

Pendekatan Ecohealth dalam Pengendalian *Emerging & Re-emerging Infectious Diseases*

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# Ecohealth in Public Health Perspective

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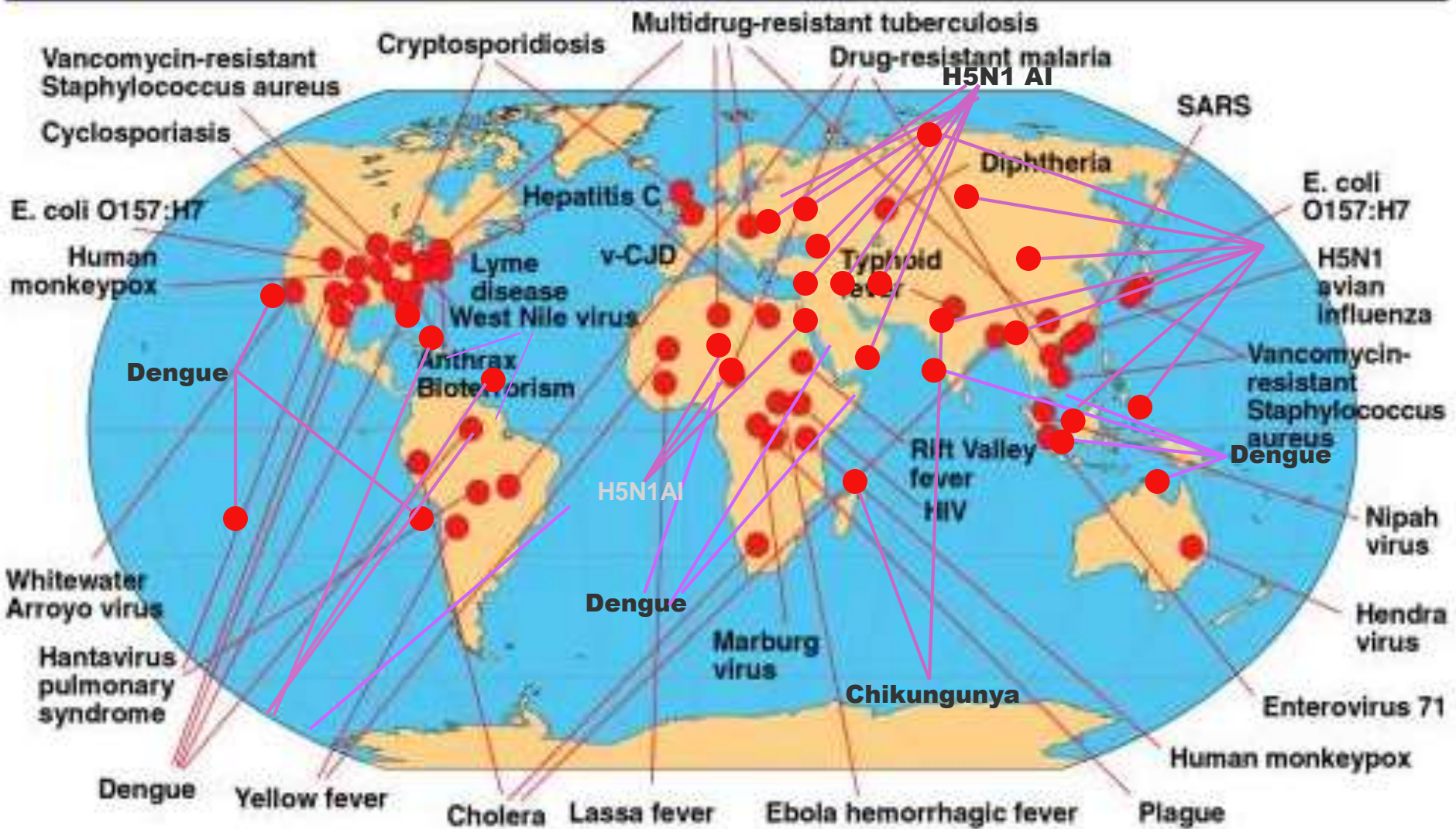
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# EID as a problem for health worldwide

