**Dysentary in Lisungwe Camp**
**Malawi, 1992**
**A Case-Study Exercise**

During the mid to late 1980s, about 750,000 Mozambicans fled civil conflict in their homeland and went to the small landlocked country of Malawi, which had a population of 8 million. While the host government was very supportive of the relief efforts made for the refugees, deforestation, crowding at waterpoints, and a shortage of land created tensions among some of the local population. A drought that struck most of southern Africa during 1991-92 led to a renewed flow of refugees into Malawi. Between May and December 1992, at least 200,000 additional refugees arrived, with the peak influx occurring in July and August. These refugees were in generally poor nutritional and general health status on arrival in Malawi.

Because of the conditions of crowding in existing camps and the shortage of water at the established sites (only 1 of 8 major camps provided 15 liters per person per day [l/p/d], and 5 existing camps could not provide 10 l/p/d), the Malawi Government and UNHCR agreed to open a new camp, Lisungwe, for all newly arriving refugees. Refugees were bussed to Lisungwe from several sites around Malawi.

**Q: In setting up this camp, what would be your first, second, and third priorities in selecting a site?**

**Q: On page 3, there is a pie chart showing the causes of mortality in Lisungwe camp in June 1992. Given perfect hindsight, does this alter your camp selection priorities?**

As the new arrivals came into the camp, many developed cholera, usually within the first 2 weeks of arrival in camp (median time in camp = 7 days; range = 0 to 93 days). A piped water system and a mechanized tube-well were providing chlorinated water at >10 l/p/d by mid-October. By November, the refugee inflow had reduced to a trickle, and little cholera was seen; the overall attack rate in the camp had been 0.7%. The camp population was 107,000 at that time.

**Q: Given that peak cholera season in Malawi is usually the wet season (October to December), had the cholera control efforts been effective? Give two distinct reasons for the epidemic's subsiding.**

The camp population in late August was approximately 60,000. Assume that 4500 refugees were arriving per week and that they usually spent approximately 2 days in a reception center before being assigned a spot in the camp. The average family had 7 individuals. With limited tools, refugees were required to dig a latrine pit (80 cm across and 2 meters deep), at which time a sanplat (cement

cover) was delivered to their spot. The families were given 4 poles for the uppers, but the construction of the superstructure was left to the families.

**Q: Why was the provision of the poles important?**

**Q: If there was on average 88% latrine coverage over this time period, what was the average length of time a family went without a latrine? (Latrine coverage was defined administratively as the number of sanplats delivered/number of families registered.)**

**Q: A community survey found that 92% of all households (average size = 7) h ad a latrine. What does this mean?**

Unfortunately, by about mid-November, many patients began arriving at the clinic with dysentery. Four attempts to isolate shigella species at the government national hospital found that 3 (7%) of 47 samples were positive for shigella *Dysenteriae*, 5 of 47 samples indicated amebic dysentery, and 5 of 47 samples were positive for *Schistosoma haematobium.*

Epi-Centre sent a team to investigate the outbreak. They conducted a case-control study matching patients to the nearest neighbor of the same and found the following:

- Cases were more likely to be male (OR = 4.0), mostly 18-30 years
- Cases were more likely to have reported eating prepared food at the market (OR = 1.6)
- Cases were more likely to have used a latrine rather than the bush (OR = 2.1)
- Cases were more likely to have fewer than 2 water vessels (OR = 1.5)

All of these findings were statistically significant. Of 20 bloody stool cultures sent to Paris for analysis, 14 were found to be shigella *Dysenteriae.*

**Q: Given this limited information, what control measures would you propose to control the epidemic?**

**Q: What is the influence of latrine availability on the incidence of shigella?**

**Q: Why is there a discrepancy between the case control study and the graph you have plotted (a cross-sectional analysis)?**

