MENDING WOUNDED MINDS

BY JACKIE POWDER • ILLUSTRATIONS BY DUNG HOANG

In developing countries, three-quarters of people with mental disorders receive no treatment. How do you deliver inexpensive, effective, science-based care to them? A team of mental health researchers has a few ideas.

The Kurdish people of northern Iraq have endured the worst that man can do to man. Operation Anfal, Saddam Hussein’s campaign of genocide against the Kurds, claimed 180,000 victims—5,000 killed in the poison gas attacks of 1988—and destroyed thousands of villages, forcing residents from their homes to refugee camps on the Turkish border. During this wave of terror, males were routinely detained, taken to military facilities, interrogated, tortured and often executed. In some cases, their families were forced to watch the killings in a public place, applaud and then pay for the bullets used in firing squad assassinations.

More than 20 years have passed, and Saddam Hussein is gone. What remains is a damaged population—torture survivors, their relatives and the families of the dead—that continues to live with crippling psychological pain.
“It’s very common to find families having one or two members who have been jailed or tortured,” says Ahmed M. Amin, MD, medical director of a trauma recovery and training center in Sulaimaniya. “For example, if I am not jailed, my brother was jailed; if not my brother, my sister or my cousins.

“We know that they are in grave need of mental health support services,” Ahmed says. “They have a great burden on their shoulders, and they are suffering on a daily basis.”

To ease the debilitating mental pain that frequently destroys family relationships and impedes day-to-day functioning, the Bloomberg School’s Applied Mental Health Research (AMHR) group is working on a project to help torture victims in Kurdistan. The effort is led by Paul Bolton, MBBS, MPH, an associate scientist in International Health, and is supported by USAID’s Victims of Torture Fund.

The AMHR group is dedicated to implementing and testing evidence-based mental health services in developing countries where care for the mentally ill is frequently non-existent or ineffective. Bolton and colleagues Judith Bass, PhD, MPH, and Laura Murray, PhD, assistant professors in Mental Health and International Health, respectively, comprise the core of AMHR, which they founded at Boston University’s School of Public Health in 2004.

During Saddam Hussein’s genocide against the Kurds, families were brought to prisons to witness the torture of loved ones. The girls might be raped. Then the families were sent home. “We’ve heard many stories, and these are the worst I’ve ever heard,” says Paul Bolton.

The group has worked with street kids in Georgia, Albania and Mexico, sexually abused children in Zambia, Indonesian villagers caught for two decades in the crossfire of warring political factions, and with affected populations in Uganda, Cambodia and Haiti.

AMHR doesn’t provide treatment services directly, but rather fills a void in how these services are planned, executed, and provided. The group uses data collection methods in collaboration with service providers to identify major mental health problems, assist in the selection and design of mental health interventions to address these problems, and set up monitoring and evaluation methods to assess their impact. It is then up to the service providers—typically NGOs or ministries of health—to deliver the selected science-based mental health care.

“I would say that international mental health at the moment is certainly not a science-based or evidence-based field, leaving people free to do whatever they think is a good idea at the time,” says Bolton, who originally trained as a family physician in Australia. In the late 1980s, he focused on tropical medicine, treating malaria, tuberculosis, parasitic infections and diarrheal diseases among refugees in camps along the Thai/Cambodian border. In 1996, he joined the Child Survival Support Program at Johns Hopkins.

“I saw people with mental illness,” Bolton says, “but we had nothing to offer them.” He adds, “The contrast between the rigorous evidence that underlies physical health programs, and the poor basis for the few mental health services that were being provided was really marked.”

While mental health issues in the

Calling for Vision

Paul Bolton made one call after another, methodically working his way down the list of NGOs. A researcher with the School’s Center for Refugee and Disaster Response, Bolton was in search of a funding partner for a project in Africa to improve mental health care. He hesitated before making the last call—to World Vision—after being turned down by every agency on the list.

“I shared an office with a guy, and I said, ‘Well, if this call fails, then I’m just going to have to do something else for a living,’” Bolton recalls of the nerve-wracking moment eight years ago.

World Vision’s answer? “It was the only one that expressed any interest,” says Bolton. The NGO agreed to back Bolton’s proposal, giving AMHR its first opportunity to introduce a mental health intervention and follow up with a clinical trial to assess the impact.

World Vision was working with a community in southwest Uganda to strengthen agricultural production, but found that the population, which had lost many residents to AIDS, seemed “lethargic,” and had little interest in the project. Onsite NGO staff suspected that depression might be a problem in the community.

In Uganda, Bolton and Bass interviewed residents to understand the reasons behind the “lethargic” behaviors. They used the information to develop a questionnaire to aid in diagnosing depression among residents and to identify participants for the trial. The researchers chose a group-based model of an interpersonal psychotherapy intervention, with weekly meetings for 16 weeks. Non-professionals could lead the sessions—a critical piece given the scarcity of mental health professionals in Uganda.

The results were dramatic: a 75 percent reduction of diagnosable depression in the treatment group. The trial was one of the first to demonstrate that simple, cheap interventions for common mental disorders can be effective. World Vision adopted the psychotherapy intervention as a permanent part of its assistance programs in Uganda, and it has served approximately 3,000 people to date.

The inclusion of mental health treatment as part of World Vision’s services reflects a central tenet of AMHR’s work: People have to be able to function to make full use of assistance programs in agriculture, finance, nutrition and other areas. Says Bass, “Mental health intersects with everything—physical health, the economy—it’s intrinsically linked with functioning.”

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developing world have not drawn wide attention, they disrupt the lives of millions, says Bolton. The effects of mental illness can ripple wide, far beyond an individual’s personal pain and dysfunction to economic hardship and the disintegration of families.

According to the WHO, more than 75 percent of people with mental disorders in developing countries receive no treatment or care. Globally, depression affects approximately 154 million people. WHO’s World Health Report 2001 ranks depression as one of the top five disabling conditions. Mental illness varies in terms of age of onset and without treatment can last a lifetime.

The public health consequences of ignoring mental illness in the developing world are great, notes Bolton. Studies have shown that depression is a risk factor for heart disease, cancer and alcohol abuse. Research in Pakistan found that children born to depressed mothers have lower birth weights, which increases the risk of death from diarrheal disease. Other research has found that depression speeds the progression of HIV and more than doubles the mortality rate in HIV-positive women.

In the arena of international mental health, AMHR is one of only a few research groups working in collaboration with service providers to bring scientifically proven, cost-effective mental health services to those most in need. Central to the AMHR model is a commitment to view mental health through a local lens. That means using ethnographic study methods to talk with local populations to understand their mental health problems from the perspective of their own culture. This is the foundation for AMHR’s subsequent scientific work of selecting and adapting interventions in ways local people will understand and accept. AHMR then collaborates with the providers to conduct scientific studies, such as controlled trials, to assess how effective the services are.

Too often, says Bass, NGOs and other service providers bypass the local perspective and simply import Western-based assessments and therapies that may not translate well to other cultures. “We need to know what the problems are, and we first spend time doing needs assessments,” she says. “We don’t go into a place and say, ‘Oh, there’s a disaster; everybody must have PTSD [post-traumatic stress disorder].’ We take an exploratory approach and determine what the problems are and how they affect people’s functioning and daily lives.”

Healing Damaged Psyches

Through his work with AMHR, Paul Bolton knows how living as a refugee, surviving a natural disaster, torture or a war can damage the psyche. Still, the stories of torture survivors in Kurdistan revealed a degree of brutality he had not encountered before.

“We work with torture-affected populations in different countries, and the common story is somebody is taken from their home then taken to a place where they’re tortured, and either killed or eventually released,” Bolton says. “It was different in North Iraq. People would be arrested, taken to a place and tortured, but the victim’s family would periodically be brought to the prison and forced to watch the torture, the girls might be raped and then the family would be sent home.

“We’ve heard many stories, and these are the worst I’ve ever heard,” Bolton says. “This was torture at a different level, very much both mental and physical torture.”

