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Building capacity on One Health in the midst of the COVID-19 pandemic: Connecting disciplines in the Philippines

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Abstract

Background and Aim: There have been limited capacity-building activities on One Health in the Philippines. To contribute to capacity development in One Health, the authors conducted the first short course on One Health in the country for health, allied health, and collaborating professionals. This study aimed to review the preparation and implementation of the One Health course and describe the challenges and opportunities of conducting the course during the coronavirus disease 2019 (COVID-19) pandemic.

Materials and Methods: The course curriculum was developed by a multidisciplinary group of experts. The objectives for the course were as follows: (1) Describe the concept, scope, and applications of One Health; (2) identify social and economic factors influencing food security and safety, control of zoonoses, and combating antimicrobial resistance; and (3) describe the challenges and opportunities in applying the One Health approach to achieve better public health outcomes. Recruitment of participants was based on predetermined criteria. The 3-day course was conducted online through Zoom. Pre- and post-tests as well as the evaluation of the course were administered through Google forms.

Results: The 3-day online course was attended by 136 participants from 15 of the 17 administrative regions of the country. A multidisciplinary group of experts delivered a total of 11 lectures divided into the following sessions: (1) Fundamentals of One Health; (2) Interrelatedness of Human, Animal, and Environmental Health; and (3) Applications of One Health.

Conclusion: As the first One Health course in the Philippines, this 3-day course demonstrated the feasibility of conducting capacity-building on One Health for a multidisciplinary group of participants during the coronavirus disease-19 pandemic. It may serve as a model for similar and more in-depth courses on One Health for specific groups in the future and has set the stage for intersectoral communication and education, providing an avenue for collaboration for professionals in various disciplines, and facilitating the expansion of One Health network in the Philippines.

Keywords: capacity-building, intersectoral collaboration, multidisciplinary approach, One Health, Philippines.

Introduction

One Health is a holistic and multidisciplinary approach to addressing a wide range of health issues through policies, programs, and research to achieve better public health outcomes [1]. It highlights human, animal, and environmental health interrelatedness and the need for collaborative action among the different sectors to develop and implement effective control strategies [2–4]. The key areas of work where the One Health approach include food security and safety, control of zoonotic diseases, and combating antimicrobial resistance [1].

The One Health approach is being adopted by an increasing number of educational institutions globally to build the capacity for a competent global One Health workforce [5, 6]. Several capacity-building activities have been conducted for professionals in various countries, including the development of One Health short courses in universities [7–10], the establishment of One Health clinics, joint academic programs, and the conduct of more One Health-related research [11–13].

There have been limited capacity-building efforts on One Health in the Philippines, which may contribute to the persistence of diseases of public health concern [14]. To help address this challenge, The University of the Philippines Manila-College of Public Health, SEAMEO TROPMED Regional Center for Public

Health, Hospital Administration, and Environmental and Occupational Health developed and conducted the first short course on One Health in the Philippines for health, allied health, and collaborating professionals. This study aimed to review the preparation and implementation of the One Health course and describe the challenges and opportunities of conducting the course during the coronavirus disease 2019 (COVID-19) pandemic.

Materials and Methods

Ethical approval

Not applicable.

Study period and location

The study was conducted online in May 2021 through the University of the Philippines, College of Public Health in the Philippines.

Development of the short course

The course curriculum was developed by a multidisciplinary group of experts in human, animal, and environmental health, who were involved in One Health-related programs and research. Existing international One Health courses were used as a reference for the final course curriculum. Experts from different disciplines, including those involved in course development, were then selected to deliver a total of 11 lectures, grouped into the following sessions: (1) Fundamentals of One Health; (2) interrelatedness of human, animal, and environmental health; and (3) applications of One Health. The objectives for the course were as follows: (1) Describe the concept, scope, and applications of One Health; (2) identify social and economic factors influencing food security and safety, control of zoonoses, and combating antimicrobial resistance; and (3) describe the challenges and opportunities in applying the One Health approach to achieve better public health outcomes.

