

## Why Are Millions of Children Needlessly Dying?

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### Abstract

To save children's lives, trial programs need to be developed and evaluated. If a program proves to be more cost-effective than other possible programs, such becomes a candidate for national funding. A problem is that the United States Agency for International Development (AID) has chosen to remain largely ignorant of proper evaluation methods, practicing a LQAS method that can conclude a project has been successful even when there's a 90% chance that it has not. Likely a major reason for avoiding good evaluation is the fact that such would mean it would be more difficult to spend money – a primary goal. Personal experiences are given.

**Key Words:** Evaluation, Corruption, Foreign aid, USAID, Service delivery research, LQAS

**To understand God's thoughts we must study statistics, for these are the measure of his purpose.**

Florence Nightingale

### 1. Introduction

Gareth Jones and colleagues (2003) in their Lancet article assembled the evidence that 2/3rds of the 10 million children who die each year would not die if their mothers had access to a set of low cost, feasible services. Jef Leroy (2007) and the Lancet people make the case that what is needed, and much underfunded, is service delivery research – how most effectively to get the needed set to mothers. The role assigned to me is to describe, from what I have seen these last 50 year, why donors have so little effectively worked to meet this need. I was a Washington bureaucrat for 20 plus years – Peace Corps, HHS – had an AID assignment in Nigeria for two years, and now have lived nearly 20 years with the poor in a little, indigenous village of the Guatemalan Highlands, with first a WHO institute, and then with one university, and now another.

Being a firm believer in foreign aid I have been most interested in the work of the government of which I am a citizen, and have watched, am watching. The rich should help the poor. Our religious traditions – Moslem, Christian, and Jewish – all similarly call us. The report will be personal. How could it anything else with millions of children needlessly dying?

Very few readers will have experienced the lives of the world's village poor. It will be difficult to see the problems and challenges. Let me open with a scene from my village.

### 2. María and Her Dead One Year Old Daughter

It was May 5<sup>th</sup>; time to send something off to Gary Shapiro, our chair. I was climbing the hill to my house. There was a white cord stretched across the path, with a big bow tie thing in the middle. Another child had died. I joined the group praying around the little white box on the table. The little girl had almost certainly died of one of two causes – diarrhea or pneumonia. Children don't die of diarrhea; they die from dehydration caused by the diarrhea. Given sugar water with a little salt, some salt gets into the blood; the salt attracts water, the dehydration ends and the child lives. If they have pneumonia their breathing is rapid – like 50 times a minute – and they need an antibiotic. This is available in Guatemala in government pharmacies for \$1.25. The mother mixes water with the powder and gives a half teaspoon three times a day. As Gareth tells us, 2/3rds of the 10 million children that die each year, would not die if mothers had universal access to low cost, feasible services.

### 3. Corruption

I hate corruption. It does terrible things to the poor in Guatemala. People don't want to pay, don't pay, their taxes. "The money will just go into the pockets of politicians." There is little money for health, for education, for the justice system. The newspapers are full of pictures of dead bodies – women and men. One university was in an isolated area, a good place for dumping bodies. I saw one. AID does well in their support of Guatemala's justice system. We speak of the "Network of corruption" and the "Parallel government". Working with the parallel government is a temptation. It smoothes the way. We know about a Guatemalan with a long history of petty corruption. Now I don't see fighting corruption as being my calling, but knowing how important the reduction of corruption is for the development of the country, I wrote a letter to AID

Washington about this man. My hope was that this might open up possibilities for communication about the need to develop statistical competence. Such actually happened! I met with officials in Washington. The response I got was, “One statistician will tell you one thing, and another statistician will tell you another. No, statistics and statisticians are of little help.” Earlier I’d gotten a bit better response to the concern. An official observed that there was so much need in the world, and so little money that they could not spend it on research.

A woman with statistics and passion changed hospital care forever. Were AID to practice similar passion, with statistics, there would be a great deal more money available to them, and millions of fewer children would die.

#### 4. My Time in Guatemala

For the reader to better understanding, as to from where I come, let me write a bit. Mr. Reagan abolished my job with the National Center for Health Services Research (NCHSR) in early 1981. The US government is good about helping to find new work for such people. My degree was in research psychology with a psychometric thesis, but I’d long felt a need for more math-stat and had been taking courses – ending with Kirk Wolter’s one year Advanced Sampling Theory. I had completed a course in statistics for which calculus was a prerequisite. This qualified me to be a statistician with the Federal Government. The NCHSR was involved in a program of large medical expenditure surveys. In December I became a survey statistician with this group. Having not taken any leave that year, I started my new job with 10 weeks of annual leave. And having seen, in an assignment in Nigeria, all the kids that were dying that shouldn’t be dying, and having since that time been searching for a place to do my things to help such mothers, I headed for Central America. My hope to spend my time in a village of Guatemala didn’t pan out because of the war, and I headed for Honduras. Our bus was stopped by a death squad that marched us around the bus. I suppose, had I not been there, that scared little man walking ahead of me would have been taken, and his body found later. It encouraged me to think about the war. Who was behind it? I spent most of the 10 weeks in a village health clinic in Honduras. In 1983 I returned for 10 weeks and learned some Spanish in Antigua Guatemala. One weekend I joined in an investigation of a reported (false) massacre which increased my interest in the war and who was behind it. Washington, where I lived, was a center of guerrilla support. Rigoberta Menchu often visited. I spent all my leave time in Guatemala. On a 1987 visit I arranged to lease some land in what is now my village. A friend, who had building adobe houses for war widows, built one for me. In 1988 I took early retirement and the following year moved to my indigenous village house in the Highlands of Guatemala. I was also the sampling statistician at the Institute of Nutrition of Central America and Panama (INCAP).

