

A black and white close-up portrait of an older man with a full white beard and mustache, wearing a suit and tie. The image is partially obscured by the Carnegie logo and the word 'RESULTS'.

Carnegie

RESULTS

Preventing Maternal Mortality: The high rate of death associated with pregnancy and birth in the developing world—particularly in West Africa—was not high on the world’s list of problems to deal with until funding from Carnegie Corporation helped to support research that led to real solutions and much welcome progress in preventing maternal mortality.

At the UN-sponsored Millennium Summit in 2000, eight goals were identified and agreed to by the 189 (today 192) member states of the United Nations as being the most critical to achieve in order “to help citizens in the world’s poorest countries to achieve a better life by the year 2015.” Among

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these was the prevention of maternal mortality, an issue that had previously been sorely and tragically neglected in terms of international focus. That was not the case, however, with Carnegie Corporation of New York, which, between 1988 and 1993, funded research that produced universally accepted successful interventions in reducing maternal mortality and led to actual reductions in deaths in many parts of the world.

These research programs had such uniquely rigorous standards at the time that they set new international standards for monitoring and evaluation in many areas of field research and NGO programs. Further, they formed the basis for the first sustained advocacy for women's health, and led the way in identifying critical reforms needed in the health systems in developing countries. They created a model for combating the brain drain of physicians from African countries to the West, and established viable blood banks where none had existed.

The grants also firmly established maternal mortality as a human rights issue. In doing so, they produced results that continue to reverberate in helping rural women demand their social, political and economic empowerment and shining a spotlight on the need for governments and NGOs to engage in community education to combat traditional and cultural barriers to reducing maternal mortality. In addition, many people in rural areas requiring emergency treatment have these grants to thank for the growing number of new accessible, emergency trauma facilities.

A Physician Hears a Wake-Up Call

The Corporation's interest in the issue began when Dr. Adetokunbo O. Lucas, an internist from Nigeria who specialized in tropical and parasitical diseases, joined Carnegie Corporation, where, from 1986 to 1990, he served as chair of the foundation's program concerned with strengthening human resources in developing countries. In his recent autobiography, *It Was the Best of Times: From Local to Global Health* (Ibadan, Bookbuilders Editions Africa), Dr. Lucas cites two publications as pivotal in attracting his attention to the issue of maternal mortality.

The first, a Nigerian study by British Professor Kelsey Harrison, "was stark and engaging," Lucas recalled in his book. The data "showed that girls under 15 years represented 6 percent of the total number of deliveries, but 30 percent of the maternal deaths recorded."

The second publication that caught Lucas's attention was even more overwhelming. Written by Drs. Allan Rosenfield and Deborah Maine, it was entitled, "Maternal Mortality—A Neglected Tragedy: Where is the M in MCH (maternal and child health)?"

The article drew lasting international attention to this issue; for Dr. Lucas, it highlighted "the massive death rate associated with pregnancy and delivery in developing countries, and the feeble, ineffectual response through the traditional, maternal and child health (MCH) programs."

"There were a half-million deaths a year, one woman every minute—mostly in developing countries," Dr. Lucas added in an interview. "Many people in these countries assumed it was normal."

Maternal mortality is defined as the death of a woman during pregnancy or within 42 days following birth due to causes directly or indirectly associated with the pregnancy. The article pointed out that, contrary to the astronomical mortality numbers in developing countries—commonly 300 or more per 100,000 live births—the rate in developed countries was only 7 to 15 deaths.

"The medical services in most Third World countries," according to the article, "were usually patterned on Western systems of medical care, with its concentration of highly trained physicians in urban medical centers." They consumed a large portion of a poor nation's health budget, yet served only a minute portion of its people, who lived largely in rural areas. Improving the situation, the article concluded, would require a "long-term undertaking of national and international health planning to provide the necessary facilities, personnel and supplies."

Deborah Maine spoke of how she and the late Allan Rosenfield came to write the article. "Allan was an obstetrician and he had a lot of frustration getting other obstetricians to deal with public health. At all the conventions, everyone interested would be the same 10 people crammed in a corner in a conference of 400 doctors. Most doctors—including many from developing countries—just packed into workshops on high-tech advances, like in-vitro fertilization."

Not long after Lucas finished reading the article, he realized "it was a wake-up call for the whole world—myself included." As Chair of Carnegie Corporation's Strengthening Human Resources in Developing Countries Program (HRDC), he decided that maternal mortality would be the primary focus of his work at the foundation.