AMHR is now collaborating with Heartland Alliance (HA), a Chicago-based NGO that in 2004 introduced limited mental health services to its network of primary care health clinics, mainly in the Kurdistan region. The goal: help the large number of torture survivors in the area cope with PTSD, depression and anxiety.

AMHR-trained local interviewers asked open-ended questions of residents and used ethnographic methods to tease out a list of general problems, including mental problems. With HA, the AMHR team put together a screening tool/questionnaire to identify the mental health problems among local people and assess their severity.

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“Using the ethnographic data we try to design an intervention that makes sense to people, is consistent with how they might address a problem,” Bolton explains. The last part of the process is to run a controlled trial to assess the intervention’s impact.

The Kurdistan assessments found depression, anxiety, PTSD and traumatic grief—which results from the loss of someone under sudden and/or violent circumstances—to be the most common problems among torture survivors. “What we have done since then is reach out to torture experts around the world and say, ‘What can we do for this population that’s locally feasible, known to be effective and deals with these particular problems,’ Bolton says. “And in the case of Kurdistan, we’ve come up with two interventions that we’re planning to

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Finding Out What Doesn’t Work

For the AMHR researchers, determining what doesn’t work in certain settings is as important as putting in place effective mental health interventions. “You shouldn’t be out there promoting change and providing services for people if you don’t know that you’re doing more good than harm,” says Paul Bolton.

Case in point: AMHR’s collaboration with an international NGO to assess the problems of urban street children.

“I guess, being naïve, one of the things I originally thought was that most street children would be orphaned,” Bolton says. “It turned out that most children are not at all orphans. Many either have contact with families or know exactly where to find them. A significant number of kids who choose not to have contact with their families do so because the situation on the street is better than the situation at home.”

Some of the children had been kicked out. Some left voluntarily. But for many the street was a better option than what they had left behind at home. Based on these findings, AMHR and the NGO partner concluded that the NGO’s focus on returning the street kids to their homes might not be the ideal solution.

Thousands of miles away, in Indonesia, AMHR researchers were called upon to evaluate a program already in place among people living with depression and anxiety in Aceh. The region had been caught for more than two decades—until 2005—in a violent conflict between the Indonesian government and GAM (Free Aceh Movement), an army of resistance fighters. Indonesian troops looking for rebel fighters hiding in Aceh jungles burned down entire villages, and beat and tortured residents. “The military would round up 10 people and beat them up in the village squares; there was raping of women,” says Bhava Poudyal, a program manager with AMHR’s partner in Indonesia, International Catholic Migration Commission (ICMC).

In Aceh, Poudyal oversees an intervention in which participants—including torture survivors—meet in groups under the guidance of a trained moderator to talk about their problems and explore coping mechanisms.

To evaluate the effectiveness of the intervention, Bass and ICMC developed a questionnaire aimed at capturing an accurate picture of mental health problems in the area. The questionnaire—adapted from a Western mental health measurement—uses a scoring system to determine an individual’s level of mental distress. The AMHR researchers modified it to reflect the culture of the target population. For example, “they talked about thinking too much, and we added that because it wasn’t on the original questionnaire,” Bass says. “The population told us about crying and feeling sad, so we used their terms for these problems in our measure.”

AMHR then set up a trial to compare the effectiveness of Poudyal’s existing intervention of group counseling sessions with a control group. The results? “At this time, in this place, [the intervention] didn’t reduce symptoms of depression and anxiety,” Bass says. However, the findings did reveal that widespread poverty could be an underlying cause of the villagers’ distress, in combination with trauma-related symptoms. Bass and ICMC staff discussed the findings with the counselors, and together came to a decision to pilot a new approach that pairs counseling with an education component intended to improve clients’ economic security. AMHR is currently analyzing the pilot program data.

“In this situation,” says Bass. “We found out something doesn’t work as is, so let’s strategize and improve the intervention, pilot those changes and actually evaluate the newly adapted intervention. It’s public health in practice, as opposed to saying, ‘Let’s keep doing what we’re doing.’”

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the industrialized West or in sub-Saharan Africa’s poorest countries. In the past few years, however, health officials in Zambia have begun to confront the issue through awareness campaigns and specialized medical services—in part because of the high prevalence of HIV among young girls, the most frequent victims of sexual predators. Especially vulnerable are AIDS orphans who have lost both parents and must live with relatives or neighbors, some of whom become their abusers.

AMHR’s Laura Murray is overseeing a project in Zambia to introduce mental health care to sexually abused children. The goals are twofold: to ease the immediate effects of trauma, and to head off potentially irreversible damage that could manifest itself in adulthood as substance abuse, risky sexual behavior or mental illness.

“If you don’t treat child sexual abuse, the research tells us it’ll snowball into a lot of adult mental health issues,” says Murray, who, as part of a feasibility study, trained 23 local clinicians in an evidence-based therapy with a strong record of success in treating sexually abused children.

For the past nine months, the clinicians have been providing the therapy to sexually abused children ages 4 to 18 throughout Lusaka. Prior to AMHR’s involvement, no effective therapy was available in Zambia for young victims of sexual abuse. “The therapists are actually meeting with children and parents all over the city: under a tree, at a church, in a house, a school,” says Murray.

Jackie Jere, a counselor in Zambia with a background in educational psychology who has worked with the United Nations High Commission for Refugees, jumped at the chance to train with Murray. “We lack manpower in the field of therapy,” she says. “This was an opportunity for me to gain the skills to become a professional therapist so we can adequately help people who need treatments.”

Jere has found that many individuals who identify themselves as counselors in Zambia, as well as in other developing countries, are not properly trained. “There’s a lot of counseling going on, regardless of the level of qualifications you have,” she says. “A lot of children receive counseling that I think is ineffective.”

The pilot study in Zambia grew out of Murray’s efforts to learn about the mental health concerns of women and children living in a low-income compound outside of Lusaka with a high HIV prevalence rate.

A review of data collected by AMHR-trained local interviewers, who spoke with the women and children, identified a need for mental health services geared to treat child sexual abuse. Forty percent of the women and 30 percent of the children themselves reported “defilement,” or sexual abuse of children, as a problem. The survey also found that 52 percent of women said that orphaned children were seen as second-class citizens by their adopted families.

After reviewing various options for treatment, AMHR settled on Trauma-Focused Cognitive Behavioral Therapy (TF-CBT). The approach has been effective in treating trauma stemming from child sexual
abuse, grief, disaster and other causes.

“In Zambia, we needed a model that was appropriate for 4- to 18-year-olds, we needed a model that included families, and we needed something that was fairly simple and teachable,” says Murray.

In TF-CBT, therapists help children to find connections between thoughts, feelings and behavior. A key component is “exposure”—helping the child begin to talk about the actual sexual abuse event. From there, they start to make connections between the abuse and their emotions and actions. The therapist might use drawing pictures or role-playing to help children construct their own abuse “narrative” through repeated retellings, a process intended to desensitize them to the abuse.

Murray assembled the 23 clinicians mainly through her contacts at Lusaka schools and NGOs in the area. The group includes psychology and child development students, as well as some local counselors who wanted some formal training. Murray also worked with a clinic at Lusaka’s University Teaching Hospital, which is designed primarily to provide medical treatment to sexually abused children. AMHR developed standardized intake and assessment forms that clinic staff now use as screening tools to identify the children most in need of TF-CBT services.

One of Jere’s clients is an 8-year-old girl who was sexually abused by a family member. “Generally, she’s a very jovial and very happy kid, but when I met her for the first time she seemed sad, quite withdrawn. She wasn’t playing with friends and didn’t talk very much,” says Jere. Her first step was to engage the child in some games and other activities that are part of TF-CBT, aimed at helping her to talk about the abuse.

“You get them to explain to you what the drawing is about,” Jere says. “For some we do role-playing, take them out of the situation. Another technique I use is asking them to talk about what happened as if it were a movie. It’s easier for them to look at things from the outside.”