- Despite remarkable advances in medical research and treatments during the 20th century, infectious diseases remain among the leading causes of death worldwide for three reasons:
  - emergence of new infectious diseases;
  - re-emergence of old infectious diseases; and
  - persistence of intractable infectious diseases.
- Only one infectious disease, smallpox, has been eradicated and stands as a landmark in the history of the control of infectious diseases

# Examples of Emerging and Re-Emerging Diseases



Adapted from Fauci, NIAID/NIH 2005

# Why are we bothering by EID?

- Avian Influenza, H5N1 (almost) forgotten, but not gone
- Swine Flu, H1N1 has caused Pandemic & huge economic loss to many countries
- Rabies in Bali, old disease, new problem, and socio-culturally complex to control

# Total Human H5N1 Cases - Indonesia

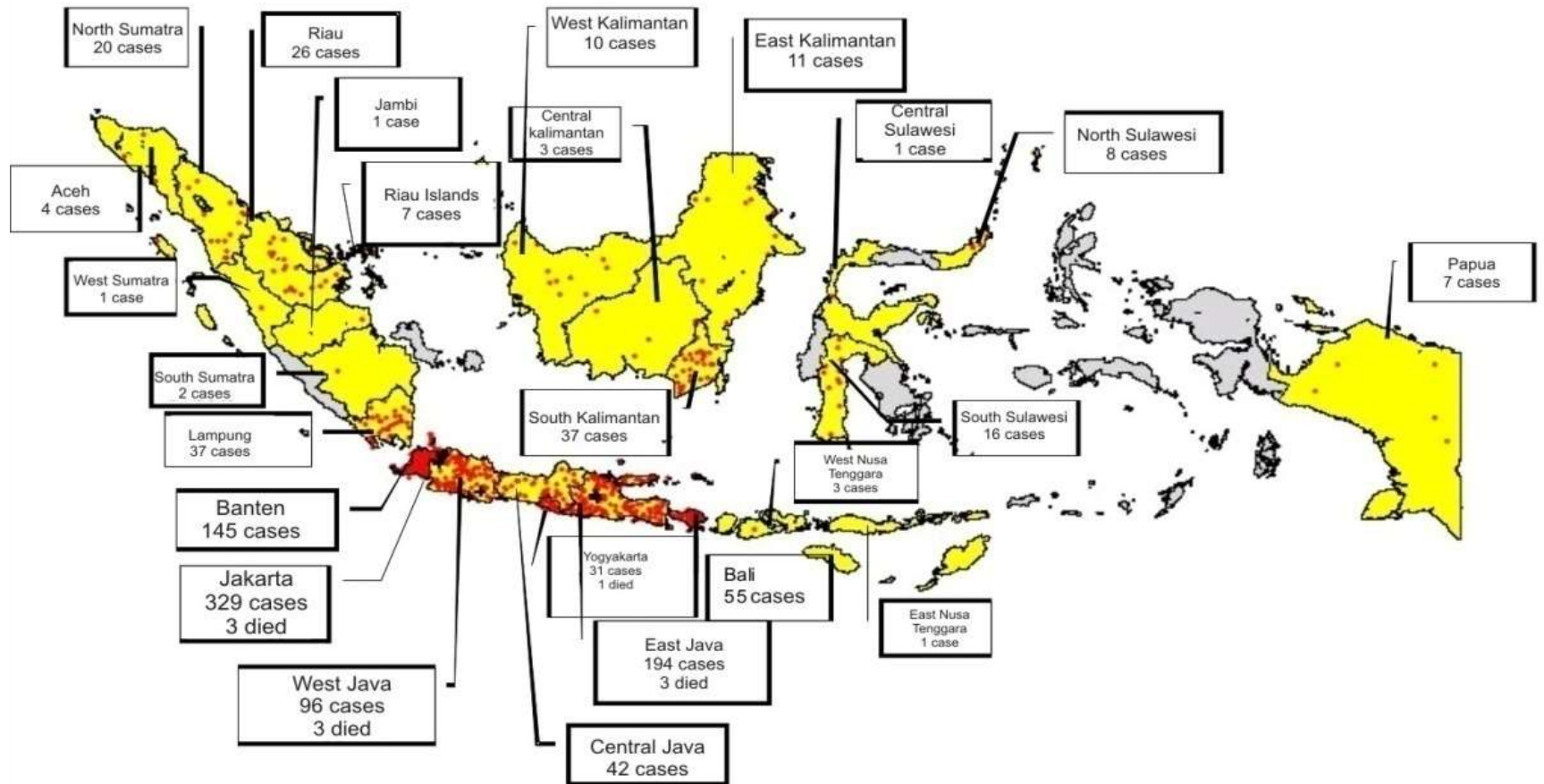
No	Province	2005		2006		2007		2008		2009		2010		Total case	
		C	D	C	D	C	D	C	D	C	D	C	D	C	D
1	DKI Jakarta	8	7	11	10	8	7	7	5	8	7	3	2	45	38
2	Banten	5	4	4	4	11	9	9	9	1	1	2	2	32	29
3	Jawa Barat	3	2	22	18	5	4	4	4	7	7	2	1	43	36
4	Jawa Tengah	1	0	3	3	5	5	2	2	1	1	2	1	14	12
5	Jawa Timur	0	0	5	3	2	2	0	0	1	1			8	6
6	Sumatera Utara	0	0	7	6	1	1	0	0	0	0			8	7
7	Sumatera Barat	0	0	2	0	1	1	1	0	0	0			4	1
8	Lampung	3	0	0	0	0	0	0	0	0	0			3	0
9	Sulawesi Selatan	0	0	1	1	0	0	0	0	0	0			1	1
10	Sumatera Selatan	0	0	0	0	1	1	0	0	0	0			1	1
11	Riau	0	0	0	0	6	5	1	0	1	1	1	1	9	7
12	Bali	0	0	0	0	2	2	0	0	0	0			2	2
13	DI Yogyakarta	0	0	0	0	0	0	0	0	1	1			1	1
<b>TOTAL</b>		<b>20</b>	<b>13</b>	<b>55</b>	<b>45</b>	<b>42</b>	<b>37</b>	<b>24</b>	<b>20</b>	<b>20</b>	<b>19</b>	<b>10</b>	<b>7</b>	<b>171</b>	<b>141</b>

