

# Guinea-Bissau Health Assessment:

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## 1. Guinea-Bissau Health Assessment:

**Introduction:** Guinea-Bissau is a country in West Africa, south of Senegal and north of Guinea, along the north Atlantic Ocean. It has a total area of 36,125 square kilometers and an estimated population of 1,360,827 (2003 estimate).<sup>1</sup> Its area is slightly less than three times the size of Connecticut. It has numerous rivers and approximately 350 kilometers of coastline. Bissau, the capital city, has a population of roughly 233,000 (1995 estimate).<sup>2</sup> The terrain is mostly low coastal plains, with some higher elevations in the extreme eastern part of the country, rising to Savannah (approximately 300 meters above sea level). The climate is tropical, generally hot and humid. There is approximately 11% arable land. Guinea-Bissau has a pre-demographic population structure and disease pattern, being comprised of a very young population, suffering mostly from infectious diseases. Approximately 42% of the population is between 0-14 years old. Only 3% of the population is older than 65 years. The population growth rate is approximately 2.23%, and the birth rate is 38.95 births/1000 population.<sup>1</sup> The crude mortality rate is 15.13 deaths/1000 population. The infant mortality rate (deaths in the first year of life) is approximately 132/1000 live births, while the under five mortality rate is 215 deaths per 1000 live births.<sup>3</sup> The life expectancy at birth is approximately 45.9 years for men, and 48.7 years for women.<sup>4</sup> The total fertility rate is approximately 6.0 children born/woman. Maternal mortality is approximately 0.9-1%, per birth.<sup>3</sup> The adult literacy rate (defined as those over age 15 who can read and write) is approximately 53% for males, and 21% for females.<sup>3</sup> The GNP per capita is approximately \$240 dollars (1995). Being one of the world's poorest countries, Guinea-Bissau has an extreme dependence on foreign aid, which represented 70% of their GNP in 1994.

Approximately 48.8% (1991 estimate) of the population lives below the African poverty line. Their external debt is \$953 million (1996 estimate). Guinea-Bissau received approximately \$115.4 million in external aid in 1995.

Adding to this already difficult living situation, a civil war broke out in June 1998. The president, Joao Bernardo Vieira, was backed by the Senegalese military, and opposed by a military-led junta led by Ansumane Mane. President Vieira was deposed, and free elections were held in January 2000. President Kumba Yala was elected. (Ansumane Mane was later killed in a brief November 2000 coup attempt against President Yala.) The war lasted from approximately June 1998 until May of 1999, and caused extensive destruction to the capital city of Bissau. Many public buildings, including the main general hospital, were damaged.

This health assessment was conducted for the purpose of identifying specific health needs in Guinea-Bissau.

## 2. Healthcare Infrastructure:

### A. Before the 1998-2000 civil war:

Prior to the war, Guinea-Bissau had 6 functioning hospitals, with a total of roughly 1000 hospital beds for its population of 1,360,827 people. The health care system is divided into 9 districts. There were 810 auxiliary nurses, and 357 general nurses, before the war, and roughly 168 licensed physicians.<sup>5</sup> (The physician to person ratio is thus 1 physician per 8100 people, compared to 1 per 435 people in the USA.) There were 67 midwives, and 73 auxiliary midwives. The infant mortality rate has been approximately 132/1000 per live births.<sup>3</sup> The life expectancy at birth is approximately 48 years.<sup>4</sup> The total fertility rate is approximately 6 children born/woman. Maternal mortality is approximately 0.9-1%, per birth (thus, roughly 1 in 17 women die in childbirth).<sup>3</sup> Approximately 80% of the population has some access to health care (by virtue of living 5 km from a health center), and 56% have access to safe water (79% in urban areas and 49% in rural areas).<sup>3</sup> Guinea Bissau's health care needs were, and still are, typical of a developing country with a GNP of \$240 per capita. Government-run clinics and hospitals are chronically under-funded, resulting in low wages for the staff (with resultant low morale), and, because of a lack of funds, they are usually unable to provide medications to patients (resulting in patients being required to purchase medicines from private pharmacies and private clinics, thus causing many patients to avoid using the public services in the first place. They instead often go directly to the private pharmacies, to be sold often unnecessary medications without a prescription. This is overall wasteful both of the patients' scarce funds, and of the government's scarce resources, because it causes underutilization of the government-run services). Although maternal mortality is very high, only about 15% of births are attended by a mid-wife or physician, because patients chose more traditional birth attendants instead. Also, due to poor roads and lack of personal transportation for most patients, transfers and referrals of sicker patients from rural areas is often difficult. Nurses and rural health workers in remote locations often complain of feeling a sense of isolation, with infrequent training updates and the inability to consult a physician with difficult cases. However, a unique strength of Guinea Bissau is its quality of epidemiology and disease surveillance, which is fairly robust. A number of public health researchers, most notably Dr. Peter Abby, live and work in Bissau. Their Bandim Health Project has been prospectively following several thousand citizens of Guinea Bissau for 20 or more years, yielding statistically valid estimates on infant mortality, stillborns, perinatal mortality, and other vital health indicators. Additionally, a variety of public health initiatives have been studied by this group, ranging from breastfeeding, to HIV prevalence, to diarrhea treatment, yielding excellent insight into potentially beneficial public health programs for the country. (Over 240 research articles have been published on a variety of healthcare topics.) This program is also working to build an epidemiologic capacity among local residents, to carry on such important research work. In a country which has very limited resources, health care dollars must be channeled into those interventions which show the most promise and appear to be the most cost effective. The Bandim Health Project is a valuable local resource which should be used to help guide government health policy in the future.

## B. After the civil war: war related damages and current needs

Approximately 20 physicians emigrated during the war, leaving 148 physicians. Approximately 40 newly trained physicians should have returned from Cuba, where, due to the civil war, they were finishing their last 2 years of medical school.<sup>5</sup> The number of nurses and midwives who left during the war is unknown, but presumably most lacked the resources to leave, and remained in the country. This report will focus only on the damages to the main referral hospital in Bissau, the Simon Mendes Hospital, as this was all which was assessed during the timeframe of the visit. However, most of the damage done from the war was indeed centered in and around the capital city of Bissau, which unfortunately also had the most developed resources in the country. Also, the needs of a rural clinic, the Biombo clinic, will be detailed. This clinic represents a typical rural health clinic, and could be expected to have similar needs as most of the other rural health clinics. Most of these needs are pre-existing, having been present before the war. They are, none-the-less, important needs.