Murray is in the process of training another cohort in TF-CBT, and using three clinicians from the original group of 23 to be on-the-ground supervisors of the therapy program. Longer term, she hopes to train the supervisors to do the training themselves, and expects to bring the AMHR-developed screening tools to other Lusaka organizations that work with children who have experienced trauma and/or grief.

“One of the most gratifying things to me is to watch my 23 counselors really become talented therapists, and to watch their successes and how they pick this up,” Murray says.

**From Meager to Reliable Research**

The AMHR team has spent the past decade slowly building its case—one project at a time—that it is possible to bring evidence-based mental health care to the developing world, even in the face of daunting obstacles: entrenched stigma, paucity funding and widespread shortages of qualified mental health practitioners.

The group is beginning to see a greater recognition from the public health community, local governments and international organizations of the long-neglected mental health needs of millions in low-resource countries. In October 2008, the WHO launched the Mental Health Gap Action Programme (mhGAP) to bridge the “huge treatment gap” that exists for mental, neurological and substance use disorders in the developing world. Defining mental health as a vital component of primary care, mhGAP urges governments and donors to boost funding and scale up treatment.

“This expanding interest means people are also looking for ways to investigate mental health, which is exactly what we do,” Bolton says. “In the past this was something we had to offer but nobody was interested.”

Increasingly, international aid organizations that fund NGOs to provide mental health services are demanding proof that the care is actually helping people. “There’s been so much money wasted because there’s been so many bad programs,” Portman says, “and we just really want to do a good one.”

The AMHR-developed model of involving local populations in identifying mental health problems and interventions, and requiring evaluations of effectiveness, was built with sustainability and expansion as key goals. “We select interventions that are relatively low-cost, that don’t require high-level training,” Bass says, “so that the organizations we work with, whether it’s a ministry of health or an NGO, can actually continue to provide services should they prove to be effective.”

AMHR aims to leave its partners equipped with the public health tools they need to duplicate the group’s methods—from identifying problems, to setting up interventions and assessing impact—and in the process add another piece of reliable information to the meager body of work on mental health in the developing world.

“We want to have all these service providers constantly testing their interventions so that when you go to the literature there are studies saying what works,” Bolton notes. “The evidence is so thin and so rare ... . We see maybe two or three studies a year in developing countries that look at the impact of any mental health intervention. The only way we’re going to build an evidence base more quickly is if these providers are doing the research as part of their programs.”

“We’re people in a hurry,” Bolton says. “The mental health field is so behind; there’s so much to do.”

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**We select interventions that are relatively low-cost, that don’t require high-level training,” says mental health researcher Judy Bass, “so that the organizations we work with ... can actually continue to provide services should they prove to be effective.”**
Welcome to the summer of unease. The new H1N1 influenza virus that emerged in Mexico in April quickly ignited outbreaks as far away as the U.K. and Japan. As epidemiologists accumulated data and scientists probed the novel virus, they found H1N1 was neither as virulent nor as lethal as first suspected. But the quick-mutating influenza virus should never be underestimated. To learn what might happen—and what should happen—before flu season returns this fall, we turned to three Bloomberg School experts.

**Prelude to the Fall**

**SPECIAL FLU REPORT**

**5 LESSONS ABOUT H1N1**

**Expect change.**

Virologist Andrew Pekosz, PhD, knows the eight-gene influenza virus as well as anyone. He’s familiar with its penchant for mixing and matching genetic fragments that can change its exterior coat of proteins to elude animal immune systems. H1N1’s novel gene fragments are not yet optimized to work with each other, says Pekosz, who has been studying samples of the virus since early May. Each viral protein also interacts with human proteins, so as the virus mutates, the changes that work best for the virus are more likely to survive and to be passed on as a new variant. “It could get better at causing disease or better at spreading from person to person. In either one of those situations, you should see an increase in the number of serious cases come fall,” he says.

**Look south.**

As summer envelops the Northern Hemisphere, H1N1 virus strains will likely retreat from here and thrive in the cooler temperatures and low humidity in southern climes, says Pekosz, an associate professor in the W. Harry Feinstone Department of Molecular Microbiology and Immunology. “It will be really important for us to look at places like Australia, New Zealand, and Argentina, which have very good public health systems and the capacity to do large-scale screening for H1N1 infections, to see if that virus emerges in the Southern Hemisphere as it has emerged in the Northern Hemisphere,” he says. “If it does, that will be a fairly strong sign that it’s here to stay, and that we should be preparing for its eventual reemergence in the fall.”

**Don’t fixate on the past, but respect it.**

The 1918 flu pandemic began with spring outbreaks in Europe and the U.S. That fall, it quickly went global and killed more than 50 million people. Was this spring’s H1N1 epidemic a prelude to catastrophe? Pekosz thinks not. “Everything about this virus in terms of its genes and known virulence factors … tells us this is much more similar to a seasonal influenza virus strain than it...”

For a timeline of the H1N1 pandemic, go to: http://magazine.jhsph.edu/flumap
VACCINE NATION

For answers about an H1N1 vaccine, we turned to pediatrician and respiratory virus expert Ruth Karron, MD, director of both the Bloomberg School’s Center for Immunization Research and the Johns Hopkins Vaccine Initiative. Karron is also a professor in International Health.

What’s the U.S. vaccine plan?
The U.S. government has allocated $1 billion for H1N1 vaccine development and testing. The CDC has supplied vaccine manufacturers with H1N1 “seed viruses,” and the manufacturers have begun vaccine production. Later this summer, a whirlwind of clinical trials will test new H1N1 vaccines.

What should we expect in the fall?
The seasonal flu vaccine may be ready as early as September, says Karron, because the manufacturers want to clear the decks for production of H1N1 vaccine. “Then maybe in October, if all the stars align, the new vaccine will be ready,” she says. If a decision is made to use the H1N1 vaccine, then most children and adults under 60 would need three doses of flu vaccine—one for seasonal flu and two for the new H1N1.

Will there be enough vaccine in the fall?
If the U.S. chooses to immunize against H1N1, it is unlikely that there will be enough vaccine to immunize everyone at once. It will be necessary to prioritize based on disease epidemiology (who is most vulnerable).

What makes the vaccine process so time-consuming?
The virus needed to create the vaccine is grown in eggs. Another way to grow the virus is to use cell culture technology—but it’s unlikely that we’ll see cell-based flu vaccines here this year, because cell culture-based flu vaccines are not currently licensed for use in the U.S.

Mist or shot?
Another option is to produce live attenuated vaccines. (FluMist is the live attenuated vaccine currently licensed in the U.S.) With live attenuated vaccines, hundreds of doses per egg can be created. The drawback? Live attenuated vaccines aren’t currently used for children under age 2, asthmatics or the elderly.

PREPARING FOR THE STORM

The relatively mild H1N1 flu outbreak in the spring was essentially a two-week dress rehearsal for emergency preparedness and crisis management for Johns Hopkins and other large institutions.

At Hopkins, the mostly smooth rollout of prevention and preparation measures included broadcasting guidance on flu prevention hygiene, issuing travel guidelines, monitoring student health and creating a temporary flu infirmary for students (which wasn’t ultimately needed). The crisis team is now fine-tuning the plan, according to Jonathan Links, PhD ‘83, deputy director of CEPAR (Office of Critical Event Preparedness and Response) and an Environmental Health Sciences professor.

On the operations side, he says the key issue is continuity of academics and research if one or more campuses are forced to close for an extended period of time. As only essential personnel will have access to buildings during a closure, Hopkins officials are counting on distance education programs, online data storage and information systems backup to continue programs.

Administratively, Links says, the primary challenge now is clarifying the “decision-making process,” that is, determining who is involved in critical decisions, like closing dorms or canceling classes. “We need to make sure everyone understands the process,” Links says. “You don’t want to figure it out on the fly as you’re attempting to make the decisions.”