C = Case D = Death

# Number of H<sub>1</sub>N<sub>1</sub> Cases in Indonesia (as of Sept 2010)

No	Province	Number of Cases	Percentage (%)
1.	DKI Jakarta	322	29,4
2.	East Java	198	18
3.	Banten	149	13,6
4.	West Java	98	8,9
5.	Bali	58	5,5
6.	Central Java	41	3,7
7.	Lampung	39	3,6
8.	South Kalimantan	37	3,4
9.	Yogyakarta	32	2,9
10.	Riau	29	2,6
11.	North Sumatera	20	1,8
12.	South Sulawesi	15	1,4
13.	East Kalimantan	11	1,0
14.	West Kalimantan	10	0,9
15.	North Sulawesi	8	0,7
16.	Papua	7	0,6
17.	Riau Island	6	0,5
18.	Nanggroe Aceh Darussalam	4	0,4
19.	Central Kalimantan	3	0,3
20.	West Nusa Tenggara	3	0,3
21.	Central Sulawesi	3	0,3
22.	South Sumatera	2	0,2
23.	Jambi	1	0,1
24.	East Nusa Tenggara	1	0,1
25.	West Sumatera	1	0,1
	Total	1097	100

# Distribution of Cases and Deaths by Province



■ = 1 case  
■ = 1 died

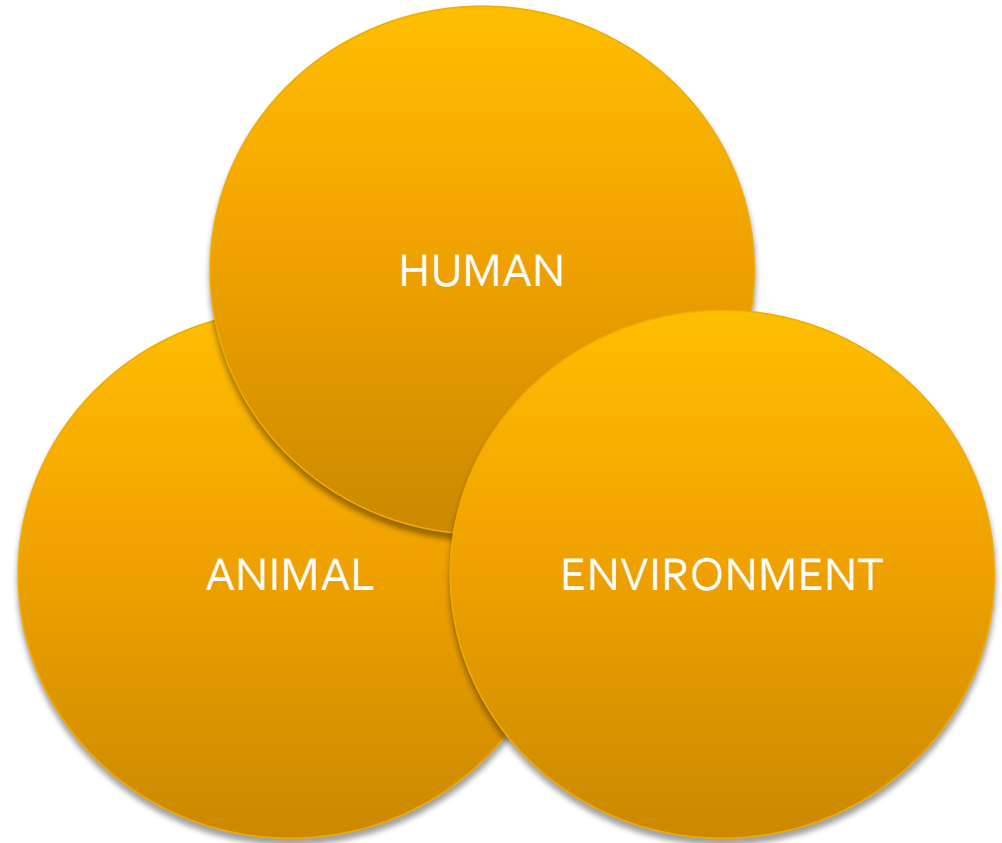
N = 1097 (1087 cases and 10 died)  
 25 provinces