1. Simon Mendes Hospital: This is the main referral hospital for Guinea Bissau, located in the capital city of Bissau. It is a 500 bed government run teaching hospital, and houses the medical school, the nursing school, a mid-wife training program and much of the government pharmaceutical and public health structure. It has medical, surgical, OB/GYN and other subspecialty capacities. It is a relatively new structure, having been built in 1980. A visit there revealed many needs, some related to war damages, and many related to chronic under-funding by the government. The healthcare budget for the entire country of Guinea Bissau was U.S.\$16 million in the year 2000. Of this, 4 million was contributed by the country's own resources, 7 million came from donated sources (almost 70%), and there was a deficit of 5 million dollars. Hence, all of the government-run health services, including Simon Mendes Hospital, have long suffered from chronic under-funding. This has led to a general state of disrepair, with no funds to service or repair equipment when it fails. As a government-run free hospital, there is very little incentive (or funding) to clean or repaint the walls, hallways or patient wards. Medications, even life-saving intravenous medications, are often not available, and families must personally purchase these medicines at local pharmacies, and bring them back to the physician to give. X-rays are either not obtainable, or the patient must first buy the film, because the hospital can't afford to provide this. Only a very limited number of tests can be performed by the hospital laboratory, and when the monthly supply of reagents runs out, some tests become unavailable until more reagents are available. The hospital is outfitted with a modern oxygen delivery system, with outlets in the walls for immediate oxygen delivery when needed. However, the system had broken, and there was no one to service it, to see what was wrong, and whether the problem could be easily fixed or not. (The hospital would appear to have no bio-medical engineering/maintenance department, and no funding to pay for such a department.) There were many other such examples of deficiencies related to chronic under-funding. These problems are, unfortunately, not necessarily related to the recent civil war, and are not by any means temporary problems which could be alleviated by a one-time donation from an aid group or an international funder. These issues will require system-wide changes in the healthcare delivery of

Guinea-Bissau, as well as an eventual increase in the Gross Domestic Product, in order to sustain these changes. A short listing of some of the many needs of the specific wards of the hospital are as follows:<sup>6</sup>

- A. Pediatric Ward: The 125 bed Pediatric building was in the process of being re-modeled when the civil war broke out. Thus it was fortunately empty when it was hit by heavy artillery and sustained major structural damage. A previous estimate to repair the damage was \$245,000. The current Peds ward was moved to a floor in the main hospital. In addition to being very overcrowded, and having few safeguards against patients cross-infecting one another, there was a shortage of intravenous fluids (lactate and normal saline), many medications, as well as glucose to treat hypoglycemia. There were only two neonatal incubators, both recently donated. However, neither was being used at the time, and I received conflicting accounts that they were either both broken, or that no one knew how to use them, and that training was needed in their use (this was probably the more likely scenario). No oxygen was available for newborn resuscitations, no suction was available, and there was a shortage of ambu bags. There was also a shortage of nebulizers for treating asthma. Lastly, there was a concern that the hospital had trouble providing enough food for the inpatients.
- B. OB/GYN: The OB/GYN Department performs 6000 deliveries per year, with a 10%-15% rate of cesarean sections. Unfortunately, although magnesium sulfate (which is cheap) is often available to treat preeclampsia, blood pressure-lowering medications often are not. It was felt that hydralazine and Adalat SL were the 2 most pressing needs here. Also, the hospital was unable to provide Pitocin and ergometrine (medicines routinely given to stop/prevent post-partum hemorrhage); families must purchase these if needed. There are also chronic deficiencies of suture material (especially chromic 2.0, 3.0, 4.0; silk; and catgut); lidocaine for local anesthesia; gloves; scissors; forceps; and foley catheters. No suctioning equipment was available in OB/GYN either. The staff stated that they would have great use for a VHS player and television, along with teaching tapes for the new mothers, on subjects such as breastfeeding, oral rehydration solution, diarrhea, etc. They stated that these could be in Portuguese, although only 10% of the population speaks Portuguese fluently, with the rest speaking mostly Crioulo. Thus any educational tapes should probably be translated into Crioulo.
- C. Surgery/Operating Theatre: The Operating Theatre was built in 1980, and looks quite modern. However, it as well suffers from a chronic lack of maintenance and a lack of medicines and supplies. At the time of this survey, only emergency surgeries were being performed, not elective. There was a perceived need by the staff here for a new halothane mixer for the anesthesia machine. There was only one working ventilator for surgical use. There was no isoflurane for general anesthesia; only halothane. There was no nitrous oxide available, no atropine, and no midazolam. There was a need for 2 new OR tables to replace the 2 old tables. Antiseptic was frequently in short supply, as well as suture material (chromic 2.0, 3.0, 4.0; seda #1, #2, #3, #4; Dexon 1.0, 2.0). No electrocautery was available, and no suction for surgery.

As well, there was a need for shrink-wrapping for sterilization. In Post-op/Recovery, there was inadequate equipment and medications to do re-animation, ie, resuscitation. There were no pulse oximeters, no ambu bags, no epinephrine, no oxygen and no cardiac monitors.

- D. Medical Intensive Care: Here there was almost a total lack of functioning equipment normally associated with a modern ICU. There were no cardiac monitors, no ventilators, no oxygen, no pulse oximeters and few blood pressure cuffs. There were no bedside glucometers to test serum blood sugar (hypoglycemia is a common side effect of iv quinine therapy for malaria). Dextrose was in short supply. There were no EKG machines and no ultrasound machine. The fluoroscopy machine was broken. There was a portable x-ray machine but the hospital could not provide film for the x-rays. The lab did have the ability to run tests for: urinalysis, complete blood count, parasitology, and a few basic electrolytes. However, it is clear that even if some of this equipment were supplied, it would quickly become unusable unless there were a way to maintain and service it, which currently there is not.
- E. Dentistry: The dentistry building was destroyed. There was a small area available for dentistry, but there was a need for a complete dental chair with drill. (The drill there is broken, and as usual there is no one to repair it.) There was also a shortage of lidocaine for anesthesia (dental lidocaine vials for an aspirating syringe). There was also no filling material (no amalgam and no porcelain).
- F. Laboratory: The laboratory and the Blood Bank have a chronic need for reagents, which get used up as tests get run. They also run out of pipettes frequently. They were using a borrowed spectrophotometer from the School of Medicine, but would eventually need to obtain their own. Frequently, if the city water supply was shut off, they would be unable to run their tests until it was turned on again, thus delaying possibly important test results. They had 2 functioning microscopes, and were able to perform parasitology screens, as well as tests for: pregnancy, VDRL (but not RPR), Widal's test for typhoid, electrolytes,  $Mg^{++}$ , creatinine, urea, transaminases, alkaline phosphatase, bilirubin and total protein. They were out of reagents for, but usually could perform, tests for blood glucose levels, cholesterol, and uric acid.
- G. Radiology: The Radiology department was re-done in 1997. The x-ray machine is broken. There was also no developer. The fluoroscopy machine was also broken. Fluoroscopy is probably a better long-term option in this setting, as x-ray film is expensive, and frequently needs replacement.
- H. Emergency Department: The Emergency Department sees 50-55 patients per day. The resources here were very limited. Typical complaints were for malaria, diarrhea, hypertension with headache, and respiratory illnesses. The ED was divided into a Medical and a Surgical side. There was a separate ortho room for casting. Very little in the way of testing was available, and most diagnoses were empiric. Very little in the way of re-animation equipment or medications was available either. It would be useful to have

some resuscitation capabilities here, although, in order to avoid duplication of expensive equipment, the reanimation equipment for the hospital (cardiac monitors, defibrillators, oxygen, pulse oximeters and ventilators) should be shared by the OR, the ICU and the ED. This may necessitate having these 3 Departments in very close proximity to each other, even sharing a common doorway. This is currently not the case. Re-organizing these 3 departments so that they could share equipment could save money in the long run.

