9. Cholera in Central America

Central America has a current population of over 30 million inhabitants, of which more than one-third live in rural areas of the various countries. The percent of people served by water and sanitation services varies greatly. For example, the countries of Costa Rica, Panama, Belize and Honduras offer 84, 73, 53 and 51% water coverage to people in rural areas, respectively. In contrast, Guatemala, El Salvador, and Nicaragua provide only 43, 19 and 18% water coverage to people in rural areas. These are also the countries with the most persistent problems of cholera and mortality due to diarrheal diseases. Estimating the population to increase to 37 million by the year 2000, and assuming the same investment in water and sanitation infrastructure, 14 million Central Americans will not have access to potable water, and 12 million will lack basic sanitation.

The low coverage of these basic necessities has without doubt been a major factor in the high indices of infant morbidity and mortality due to waterborne diseases. This is exacerbated by the lack of inter-institutional coordination which have specific, concrete plans to improve conditions in the near future. The countries have made some effort to improve coordination and execution of water and sanitation projects, with the formation of institutions such as “Social Investment Funds”, and “Social Development Funds”, which decentralize funds to the local level, yet a basic plan of coordination needs to be established to eliminate duplication of efforts by different sectors and to maximize utilization of resources.

9.1 Guatemala: Establishing a Water Quality Surveillance Program

The Republic of Guatemala has a population of approximately 10.3 million people. Two-thirds of the population live in rural areas, the majority in dispersed towns of less than 500 inhabitants. Serious social and economic problems exist in the country, with 55% of the population living in extreme poverty, 49% illiteracy, and 46% of the rural population with difficult access to health services. Of the ten primary causes of mortality, 50% are related to water and sanitation. The infant mortality is one of the highest in the region (48.3/1,000 births)- 30% of which is caused by diarrheal disease. Guatemala continues to have a serious problem with cholera.

According to information received from the literature review prepared by Guatemala, the major foci of cholera prevention in the country were: 1) improved laboratory diagnostic capabilities for cholera and other diarrheal diseases, 2) the purchasing and distribution of
clinical supplies, 3) reduction in mortality due to cholera, 4) training of local groups for promotion of cholera education, and 5) improvement of basic sanitation in priority locations. Weaknesses which prevented the realization of these plans included: i) poor surveillance of cholera and other diarrheal diseases, ii) centralization of decision-making, iii) actions implemented without follow-up, and iv) lack of adequate funding. Despite these difficulties, several projects aimed at the prevention of cholera and other enteric diseases have demonstrated the potential impact of the improvement of water quality on these diseases. One example is the Guatemalan Water Surveillance Program (PROVISAGUA), which targets the monitoring of water quality at the community level. PROVISAGUA recovers data, processes the data into indicators, and channels the analysis of this information into concrete interventions. This program is supported by PAHO and by the Swedish Agency of International Development. A pilot project has been implemented in "Region VI" of Guatemala, with promising results. When indicators were measured for microbiological water quality, continuity, quantity, and coverage, the areas with samples indicating poor water quality (>0 coliforms/100 ml) had a strong association with elevated incidence of both cholera and diarrheal diseases. Levels which were 2-5 times the national average! This information is then used to prioritize high-risk areas, and a) train local residents to act as sanitary inspectors and technicians to monitor water and make minor repairs in equipment, and b) distribute revolving funds for more substantial infrastructure improvements.

9.2 Household Disinfection and Community Mobilization

Another project which deserves mention is the household disinfection and community mobilization project in Escuintla, Guatemala (Moran and Gonzalez, 1996). The intervention is identical to that which was described previously in Bolivia. Although this project did not include an on-going analysis of water quality in stored water both before and after the intervention was implemented, it offers various insights as to the successful implementation of such a project. One of the primary objectives of this project was to promote community mobilization and the sustainability of the system. This was accomplished by the training of over 60 community members concerning cholera prevention, operation and maintenance of the disinfection equipment, and the training of a community cooperative which manages the production, distribution, and financial sustainability of the project. In total, a population of over 3,000 people benefitted from the project. Schoolteachers were also involved, with the agreement to leave containers and disinfectant for all schools in the area. The communities themselves were organized into the following committees: 1) technical, for decision-making and planning; 2) executive, for operation and maintenance of the disinfection equipment; 3) distribution, for the packaging and distribution of the disinfectant; 4) administrative, for the management of recovering finances and buying necessary items; 5) supervision, to collect epidemiological information related to waterborne diseases and to make household visits to
check chlorine concentrations, and 6) education, to promote better hygiene and prevention strategies in the community. To measure the impact of this intervention on the prevalence of diarrheal diseases, a comparison will be made based on health records from the local hospital and primary health care centers from May-December, 1994, and the same months in 1996. An analysis of the comparative costs for the disinfection of water per person/year were calculated for the on-site production of sodium hypochlorite (used in this study) and for other alternatives (chlorine gas, calcium hypochlorite, and commercial bleach). The costs for on-site production were lower than any alternative, without factoring in the extra savings in transportation. The estimated cost in this study was US$ 1.14 per family/year for the disinfectant, and US$ 5.85 per family/year for the containers, making it possible for a family to have safe water at a cost of only US$ 7.00 per year.

9.3 Improving Water and Hygiene of Street Vendors

Finally, the CDC, in collaboration with PAHO, has launched a pilot project to evaluate an intervention targeted at the improvement of water quality and hygiene of street vendors selling beverages (Mahon and Sobel, 1996). The intervention consists of a system for on-site water disinfection, storage, and handwashing (through soap attached to a plastic water container). The pilot phase consisted of testing the acceptance and appropriateness of the system, and in determining the practices of the street vendors concerning beverage preparation, storage, and handling. Samples of the beverage, wash water, vendor’s hands, and ice were analyzed for levels of bacterial contamination. The results of the pilot study showed that although the source water used for the preparation of beverages was relatively clean and had acceptable levels of free chlorine (>0.5 mg/L), contamination occurred in the handling of the water and by adding ice and other ingredients. Handwashing and using soap was not popular among street vendors, as samples of handwashes continued to exhibit high levels of fecal coliforms. However, an interesting secondary benefit of the study was the use of the soap and disinfected water by customers. Based on the lessons learned from this pilot study, a modified controlled-trial of the intervention will be conducted in Guatemala in May and June, 1996.