■ = 7 q16q  
■ = 1 0836

32 b10w10c2

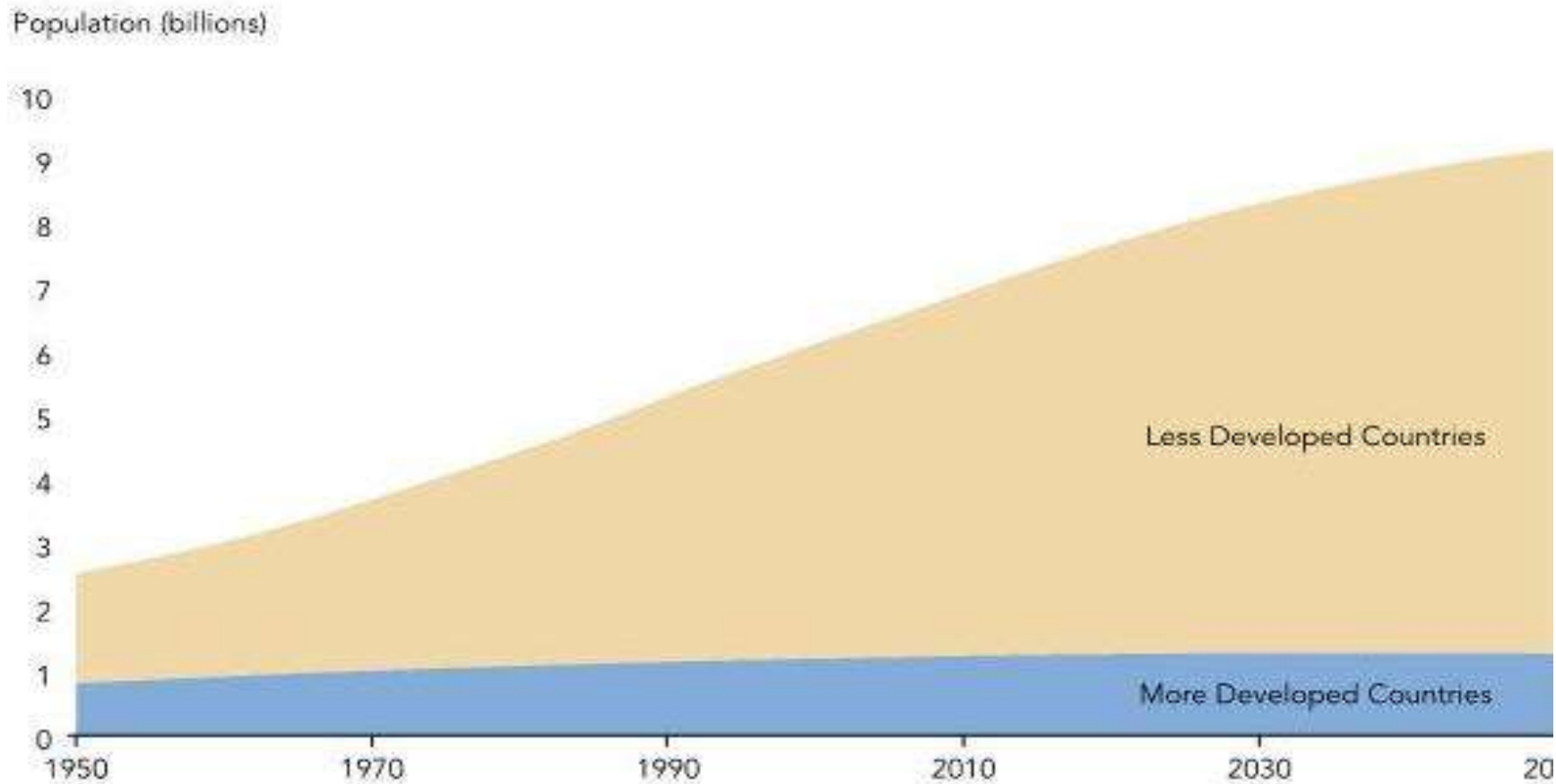
# Key risk factors for important EIDs

- Human
- Animal
- Environment
- Their interactions





# World Population

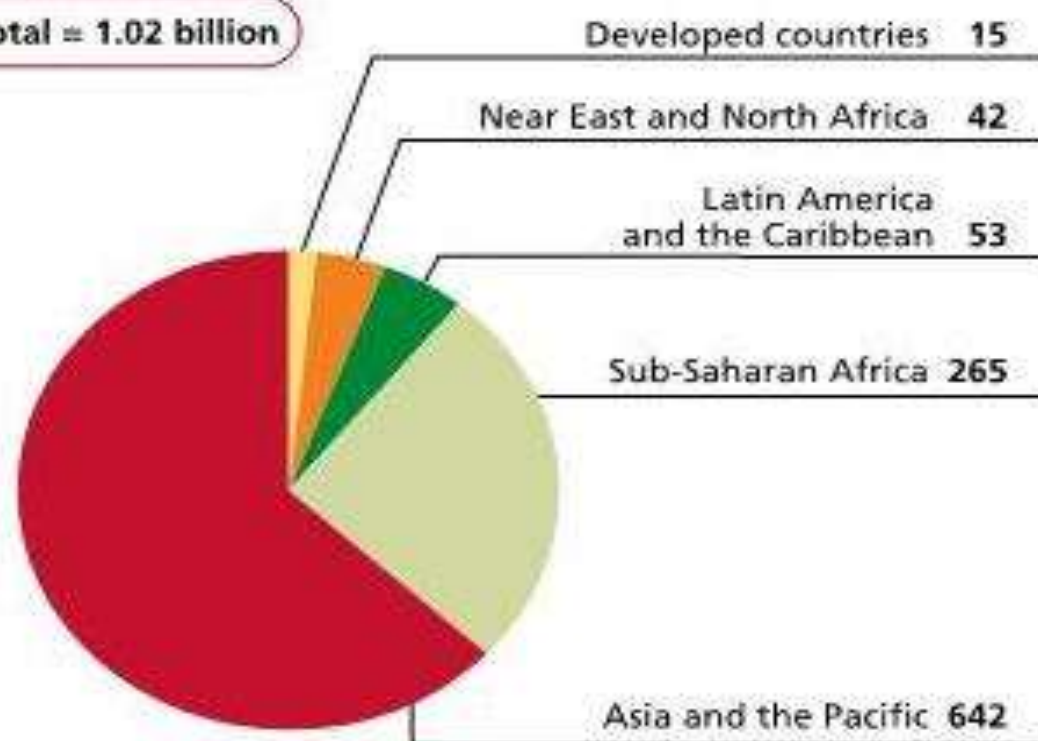


**SOURCE:** UN Population Division, *World Population Prospects: The 2008 Revision*, medium variant (2009).

# World Undernourishment

Undernourishment in 2009, by region (millions)

