Building a healthy future in Haiti

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For more on the **TB Alliance** see http://www.tballiance.org/home/home.php

Jan 12 marked the first anniversary of the Haitian earthquake that destroyed an estimated 300 000 properties, creating a housing crisis from which the country has not yet recovered: 1 million Haitians still reside in camps. Against this backdrop, the five winners of the international housing design competition Kay E Sante Nan Ayti—Creole for Housing and Health in Haiti—were announced. The winners will see their designs built in Saint-Marc, ready for habitation in July of this year. The homes will house one family each and have been designed to maintain the physical wellbeing of their inhabitants, especially to minimise the airborne transmission of tuberculosis, a disease of which Haiti has the highest rate in the Americas.

International non-profit organisation Archive (Action for Health in Vulnerable Environments) is behind the competition, which attracted 147 entries from teams around the world. "In rebuilding and improving housing, one ought to prioritise design solutions which are proven to be able to combat disease", Peter Williams, Archive's founder, told *TLID*. "We work with housing as a key strategy for improving health."

Entries were judged on criteria that included sustainability, use of local materials, and attention to health challenges. Breathe House, an Anglo-American design, came first. Williams hopes that the competition is the first stage in a much larger project. For comparison, over the past few months, Archive have been measuring and recording the conditions in typical Haitian homes, including carbon dioxide concentrations, indoor temperatures, and access to direct sunlight. The winning submissions will be monitored and evaluated, and the design that proves most effective in restriction of the spread of tuberculosis could be rolled out elsewhere in Haiti, or aspects of the design could be incorporated in subsequent housing projects. Maison Canopy, for example—which came second in the competition—separates the cooking area from the communal space. Competition judge Edward Nardell (University of Harvard, Massachusetts, USA) points out that there are good data linking air pollution—both indoor and outdoor—with tuberculosis. "Globally this may be an important factor."

But is architecture, outside of hospital settings, really a feasible means of controlling tuberculosis? Nardell notes that this is the first campaign of its kind. "We don't know how much difference it will make", he told *TLID*. "Certainly poorly ventilated homes would be conducive to transmission, and in principle better ventilated structures should be helpful." There's more to this than simply increasing the size and number of windows. People in developing countries might be reluctant to open windows for fear of crime. Moreover, in Haiti, there is a superstition that evil spirits might be able to enter the house through open windows.

Other issues are more contentious. The Archive website states that "mould is associated with suppressed T-cell production, which has been linked to slower recovery", but TB Alliance's Mel Spigelman has his doubts. "I've never seen any decent data on the interaction between mould and tuberculosis", he said. Relative humidity is another issue. "There's a correlation between high levels of relative humidity and the lifespan of the tuberculosis pathogen", contends Williams. Building materials containing, for example, powdered charcoal are enormously effective in absorption of moisture, and hence reduction of mould and relative humidity. But Spigelman warns against overestimation of the importance of this factor. "The tuberculosis bacillus is incredibly hardy", he points out. He welcomes the project—"the more attention paid to living conditions and tuberculosis, the better off everybody is"—but cautions against focusing too firmly on housing to the detriment of other crucial areas. "We're dealing with structural poverty here. It is a combination of factors. I don't know how much it will help to set up a house which will have better windows but to still have people who don't have enough food."

"We're interested in testing the extent to which the pathogen remains alive and well if we are able to control the intensity of relative humidity levels indoors", answers Williams. This project is part of a wider endeavour, an attempt to encourage architects, environmental engineers, clinicians, and policy makers to work together to address public health issues. And not before time, says Nardell. "Generally architecture for the problems of the poor has been neglected."

Even if this particular project proves excessively ambitious, the lessons could be extrapolated to illnesses such as AIDS (separate rooms for sick people), Chagas disease (exclude the vector from the walls of a building), malaria (fit screens to keep insects out), and cholera (pay close attention to sanitation). Nardell thinks the competition generated excellent ideas that could inform future building projects in developing countries. "Perhaps for the first time people have begun to get the attention of architects to bring their talents to global health problems. That can only be a good thing", he concluded.

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Archive

Breathe House: the winning design to reduce tuberculosis transmission