



SUMMARY OF RESPONSES TO THE K-12 ONE HEALTH EDUCATION SURVEY

QUESTION 1

List 5 words that come immediately to mind when you think of One Health.

The categories of words cited in order of descending Frequency were:

- Cooperation (transdisciplinary, interdisciplinary, working together, collaborating, other): 61
- Health (human, animal, environment, public): 36
- Animal (including wildlife): 36
- Environment: 29
- Education: 26
- Disease (infectious, emerging, zoonotic): 25
- Humans: 24
- Ecosystem: 13
- Sustainability: 11
- Climate: 7
- Miscellaneous words that appeared only once

QUESTION 2

Please rank the following types of sustainability from 1-5 in order of their importance to One Health (where 1=most important and 5=least important)

| Answer Options | % |
|---|------|
| Ecological | 66.1 |
| Cultural/Social | 41.0 |
| Economic | 39.0 |
| Ethical | 33.9 |
| Justicial (of or relating to justice, as opposed to judicial) | 25.8 |

QUESTION 3

List 3-5 One Health challenges that could be used to illustrate the need for a One Health approach. Please include no more than one zoonotic disease.

| | |
|-------------------------------------|----|
| Zoonotic Disease | 48 |
| Environment (water, air, soil) | 24 |
| Antimicrobial Resistance | 18 |
| Food Security And Availability | 17 |
| Climate Change | 16 |
| Education | 10 |
| Non-zoonotic Disease (malaria, HIV) | 10 |

| | |
|--|----|
| Non-communicable Disease (CVD, asthma) | 10 |
| Poverty | 9 |
| Foodborne Disease | 8 |
| Toxins | 7 |
| Disasters | 5 |
| Biodiversity | 4 |
| Conflicts (geopolitical) | 2 |

QUESTION 4

Please choose what you believe are the 5 most important contributing factors to the development of One Health challenges (not limited to disease transmission) that should be considered in developing preventive policies or sustainable solutions for those challenges:

| Answer Options | Response Percent |
|---|------------------|
| Compartmentalization of health services and policies | 58.2% |
| Lack of knowledge/understanding | 52.7% |
| Lack of funding streams that encourage collaboration and provide support for One Health initiatives | 49.1% |
| Overemphasis of treatment of individuals (human and animal) at the expense of preventive medicine and population health | 41.8% |
| Poverty, distribution of wealth, inequity | 41.8% |
| Political systems that support individual/corporate interests above all else | 40.0% |
| Overemphasis of human health at the expense of animal and environmental health | 38.2% |
| Short-term decision/policy horizons | 34.5% |
| Climate change | 32.7% |
| Over-exploitation of natural resources | 29.1% |
| Lack of methods and tools to investigate complex problems | 27.3% |
| Human population growth and development | 27.3% |
| Lack of uniform standards for information management and sharing | 23.6% |
| Globalization in the absence of global standards of practice | 16.4% |
| Tribalism | 3.6% |

QUESTION 5

How well do you think a One Health-themed K-12 education program relates to each of the following UN Sustainable Development Goals (SDGs)? On the scale provided, 1=not at all related and 5=highly related.

Summary : The SDG's thought to be most relevant (>= 60% in categories 4 and 5 combined):

| | |
|---|-------------|
| SDG 3: Ensure healthy lives and promote well-being for all ages | 81.4 |
| SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development | 70.7 |
| SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss | 70.7 |
| SDG 6: Ensure availability and sustainable management of water and sanitation for all | 67.2 |
| SDG 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture | 66.1 |
| SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable | 65.5 |
| SDG 13: Take urgent action to combat climate change and its impacts | 64.9 |
| SDG 12: Ensure sustainable consumption and production patterns | 63.2 |
| SDG 4: Ensure equitable and inclusive quality education and promote lifelong learning opportunities for all | 62.7 |

QUESTION 6:

Are there other sustainability goals that you think should be included? If so, please list them. These are not summarized here

QUESTION 7

Which one of the following graphical representations best captures your understanding of the values and principles of One Health (please select one)?