Total = 1.02 billion



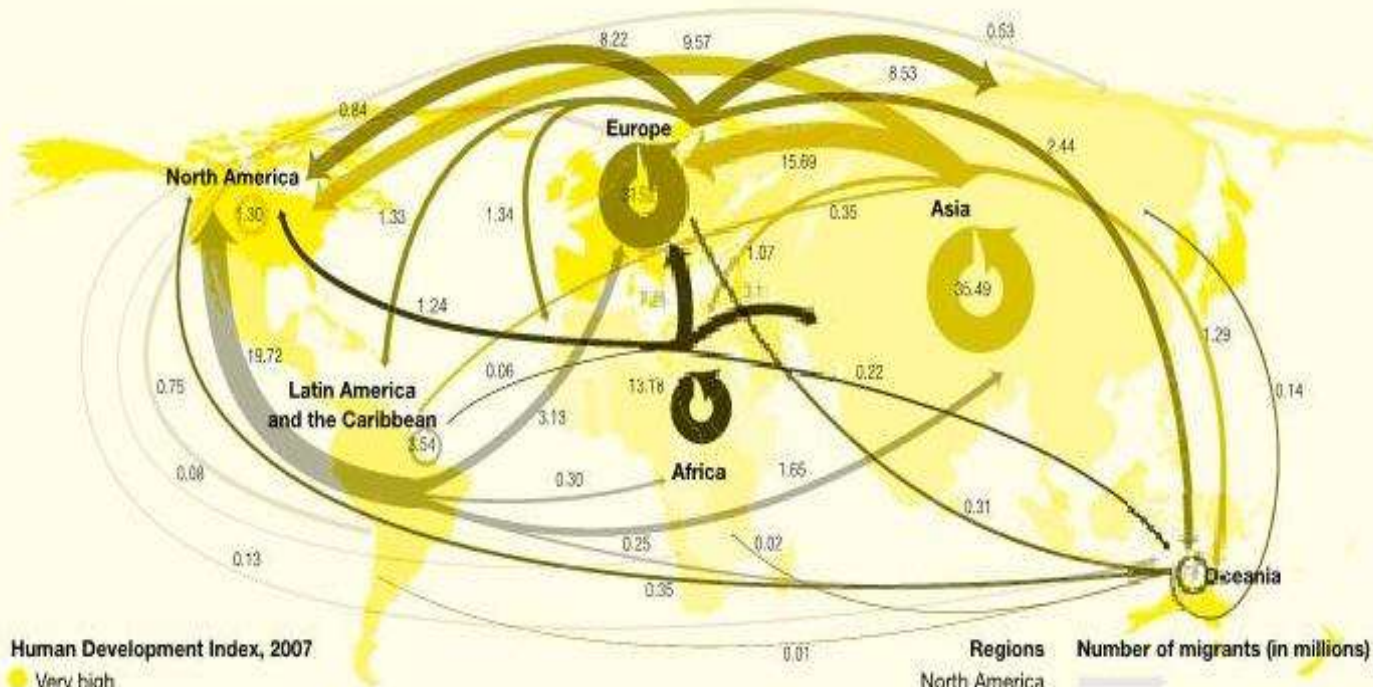
Source: FAO.