This WHO institute had had a world wide reputation, established by its founder and first director, but was going down hill, thanks to its direction. The US had cut funds to WHO. Money to INCAP was sharply reduced. AID stepped in and for five years generously gave some millions of dollars. Now child nutrition is very important in their health. Recent studies suggest that half of the children who now die, would not die if they were well nourished. Most of us had measles – at least in my generation. We did not die. But with the poor nutritional state of many it’s a big killer of children in the poor world - now with increased vaccination down from a million a year. Here AID had an opportunity to help raise work at INCAP toward its former level. Research could do much to improve the nutritional status of the people of Guatemala – then and now very bad. This did not happen. AID money pushed INCAP further down hill. Rosie of the AID mission passed out the millions under the prevailing bureaucratic philosophy, “The more money you spend the more important you are.” We had a senior man. His home was in another Central America country. He’d apply for some of this money and go off to his country, collecting his \$200 a day per diem – and drink. He had a drinking problem. It later killed him.

One by one the few good people left. Juan Rivera went to the Centro de Investigación en Nutrición y Salud of the Instituto Nacional de Salud Pública in Mexico. Rafael Flores went to Emory. Omar Dary is in Washington where he is a top micronutrients person. Olga Torres is with a medical laboratory in Guatemala. Only Humberto remains. WHO Geneva wanted him but decided his English was too poor. I see him from time to time. We grieve together.

In the late 90’s I taught a course in sampling theory at Universidad Del Valle de Guatemala and after that moved to the department of mathematics where the chair and I started a social research program. As research in education, health services, psychology, sociology, etc is not well known or honored in Guatemala, and as our space was needed to take in more sons and daughters of the rich, our program was cancelled. The university was built by AID. Possibly they had something to do with the closing of our program. They arranged for an earlier termination. We are now with an economic and social research institute at Guatemala’s Jesuit university.

#### 5. Problems

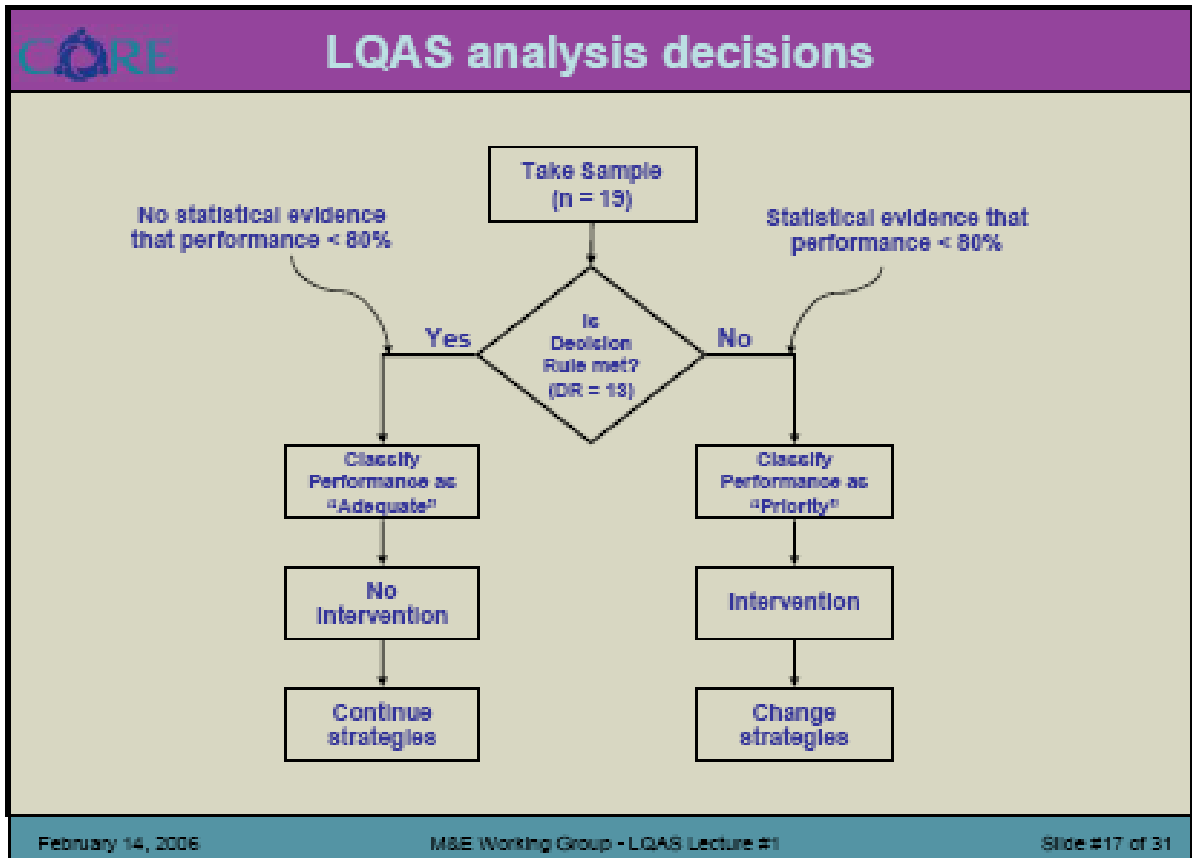
I’m not prepared to be very detailed on the problems I have seen, and if I were there would not be time and space. Furthermore it doesn’t seem good to go into detail about some things like corruption although I would be pleased to talk

with someone from AID Washington. He could spend a day or two with me in my village and we could share about doing better by the poor of the country. We could visit Humberto and Mepe and they could go into detail about what they have experienced, and how it has contributed to INCAP going down hill, retarding development.

