

One Health Une santé

One Health programs at Canadian universities with a veterinary college – 1. The University of Guelph

Peter Kelly

In 2026, a graduating class will cross the University of Guelph's (UofG) convocation stage to receive their Bachelor of One Health (BOH) degree, the culmination of > 3 decades of leadership to incorporate the interconnectedness of animal, human, and environment health into the UofG curriculum, an approach now widely known as One Health (OH).

The BOH degree is new, but the OH approach is not. Indigenous Peoples have long had a worldview of the interconnectedness of humans, animals, and the environment. This column has summarized the origins and lineage of OH (1,2). From Edward Jenner's use of comparative medicine to solve human health problems (linking human and animal medicine), to development of Veterinary Public Health (integrating public health and veterinary medicine), to Karl Frederick Meyer's advocacy for incorporating ecological thinking into veterinary medicine, OH developed in parallel with veterinary science.

In 2004, the Wildlife Conservation Society promulgated the "Manhattan Principles," a new approach to health under the "One World — One Health" framework. In 2019, this was updated by the "Berlin Principles," a Call to Action to reintegrate ecosystem health and integrity and address current pressing issues, including climate change and antimicrobial resistance (3).

Dr. Ole Nielsen, then Dean at the Western College of Veterinary Medicine (WCVM), documented the first case of mercury pollution in a Canadian river. Nielsen, who subsequently served as Dean at the Ontario Veterinary College (OVC) from 1985 to 1994, used an administrative leave and a federal grant in 1991 to investigate how the concept of health could be more widely applied to the environment. In 1992, Nielsen published an article in *The Canadian Veterinary Journal* advocating for an "Ecosystem Health" approach as a core component of veterinary medicine, apparently the first such advocacy in a veterinary publication (4).

At OVC, Nielsen had Ecosystem Health allies amongst colleagues such as Drs. David Waltner-Toews and Bruce Hunter. Together, they spearheaded the Ecosystem Health rotation for senior DVM students; a collaboration across Canadian veteri-

nary faculty that introduced students to complex health challenges, the solutions to which required a holistic approach not previously taught. This rotation is ongoing, taught by and for a range of disciplines, and provides veterinary students with skills such as systems thinking, transdisciplinarity, sustainability, and social and gender equity. Dr. Jane Parmley (WCVM '98), an Associate Professor in OH at OVC, recalls that the Ecosystem Health rotation was her first introduction to veterinary faculty and students at other universities and one of few opportunities as a student to learn from professionals other than veterinarians.

After David Waltner-Toews retired, OVC maintained a faculty position in Ecosystem Health. By the mid-2000s and with a solid foundation in Ecosystem Health, OVC embraced OH, with leadership on campus outside OVC, including former UofG President Franco Vaccarino (2014–2020), Vice-President (Research) Malcolm Campbell (2015 — present) and Provost (now President) Charlotte Yates. In 2016, Yates contacted the university's 7 Deans, including OVC's Dean Jeff Wichtel, regarding a new university fund to launch 3 new initiatives. Wichtel consulted with Cate Dewey, soon to be stepping down as Chair of the Department of Population Medicine at OVC, about a formal OH proposal, including creating a OH Institute (OHI), and a suite of undergraduate and graduate programs. That Institute would complement the Centre for Public Health and Zoonoses (CPHAZ), the agreement between the UofG and the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), the Guelph Institute for Development Studies, and the Guelph Institute for Environmental Research. Most importantly, the proposed OH Agenda included social sciences and humanities as full partners in achieving OH goals, and for the first time included OH projects and academic programs in colleges other than OVC. The proposal was approved in 2018 (5).

Establishment of the OHI was a critical first step in advancing the OH Agenda at the UofG and promoting a OH Community of Practice on campus. Dewey was inaugural director and Katherine Heyland was program manager, coordinating and advancing OHI's goals, *i.e.*, provide a focal point for

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the broad UofG community engaged in OH research, promote OH academic programming, and generate and promote the potential of OH research to solve health challenges and inform public policy.

A principal goal of the OH Agenda is to produce graduates that transcend traditional disciplinary silos to solve complex health problems. Therefore, curricula (graduate and undergraduate) were needed to train future leaders. Although Western University has an honours specialization in OH as part of their BSc in Health Sciences, there were no dedicated OH undergraduate or graduate programs in Ontario. The UofG OH curricula will produce OH leaders in conjunction with Western's honors specialization, University of Saskatchewan's undergraduate and graduate certificate program in OH, and the University of Calgary's concurrent DVM-MPH program.

