



Grand Challenges Canada™
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News Release

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Grantees and Grand Challenges Canada officials are available for advance interviews.

Short videos explaining each project are online, together with photos, at

<http://www.grandchallenges.ca/stars-r3-grantee-announcement-en>

STARS IN GLOBAL HEALTH RESEARCH SHINE WORLDWIDE, GRAND CHALLENGES CANADA AWARDS SEED FUNDS

***51 innovators from 18 low and middle income countries, 17 from Canada,
are selected for bold, out-of-the box ideas to tackle debilitating disease
and save lives in developing countries***

Toronto. Grand Challenges Canada, which is funded by the Government of Canada, today announced \$100,000 grants to 51 innovators in 18 low and middle income countries worldwide to pursue bold, creative ideas to tackle health problems in resource-poor countries.

Grants were also announced for 17 Canadian-based projects to be implemented in developing countries.

Out-of-the-box ideas include a new trading system in Kenya: seeds and fertilizers for proof of child vaccinations; a \$100 kitchen reno to reduce indoor pollution and problem pregnancies in Bangladesh; cultivating disease-fighting prawns in Senegal; and creating wealth from human waste in cholera-troubled Haiti.

The *Stars in Global Health* program seeks unique, breakthrough and affordable ideas which can be transformative in addressing disease - innovations that can benefit the developing world. A total of more than \$7 million in funding will support 68 projects -- **38 in Africa** (Benin, Burkina Faso, Cameroon, Ghana, Nigeria, Rwanda, Senegal, Tanzania, Uganda, Zambia, Zimbabwe and South Africa), **23 in Asia** (Afghanistan, Bangladesh, China, India, Indonesia, Malaysia, Mongolia, Nepal, Pakistan, Vietnam), **5 in Latin America / Caribbean** (Haiti, Guatemala, Nicaragua), and **2 in the Middle East** (Jordan, Tunisia).

“Canada works with our like-minded partners throughout the world to leverage our investments in health innovation so they're focused on getting results,” said Foreign Affairs Minister John Baird. “We support Grand Challenges Canada’s Stars in Global Health so these innovators can apply their talents and further efforts to make the world a healthier and safer place.”

“This is the largest pipeline of bold ideas in global health from innovators worldwide, and shows unequivocally that poor countries can be rich in ideas about how to improve the health of their people,” says Dr. Peter A. Singer, CEO of Grand Challenges Canada. “Grand Challenges Canada is proud to support these extraordinary innovators because they will make a difference to so many lives.”

Each of the innovators, selected from over 250 applicants, will receive a grant of \$100,000 to develop their innovations. If their ideas prove effective, the innovators will be eligible for an additional Grand Challenges Canada scale-up funding of \$1 million.

Today’s grants include:

High-tech wristband monitors to save lives of remote moms and newborns in Kenya
(for video: <http://bit.ly/T2mCh9>)

Many maternal and newborn deaths in developing countries could be prevented through better monitoring of blood pressure, hemoglobin and blood sugar levels of pregnant women.

Kenya-based researchers will design a low-cost, non-invasive wristband for mothers-to-be with built in sensors that can measure and transfer these readings to healthcare providers along with the mother’s GPS location.

The sensors will collect information via copper wire and Bluetooth. The data will be processed in a central core, which will process and encrypt the vital sign information, tag the patient’s location, and periodically transfer the information to health providers.

“The solution not only addresses a huge gap in maternal and child health, it allows the health system to direct resources to high-risk pregnancies and addressing emergency cases, thus reducing mortality,” says lead researcher Shariq Khoja of the Aga Khan University, Nairobi.

A new trading system in Kenya: seeds and fertilizers for proof of child vaccinations
(for video: <http://bit.ly/UFIMmN>)

To eliminate persistent pocket areas of Kenya where children are not vaccinated or undervaccinated, researchers will create a barcoded vaccination card redeemable for farm seeds and fertilizer.