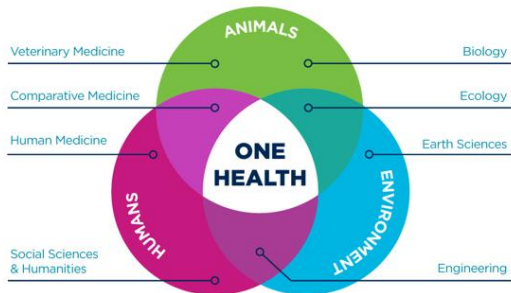
a) Sustainability donut



b) Umbrella



c) Triad



d) Venn Diagram



e) Concentric circles

| Answer Options | Response Percent |
|---|------------------|
| d. Venn diagram | 35.6% |
| c. Triad | 33.9% |
| b. Umbrella | 18.6% |
| a. Sustainability donut | 8.5% |
| e. Concentric circles | 1.7% |
| f. None of the representations are satisfactory | 1.7% |

QUESTION 8

Which of the following values do you think are essential to One Health (please select all that apply)?

| Answer Options | Response Percent |
|------------------------|------------------|
| Cooperation | 84.9% |
| Sustainability | 84.9% |
| Diversity/Biodiversity | 75.5% |
| Responsibility | 75.5% |
| Vision | 75.5% |

| | |
|------------------|-------|
| Understanding | 69.8% |
| Leadership | 66.0% |
| Competence | 60.4% |
| Balance | 58.5% |
| Community | 58.5% |
| Respect | 58.5% |
| Resilience | 56.6% |
| Integrity | 52.8% |
| Justice/Fairness | 52.8% |
| Transparency | 50.9% |
| Synergy | 49.1% |
| Empathy | 41.5% |
| Compassion | 34.0% |
| Growth | 34.0% |
| Self-awareness | 34.0% |
| Curiosity | 30.2% |
| Experience | 30.2% |
| Humility | 30.2% |
| Tolerance | 30.2% |
| Reason | 28.3% |
| Compromise | 26.4% |
| Mindfulness | 26.4% |
| Rigor | 26.4% |
| Freedom | 24.5% |

QUESTION 9

To what extent do you agree with each of the following statements as it relates to One Health, where 1=strongly disagree and 5=strongly agree?

| Answer Options | 4+5 (%) |
|--|---------|
| The health of humans, other animal species and plants cannot be separated. | 94.6 |
| "Environment" includes natural and built environments. | 92.9 |
| Humans have a moral imperative to address One Health challenges. | 85.7 |
| One Health should be practiced so that there is no net (ecosystem) loss of biological diversity. | 83.9 |
| One health embraces the value of social interaction as a critical component of health and well-being. | 75.0 |
| The World Health Organization defines "health" as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." This definition also applies to other animals and ecosystems. | 71.4 |
| One Health recognizes the intrinsic value of life on earth (plants, animals, microbes) regardless of a direct benefit to humans. | 70.4 |
| Ecological, economic, social/cultural, ethical and justicial sustainability are equally important for One Health. | 66.1 |
| When you optimize health for one species, health for others is marginalized or eliminated. | 23.2 |