For longer versions of these stories, go to: http://magazine.jhsphs.edu/flustories.
If public health is science painted with broad brush strokes, basic science is pointillism, the art of connecting infinitesimal dots. Public health engages with populations of people; basic science pores over populations of mosquitoes, cells and enzymes. But in a public health setting, the endgame for these bedfellows is the same—large-scale prevention of disease. So how does the study of mechanisms in cells and tissues at their most fundamental levels complement the public health mission to protect millions? The answers are myriad, all hinging on translation. As you’ll find in the case studies that follow, disciplines such as toxicology, biochemistry, molecular and microbiology, epidemiology, and biostatistics can endlessly inform each other, and lead to cross-fertilization, clues, predictions—and ultimately—solutions to the world’s most vexing health problems.
**Food Can Fix You**

The vitamin D story may have its origins on a Kansas farm, where a young boy helped his father raise pigs. Elmer Verner McCollum and his brother were given the runts of the litter and told that they could feed them as they chose, and keep whatever money the pigs would bring. The boys fed the runts milk, the runts became healthy, and the brothers made a profit.

Years later, as a biochemist, E.V. McCollum used an elegant methodology to answer questions about the basic science of nutrition. With methodical precision, he perfected what is now referred to as molecular nutrition, using lab rats on restricted diets to isolate properties found in foods.

As head of the Department of Chemical Hygiene at the Johns Hopkins School of Hygiene and Public Health, he collaborated with pediatricians and pathologists who wanted to study rickets in a laboratory setting. McCollum fed his rats cod liver oil, used for centuries in Europe to treat the bone disease. Their investigations led to the discovery of vitamin D, the fourth vitamin to be discovered.

But McCollum’s work extended beyond the laboratory. Dedicated to the dissemination of knowledge about nutrition and “protective foods,” he advocated tirelessly for putting milk and leafy vegetables on dinner tables. Over time, McCollum’s discovery was translated into a population-wide prevention program in the U.S.—the fortification of milk and bread with vitamin D. As a result, rickets was eradicated in this country.

McCollum’s department became part of what is now Biochemistry and Molecular Biology (BMB). Pierre Coulombe, PhD, the newly appointed E.V. McCollum Professor and BMB Chair, believes that McCollum’s work represents the mission of all basic scientists working in public health: “If you identify the chemical principle, if you can find the purified substance, that becomes the basis for a potential mass intervention.”

**Virus Plus Toxin Equals Cancer**

In China’s Jiangsu province, the rates of liver cancer far outpace the global averages, and its victims are far younger than elsewhere. At a population level, Jiangsu is an obvious outlier. “Any time you see a lack of uniformity in disease, it smacks you in the face, and you realize that there must be dramatic exposures to something in the environment,” says chemist and toxicologist John Groopman, PhD, chair of Environmental Health Sciences (EHS).

Thirty years ago, Thomas Kensler, PhD, a toxicologist and professor in EHS, considered the questions posed by the epidemiological research in Jiangsu, and he began to look for answers on a molecular level. Hepatitis B (HBV), which is four times more prevalent in Asia than in developed nations, was part of the explanation.

Could there be a chemical agent, a “DNA damage product,” operating in conjunction with HBV? Kensler and Groopman identified just such an agent, which works with HBV to create mutations in a tumor-suppressor gene known as TP53—the most commonly mutated gene in all human cancers. The agent, aflatoxin, is a product of moldy crops such as peanuts and corn, is ubiquitous in Jiangsu, and can’t be cooked out of food. By itself, it can mutate cells in small measure. But a person who has biomarkers for both risk factors—aflatoxin exposure and HBV—has 60 times more risk of developing liver cancer than someone who has neither biomarker.

The translation of these basic science discoveries is a two-pronged population-wide prevention plan that incorporates vaccinating against HBV at birth, and communications programs that help Jiangsu residents to consume less aflatoxin. Both efforts are now under way.

The toxicologists are also exploring ways to diminish the impact of unavoidable exposure to aflatoxin. With a clear molecular target—the antioxidant signaling pathway Nrf2, which eliminates toxins and protects against mutations to TP53—they’ve conducted clinical trials involving drugs and compounds that include oltipraz, chlorophyllin, sulforaphane and tea made from broccoli sprouts. All compounds were found to significantly reduce DNA damage. “And even a modest reduction in DNA damage,” says Groopman, “can confer quite a large reduction in cancer.”
Hunch to Bench to Vaccine

One of the questions that epidemiology answers is, “Who is at risk?” After epidemiologists identify risk factors and biomarkers for a disease, basic scientists try to understand the mechanisms behind the markers. They “go molecular” to answer the questions, “What is going on in the cells and tissues?” and “How does that mechanism work?”

“Cervical carcinoma is a beautiful example of this,” says Diane Griffin, MD, PhD, the Alfred and Jill Sommer Professor and Chair of the W. Harry Feinstone Department of Molecular Microbiology and Immunology (MMI). “Epidemiology identified that having a particular infection was a risk factor for cervical cancer, and basic science is helping us to understand it.”

Cervical cancer is the most prevalent form of cancer among women in developing countries. According to Keerti Shah, MD, DrPH ’63, MPH ’57, an MMI professor, clinicians have suspected for more than 100 years that there might be a connection between cervical cancer and a sexually transmitted infection; the cancer seemed most prevalent in women who had many sexual partners.

In the late 1980s, Shah was approached by two virologists who were looking for a virologist who could help them link a human papillomavirus (HPV) to cervical cancer.

The meeting led to a long and productive collaboration. Building on work by German scientist Harald zur Hausen, who won the 2008 Nobel Prize in Medicine for his work in cervical cancer, and using new recombinant DNA technology, Shah and his collaborators conducted comprehensive epidemiologic studies that established the relationship between HPV and the cancer. They published a paper that proposed the causal relationship, and seven years later, Shah and colleagues had proven that nearly all cervical cancers—in all parts of the world—are caused by HPV. Furthermore, they showed that cervical cancer is caused solely by a virus.

The current translation of these discoveries is a mass intervention, an HPV vaccine that will prevent the cancer-inducing infection.

Resisting Malaria

In the battle against malaria, which kills more than one million people every year, resistance is an important consideration, and it wants molecular solutions, says Griffin, founding director of the Johns Hopkins Malaria Research Institute (JHMRI).

One of the strategies for protecting human populations against malaria is to kill the mosquitoes that transmit the malaria parasite to humans. For this work there is insecticide. But what happens when the mosquitoes become resistant to that insecticide? More malaria. Using molecular population genetics, microbiologists at JHMRI are studying ways to overcome insecticide resistance.

Also vexing in malaria work is the incidence of resistance to drug therapies. Ideally, antimalarial drugs restore health to a malaria-infected person by killing the Plasmodium parasites in his body. For decades chloroquine was a very effective treatment against malaria. However, the parasite has developed a widespread resistance to that drug, and there are reports of resistance to newer artemisinin-based antimalarials. To build a better drug, basic scientists at JHMRI are at work now to better understand what happens inside the cells when antimalarial drugs are resisted.

And then there are transgenic mosquitoes, insects that have been exquisitely engineered by scientists to resist infection by the parasite. MMI professor Marcelo Jacobs-Lorena, associate professor George Dimopoulos and assistant professor Jason Rasgon are involved in Plasmodium-resistant mosquito research (see page 15). Ideally, the modified mosquitoes would not only survive in the wild but replace the wild-type mosquitoes because of a selective advantage.

Defense of the Lung

The lung disease known as chronic obstructive pulmonary disease (COPD) is the fourth-leading cause of death in the U.S. An irreversible condition, it results from environmental insult—mainly cigarette smoke but also air pollution—and as pollution and smoking rates increase, so do the death rates from COPD.

In our bodies, there are hundreds of antioxidant genes that can be switched on to prevent cell damage in the event of environmental insult or stress from oxidants such as cigarette smoke or pollution. According to Shyam Biswal, PhD, EHS associate professor, all of our lungs’ defenses—the entire pulmonary antioxidant network—are regulated by signaling pathway Nrf2, the same one targeted by Groopman and Kensler.

The pathway not only protects our lungs but regulates many carcinogen-fighting enzymes throughout our bodies.

“With such a complex environmental stress response network as Nrf2,” Biswal
asks, “how come people are still getting lung disease?” Further vexing is the question of why 20 percent of ex-smokers develop COPD, sometimes years after quitting.

