On behalf of individuals from the **One Health Action Collaborative**, Forum on Microbial Threats, US National Academies of Sciences, Engineering, and Medicine

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Health challenges today are complex and cross-cutting
Antimicrobial resistance, political & natural disasters, food insecurity, emerging infectious disease, pollution etc.

In response: Global initiatives - International Health Regulations (2005), Global Health Security Agenda, Joint External Evaluation, Sustainable Development Goals etc.

US Joint External Evaluation: Develop a more formal One Health strategy & need for competent One Health professionals

First step: Train future One Health professionals through sound, competency-based education

ONE HEALTH

ANIMALS

ENVIRONMENT

PLANTS

HUMANS
**Competencies** are specific knowledge or skills that are acquired through education and training.

*E.g.* Identify and understand the origins and determinants of health.

**Competency domains** are groups of competencies.

*E.g.* Health knowledge

**Competency-based education** differs from traditional, time based education. It measures the learner’s abilities to demonstrate specific skills.
Research Questions & Methods

• Have there been past initiatives to develop core competencies in One Health?
  
  Literature search

• Are there One Health academic degree programs in the US? Where, how many, since when?
  
  Web-based search & direct communication

• Do existing degree programs provide sound, competency based education?
  
  Evaluation of degree requirements, course description, core competencies

  Are there any gaps?

Inclusion criteria
US program described as employing an interdisciplinary approach linking human, animal, and environmental health disciplines
Findings

Past initiatives

- 2008 Bellagio initiative
- 2010 Stone Mountain Training Workgroup
- 2011 USAID RESPOND
- 2012 Rome synthesis

Accreditation

There is no accrediting body for One Health degree programs.
Findings

45

One Health academic degree programs

Academic level
- 10 (22%) Bachelor’s
- 27 (60%) Master’s
- 8 (18%) doctoral

Type of school
- 44 in schools of health sciences
- 1 in a law school

Availability of core competencies
- 14 (31%) publicly available
- 4 (9%) available after direct communication
- 27 (60%) did not have competencies available

Training components
- 31 (69%) practical training
- 19 (42%) communication
States with academic institutions identified with One Health educational programs

**FIGURE 1 | Geographic Location of One Health Programs by State**

SOURCE: Togami et al., “Core Competencies in One Health Education: What Are We Missing?,” National Academy of Medicine.

NOTE: One Health academic programs were identified in the contiguous United States only.
1947  CDC establishes Veterinary Public Health Division [a]
2004  Manhattan Principles released to holistically prevent epidemics and main ecosystem integrity
2007  AMA and AVMA call for increased collaboration between human and animal health [b,c]
2009  USAID establishes Emerging Pandemic Threats program [d]
       CDC establishes One Health Office
2010  WHO-OIE-FAO Tripartite publishes collaborative concept note [e-g]
       United Nations and World Bank sets One Health framework for animal and pandemic influenza
2017  G20 recommends One Health approach to address antimicrobial resistance [h]
### Figure 3: Key Areas Represented in One Health Degree Programs

<table>
<thead>
<tr>
<th>Under-represented</th>
<th>Identified in 25% to &lt;50%</th>
<th>Identified in 50% to &lt;75%</th>
<th>Well-represented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key areas identified in <strong>less than 25%</strong> of total programs*</td>
<td>Plant health</td>
<td>Food safety/ food security</td>
<td>Epidemiology</td>
</tr>
<tr>
<td></td>
<td>Antimicrobial resistance</td>
<td>Agriculture/ livestock</td>
<td>Environmental health/ ecology</td>
</tr>
<tr>
<td></td>
<td>Law</td>
<td>Policy</td>
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<tr>
<td></td>
<td></td>
<td>Vector-borne diseases/ entomology</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Social and behavioral sciences</td>
<td></td>
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</tbody>
</table>

*Total programs” refers to the 45 One Health academic programs identified in this study. GIS = geographic information system.

**Source:** Togami et al., “Core Competencies in One Health Education: What Are We Missing?,” National Academy of Medicine.
Three competency domains and 20 core competencies recommended:

1. Health Knowledge

2. Global & Local Issues in Humans, Animals, Plants, and the Environment

3. Professional Characteristics
1. Voluntary commitment to indicate program competencies

Clearly state core competencies, including proficiency in at least one health science

2. Key areas in One Health degree programs

Educate future professionals in disciplines that are currently well represented, as well as disciplines that are not well represented

3. Practical training

Continue to focus on practical and applied training

4. Communication

Emphasize communication for better coordination and collaboration

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**Recommendations**

**A step-by-step checklist for academic program administrators**

<table>
<thead>
<tr>
<th>Step</th>
<th>Task</th>
</tr>
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</table>
| 1 | Understand the benefits and challenges of competency-based education.  
   |   | If not already, become familiar with the basics of competency-based education, the development process of the competency model for the master of public health degree, and previous efforts regarding One Health core competencies, as well as other references. |
| 2 | Evaluate and catalogue the objectives of your academic degree program. |
| 3 | Review the curriculum structure of your program and the list of core competencies. If available,  
   |   | Compare them with the One Health competency domains, as well as subdomains and competency examples from past initiatives, such as the US Agency for International Development, RSPSND initiative’s One Health Core Competency Domains, Subdomains, and Competency Examples.  
   |   | Consider incorporating the core competencies and skill sets suggested above. |
| 4 | Consider adding missing disciplines and skill sets to your existing program.  
   |   | Include key focus areas in introductory courses to orient students to One Health early in the curriculum.  
   |   | Identify strengths and weaknesses of your program, in relation to core competencies.  
   |   | Add guest lectures for gaps in faculty expertise. |
| 5 | Make the core competencies of your program publicly visible.  
   |   | Make the core competencies available on your website and in recruiting materials for the benefit of both prospective students and employers of your graduates. |
| 6 | Solicit feedback from students, graduates, faculty, and alumni to continue revising and optimizing core competencies and associated curricular offerings.  
   |   | Consider a continuous quality improvement plan or other regular systematic appraisal.  
   |   | Determine a process by which to incorporate feedback, improvement, and innovation into the curriculum. |

**FIGURE 4 | A Step-by-Step Approach to Applying One Health Core Competencies in Academic Programs**

SOURCE: Tognoni et al., “Core Competencies in One Health Education: What Are We Missing?,” National Academy of Medicine.
Next steps

Understanding One Health workers
Literature search, web-based search & survey
- Who/where are One Health workers?
- How are they finding jobs?
- Who is hiring them?
- Are employers satisfied with One Health degree program graduates?

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Rx One Health
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Upcoming course dates: June 24 - July 19, 2019

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Destination: TANZANIA
Dar Es Salaam, Maffia Island, Bagamoyo, Morogoro, Iringa, Ruaha