**5.1 The Low State of Statistics at AID**

I have a June 2008 letter from AID Washington’s top health person in response to something I’d written. I’m a member of ASA’s human rights committee. There I have suggested that when flawed statistics puts children’s lives at risk there is cause for committee action. The committee rightly wanted evidence that AID actually used the method based on a statistical error. So I, among other things wrote the letter, not really expecting a reply as it was clear, at least to anyone knowledgeable, that I was seeking information on poor work. I didn’t want to deceive him. AID encourages the private voluntary organizations and non-governmental organizations (PVO/NGO) they support, to evaluate their work using a method they call Lot Quality Assurance Sampling (LQAS). With no control group it is a low level method but that’s not the main problem, the one of concern here. Let’s say a PVO has a project with the goal of raising the child measles vaccination rate in a community to 80%. In statistical terms the method poses a null hypothesis that the community rate is 80%. A sample of 19 children is drawn and their vaccination status is determined. If 13 of the 19 are vaccinated, 68%, it is concluded – as is given in the slide below from an AID funded lecture series promoting LQAS – that there is, “No statistical evidence that performance < 80%”. Thus a null hypothesis is accepted – a well known statistical error. “Any statistics book will tell you that a null hypothesis is never accepted.” - Stanley Lemeshow. Accepting a protected null hypothesis, using an alpha of 10%, could mean a 90% chance that community children are not protected. The AID person reported in his letter that 30 of the current 57 projects were using LQAS (and the others were using another statistically flawed method). Our committee is, hopefully, taking action steps but it’s not certain. Criticizing moneyed groups is something few are willing to do, especially if it might reduce the chances of making money.

In my opinion an agency that bases its evaluation work on something so obviously incorrect doesn’t know how to proceed so as to effectively carry out the mission it has been given.



I suppose AID more or less knows that they don't know much statistics and have decided to not know the statistics which we think they should. We already have a quote from one AID person suggesting that statistics is useless. It takes a lot of study to become a good and useful statistician. The prospects of an administrator in the present AID appreciating, and learning some statistics is remote. And one or two people who use fancy words like Lot Quality Assurance Sampling, factor analysis, structural equations, or propensity scoring is not the answer. The World Bank, in their foreign aid work has such people and a good deal of their evaluation work is not very good – with some being really bad. AID has gotten itself into an a-statistical, anti-statistical state. It would be unpleasant for them to allow a statistician to infiltrate into their ranks, at least one with courage. She might comment on, e.g., LQAS – a state-of-the-art method according to the author of my AID letter. AID would see that they had made a mistake in hiring her and invite her to leave. I got into productive email exchanges with a demographer there. He was the project officer for their Demographic and Health Survey contract (DHS). In a visit to Washington we talked. He told me the DHS contractor (and his superiors?) were sensitive. The same contractor sent their “statistician” all the way to Canada to hear my paper at JSM meetings. I was pleased to see him and looked forward to talking with him about joint work after the session, but he disappeared. He was not registered. Later when I was again in Washington I looked for this demographer. He was gone. No one could tell me where he was.

Statistics is little known, not only in AID but in international health generally. I'm seeing as I write, something of Georgia, between meetings. In October it will be meetings of the American Public Health Association in San Diego. I've been a member of the APHA and its International Health Section (IHS) for like 30 years. The past IHS chair invented the LQAS method above and sold it to AID. Will I get a hearing in IHS circles there?

### 5.2 Spending Money As the Goal

There's a well known Washington rule – “The more money you spend the more important you are, the higher your GS rating.” This works out fairly well at, say the Bureau of Labor Statistics (BLS) where there are a lot of people watching. Some of these people are themselves expert in statistics. They are motivated to challenge poor work, and do. But almost no one knowledgeable in statistics watches the foreign aid work of the US government or the World Bank. I'd say there's a role for the ASA. Don't we watch closely the work of the Census Bureau? The US spends billions on Homeland Security, and hundreds of billions on the military, in an effort to protect the country. But there's likely nothing more important in protecting the people of the US from another 9/11 or worse – much worse – than effective, concerned action to help the poor of the world. Statistics is needed but no one is watching, is saying statistics is important - besides it's too difficult to learn. And perhaps worst of all, good evaluation will make it more difficult to spend money. Now the Global Health Council, based in Washington and Vermont is “the world's largest membership alliance dedicated to saving lives by improving health throughout the world”, but it does not directly represent those mothers whose children are dying. Its members, those it represents are the PVO/NGO which receive significant funding from AID. They want money. AID has a lot of money. But with regard to statistics, AID's head is buried in the sand. A PVO that wrote in a grant application that better statistics were needed and that they were prepared to apply such, might well be seen as an enemy – trying to change them from the more or less successful course they had developed for getting money from the Congress. Their grant application would surely be rejected. (I may be wrong. A colleague with whom I share concerns has made contact with a young woman, newly hired in CARE research, who wants to learn about evaluation from him. I wish her success.) These PVO/NGOs do much good but following AID see statistics of little relevance. They live pre-Nightingale. AID and the PVO/NGOs want to receive and spend money. Statistics is a hindrance, not a help. Again let me say ASA could be helpful.

Now there's some pressure for AID to evaluate its work. Thus we see LQAS with its flaws. The method is cheap to carry out and with it, it is easy to claim success. If Statistics is not watching – and to watch might mean it would be harder for members of our discipline to get AID money - everyone is happy. Excessive numbers of children die. We see more 9/11s. The answer is more money for guns. The country heads for bankruptcy.

There's a tendency in our world, in our government, to see money-spending as a solution to our problems – personal and corporate. Rice's first Administrator spent money to resolve his problems. It can be useful. You can do money favors for members of the parallel government, and they will do favors for you, like seeing that your work moves along fast enough so as to meet deadlines for spending money. We could give a good example of this. Reporting to the world what the US spends on foreign aid is right and proper. A dollar wasted is still a dollar to be reported. Corruption raises its ugly head in all of this, and retards development. AID could help reduce this. A grant could depend on a country putting up bond money. If there was some suspicion of corruption on the part of a person receiving grant money, his salary could come from the bond. AID could work more honestly to avoid seeking favors from the parallel government.

### 5.3 Influences of the Medical and Commercial Communities

A María in some countries, with a child recognized as having pneumonia – rapid breathing – can not get the antibiotic needed for \$1.25 as is the case in Guatemala. She might have to pay much more, and she may not be able to get it at all, without a prescription from a physician. Thus treatment might cost \$20-\$30 – like a family's week's cash income in my

village - which she might well not be able to raise. Treatment would be delayed, or might not happen at all with the need for so much money and the lack of knowledge of consequences. Her child might well die. Mariás need a \$1.25 antibiotic, and they need good education.