Incorporating OH into the graduate school curriculum outside OVC was a challenge. Dr. Katie Clow, Assistant Professor in OH in the Department of Population Medicine at OVC, described it as trying to put something in a box that is not meant to be in a box. A program was needed that would break down barriers. The Collaborative Specialization in One Health is an intra-university graduate field of study providing multidisciplinary experiences for students from 5 of the university's 7 colleges and 18 of its departments (including Philosophy, Political Science, and Population Medicine). Students choose an advisor who has self-identified as an OH faculty member. Students submit a letter of intent outlining their interest in OH and how their research uses a OH approach. The trans-disciplinary nature of the Collaborative Specialization is designed to produce leaders who can conduct multidisciplinary research, mobilize knowledge, and inform policy. With an initial cohort of 5 graduate students from 2 colleges in 2020, in 2022 there are 13 graduate students from all 5 participating colleges.

Beyond the Collaborative Specialization, the introduction of a Doctor of Veterinary Medicine-Master of Public Health (DVM-MPH) degree program at the UofG was a logical next step, modelled on initiatives at US veterinary schools. This enables DVM graduates to complete their MPH degree in 1 additional year and is intended to support future graduates working in traditional clinical settings, plus those pursuing alternative careers in public or animal health.

Training veterinarians in public health is complementary since many veterinarians diagnose and control zoonotic and non-zoonotic communicable diseases that affect human health. DVM-MPH graduates are uniquely qualified to understand and respond to emerging zoonotic diseases, address global food system problems, and promote resilient and healthy communities. Applications for the DVM-MPH program were first accepted in early 2021.

The third and most complex addition to the OH curriculum at the UofG has been the Bachelor of One Health (BOH) undergraduate degree program, initiated in 2019 and led by the College of Biological Sciences. The primary goal is to create interdisciplinary problem solvers with a working knowledge of interactions among humans, animals, and their environments, and an appreciation of diversity and the social and scientific determinants of health.

Despite many initial concerns, Brian Husband, Professor and Associate Dean (Academic) for the College of Biological Sciences and tasked with leading program development, discovered universal buy-in. According to Heather Pollock, Manager Academic Programs in College of Biological Sciences, the program succeeded because faculty focused on how their departments could contribute to the "bigger picture." Despite noticeable differences among disciplines in the way faculty think, Pollock found this more interesting rather than the challenge that one might anticipate.

The new BOH program has 4 areas of emphasis: i) Disease, Complexity & Health; ii) Environment, Food and Health, Policy; iii) Economics and Health (PEH); and iv) Culture, Society and Health (CSH). The Disease, Complexity & Health emphasis ensures students have pre-requisites for veterinary and medical programs. Students in the BOH program take a core series of new OH courses each year including Concepts of OH, Case Studies in OH, Topics in OH, and Applications in OH. These courses are foundational; all BOH students are required to take them as well as core courses required for their areas of emphasis. Students can complete the BOH degree with or without the co-op option, or students outside the degree can complete a OH minor. The first class begins fall, 2022.

Overall, 8 departments in 4 colleges are participating in the BOH curriculum. Approximately 270 applications have been received (most have BOH as their first choice) for just 45 spots (with a 50:50 split between co-op and non-co-op). Among external organizations, Husband has never heard such buzz around a new program at the UofG. Ultimately, he says, the success of the program will be judged by where BOH graduates go, their influence and accomplishments.

Other OH initiatives on campus include introduction of OH principles into the DVM curriculum (in Health Management I and II), new OH modules in Health Management III (a pre-requisite for the DVM/MPH program), and a new OH module will soon be offered as a Year-4 rotation. One Health faculty hires are underway to support the new programs. A course titled "Pandemics: Culture, Science and Society" was offered for the first time in 2020 and the One Health Student Committee, spearheaded by graduate student Sydney Pearce in 2019, continues to be an engaged and driving force on campus and around the world with initiatives including the Exploring One Health Series that was launched in 2021 and completed by students from 9 countries.

Graduation of the inaugural class of BOH graduates in 2026 will be a watershed moment for OH at the UofG, and the culmination of years of work to incorporate OH into the curriculum. Furthermore, it will be a starting point for a more concentrated effort to train leaders to tackle future complex health challenges.

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