * | * | * | * | * |
| **BASE** | 32 | 5 | 9 | 3 | 8 | 7 | 2 | 13 | 19 | 7 | 6 | 6 | 5 | 8 |

* Ns in subgroups too low to permit meaningful calculation

# SENEGAL
## COVERAGE, APPROPRIATE USE, AWARENESS, AND EXPOSURE INDICATORS
## NETMARK HOUSEHOLD SURVEY, 2000 AND 2004
## REVISED 3/18/05

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**Table 1. Percent of households owning mosquito nets and insecticide-treated nets**
Among all households

| | | Total | Sites (city plus surrounding rural areas) | | | | | Urban Dakar only | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Dakar | Thies | St Louis | Kaolack | Tambacounda | | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| Owns a net | 2000 | 33.6 | 18.0 | 20.6 | 55.2 | 25.3 | 49.2 | 18.8 | 28.8 | 36.8 | 36.5 | 42.0 | 32.0 | 27.5 | 30 |
| | 2004 | 56.1 | 30.6 | 45.4 | 69.8 | 52.3 | 82.5 | 22.0 | 53.3 | 58.0 | 52.0 | 57.4 | 55.6 | 58.3 | 57.3 |
| Owns ever-treated net | 2000 | 11.0 | 2.9 | 9.0 | 24.9 | 11.6 | 6.6 | 4.7 | 10.0 | 11.7 | 9.0 | 15.5 | 9.5 | 9.0 | 12.0 |
| | 2004 | 42.8 | 22.6 | 31.7 | 46.8 | 40.8 | 72.0 | 18.9 | 45.0 | 41.3 | 36.8 | 43.9 | 40.1 | 45.0 | 48.0 |
| Owns ITN (12 mos.) | 2000 | 8.2 | 2.0 | 6.0 | 17.9 | 9.6 | 5.6 | 2.4 | 7.3 | 8.8 | 6.0 | 12.5 | 8.0 | 5.0 | 9.5 |
| | 2004 | 38.7 | 20.1 | 27.4 | 39.3 | 37.5 | 69.0 | 18.2 | 40.8 | 37.3 | 35.3 | 38.7 | 35.3 | 40.8 | 43.3 |
| BASE | 2000 | 1000 | 205 | 199 | 201 | 198 | 197 | 85 | 400 | 600 | 200 | 200 | 200 | 200 | 200 |
| | 2004 | 2000 | 399 | 401 | 400 | 400 | 400 | 159 | 800 | 1200 | 400 | 401 | 399 | 400 | 400 |

**Table 2. Mean number of nets owned**
Among households that own each type of net

| | | Total | Sites (city plus surrounding rural areas) | | | | | Urban Dakar only | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Dakar | Thies | St Louis | Kaolack | Tambacounda | | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| Nets | 2000 Mean | 2.1 | 1.43 | 1.59 | 2.77 | 1.74 | 1.99 | 1.5 | 1.82 | 2.24 | 2.08 | 2.06 | 2.23 | 2.02 | 2.1 |
| | 2000 BASE | 336 | 37 | 41 | 111 | 50 | 97 | 16 | 115 | 221 | 73 | 84 | 64 | 55 | 60 |
| | 2004 Mean | 2.8 | 1.5 | 2.0 | 3.7 | 2.4 | 3.3 | 1.5 | 2.5 | 3.0 | 2.8 | 2.8 | 3.0 | 2.8 | 2.8 |
| | 2004 BASE | 1122 | 122 | 182 | 279 | 209 | 330 | 35 | 426 | 696 | 208 | 230 | 222 | 233 | 229 |
| Ever treated nets | 2000 Mean | 1.8 | 2.0 | 1.1 | 2.0 | 1.7 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.6 | 1.8 | 1.7 | 2.0 |
| | 2000 BASE | 110 | 6 | 18 | 50 | 23 | 13 | 4 | 40 | 70 | 18 | 31 | 19 | 18 | 24 |
| | 2004 Mean | 2.2 | 1.4 | 1.7 | 2.3 | 2.1 | 2.6 | 1.4 | 2.1 | 2.2 | 2.3 | 2.2 | 2.2 | 2.2 | 2.2 |
| | 2004 BASE | 855 | 90 | 127 | 187 | 163 | 288 | 30 | 360 | 495 | 147 | 176 | 160 | 180 | 192 |
| ITN (12 mos.) | 2000 Mean | 1.9 | 2.5 | 1.2 | 2.0 | 1.8 | 1.9 | 2.5 | 1.9 | 1.8 | 2.1 | 1.6 | 1.9 | 1.7 | 2.1 |
| | 2000 BASE | 82 | 4 | 12 | 36 | 19 | 11 | 2 | 29 | 53 | 12 | 25 | 16 | 10 | 19 |
| | 2004 Mean | 2.2 | 1.4 | 1.7 | 2.3 | 2.0 | 2.6 | 1.4 | 2.1 | 2.2 | 2.3 | 2.2 | 2.1 | 2.1 | 2.1 |
| | 2004 BASE | 773 | 80 | 110 | 157 | 150 | 276 | 29 | 326 | 447 | 141 | 155 | 141 | 163 | 173 |