The oral rehydration fluid needed by a child with serious diarrhea can be prepared by the mother with the sugar and salt which she has. A bit better would be to use a packaged product that might sell for 10 cents for preparing a liter. UNICEF has distributed such free. But the mother will likely find herself under commercial pressures to buy liter bottles of a colored and flavored fluid for much more. In the worst case, the medical establishment might have led the people to believe that only an IV – as given in the US for dehydration - would give good results. The establishment has made progress in this direction in Guatemala. So many times neighbors have spent a lot of money to get IVs with vitamins. It might be best to limit physician practice, except for the rich, to government hospitals and clinics, something very “un-American” and something AID would strongly oppose. I try to tell my neighbors that they should be careful about doctors. Many are ladrones (thieves),

In countries with malaria, such as many in Africa, death from the disease can be greatly reduced if children sleep under treated nets. AID has promoted the sale, under the name “Social Marketing” of such nets which too few can afford. In other ways they have promoted “free enterprise” medical care. My impression, with regard to nets, is that they are doing better. Still AID could learn from Cuba, a poor country that spends much less on health care than the US but has a lower infant mortality rate than the US – 5 versus 6 per 1,000 live births.

I was for two years an employee in Nigeria of an educational research organization, under a contract with AID. Helping on test development and the use of psychological tests was our mission. We didn’t do too well by the Nigerians. We didn’t know much psychometrics. Our main goal was to control things so that the contract would be continued. Thus we made, for them, some bad mistakes. A reformed AID would have researchers, such as in education, nutrition, and health so that when they set about to help a country in such areas - and all areas - they would be able to find people who knew enough so as to help. The tendency is to think that if they spent enough money they will get good people. At least they meet their goal of spending money. What they tend to get is people whose employment is shaky, and seek a lot of money. I must say they were extremely generous with us, and we were most appreciative. At the end of our two years they bought us tickets to Morocco, and from Calcutta to California, and we drove between the two – by way of Moscow - with our five children. It was a great family adventure. What AID needs to do is find ways so that working with them is scientifically and professionally satisfying – and most importantly in a way that allows them to apply their knowledge and to know that they have been working to make a better world. Employees at the junior and intermediate level should be encouraged to be active members of the IASS, ASA, APHA, ASP, etc. An example of failure to see statistics as important in health: How many AID employees in Washington are members of the Washington Statistical Society – likely none. There are statisticians with the government, who would be open to taking a break and work for two years in some developing country – if they were allowed to do good work, to help. AID needs to work, not on spending money and looking good, but on spending money well and doing good. To the extent that they do they will find good people, and the mission will bloom.

#### **5.4 Congress**

Congress is indeed a problem. Individual Congress people put items into the appropriation bills to fund this or that organization in their district. What needs to be done in order to develop programs to save children’s lives is to plan, develop and experimentally evaluate such programs and this can take many years. The Congress makes it difficult to plan long range. The solution, and its not a sure solution, is for AID to set about to make itself effective. Congress will little by little, if AID makes the effort, see that they are planning well, and will more and more tend to support AID’s requests and proposals, and interfere less.

It would help if AID was freed from the need to support US foreign policy of the moment and was given solely the mission of helping poor countries to develop. I would argue that giving it such a mission would allow AID to best promote long term US interests. The requirements to “buy America”, to promote only free enterprise economics, to punish those countries that large voting blocks don’t like, and to support those countries that large voting blocks do like is, I’d say, bad for the world and, in the long term bad for the US.

### **6. Suggested Directions**

The US overthrew the elected government of Guatemala in 1954 and then helped to install a military government. Following this AID activity was greatly increased. A K-12 American school was built and later the Universidad Del Valle de Guatemala was established on adjacent land. It opened with an American board and had high standards in mathematics and the sciences. Many people who now have important positions in the country are Del Valle graduates, including the head of the financial institution where I have money invested. A similar firm has proven to be corrupt. The retired general,

defeated in the recent presidential elections got a lot of illegal money from this firm. Maybe the country, with his defeat, is after 54 years, back on a solid path towards democracy. To handle the greatly expanded AID program a large eight story building was built, with high security, and a cafeteria that has good US food at low prices. Being in the building one feels quite isolated from Guatemalan realities, Guatemalan poverty, and the dollar a day – or less – lives of my neighbors. The building is a symbol of US ways, of its past efforts to manipulate the country in ways that the rich of the US judged were in their interest.

I suggest that the first decision that a new health-education AID person who wants to help the people of Guatemala should make is where he wants to establish himself and his family. I suggest, not in the eight story building in the capital, but rather in a house in the historic part of Antigua – and not in some foreign compound there with a locked gate and guards. It would be most pleasant. He and his wife, and possibly children if they were interested and not in school, would make frequent, unannounced visits to villages, schools and hospitals – perhaps with a driver in their little Toyota, - no convoy. Some meeting could be in the back room of Doña Luisa’s restaurant or in the comedor whose \$2 pepion is the best in the country. The lady who runs the place has been serving her pepion there for 52 years. The Pope invited her to Rome to thank her for her good works. The comedor is so Catholic. The driver could be one of the young Guatemalans with physician training in Cuba, who carried his black bag in case they happened on a sick child. Sharing would give the AID man a feel for how Cuba has lowered their child death rate to six, while the rate in the US is eight - and Cuba is a poor country. So is Guatemala. Their children could attend bilingual schools. There are good schools there, and a very good one in nearby San Lorenzo. We had a very good US ambassador some 15 years ago. He and his wife would go with Mike to the north of the country – Quiché and Huehuetenango. The war was still going on. Mike knows the country. He had investigated the massacre of Finca San Francisco. I went with him in 1983 to investigate the reported massacre of Parraxtut.