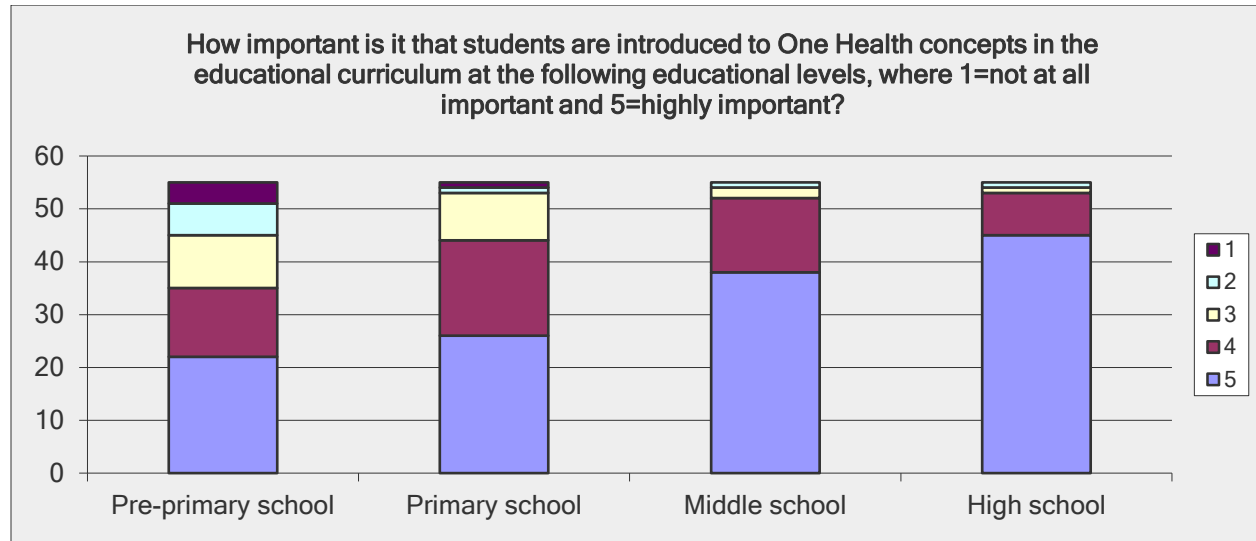
QUESTION 10

In your experience, to what extent are students currently exposed to concepts related to One Health (including well-being), where 1=not at all exposed and 5=highly exposed?

| Answer Options | Categories 4+5 (%) |
|----------------------------------|--------------------|
| College and university education | 18.9 |
| Secondary education | 5.6 |
| Primary education | 5.5 |
| Adult education | 3.8 |
| Pre-primary education | 3.6 |

QUESTION 11

How important is it that students are introduced to One Health concepts in the educational curriculum at the following educational levels, where 1=not at all important and 5=highly important?



QUESTION 12

In what types of schools would you pilot a One Health-themed curriculum, understanding that not all school types are found in every country (please select all that apply)?

| Answer Options | Response Percent |
|---|------------------|
| Publicly-funded schools | 93.9% |
| Colleges or universities | 89.8% |
| Privately-funded schools | 67.3% |
| Summer school or camps | 63.3% |
| Faith schools | 57.1% |
| Extra-curricular education (after school) | 53.1% |
| Independent schools | 49.0% |
| Magnet schools | 40.8% |
| Home school networks | 36.7% |
| Charter schools | 34.7% |

QUESTION 13

What broad-based skills should students learn through a One Health-themed educational program (please select all that apply)?

| Answer Options | Response Percent |
|-------------------------------------|------------------|
| Collaboration | 90.2% |
| Interdisciplinary thinking | 88.2% |
| Problem-solving | 86.3% |
| Systems thinking | 86.3% |
| Team-building | 76.5% |
| Conservation | 74.5% |
| Communication to diverse audiences | 72.5% |
| Goal-setting | 62.7% |
| Leadership | 62.7% |
| Experimental design/methods/inquiry | 58.8% |
| Concept mapping | 45.1% |

QUESTION 14

To what extent should students be exposed to the following concepts in a One Health-themed educational program, where 1=not at all exposed and 5=highly exposed?

| Answer Options | 4+ 5 (%) |
|---|----------|
| Personal responsibility -- how individual actions impact One Health | 96.3 |
| Respect for natural systems and human responsibility for planetary health | 94.4 |
| Role of natural and built environments in human and animal health and well-being | 92.7 |
| Corporate, political and societal responsibility -- how their actions impact One Health | 90.7 |
| Environmental contexts of One Health issues | 88.9 |
| Staying healthy and making good choices for the environment | 86.8 |
| Climate change and health of the planet | 85.2 |
| "Cradle-to-grave" thinking | 79.2 |
| The connection between well-being and mental/physical health | 77.8 |

