The *other* UNIVERSAL HEALTHCARE

'One Health' adherents reject the single-player system in favor of a multidisciplinary response to global maladies

Jeffrey G. Harris, MBA & Richard A. Skinner, PhD

Ask random passersby what they think of "One Health," and you're likely to get an assortment of brush-offs, blank stares, and nonsensical, if sincere, answers.

"Single-payer healthcare is @#$%&! socialism, pure and simple."

"I'm all for it — as long as it covers pre-existing conditions and I can keep my doctor."

"If you ask me, it's another sign that our healthcare system is going to the dogs."

Oddly enough, among those three assessments, the third might represent the most accurate characterization of the little-understood One Health concept. Thanks to our increasingly urban, increasingly interconnected global society, healthcare *is* going to the dogs — and to every other organism on the planet.

And not a moment too soon, Michael D. Lairmore would argue.

Lairmore, DVM, PhD, dean of the University of California-Davis School of Veterinary Medicine, is one of the world's most outspoken champions of One Health.

"One Health," in the words of the Centers for Disease Control and Prevention, or CDC, "is defined as a collaborative, multisectoral, and transdisciplinary approach — working at the local, regional, national, and global levels — with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment."[1]

Translation: Like it or not, all of us — two-legged, four-legged, eight-legged, or no-legged — are hurtling through the universe in the same somewhat leaky astronomical boat. What afflicts one species can, and often does, have ramifications for everyone (or everything) else on board. Accordingly, the scientific community would be foolhardy not to address threats to our collective wellbeing in a coordinated manner.

The threats, incidentally, aren't just theoretical. The CDC estimates that 60 percent of the infectious diseases that now afflict humans originated with animals and that 75 percent of emerging infectious diseases can be traced to other species. That's no small matter inasmuch as infectious diseases have been debuting at a rate of at least one per year since the 1970s.[2]

What's more, the diseases in question are by no means the epidemiological equivalent of paper cuts or runny noses. We're talking about the likes of Ebola, bubonic plague, dengue fever, swine flu, hantavirus, Zika virus, West Nile virus, and Severe Acute Respiratory Syndrome, or SARS, all of which can be deadly.

This plethora of potential pandemics has underscored the weakness of what could be dubbed a single-player system — one in which physicians worry about humans, veterinarians worry about animals, and environmental scientists worry about the air, soil, and water.

'It's important to all of us'

Lairmore, 63, has made One Health the cornerstone of his eight-year tenure atop the UC-Davis School of Veterinary Medicine, widely viewed as the best animal-health program in the United States, if not the world.[3]

"We have a very simple mission, which is a One Health approach," Lairmore said. "It's really that interface of animals, people, and the environment. We expect to lead veterinary medicine, which is what we are doing, but the important part that separates us out and definitely makes us unique is that we address societal needs."[4]

Lairmore has carried that same philosophy to the presidency of the Association of American Veterinary Medical Colleges, or AAVMC, which comprises 49 accredited veterinary schools in the United States, Canada, Mexico, the Caribbean, Europe, Australia, and New Zealand.

"I'd like people to understand that (One Health) isn't only important to animals; it's important to all of us," Lairmore said on a just-released edition of the higher-education podcast *Innovators*.

"We share the globe. We have a very small planet in the scheme of things. The threats that affect us — climate change, zoonotic diseases, human population growth, changing land use, the stress that's on the Arctic right now, for example — these are all problems that cannot be fixed with one discipline."

Lairmore wasn't always a One Health crusader. Early on, he fancied himself a modern-day James Herriot, the British veterinarian at the center of a series of best-selling books that eventually inspired two movies and a television series, *All Creatures Great and Small*.

"He was the reason I started my career in dairy and small-animal practice," said Lairmore, who spent two years in private practice after receiving his veterinary degree at the University of Missouri. "I wanted to *be* James Herriot."