**Table 3. Baby Net Ownership**
Among all households

| | Total | Sites (city plus surrounding rural areas) | | | | | Urban Dakar only | Urban/ Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St Louis | Kaolack | Tamba counda | | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| Own baby net | 9.5 | 8.5 | 14.0 | 4.5 | 13.3 | 7.3 | 5.7 | 12.6 | 7.4 | 4.3 | 6.5 | 9.0 | 14.5 | 13.3 |
| BASE | 2000 | 399 | 401 | 400 | 400 | 400 | 159 | 800 | 1200 | 400 | 401 | 399 | 400 | 400 |
| Mean baby nets owned* | 1.2 | 1.4 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.1 | 1.2 | 1.2 | 1.0 | 1.4 | 1.1 | 1.2 |
| BASE | 190 | 34 | 56 | 18 | 53 | 29 | 9 | 101 | 89 | 17 | 26 | 36 | 58 | 53 |
| Own only baby net (no hanging net) | 4.3 | 6.5 | 7.7 | 2.0 | 4.3 | .8 | 4.4 | 4.9 | 3.8 | 2.3 | 3.2 | 4.0 | 6.3 | 5.5 |
| BASE | 2000 | 399 | 401 | 400 | 400 | 400 | 159 | 800 | 1200 | 400 | 401 | 399 | 400 | 400 |

*Among households owning a baby net

**Table 4. Proportions of nets treated**

Among all nets owned - 2000

| Senegal 2000 | Total | Sites (city plus surrounding rural areas) | | | | | Urban Dakar | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St Louis | Kaolack | Tamba counda | | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| Bought pre-treated (pre-treated) | 18.4 | 25.0 | 21.9 | 18.1 | 39.2 | 6.7 | 31.8 | 28.0 | 13.9 | 7.9 | 15.8 | 17.6 | 24.3 | 30.6 |
| Treated since purchase (post-treated) | 15.1 | 2.0 | 9.2 | 23.2 | 16.5 | 8.7 | 4.8 | 13.4 | 15.9 | 16.9 | 19.4 | 13.2 | 6.6 | 17.0 |
| Ever treated | 30.2 | 22.6 | 30.8 | 38.1 | 48.7 | 12.9 | 29.2 | 34.6 | 28.2 | 23.6 | 31.2 | 28.5 | 28 | 40.9 |
| Currently treated (12 mos ) | 12.5 | .0 | 9.2 | 17.7 | 16.3 | 8.1 | .0 | 11.2 | 13.1 | 13.2 | 16.3 | 11.4 | 6.5 | 13.0 |
| BASE | 649 | 53 | 65 | 265 | 80 | 186 | 24 | 205 | 444 | 144 | 160 | 123 | 107 | 115 |

Among all nets owned - 2004

| Senegal 2004 | Total | Sites (city plus surrounding rural areas) | | | | | Urban Dakar | Urban/Rural | | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St Louis | Kaolack | Tamba counda | | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| Bought pre-treated (pre-treated) | 66.3 | 68.5 | 64.4 | 55.6 | 73.8 | 70.8 | 78.8 | 78.3 | 59.1 | 50.7 | 63.0 | 64.9 | 75.9 | 75.2 |
| Treated since purchase (post-treated) | 26.4 | 15.6 | 11.8 | 17.4 | 15.2 | 48.3 | 21.2 | 25.7 | 26.8 | 46.4 | 25.0 | 22.0 | 21.3 | 19.9 |
| Ever treated | 72.7 | 70.3 | 64.1 | 58.8 | 74.0 | 88.1 | 82.7 | 82.5 | 67.2 | 73.3 | 70.4 | 68.9 | 72.9 | 78.3 |
| Currently treated (12 mos.) | 64.8 | 62.2 | 55.1 | 48.4 | 65.4 | 83.2 | 80.8 | 72.4 | 60.6 | 70.9 | 61.9 | 58.2 | 64.8 | 69.0 |
| BASE | 2579 | 185 | 334 | 746 | 457 | 857 | 52 | 931 | 1648 | 461 | 540 | 517 | 532 | 529 |

