The Role of Public Health Practitioners: in Achieving Healthier and Safer World

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The Emerging Infectious Disease and The Disease of Tomorrow

70% out of all Emerging Infectious Disease in the world today are **ZOONOSIS**
The first case of AIDS was documented in the UK in 1981.

The beginning of July 1986, a total of 452 cases, from 23 states, had been reported in US.

By the end of 1986, 85 countries had reported 38,401 cases of AIDS to the World Health Organization. By region these were: Africa 2,323, Americas 31,741, Asia 84, Europe 3,858, and Oceania 395.

It has been known for a long time that certain viruses can pass between species. Indeed, the very fact that chimpanzees obtained SIV (Simian Immunodeficiency Virus) from two other species of primate shows just how easily this crossover can occur.

Central Africans accustomed to consume bushmeat and expose to primates which increase Immunodeficiency Virus transmission.

36.9 million people are living with HIV worldwide and 2.6 million children are living with HIV, reported in 2015.
Respond to MERS-CoV in 2015

South Korea

Same source, different actions

Indonesia
Middle East respiratory syndrome (MERS) is a viral respiratory disease caused by a novel coronavirus (MERS-CoV) that was first identified in Saudi Arabia in 2012.

Coronaviruses are a large family of viruses that can cause diseases ranging from the common cold to SARS.

Camel milk was investigated as a possible route of transmission, given the common practice of consuming camel milk in the Arabian Peninsula.

Since September 2012, MERS-CoV was reported in 10 countries.

There are 261 cases of MERS-CoV including 93 deaths in worldwide.
The disease emerged in 1976 in almost simultaneous outbreaks in the Democratic Republic of the Congo (DRC) and Sudan.

Human can be infected Ebola through close contact with infected animal and the consumption of raw meat while fruit bats are natural virus hosts.

Semen is potential source of Ebola infection in the latest finding (S.E. Mate, US AMRIID, 2015)

Ebola then disappeared after 1979 and was not recognized again until 1994.

Since 2014, Ebola outbreaks have occurred for the first time in Guinea, Liberia and Sierra Leone, and in these countries there has been intense transmission in urban areas.

There are 28.421 cases of Ebola including 11.297 death in worldwide.
Population growth, technology and consumption

Regional environmental change

Urbanization
- Increasing city or peri-urban settlement population size
- Suburban and peri-urban encroachment into wildlands
- Settlement coalescence
- Rapid long distance transport
- Habitat expansion/creation for domestic or peri-domestic hosts and vectors

Forest habitat alteration
- Biotic collapse and hyperabundance of potential and actual vector and reservoir species
- Decline of natural pathogen regulation capacity
- Human settlement, encroachment, increasing human–wildlife contact

Agricultural intensification
(including food production)
- Water diversion and irrigation vector and reservoir expansion
- Concentration/mixing, wild/domestic species
- Bushmeat trade
- Agrochemical accumulation

Species' ecological-evolutionary dynamics
Opportunistic habitat expansion/ecological release

Vector/reservoir wildlife (domestication transport)
Feral reservoir species
Human encroachment
Natural ecosystem

Human–natural environment continuum

Host–pathogen dynamics
Emergence processes of host–parasite biology
- Host switching (host novelty)
- Breaching of pathogen persistence thresholds
- Transmission amplification and genetic exchange (pathogen novelty)

Disease emergence

Public Health Professionals
Public Health Nomenclature in Indonesia

Diploma
1. Sanitation
2. Occupational Health and
3. Health Promotion
4. Hospital Administration
5. Health Information

Undergraduate
1. Public Health
2. Public Nutrition

Master Degree
1. Public Health
2. Environment Health
3. Reproductive Health
4. Hospital Administration
5. Health Promotion
6. Occupational Health and Safety

Doctoral Degree
1. Public Health

Source: Ministry of Research and Higher Education of Indonesia, 2015
Public Health Workforce in Indonesia