Under Lucas's leadership, the Corporation issued over 90 grants for about \$11 million that addressed a range of issues associated with maternal mortality and morbidity. As noted earlier, the bulk of the grants were made during the period 1988 to 1993. Grants were widely distributed to universities and nongovernmental organizations, primarily in West Africa. The major thrust was on identifying the most promising approaches to preventing maternal mortality. Toward that end the grantees tackled advocacy, operational research, professional leadership and technology evaluation and use.

Funding Makes a Critical Difference

The earliest grant went to fund a proposal from the article publishers, physicians Allan Rosenfield, who was then head of the Columbia School of Public Health, and Deborah Maine, also with Columbia. They sought to research and identify practical measures that could be used to deal with the well-known causes of maternal mortality. In the end, all agreed on a plan to establish a network of research groups in West Africa—where maternal mortality rates were, and remain, the worst in the world—to conduct research under the leadership of the Columbia team. Thus, the Prevention of Maternal Mortality (PMM) network was born.

Initially, the network consisted of 12 multidisciplinary research teams working in three representative West African countries: Ghana, Nigeria and Sierra Leone. These countries were chosen as representative of West Africa, where a grossly disproportionate share of the world's maternal deaths occurs. Most maternal deaths in Africa take place outside the medical system, since most women in rural areas receive no benefit at all from modern health care systems.

Each team consisted of obstetricians, social scientists, nurse-midwives, community physicians, anesthetists, journalists and human rights activists. The teams were selected as a result of a competitive process requesting proposals that saw only the very best proposals chosen. The focus of the research was on understanding the many interacting factors—cultural, social, economic, geographic and others—that prevent prompt treatment of obstetric complications.

The PMM looked for practical interventions that could directly reduce maternal deaths. The investigations found that timely emergency obstetric care, or EmOC, was the key to reducing mortality rate in developing countries. The network also identified the so-called “Three Delays” model in determining how most maternal deaths occur: they result

from delays at home in seeking emergency care; delays in reaching clinics or hospitals that can provide emergency obstetric care; and delays in providing that care at clinics and hospitals.

The research teams looked at access to services, including transportation and communications, the quality of facilities, including equipment, staff and medicines, as well as related services, including blood transfusions and record keeping.

“It was really fabulous working with Carnegie Corporation,” Maine said in an interview. “They supported the work but didn't interfere. They gave us good advice and let us do our work.”

Field Research Teams Turn to Action

When the research phase of the project ended in 1996, Angela Sawyer, a Liberian nurse-midwife who had been with the research team from the start, became the founder and director of its successor, the Regional Prevention of Maternal Mortality Network (RPMMN), which remains the leading African NGO working to combat maternal mortality. Carnegie Corporation provided the funding needed to expand the network to 22 sub-Saharan African countries.

“We are a research and action organization,” Sawyer explained. “We start with needs assessments, implement interventions and monitor and evaluate whatever is being done and use results to further advocate for policy change. Ours is a network that looks for the community all the way through the health system. We involve community members to be part of the process so they will have ownership. We want to promote sustainability.”

The research also identified socio-cultural factors that contribute to maternal mortality, including women's status in communities; discrimination; accessibility factors such as transportation and geographical and social distance; corruption and bribes; costs and health service factors, including the use and availability of blood and staff problems,

Dora Shehu, another RPMMN official, also worked on the early research. Every team had to have a social scientist. Shehu, a professor of social development and geography, was the social scientist for her group in Nigeria.

“Before the Corporation grant,” Shehu said, “people hardly knew what the social causes of maternal mortality were. This research proved extremely useful to many in the com-

munities where it took place. The governments found it very difficult to comprehend.” Added Shehu, “There are quite a number of cultural, social and religious barriers [including practices related to Islam]. Sure, many Muslims may resign themselves to a kind of ‘will of Allah’ reaction to maternal mortality, and they have other practices like not allowing wives to leave a house without being accompanied or without a husband’s permission, but there are just as many barriers in other religions.”

Since most physicians and modern medical facilities are located in urban areas, researchers found that the vast majority of people in the rural areas of Africa rely on traditional spiritual healers for medical attention. Time is often spent praying and forecasting obstetric complications or waiting for herbal treatments to take effect. These efforts are often time consuming and delay seeking more modern medical services. These delays often lead to further complications and death.

“This interaction of social and cultural factors varies from country to country and within countries,” Shehu said. In West Africa, she added, childbirth is regarded as a natural process and signs of trouble are not always recognized. For example, feet swelling, which can indicate potentially fatal seizures called eclampsia, instead are often seen in one place as a sign of carrying a boy, or carrying twins in another.

In many parts of West Africa, according to one publication of the network’s research, many women believe that certain behaviors, such as infidelity and disobedience to one’s husband, lead to obstructive labor and hemorrhage. If a local oracle is consulted and confirms this belief, the woman must apologize to her husband and perform certain cleansing rituals before she can be taken to treatment.