Updated each time a child gets a vaccine, the card is taken to one of about 20,000 local agro-vet outlets, where the barcode is scanned using an app on a camera-equipped smartphone. The farmer would then redeem an “agri-credit” for essential farm inputs.

Lead researcher Benson Wamalwa of the University of Nairobi says the program “would powerfully incentivize parents to seek and adhere to their children’s immunization schedule even when hard pressed financially to reach a distant vaccination centre.

The idea is a practical solution that would significantly boost small farm productivity and incomes for poor household while safeguarding the general health of children in farming villages through up-to-date immunizations.”

Creating wealth from human waste in cholera-troubled Haiti

(for video: <http://bit.ly/RBbN38>)

The recent cholera outbreak in Haiti heightened both awareness of the problem’s cause and demand for better sanitation services -- a tough challenge in environments without reliable running water. Meanwhile, national demand for farm and forest compost is high.

Hoping to capitalize on those twin realities, a Haitian group will build in urban slums the first new \$200, waterless “EcoSan” toilets that produce revenue-generating compost, with hopes of inspiring entrepreneurs to replicate the project throughout Haiti and around the world, where 2.5 billion people lack sanitation access.

The project will document the number of toilets built and people receiving sanitation services, quantity of compost produced, sales and the outcomes of tests for pathogens and nutrients.

A \$100 kitchen reno to reduce indoor pollution and problem pregnancies in Bangladesh

(for video: <http://bit.ly/THAPNQ>)

The International Energy Agency estimates that biomass fuels such as wood and dung will continue providing 30% of global energy in resource-poor settings though 2050.

Exposure to smoke from biomass cooking fuels, however, is known to cause placental dysfunction and is highly associated with low birth-weight babies in developing countries. Part of the solution could be a locally-made, simple prefabricated “\$100 kitchen” featuring a clean-combustion stove.

Researchers in Bangladesh will conduct a randomized controlled trial with 430 willing mothers, 2 to 3 months pregnant, half of whom will use the innovative, well-ventilated \$100 kitchen with reinforced cement infrastructure, a waste disposal system, and a stove that combusts biofuels with minimal smoke.

Mobile app to reduce obesity in northern Nigeria

(for video: <http://bit.ly/THB7nV>)

WHO projects that globally by 2015 about 2.3 billion adults will be overweight; more than 700 million will be obese -- an epidemic growing fastest in developing countries and leading to diseases like type 2 diabetes, cancers, cardiovascular disease, hypertension and stroke.

In rural northern Nigeria, where mobile phone use is now common (use in Nigeria rose almost 1,300% in 2010-11), health researchers led by Sally Akarolo-Anthony will work with a high-tech firm to create a smartphone app to provide a virtual mentor and online buddy system.

The app will compute a user's metabolic rate and caloric requirement, prompt daily exercise, collect data on activity and eating, offer healthy diet tips (e.g. white vs. brown rice), estimate the daily calorie intake required to meet a weight-loss goal, and monitor change over time.

Using mobile phones to improve vaccination in urban slums and rural Bangladesh

(for video: <http://bit.ly/TDsJnn>)

In Bangladesh, although 79% of 12-23 month old children are fully immunized, coverage remains low (42%-60%) in 22 rural hard-to-reach districts and children living in urban streets. In collaboration with local mobile phone companies, this initiative will establish a computerized data base, auto registration and reminder system related to vaccinations for children living in rural hard-to-reach areas as well as the streets of Bangladesh.

The tool created will register every birth electronically, and obtain their location to help ensure that every child is vaccinated, and ultimately help lower under-five illness and death. Vaccinators' working at the sub-district level will have access to the data base of pregnant and recently delivered women and their mobile phone numbers.

Caregivers and / or birth attendants will be encouraged to register a newborn by voice or text messaging, which will automatically create a file that follows vaccines received and up-coming due dates. Parents will get a reminder text message one day prior to their child's appointment at the vaccination centres.