**Table 5. Source of nets**

Among all nets owned, where respondent knew source of net - 2000

| Senegal 2000 | Total | Sites (city plus surrounding rural areas) | | | | | Urban Dakar | Urban / Rural | | Socio-economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St Louis | Kaolack | Tamba counda | | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| **COMMERCIAL** | **84.1** | **88.7** | **76.2** | **79.3** | **76.2** | **94.8** | **95.0** | **82.3** | **84.7** | **88.7** | **82.5** | **83.5** | **78.3** | **85.1** |
| Market | 55.4 | 56.8 | 31.7 | 60.3 | 46.3 | 59.9 | 55.0 | 49.0 | 58.4 | 65.5 | 58.4 | 50.5 | 37.1 | 58.9 |
| Kiosk | 1.7 | .0 | .0 | 4.0 | .0 | .0 | .0 | .0 | 2.5 | 2.8 | 1.3 | 3.9 | .0 | .0 |
| Street vendor | .2 | 2.3 | .0 | .0 | .0 | .0 | 5.0 | .5 | .0 | .0 | .0 | .0 | 1.0 | .0 |
| General shop | 5.0 | 2.3 | 4.8 | 1.6 | .0 | 12.4 | .0 | 3.1 | 5.9 | 2.1 | 6.7 | .0 | 12.4 | 4.7 |
| Textile shop | 6.9 | 2.3 | 4.8 | 5.7 | 1.5 | 12.4 | .0 | 6.3 | 7.1 | 10.6 | 6.7 | 6.8 | 8.2 | .9 |
| Wholesaler | .5 | .0 | 1.6 | .0 | .0 | 1.1 | .0 | .0 | .7 | .0 | 1.3 | .0 | 1.0 | .0 |
| Pharmacy / drug store | .3 | .0 | .0 | .8 | .0 | .0 | .0 | .0 | .5 | .0 | .0 | 1.9 | .0 | .0 |
| Supermarket | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| Minimart | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| Gift | 12.9 | 22.7 | 25.4 | 6.9 | 26.9 | 9.0 | 35.0 | 20.8 | 9.1 | 7.7 | 8.1 | 19.4 | 15.5 | 17.8 |
| Employer | 1.0 | 2.3 | 7.9 | .0 | .0 | .0 | .0 | 2.1 | .5 | .0 | .0 | 1.0 | 3.1 | 1.9 |
| Bought abroad | .2 | .0 | .0 | .0 | 1.5 | .0 | .0 | .5 | .0 | .0 | .0 | .0 | .0 | .9 |
| **NON-COMMERCIAL** | **16.0** | **11.4** | **23.8** | **20.6** | **23.9** | **5.1** | **5.0** | **17.7** | **15.1** | **11.2** | **17.5** | **16.5** | **21.7** | **14.9** |
| Clinic | 6.0 | 9.1 | 3.2 | 6.9 | 7.5 | 4.5 | .0 | 3.6 | 7.1 | 3.5 | 5.4 | 7.8 | 12.4 | 2.8 |
| Hygiene services | 4.2 | 2.3 | 1.6 | 6.1 | 10.4 | .6 | 5.0 | 9.4 | 1.7 | 1.4 | 4.7 | 1.9 | 4.1 | 9.3 |
| Project | 3.3 | .0 | 11.1 | 3.6 | 6.0 | .0 | .0 | .0 | 4.9 | 3.5 | 6.0 | 2.9 | .0 | 2.8 |
| School | .0 | .0 | .0 | .0 | .0 | .0 | 0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| Organizations | 1.2 | .0 | 1.6 | 2.4 | .0 | .0 | 0 | 3.1 | .2 | .0 | .7 | 2.9 | 3.1 | .0 |
| Other | 1.3 | .0 | 6.3 | 1.6 | .0 | .0 | .0 | 1.6 | 1.2 | 2.8 | .7 | 1.0 | 2.1 | .0 |
| BASE | 598 | 44 | 63 | 247 | 67 | 177 | 20 | 192 | 406 | 142 | 149 | 103 | 97 | 107 |