Women in other communities are reluctant to seek treatment at a hospital for fear of being stigmatized. Such women who do not deliver vaginally are thought to have failed in their essential roles. Some women in parts of rural Sierra Leone told researchers they would rather die than be taken to a hospital for surgical delivery.

In other communities, some women live in seclusion within walled communities and cannot leave the compounds without a husband’s permission. Researchers learned of cases where women died waiting for traveling husbands to return to ask for permission.

Such evidence reveals that women who are economically dependent are particularly at risk. Many women are not

allowed to engage in forms of commerce and have no cash available in times of emergency unless they receive it from their husbands.

The RPMMN established multidisciplinary and multisector teams of professionals in 22 countries, where training manuals were also produced. The network also created a Center of Excellence, where master trainers were trained in the design, implementation, monitoring and evaluation of programs to strengthen health systems in order to reduce maternal and neonatal mortality. More than 800 nurses, midwives and university medical students become master trainers, that is, they were trained to train others. In project areas, fatality rates were reduced by half, and monitoring systems requiring bi-annual activities and data reports were established.

In recognition of the unique contributions of RPMMN in developing appropriate low-cost sustainable strategies in Africa, the Network won the Global Health Council Award for Best Practices in 2003. The health ministries in several African countries now use RPMMN research findings on emergency obstetric care in developing their national plans to reduce maternal mortality. Network teams work with university medical schools, hospital staff, midwives, and communities to upgrade maternal health facilities, organize life-saving skills classes, establish community-savings societies to provide resources for women to buy medications and transport to reduce delays in receiving emergency care.

France Donnay is the Bill & Melinda Gates Foundation’s senior program officer for maternal health. She first began working with Deborah Maine in the early 1990s while serving as the senior women’s health adviser for UNICEF. “The funding for the network from Carnegie Corporation was really the key funding that brought everything together,” Donnay says. “UNICEF used [the results of the Corporation research] to apply at the country level. No one else except the Corporation was paying attention to Deborah’s research, and it proved to be the most important thing to happen to maternal health. Those grants were critical.”

Innovation in Monitoring and Evaluation

Donnay believes that the maternal mortality research funded by Carnegie Corporation has implications far beyond maternal mortality that continue to this day in all kinds of field research throughout the world.

“At the time that the Carnegie Corporation funding began,

most foundations and donors did not have really strong monitoring and evaluation regimes for their giving,” Donnay said. “The Corporation-funded research had a focus on theory of action, what they were trying to do and why. And they had strong indicators and standards for monitoring and evaluation. It was a major step forward in strengthening monitoring and evaluation for all donors’ field research ever since.”

Alicia Ely Yamin, an editor of *Health & Human Rights Journal*, agrees. She is the author of numerous scholarly articles and books relating to health and human rights, including one groundbreaking work on “Maternal Mortality as a Human Rights Issue.” Yamin is an internationally recognized leader in the conceptualization and implementation of rights-based approaches to health.

“Maternal mortality is a human rights issue,” she said, “not because we don’t know what to do. A mother dies every 90 seconds. It’s a human rights issue because women are discriminated against and not listened to. That’s what makes women die.”

Yamin says this marginalization of women “occurs across cultures and religions—Christianity, Conservative Judaism and others, not just Islam. People in every religion believe women should not die in childbirth. When a woman dies, it destroys a whole family for generations.” Yamin adds that many laws and policies need to be changed to be conducive to women’s rights and equality.

Yamin worked at the Columbia program and, over the years, has seen firsthand the impact of the Carnegie Corporation grants. She said that the Corporation-supported research “had a huge impact in changing the paradigm of maternal mortality.” Almost exclusively based on that work, Yamin notes, indicators were developed by the United Nations and the World Health Organization. “That was a game-changer in the field,” she said.

The Maternal Mortality Issue Takes Wing

Dr. Lynn Freedman is Deborah Maine’s successor as director of the Columbia University program. The program has moved beyond basic research to become a global group focusing on advocacy and “implementation science,” Freedman said.

The early successes led to a \$50 million grant from the Gates Foundation and the establishment of the Averting

Maternal Death & Disability Program (AMDD), which focuses on research and advocacy seeking improvements in the health systems of countries with high maternal mortality rates. The program has 56 field projects in 43 countries with a cumulative population of 270 million people.