- I. Medical Library: There was a small medical library for teaching purposes. (The medical school is on the campus of the hospital.) There was a computer, a copier, and an overhead projector for lectures. There were only 5-10 books. There was a need for more shelves to display more books. The library could benefit from access to the internet, which would allow researching of medical topics on international medical sites such as PubMed. This is available from Guinea-telecom for:
  - 52,800 CFA to have a phone installed (should be sure to have the ability to make calls turned off)
  - 15,000 CFA to set up the internet
  - 1500 CFA/hour to use the internet (about \$3/hr)
  - Total: U.S.\$130 to set it up; \$1800/year to provide 50 hours a month of internet access.
- J. General hospital needs: The power in the hospital is dependent on that of the city, which is unreliable. Thus the hospital needs its own back-up generators, to avoid serious consequences from power outages to its blood bank, its labs, its ventilators, its incubators and its Operating Theatre. (Likely, each of these departments will need their own back-up generators.) This would seem to be a very urgent issue. As well, the hospital's water supply is dependent on the city as well, which is also unreliable. The hospital should eventually build its own water tower, for storing and dispensing its own water. The hospital could also greatly use an oxygen generator, so it would not have to rely on imported oxygen canisters, which are both expensive and difficult to obtain reliably. There is also no working incinerator, and hospital waste and trash is not dispensed of properly. (It was being dumped outside the hospital when I was there, and there were vultures sitting on the fence outside the OB/GYN ward.) The hospital laundry is often hand-washed. There are 5 washing machines; 2 currently still work, 3 don't. They frequently run out of soap. It would obviously be more efficient, and more sanitary, to use a washing machine with very hot water to sanitize the hospital gowns and sheets. As mentioned above, the hospital desperately needs a Biomedical Engineering/Maintenance Department, as much of their relatively new donated equipment lies broken and unusable. These local people would likely benefit from training from volunteer Biomedical Engineers from the USA and Europe. However, in the end, the government would have to see to it that their salaries got paid, so that the hospital could continue to utilize their services on an everyday basis, when equipment breaks down. Money would need to be made available for supplies and parts to make these needed repairs as well.

- K. National Drug Repository: The National Drug Repository was damaged, with approximately \$250,000 worth of medications destroyed. The medications in most urgent need were: procaine penicillin, erythromycin tablets, Artan, iron tablets, aspirin, and diazepam.<sup>7</sup>
2. Biombo Medical Clinic<sup>8</sup>: The Biombo Medical clinic is a rural medical clinic which is church-sponsored and supported. Adults are charged 650 CFA (about \$1) per visit; children are charged 250 CFA. Most medications are included in the visit fee. Medications can be obtained from the government, but this is very unreliable. Instead, most medications are purchased from ECHO, which is much more reliable. The clinic is run by a nurse/midwife, who is paid by the government, and 6 lesser trained medical assistants, who are paid by the fees collected from patients, and by donations. (There is no physician present, and the nurse in this situation essentially functions as the physician in charge.) The clinic has one vehicle to serve as an ambulance for transports to Bissau for emergency cases, although this vehicle is not 4 wheel drive, and hence cannot travel well during the rainy season. The clinic serves a population of 20,000 people, from the surrounding 8 kilometers, and sees 25-30 patients per day (in the dry season) to 50-60 per day (in the rainy season). The clinic is available 24 hours per day for emergencies. There are 3 observation beds, which functionally act as hospital beds for cases of dehydration, infections requiring iv antibiotics, OB cases, and other cases where the decision has not yet been made to transfer the patient to Bissau. The clinic collects about \$1200 per month in fees, which it uses to buy supplies and pay its staff members salaries. After interviewing the staff members, the concerns/perceived needs were:
- A. Salaries: There was some concern that salaries had not been raised in several years.
  - B. Malnutrition of patients was seen as a problem, and the clinic was unable to provide enough food for these patients.
  - C. The clinic performs 4-5 deliveries a week. They feel that they could use more beds in the clinic beyond their 3 observation beds. They have no medications for pre-eclampsia. They have no Pitocin for post-partum hemorrhage. They would like clindamycin and doxycycline for post-partum infections. They also have no medicines or equipment for resuscitation of the mother or baby (ie, epinephrine, oxygen, ambu bags). There is concern that all emergency c-sections must be sent to Bissau, and that a second vehicle, with 4 wheel drive capacity for the rainy season, should be available for these emergency transports.
  - D. Lab: They have no microscope and no ability to do any simple lab tests. It would seem that a microscope, and hemacue centrifuge for measuring for anemia, and a glucometer for measuring blood glucose, would be relatively useful and simple lab equipment to have at this clinic.
  - E. Malaria is seen frequently. Medications occasionally run out for treating malaria.
  - F. They have no dental instruments, but frequently have patients needing dental care.

- G. They would like to have health cards, to record patient medical records on. They have a form they currently use, but need about 5000 copies of it.
- H. They could always use donations of medications, as their collections do not always cover their costs. (When patients are unable to pay for treatment, the clinic still agrees to see and treat the patients.) The medications they use the most are: for malaria: chloroquine oral tablets and quinine oral tablets, quinine pediatric suspension and injectable; for diarrhea: Oral Rehydration Solution packets and ciprofloxacin; for pneumonia: amoxicillin pediatric oral suspension and Bactrim pediatric oral suspension; for worms, mebendazole (chewable tabs); for STD s, penicillin injectable, procaine injectable, and metronidazole oral tabs. They need some anti-hypertensives for severe hypertension, to stabilize the patient before transfer to Bissau (hydralazine i.v. or Adalat 10mg and 20mg capsules).
- I. They have no autoclave, and currently re-sterilize their needles over an open flame.
- J. Supplies: they need gloves for sterile procedures, bandages, gauze, suture (esp. chromic 3.0), and dressings.
- K. They need a constant electrical supply to keep vaccines which need refrigeration from spoiling. This could be achieved by having a second, back-up generator, or from getting solar panels installed.
- L. They could use teaching materials about Oral Rehydration Solutions printed in Crioulo, or better still, as videos, with a TV and a VCR. Other videos, such as those teaching about breastfeeding, and HIV prevention, etc, could be made.
- M. They requested several flip-lid metal trash containers, with bags.
- N. They could use an adult scale.
- O. They could use 3 doctor gowns.

### 3. Profile of Diseases:

Guinea-Bissau has a profile of diseases typical of a pre-demographic, developing country. Most deaths occur in younger individuals, from infectious diseases. These are related mostly to malaria, malnutrition, measles, diarrhea and pneumonia.