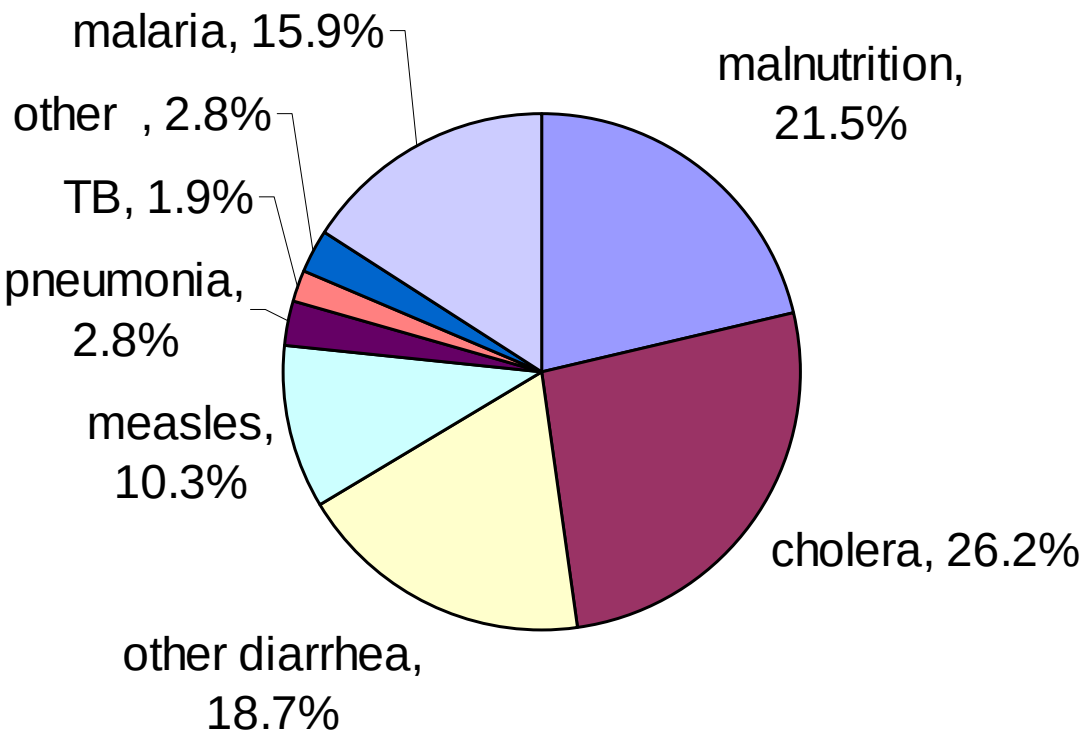
The shigella outbreak continued at a low level in Lisungwe camp for several months after peaking in January of 1993. During the spring of 1993, large numbers of Malawian residents developed dysentery, although the overall attack rate in any given region never approached that seen in Linsungwe camp. Shigella *Dysteneriae Type 1* has continued to attack residents in Malawi for the past 2 years, and many people now consider it endemic.

The outbreak in Lisungwe Camp and the two evaluations demonstrate the fact that using a latrine does not protect you, it protects your neighbor. A CDC investigation in Zambia in 1993 also found that use of a latrine increased an individual's risk for developing shigella. If poorly maintained, a latrine can be a place where individuals encounter the feces of others as well as protect their neighbors. Even so, the community benefits far outweigh the individual risks as demonstrated in Lisungwe camp.

The specific data presented here are not accurate and were fabricated for the purpose of this exercise and should not be cited. The events and two surveys described here did occur and actual investigation reports should be obtained from Epi-Centre in Paris.

**Causes of Death Among Mozambican Refugees**
**All Ages, Lisungwe Camp, June 1992**
**Chikwawa District, Malawi**

**Total Deaths = 107**



An MSF sanitarian looked at the attack rate by section and found the following information:

| Section | People (n) | Latrines (n) | Cases (n) |
|---|---|---|---|
| 1 | 6745 | 879 | 14 |
| 2 | 7109 | 914 | 11 |
| 3 | 6644 | 798 | 13 |
| 4 | 8201 | 826 | 9 |
| 5 | 4726 | 827 | 49 |
| 6 | 3964 | 286 | 16 |
| 7 | 4482 | 647 | 8 |
| 8 | 3371 | 146 | 46 |
| 9 | 3947 | 228 | 61 |
| 10 | 5151 | 704 | 11 |
| 11 | 5676 | 839 | 7 |
| 12 | 6091 | 812 | 110 |
| 13 | 6701 | 616 | 19 |
| 14 | 4487 | 771 | 7 |
| 15 | 5190 | 816 | 9 |
| 16 | 6328 | 830 | 11 |
| 17 | 4917 | 660 | 13 |
| 18 | 3946 | 186 | 22 |
| 19 | 3386 | 114 | 57 |
| 20 | 2987 | 97 | 49 |
| 21 | 2291 | 112 | 34 |

**Q: Please plot latrine coverage vs. dysentery attack rate by section.**

**Q: Please provide two explanations for the findings regarding latrines. Why could this result be erroneous?**