AMDD works worldwide in partnership with national governments, United Nations agencies, and international and local nongovernmental organizations to build the capacity of health systems to care for all citizens. While AMDD focuses on transforming health systems to deliver EmOC, the changes it promotes can vastly improve other health services. With strong national health systems, it’s easier for countries to lift themselves out of poverty—ultimately saving countless more lives. Their primary activities include:

- Researching and building evidence for innovative solutions;
- Sharing technical expertise with partners;
- Analyzing health systems policy;
- Advocating for a health systems and human rights approach to making change.

“We examine how to successfully implement each step consistently so that emergency care is accessible to all women and newborns,” said Freedman. “We work with partners to better understand how to translate policies and strategies into sound action on the ground.”

Freedman cites the many barriers erected in developing countries to the equitable access of women to emergency obstetric care, as a major area of concern. “It is absolutely essential,” she said, “that the health system works at every step of the way to provide seamless emergency care—from transporting patients, to maintaining supplies and training health workers. We are now giving systematic attention to ‘implementation science.’”

Freedman believes that mitigating maternal mortality has proven so intractable in West Africa because, “the problems in the health care system are deeper and more systemic. Health systems are weakest in West Africa. The reasons are very complicated, but many have to do with aspects of colonial history and the urban-dominated systems of education and health that were set up. These kinds of problems,” Freedman continued, “involve inadequate facilities in rural areas as well as lack of equipment, medicine, training, supervision, procurement and supply systems.”

Capturing the Voices of Experience

Dr. Peggy Marshall is currently the senior technical advisor for Maternal Child Health at the United States Agency for International Development. In 1989, Marshall was with the American College of Nurse Midwives, working in Ghana, and began working on the maternal mortality issue while introducing a training facility for family planning.

Marshall convinced the Corporation's Dr. Lucas to approve four grants to allow research into "all the things that contribute to delaying access to help—from decisions made by the family right on through those made at the health institution."

For her doctoral dissertation, Marshall wanted to focus on midwives. "They were much better distributed than government health facilities," Marshall said, and midwives were involved in all aspects of delivery. They were well integrated into local communities and they knew the helpful and the harmful practices. They were major sources of information. Private sector midwives had an average of 25 years experience.

"We looked at skills other midwives could be trained in that would attack the major causes of mortality," Marshall added, "and then we identified the interventions that could be used in the rural area with minimum resources."

In the end, Marshall designed a 10-module *Manual on Life Saving Skills*, which encourages an expanded role for the midwife in recognizing and responding to life-threatening emergencies. The topics include prenatal risk assessments, monitoring labor progress, repair of lacerations, treatment of hemorrhage, resuscitation, hydration and vacuum aspiration.

The manual, now in its fourth edition, has helped to train trainers in more than 30 countries, including Ghana, Nigeria, Uganda, Indonesia, Vietnam, Eritrea, Tajikistan, Malawi, Zambia, Ethiopia, Tanzania and Honduras. The manuals have helped midwives and doctors gain proficiency in life-saving skills. The curriculum has been translated into French, Spanish, Vietnamese, Indonesian and Russian.

"We tried to make sure the language was adequate for a sixth-grade English student," Marshall said, "as English is the third or fourth language for a lot of people. Missionaries and others have also translated the manual into many local languages around the world."

Just as important, the manual is also used in continuing education programs for experienced midwives and others. The nurse-midwives Marshall interviewed had been in practice for up to 27 years, but none of them had received even one hour of post-qualification training.

The manual was also used to strengthen pre-service training for midwifery students and was incorporated into basic training programs, which can be run by ministries of health, schools of education or midwifery associations.

"I'm incredibly grateful to Dr. Lucas," Marshall said. "He took a fly on a very young international health professional and bought into her passion. He was willing to give the time and space to look around and think, for us to talk to people and figure out a way forward."

Midwives Meet Resistance

The greatly expanded role for midwives envisioned by the manual caused great consternation—and still does—among quite a number of male physicians.

"Ghana and Nigeria both had doctors who opposed midwives doing what they called very complicated medical procedures," Marshall recalled. "They screamed that [the midwives were] killing babies." Dr. Joe Taylor, in Ghana, "proved to be the life saver," Marshall said. "When others were naysayers, he came to the midwives' defense. Dr. Taylor recognized that the midwives were on the front lines and that they were the only ones who could save lives."

Dr. Taylor became involved with the issue while director of a regional, government hospital in Eastern Ghana with responsibilities for training midwives and doctors.

"Initially," Taylor said, "many male doctors were vehemently opposed to midwives doing these interventions, such as vacuum extractions and manual removal of placentas. Some doctors genuinely believed the midwives weren't qualified, but others just had inflated opinions of themselves, their educations and their capacities."