Among all nets owned, where respondent knew source of net - 2004

| Senegal 2004 | Total | Sites (city plus surrounding rural areas) | | | | | Urban/Rural | | Urban Dakar | Socio economic status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St Louis | Kaolack | Tamba counda | Urban | Rural | | 1 Low | 2 | 3 | 4 | 5 High |
| **COMMERCIAL** | **35.6** | **48.0** | **41.0** | **45.9** | **41.4** | **19.8** | **34.6** | **36.1** | **72.0** | **33.1** | **35.7** | **34.8** | **34.3** | **39.9** |
| Market | 15.6 | 13.9 | 13.1 | 21.8 | 21.1 | 9.2 | 10.9 | 18.2 | 12.0 | 21.0 | 16.7 | 16.1 | 13.8 | 10.7 |
| Kiosk/ Street vendor | .4 | .0 | .0 | .9 | .0 | .4 | .1 | .5 | .0 | .5 | .4 | 1.1 | .0 | .0 |
| Itinerant vendor | 3.2 | 3.5 | 3.1 | 6.5 | .8 | 1.5 | 1.5 | 4.1 | .0 | 3.7 | 5.0 | 3.2 | 1.9 | 1.9 |
| Pharmacy/ Drug store | 4.8 | 20.8 | 11.0 | 2.7 | 3.2 | 1.6 | 8.5 | 2.8 | 46.0 | .2 | 1.3 | 3.7 | 6.0 | 12.7 |
| General shop | .6 | .0 | .3 | .5 | .3 | 1.0 | .4 | .7 | .0 | 1.2 | .8 | .6 | .0 | .2 |
| Textile shop | .9 | .0 | .3 | 1.2 | .0 | 1.5 | .9 | .9 | .0 | .9 | .8 | 1.9 | .6 | .2 |
| Wholesaler | .3 | .0 | .7 | .0 | .0 | .6 | .6 | .1 | .0 | .2 | .6 | .2 | .0 | .4 |
| Supermarket | .0 | .0 | .0 | .0 | .3 | .0 | .1 | .0 | .0 | .0 | .0 | .0 | .2 | .0 |
| Minimart | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| Tailor | 1.4 | 1.2 | .7 | 3.8 | .8 | .1 | .1 | 2.1 | .0 | .9 | 2.3 | 1.5 | 1.1 | 1.3 |
| Petrol station | .1 | .0 | .0 | .3 | .0 | .1 | .4 | .0 | .0 | .0 | .4 | .2 | .0 | .0 |
| Mothercare/ Baby shop | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | .0 |
| Gift | 7.9 | 8.7 | 10.3 | 7.7 | 15.0 | 3.6 | 10.4 | 6.5 | 14.0 | 4.0 | 6.9 | 6.2 | 10.6 | 11.4 |
| Employer | .4 | .0 | 1.4 | .6 | .0 | .1 | .9 | .1 | .0 | .5 | .4 | .0 | .0 | 1.1 |
| **NON-COMMERCIAL** | **64.4** | **52.0** | **59.0** | **54.1** | **58.6** | **80.2** | **65.4** | **63.9** | **28.0** | **66.9** | **64.3** | **65.2** | **65.7** | **60.1** |
| Clinic | 51.3 | 42.8 | 35.5 | 38.1 | 46.4 | 72.0 | 47.5 | 53.4 | 18.0 | 52.7 | 54.3 | 55.5 | 53.0 | 41.2 |
| Project | 8.0 | 4.0 | 12.4 | 12.2 | 8.7 | 3.4 | 9.7 | 7.0 | 2.0 | 8.6 | 6.9 | 6.0 | 7.4 | 10.9 |
| School | .4 | 1.2 | .0 | .0 | .3 | .7 | .6 | .3 | .0 | .5 | .0 | .2 | 1.1 | .2 |
| Women's group | 4.4 | 4.0 | 11.0 | 3.3 | 3.2 | 3.5 | 7.5 | 2.7 | 8.0 | 4.7 | 2.7 | 2.8 | 4.3 | 7.5 |
| Other non-commercial | .3 | .0 | .0 | .5 | .0 | .6 | .0 | .5 | .0 | .5 | .4 | .6 | .0 | .2 |
| BASE | 2309 | 173 | 290 | 662 | 379 | 805 | 811 | 1498 | 50 | 429 | 479 | 465 | 470 | 466 |