- A. Malaria: There were an estimated 197, 454 visits to healthcare providers for suspected malaria in 1999.<sup>5,9</sup> (Thus roughly 1 in every 6 people in the country suffered a bout of malaria in 1999!) This represented 58% of all healthcare visits, and ranks as the most frequent, as well as the most serious, cause of morbidity and mortality in the country. There were 29,904 cases of malaria requiring hospitalization in children under 5 years old in 1999.<sup>5,9</sup> Most deaths from malaria occur due to cerebral malaria, which is much more common in children under age 2 and in pregnant women.
- B. Acute Respiratory Infections/Pneumonia: This accounted for 33, 764 visits to healthcare providers in 1999.<sup>5,9</sup> This is commonly caused by bacteria or by the measles virus. It is most often fatal when it is caused by measles, when it occurs in children under age 5, when it occurs in children who are chronically malnourished, and in the case of measles, when the children are Vitamin A deficient.
- C. Diarrhea: Cases of diarrhea accounted for 27, 824 visits to healthcare providers in 1999.<sup>5,9</sup> Diarrhea in Guinea-Bissau is most often caused by fecal-oral transmission of bacteria, viruses and parasites through contaminated drinking water. As with ARI, it is most often only serious in those under age 5, where, when coupled with malnutrition, it can be fatal. It is usually easily treatable with proper use of Oral Rehydration Solution. There are sporadic outbreaks of cholera in Guinea-Bissau, but most deaths due to diarrhea are actually due to common infections with E. Coli and rotavirus. Shigella is becoming a more common cause of death from diarrhea.
- D. STD s (excluding HIV): Gonorrhea, Chlamydia and other STD s accounted for 6,369 visits to healthcare providers in 1999<sup>5,9</sup>, the 4<sup>th</sup> most common reason to go to the clinic or hospital. While usually treatable, lesions from other STD s can enhance transmission of HIV through broken skin.
- E. HIV/AIDS: Guinea-Bissau is one of the few countries of the world which has a significant proportion of HIV-2 infection, with a prevalence of 13.5 %.<sup>10</sup> (HIV-2 is believed to have originated here.<sup>11</sup>) While HIV-2 is similar in many respects to HIV-1, it has a lower rate of infectivity, lower overall blood viral loads, and a much longer progression to the eventual immunosuppressive infections which define AIDS.<sup>12,13</sup> This fact should affect recommended HIV treatment and prevention strategies. While HIV-2 is also spread in Guinea-Bissau mostly by sexual intercourse and blood transfusions (similar to HIV-1), it is much less likely to be spread vertically from mother to child during childbirth or during subsequent breastfeeding.<sup>14</sup> Thus recommendations made for other countries which have an HIV-1 prevalence of 15-20%, such as empiric single dose antiviral treatment of all pregnant women during delivery, or discouragement of breastfeeding in high risk women, do not apply at this time to the women of

- Guinea-Bissau. Unfortunately, the early reports (and rumors) that perhaps HIV-2 infection would confer immunity against HIV-1 infection have not borne out to be true.<sup>15,16</sup> While the prevalence of HIV-2 has remained constant over the last 5 years, the prevalence of HIV-1 is rising, and is currently at 2.1%.<sup>10</sup> While not at crisis levels yet (as it is in some other African countries), public health measures aimed at prevention of transmission should obviously be encouraged.
- F. Immunization Coverage: Immunization levels are unacceptably low for many preventable childhood diseases. The WHO Expanded Program on Immunizations (EPI program) was interrupted during the civil war, but has since been restarted. UNICEF statistics report 1 year old immunization rates as follows: BCG 74%, DPT 3 shots 38%, polio 3 doses 42%, measles 70%.<sup>3</sup> Many vaccines unfortunately need constant refrigeration until they are administered, making distribution and storage in rural areas difficult at times.
- G. Malnutrition: 20% of infants are born as low birth weight infants. There is a 23% rate of children under five with moderate to severe malnutrition, and a 5% rate of severe malnutrition. 28% of the children show moderate to severe stunting from chronic malnutrition.<sup>3</sup>
- H. Maternal mortality: Maternal mortality is relatively high, at 0.9%-1.0% per child (910/100,000 births).<sup>3</sup> Given that the average number of children a woman will have is six, 1 in 17 women will die during childbirth. This high mortality is due to a variety of causes, including lack of prenatal care and lack of medications to treat pre-eclampsia, post-partum infections and post-partum hemorrhages. There is an increased incidence of obstructed labor in Fula and Mandingo women, perhaps due to their pelvic proportions. In rural areas, transport of these women to a health facility where an emergency cesarean section can be performed can be difficult, especially during the rainy season. Additionally, most women chose not to go to a health facility to deliver their children (only 15% of births are attended by a physician, nurse or midwife).<sup>5,9</sup> There are multiple causes for this, related overall to a lack of trust in the health care facilities, coupled with chronic shortages in medications and supplies, as well as sometimes unsanitary conditions.<sup>17</sup> This is similar to elsewhere in Africa.<sup>18</sup> Clearly, any attempt to decrease the maternal mortality will need to first improve the utilization of the existing healthcare facilities for childbirth.

#### 4. Recommendations for Healthcare Interventions:

Any recommendations for healthcare interventions must take into account the available resources, the likelihood that the interventions will be sustainable, and the likelihood that the interventions will have the desired effect (and not the opposite effect, as sometimes occurs even with well-intentioned public health interventions). In addition, given that resources are often very limited, choices made in support of one intervention are necessarily made at the expense of others. Difficult decisions become necessary, as to which of many human tragedies one wants to target initially, and which can wait, and how much of the overall health care budget should be spent on any specific group of individuals. These choices are especially difficult in Africa where health care is generally less available in rural areas, and yet most of the taxable income and economic prosperity of a country is centered in the urban regions. Hence most of the health care budget is raised from the urban areas. Thus, much political pressure is often wielded to direct resources towards the health care issues of the urban population, while the overall greatest number of deaths occur in people living in rural areas, where malnutrition and lack of safe drinking water and inadequate health care are more prevalent issues. Additionally, in developing regions such as Guinea-Bissau, the majority of preventable deaths occur in children under age 5, a population which has no political voice whatsoever. Thus, without any attempt to rank the importance of these interventions, the following is a list of common medical problems in Guinea-Bissau, and potential interventions for those problems.