"I countered that their arguments just didn't hold," Taylor recalled. "Considering there are so few doctors and their numbers are so unevenly distributed, and considering the number of midwives in the rural areas, it just made sense. Many people don't have access to doctors and many women

are dying because they can't get to places where there are doctors. There are many places in rural areas where doctors don't even want to live." On the other hand, "If you can train people," Taylor insisted, "they can do anything."

Eventually, such arguments held sway, Taylor said, adding, "The battle was won." Many ObGyns now support the program. "I think the Carnegie Corporation grants were very welcome," said Taylor. "Their impact was pretty large."

Such resistance was common in many developing nations initially, but some have been quicker to exploit the lessons. Mozambique, for example, has only about a dozen obstetricians for 15 million people, yet they developed a process of training medical assistants who handle even the most complicated medical procedures, including caesarean deliveries, according to Columbia University's School of Public Health.

Tackling the Brain Drain

Ghana has proved to be a leader in many of the innovations to reduce maternal mortality rates, particularly in the area of "brain drain." Africa has suffered from a "brain drain" of a wide variety of professionals who leave their homelands for better pay and prospects in developed countries. The medical profession has been especially hard hit.

Between 1993 and 2000, 68 percent of Ghanaian-trained medical school graduates left the country. The government had awarded training grants to 30 doctors to train in obstetrics in Britain but only three of them returned to serve in Ghana. The others remained in the UK or went to take up positions in Saudi Arabia and other Middle East countries.

"Brain drain" has been particularly prevalent in Ghana. According to the Ghana Ministry of Health, approximately 60 percent of physicians trained in Ghana in the 1980s left the country. As of 2002, 30 percent of physicians trained in Ghana were practicing in the United States or Canada. In 2003, the United Kingdom approved 850 work permits for Ghanaian health and medical personnel, including physicians and nurses.

An American obstetrician, the late Dr. Thomas Elkins from Louisiana, approached Carnegie Corporation with a proposal to support the training of obstetric residents in Ghana by helping hospitals acquire modern medical equipment in

support of advanced training. In his autobiography, Dr. Lucas recalled his reaction to this idea. "It seemed to me...that we should use this opportunity to develop a wider approach to the whole question of strengthening obstetric skills in Ghana. To cut a long story short, I suggested and he agreed that we develop a partnership" to help Ghana retain more of the obstetricians it was training.

Lucas elaborated in an interview. "The Ghanaians had followed the old system of sending doctors to Britain to become specialists in obstetrics. The whole system of training in obstetrics and health care had to be changed. This is the model that other countries should follow. Train them locally, bring expertise from outside. So they can see themselves being useful."

Lucas believes this and other innovations explain why Ghana has some of the lowest maternal mortality rates in West Africa. "Maternal mortality in Ghana is less than half that in Nigeria," he said. "Nigeria has been very slow in adopting the kind of creative interventions that Ghana picked up."

Eventually, an international partnership was established that included the Ghanaian Ministry of Health, two medical schools in Ghana, the American College of Obstetricians and Gynecologists and the Royal College of Obstetricians and Gynaecologists in the United Kingdom.

Dr. J. B. Wilson of the Department of Obstetrics and Gynaecology at the University of Ghana Medical School in Accra, was instrumental in creating the partnership. "For quite a while, many doctors didn't come back after they went away for training," Wilson said. "We couldn't train them locally because we lacked so much in terms of equipment and other resources. That was what led to the initial discussions with Carnegie Corporation for help in getting equipment."

Under the program that was established, the residents receive training in maternal health issues, among other topics. The fourth year of the program is unique: the resident attends a hospital management course for three months, goes for a clinical rotation in the United States or United Kingdom for three months, and moves to live and work in a rural district hospital for six months.

"We included six months for residents to go to the districts because we needed them to know what the problems in the districts were," Wilson said, adding, "another critical part of the program was to sponsor teachers from abroad to come

to Ghana to assist in training. They would spend two weeks in Accra and two weeks in Kumasi. Mostly they would lecture, but they would also go into the operating rooms with our doctors.”

“By the time the program ended,” Wilson continued, “we had trained 50 obstetricians and kept all but one, and the only reason we lost that one is that his family moved to the States. Since 1989, we have trained 103, and kept 102. All this could only happen because of the substantial support from Carnegie Corporation and the teachers in America and the UK.”

In his autobiography, Lucas lauds the program as having exceeded expectations. “It has trained four times as many specialists as originally projected. The remarkable feature is that practically all the trainees have remained to work in the public sector in Ghana. This is an extraordinary achievement when viewed against the background of massive brain drain of doctors from African countries, including Ghana. As repeatedly stated in publications about the program, the model deserves replication.”