Then, however, came a return to graduate school and an exposure to cutting-edge research. At Colorado State University in Fort Collins, where Lairmore earned a doctorate in experimental pathology, one of the major focuses was sheep-borne illnesses, including a subclass of retroviruses known as lentiviruses.

LISTEN IN

Michael D. Lairmore, DVM, PhD, dean of the University of California-Davis School of Veterinary Medicine and president of the Association of American Veterinary Medical Colleges, discusses the challenges facing the One Health movement in the latest edition of the higher-education podcast *Innovators*. The audio series, presented by Harris Search Associates, is available on the web at harrisandassociates.com and on leading podcast platforms such as Apple Podcasts, Libsyn, Google Podcasts, Overcast, Stitcher, and Spotify.

That's where Lairmore had his eureka moment.

"We were in the laboratory when my adviser brought us an electron micrograph of a virus particle," he recalled. "We all said, 'Well, that's the sheep virus,' because we knew the shape of it. But, it turns out, it was from a human — a human dying of immunodeficiency disease in San Francisco. That was when they first discovered that AIDS was caused by the same type of virus that I was studying in the laboratory.

"As you can imagine, my world changed overnight. We were brought into a world that needed to understand the knowledge and the information that we as veterinarians knew in the field of viruses."

Lairmore went to work for the CDC, where he was given the opportunity to study human T-lymphotropic virus type 1 (HTLV-1). It became the abiding focus of his research, which, in turn, helped secure his election to the National Academy of Medicine in 2010.

"Those early exposures — I didn't know it (at the time) — were really in a subject called 'One Medicine,'" Lairmore said. "Back then, that was the term coined — and incorporated later into what we now call 'One Health.'"

Specialization yielded separation

The notion of taking a holistic, interdisciplinary approach to the planet's wellbeing predated both monikers, One Medicine and its successor, One Health — by a few thousand years, in fact.

"It was known in ancient times that healers of both humans and animals often practiced similar arts," Lairmore said. Indeed, the concept appeared in Hippocrates' seminal *On Airs, Waters, and Places,* written in 400 BC.[5]

"It was only later that they became, in a sense, split."

One of the driving forces behind that split was increasing specialization, facilitated by — and encouraged by — advances in medical science.

"The value of (specialization) is that you know a subject very much in-depth," Lairmore said. "We can expect a cardiologist to know everything about the heart, for example. The problem is that many of the problems that we face in our society are really related to more complex issues that involve multiple factors, multiple disciplines."

Few scientists saw value in bridging the long-standing human-animal divide until the 19th century, when Rudolf Virchow, MD, a German pathologist studying porcine parasites, became interested in the linkages between human and veterinary medicine. According to the CDC, Virchow coined the term "zoonosis" to describe infectious diseases that pass between humans and animals.[6]

"Between animal and human medicine there are no dividing lines — nor should there be," he concluded. "The object is different but the experience obtained constitutes the basis of all medicine."

Through the work of other pioneering researchers, including William Osler, MD, a Canadian physician who is considered the father of veterinary pathology in North America, such thinking continued to gain standing into the 20th century.[7]

In 1947, James H. Steele, DVM, founded the Veterinary Public Health Division at the CDC. The division would play an important role in the medical community's response to zoonotic diseases such as rabies, brucellosis, salmonellosis, Q fever, bovine tuberculosis, and leptospirosis.[8]

Calvin Schwabe, a founding faculty member of the UC-Davis School of Medicine and an epidemiology professor at the university's School of Veterinary Medicine, was the first person to use the term "One Medicine" — in his 1964 book *Veterinary Medicine and Human Health*.[9] William B. Karesh, DVM, executive vice president for health and policy at EcoHealth Alliance, is credited with coining "One Health" four decades later.[10]

In recent years, the concept has earned the endorsements of a long list of national and global organizations — both governmental and nonprofit. Among them: the CDC, the American Medical Association, the American Veterinary Medical Association, the World Health Organization, the Wildlife Conservation Society, the U.S. Department of Agriculture, the U.S. Food and Drug Administration, the National Oceanic and Atmospheric Administration, the World Organisation for Animal Health, and the Food and Agriculture Organization of the United Nations.