1. Malaria: Malaria accounts for about 58% of all health care visits.<sup>5,9</sup> Insecticide-impregnated bednets (available at low cost from Thailand) are among the most effective prevention methods for malaria in Guinea Bissau. (The species of *Anopheles* mosquito responsible for malaria transmission in Guinea-Bissau bites late at night, when most people are sleeping, and hence bednets would be a good option for Guinea-Bissau.) In 1999, UNICEF supported the National Program on Malaria with 40,000 bednets, which the ICRC distributed. The best bednets are impregnated with insecticides, and do not require frequent re-treating to be effective. Untreated bednets are much less effective, and older styles of nets required frequent re-treatment, which often did not occur. Bednets are best utilized by all ages in hypoendemic and mesoendemic areas (where malarial transmission rates are relatively lower), but only by pregnant women and children in holoendemic and hyperendemic regions (where malaria rates are so high that most adults have a fair degree of protective immunity, which ironically would be lost by having long periods of protection by bednets). As most cases of cerebral malaria occur in children less than 5, and in pregnant women (who are relatively immunocompromised in the pregnant state), bednets would be best targeted at these groups in all areas. Unfortunately, in many regions the men in the home feel that they need to protect themselves from getting malaria in order to be able to work, and so they often use the family's only bednet for themselves. Also, at times people will refuse to sleep under bednets because it is hotter. Clearly, in some areas education regarding the link between malaria and mosquito bites will need to be emphasized if successful bednet usage is to be initiated. Overall,

- bednets are a good healthcare investment to decrease long-term morbidity and mortality from malaria. The UNICEF program charges a small fee for each net, in order to generate a revolving fund of money with which to purchase more bednets. Potential donors in Guinea Bissau should contact UNICEF to buy bednets through this program, and have them distributed by ICRC.
2. Acute respiratory infections/pneumonia: Accounting for about 10% of all healthcare visits,<sup>5,9</sup> pneumonia can only be prevented in cases which involve measles, and in these cases by enhancing measles immunization rates. (There were 498 reported cases of measles in 1997.<sup>4</sup>) Complications from measles in general can be decreased by Vitamin A supplementation (about 77% of children in Guinea Bissau currently receive Vitamin A supplementation.) For other causes of pneumonia, curative care depends on the patient's ability to get to a healthcare facility, and on that facility's ability to provide appropriate antibiotics (and/or on the patient's ability to buy them). Donor programs which lead to increased measles vaccination rates, enhanced Vitamin A supplementation, or permanently increased levels of antibiotics being available for treatment of pneumonia, would all be useful.
  3. Diarrhea: Accounting for 8% of all healthcare visits in 1999,<sup>5,9</sup> diarrhea is usually due to fecal contamination of drinking water. In Bissau, many people use public water pumps at street corners, fill containers, and take these containers home for consumption later. In rural areas, most people drink from shallow, unprotected open wells. This water is also often collected in containers and brought into the home for usage. In both instances the water may be contaminated at the source, but is often fairly clean there, and becomes contaminated at home while waiting to be consumed. The long-term solution is of course to provide every house with chlorinated, piped drinking water as occurs in more developed countries, but given the current level of economic development of Guinea Bissau, this will not occur anytime soon. Hence, a good temporary solution would be home usage of chlorine or iodine tablets for sterilization of the water containers while in the house. Unfortunately, this changes the taste of the water, and is unacceptable to many people, who may not necessarily understand the connection between contaminated drinking water and the diarrhea they get 3 days later. Education is imperative to increase usage of chlorine or iodine tablets. Attempts to drill more deep water wells in rural areas have met with only limited success in the past because these pumps often broke down, and were never repaired. Prior to drilling any more wells now, a Village Pump Committee should be formed, to be responsible for maintaining and repairing the well as needed. Also, certain wells, such as those used in Zimbabwe currently, have a better maintenance history, and are easier to repair. While providing safe drinking water can be a difficult long-term program, it should be remembered that most cases of diarrhea can be successfully treated by Oral Rehydration Solution (ORS) at home. Mothers should be given more packets of ORS, and instructed in proper preparation and usage. They should also be educated on the signs of dehydration, as well as the need for antibiotics if the diarrhea is bloody or the child has a fever. In countries where ORS has become more widespread, deaths from diarrhea are becoming limited only to those cases which involve shigella (bloody diarrhea). Effective

(and relatively inexpensive) donor programs for diarrhea should attempt to distribute more ORS packets to mothers at home (without requiring them to come to a health center to obtain the ORS), thus increasing the usage of this safe and life-saving remedy for dehydration. This program should be coupled with an educational program on the causes of diarrhea (emphasizing hand-washing after defecation, keeping all hands out of the family's water containers, and perhaps even chlorinating the water containers at home at least weekly), as well as information about properly mixing and using the ORS packets (the solution must be used within 24 hours of mixing). As well, education should be directed at when to visit your healthcare center (for any bloody diarrhea, for any fevers associated with the diarrhea, or for physical signs of dehydration, such as tenting skin, dry mucous membranes, lethargy, and absent urination). Given that only 21% of adult females are literate in Guinea Bissau, these educational materials would need to be pictorial. Any written or spoken messages (such as videotapes to be viewed at the clinic or during field visits) should be in Crioulo and not Portuguese, as most patients understand this much more clearly. Chlorine or iodine tablets to purify the water supply at home can have some dangers associated if not mixed properly, but could possibly represent a viable solution if the family could reliably be taught to mix it properly. However, a simpler program would be to increase home usage of ORS through education and large-scale distribution of ORS packets directly to households.

4. Sexually Transmitted Diseases (STD s) and AIDS: STD s accounted for about 5% of adult consultations to health clinics in 1999.<sup>5,9</sup> Programs aimed at behavior modification are theoretically the best solution to prevent STD and AIDS transmission. Unfortunately, it is often very difficult (and usually unsuccessful) to attempt to change human behavior. As with other diseases in Guinea Bissau there are often shortages of medications for effective treatment of STD s, which usually involves cheap medications such as penicillin and doxycycline. In patient populations with very high STD prevalence (such as prostitutes) or in very high prevalence villages (>10%), it has been suggested in other African countries that mass treatment of all reproductive age patients with antibiotics may have benefit, because of a large percentage of asymptomatic carriers of STD s. This would only be useful in very high prevalence populations, and would not be recommended as a whole for Guinea Bissau. In terms of HIV, Guinea Bissau's current situation is unique within Africa, in that most of the HIV present is HIV-2 (prevalence 13.5%), which is a somewhat less infectious and less virulent virus than HIV-1. Complications do eventually develop in most patients, although usually after a latency of greater than 10 years. Unfortunately, the HIV-1 prevalence is also increasing (currently 2.1%). Treatment of infections related to the immunocompromised state is essentially the same for both viruses, and antiviral therapy is also the same. Treatment for the less virulent HIV-2 could conceivably be more effective than for HIV-1. Unfortunately, antiviral therapy with triple drug cocktails, as is the standard in Westernized countries, is still far too expensive for widespread use in Guinea Bissau. As well, temporary and inconsistent therapy with antiviral medications should be discouraged, as this will eventually lead to increased drug resistance, which could then spread worldwide.