Recruitment of participants

A call for applications was sent through relevant government and non-government networks. Applicants were required to submit an accomplished form and a letter of endorsement from their unit/department head through a Google Form (Google Inc., CA, USA). Participants with research involvement were requested to submit a list of recent research and publications.

The course was designed for participants from health, allied health, and collaborating professions with relevant postgraduate degrees who were: (1) Affiliated with a higher education institution or a relevant government or non-government agency and (2) involved in teaching-training, research, and/or policy development.

Conduct of short course

The 3-day course was conducted online through Zoom (Zoom Video Communications Inc., CA, USA). Lectures were delivered through live video feeds, with the aid of slide presentations controlled remotely by the lecturers. Interactive tools such as polls and word clouds were used to elicit insights from the course participants during the lectures.

Pre- and post-tests

A 20-item multiple-choice questionnaire was developed from questions provided by each course lecturer. The questionnaire was administered through an online form at the start of the course as a pre-test to measure the baseline knowledge of participants on One Health topics. The same questionnaire was used as a post-test at the end of the course. Participants were given 30 min to accomplish each test. The mean and median of the scores of the participants for both tests were calculated to obtain percent improvement. The minimum and maximum scores between the two tests were also determined.

Evaluation of the course

Participants were required to complete an online evaluation form at the end of each session by answering preset questions with numerical feedback ratings and free text responses. An overall evaluation was also required at the culmination of the course.

Results

A total of 136 participants from various disciplines attended the course. The ages of the participants ranged from 21 to 64 years, with almost half (42%) from the 31 to 40 years age group. There were more female (64%) than male (36%) participants (Figure-1).

There were attendees from 15 of the 17 administrative regions in the Philippines (except Soccsksargen and Caraga Regions), with almost half (41.2%) coming from the national capital region (NCR) (Table-1 and Figure-2) [15].

Participants were from a broad range of disciplines, including medicine, allied health, veterinary medicine, agriculture, education, and social science (Table-2).

Most (n = 120, 88.2%) answered both pre and post-test questionnaires. Statistical analysis of the scores done through a paired t-test using STATA Release 13 (StataCorp®, Texas, USA) revealed a statistically significant mean difference between pre- and post-test scores. Participants scored higher after the course (13.83 ± 2.12) compared to baseline (12.78 ± 2.90). Statistically significant ($p < 0.05$) increases in the mean, median, and minimum scores were also observed (Table-3 and Figure-3). Further

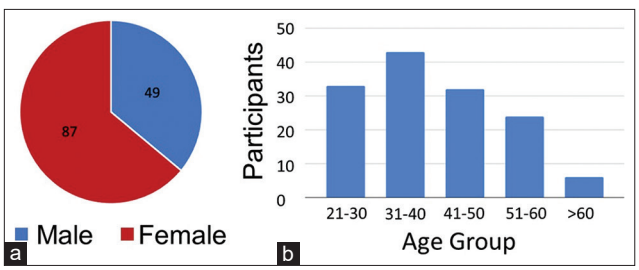

Figure-1: Profile of participants by sex (a) and by age (b).

Table-1: Course participant profiles by region.

Region	Number of participants (%)	
National capital region	56	(41.2)
Cordillera administrative region	1	(0.7)
I (Ilocos)	10	(7.4)
II (Cagayan valley)	11	(8.1)
III (central luzon)	10	(7.4)
IV-A (Calabarzon)	8	(5.9)
IV-B (Mimaropa)	1	(0.7)
V (Bicol)	5	(3.7)
VI (Western Visayas)	4	(2.9)
VII (Central Visayas)	3	(2.2)
VIII (Eastern Visayas)	1	(0.7)
IX (Zamboanga Peninsula)	3	(2.2)
X (Northern Mindanao)	10	(7.4)
XI (Davao)	13	(9.6)
XII (Soccsksargen)	0	(0)
XIII (Caraga)	0	(0)
BARMM	2	(1.5)

BARMM=Bangsamoro autonomous region in Muslim Mindanao

Table-2: Classification of participants by field and affiliation (n = 136).