# World Movement of People

Map 1

## Most movement occurs within regions

Origin and destination of international migrants, circa 2000



### Human Development Index, 2007

- Very high
- High
- Medium
- Low

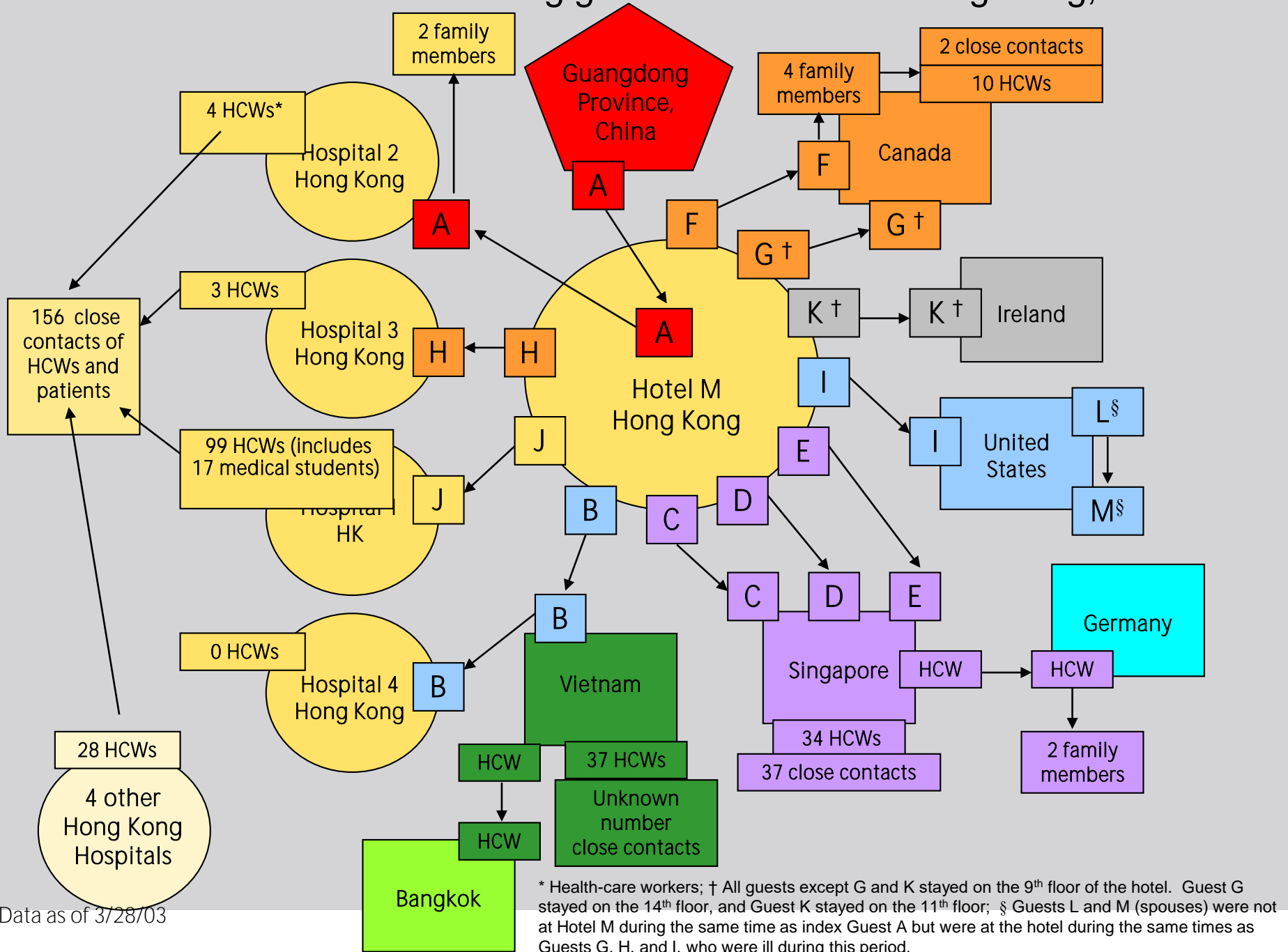
The size of countries is proportional to 2007 population.

### Regions Number of migrants (in millions)

- North America
  - Europe
  - Oceania
  - Latin America and the Caribbean
  - Asia
  - Africa
- Intra-regional migration

Source: HDI (can estimates based on Migration DRC (2007) database.