Fill silos with grain, not knowledge

Despite the backing of such prominent entities, One Health has struggled to gain traction among rank-and-file practitioners. For whatever reason, the seemingly simple logic behind One Health hasn't spread nearly as rapidly as the pathogens it seeks to stymie.

"When I do One Health talks for veterinarians and I ask if people have heard of One Health, almost everyone raises their hand," Audrey Ruple, DVM, PhD, wrote in *American Veterinarian*.[11] "When I ask the same question in a room full of MDs, almost no one has ever heard of One Health. It's a message that our profession has done a really good job in communicating to each other, but we haven't been as great about spreading the word outside of our profession.

"I think many veterinarians see themselves as working in a silo rather than seeing how their work interlocks with the rest of the puzzle."

Unfortunately for One Health advocates, a knowledge of the concept doesn't guarantee *acceptance*, especially among health professionals steeped in the superiority of their respective fields.

"We (veterinarians) often find ourselves called, in a sense, to a problem, such as a foodborne-illness outbreak, but, in some cases, we're convincing our colleagues of our role in the equation," Lairmore said. "Sometimes, we are knocking at the door, trying to get into that equation."

Two long-running jokes, each more barbed than the wire fencing that surrounds many cattle farms, capture the professional tensions that occasionally arise between doctors who focus on humans and those who care primarily for animals.

Question: What do you call a veterinarian who knows how to treat only one species? Answer: A physician.

Question: What's the difference between a physician and a veterinarian? Answer: About $100,000 a year.