Despite the successes, Wilson says that Ghana is still struggling to give rural women access to modern health care professionals. While the Carnegie Corporation grants helped keep Ghanaian doctors in Ghana, Wilson said, getting those doctors to serve in rural areas is still a problem, as it remains throughout much of Africa. “We are still struggling to get them out of the cities,” he noted. “There are some outreach efforts to get [physicians] to work in the districts once every couple of weeks, but that’s not the same as a permanent placement. Doctors are professionals with wives and children and they prefer the amenities and choices in the more urbanized areas.”

African Research Leaves Africa Behind

Though much groundbreaking research has been carried out and treatment innovations discovered in West Africa, the unfortunate reality is that these advances don’t seem to have made a substantial difference in maternal health conditions. Many countries, especially in Asia and Latin America, have made much more remarkable improvements in their maternal mortality rates. For example, there were 1,200 maternal deaths per 100,000 live births in Mali, 1,100 deaths in Zimbabwe and Nigeria, and 1,000 deaths in Kenya

in 2007. China has cut its maternal mortality rate to 56 per 100,000. India’s is 540. Indonesia reduced its maternal deaths from 307 in 2003 to 228 in 2007.

Sub-Saharan Africa, which contains 16 out of the 20 countries with the worst maternal mortality rates, accounts for 57 percent of maternal mortality cases, while 30 percent of them occur in South Asia. Estimates reveal that one in eight women die during pregnancy or childbirth in Sierra Leone compared to the recorded one in 76 average in the rest of the developing world and one in 8,000 in the developed world. In Sierra Leone, fewer than one in five births are carried out in health facilities, while only 30 percent of Liberian mothers give birth with skilled health workers in attendance. A child born in Sierra Leone today has a more than 25 percent chance of not living to her fifth birthday.

Dr. J. B. Wilson agrees with the assessment that countries around the world have benefited from the Corporation-supported research on the prevention of maternal mortality more than West Africa. “People in West Africa are spending a lot of money trying to reinvent the wheel,” he said. “What works has been identified and published.” Wilson blames the devastating wars, instability and military dictatorships for much of the collapse of the medical systems generally. “A lot of doctors were either killed or ran away.”

Ghana, whose maternal mortality rate appears to be the lowest in West Africa, at 210 deaths per 100,000 live births, has done much better, Wilson believes, “because we have had stable government for two decades. And the government was committed to building hospitals outside the capital, where they were needed. We started with only five regional hospitals and now we have twenty.”

Though the World Health Organization released a report last year suggesting that maternal mortality had not improved in the last 30 years, with roughly half-a-million mothers dying during pregnancy and childbirth each year, one recent study published in the journal *The Lancet* found that the number of maternal deaths had actually dropped by some 35 percent during that time period—from 500,000 in 1980 to 343,000 in 2008.

The study, by Dr. Christopher Murray, director of the Institute for Health Metrics and Evaluation at the University of Washington, has proved to be quite controversial and many of those involved in the early, groundbreaking research

dispute the methodology and the findings of the research.

Liberia's Angela Sawyer, founder of the Regional Prevention of Maternal Mortality Network, is especially dismissive of suggestions that the problem is improving—at least in West Africa. “People working in the field don't believe the problem is getting better,” Sawyer said. “The problem is getting worse in Africa. I can challenge anyone on that; maybe in Asia, but definitely not Africa. There are such appalling variations in West Africa.” Sawyer believes the main problem is that the money spent on advocacy on the maternal mortality issue would be better spent in the field. “There is money in the system globally,” she added, but it's not reaching where it's needed.

“Because of our initiative,” she continued, “the world now has tangible data on what works and what can be done. Most of the big players are still putting money into needs assessments instead of implementing best practices,” she continued. “The only people who believe the problem is getting better are those people who spend all their time and money going to big meetings.”

“What's missing now,” Sawyer believes, “is the kind of leadership Carnegie Corporation provided back when it funded this early research. It's like the Corporation gave birth to this beautiful baby and then abandoned the child before it became a teenager.”

In an interview, Lucas agrees that the issue suffers from a lack of leadership today. “Carnegie Corporation may not fully appreciate what was achieved back then,” Lucas said. “Also, the whole thing cooled down with changes in the leadership at the World Bank, which had picked up the baton from the Corporation.”

The Gates Foundation's France Donnay agrees that the issue of maternal mortality has become “an orphan. No one believes this Millennium Development Goal (which would cut the rate by three-quarters by 2015) will be met.”

“All other Millennium Development Goals have a home in a United Nations agency,” said Donnay, who also doubts that the problem in West Africa has improved. “That is a reflection of the weakness of UN agencies working on the issue.”

Columbia University's Lynn Freedman also agrees that work in the field has been neglected in favor of advocacy. “There is a very big disconnect between the global discourse and the reality on the ground,” said Freedman.