A major goal would get to know people in health and education inside and outside of government, to find people who saw that working with the parallel government was not the answer, and for him to come to a feeling as to who had a vision as to directions for the country. This AID person will likely come into contact with some Guatemalan, likely an “important” person, who with hints and smiles will convey the idea that he can facilitate those things that AID wants – influence with the government and good public relations. Little by little he will separate himself from this senior member of Guatemala’s parallel government. Facilitating such separation will be the fact that, to show his influence and power, this person will likely stay at a place like the Santo Domingo at \$200-\$300 a night, and not be much interested in the old lady’s pepion. He would work to find any people inclined toward education research, and statistically sophisticated people who might be encouraged in the direction of health services research. My colleague could help him find and develop, such people. Hopefully a reformed Washington AID would have short courses to help develop such researchers, evaluators - open to candidates who had demonstrated competence in English, calculus, computer programming – R or Fortran - and had taken email courses in things like item response theory and sampling, from people at AID. Instructors would be people that themselves traveled to countries like Guatemala to work with the groups brought together with the help of AID mission people, planning, developing, and carrying out experimental evaluations. I trust the reader sees my concern that AID Washington not continue to be an army of contracting bureaucrats with the motivation of looking good and spending money.

Gradually, after a year or two this AID person and the education and the health people with whom he came to be working, would form a group in each area. Let’s call them Millennium Development Commissions (MDCs). They would be Guatemalan, but would be strongly influenced by AID, as it would only fund the evaluation of programs that they had concluded were likely to be effective and had an approved evaluation design, plus if there were money, programs that had already shown their merit in previous evaluations. Big money would more likely come from the Millennium Challenge Corporation. Further, if the AID person and his advisors found the evaluation plan was not being strictly followed, funding would end. Let us here point out how different is the recommended AID from the present AID where 1) the ending of approved funding is rare, 2) such ending on the basis of the some violation of a good evaluation designed has not happened, among other things being that AID, as far as I know, has never specified a good evaluation, and 3) should a good evaluation have been specified, the current AID is not sufficiently sophisticated statistically to see when such a design has been violated. The MDC, being Guatemalan, they would be in a good position to work with areas being invited to participate in the research, to help them understand that to which they were being invited. Some areas for participation in the experiment would be randomly assigned to the experimental program, with others to be assigned to control areas, where data would be collected but the experimental program not initiated. Control areas could be told that if the project was found good and funding was forthcoming so as to move the program toward national implementation, they would have priority over those areas that declined to participate in the experiment. They would develop proposals to be investigated. In developing the proposal they would work with ministry people but little by little it would become apparent to the government currently in power that important donor funding would be only for work that fit into the planning of these MDCs. There are reasons for this. To develop and carry out an experimental program would take in most cases more than the usual four year limit of a

government in Guatemala. The current AID would not do this. The government would want AID to support programs that would give them political support in time for the next election. Such support would buy the US political influence, but an AID that worked effectively to reduce the number of the country's children who died, would in my opinion, be a better AID.

Now all programs do not need to be experimentally evaluated. All mothers and fathers have a right to know how to space and limit the number of their children. AID in Guatemala has done well in supporting the Aprofam program, and it takes many years for the idea of child spacing to be appreciated. Something personal if I may. My neighbors Don Pedro and his wife, when she was in her early 40s with 9 children, began to think about a Aprofam visit but before they made a final decision to act, she entered menopause. One child died. Their oldest daughter has like 10 children. The last pregnancy was very difficult. Another might kill her. The next child has four. One son was shot dead. The next daughter has two children and I expect will have no more. The next daughter is married to a very ineffective man. They would have great difficulty having a child. The youngest, age 20, has continued her education, after a long break. She will graduate from primary school in November and plans to go on. She's very bright. If she doesn't give up her education she will be entirely ineligible for marriage, as no indigenous man would want to marry a well educated woman.

It is suggested that AID, and the donor community generally, should largely limit their funding to program evaluation, and to the funding, if money is available, to programs that have been experimentally evaluated. It is further suggested that the grants of the MCC, typically about \$300 million be increasingly limited for programs that have been experimentally evaluated. I think MCC has begun funding some such evaluations, but to my mind it would be far better for AID to tool up itself, with statistical competence, to work with counties to develop development plans, and then with solid data, apply for a MCC grant. I'd hate to see MCC take over everything and have AID be relatively useless, except for their important disaster relief work.

## 7. An Example of a Possible Experimental Evaluation

To see better academic achievement, better teaching in better school environments is needed. That Guatemalan teachers are poorly trained is suggested by a recent event on our campus. Happily we are making an effort to recruit a few indigenous students - almost all students now being ladino sons and daughters of parents that have paid for primary and secondary private education. This year a bright Kachiquel young woman has entered with a university scholarship. She is doing reasonably well in the strange environment, except in mathematics. We certainly have the best, possibly the only, math department in the country. Statistics at the national university is in agronomy! Most students taking some math start with a precalculus course which reviews what they should have learned in their secondary training, but probably will have not. A number of students entering are not prepared for such, so there is a low level math course that introduces them to concepts in mathematics. She could not follow what was taught even there so was moved to the Saturday program for training math teachers. Math teachers in Guatemala having no "real mathematics" - and our university is the best in the country! No wonder achievement is low.

The above is to try to give the reader some feel for the need for a radical overhaul of teacher training and of an improved educational program in Guatemala. Those concerned to see the country develop need to find a way to see developed at one of our universities, what might be called a College of Education which would grant a four year degree in a full time program - Monday-Friday. Such a College of Education would have professors working in educational research which would include the development of achievement tests.