Weaving mosquitos where they belong: outside

(for images <http://bit.ly/TCLYQm>, cutlines / credits <http://bit.ly/UByrwH>; video: <http://bit.ly/SIkGfq>)

To control malaria, researchers will install on existing village homes in Kenya a ventilated ceiling made of mats woven by local artisans using local materials and fitted with a small amount of insecticide netting. This will be used to block mosquitoes that access homes through open eaves -- a characteristic of village houses.

The papyrus mat ceilings will be added to the houses of 80 willing villagers (with 80 unmodified homes studied as controls).

Researchers will then assess the impact of the mats on rates of indoor insect bites and expect an approximately 50-90% reduction in malaria prevalence and anaemia and to improve child school attendance.

Bedside diagnosis of a disfiguring disease in Africa

(for images, <http://bit.ly/ZpoTop>; cutlines / credits <http://bit.ly/UByrwH>; video: <http://bit.ly/THBmiR>)

Researchers in Accra, Ghana, aim to create a simple, accurate, cost effective diagnostic test to the doorsteps of communities endemic with Buruli ulcers - a disease caused by a relative of the

bacteria that causes tuberculosis and leprosy and characterized by large ulcers, usually on the legs or arms.

Up to half of patients are left with disabilities that have long-term social and economic impacts. Early diagnosis and treatment are vital but accessing health care is often difficult.

In sub-Saharan Africa, the average cost of surgical treatment per patient is US\$780, an amount which far exceeds per capita national government spending on health.

All items needed to diagnose the disease will be packaged into a test kit, including swabs and single step DNA extraction and amplification tools.

Hitching a ride on Coca-Cola's distribution chain to get medicines to the ends of the Earth
(for images, <http://bit.ly/SKKMcs>; cutlines / credits <http://bit.ly/UByrwH>; video: <http://bit.ly/W6hYfs>)

Researchers from Antara Global Health Advisors and the Johns Hopkins Bloomberg School of Public Health, working with UNICEF and RuralNet Associates, will study how piggy-backing essential medicines on the highly developed Coca-Cola supply system might improve "last mile delivery" in low and middle-income countries.

The effort is spearheaded by the organization ColaLife and delivered by local partners.

Pursuing a new vaccine in Uganda for sleeping sickness (African Trypanosomiasis)
(for video: <http://bit.ly/UFmy3q>)

Tsetse fly-inflicted African trypanosomiasis (aka "sleeping sickness") is a debilitating and dehumanizing neglected tropical disease whose victims (30,000 in 2009) are typically ostracized. The few therapies available today are toxic with poor patient compliance because they're administered intravenously.

Using genomics, bioinformatics, molecular biology and other modern sciences, Uganda researchers led by Savannah Mwesigwa will test novel ideas for an innovative vaccine to combat the disease in people as well as livestock, the loss of which causes serious economic hardship (3 million cattle killed in 2005 at a loss of \$4.5 billion).

Floating farms in Nicaragua to improve nutrition
(for images, <http://bit.ly/ZFbqRl>; cutlines / credits <http://bit.ly/UByrwH>; video: <http://bit.ly/RSppZq>)

Researchers working on lakes in Costa Rica and Nicaragua will establish floating farms to cultivate native aquatic plants, rice and filter-feeding fish in hopes of reducing agricultural water needs and removing excess nutrients in the water by plant uptake.

The aquatic plants (e.g. Azolla, duckweed, water hyacinth, alligator weed, water fern) have high (up to 40% or more) protein content usable as food for humans, fish and livestock. Their use as biofuel is equally valuable.

If successfully proven, they plan to adapt the technology and technique to sea conditions.

Screening for hearing-impaired babies

(for video: <http://bit.ly/TDt49s>)

Of the 500,000 hearing impaired babies born every year worldwide, 100,000 are born in India. And in resource-poor settings, hearing impairment often goes undiagnosed until the child is about three years old -- too late for effective care to avoid speech loss and impaired communication.

An innovative, low-cost technique enables even minimally-trained users to screen babies quickly even in noisy environments.

Researchers will run a safety and efficacy clinical validation on 30 adult subjects with the present prototype. With the next developed prototype, they will collect data from newborns.