Demographic characteristics	Number of participants (%)	
Field		
Agriculture	1	(0.7)
Biology	9	(6.6)
Community development	1	(0.7)
Environmental health	3	(2.2)
Health administration	3	(2.2)
Health professions education	1	(0.7)
Hospital administration	2	(1.5)
Medical technology	7	(5.1)
Medicine	31	(22.8)
Microbiology	1	(0.7)
Nursing	16	(11.8)
Nutrition	1	(0.7)
Pharmacy	2	(1.5)
Physical therapy	1	(0.7)
Public administration	1	(0.7)
Public health	16	(11.8)
Social science	1	(0.7)
Veterinary medicine	39	(28.7)
Government affiliation		
Government	120	(88.2)
Non-government	16	(11.8)
Type of affiliation		
Academe	50	(36.8)
Line agency	61	(44.9)
Department of health	45	(33.1)
Department of agriculture	15	(11)
Department of education	1	(0.7)
Local government	20	(14.7)
Provincial government	17	(12.5)
City government	3	(2.2)
Others	5	(3.7)
Non-government organizations	5	(3.7)

analysis revealed an average increase in scores across most age groups, with the greatest improvement in the >60 age group (mean % improvement = 55.20, standard deviation = 1). No significant differences in percent improvement among age groups (F

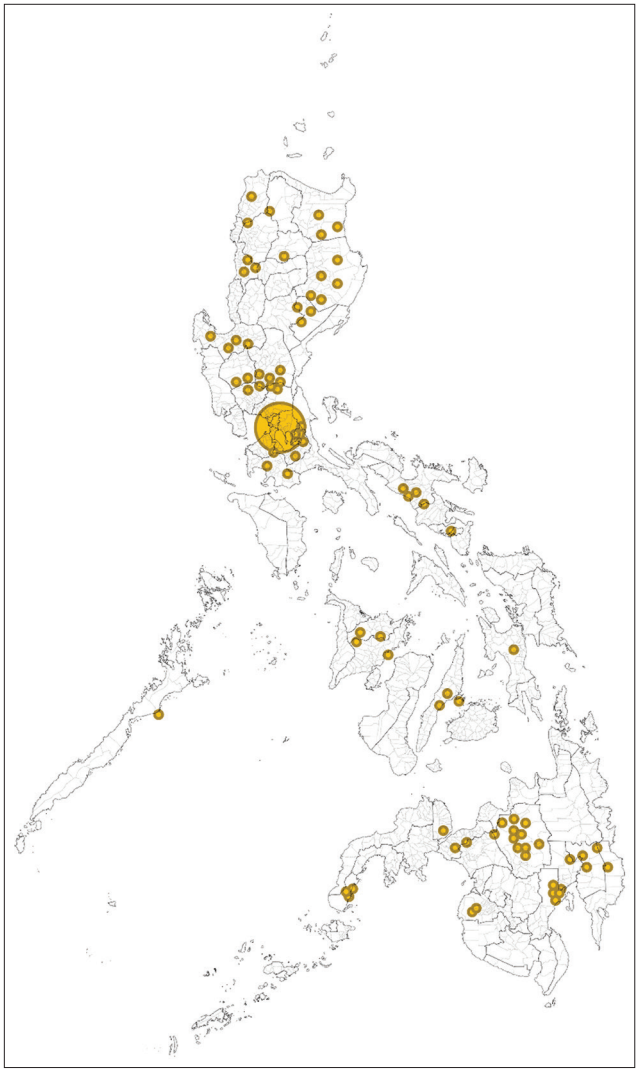

Figure-2: Distribution of the course participants across the regions of the Philippines. [Source: Modified from public domain map "Municipalities of the Philippines" (https://commons.wikimedia.org/wiki/File:Municipalities_of_the_Philippines_(simplified).svg), Participants indicated with markers overlaid on the Philippine map, https://creativecommons.org/publicdomain/zero/1.0/legalcode].