QUESTION 15

In your opinion, what are 3 main barriers to incorporating a One Health-themed program in K-12 education in your country?

| Barriers | # responses |
|-----------------------------|-------------|
| Lack Of Awareness Knowledge | 20 |
| Lack Of Funds | 17 |
| Overloaded Curriculum | 15 |
| Teacher Training | 14 |
| Curricular Issues | 14 |

| | |
|--|---|
| Resistance To Change | 8 |
| Oh Complicated | 8 |
| Lack Of Resources, Tools | 8 |
| Human weaknesses (arrogance, lack of confidence, others) | 8 |
| Educational System | 6 |
| Siloed Education | 5 |
| Time | 4 |
| Lack Of Leadership | 3 |
| Disparities | 2 |
| No One Health Jobs | 1 |

Some of the most interesting and practicable responses to this question were:

- Does not fit with government objectives for educational outcomes
- The understanding of the importance of OH approach in addressing the modern health challenges in the country (disasters, infectious diseases, climate change impacts, sanitation in rapidly growing urban settlements, etc)
- need for simple, concrete examples
- A curriculum that can be incorporated/linked with existing learning areas
- Focus only on basics-literacy, maths etc not on world in which they live
- society value to nature /environment
- lack of innovation/ design for low income environments
- lack of validated K12 One Health curriculum
- Lack of visionary leadership
- Lack of reference books relevant for K-12 to be used in the schools
- Lack of interactive activities, group/team/case studies activities, innovative teaching
- Teaching ways of thinking/addressing problems will be just as important as content, and that can be more challenging to implement.
- need to tie OH to current academic requirements (which is doable)
- lack of pedagogical tools customized for the right cohort

QUESTION 16

What do you believe should be some long-term outcomes (how might it change the knowledge, understanding, attitudes or behaviors of students) of a One Health-themed curriculum?

The most frequently cited outcomes were:

Increase in knowledge, understanding of: challenges, human-animal-planet connections, the environment, One Health climate change and health, interrelationships, One Health and its relevance, environmental and ecological protection at local level, global changes (climate, human footprint) on human-animal-ecosystem health, how students can affect change in their communities, one's role and impact on others, of human behavior on the environment of conservation, of health inequalities, role of animals in society, how individuals can make a difference, enthusiasm for science learning, learn to engage in meaningful discussions about these issues, appreciation of the values of equality and sustainability, knowledge and resources to drive global change forward, appreciation for the fragility of the environment, impact of choices, political awareness, Students should be prepared to address challenging problems with multiple stake-holders (N=31)

Changes in attitudes: values, respect for the environment, thoughtful global citizens, respect for cultural/personal differences, concern for the well-being of the community, social responsibility, empathy, compassion, commitment, an development of caring ethos for each other, the planet and animals, culture

of health, attitudinal change toward corporate health, positive attitudes towards appropriate actions that will support One Health implementation, honor, empowerment, Integrating science within the One-Health theme is likely to increase females' interest in science. Females often start from an 'ethic of care,' which resonates with One-Health (N=27)

Changes in behaviors: tobacco and alcohol addiction (!), engagement, translate words to actions, collaborative approach to risk assessment, influence tomorrow's consumers, health and animal husbandry integration, recycle more (!), more environmentalism, improved human-animal interactions, multidisciplinary approach to risk analysis, collective action, enhanced communication and collaboration skills, promote ideas for future generations, contribute to innovative solutions, shift from controlling environment to living in harmony with it, Positive Actions towards safe environment and disease prevention, be an ambassador for the topic, consumers make sustainable choices, influence behaviors of next generation, influence parents to make One Health decisions, sustainable cooperation and collaboration from childhood (N=20)

Changes in skills: leadership in environmental health, accountability and resilience, ability to cooperate, listen, work in teams, move beyond partisan thinking, advocacy, creative problem solving (N=8);
I also include systems thinking in this category, which was mentioned by several respondents (N=5)