- In general, unless consistent long-term therapy can be relatively guaranteed for HIV patients, antiviral therapy should not be started.** Similar to treatment for tuberculosis, incomplete treatment of HIV breeds resistance, and from a public health standpoint, is much worse than no treatment whatsoever. Hence, at this point, interventions for HIV-1 and HIV-2 in Guinea Bissau should be primarily aimed at education regarding prevention of spread. Efforts to institute antiviral therapy must await the availability of cheap generic antiviral medications, and potentially an HIV vaccine, neither of which at this point are currently available.
5. Measles, polio, diphtheria and preventable childhood illnesses: Immunization coverage for these preventable childhood illnesses is still unacceptably low. Improved coverage depends on repeat immunization campaigns into rural areas, and on improvement of basic health services/clinics in rural areas. Immunization programs require much advance preparation and coordination, involving coordination of volunteers, recruitment of eligible children to be vaccinated, and coordination of the cold chain of refrigeration for the vaccines. The WHO Expanded Program on Immunizations is active in improving vaccinations within Guinea Bissau, and all efforts to support improvements in vaccinations should be made through their offices.
  6. Malnutrition: Management of malnutrition in a setting of inadequate resources involves identification of high-risk populations, such as children of single parent households, children who are hospitalized or ill from concurrent infections, and areas where food security has suddenly become an issue. Routine screening by measuring arm circumferences, or calculating weight-for-height, can help identify under-nutrition in children before actual malnutrition sets in. Mobile screening can help identify entire villages and regions which are beginning to suffer early signs of malnutrition after a regional disaster, such as a flood or a crop failure. Screening can help determine which villages need interventions and which do not, thus helping to direct finite resources to where they are needed most. Because malnutrition ultimately leads to much higher mortality rates for childhood illnesses, it should be thought of as a disease itself, and treated as such. Hence, funds should be directed at improving malnutrition screening at clinics, and enhancing the resources of the clinics and the hospital to provide food to their malnourished patients.
  7. Maternal Mortality: At nearly 1%, maternal mortality is extremely high in Guinea Bissau. Most women who die from childbirth die from post-partum infections, post-partum hemorrhage, eclampsia or obstructed labor. Unfortunately, only 15% of women have a birth supervised by a medically trained attendant (doctor, nurse or midwife). The reasons for this are diverse, but appear partly to reflect a lack of trust in the medical system, partly justified by chronic shortages in medications needed to treat the above conditions. No improvements in maternal mortality can be expected until a higher percentage of woman receive prenatal care and have births supervised by a trained attendant, who can identify and treat each of the 4 major determinants of maternal mortality. Hence, programs aimed at decreasing maternal mortality should work at educating women for the need to have a trained birth attendant at their birth. Additionally, efforts should be made to increase the availability of medications at the rural health clinics, including pitocin (for post-

partum hemorrhage), clindamycin and doxycycline (for post-partum infections), and magnesium and hydralazine (for treatment of eclampsia). Management of obstructed labor is more difficult, and would require transport (in any weather) to a facility which can perform an emergency c-section.

## 5. Sustainability Assessment: Sustainable Health Interventions for Guinea Bissau

As mentioned previously, many of the health deficiencies existing in Guinea Bissau pre-date the recent conflict, and really relate to inadequate economic resources and a failure of the current health care delivery system to efficiently distribute the resources which are present. The health problems of Guinea Bissau are not unique, and are similar to problems seen throughout the developing world.<sup>19</sup> Unfortunately, the current health budget of Guinea Bissau (and the overall economy is general) is extremely dependant on foreign aid. While temporarily limiting excess morbidity and mortality, this foreign aid often does not build local capacity to supply the needs of Guinea Bissau in the future, and may in fact stifle the development of local capacity and create an unsustainable level of medical care. For political reasons Guinea Bissau has, in its history, been courted by various international interests, ranging from the communist eastern bloc countries, to Cuba, to Portugal, Brazil, China, Taiwan, the United States and others. Many made temporary donations of modern equipment and facilities (such as building a relatively modern hospital in 1980) without providing the means to update or upkeep these relatively expensive health facilities. Ideally, Guinea Bissau should have the most modern health care system that its economy can support, but it is unclear exactly what that level is which it could support. Guinea Bissau also has a legacy of socialized medicine, which while nobly attempting to provide free health care for all can, in very poor countries, actually only deliver a very meager level of health care. For a government to be able to provide a high level of health care for its people, free of any charges to them, that government would need to have a very high level of revenue from some source, such as oil income or taxes. In countries where the average income is less than \$250, the government is unlikely to have the resources to provide a high level of health care free of charge. Other health care providers, such as private pharmacies, private clinics and traditional medicine providers will fill the void, with patients seeking their services instead of the free government services. Thus, in a very poor economy such as Guinea Bissau, free government healthcare essentially amounts to a de-facto fee for service system, whereby patients need to buy essential medications themselves anyway, and often seek private care if they can afford it. Expenditures on these services and medicines represent private resources which are being inefficiently spent on healthcare. Unfortunately, these services also often duplicate some of the government services, essentially wasting government resources. Additionally, these health care facilities are usually not regulated by the government, and may, or may not, provide adequately safe and appropriate levels of health care. Patients going directly to a private pharmacy to buy a medicine for their illness will likely be sold a medication, regardless of whether it is the right medicine, or whether any medicine is needed at all. This medicine will often be much more expensive than if the government provided it through

bulk purchases. (For example, a course of quinine tablets for malaria could cost up to US\$10 in a private pharmacy in Bissau.) In an ideal system, expenditures by those patients who can afford to pay for their health care should somehow be collected by the government to help provide for those patients who cannot pay for their care. Under the current healthcare system in Guinea Bissau this does not occur. Additionally, in a country where there are very limited resources, additional methods need to be employed to attempt to create additional revenue for the healthcare system (such as small co-payments for bednets, office visits and medicines.)

There are a number of potential health care reforms which could be attempted in Guinea Bissau. Other African nations have moved towards decentralization of health care services, privatization and introduction of health care user fees.<sup>20,21</sup> Unfortunately, because there is a previous expectation that all government health care should be free of charge, it may be difficult to introduce small co-payments, or any payments, even for those who can afford it. Potentially different reforms may be needed for urban areas, such as Bissau, than for rural areas. In general, whichever reforms are enacted should aim to address the following problems, which are not unique to Guinea Bissau, but have been reported in other Sub-saharan African countries as well:<sup>22,23,24</sup>

1. Low overall resources for the government healthcare budget:
  - A) Lack of funds means low government salaries for doctors, nurses and midwives. Thus nearly all of the doctors in the hospital in Bissau also work in private clinics, usually leaving the hospital by 2pm. Private clinics, supported by funds from private patients, are often much better equipped than the hospital itself.
  - B) Patients usually have to pay for medicines entirely on their own. There may be no real safety net for patients who truly cannot afford medications which may be life-saving.
  - C) Nurses and staff in rural government clinics often have low morale, related to low salaries, lack of medications to treat patients, lack of supervision, lack of incentives and general frustration over their inability to address these problems.
  - D) Because of deficiencies in government services, wealthier patients chose to use private clinics, which are entirely out of the government's control. The care in these clinics may be good, or may not be, but in any event is not subject to any government regulation. The government also does not benefit from the resources spent by these wealthier patients at these private clinics.
2. Low wages for highly trained individuals, such as physicians (and other government professionals) encourages many to emigrate to countries where they can make higher wages (ie, a brain drain).
3. Most people are unwilling to pay anything for healthcare (unless they are sick).
4. Ideally, the burden of healthcare costs should be spread over all of the people in a society (the well and the sick), rather just upon those who are sick. (An example of this would be mandatory health insurance.) This allows for a greater base for collecting funds. However, while people are willing to pay for health care when they are sick, few people are willing to pay for preventative services when they

are well. (Human nature dictates that most people never believe they will ever get sick.)