To have any hope for such an education program being developed so as to have something to be evaluated, would require two things - what we have called MDCs, a group of respected individuals - and a donor supporting what was being done, who would make it clear that the country, e.g. the US, would stick with the country and its MDC for the long haul. About the first thing to do would be to make moves toward this College of Education. To start off its professors should themselves be well educated - an unusual demand - knowing Spanish grammar and literature, history, a science such as chemistry or physics, and some solid math including an introduction to calculus. The MDC and donor - say USAID - might start very modestly by sending a letter to our universities suggesting one might move toward this College of Education and that they would pay for the math, etc. at say UVG. This would certainly tend to separate "the sheep from the goats". The response from some, perhaps all, would be "No thanks. We would certainly not suggest that our distinguished professors take a course with undergraduates". Maybe such a College could be started with younger professors.

Well let's say we have our College of Education and that in four or five years time there are enough teachers ready, criterion measures such as achievements tests have been, are being, developed, and that our donor has provided funds to equip one education district - a junior and senior high school building, facilities for breakfast and lunch programs, buses for transportation, dormitories - everything needed in one school district for the planned program. So now the experimental

design, based on solid statistics - which has gone into planning from the beginning - is applied – finally. The country was divided into educational districts of a population size appropriate for one junior and one senior high. Similar districts were paired; one pair was selected, and the district to be experimental was randomly selected from the pair, with the non-selected district being a control. The donor would have given funding only where the evaluation is to be experimental, and almost certainly would have its representative present at the time of selection. The MDC would have played a most important role. They would have worked with the people of the two districts to ask if they wanted to participate in the experiment. If one or both declined they would be told they would later be given another chance, assuming that the experiment continued, but a second pair would have been selected and again the interests of the two districts sought. It seems reasonable to hope, with a good educational system designed and with a solid evaluation ensured - as long as the experiment continued – AID and other donors would provide further fund so that eventually there would be like 25 experimental and 25 control districts. Criterion data would be collected in both the experimental and control districts – achievement, health, poverty, crime, age of marriage, etc. To me, at least, much could be expected of such an effort. Economists are usually the group called on to plan development projects, and they have much to contribute to development, but I think it is clear that experimental evaluation of well thought out health and education programs should have the highest priority – whether carried out by economists, social psychologists, statisticians, or whoever.

## 8. Some Final Thoughts

Here are some thoughts as to how the new US President might move to end the scandal of millions of children needlessly dying – not well done previously. He would appoint, say a Sally Morton – someone that knows health services delivery research – to head health work at AID. She would end or greatly limit contracts with, e.g., CORE and MACRO International that have shown their lack of competence, or at least integrity, by supporting LQAS and poor sampling, and move to improve the DHS work, adding funds to train survey researchers in those countries where DHS surveys are taking place. Some work of more or less the current type would continue, e.g. a PVO might carry out a pilot project of a program that would help in the development of a program that might later be further developed and become a candidate for full evaluation. But please, no more LQAS or the use of what AID calls their 30-cluster methodology. Hopefully the turn around that is needed will be facilitated by someone in one of the PVO/NGOs with which AID has worked who has come to “see the light”. We are currently in contact with a young woman in CARE who has expressed an interest in learning about evaluation. CARE could thus take a lead. We need an administration in Washington that has shown a commitment to working for some good change, and it looks like we are going to get it.

Working with the Congress a Social Development Fund could be established that would permit the funding, long term, of major evaluations as long as work continued on the evaluation as planned. Were political pressures applied which would end the evaluation, funding would be ended. I trust the reader will see how radical is this idea, with people of an agency that have always given high priority to spending money. Remembering how AID money sped the ruin of INCAP should give understanding. When the health-education officer, say of the Guatemalan mission, and the Washington evaluation person with whom he has been working – who has frequently spent time in the country – decide that it was a good time, working with the Guatemalan education MDC, to start developing a planned education system for the country, their proposal would be added to other such proposals, and Washington would make its decision. Once a decision is made to fund, and as long as the plan of the MDC is being followed, Guatemala would be pretty much sure of long term funding – for say 5-10 years, or longer.

In some countries, at some times, the situation is relatively hopeless, and we can only work slowly to improve things. The AID person doesn't seem to care. She doesn't come to meetings. Some countries are less concerned than others about conditions for the poor. It would seem good to try to identify those countries trying to do better by their people and give higher priority to efforts there. I suggest that AID follow the work of Megan Price and her colleagues at Emory (Evans, 2006) who have done quantitative work to rate countries on their concern. There may be a considerable amount of corruption and the people of a mission may find it comfortable to ignore the fact of it and to accept its favors. Actively fighting such would make spending money more difficult. But any country mission working to fight corruption should be sympathetically viewed and supported. AID Washington needs Administrators who know and understand both Washington and poor world realities.

## 9. Appended Evaluation Examples

### 9.1 Progresas Program in Mexico

Relevant to our concerns here, the world's best experimental evaluation of nutrition and educational programs are being carried out by the Centro de Investigación en Nutrición y Salud of the Instituto Nacional de Salud Pública in Mexico. An important report of their work is the 2004 JAMA article (Rivera, et al). From 506 poor rural communities 205 were randomly selected to be experimental, and from these communities 1815 households with children were randomly selected



and data collected. Control children were from 1415 households randomly selected from 142 communities randomly selected from the 506. In experimental households, Progresa provided fortified foods for women and children, health services, and cash transfers for the family. The experiment was planned for two years but under political pressure the services were given to children and families of the control communities after only one year. Growth and hemoglobin levels of the poorest and youngest children were significantly better among experimental children. This good evaluation work in Mexico continues under the name *Opertunidaes*.

Juan Rivera, first author of the above report, was a member of INCAP during my time there. We might say that AID, in their support of INCAP, did well as it gave Juan a place in which to develop. I see it differently. Had AID had a passion for development it would have come to know the importance of statistics, it would have prepared itself, and when it had the possibility with the millions for INCAP it would have used the money to promote what Guatemala and the poor world needed. Juan might still be at INCAP, as Director, and an AID supported organization might today be a leading supporter of children and their health. Instead a bureaucrat passed out the money in a way that accelerated the downfall of the institute. I'd like to think that my unsuccessful efforts to promote experimental evaluation at INCAP played some role in the direction Juan has taken things in Mexico.