In their attempts to answer such questions, Biswal and colleagues conducted experiments and found that COPD was linked with significantly reduced levels of Nrf2 activity. The research has yielded insight into lung conditions that extend beyond COPD. With Patrick Breysse, PhD ’85, MHS ’80, director of the Center for Childhood Asthma in the Urban Environment, Biswal is working to explore the role of Nrf2 in asthma.

In fact, drug development is in progress, as Biswal’s lab explores how “small molecule activators” can spur the Nrf2 pathway to “turn on” and tackle more toxicants. Biswal, Breysse and colleagues are hopeful that asthmatics will soon have access to a therapy that will kill the symptoms and halt the disease.

Biswal’s lab may soon make another big leap with its explorations into the lung health/Nrf2 partnership. The lab has found that the pathway is important in the body’s defense against lung infection, which can lead to pneumonia, one of the world’s most ruthless killers. An intervention that stimulates the gene and protects against pneumonia would be a great advance in public health.

**Is the aging of cells merely an accumulation of damage resulting from insult after insult over time, or do age-related “events” also make cells particularly susceptible to acute insult? A team of reproductive biologists, a cell biologist and a genome biochemist want to know.**

**The Mysteries of Age**

Last summer, BMB professor Barry Zirkin, conducted an experiment using people, not rats. “We put a bunch of scientists in a room to see what would happen,” he says. “As usual, things happened.”

What resulted was a collaboration among BMB reproductive biologists, a cell biologist and a genome biochemist, all of whom want events make cells particularly susceptible to an acute insult. These scientists—Haolin Chen, Mike Matunis, Paul Miller, Bill Wright and Zirkin—are writing a project program grant that would fund studies into both questions.

The team studies the mechanisms that affect the cell’s ability to protect and repair itself as it ages. They research the aging cell’s increased susceptibility to stress, its decreased ability to fend off insult and its diminished skill at repairing itself. Among its participants, biochemist Paul Miller, the grant’s principal investigator, is an expert in genome integrity and DNA repair; Zirkin, a reproductive biologist, knows stem cells and Leydig cells, which provide a tractable system for genome chemistry. “Studying genome integrity with these elegant methods [used by Miller] is not something a reproductive biologist would have thought about doing on his own,” says Zirkin. “It’s the coolest chemistry I’ve ever seen applied to a reproductive cell.”

Aging is a field rife with questions that beg to be explored. There is no real consensus, even, on what it means for a cell to be “aged.” How do we measure aging? “It differs from type of cell to type of cell,” says Zirkin. Do stem cells age? “We think they do.” Can we prevent cells from aging? “We can in a rat.”

The goal of BMB’s forays into the basic science of aging is intervention that would prevent or postpone conditions afflicting the elderly—osteoarthritis, Alzheimer’s, decreased cognition and vitality, to name a few. Zirkin credits the public health mindset with guiding his own and the team’s research toward this kind of translation.

“You get seduced here,” says Zirkin, “and you ask yourself, ‘Is this basic science applicable to a population?’ ”

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**JOHNS HOPKINS PUBLIC HEALTH / SUMMER 2009 29**
When scores of college and university presidents and chancellors agree on any one issue, it’s bound to garner notice. But when the subject is college binge drinking, and the thing they agree upon is to sign a Web pledge created by a group that encourages debate about lowering the minimum drinking age, the media firestorm that follows is almost a fait accompli. Such is the case with the Amethyst Initiative, a concept created by John M. McCardell, Jr., president emeritus of Middlebury College in Vermont.

On its website, the Amethyst Initiative boldly proclaims, “Twenty-one is not working.” The Amethyst pledge argues that since Congress pressured states to raise the minimum drinking age to 21 in 1984, a culture of off-campus “clandestine ‘binge drinking’” has developed and students have not significantly changed their behavior. (Public health researchers dispute both points.)

It is a startling argument, one that caught the attention of The New York Times, The Wall Street Journal, and more than 100 newspapers and media outlets. It also moved 135 college and university presidents—including former Hopkins President William R. Brody—to sign the pledge. And though some presidents, including Brody, signed to pledge to raise issues and seek solutions outside of changing the drinking age, as McCardell notes, “I would say many of the signatories of Amethyst do, in fact, support lowering the drinking age.”

But, would lowering the drinking age help cure or only exacerbate the problem?

There’s no doubt that binge drinking is a huge problem on college campuses. According to a 2008 National Institute on Drug Abuse (NIDA) survey, 41 percent of college students said that in the two weeks prior to their interview they had engaged in binge drinking, defined as having consumed five or more drinks within two hours.

But it’s not just binge drinkers who are creating problems. Alcohol use in general by students has created a crisis. The National Institute on Alcohol Abuse and Alcoholism (NIAAA) figures show that alcohol consumption annually plays a role in the deaths of 1,700 college students, 599,000 unintentional nonfatal injuries, 696,000 assaults and 97,000 sexual assaults, including date rape. Given those horrifying numbers, one can understand why college administrators are anxiously looking at new strategies to attack these issues.

But is lowering the minimum legal drinking age (MLDA) the answer? Bloomberg School faculty who’ve studied the problem are unanimous in their response:

No.

“I’ve not seen one shred of evidence that allowing an earlier onset of legal drinking in 18- to 20-year-olds will have any positive impact on them,” says Debra Furr-Holden, PhD, an assistant professor of Mental Health who specializes in drug and alcohol dependence epidemiology. Furr-Holden’s comments echo those of her colleagues: The data show that raising the drinking age from 18 to 21 has had numerous public health benefits, which investigators fear will greatly erode if the drinking age is lowered.

The National Highway Traffic Safety Administration (NHTSA), for example, has estimated that 900 lives are saved annually due to MLDA laws, with more than 25,000 lives saved since 1975.

Researchers have confidence in their arguments because the move has been so well studied. In the 1970s, partially in response to the lowering of the voting age to 18 in 1971, 29 states dropped their MLDA below 21 between 1970 and 1975. Studies done in the immediate aftermath showed a significant jump in teenage auto accidents. Pressure came
from citizen groups to push the MLDA back to 21. That happened under the Uniform Drinking Age Act of 1984, which was a great research opportunity,” says David Jernigan, PhD, associate professor of Health, Behavior and Society, and one of the country’s foremost experts on alcohol public policy.

The reason the Act was an epidemiological goldmine is that it wasn’t implemented all at once. In fact, Congress left it up to the states whether to change their laws or not. The cutlass the feds held over their heads was slashing 10 percent of a state’s annual federal highway funding if it didn’t comply. The resulting variations between states—some such as Washington and Pennsylvania had age 21 minimums on the books since the 1930s, some moved from 18 to 21 in 1984, while others such as Wyoming and South Dakota didn’t fully go to 21 until 1988—allowed “so many natural experiments, easy comparisons that public health researchers could make,” says Jernigan. The resulting sophisticated, quantitative analysis has continued for decades. “There have been literally hundreds of studies that have looked at the law,” he says. “The preponderance of the evidence is clear: These laws have saved thousands of young people’s lives.”

College administrators are, understandably, concerned with those they’re paid to protect, namely the nation’s roughly 18 million college students. They look at the devastation alcohol is creating on and off their campuses, and think there has to be a better way, especially because so many of their students started drinking in high school. NIDA statistics show that 72 percent high school seniors have consumed alcohol at some point in their lives. “But the law says ‘don’t drink,’” notes John McCardell. “How can we say this law has been effective?”

Public health researchers tend to look at the larger picture, including the rest of the age 18 to 20 population who never go to college but would also be affected by any national change in the drinking age (see sidebar next page). These young adults make up, by some estimates, nearly half of the entire demographic.

Looking at the overall group, Susan Baker, MPH ’68, says it is impossible to ignore the effect of raising the MLDA to 21. “The decrease in alcohol-related crashes involving drivers [under 21] was far greater than in any other age group. It dropped fatal crashes,” notes Baker, a Health Policy and Management professor and co-director of the NIAAA’s Training Program in Alcohol, Injury and Violence. Conversely, she predicts, “If you lower the drinking age, young people are going to drink and drive more and crash more and kill more people and not just themselves.”