They also envision a network of audiologists providing after care, starting with 50 audiologists in India.

“Universal Newborn Hearing Screening has the potential to transform the lives of individuals born with hearing impairment by allowing them to be active participants in the social and economic life of their communities,” says lead researcher Nitin Sisodia of Stanford University, USA.

“Additionally, no longer requiring full support from their families, these individuals can become productive members of society, contributing to the economic growth of developing nations.”

A quick DNA-based test to diagnose crippling dengue fever in Indonesia

(for video: <http://bit.ly/ZEYfr1>)

Proper care of mosquito-borne dengue fever -- which causes headache, muscle and joint pains, and a rash similar to measles -- requires early detection but current diagnostic tests offer results only after 5 days of fever, or they are very expensive and not very accurate.

Researchers in Indonesia, where dengue fever is the most common cause of acute illness requiring hospitalization, will test a new low-cost DNA-based test potentially capable of diagnosis in 5 to 15 minutes, which would significantly reduce fatalities and care costs.

Cultivating disease-fighting prawns in Senegal

(for video: <http://bit.ly/X5qo3F>)

Schistosomiasis is a neglected tropical disease spread by snails that damages internal organs and, in children, impairs growth and cognitive development.

Of the 200 million cases recorded annually, 184 million are in Africa. Another 790 million people are at risk in Africa, Asia and South America.

In Senegal, researchers will try to restore populations of native freshwater prawns, which thrive on the troublesome snails.

Village cooperatives will sell the prawns, raised in controlled, low-density aquaculture operations, thereby improving nutrition while attacking the schistosomiasis problem.

Creating cheap fuel, fertiliser and a cleaner, healthier, more prosperous Uganda

(for images: <http://bit.ly/RBhmP2>; cutline/credits <http://bit.ly/UByrwH>; video: <http://bit.ly/UFmWi9>)

In Uganda's capital Kampala, youth will be paid to collect and sort discarded organic waste and deliver it to a plant for conversion to fertiliser and biogas, to be packaged in bags and canisters. Youths will then help market the products to households and institutions, the biogas canisters offering an affordable alternative to liquified petroleum gas, charcoal and fuel wood.

The urban waste collection effort will unclog drainage systems, reducing water borne diseases and breeding sites for mosquitoes. It will benefit as well the health of ecologically-sensitive Lake Victoria. And, project leaders say, the concept can easily be scaled and transferred to comparable urban areas throughout Africa.

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The 17 Canadian-based research projects receiving \$100,000 grants include:

- **Vancouver:** Dr. Christian Kastrup will mimic rocket technology to propel coagulant nanoparticles into the bloodstream and stop maternal bleeding, a major cause of death in the developing world. (<http://bit.ly/RWdW9w>)
- **Vancouver:** Dr. Robin Evans is developing a Burn Survival Kit, a high-tech solution to burn victims. The innovation is being tested in Uganda where often burns are untreated or mistreated. This unique kit will include a low-cost silver nanotubule dressing so that the treatment is affordable. (<http://bit.ly/T2rPFK>)
- **Edmonton:** Dr. Julianne Gibbs-Davis is creating a unique approach to diagnosing TB. It involves extracting DNA from the infected persons TB bacteria and does not require the usual temperature recycling that is expensive and difficult to implement in low resource settings. (<http://bit.ly/SKNLSf>)
- **Hamilton:** Dr. Leyla Soleymani is also tackling TB diagnosis with a hand-held, solar rechargeable, inexpensive diagnostic for rapid assessment of patients at the bedside. (<http://bit.ly/T02HhS>)
- **Toronto:** Dr. Cheng Lu has a unique idea for tackling clinic and hospital infections. A coating can be sprayed or wiped on surfaces; once applied, the long-lasting anti-bacterial components are activated by sunlight or artificial light. Easy to use and effective. (<http://bit.ly/TDxU6L>)
- **Kingston:** Dr. Karen Yeates will employ cell phones to improve cervical cancer screening and detection. It is being tested in remote areas of Tanzania. (<http://bit.ly/RSvWTK>)