5. Any changes which one attempts to implement must take into account the major stakeholders who will be affected by the changes, with an effort to avoiding opposition as much as possible. Hence, the introduction of fees for government services is likely to be unpopular with the general population, who are accustomed to receiving care for free. This then is likely to be unpopular politically. The abolition of private clinics is likely to be opposed by the physicians who profit from them. The abolition of private pharmacies would be opposed by those who own them.

The following are recommendations for potential health care reforms that may be more sustainable than the current system:

A) In Urban Areas:

Because private clinics are already an important part of the health care system in Bissau, an attempt should be made to build upon them, but also to regulate them. The government could potentially require them to be licensed by the government. The license could require that clinics follow certain protocols for evaluation and treatment of patients. In exchange, the government could offer to help finance these clinics, by providing low cost (or free) medications, and equipment (but not salaries). Salaries would be, as they are now, derived directly from productivity on a fee-for-service basis. Clinic staff would be paid, as they are now, by the physicians out of profits from the clinic. The clinic would be allowed to set its own fees (as they do now). Thus the day-to-day management of the clinic will be left to those who run the clinic, maximizing efficiency. In exchange for the government support of subsidized medications, which would allow the clinics to be more profitable, the physicians would have to provide a certain amount of charity care to patients who could not afford care, at the Simon Mendes hospital. This could be done through service at the hospital for one day a week, or for part of each day, as is often done now. There would be no salary for this work at the government hospital. (This would free the government from having to pay these physicians salaries, which they are now paying. In urban areas such as Bissau, government salaries only account for approximately 10% of these physicians overall incomes, with the rest coming from their private practices.) Participation in the program would instead be re-paid by financial assistance to the physicians in the form of low cost medications and equipment for their private clinics. Patients could choose the free government hospital services, or the private clinics, where they would have to pay for care. This system attempts to build on the situation which already exists at the current time in Bissau, without making any major changes. The benefits of the system are that patients could still enjoy free government services if they wish. However, those who could afford to pay for services would likely seek care at a private clinic, which has a shorter waiting time and nicer facilities. Because these clinics would now be regulated by the government, the government could ask for records to be kept on patient visits, patient charges, medications given, etc. Care at these facilities could be more easily scrutinized, and taxes could be levied on successful private clinics, with the proceeds going to help pay for the care at the Simon Mendes hospital.

The government would also save resources by not having to pay the physicians' salaries at the hospital. These extra resources should go towards purchasing low cost medications from the National Formulary to be given to patients at the hospital, and to physicians for distribution in their offices.

Under the current system the government pays for salaries, but often can't pay for medications, which then must be purchased at private pharmacies, often at inflated prices. The government of Guinea Bissau should work towards privatization as much as possible, and should try to limit as much as possible the amount it spends for salaries. Instead, wherever possible, medical personnel should be supported by the patients they treat. This increases the accountability of the medical personnel to their patients, improving medical staff performance, attitude, efficiency and morale. Instead of paying salaries the government should spend the bulk of its healthcare budget on procuring large quantities of low cost generic medications, which it could supply to clinics in order to allow them to see patients. Physicians would likely support the program if it allowed them to profit more in their private practices, by providing them with equipment and subsidized medications to distribute to their patients. The government would benefit because they would not have to provide salaries to the physicians for their work at the hospital, and they could gain some control over the care given at private clinics. The government could concentrate its efforts on the procurement of low cost medicines in large volumes, which in turn would increase utilization of the hospital. Patients would benefit if the program allowed more medications to be distributed to more patients, at lower costs. The only significant interest who would lose income would be the private pharmacies. Thus the private pharmacies would likely oppose this program, as it would steer patients away from them, because the patients would now be able to get their medications at the hospital or from their doctors in the private offices. However, they would still be able to sell non-formulary medications which are not covered under the program to wealthier patients. These pharmacies should also be regulated, and not be allowed to sell medications without a prescription from a physician or nurse. While these changes may be vehemently opposed by the interests who run these pharmacies, overall they would lead to a decrease in wasted resources spent on expensive medications which may not necessarily be needed to treat a particular illness.

#### B) In Rural Areas:

In rural areas there are several different variables which make provision of health care more difficult. Patients tend to be more spread out, making it harder to centralize services in a single facility. As compared to Bissau, patients are also relatively more poverty-stricken, and are less likely to be able to buy their own medications or pay for their own health care. Private practice is less common, and government salaries account for about 55% of these physicians' overall salaries. Because of these unique aspects of rural health care, there exists a need to have care given by physician extenders, such as nurses or rural health workers. Guinea Bissau currently has 168 physicians, for roughly 1,360,827 people (ratio 1 physician for every 8100 people). Approximately half of these physicians live in the capital Bissau, which has a population of roughly 233,000. Thus in rural areas there is a physician ratio of 1:13,426. If Guinea Bissau were to equal the United States ratio of 1:435, they would need to have 3128 physicians! Given that the medical school only graduates 40 physicians a year, it would take roughly 74 years to reach this number

(assuming the population stayed constant, which it obviously would not.) Additionally, the economy of Guinea Bissau could not support this number of physicians, who would emigrate to countries where they could make a better income. Hence a better solution for Guinea Bissau, especially for its rural regions, is not to train more physicians, but rather to train advanced nurse/midwives, who could perform many of the functions of a midwife and a physician (as at the Biombo Clinic described above). These individuals should undergo training which involves knowledge about midwifery, as well as basic childhood illnesses (the WHO's Integrated Management of Childhood Illnesses, or IMCI program, is a good template<sup>25</sup>), and general treatment aspects of common adult diseases such as malaria, STDs and pneumonia. In addition, other lesser-trained Rural Health Workers (RHWs) could be trained for more remote regions. Their training would be less rigorous, mainly involving use of ORS, treatment of malaria and pneumonia, screening for malnutrition and recognition of serious illnesses in need of transport to a clinic or hospital. Preferably, these advanced nurse/midwives and RHWs should be chosen by the government from rural villages, so that they would be more willing to return there to live. Following the model of other experimental village health worker programs in Africa<sup>21</sup>, these people would best be female volunteers from the villages, who would be willing to work for little or no salary (in other programs, women have proved to be more willing to participate, because of a lessened need to provide an income for the family). The village should be willing to support these individuals, through monetary donations or gifts-in-kind, in exchange for their services. (In some instances the village may not know that the volunteer receives no salary, and they may need to be told that it is their responsibility to support these individuals.) In instances where the community can afford it, the advanced nurse/midwife should be allowed to charge fees, in order to support themselves and pay for the expenses of the clinic, such as assistants and medications. (The Biombo clinic described above represents a good example of a nearly self-sustaining clinic similar to what should be duplicated throughout rural Guinea Bissau.) As in urban areas, the government should dedicate most of its budget not to salaries, but to procuring large quantities of low cost medications to provide to the clinics for treatment of their patients. The government should supply these medications at very low cost (or free) to the clinics. The key to keeping these clinics running successfully will be the government's ability to reliably provide a continuous supply of medications. Given past problems with the reliability of the government's supply of medicines, villages may want to try to raise funds independently to pay for their own monthly/yearly supplies of medicines through a form of mandatory village health insurance. (In very authoritative Fula villages, for example, a solution such as this might work well.) A small co-pay for health clinic visits could also be instituted, which could be waived for individuals known to the staff to be too destitute to pay anything. (One advantage of rural medical care is that the staff is much more likely to personally know the financial assets of their patients.) Although the government should train these nurse/midwives and RHWs, if possible salary support for them is best left up to the local villages, or should come from fees they charge for their services. Thus the government should not have to be financially responsible for these salaries, and should instead have more finances left to procure large quantities of low cost medications. Again, instead of providing salaries (which are low anyway), and not supplying the clinics with medications (which makes patients less willing to visit the clinics), the government should concentrate on supplying the medical personnel with