The numbers bear out Baker’s assessment. According to the NHTSA, between 1984 and 1998, fatal crashes involving drunken youth dropped 61 percent. Driving after binge drinking dropped 45 percent, while binge drinking itself fell 22 percent.

That last statistic is of particular interest to researchers. The claim that binge drinking suddenly showed up on campus when the MLDA was raised is, in David Jernigan’s opinion, patently false. “Show me the evidence that that’s something new,” demands Jernigan, adding that in more than 25 years of research, no such data has ever crossed his desk. Quite the opposite. “Binge drinking has always been there,” he adds. “That’s what we battle here, that’s true. But 21 didn’t create that.”

In fact, Jernigan says it may help combat it. It’s hard to argue that, nationwide, increasing the MLDA to 21 didn’t alter behavior patterns. In the first seven years after the new drinking age was rolled out, Jernigan notes, the number of 18- to 20-year-olds who said they were currently drinking dropped from 59 percent to 40 percent. Though that decline reversed itself a bit by the turn of the millennium, it was still significantly below pre-MLDA 21 levels.

Similarly, there was an on-campus impact, especially with regard to drinking and driving. From 1982 to 1991, covering the transition period, students who reported driving after consuming several drinks dropped by 27 percent.

Given all this data, Jernigan is asked how he feels about Amethyst’s claim that “Twenty-one is not working” on college campuses.

His answer is surprising. “I would agree. Twenty-one isn’t working.”

He goes on to explain, “The reason it isn’t working is because the rest of the environment completely undermines it. We set that law out there by itself as if it’s supposed to do the whole job. Of course, it’s not.”

Jernigan points to the drinking stats on campus as an example of where MLDA 21 needs help. The law didn’t do much to significantly change the overall prevalence of drinking. In 1991, 74.7 percent of all college students reported having a drink in the previous month. In 2007, it was 66.6 percent, still a vast majority. And binge drinking
numbers have hardly changed in 25 years.

But Jernigan insists that lowering the MLDA isn't the answer. Nor is alcohol education per se. "There's a naive belief among educators that you can educate your way out of anything. What the research has shown over and over again in my field is that alcohol education all by itself doesn't work," says Jernigan.

The disconnect between education and the surrounding physical environment is often too hard for college students to resist. "If you tell a person in a school room 'don't drink' and they walk outside to a neighborhood that's surrounded by bars, restaurants and convenience stores with posters telling them how wonderful [drinking] is, what educational program is going to be able to balance that level of 'positive' messaging?"

Even freshman orientations that include alcohol awareness components have limited effects. "The follow-up shows there's no difference in behavior," notes Jernigan. "That is what alcohol education finds over and over again. You get a difference in knowledge, but not a difference in behavior."

So is the situation hopeless? Not exactly. Jernigan says there are a few examples of universities and their communities who've joined forces to impact drinking, often spurred on by student alcohol-related tragedies. Frostburg State University was one such community. In November 1996, a freshman there died after consuming a minimum of six beers and 12 shots of vodka at a frat party. In 2005, alcohol-laden hazing by teammates nearly killed a field hockey player. And in February 2006, an intoxicated student reportedly vomited and choked to death in his off-campus home.

In response, Frostburg's leadership phased in a zero-tolerance policy for illegal alcohol consumption both on and off campus, including parent notification of student violators. Off-campus alcohol violators also had to face a university judicial board. Outside the university's borders, the school and the bars took aggressive action to enforce existing laws and curb policies that encouraged excessive drinking. The goal, according to Frostburg President Jonathan Gibralter, who arrived on campus in August 2006, was to alter the "culture of alcohol abuse." It appears to have worked; according to The Washington Times, Frostburg officials claimed that second offenders of the school's alcohol policies dropped by 89 percent the year after the new policies began on-campus, and off-campus citations fell 39 percent after Gibralter brought those offenders before Frostburg's judicial board.

Jernigan says Frostburg and the University of Delaware have worked with businesses surrounding their campuses to create the kind of controlled environment that can be effective. The key, he insists, is limiting

Though many question why adults under 21 can vote and join the military, but can't drink a beer, injury prevention pioneer Susan Baker says, "I just don't get that 'if you're old enough to fight for your country, you're old enough to put a harmful substance into your body.'"

Debra Furr-Holden, PhD, has made a career out of studying populations vulnerable to public policy. That's why she's concerned by talk about lowering the drinking age. So while college presidents are debating such a proposal, Furr-Holden is considering a group that's so far been left out of the discussion: Those in the affected age group who are neither in college nor employed.

Among those in this population—often poor and minorities—she notes, "this will be 100 percent to their detriment."

"We know for a fact that there's a relationship between access and consumption," says Furr-Holden, an assistant professor in Mental Health at the Bloomberg School. "When we remove the access barrier for these 18- to 20-year-olds who are not in college and are unemployed, these kids will have increased access with no interventions or services. And many of these kids are uninsured."

Furr-Holden, who received a five-year, $3 million Presidential Early Career Award for Scientists and Engineers in 2006 for her work studying how alcohol and drugs contribute to youth violence, has combed alcohol access points in Baltimore, Washington, D.C., and the San Francisco Bay Area to observe and survey youth behavior. Her findings are disturbing. "Forty percent of kids who frequent nightclubs and bars are not employed, not in college, and already have the beginning of pathology in the use of alcohol and drugs," she says.

In Furr-Holden's opinion, restricting access until 21 is crucial for protecting the young people who fall into this group. On one hand, she notes that most young drivers can't handle alcohol at all. "Kids who are 18 to 20 are 10 times more likely, with any blood alcohol content, to be involved in a crash. Even if they've had one drink," she says.

Then there's the fact that this is a population long primed by advertising and pop culture to think highly of drinking. A report by Dartmouth and University of Oregon researchers in the March issue of Archives of Pediatrics & Adolescent Medicine—which includes an accompanying editorial by Bloomberg School associate professor David Jernigan—notes a link between adolescents who wear alcohol-branded merchandise and the onset of a positive mindset regarding the use of alcohol.

“This study presents some of the strongest evidence to date that ownership of alcohol-branded merchandise is a powerful predictor of kids initiating drinking,” Jernigan says. “Self-regulation doesn’t work.”

“It’s interesting,” says Furr-Holden, of the effect of alcohol-related media on youth. “Very young kids—9, 10, 11 years old—report a very high level of harm from alcohol use. So if you ask those kids ‘How harmful is it if you have five drinks?’ they’ll say ‘Oh, that’s bad, you’ll be drunk.’ Ask that same kid when they’re 14 and they’ll say, ‘It’s not harmful. It’s fun.’”

Add in evidence that those who delay drinking or drug use until their 20s are far less likely to fall into the cycle of use, dependency, treatment and relapse, and it’s easy to understand why Furr-Holden is greatly concerned about any attempt to lower the MLDA. “The kids who most need the protection will get nothing but increased access,” she says.

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If there is to be a debate over the MLDA, researchers interviewed for this story say it has to be an honest one, with all the cards laid on the table. In the case of the Amethyst Initiative, that means questioning some of the group’s assertions and pointing out areas of impact the initiative has yet to address.

Of the former, perhaps most notable is Amethyst’s notion that lowering the drinking age is essentially an act of fairness and equity. “Adults under 21 are deemed capable of voting, signing contracts, serving on juries and enlisting in the military,” reads the statement signed by the 135 administrators, “but they are told they are not mature enough to have a beer.”

“I don’t buy that argument,” counters Sue Baker. “At a certain age, you go from junior high to senior high. So, if you’re old enough to go to senior high, you’re old enough to do drugs? I just don’t get that ‘if you’re old enough to fight for your country, you’re old enough to put a harmful substance into your body.’”