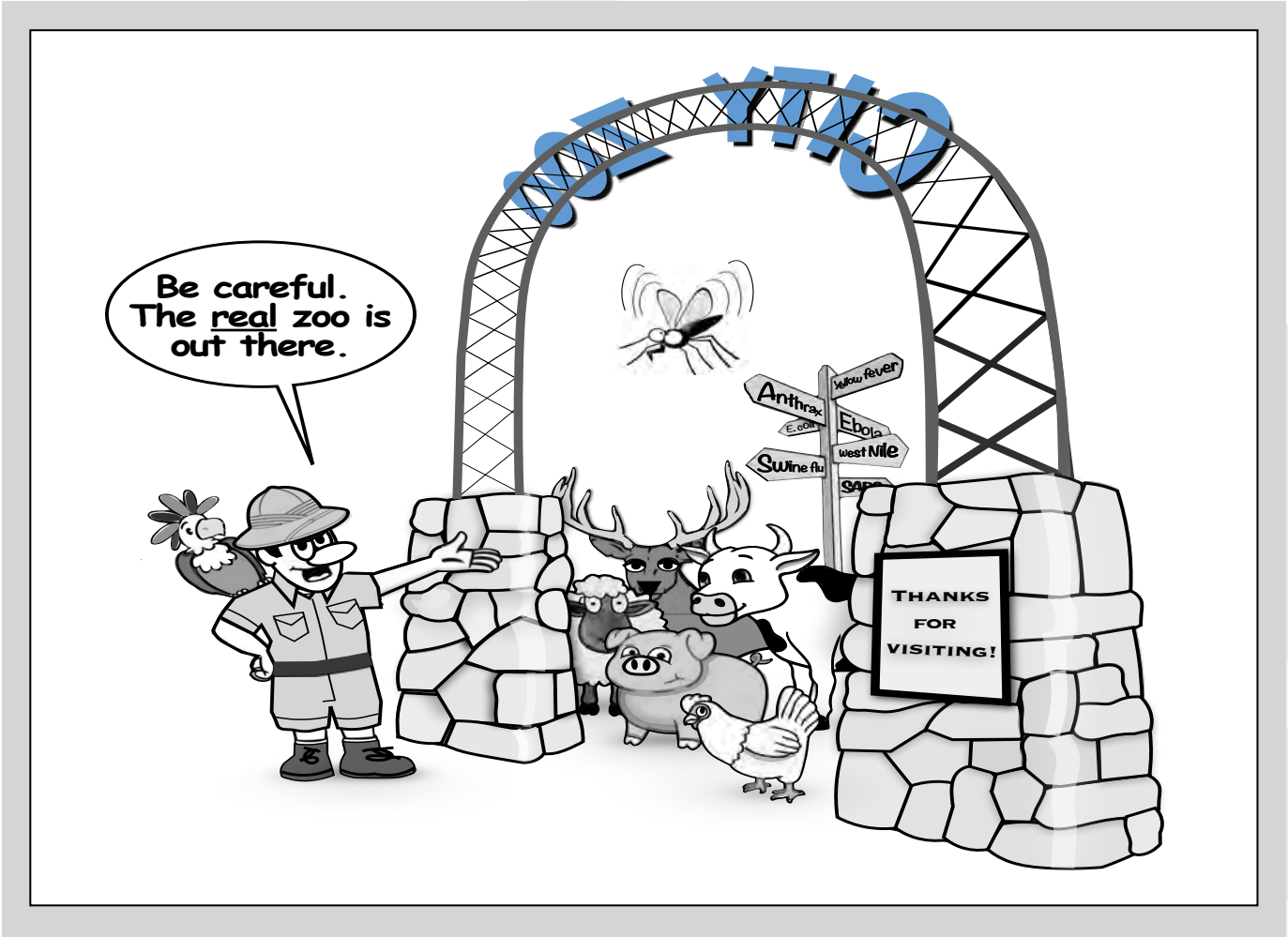
Science friction is all too real

Why do physicians and veterinarians sometimes find themselves at odds when it comes to the prevention and treatment of disease?

"One Health is a transformational strategy and is quite different from our traditional health care system," the American Veterinary Medical Association (AVMA) points out in its report *One Health — Responding to the Charge*. "This transformation can be threatening and goes against our current training and mindsets regarding medicine and health care. One Health might be categorized (unfairly) as 'fringe or alternative medicine' because it is non-traditional and its precepts may be considered too avant-garde."[12]

The AVMA has identified a number of specific "barriers" to One Health's advance.

- Because the "vast majority" of veterinary practices lack a standardized electronic medical record-keeping system, the profession has been unable to coordinate national monitoring or develop "an effective and comprehensive early detection system" for zoonotic diseases.
- The monitoring systems that do exist primarily cover "richer and developed countries," thereby ignoring the areas of the world "at greatest risk and with the highest probability of incubating the next emerging infection."
- Many healthcare providers, particularly in the human health arena, aren't focused on preventive medicine but rather clinical intervention, or "disease care," which, almost by definition, promotes "increasing specialization and fragmentation of the field" — not interdisciplinary coordination and collaboration.
- The bias toward highly specialized, highly individualized clinical care isn't likely to give way anytime soon, since "health professionals continue to be educated and trained in professional-centric academic institutions with seemingly little appreciation for the integration and coordination of disciplines, especially beyond their own professions."
- Similarly, the private-sector funders of major health initiatives tend to be motivated not by a desire to promote general wellbeing, a nebulous proposition at best, but rather by the imperative to declare victory in the war against a *particular* headline-grabbing disease or condition.



In the end, though, One Health's biggest challenge might come down to sheer numbers. Veterinarians are far outnumbered by physicians — roughly 10-to-1 in the United States.[13] The veterinary profession therefore lacks the heft to compel action by peer groups in human medicine and the health sciences.