**Table 6. Percent of households aware of ITNS**

Among all households

| | Total | Sites (city plus surrounding rural areas) | | | | | Urban Dakar | Urban/Rural | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St Louis | Kaolack | Tamba counda | | Urban | Rural | 1 Low | 2 | 3 | 4 | 5 High |
| 2000 | 70.2 | 60.5 | 67.3 | 89.1 | 73.7 | 59.4 | 69.4 | 76.3 | 65.8 | 53 | 71 | 66.5 | 77.5 | 82 |
| 2004 | 97.3 | 99.0 | 96.0 | 99.5 | 92.8 | 99.0 | 99.4 | 99.6 | 95.7 | 92.8 | 94.5 | 99.2 | 99.8 | 100.0 |
| BASE (2000) | 1000 | 205 | 199 | 201 | 198 | 197 | 85 | 400 | 600 | 200 | 200 | 200 | 200 | 200 |
| BASE (2004) | 2000 | 399 | 401 | 400 | 400 | 400 | 159 | 800 | 1200 | 400 | 401 | 399 | 400 | 400 |

**Table 7. Seen or heard anything about mosquito nets treated with insecticide in past 12 months**

Among all households

| | Total | Sites (city plus surrounding rural areas) | | | | | Urban Dakar | Urban/Rural | | Owns a net | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St Louis | Kaolack | Tamba counda | | Urban | Rural | No | Yes | 1 Low | 2 | 3 | 4 | 5 High |
| Yes | 89.8 | 92.2 | 88.0 | 89.8 | 80.8 | 98.0 | 96.9 | 97.5 | 84.6 | 85.1 | 93.4 | 76.8 | 85.3 | 94.0 | 95.5 | 97.3 |
| BASE | 2000 | 399 | 401 | 400 | 400 | 400 | 159 | 800 | 1200 | 878 | 1122 | 400 | 401 | 399 | 400 | 400 |

**Table 8a. Proportions of vulnerable groups who slept under a net and under ITN last night**
Among vulnerable groups in **ALL** households - 2004

| Senegal 2004 | Total | Sites (city plus surrounding rural areas) | | | | | Urban Dakar | Location | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St Louis | Kaolack | Tamba counda | | Total Urban | Total Rural | 1 low | 2 | 3 | 4 | 5 high |
| **Children <5** | | | | | | | | | | | | | | |
| Hanging net | 35.4 | 15.0 | 18.0 | 52.4 | 31.1 | 56.9 | 15.7 | 33.2 | 36.6 | 34.2 | 34.9 | 35.4 | 36.6 | 36.7 |
| Hanging or baby net | 37.6 | 17.9 | 20.6 | 53.2 | 34.0 | 58.6 | 18.6 | 35.6 | 38.7 | 35.4 | 36.3 | 37.7 | 39.7 | 40.0 |
| ITN (12 mo.) | 23.8 | 9.2 | 10.3 | 27.0 | 21.1 | 47.2 | 13.3 | 25.1 | 23 1 | 24.9 | 23.9 | 20.9 | 24.3 | 25.3 |
| BASE | 4116 | 708 | 868 | 782 | 824 | 934 | 210 | 1428 | 2688 | 948 | 908 | 828 | 795 | 637 |
| **WRA / Females 15-49** | | | | | | | | | | | | | | |
| Any net | 35.0 | 15.8 | 19.7 | 46.0 | 32.8 | 54.0 | 13.7 | 31.5 | 37.2 | 32.7 | 37.2 | 34.6 | 35.9 | 34.4 |
| ITN (12 mo.) | 23.2 | 10.7 | 11.0 | 22.1 | 22.4 | 46.0 | 11.4 | 23.7 | 22.8 | 23.6 | 23.9 | 20.7 | 23.5 | 24.5 |
| BASE | 4236 | 626 | 902 | 965 | 845 | 898 | 211 | 1617 | 2619 | 789 | 872 | 915 | 864 | 796 |
| **Pregnant women** | | | | | | | | | | | | | | |
| Any net | 41.7 | 26.7 | 32.1 | 50.0 | 45.9 | 53.2 | 22.2 | 41.2 | 42.0 | 36.8 | 41.8 | 45.5 | 36.8 | 53.1 |
| ITN (12 mo.) | 31.0 | 15.6 | 19.8 | 34.0 | 32.4 | 49.4 | 22.2 | 33.0 | 30.1 | 31.6 | 28.4 | 34.8 | 25.0 | 40.6 |
| BASE | 290 | 45 | 81 | 50 | 37 | 77 | 9 | 97 | 193 | 57 | 67 | 66 | 68 | 32 |

