Evaluating the Health and Human Rights Impacts of Access to Household Chlorination in Rural Haiti (Village of Jolivert, Northwest Haiti)

**Research Objectives**
- Evaluate the health impact of household (HH) chlorine water treatment in rural Haiti and analyze how barriers to safe water access might affect Haitians’ human rights
- Use quantitative and qualitative approaches to examine the relationship between the use of HH chlorination and the incidence of diarrhea
- Analyze the determinants of chlorine adoption among users and non-users, the relationships between local church parishes and safe water initiatives, and the likelihood of consistent chlorine use among families in DSI program areas

**Expected Outcomes**
- Increase the knowledge base regarding sustained health impact of chlorine use and the determinants of adoption
  - Address recent controversy on the long-term impact of water chlorination programs
- Information gathered and analyzed will assist DSI during a critical transition period as they move from managing two programs involving more than 48,000 bottle equivalents of chlorine have been used

**Project Partners**
- **Clair Null**, Rollins School of Public Health, Hubert Department of Global Health
- **Anna Turbes**, Emory School of Medicine
- **Daniel Hougenobler**, Emory Law School
- **Jason Myers**, Candler School of Theology

**Populations/Communities Served**
Program area for Deep Springs International in the Northwest Province of Haiti

**Background**
- Over 90% of the population gathers untreated water from a river, spring, or community tap
- 16.5% of all deaths among children <5 are related to diarrheal disease (WHO)
  - These deaths are 1.7 times higher in rural areas

**Table 1: Partial Survey Results: Water Beliefs & Diarrheal Disease**

<table>
<thead>
<tr>
<th>Measure of Interest</th>
<th>Program Participants (% of HH)</th>
<th>Controls (% of HH)</th>
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<tbody>
<tr>
<td>Believe their water is safe to drink</td>
<td>83%</td>
<td>44%</td>
</tr>
<tr>
<td>Reason stated: water free from bacteria</td>
<td>91%</td>
<td>65%</td>
</tr>
<tr>
<td>Positive chlorine residual test</td>
<td>62%*</td>
<td>11%</td>
</tr>
<tr>
<td>Diarrheal disease prevalence in children &lt;5 in the last week</td>
<td>19 %*</td>
<td>31%</td>
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*Over the life of the program, 74.8% of HH visits yielded a positive chlorine residual

**Project Timeframe**
- **Spring 2010**: Establish research objectives and develop proposal
- **Summer 2010**:
  - **June**: Continue conducting survey; conduct in-depth interviews
  - **July**: Complete survey, share preliminary results with program staff
- **Fall 2010/Spring 2011**: Continue analysis and deliver final results

**Qualitative**
- Conducted key informant interviews in 6 Gift of Water communities and with 15 US-based parishes
- Preliminary analysis of interviews revealed concern about the transition from a short-term free distribution of a filtration system to a fee-based chlorination system

**Quantitative**
- Completed over 600 household surveys
- Recorded chlorine sales data from September 2002 to May 2010 for over 4,500 program participants
- Provided preliminary results to program staff in Haiti, including:
  - Over 48,000 bottle equivalents of chlorine have been sold, enough to treat 600,000,000 liters of water (10.7 bottles per HH)
  - Consistent chlorine use and 51% diarrheal disease reduction in a long-term, cost-recovery household chlorination program

**Next Steps**
- Complete a full report on the results of the technician interviews to be submitted to DSI and relevant journals
- Perform in-depth data analysis of survey results
- Distribute final report to project partners and submit manuscripts to relevant journals
- Complete Global Health Thesis projects