[5.108] = 2.05, p = 0.74) and disciplines (F[3.110] = 0.642, p = 0.59) were noted. All four sessions were generally rated positively in the evaluation (Table-4).

Discussion

This article documented the first short course on One Health in the Philippines for health, allied health, and collaborating professionals from multiple disciplines and sectors across the country. Almost half (41.2%) of the course participants were in NCR, while the rest were distributed across 14 of the 17 remaining administrative regions. Professionals from medicine (22.8%) and veterinary medicine (28.7%) accounted for the largest percentages of attendees, and majority of the total number of participants were affiliated with government agencies (88.2%).

The conduct of a course on One Health was particularly timely in the COVID-19 pandemic, as there

were increasing concerns regarding emerging infectious diseases and the threat of epidemics. The current pandemic provided a tangible backdrop for the course that illustrated the interrelatedness of human, animal, and environmental health and the need for cross-cutting solutions to multidimensional challenges [15, 16]. Education and training in One Health are essential in improving epidemic preparedness, by helping enhance the detection, control, and prevention of diseases of public health concern, and by reducing logistical barriers between relevant stakeholders [15].

The 3-day course was held online, utilizing digital tools such as Zoom, Google forms, and other interactive tools as an alternative to face-to-face learning during the pandemic. The conduct of the course through an online platform enabled lecturers and participants from various regions to join with no additional cost and without the need for travel to a single venue. On the other hand, the use of online platforms for learning for prolonged periods of time inevitably leads to attention fatigue [15]. Ease of use and level of understanding through online platforms may also be limited by hardware availability and capability, quality of internet connection, and comfort of the users with the digital interface [6]. Despite these challenges, the course received generally positive feedback from all the participants due to the perceived excellence of the lecturers and the relevance of the topics. The future capacity-building initiatives may benefit from maximizing online tools, continuing to involve a multidisciplinary team of experts from various sectors, and selecting topics that are timely and tailored to the specific needs and relevant interests of a wider range of participants. The future courses on One Health may also benefit from enhanced dissemination of information through formal (e.g., official communication) and informal (e.g., social media, advertising) networks to reach more participants, particularly those outside the national capital, from other disciplines such as environmental health and non-traditional One Health professions, from the non-government sector, and even the general public.

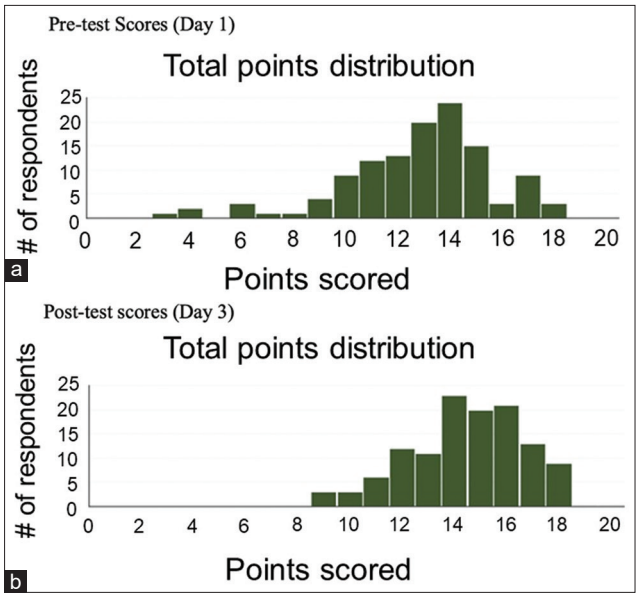

Figure-3: Distribution of participants' scores in the online pre-test (a) and post-test (b).

Table-3: Summary of pre- and post-test assessment scores (n = 120, p < 0.050).

Variable	Mean	Standard deviation	95% confidence interval
Pre-test scores	12.78	2.90	13.44–14.21
Post-test scores	13.83	2.12	12.26–13.31
Mean difference*	1.04	3.43	0.42–1.66

Statistically significant improvement was noted in the mean, median, and minimum test scores of the participants, suggesting increased familiarity with the discussed concepts in One Health. In addition to theoretical knowledge, the future training programs on One Health may include the application of concepts through practical exercises such as exposure to One Health clinics or involvement in One Health-oriented research to encourage long-term engagement in similar initiatives and further contribute to professional development [11, 17].

