

The MSU College of Engineering

Design Day

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biomedical
applied
civil
computer science
mechanical
electrical
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chemical
material science
systems

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design 
program

THE APPROPRIATE TECHNOLOGY DESIGN COLLABORATIVE: VACCINE COOLING FOR REMOTE REGION

Over two billion people live without access to electricity. Another billion live with unreliable power in squatter settlements. Much of rural Africa, Asia, and Latin America live so far from power that refrigeration is the limiting factor in the distribution of medical supplies. Conditions are not improving. In Africa, the population is increasing faster than rural electrification.

Vaccines must be kept cold to maintain their potency. Vaccinations in rural areas depend on time limited technologies such as ice, dry ice, and cold storage boxes. As a result, 50% of rural vaccines are wasted through spoilage due to lack of cooling. Public health suffers as a quarter of all children born every year—34 million infants—are not protected against diseases for which there are inexpensive vaccines and an estimated 2.1 million people around the world die every year of diseases preventable by common vaccines. (WHO 2005)

The goal of this project is to design and fabricate an inexpensive appropriate technology freezing chamber that can be made primarily from locally available resources in rural Africa and Asia. The purpose of this design is to produce ice so that vaccines can be maintained at the proper temperature of between 2°C and 8°C. This design should not rely on grid connected power. All other technologies should be considered, however the simpler the technology the better.

The final design will be licensed through Creative Commons. The Appropriate Technology Design Collaborative is actively seeking funding to produce demonstration prototypes in Africa. Mr. Souleymane Kone of The World Health Organization, Department of Immunization, Vaccines and Biologicals will be reviewing and commenting on this project.

...*The Appropriate Technology Design Collaborative Student Design Team*



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Extending the shelf life of vaccines through the design and prototyping of a simple freezing chamber will save lives. It will greatly help expand vaccination programs, improve public health, and contribute to the eradication of disease. Additional benefits include preserving food so that farmers can get more of their produce to markets and for home owners to preserve food for their families. This design may even be used to help small businesses cool beverages.

-John Barrie,
The Appropriate Technology Design Collaborative



Mr. Barrie



Prof. Thompson