Jernigan, who is also a sociologist, points out that American society has consistently decreed that the passing of time allows the assumption of different responsibilities. “I don’t buy that argument,” counters Sue Baker. “At a certain age, you go from junior high to senior high. So, if you’re old enough to go to senior high, you’re old enough to do drugs? I just don’t get that ‘if you’re old enough to fight for your country, you’re old enough to put a harmful substance into your body.’”

Jernigan, who is also a sociologist, points out that American society has consistently decreed that the passing of time allows the assumption of different responsibilities. Eighteen-year-olds “can’t run for Congress, for president, and in a lot of states can’t rent a hotel room,” he notes. “We have lots of different ages of majority. For sex crimes it’s 16. Smoking is 18. Alcohol is 21. They speak to our consensus as a society around what is going to protect our children and permit their development.”

Advocates for lowering the MLDA also contend that legalizing drinking for all college-age students will create a less clandestine, more controlled atmosphere where students stay or come on campus to consume alcohol as opposed to going to off-campus frat parties and bars. But Debra Furr-Holden, who has interviewed numerous young adults on their drinking habits, says that’s an unproven assertion. “We have no data to support that. I don’t think most of the on-campus opportunities for drinking are going to appeal to the population we most want to impact, which are heavy binge drinkers. They want to drink in ad-lib locations; bars where excessive drinking is allowed, clubs, fraternity and private parties … it’s just not going to appeal to the most problematic of the group.”

Phil Leaf, PhD, a Mental Health professor and director of the Bloomberg School’s Center for the Prevention of Youth Violence, is also skeptical. “If you’re not living on campus, why would you come on campus just to get alcohol? Unless it’s amazingly cheaper on campus, in which case you’re going to get some heat from the local bars.”

Left unaddressed by any effort to lower the drinking age are two major areas of concern. The first is the 25 percent of college students who, according to the NIAAA, report that their academics are suffering because of alcohol use. The second is the potential impact that lowering the MLDA to 18 would have on high schoolers and their underage friends. “You tend to know people closer to your age than not,” says Leaf. “Some of the people in high school will be 18 in their senior year. It increases access just because of relationships with people who will legally be able to purchase.”

And that access, says Jernigan, could guarantee that some kids will never get to college, or at least not to the college of their choice. “Human brains, as it turns out, are not mature until the early 20s. The research that’s been done on 16- and 17-year-olds [shows that] heavy drinking in that period leads to demonstrably lower test scores. And when they do MRI imaging of these kids, you see less activity in the brain than in nondrinking kids of the same age.”

Despite all these reasons for rejecting a lower MLDA, Jernigan says that the Amethyst Initiative can be the beginning of an important dialogue. He says it all depends whether college administrators truly want to solve the problem as opposed to getting off the hook for enforcing the existing law on their campuses. If it’s the former, he just wants them to be armed with public health facts.

“I’m really glad they care about the problem,” he says. “If this debate they’re calling for can lead to more widespread use of solutions that are based in science, then I’m all for the debate. But if it leads us down the road to increasing access to alcohol for a group that is hugely at risk of adverse consequences from drinking, then I think it’s all a big mistake.”
Keeping Howard Healthy

story by jonathan bor / photos by chris hartlove

Can an experimental program in the richest county in one of the richest states influence the nation’s health care reform agenda?

Eighteen months ago, Elizabeth McCarthy lost her auto sales job and the health insurance that went along with it. She and her husband, Jay, realized that if they got sick they’d have to reach into their own pockets or forgo care altogether. As it turned out, they did a little of both. Jay spent nearly $500 on medications to quell spring allergies that may have been exacerbated by the chemicals he uses in his furniture refinishing business. Elizabeth decided against seeing a doctor for a new prescription of the anti-anxiety drug she’d been taking for several years. And after slipping and cracking her elbow on her icy front stoop, she toughed out months of pain rather than pay for X-rays and treatment.

Photo: Elizabeth and Jay McCarthy relax with their dog Stoney outside their Howard County, Md. home.
Keeping Howard Healthy

The McCarthys are among the estimated 48 million people across the country without medical insurance. The problem was growing at a rapid clip even before the recent meltdown of the national economy, increasing by almost 8 million people between 2000 and 2008. Now, as the unemployment rate rises, health economists worry that the uninsured could swell by millions more.

The repercussions are well-documented: delayed care, large out-of-pocket expenses and over $40 billion nationally in uncompensated care that forces up premiums for those with insurance. An uninsured American receives less preventive care, gets diagnosed later and, once diagnosed, has a greater chance of dying than someone with insurance.

For the McCarthys, this was a reprise. They first lost coverage in the early part of the decade, when Elizabeth, now 50, lost her job selling homes in new developments. Not long after, she spent three days in the hospital where she incurred a $5,000 debt that still dogs the couple today.

Losing health insurance for a second time brought a new round of anxiety. But last fall, they were surprised to learn they were eligible for a new program called the Healthy Howard Access Plan. For a low monthly premium, the plan provides an array of primary care and specialty services along with subsidies for prescription drugs. Among the first residents to enroll in the program, the McCarthys are now part of an experiment to see if—in the absence of comprehensive national reform—a county going its own way can ease the health insurance crisis within its borders.

The richest county in one of the nation’s richest states—with a median household income of $101,000 and a 7 percent uninsured rate that’s less than half the national average—Howard may be more primed for success than most jurisdictions. County Health Officer Peter Beilenson, MD, MPH ’90, who during his 13-year stint as Baltimore health commissioner founded a universal coverage movement called Maryland Health Care for All, went to work on Healthy Howard soon after assuming his new post in February 2007. He says he’s first concerned with the “parochial” goal of bringing relief to thousands of uninsured Howard residents. But he hopes that success will ultimately have the broader effect of prodding state and even national leaders into action.

“Frankly, the reason we did this in Howard is that we’re tired of waiting for things to happen,” says Beilenson, who testified on the issue before a U.S. Senate committee in February. “We didn’t need anyone else’s approval to do this. But on the grander scale, our goal is to influence what comes out of Washington.”

David Holgrave, chair of the Bloomberg School’s Department of Health, Behavior and Society (HBS), calls Healthy Howard “a proof of concept.” Says Holgrave, PhD, who will be evaluating the program, “If this works in Howard County, an interesting next study would be to see if there are another five to 10 counties across the country that have wider ranges of income and challenges. They could serve as demonstration projects.”

The McCarthys were the sort of family that county leaders had in mind when they went about crafting their Healthy Howard Access Plan. Started in October 2008, it provides services to uninsured residents who earn too much to qualify for Medicaid but not enough to afford the high cost of individual coverage. To qualify, people must earn somewhere between 116 percent and 300 percent of federal poverty (or $25,000 to $66,000 for a family of four), and pay $50 to $85 a month depending where in the spectrum they fall. Jay and Elizabeth McCarthy pay a combined $115 for dual coverage. (A staff member also helped them enroll their daughter in the state and federally funded Maryland Children’s Health Program, for which they had no idea she was qualified.)

Healthy Howard isn’t exactly health insurance, but a network of services that includes up to six primary care visits per year at the not-for-profit Chase Brexton Health Services clinic in Columbia, Md., and pro bono services from a bank of 200 specialists in 17 fields. With permission from a state regulatory commission, Howard County General Hospital has agreed to provide free hospitalization to members, forgoing the usual procedure under Maryland’s all-payer system of pursuing collection from uninsured patients. Johns Hopkins Hospital and the Maryland Shock Trauma Center have stepped up too, agreeing to see patients who need care unavailable at Howard County General. The program transfers members requiring very costly treatment to the more inclusive Maryland Health Insurance Program (MHIP) by paying down the required $4,500 deductible. Then they are left to pay the somewhat higher MHIP premium.

There are notable limitations: Healthy Howard provides no coverage outside the area, so members who get sick or injured while traveling are out of luck. Also, it doesn’t cover the county’s undocumented immigrants, who may number in the thousands. But it may be the only public program in the nation to require that enrollees meet periodically with health coaches, who help them set and meet goals such as losing weight or lowering blood sugar through diet and exercise. In this way,
“The philosophy is that health care is a human right but also a responsibility, both financially and behaviorally for participants.”