## 9.2 Fortification of Tortillas

In thousands of Guatemalan villages, over the wood fire used to cook supper, a big pot of cal-water-soaked maiz (corn) is placed, and boiled for an hour or so. In the morning the maiz is washed (How much nutrition is lost?) and the drained maiz is taken to the village molina for grinding into masa. Final grinding, perhaps to recall how masa was prepared in the old days, is done by a woman with a stone in her comedor – kitchen-dining room. The woman forms balls of this masa making a row on the stone rolling pin. Taking one at a time she pats the masa into tortillas and cooks them on a 3ft round, fired clay disk. I hear the pat-pat-pat sound frequently from my house. Tortillas, morning, noon, and night and beans with some vegetables – leaves picked from the fields and forests and tomatoes, onions, squash, and potatoes from a market, with occasional meat and eggs – form the diet of the Mayan people. Today a fortified corn flour mix is sold for making tortillas. INCAP has done some work supporting this commercial product, but no work of which I know, on the masa of the people. Why is a good question. Does the parallel government operate here? Things are possible and should be investigated. The cal water in which the maiz is soaked and cooked is traditionally made from calcium rock found locally. Women sell it in the markets. Poorer women use the commercial lime used for plastering the adobe houses. A nutritionist told us that he has tested different batches of tortillas and has found they differ in their micronutrient content, such as iron. He reasons that the cal used in different places differs in say iron content. This strongly suggests it would be good to experiment with fortified cal. The commercial product is protein fortified with soya. The possibilities of soaking and cooking soy beans with the maiz should be investigated. As any fortification would be reduced by the washing, and because an hour of cooking might not be enough for the soy beans, perhaps it would be more efficient to add a micronutrient-protein powder at the molina. Feasible fortifications should be explored. With a good candidate, an experimental evaluation should be carried out to learn the affects of its use on child growth and anemia rates.

## 9.3 The Evaluation of the Massachusetts Home Care Program

In 1972, at the National Center for Health Services Research, I was invited by a colleague to go with her on a site visit to the Department of Psychology at Northwestern University. Just before lunch we were joined by Donald Campbell, a social psychologist well known for his work on research design. We bonded. When we parted he gave me a copy of his never published 1971 paper, "Methods for the Experimenting Society". I became, in his words, his ambassador in Washington. A group of us, inspired by Campbell, met monthly at a Senate Office Building with the staff person of a Senator who was developing legislation which would favor proposed new Federal programs that had been experimentally evaluated. During this time my office had a grant application from the State of Massachusetts to evaluate a home care program they were developing. The Study Section had approved the application but said we should work with them on their evaluation design. My office, aware of my monthly trips downtown, sent me to Boston. Medicaid patients were being discharged into nursing homes. The idea was that such patients would be screened, and those that they thought could, with help, continue living at home would be, to the capacity of their program, offered their home care option rather than a nursing home. I suggested that a patient, once screened as eligible and who was open to home care, be randomly placed in home or nursing home care. They were not keen on the evaluation design suggested. I later learned that the Visiting Nurse Association had hoped, planned, to make the selection decisions. My office was not happy with me. Richardson, the current HHS Secretary had been Governor of Massachusetts and they wanted to please him. Although I had no more official responsibilities I had contacts in the state and pulled all the strings I could think of. I thought I had lost but some years later the long-term people in our office did a review of the home care research. The Massachusetts evaluation had indeed been experimental, although no previous ones had. They found that all later home care evaluations had been experimental. Some further years later I was at the Hubert Humphrey building downtown – HHS headquarters. Somehow the Massachusetts study came up. The person I was visiting pulled out a copy of a memo to Richardson on a possible evaluation of the home program. The Secretary had underlined and initialed a sentence indicating that he wanted to see a good evaluation design used.

The decision for an experimental evaluation of this home care effort took place in the mid 70s. It could have been the first federally funded experimental evaluation of a major social program. It illustrates both the difficulties of initiating a good evaluation and the seen wisdom in using such a design, as further work in the area used the design. My belief is that when a few evaluations in international health are experimental, we will see many more. The main problem holding up good evaluations is that it makes it more difficult to spend money, as there is political resistance to such evaluations – like there was from the visiting nurses – and to be blunt bureaucrats, saying ignorantly that statistics is useless - like that AID official in Washington said - may be more interested in spending money than saving children's lives.

#### **9.4 Under Fives Clinics in Nigeria**

Because I knew Nigeria and because, from when I returned from Africa some seven years earlier, I had been working in health services research, AID sent me back to Nigeria to evaluate the work of Prof. Ransome-Kuti (Koye) that they had supported. Koye, himself an MD, knew there were many nurses but few MDs in his country. He established, eventually with AID backing, eight Under-Fives clinics, modeled on the earlier work in rural Nigeria of David Morley. Nurses were in charge, but worked under written physician standing orders. The emphasis was on education. At a nurse's desk there were benches in front – with the next two mothers and their children. The mother and her children being served were on benches to the right, but all three of the mothers were encouraged to participate in the consultation and learn. Some AID man did very well in getting support for Koye's work, delivering at one point a shoebox full of Nigerian money. The work was opposed by powerful people in the Ministry of Health. The experience gave me insight on the pressures and problems that AID can face, too often just spending money, but in this case I saw how problems had been overcome – like with the shoebox. AID Washington sent me to Nigeria, but the embassy there handled my visit. There were Nigerians in the embassy that represented the Nigerian bureaucracy. The response I got when I reported was an effort to try to make me decide to turn around and go home. They didn't want any publicity for Koye's work. They had no hotel reservations for me. I spent a half day and a lot of taxi money trying to find a room. I finally looked up Koye – everyone knew him and where he lived. He made a phone call and a fine place was arranged. He had not been informed of my visit but agreed to see me the next day. For two hours he told me about his work. At the end I told him I was in the country to visit all eight of his clinics. He said he would be happy for me to do so but unfortunately it was not possible. It took weeks to arrange drivers and hotels. I told him I knew his country and didn't need such help. He agreed to see me again in a few days. When I showed up with a stack of air tickets he capitulated. I stayed on a few days in Lagos and eventually read all of his relevant files – some two feet. He had for years been helping poor women throughout the country, especially women of the Muslim north. (When I talked with a woman at the clinic in Kano, she told me she hoped her husband would find another woman and leave her alone. She had too many children and was exhausted). Koye was from a family of Methodist preachers of Abeokuta. He had a passion to help those women and their children, and could show it. There were some politicians who tried to take over his first clinic. He slammed his fist down on the table and said, "God will damn people who try to destroy help for poor women" – sort of a male Nightingale. How good it would have been, had AID encouraged him to select, not eight sites but eight pairs of sites, and randomly placing his clinics in one of each pair and collecting child health data in all 16. He would have had solid findings on which to base relevant decisions when he later became Minister.