**Table 8b. Proportions of vulnerable groups who slept under net last night**
Among vulnerable groups in **NET-OWNING** households - 2000

| Senegal 2000 | Total | Sites (city plus surrounding rural areas) | | | | | Location | | | | Urban/Rural | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St. Louis | Kaolack | Tamba-counda | Dakar Urban | Other Urban | Near Rural | Far Rural | Total Urban | Total Rural | 1 | 2 | 3 | 4 | 5 |
| **Children (0-4)** | | | | | | | | | | | | | | | | | |
| Any net (n=320) | 52.5 | 26.9 | 39.3 | 68.9 | 43.0 | 57.1 | 24.1 | 50.0 | 50.0 | 59.6 | 46.1 | 55.4 | 57.4 | 60.9 | 38.3 | 54.3 | 50.5 |
| **Females (15-49)** | | | | | | | | | | | | | | | | | |
| Any net (n=327) | 48.9 | 18.9 | 37.0 | 65.8 | 42.5 | 51.8 | 18.6 | 45.1 | 46.8 | 58.8 | 40.3 | 53.6 | 65.1 | 50.9 | 44.8 | 45.8 | 37.7 |
| **Pregnant Women** | | | | | | | | | | | | | | | | | |
| Any net (n=25) | 59.5 | 33.3 | 20.0 | 71.4 | 66.7 | 64.3 | 50 | 43.8 | 64.3 | 80.0 | 44.4 | 70.8 | 75.0 | 50.0 | 66.7 | 75.0 | 36.4 |

**Table 8c. Proportions of vulnerable groups who slept under net last night**
Among vulnerable groups in **NET-OWNING** households - 2004

| Senegal 2004 | Total | Sites (city plus surrounding rural areas) | | | | | Urban Dakar | Location | | Socio-Economic Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dakar | Thies | St Louis | Kaolack | Tamba counda | | Total Urban | Total Rural | 1 low | 2 | 3 | 4 | 5 high |
| **Children <5** | | | | | | | | | | | | | | |
| Hanging net | 60.1 | 45.3 | 38.5 | 70.7 | 57.7 | 69.5 | 67.3 | 59.9 | 60.2 | 58.9 | 62.4 | 61.2 | 57.5 | 60.9 |
| Hanging or baby net | 61.9 | 47.4 | 40.5 | 71.0 | 61.0 | 71.3 | 71.4 | 62.6 | 61.6 | 59.6 | 63.6 | 63.5 | 60.1 | 63.5 |
| BASE | 2427 | 234 | 405 | 580 | 444 | 764 | 49 | 791 | 1636 | 550 | 508 | 479 | 506 | 384 |
| **WRA/ Females 15-49** | | | | | | | | | | | | | | |
| Any net | 57.1 | 50.0 | 41.3 | 60.3 | 58.3 | 64.2 | 56.9 | 52.9 | 59.6 | 58 8 | 61.7 | 57.1 | 55.4 | 53.0 |
| BASE | 2596 | 198 | 431 | 736 | 475 | 756 | 51 | 964 | 1632 | 439 | 525 | 555 | 560 | 517 |
| **Pregnant women** | | | | | | | | | | | | | | |
| Any net | 66.1 | 52.2 | 60.5 | 69.4 | 85.0 | 67.2 | 100.0 | 65.6 | 66.4 | 60.0 | 75.7 | 75.0 | 51.0 | 77.3 |
| BASE | 183 | 23 | 43 | 36 | 20 | 61 | 2 | 61 | 122 | 35 | 37 | 40 | 49 | 22 |