“The implementation of programs and interventions has not kept up. A lot of the energy in the field is devoted to global discussion and far too little devoted to the very hard work of putting interventions in place.”

Freedman acknowledges that the task of making systemic changes in the health systems and priorities of governments in developing countries “is, by definition, a long and difficult process.” Still, a UN conference on the status of Millennium Development Goals in late 2010 saw numerous governments and NGOs refocus their commitment to decreasing maternal mortality. The UN Foundation pledged \$400 million to make motherhood safer and the UN announced concrete commitments from 26 developing nations toward the new strategy. In addition, CARE announced a \$1.8 billion pledge to expand its maternal, newborn and child health programs to more than 30 countries by 2015.

Freedman sees potential solutions to the problem following the refocusing of Columbia University's Averting Maternal Death & Disability [AMDD] program on “implementation science.”

“The whole infrastructure that's been developed for the treatment of HIV and AIDS is a potential platform for providing the kind of services that maternal mortality requires,” Freedman said. “Both HIV and maternal mortality programs are inherently dealing with the same kind of service delivery problems, in that they must be able to deliver highly discretionary and transactional services.”

Freedman said that maternal mortality “like HIV, needs a workforce that makes judgments many times for each patient. You need an infrastructure and a human workforce that needs to be developed, supported and supervised. Our colleagues in the HIV field have developed approaches to do ongoing mentorship and problem solving in facilities where care and treatment is given. We did the same thing in AMDD projects. We need to begin thinking about the same people providing some of the same services.”

“This will start to happen,” Freedman continued. “In some places where there are substantial HIV programs, we will start to see those support infrastructures broaden to include maternal mortality. We have five million people in treatment for HIV, which is a lot more complicated than a nine-month pregnancy. The HIV folks need us too. They can't maintain their approach [alone].”

President Obama's administration is also committed to the idea. The president has announced a \$63 billion, six-year initiative to move U.S. foreign health assistance away from its focus on HIV, malaria and tuberculosis toward solutions for women's, children's and family health.

Freedman said that President Obama wants to take the President's Emergency Plan for AIDS Relief (PEPFAR), which began in 2003 under President George W. Bush as the U.S. government's emergency response to HIV, and integrate that into the health systems of countries where AMDD operates.

Creating a System of Blood Transfusion from Scratch

Another Corporation-funded innovation deserving replication concerned the transformation of blood transfusion services in Uganda. One of the reasons maternal mortality rates in Africa are the highest in the world is that much of the health infrastructure lay in ruins following decades of civil war, insurrection and military misrule. A key part of this infrastructure is the near-total absence of systems to produce safe blood transfusions in many parts of the continent.

Unlike transfusions in developed countries, where blood is typically used in cases of high trauma such as major surgery, car accidents and industrial injuries, in Africa, blood is much more likely to be used by a mother in childbirth, or children with malaria-related anemia.

In Europe or America, a reliable supply of blood products is produced by an integrated system of transportation, refrigeration, blood screening and volunteer donors. All of these conditions exist in only a handful of African cities.

In Uganda, Corporation-funded research eventually led to the complete transformation of the country's Blood Transfusion Service. The effort began when Dr. Lucas received a proposal from a friend, British hematologist Dr. John Watson-Williams, who he had met at University College Hospital in Ibadan, Nigeria, where he had worked on the Blood Transfusion Service.

Uganda was emerging from many years of civil and international conflict. Medical services, including that for blood transfusion, had virtually collapsed. HIV prevalence was high—about the highest in Africa at that time.

"John telephoned me at Carnegie [Corporation]," Lucas recalls in his book, "asking if there was a possibility of funding his proposed program in Uganda." Because half of all African blood transfusions were administered to

pregnant women, Lucas was able to justify a small discretionary grant of \$25,000. "Surprisingly," Lucas wrote, "he happily accepted this token sum and proceeded with his plans for Uganda."

Watson-Williams and his wife, a medical practitioner, both waived their salaries and forged a partnership with the American Red Cross and proceeded to build the Ugandan Blood Transfusion Service from scratch, focusing on a core group of unpaid, volunteer, repeat blood donors who were HIV free to give blood regularly.

Watson-Williams had learned from previous work in Nigeria that there were fundamental differences in a blood transfusion system in Africa compared to those in more developed countries. Like most countries in Africa, and many parts of Asia, Uganda had previously relied on professional paid blood donors who make their living out of giving their blood, often as a result of extreme poverty. These people and their behavior are hard to keep track of, and they tend to have abnormally high rates of HIV infection.