#### **9.5 An AID Program to Improve Teaching in Central America**

The AID mission in Guatemala has for years funded educational efforts at Del Valle University. My colleague and I have sometimes been asked to give some help, like in drawing a sample of schools. We were aware of an AID funded program being implemented in countries of Central America to improve teaching in elementary schools. Overall evaluation responsibilities had been given to the Del Valle people. AID had written a contract with some university education people who would give "technical assistance". We had preliminary talks about participating so had some idea of the work planned. We became aware that these consultants – likely in part because they knew so little about Central America and spent so little time here – but mostly because what we saw of data collection suggested they knew little about educational research, they were not going to have data to evaluate the effort. We rather thought that we would be asked to try to save the effort, but this did not happen. AID had achieved its goal of spending money. They could say that they had spent a lot of money on something very important – true. Almost no one will ever read their report, at least no one knowledgeable about educational research. Should someone knowledgeable read it they would very likely say this was just work of AID so one shouldn't expect much. Anyone foolish enough - concerned about the children of Central America - to try to help AID to do better might be put on their black list.

#### **9.6 School Feeding Programs**

In Guatemala we "in theory" have school feeding programs but they operate only some times, in some places, in some ways, and at times when the government has money that it wants to give to the program. A donor could step in and work to get some solid data to evaluate the impact on child health of a food program that provided good nutrition. It would step in and provide from its own funds money to finance the feeding program when government funding was not forthcoming.

Perhaps 100 schools might be picked and 50 randomly selected for a good and regular feeding. Educational achievement as well as health measures would be taken in all 100 schools and the findings in the two sets of villages compared.

### **9.7 Nutrition and Child Health**

There is a recent and growing literature suggesting that child deaths would be cut in half were all children well nourished. I'm aware of the Caulfield *et al* 2004 article in the American Journal of Clinical Nutrition and this year there is a new Lancet series, free for downloading, on nutrition and health. How to get the nutrients needed by children to them is the challenge. Breast feeding is important. In my aldea most mothers breast feed, and the usual practice is for two years. I wonder if Maria's one year old daughter would not have died had she received breast milk. Mexico has a lot of experience with programs of food distribution which should be studied. In the US the WIC program is seen as being valuable although I'm not aware as to whether, and if so, what part of it has been experimentally evaluated. It is of course too expensive for Guatemala. Cuba, a poor country, with their good health record – better in important regards than the US's – probably has programs for imitation. Each country needs to seek child nutrition solutions for itself and then to carry out experimental evaluations to see if promises hold.

### **9.8 A Model Being Tried Out in Ethiopia**

AID funded some promising work in Ethiopia to bring the low cost and needed services to poor families. Gates is funding the expansion of this program. They pick a family in a village and work with them – for example in how to treat diarrhea and pneumonia – and then in mostly non-financial ways they encourage other families of the village to learn from this one family. The project seems to work closely with the Ministry of Health. As I read AID reports it seems that work with the ministries is too limited for a program initiated by a PVO/NGO to have a good chance of continuation. Unfortunately there appears to be no experimental evaluation of the efforts being carried out. Such would give Ethiopia and other countries solid data on the children's lives saved.

### **9.9 Transportation Needed by Mothers in Delivery**

In rural Guatemala the number of mothers, and their unborn children, who die when there is a problem in delivery is tragically large. The country does have a network of hospitals with physicians prepared to do caesarians. The problem is in how to get women needing help to these hospitals. There is a small project operating out of an office at the Bherhorst clinic in Chimaltenango. They work in aldeas (villages) of San Martin. There is usually a pickup available in an aldea where there is a woman needing transportation, if she is to live. The problem is money to pay for gas. The program works with people of their aldeas so that they know that the program will loan the money, provided that the husband agrees to repay it later when there is time, say selling some chickens or frioles. Had a decision been made to experimentally evaluate the program, evidence might be available at some point of time showing that a significant number of lives were saved, and could be expected to be saved, with a government that paid such transportation costs.

### **9.10 Community Development**

I see a need but how to proceed is something about which I know little. In the early days of our country, in rural communities as people moved west, the only person with much education, and hence a community leader, was often the one room school teacher – like my mother. In my village teachers often arrive late and leave early. They often have afternoon jobs. Not infrequently I'll see a child on a week day morning and ask why she isn't in school. "No hay clases" (There are no classes). Why parents don't organize and protest is difficult to understand. For a couple of years we had a breakfast program and an educational committee. We had hopes of meeting with teachers, and perhaps have meals together. Some came from towns an hour or two away by bus. None lived in the village. They seemed to have contempt for our poor, uneducated indigenous people. It would seem good to have some kind of government program that hired and supported teachers who would live in, and be a part of, our village. Some could hold special classes in the afternoon. Some might be health workers. They would not make a lot of money, but would have a good life. The government might provide them with educational and entertaining videos – like those Mexican comedies, and video equipment. We could have good times together in the early evening in our salon comunidad. Perhaps I have suggested things that might be evaluated for their impact on health, education, and community spirit.

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