Lacking of health workers and the distribution throughout all provinces

In 2010, Indonesia public health professional needs gap:
Needed : 26,964 public health workforce
Available : 6,505 public health workforce

Ironically, 80% of health development is determined by health resources while the remaining 20% includes program funding

Not Accredited Yet:
70% of undergraduate degree
80% of from master degree
One Health is

“A worldwide strategy for expanding interdisciplinary collaborations and communications in all aspects of health care for humans, animals and the environment”

Medical Doctor protects people from infectious diseases

Veterinarian protects animal from infectious diseases

Public Health prevents the infectious disease transmissions through health system improvement
One Health Education Institution and the Workforce

“One Health” Relevant Education Institution in Indonesia

Distribution of Indonesian Health Worker

Source: EPSBED, 2010

Source: MoH of RI Bank Data, 2013
# Public Health and One Health Competencies

## Public Health Core Competencies
- Communication Skills
- Financial Planning & Management
- Cultural Competency Skills
- Leadership and System Thinking Skills
- Analytic/ Assessment Skills
- Policy Development/ Program Planning Skills
- Community Empowerment
- Public Health Science Skills

## One Health Core Competencies
- Communication
- Management
- Culture and Belief
- Leadership and Professionalism
- Systems Thinking
- Collaboration
- Values and Ethics
Work Across Profession

Animals

Comparative Medicine

Humans

Veterinary Medicine

One Health

Ecology

Human Medicine

Environment

Engineering

Public Health Professional

Earth Sciences

INDOHUN
How to Deal with Zoonosis and EID

**Identify**
- Identify the agent, source, mode of transmission, and associated risk of disease

**Predict**
- Predict the disease manifestation, potential outbreak, through epidemiology investigation & surveillance

**Prevent**
- Effort to prevent transmission & outbreak by minimizing contact & exposure with the risks

**Respond**
- Action to respond and to mitigate the outbreak by working collaboratively across professions & sectors

- Strengthening laboratory capacity
- Report common animal and human pathogens
- Strengthening surveillance and laboratory capacities
- Characterizing risks associated with disease transmission
- Developing risk-mitigation strategies
- Strengthening outbreak response capacity with multi-sectoral work
One Health Collaborative Work: Cross-sectoral Organizations
SEAOHUN
South East Asia One Health University Network

4 countries involving 10 universities

VOHUN
- Hanoi School of Public Health
- Hanoi Medical University
- Hanoi University of Agriculture

THOHUN
- Chiang Mai University
- Mahidol University

MYOHUN
- Universiti Kebangsaan Malaysia
- Universiti Putra Malaysia

INDOHUN
- Institut Pertanian Bogor
- Universitas Indonesia
- Universitas Gadjah Mada
INDOHUN

*Indonesia One Health University Network*

**VISION**

INDOHUN fostering sustainable trans-disciplinary capacity building to respond to emerging and re-emerging infectious and zoonotic diseases and to improve the people, animals, and ecosystem health in Indonesia.

**MISSION**

To leverage the capacity building of the university network with training, education and research to build the skills, knowledge and attitude based on OH concept for OH leaders.

**INDOHUN MEMBER**

INDOHUN, establish in Yogyakarta, Indonesia, on **January 6, 2012**, is a part of SEAOHUN. There are **34 faculties from 20 universities** in Indonesia belong to INDOHUN members.

**LEGAL ENTITY**

INDOHUN has been legalize and registered in Ministry of Law and Human Rights.
## INDOHUN Faculty Member Distribution

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<tr>
<th>Faculty of Medicine</th>
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<th>Faculty of Veterinary Medicine</th>
<th>Faculty of Nursing</th>
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<td>Universitas NTB</td>
<td>Universitas Indonesia</td>
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In addressing global health challenges, **The Super team** that develop collaboration amongst multi-partner will result greater changes to obtain optimal health for people, animals, and our environment.

So, Do you still want to be **A Superman**?