medications, and allowing them to charge the patients for their medications and visit, in order to pay their salaries. This would motivate the medical personnel to be as efficient as possible in dealing with their patients, and it would also motivate the patients to utilize the government services, because medicines would be available there.

## Appendix A: Principle Persons Met

### Summary of Meetings

Monday 3/6/00:

1. 11:00 am. Dr. Francisco Dias, Director of Public Health, Guinea Bissau.  
Present: Brandau Gomes Co, MD, former Minister of Health, Guinea Bissau  
Michael Blondino, Director, LEAD Ministries  
Julian Lis, MD; Fellow, Center for International Emergency Medicine  
Studies, Johns Hopkins Hospital  
Re: Needs of the Health Sector; war damages; current aid efforts of other groups;  
5 Year National Health Plan

Outcome: Dr. Dias would of course like any health related aid to be coordinated with the goals and efforts of the 5 Year Health Plan. He will provide a copy of this Health Plan, as well as a list of NGO s currently working in Guinea Bissau, and their areas of focus. Needs mentioned included repairs to Simon Mendes Hospital, which was heavily damaged.

2. 12:30 am. Dr. Candida, Director of Pharmaceutical Services, Guinea Bissau.  
Present: Brandau Gomes Co, MD, former Minister of Health, Guinea Bissau  
Julian Lis, MD; Fellow, Center for International Emergency Medicine  
Studies, Johns Hopkins Hospital  
Re: Pharmacy Needs, damage to Central Drug repository, specific medication needs.

Outcome: She will provide a list of essential drugs, with most pressing needs emphasized.

Tuesday 3/7/00:

1. 10:00 am. Dr. Alfredo Alves, Director, Simon Mendes Hospital.  
Present: Brandau Gomes Co, MD, former Minister of Health, Guinea Bissau  
Michael Blondino, Director, LEAD Ministries  
Julian Lis, MD; Fellow, Center for International Emergency  
Medicine Studies, Johns Hopkins Hospital  
Re: Specific needs of Simon Mendes Hospital.

Outcome: Will accompany team on a ward-by-ward inspection on needs.

2. 11:00 am. Dr. Amebelia Rodrigues, National Epidemiologist, Guinea Bissau.  
Present: Brandau Gomes Co, MD, former Minister of Health, Guinea Bissau  
Julian Lis, MD; Fellow, Center for International Emergency  
Medicine Studies, Johns Hopkins Hospital

Re: Most recent statistics on infant mortality, maternal mortality, AIDS; most effective/needed public health interventions at this time; National Malaria Program.

Outcome: She will provide current lists of health indicators. Malaria, diarrhea and high maternal mortality appear to be the greatest public health needs. Bed nets, home distribution to promote use of ORS, and increasing maternal utilization of clinic services for delivery (along with training additional midwives) are the most needed interventions.

3. 12:00 PM, noon. Dr. Peter Aaby, Director-Bandim Health Project (a 20 year cohort study investigating health interventions in Guinea Bissau).

Present: Brandau Gomes Co, MD, former Minister of Health, Guinea Bissau  
Julian Lis, MD; Fellow, Center for International Emergency  
Medicine Studies, Johns Hopkins Hospital

Re: Effect of health interventions in past; reasons for failures/successes; most appropriate future interventions. (Received a copy of abstracts of health intervention studies done by him and his colleagues in Guinea Bissau since 1983. Approximately 239 studies in all! 39 studies published in 1999!)

Outcome: Clearly, any proposed health intervention attempted in Guinea Bissau could benefit by collaborating with Dr. Aaby and his colleagues, as he has years of experience working here. In his opinion, he agrees that malaria and infantile diarrhea are among Guinea Bissau's most pressing immediate needs. He also feels that a long term problem which needs to be addressed is apathy among the health workers, leading to lessened utilization of the health care services.

Wednesday, 3/8/00:

12:00 Noon. Visited Biombo Medical Clinic. Toured facility. Looked at specific equipment and medication needs.

Present: Brandau Gomes Co, MD, former Minister of Health, Guinea Bissau  
Michael Blondino, Director, LEAD Ministries  
Julian Lis, MD; Fellow, Center for International Emergency  
Medicine Studies, Johns Hopkins Hospital  
Other members of LEAD Ministries Guinea-Bissau Team

Re: Specific needs, types of diseases treated, suggestions for the clinic

Outcome: List of needs developed

Thursday, 3/9/00:

10:00 am. Ward by ward assessment of needs of Simon Mendes Hospital, with Anselmo Diaz (Hospital Administrator).

Present: Brandau Gomes Co, MD, former Minister of Health, Guinea Bissau  
Michael Blondino, Director, LEAD Ministries  
Julian Lis, MD; Fellow, Center for International Emergency  
Medicine Studies, Johns Hopkins Hospital  
Other members of LEAD Ministries Guinea-Bissau Team

Re: Specific Needs

Outcome: Ward by ward lists of needs generated

Friday, 3/10/00:

9:00 am. Meeting with Camilo Simones Pereira, MD, Director of National School of Health

Present: Brandau Gomes Co, MD, former Minister of Health, Guinea Bissau  
Michael Blondino, Director, LEAD Ministries  
Julian Lis, MD; Fellow, Center for International Emergency  
Medicine Studies, Johns Hopkins Hospital  
Dr. Alfredo Alves, Director Simon Mendes Hospital

Re: Presentation of Medical Textbooks; pledge of support of medical education.

Outcome: Possible future collaborations for medical training programs discussed.

10:00 am. Meeting with Eng. Antonio Bamba, Minister of Health, Guinea Bissau

Present: Brandau Gomes Co, MD, former Minister of Health, Guinea Bissau  
Michael Blondino, Director, LEAD Ministries  
Julian Lis, MD; Fellow, Center for International Emergency  
Medicine Studies, Johns Hopkins Hospital

Re: Appropriate health interventions in Guinea Bissau. Approval for health interventions in Guinea Bissau.

Outcome: Any humanitarian assistance welcomed. The Minister was glad to see that Dr. Brandau was involved, and felt re-assured that any potential assistance would be appropriate. He welcomed our efforts, and pledged his support.

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