At present, there are limited opportunities for capacity-building in One Health in the Philippines as well as training that convenes professionals from multiple disciplines. Challenges in developing One Health curricula include the lack of leadership and expertise to teach, scheduling and budgetary limitations, and resistance to change [13]. Current curricula in health also remain predominantly "human-centric" in focus. Education and training on the One Health approach may aid in breaking down this anthropometric viewpoint and provide a platform for increasing intersectoral understanding of the human, animal, and environmental health sectors' respective professional skills and capabilities [16]. There is also a need for

Table-4: Summary of numerical feedback ratings for the short course.

Sessions	Choice of speakers	Preparedness and knowledge of resource persons	Ability of resource persons to sustain interest	Ability of resource persons to address questions/issues correctly and appropriately	Related the subject matter to issues and developments in the approach and/or real life concerns	Mean numerical ratings
1	4.90	4.93	4.79	4.83	4.89	4.87
2	4.91	4.91	4.78	4.86	4.86	4.86
3	4.90	4.91	4.84	4.90	4.86	4.88
4	4.92	4.92	4.85	4.90	4.90	4.90

better integration of disciplines such as environmental health, social sciences, and physical sciences such as engineering, physics, and mathematics into One Health [8].

These highlight the need for the leadership of professionals with experience in One Health, particularly as early training on One Health for medical, veterinary, and environmental professionals is critical in building a competent global workforce with a thorough understanding of the approach [15]. Universities may serve as the ideal platform for increasing capacity-building in One Health, being inherently multidisciplinary in nature with far-reaching networks of collaboration, and the expertise to educate and train professionals in One Health-related fields [11, 18]. Topics on One Health may also be considered for integration into standard curricula for primary and secondary education to build necessary interdisciplinary foundations [19].

Current practitioners of One Health may draw on shared competencies – a set of relevant abilities, knowledge, or skills that extend beyond respective expertise on human, animal, or environmental health – to translate concepts into practice which may then allow more experienced One Health practitioners to mentor less experienced ones [13]. Shared courses, exchange programs, and other collaborative methods among recognized educational institutions will maximize knowledge while minimizing the expenditure of resources and the demands of core course requirements on students [19]. Long-term commitment to training the future workforce, conducting relevant research, and effectively communicating One Health to pertinent stakeholders is essential to make capacity-building in One Health sustainable. In addition, cultural awareness and consideration of local contexts may help in the integration of One Health curricula into existing programs [20, 21].

Sustainable training on cross-cutting issues must be established to operationalize the One Health approach [11]. The establishment of a One Health Center, joint task forces, or other Multisectoral coordinating mechanisms through relevant policy informed by evidence-based recommendations may be considered to further this goal [20]. Systems-level advocacy and engagement of policymakers may also lead to an increase in support, lobbying of policy, and allocation of funding for programs utilizing the One Health approach [21].

Conclusion

As the first One Health course for health, allied health, and collaborating professionals in the Philippines, this 3-day course demonstrated the feasibility of conducting capacity-building on One Health for a multidisciplinary group of participants during the COVID-19 pandemic. It may serve as a model for similar and more in-depth courses on One Health for specific groups in the future and has set the stage for intersectoral communication and education, providing an avenue for collaboration for professionals in various disciplines, and facilitating the expansion of One Health network in the Philippines.

Authors' Contributions

VYB and CL: Conceptualization. SAMA, LMDG, CL, and VYB: Conduct of the course and formal analysis. SAMA, RCN, MML, MM, VGP, LMDG, CL, and VYB: Conducted the course. SAMA, LMDG, CL, and VYB: Formal analysis. All authors participated in implementation of the course. All authors have read, reviewed, and approved the final manuscript.

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Competing Interests

The authors declare that they have no competing interests.

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