Products: environmental sustainable growth programs, Integration of the curriculum into the national syllabus, project design competitions to solve specific community issues, Future One Health Practitioners, new, integrated disciplines / study areas, Unitive solutions to wicked problems, enhanced political activity, inventions, better health of people and planet, better nutritional status, better quality of health, Strong, resilient communities, reduce gender gap, well-being of people and planet, happier population, sustainability, prevent outbreaks, early detection (presumably of infectious disease), rapid adoption of UN SDG's, health promotion, reorient educators, slow down climate change, influence career paths, peer-to-peer communications, more funding, more trained educators, citizens promote One Health in communities, generation health entrepreneurship, adaptation to climate change, influence governments, teacher advocates for One Health, economic benefits, more sustainable policy/decision making in a generation, fast and efficient control (of emerging infectious diseases), integrative approach to risk management (N=39)

QUESTION 17

What educational stakeholder sectors (e.g., state, private, other) should be represented in developing the concept of a One Health-themed education initiative into a successfully-funded proposal?

Answers most frequently cited were the government and its educational bodies (Ministries, Departments), teachers and educators at all levels, particularly at the university and health sciences schools, public and private teachers' associations, business/industry (including publishers), and health (human, animal, environmental, conservation/ecological) institutes and government agencies. A few interesting suggestions were:

- Religious leaders/faith institutions
- Relevant teacher's associations, e.g. National Science Teachers Association
- eLearning institutions
- Washington DC education change agents
- Meta-leaders who understand broad concepts and outcomes
- Design thinkers, Innovation labs
- media

QUESTION 18

Please suggest up to 3 funding organizations that might support implementation of a One Health-themed education initiative.

| POTENTIAL FUNDERS | # TIMES SUGGESTED |
|-------------------|-------------------|
| Gates | 15 |

| | |
|---|----|
| Un Agencies (WHO, OIE, UNDP, UNICEF, UNESCO) | 16 |
| World Bank | 7 |
| Rockefeller | 6 |
| USAID, DFID | 8 |
| EU Organizations | 5 |
| USDA, DHHS, DoD | 4 |
| World Wildlife Fund | 2 |
| NIH | 3 |
| Wellcome Trust | 2 |
| EPA | 2 |
| Pet Food, Pharma Companies | 2 |
| NERC | 1 |
| EWB | 1 |
| African Development Bank | 1 |
| Soros | 1 |
| Josiah Macy Foundation | 1 |
| Dept. of Education Associates | 1 |
| Rotary International | 1 |
| Howard Hughes | 1 |
| Nike | 1 |
| Zuckerberg | 1 |
| ACS (?) | 1 |
| National Lotteries | 1 |
| NSF | 1 |
| Skoll Foundation | 1 |
| Save The Children | 1 |
| Commonwealth | 1 |
| FDA | 1 |
| Global Partnership for Education | 1 |
| Foundation for International Medical Edn and Research | 1 |
| The Network: Towards Unity for Health | 1 |
| Canadian Tri-Council | 1 |
| Global Fund | 1 |
| Kansas City Environmental Educators Network | 1 |
| KSU, KU, and MU | 1 |
| End beneficiaries of the well trained One Health students (as is the case of private companies, universities, etc.) | 1 |

QUESTION 19

Please list up to 3 major logistical challenges to scaling-up a K-12 One Health curriculum to a global stage.

While the usual suspects (lack of funding, lack of human resources) were often mentioned here, the most frequently noted challenges were:

- cultural differences (contextual diversity, align different faiths, different cultural priorities, political differences, clash of cultural values, localization of materials, training appropriate to each country, students engage best with issues related to them and often framing learning objectives within local issues is most effective, cultural variation, diversity of context, culture and stakeholders, need to engage in intercultural communication - the Open Space Approach)
- different education settings and formats, therefore priorities
- technological challenges: need for fast internet and technology especially in low income countries, quality digital-based materials and outdated classroom equipment, organization of simulation exercises
- need to measure added value of pilot projects
- having real content and not just teaching about cooperation!