— Peter Beilenson, Howard County Health Officer

the Howard plan is partly an experiment in prevention—an effort to see if the county can offset costs by helping residents forestall ailments that are expensive to treat. “The philosophy is that health care is a human right but also a responsibility, both financially and behaviorally for participants,” says Beilenson.

Beilenson has sown seeds of reform since the late 1990s when he founded the Maryland Health Care for All Coalition, a small collection of doctors and health policy experts who agitated for statewide universal health coverage at a time when the momentum nationally seemed to have stalled out (see sidebar below).

That work caught the eye of Howard County Executive Ken Ulman. Two years ago, he tapped Beilenson to become his chief health officer and transform the county into a model public health community. Beilenson’s central challenge: Craft a health care plan for some of the estimated 20,000 residents without insurance.

Its architects drew ideas—if not the precise details—from San Francisco, which covers people making less than 400 percent of poverty but relies on an existing network of public clinics and hospitals. They also looked to Muskegon, Mich., which offers a health access plan that covers a limited number of clinic visits and is funded in equal shares by employers, members and the city.

The Howard County reformers ended up with a homegrown plan that taps the altruism of community specialists and makes use of a clinic, Chase Brexton, with long experience delivering care to uninsured and marginally insured patients. And it requires nothing of local businesses.

“We’re not obligating businesses that for the most part are doing the right thing, and we didn’t want to compete with those already offering health insurance to their employees,” says Elizabeth Edsall Kromm, PhD ’08, an adjunct professor in HBS at the Bloomberg School, who directs Howard County’s Bureau of Healthy Community Development.

Also, neither the San Francisco program nor the Muskegon program required health coaching, a concept that some insurers have applied to members with chronic

Moving Together Toward Reform

When Peter Beilenson founded the Maryland Health Care for All Coalition in the late 1990s, he looked to Vincent DeMarco (right), now an adjunct assistant professor in HBS, to lead the charge. A tireless grassroots organizer with a proven track record, DeMarco had waged winning campaigns for gun control and an increase in the state’s tobacco tax.

As president of the health care coalition, DeMarco used his organizing skills to win the endorsements of more than 1,100 businesses, labor unions, nonprofits and religious groups. The health plan has gone through several versions, the most recent one introduced in this year’s legislative session.

In its present form, the plan would expand Medicaid to cover nonparents earning less than 200 percent of federal poverty or parents with incomes under 300 percent of poverty. Uninsured people making more than that would be required to buy coverage on the open market, but policies would, in theory, be made cheaper through the creation of a giant statewide risk pool. And the state would provide catastrophic “reinsurance” that would cover most health care expenses exceeding $35,000—a measure that would reduce premiums while safeguarding families from medical bankruptcies.

The plan would also create an institute that would identify best practices for various medical conditions and establish reimbursement rates accordingly. All told, it would cost an estimated $3 billion a year, financed by the 2 percent payroll tax and increases in levies on cigarettes and alcohol.

DeMarco didn’t expect passage this year and doesn’t even expect it next year. But he remains patient and optimistic. “We’ll make it an election issue in 2010 and pass it the next year in 2011,” he predicts. “We’re a very cautious, practical organization.”

Jonathan Weiner, Bloomberg professor in HPM and one of the plan’s original authors, notes that states enacting their own plans could provide a path to national reform.

“Any Obama plan is likely to build upon state plans,” says Weiner, DrPH ’81. He also expects the president to leave some options open to the states no matter what he proposes. “Do you wait for the feds or move forward? Our goal is to say yes and yes. Move forward but hope that the president will move ahead.”

— JB
illnesses. But Howard County is betting that coaching for everyone, regardless of health status, will pay dividends in the long run.

“Good health coaching is rooted in the development of a trusting, caring relationship between patient and coach and allowing patients to drive the agenda to a large extent,” says Glenn Schneider, director of health planning and policy for Beilenson. “Long term, our coaching process will hopefully result in healthier patients—ones that have better health outcomes and avoid costly hospital stays.”

According to Holtgrave, there really is no model for what Healthy Howard is doing, so the county may provide the first data of whether coaching saves costs in the long run. In theory, coaches can hold members accountable for complying with mutually agreed-upon plans and can terminate members for nonadherence. But Maureen Pike, a registered nurse who is one of four coaches with the plan, says she and her colleagues expect to function more as guides than enforcers, and don’t expect to cut many patients loose.

“We’re not telling people what to do,” she says. “The goal is to sit down with people and get to know them. What is it about their health they’d like to work on?” Ultimately, they will look for signs that people are trying, whether or not they achieve hard results.

So far, coaches have met with Howard County residents who struggle to gain or lose weight and members so overwhelmed by family stresses they can’t begin to think about their health. They have linked patients to social service agencies that can help them pay bills, arrange for the care of an elderly parent, and find cheaper gym memberships.

Not everyone supports the new initiative. Although Howard County Councilman Greg Fox has derided many elements of the plan (including premiums that he says may cost the average healthy resident more than simply paying out of pocket for care), he reserves his harshest criticism for health coaching. Fox, who as the council’s lone Republican cast the only dissenting vote, said he could hardly believe his eyes when he read a handout describing suggestions a health coach could make. “Meet with a dietitian to

Although they are two of the 48 million Americans who lack health insurance, Elizabeth and Jay McCarthy can still see their primary care doctors and specialists thanks to the Healthy Howard Access Plan. “It’s peace of mind,” says Jay.

prepare at least four healthy dinners? Join a gym? You’ve got to be kidding!” Such advice, he says, strikes him as mere common sense, hardly worth the salaries paid to the coaches.

But Elizabeth McCarthy says she could really use a helping hand in meeting personal health goals such as controlling anxiety and losing weight. “I’m having trouble on my own implementing a diet that the whole family can get on board with,” she says. “I don’t think doctors always have time to explain, to help you implement things into a plan.”

When Howard held enrollment sessions in libraries and other venues last fall, about 1,100 people showed up to apply. This was half the first-year goal of 2,200 people, and the health department quickly discovered that most of them qualified for Medicaid and other programs they didn’t know they were eligible for. By early June, the county had enrolled more than 200 people in Healthy Howard and had helped 2,400 others sign up with federal or state programs for which they hadn’t known they were eligible.

Fox cites the relatively small number of people enrolled in Healthy Howard as evidence that the program isn’t worth the $500,000 the county is spending on it in the first year. (The Horizon Foundation has kicked in an additional $500,000 toward the program’s annual budget of about $1.5 million, with remaining revenues expected to come from patient fees.)

But Beilenson argues the county is merely doing the right thing by linking residents to insurance that doesn’t cost the county anything. “It’s really an indictment of the current system,” he says, noting that American health care is so “fragmented” that many people don’t know how it works.

In evaluating the program, Holtgrave will be asking many questions: What are its costs? What health problems do its members have upon entry? Are they receptive to their coaches? What, for instance, has happened to important markers such as blood pressure or body mass index since people entered the program? Healthy Howard isn’t large enough for a randomized trial comparing people inside and outside the program, so he plans a smaller descriptive study of a few dozen patients.

“This is really a pretty interesting proof of concept in Howard County,” Holtgrave says. “It’s an affluent county, and it’s a good test to see if you’re able to construct this provider of last resort. As we look at other counties, the size of the population may be larger and the health needs greater, but it’s good to see if you can prove the concept and then go forward.”

The McCarthys are optimistic that Healthy Howard will work for them. Already, Elizabeth has made an appointment for physical therapy that she hopes will help ease the pain of her arthritic back, and she expects also to see a podiatrist about a foot problem. Her primary care doctor is requesting prior medical records so he can decide how best to treat her anxiety. Jay has learned that his blood pressure and cholesterol levels are normal, and has talked to his doctor about additional tests that could determine if he’s suffered kidney or liver damage from the fumes he inhales at work. And both look forward to their first coaching appointments.

“Knowing that we have a health plan in effect means that if I get hurt, I can go get treated,” says Jay. “It’s peace of mind.” ♦