Indeed, the veterinary profession is stretched so thin that it struggles just to keep up *its* end of the One Health bargain — to the extent there is one

"In the United States, for example, nearly 80 percent of veterinarians practice pet medicine due to societal demand," said Laura H. Kahn, author of the 2016 book *One Health and the Politics of Antimicrobial Resistance.* "While important, companion-animal medicine alone isn't enough. Without funding for animal health institutions and imperatives, there aren't enough jobs in veterinary epidemiology, livestock and wildlife health, or animal disease research to entice veterinary medical graduates to dedicate their careers to them."[14]

Meeting public expectations

As dean of the UC-Davis School of Veterinary Medicine and president of the AAVMC, Lairmore sees the challenges daily.

The United States has only 30 accredited veterinary schools, and the rest of the world has fewer than 20. The vast majority of those programs allow students to pick among various specializations, some of which are more essential to the One Health mission than others, at least in the short term

"At a school like ours, we have over 30 specialties in which students can become board certified," Lairmore said in the podcast. "We are training veterinarians for practice and in multiple areas — and in other fields as well, such as public health, research, and government."

Influenced by career interests, personal circumstances, and impossible-to-ignore economic realities (i.e., the prospect of earning a healthy paycheck vs. the prospect of accruing additional student debt), most newly minted DVMs in the United States choose to put their degrees to work immediately — usually at small-animal practices in urban and suburban areas — and thereby forgo the postdoctoral studies that could lead to difference-making careers in global pathological and epidemiological research.

"Graduating veterinarians do face choices," Lairmore said. "Many of them want to go into practice. We don't fault them for that. We understand that. But there are also great needs in our society."

Lairmore is employing multiple tactics to ensure that veterinary schools — and the veterinary profession as a whole — rise to the occasion before it's too late. He's seeking more financial support for students. He's lobbying for more funding for schools and for research. He's looking for ways to give incoming veterinary students and prospective matriculants — particularly those from historically underrepresented populations — a greater appreciation of the immense, if often delayed, professional rewards that can accompany research targeting seemingly intractable global problems.

As Lairmore sees it, he and his peers in academic leadership have no other choice.

"The next generation will demand of us: What did we do to be good stewards of our planet? We really need to reach across disciplines and get the unique knowledge and skills of veterinarians applied toward these big problems — and also link arms with our colleagues in other disciplines. … The public, they *expect* us to come together as scientists. They have high expectations."

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Harris Search Associates is a leading global executive search and talent advisory firm. Established in 1997 by Jeffrey G. Harris, the firm focuses on the recruitment of senior leaders to support the growth of the foremost universities, research parks, institutes, national laboratories, academic health centers, hospital enterprises, and organizations driving global innovation and discovery. Based in Dublin, Ohio, a suburb of Columbus, Harris Search Associates maintains regional offices in Dallas and San Francisco. The firm is a shareholder member of IIC Partners, one of the largest global retained executive search organizations, with 43 offices in 29 countries.

About the *Innovators* podcast

The Innovators podcast features timely conversations with global thought leaders in the areas of higher education, research, engineering, technology, and the health sciences. The audio segments, which give listeners an opportunity to learn from national leaders who are changing the landscape of innovation and discovery, are available on the web at **harrisandassociates.com** and on leading podcast platforms such as Apple Podcasts, Libsyn, Google Podcasts, Overcast, Stitcher, and Spotify.

About Jeffrey G. Harris, MBA

Jeffrey G. Harris is founder and managing partner of Harris Search Associates. He is an active member of CUPA-HR, the American Council on Education (ACE), the American College of Healthcare Executives (ACHE), and the Executive Search Roundtable, an association of professionals dedicated to the development of best practices in higher education talent recruitment. Mr. Harris holds a bachelor's degree from Ithaca College and an MBA from the University of Dayton.

About Richard A. Skinner, PhD

Richard A. Skinner is senior consultant at Harris Search Associates. He formerly served as president of Clayton State University in Atlanta and as president and vice chancellor of Royal Roads University in Victoria, British Columbia. Dr. Skinner also was senior vice president for programs at the Association of Governing Boards of Universities and Colleges. He holds a PhD and a master's degree in Government and International Studies, both from the University of South Carolina.

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