QUESTION 20

Please provide any other comments or suggestions.

| |
|--|
| One Health is need of hour to overcome problems like AMR and Climate change |
| K-12 curriculum should be based on skill set of specific teachers in specific situations. A global curriculum is not any more likely to work in K-12 than it does for undergraduate or professional |
| None |
| One health curriculum HAS to be content rich and not just another vague thing about relationships and collaboration. Needs to address critical problems like climate change, agricultural intensification, comparative medicine, environmental health threats |
| Challenging survey - Thanks |
| A very good initiation! Good luck for putting into practice! :) |
| Consider strengthen and use innovative on line teaching, flipped class room, take advantage of existing educative one health tools (MOOC on one health, environment challenges ..), creates new one |
| My major interest is in college/university career paths that can lead to recognized career paths that will create One Health Practitioners. I'm working on the concept of a DVM-Doctor of Nursing Practice. First we need to identify One Health mentors with the vision and qualifications willing to dedicate time and effort to writing grants and influencing educators that we need to urgently educate differently for our siloed systems now. |
| Actually, the biggest challenge we face in implementing a One Health curriculum at a global stage is the lack of a major driving force in One Health. Although we are trying our best as One Health clusters, we need to have a major support from a so called "Poster Boy", something that will catalyze our efforts. |
| One-Health process should be a process that start at pre-primary level to change mind-sets, although there should be entry-levels at all phases for those who were not exposed from the start. It will be beneficial if the one-health principles thinking can be incorporated as it relates to different subject streams (eg economics, social science, etc). |
| "Being a transdisciplinary is like being an essential ingredient in a gourmet dish- where each ingredient focuses on the making of the gourmet dish, and not just on being the most essential ingredient-- to attain this state requires a gourmet chef who understands well his ingredients and sees the value in All." |
| I can see there will be a need to define OH as compared to Planetary Health, etc. How one answers these survey questions obviously depends on the definition(s) one is using. I am happy to discuss the effort further. |
| Diverse indigenous social and cultural considerations must be foundational addressed in the design of curriculum |
| Hope this works !!!! |
| An extremely important project at a very volatile time in our world. Education is the key to supporting and delivering the UN 2030 SDG . |
| This is a very good idea |

INFORMATION ON APPROXIMATELY HALF OF THE RESPONDENTS (THIS QUESTION WAS OPTIONAL)

Summary: Most of the 42 respondents had advanced or terminal degrees (MD, DVM, PhD); the areas represented most often were Europe (14) and the US (15); a few were from Africa (9), Asia (3) and South America (1).

Highest level of education/training

Ph.D
 university
 MD

PhD
 PhD in education science
 University
 MSc
 University
 Masters in Science (Climate Change &
 Sustainable Development)

Master (MD, MPH)
 Undergraduate Student
 MD
 Ph.D.
 MSc

Ph.D.
 DVM, PhD
 M.Ed. (PhD in progress)
 PhD
 MD, MEd
 DrPH
 Masters
 DrPH
 doctoral
 PhD
 MS, DVM, Board Certifications
 PhD
 PhD (s)
 MSc Community/Environmental Health
 University
 Masters
 DVM
 Juris Doctorate
 DVM
 PhD
 DVM/MPH
 Masters in Education
 DVM
 PhD
 Masters
 DVM, PhD
 Doctorate

Country where you work

INDIA
 Romania
 INDIA
 Netherlands
 Kenya
 Belgium
 Denmark
 United Kingdom
 United Kingdom

South Africa
 Tanzania, United Republic
 of
 Brazil
 USA
 Ethiopia
 Armenia
 UK
 Hungary
 Switzerland
 United States

USA
 Nigeria
 United Kingdom
 USA
 USA
 United States
 USA
 USA
 Romania
 South Africa
 Liberia
 Philippines and Regional
 USA
 United States
 United States
 Nigeria
 United States
 USA
 United States
 United Kingdom/other
 Sierra Leone
 USA
 England