

Childrens' Health, Food and Nutritional Security through School Science Curricula Development and Self-Reporting of Learners

PILOT PHASE

Principle Investigator: Wayne M. Getz¹, University of California at Berkeley
www.cnr.berkeley.edu/~getz/, email: wgetz@berkeley.edu.

Partner Organizations (for Phase I: Pilot Program)

South African Center for Epidemiological Modeling and Analysis (SACEMA)

<http://www0.sun.ac.za/sacema/>: data security, management and analysis

University of California at Berkeley: data collection protocols, development of curriculum, and analysis of data (through the Berkeley Alliance for Global Health

<http://globalhealth.berkeley.edu/>, Blum Center for Developing Economies

<http://blumcenter.berkeley.edu/>, Center for Emerging Neglected Diseases

<http://globalhealth.berkeley.edu/cend/>, Center for Sustainable Development

<http://nature.berkeley.edu/csrd/>, Schools of Education and Public Health).

eduWeavers <http://www.eduweavers.org/>: curriculum development, coordination of field work, teacher training and school-to-school partnerships.

South African Universities: data collection protocols, field participation, development of curriculum, and analysis of data (researchers at Schools of Public Health and Schools of Education from Cape Town, KwaZulu-Natal and Witwatersrand Universities).

Manguzi Education Center (contact: Mr. Paulos Mdluli, manguzi.ec@kzndoe.gov.za)

Project Concept

The underlying concept is that young learners in the poorest rural areas of sub-Saharan Africa and elsewhere in the developing world are at an enormous educational, health, and overall developmental disadvantage compared with their peers living in wealthier communities due to stresses induced from health, nutritional and food security (HNFS) factors as described below.

The goals of this proposal are:

First Level Goals:

1. Better educate pre and young teenagers regarding nutritional, health and food security issues that directly affect themselves.
2. Develop awareness, skills, and knowledge in science, technology and social contexts beyond HNFS issues through exposure of the learners to the use of computers as tools of analysis and communication.

Second Level Goals:

3. Establish a network for monitoring the HFNS wellbeing of school-age children through self-reporting supported by school curricula and educational activities.
4. Establish a network for real-time monitoring of epidemics including influenza and malaria to facilitate public health institutional rapid response programs.

¹ Professor Getz is a Founding Trustee of South African Center for Epidemiological Modeling and Analysis, a Professor of Environmental Sciences at UC Berkeley, an Extraordinary Professor at the University of Pretoria. He has a Ph.D. from WITS (1976) and a D.Sc. from the University of Cape Town (1995) and is a Fellow of the South African Royal Society. Professor Getz is currently a Visiting Fellow at the Stellenbosch Institute for Advanced Studies (STIAS).

5. Assess the risk factors pre and young teenagers face with regard to HNFS issues including TB, HIV, diarrheal and various diseases related to malnutrition.

The following is a brief elaboration of the concept elements:

- Health Security: Maputaland, Bushbuckridge, Maputaland and other target areas of the proposed first phase of this program, have high unemployment, are economically undeveloped for South Africa and have relatively high HIV/AIDS and TB prevalence levels. Many children in these areas have lost one or both parents to HIV, and a number these orphans live in flimsy structures (i.e. reed huts, or shacks) within a household led by an older (i.e. mid to late teenage) sibling, cousin, or elderly grandmother. This project will provide detailed information on the day-to-day health of children, their primary ailments—colds, influenza, diarrheal diseases, body sores, parasites, malaria and chronic coughs (e.g. from TB). The set of questions that the children will be asked to address on a regular basis (1-2 times a week) during a period of time that conforms to curriculum design, and biomarkers that will be recorded at the beginning and end of the period (e.g. physical measurements of weight, height, etc.) will be developed by our public health school collaborators. The children will be taught to better assess their own health status and wellbeing through the development of age-appropriate science/biology/social studies curricula. These curricula will be developed by eduWeavers in collaboration with teachers and educators associated with the project (see 4. below).
- Food Security: In theory school children are supposed to get free school lunches every school day. In practice the delivery of these lunches is variable. One school that eduWeavers has been associated with for the past 6 years has been able to provide free lunches only a small fraction of the time since March 2008 (the resources for these lunches are coordinated at the district level and according to one source about 50% of these resources do not make it to the schools). The poorest children have to rely on charity and local resources (gardens etc.). The children will be asked to keep a diary of what they eat on selected days (according to curriculum design) and the source of their food (store, garden, bushmeat). The data will ultimately be used to map local food sources (informal agriculture, local gardens) and to assess the extent to which these sources can be used to meet local needs.
- Nutritional Security: The learners will be taught to understand their nutritional needs and, as part of the diaries they keep to record nutritional aspects of their food intake. The development of suitable curricula and the instruction of learners on types of information to record will be developed by the public health and educational collaborators in this project.
- School-to-School Partnerships, Curriculum Development and Teacher Training: Over the past six years, eduWeavers has created close ties with school principals and teachers in the Maputaland area, as well as parts of the Western Cape through their School-to-School Partnership program. eduWeavers is already involved in curriculum development in the area through the school partnership concept (see <http://www.eduweavers.org/curriculum.php>) and in collaboration with organizations in South Africa, such as Shikaya (<http://shikaya.org/>) and in the USA with Facing History and Ourselves (<http://www.facinghistory.org/>). For this project eduWeavers and collaborators from schools of education, and headmasters and teachers locally in South Africa and in the USA (through the partnership school concept) will help create appropriate curricula relating to health, nutrition and food security issues.

- **Data Management and Analysis:** eduWeavers is currently working with organizations such as One-Laptop-Per-Child (OLPC) to bring computers and digital networking to local schools (www.youtube.com/watch?v=psF_Yh0U9c4). eduWeavers will ensure that adequate internet communications are in place (at a minimum, all that is needed is for the school to have a desktop computer with cell phone access to get onto the internet) and a teacher appropriately trained to ensure that the information generated by the learners is sent to a central location managed by SACEMA. Where possible, the learners themselves will be educated to work with computers and enter their own data, but systems will be set up to ensure the integrity and security of the data, with appropriate protocols for backing up data put in place. The data will also be uploaded from SACEMA to a mirror site at Berkeley. The data will be made available to students in education and public health schools at both South African Universities and at UC Berkeley for study and analysis.
- **Implications for Government Policy:** Three phases of this project are proposed. The first to develop methodology and curricula and demonstrate proof of concept. The second phase will be to implement the program in a group of schools, possibly in collaboration with one or more Provincial Governments (or Departments of Health, Education, and Agriculture). The third phase will be to involve the South African National Government in rolling out the program at various sites around the country and also make the program available to other interested countries. The scope of Phases II and III will depend on Government buy-in and on the advantages they see to use the information to set and evaluate policy, for example as it relates to school lunch programs, location of clinics, vaccination programs, monitoring of outbreaks of malaria and influenza epidemics, agricultural assistance for households and small farmers, and so on.

Implementation

- **Phase I: Pilot.** July 2009-Dec 2010: working with one or two schools to develop suitable curricula for learners in grades 6 to 8, design questionnaire protocols to record and report information, develop software programs that students use to enter their own data and interrogate the group data (using age-appropriate windows driven software) to learn how to summarize group data using simple graphs, charts and tables etc., demonstrate proof of general concept. Cost: US\$50,000-100,000.
- **Phase II: Local implementations:** Jan 2011-Dec 2013: Implement the program in several different areas. Cost depends on number of districts and schools involved and on returns-to-scale economics. Part of the support during this scale up will come from US partner schools participating in the eduWeavers school-to-school partnership program (i.e. local schools that have a US partner school will be receiving resources from its partner school, much in the same way that eSibonisweni receives resources from Saint Marks School in California for computers, food distribution programs for AIDS orphans etc).
- **Phase III:** Roll out at a National level and to other countries in sub-Saharan Africa.