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Moustaïd-Moussa Ready to Lead Collaborative Institute for One Health Innovation

Definitions for the One Health concept in health have been put forward by several health care organizations, including the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO). The CDC definition recognizes that human health is closely linked to the health of animals and the environment they share. WHO defines One Health as an integrated and unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems.

Regardless of the definition, Naïma Moustaïd-Moussa, Ph.D., the inaugural executive director of a collaborative effort between the Texas Tech University Health Sciences Center (TTUHSC) and Texas Tech University (TTU) known as the Institute for One Health Innovation (IOHI), said they all advocate for the same basic ideas.

"One Health is really an integrated and sustainable approach that recognizes that the health of humans, animals, plants and the environment are all interconnected," Moustaïd-Moussa said. "That means if you want to have healthy humans, you need to make sure the environment around them is healthy. You want to make sure the animals are healthy and the food that animals and humans eat is also healthy, with minimal impact on the environment. We need to ensure that the animals we care for, such as pets, also are healthy because the health of humans, animals, plants and the environment are all interconnected and interdependent."

Moustaïd-Moussa is a Paul W. Horn Distinguished Professor of Nutritional Sciences at TTU, a professor in the TTUHSC Department of Cell Biology and Biochemistry (CBB) and founding director of TTU's Obesity Research Institute (ORI), which she co-directs with Jannette Dufour, Ph.D., a University Distinguished Professor and CBB chair. She said providing optimal patient care is at the heart of the One Health concept, especially for rural West Texas.

To achieve that goal, practitioners are to be educated about One Health approaches and consider factors that may affect a patient's health, such as their home, family and outside environment and community; conditions and factors to which they are exposed; and the quality and safety of their food.

"Health professionals need to consider other factors when advising patients," Moustaïd-Moussa asserted. "They also need to know about the environment the patients live in: are they living in drought regions? Is there dust and extreme heat? Are there allergens, pollutants or contaminants in the area? Are they eating foods or interacting with animals that may transmit diseases (foodborne or vector-borne, respectively)? Practitioners need to know all this information because they may advise their patients differently when considering the factors in the environment where the patients live, work or play."

Moustaïd-Moussa described two examples of patients being treated for cardiovascular disease who may require somewhat differing treatment plans because of where they live. One patient's condition may be amplified because they live in a rural area with extreme heat and dust or exposure to wild animals, while the second patient lives in an urban environment with poor air quality caused by heavy traffic and industrial processes.

"Whether you're in the Mississippi Delta or in West Texas with different challenging environmental conditions and exposures, we must take these factors into account," Moustaïd-Moussa said. "That will involve collaboration between people from different areas of expertise, such as an infectious diseases person collaborating with an environmental expert or an animal scientist with a physician. It requires us to work together to understand how to best advise the patient. That's how I define what One Health means for health care."

Though not currently applied broadly in medicine, Moustaïd-Moussa said the One Health concept is gaining momentum nationally and globally. She recently returned from a One Health meeting coordinated by Colorado State University and North Carolina State University that brought together individuals or institutions that have One Health programs, centers or institutes. Discussions focused on developing a North American One Health University Network that pulls expertise and synergizes efforts across One Health programs in North America to collaborate, train students and convey evidence-based information.

"I met several experts in One Health during this meeting, and I will be inviting some of them to serve as speakers at our IOHI events or as external advisors because we need to get different perspectives as we move forward," Moustaïd-Moussa said. "We're fortunate at TTU that we have a state funded surveillance and diagnostics lab at the Institute for Environmental and Human Health in the environmental toxicology department that provided impactful services during the COVID-19 pandemic, including testing and vaccinations. I hope that centers like this one — and others within the Texas Tech University System (TTU System) — continue to play a big role and collaborate with health care professionals in applying One Health approaches."

In addition to actively engaging in One Health networks with other universities and their researchers, Moustaïd-Moussa envisions expanding the overall TTU System IOHI beyond zoonotic and infectious diseases.

"Classically, One Health has been applied to infectious diseases; when you look at the WHO, the emphasis has basically been on One Health as it refers to transmission of infectious zoonotic diseases primarily from animal to human, but also foodborne and water pathogens to humans," Moustaïd-Moussa said. "But my vision for our IOHI is to expand this concept because we have expertise not only in infectious diseases, but also in other important areas where One Health must be applied, such as metabolic health, brain health and cancer."

Exploring collaboration opportunities is an ongoing endeavor between TTUHSC and TTU. About 18 months ago, each university's provost (Darrin D'Agostino, D.O., from TTUHSC; Ronald Hendrick, Ph.D., from TTU) and senior vice president for research and innovation (Lance McMahon, Ph.D., TTUHSC; Joseph Heppert, Ph.D., TTU) joined efforts around One Health. Relevant to this collaboration, the TTU strategic research plan includes advancing One Health, and the TTU School of Veterinary Medicine developed a Ph.D. program in One Health. These developments added momentum and opportunities to expand One Health across the TTU System.

A research committee comprised of faculty and administrators from both universities — including Moustaïd-Moussa — explored specific areas where TTUHSC and TTU had developed strong research expertise and recognition that would be further strengthened within the One Health concept through additional resources and faculty hiring. The committee identified four research themes (cancer, metabolic health, brain health/neurological diseases and zoonotic/infectious diseases) and then held a series of workshops that brought together researchers from across the TTU System to analyze these areas. The next step is to formalize the strategic plans for each of those areas and develop an overarching strategic plan for IOHI.

“We want to elevate and extend collaborations around these identified areas of strengths, but with the emphasis that we’re under the One Health umbrella, and stressing the necessity to integrate and apply One Health approaches in our research,” Moustaïd-Moussa explained. “For example, we've had the ORI that I had been co-directing with Dr. Dufour. She and I have closely worked to bring in people from various TTU System institutions and campuses to collaborate in our obesity and diabetes research. With the creation of IOHI, ORI members can expand their research areas to include One Health by looking into how environmental factors, climate conditions and food production approaches influence the development of obesity or diabetes in humans and potentially in animals. These are other examples of One Health research.”

Moustaïd-Moussa cited another example of the One Health concept being applied outside the infectious disease arena that involved a faculty member from animal science (TTU) collaborating with a faculty member in psychological sciences (TTUHSC). They worked together to obtain a grant from the National Institutes of Health that focused on using dog walking as a therapy for childhood obesity that will help both the child and the animal.

She said equine therapy, an important area in which TTU and TTUHSC already collaborate, is an example of One Health that is applied to human well-being and mental health.

“To me, that's One Health,” Moustaïd-Moussa said. “It doesn't have to be transmittable diseases or vectors of viruses from animals to humans. We have a lot of talent across the TTU System institutions related to human health, to basic clinical and community science, to plant, animal and environmental health and to infectious diseases, so we need to work together to elevate what we do to include an understanding of how environmental factors in our area and beyond affect our human health.”

Bringing that talent together under the IOHI will require much more work, time and effort, but Moustaïd-Moussa said it’s a great and unique opportunity she is ready to tackle with the current momentum and support of the TTU System.

“I'm very excited because that's the right way to go,” Moustaïd-Moussa said. “We don't do enough collaborating, and in today’s world, you cannot address health problems with one discipline. I'm very excited about facilitating and fostering these collaborations with support from the administrations of TTU, TTUHSC and our TTU System Chancellor because this will not only benefit the researchers and their careers, but also, ultimately, patient health will benefit from us finding new health care solutions.”

- 30 -