- **Ottawa:** Dr. Marion Roche will use social marketing to rejuvenate interest in taking zinc to control childhood diarrhea. (<http://bit.ly/QF7S8t>)
- **Montreal:** Dr. Philippe Archambault will use virtual reality to assist rehabilitation of stroke victims suffering from hand or arm immobilization. (<http://bit.ly/T2rX7X>)
- **Montreal:** Dr. Hanna Kienzler's project is called "Defeating the Giant with a Slingshot" and is a novel approach to treating trauma in the developing world. The innovation results in blocking trauma memory and will be tested with torture victims in Nepal. (<http://bit.ly/QF7TJx>)
- **Montreal:** Dr. Alexis Vallée-Bélisle is developing a meter to detect HIV infection in fewer than 5 minutes. This diagnostic will lead to earlier treatment of the disease. (<http://bit.ly/XD4oFw>)
- **Halifax:** Dr. Patricia Livingston's project will improve emergency services with a specific focus on crisis management for mothers delivering babies. The project is being tested in Rwanda. (<http://bit.ly/TCTACv>)

For more information on the grants, as well as photos and short videos explaining each project, visit <http://www.grandchallenges.ca/stars-r3-grantee-announcement-en>

"Canada is enabling bold ideas which can have big impact," said Joseph L. Rotman, Chair of Grand Challenges Canada. "This program is about what can happen if the ideas of early career innovators are vigorously supported. It is about the Government of Canada enabling young innovators in developing countries to solve their own problems."

There have already been 436 applications, including 338 from low and middle-income countries, for the next (4th) round of funding under the GCC Stars in Global Health programme.

Grand Challenges Canada is funded by the Government of Canada through the Development Innovation Fund announced in the 2008 Federal Budget.

Please visit [grandchallenges.ca](http://www.grandchallenges.ca) and look for us on **Facebook**, **Twitter**, **YouTube** and **LinkedIn**.

About Grand Challenges Canada

Grand Challenges Canada is dedicated to supporting bold ideas with big impact in global health. We are funded by the Government of Canada through the Development Innovation Fund announced in the 2008 Federal Budget. We fund innovators in low and middle income countries and Canada. Grand Challenges Canada works with the International Development Research Centre (IDRC), the Canadian Institutes of Health Research (CIHR) and other global health foundations and organizations to find sustainable long-term solutions through integrated innovation - bold ideas which integrate science, technology, social and business innovation. Grand Challenges Canada is hosted at the Sandra Rotman Centre.
www.grandchallenges.ca

About Canada's International Development Research Centre

The International Development Research Centre (IDRC) supports research in developing countries to promote growth and development. IDRC also encourages sharing this knowledge with policymakers, other researchers and communities around the world. The result is innovative, lasting local solutions that aim to bring choice and change to those who need it most.

As the Government of Canada's lead on the Development Innovation Fund, IDRC draws on decades of experience managing publicly funded research projects to administer the Development Innovation Fund. IDRC also ensures that developing country researchers and concerns are front and centre in this exciting new initiative.

www.idrc.ca

About Canadian Institutes of Health Research

The Canadian Institutes of Health Research (CIHR) is the Government of Canada's health research investment agency. CIHR's mission is to create new scientific knowledge and to enable its translation into improved health, more effective health services and products, and a strengthened Canadian health care system. Composed of 13 Institutes, CIHR provides leadership and support to more than 14,100 health researchers and trainees across Canada.

CIHR will be responsible for the administration of international peer review, according to international standards of excellence. The results of CIHR-led peer reviews will guide the awarding of grants by Grand Challenges Canada from the Development Innovation Fund.

www.cihr-irsc.gc.ca

About Sandra Rotman Centre

The Sandra Rotman Centre is based at University Health Network and University of Toronto. We develop innovative global health solutions and help bring them to scale where they are most urgently needed. The Sandra Rotman Centre hosts Grand Challenges Canada.

www.srcglobal.org

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