According to a European Commission (EC) study, the key concept in modern transfusion medicine is the *integrated blood transfusion service*, which seeks to ensure an adequate and timely supply of safe blood products at an affordable cost. "The global reality is stark," according to the study. "While the integrated system is a reality in industrialized countries, the people of the developing world rarely receive the full benefits of blood transfusion."

In developing an integrated blood transfusion service, Uganda had to confront particular realities of blood transfusion in Africa.

Like many countries in sub-Saharan Africa, much of the health infrastructure in Uganda had been destroyed by

“We are trying to find places to test approaches to doing that,” Freedman noted. “I don’t think it will take a long time. We’ll get some results from the field within a year.”

Despite the apparent neglect of on-the-ground interventions

civil war and civil strife. And the continent’s high rate of HIV and other infections resulted in high contamination rates of the blood supply.

African economies are generally too poor to import “safe” blood supplies from abroad, and the full-scale blood services found in the global north are often considered too expensive for many African countries. Therefore, most blood in Uganda, and many other African countries, is donated at the level of the individual hospital as compared to centralized systems. Relatives often donate any blood needed by patients on the spot. This decentralized system makes the quality control of personnel, procedures and the blood itself especially difficult.

The effect of all this, according to the EC study, is that “you cannot (even if you have the money) just take a blood transfusion service from an industrialized country, where none of these characteristics apply, and plunk it down unaltered and unmodified in an African (or other developing) country and assume that will be enough to solve the problem... It is much more complex than that.”

The EC study, entitled *AIDS in Africa*, published in 1994 in New York, also suggests that “Even more frustrating from the public health point of view is the realization that the experiences and strategies of developed countries for preventing blood-carrying HIV transmission are not useful in Africa. If the American blood donor screening program were implemented in Zaire, for example, almost all Zairian donors would be ineligible to give blood.”

So the choice of standards has to be realistic in light of African conditions. The choice of blood donors has to be adjusted to the rate and age profile of HIV infection in Africa, and the infections to be screened against have to be chosen in the light of the epidemiology—the main diseases prevalent—in Africa.

Watson-Williams helped the government develop a strategy for a sustainable, integrated blood transfusion

in many parts of West Africa, it appears the issue may be once again gathering momentum. The Millennium Development Goals appear to be galvanizing attention. International organizations are making new monetary commitments. And many West African governments are showing growing em-

service. He drew up a proposal for the supply of refrigerators, computers and other hardware, which the European Commission helped to fund with an initial grant of two million ECU.¹

The blood transfusion service offered HIV screening to the general public as an income-generating activity. Two years later, Carnegie Corporation gave another small grant for training the workers at a sub-regional center. To facilitate the distribution of blood products, Watson-Williams also helped organize a complex transport system involving roads, public bus and taxi services, post office vans and local air services to compensate for poor local roads.

Today, Uganda’s blood service is completely transformed and stands as a model for much of the developing world. It is supplying almost all Uganda’s 90 hospitals with nearly 40,000 units of blood each year. The supply has to be continuous, as even in cold storage, blood lasts only 35 days.

According to a European Union Commission report, the Uganda Blood Transfusion Service has saved countless lives, not only among mothers in labor who need a blood transfusion, but also among those who, as potential blood donors, have received AIDS education or who have sought a blood test so as to know their HIV status and avoid passing on the infection to others, for example, when about to marry and have children.

Patricia Rosenfield, director of the Carnegie Scholars Program, who also formerly served as chair of the Corporation’s Strengthening Human Resources in Developing Countries program, says the successes of the grants for the Uganda Blood Transfusion Service show that often, tremendous amounts of money are not needed for substantial change. “We had a fantastic program with two \$25,000 grants to Professor Watson, and these little grants had enormous impact.”

¹ The European Currency Unit, the predecessor to the Euro.

CARNEGIE CORPORATION OF NEW YORK
437 Madison Avenue
New York, New York 10022
Phone: (212) 371-3200
Fax: (212) 754-4073
Web site: www.carnegie.org

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barrassment at the horrible rates of maternal mortality in their country.

However slow progress may be in the future, nearly everyone believes it is impossible that the situation will return to the astronomical rates of maternal mortality that existed before Carnegie Corporation became involved.

Written by: Kenneth Walker. Walker currently runs Lion House Productions, a South African media company. He has had a distinguished career as a journalist. In the U.S., he worked for ABC News, covering the White House as well as the U.S. Justice Department and also served as a foreign correspondent. Before that, for 13 years he reported for *The Washington Star* newspaper, which assigned him to South Africa in 1981 where his work earned several of the most prestigious awards in print journalism. In 1985 he won an Emmy for a series of reports he did on South Africa for the ABC news program *Nightline*.




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