# Chain of transmission among guests at Hotel M—Hong Kong, 2003



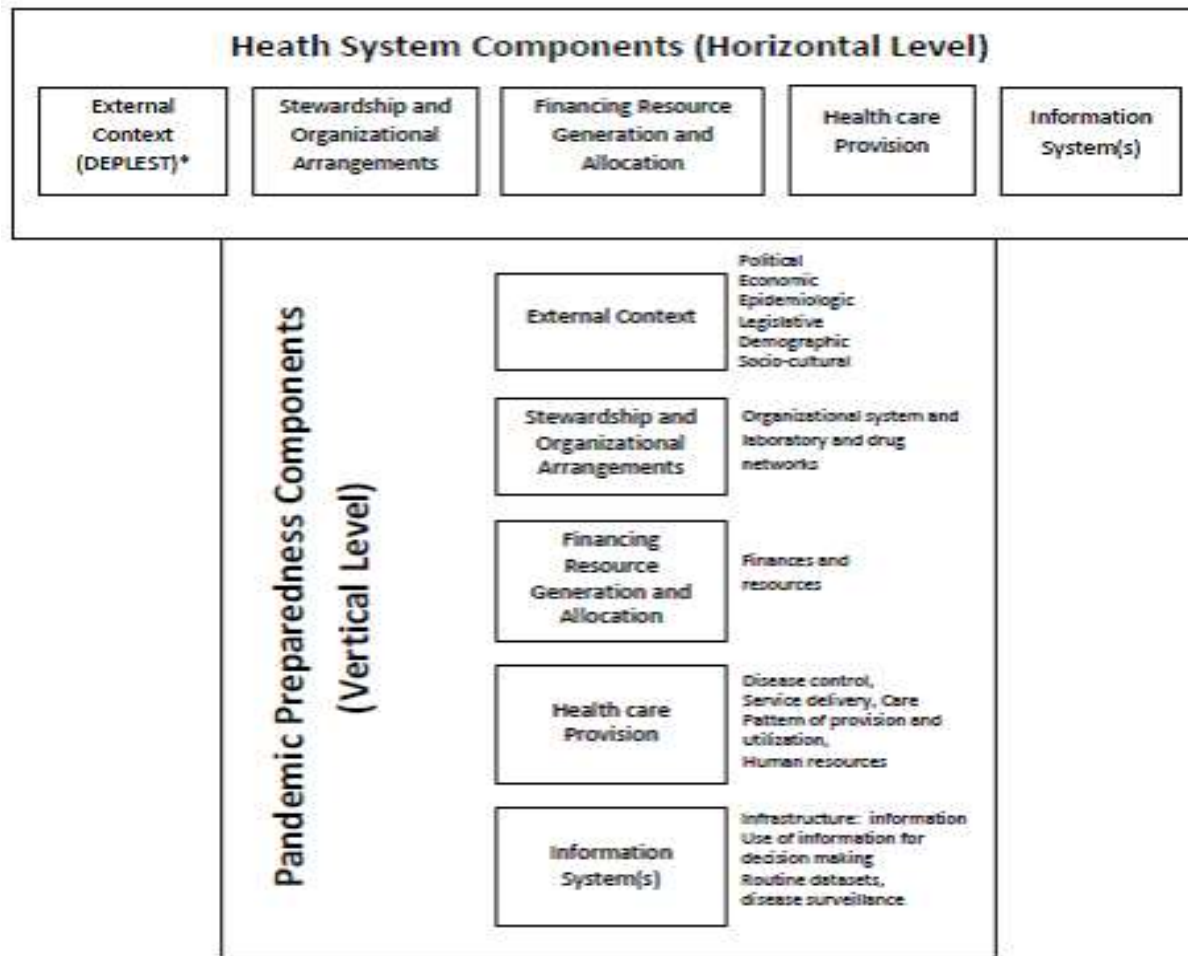
Data as of 3/28/03

\* Health-care workers; † All guests except G and K stayed on the 9<sup>th</sup> floor of the hotel. Guest G stayed on the 14<sup>th</sup> floor, and Guest K stayed on the 11<sup>th</sup> floor; § Guests L and M (spouses) were not at Hotel M during the same time as index Guest A but were at the hotel during the same times as Guests G, H, and I, who were ill during this period.

# Resilience to EID?

- Health System Integration:
  - How human health system and animal health system interface and evaluate whether integration improved resilience to EID?
- National, Regional to Global Intergration

# Health System Analysis (R Atun, 2010)



# Connecting the World on EID

- CHORDS: Connecting Health Organization on Regional Disease Surveillance
- Networks are arisen naturally responding to global threat of natural disaster and EID pandemic.
- To name a few of regional networks:
  - East African Integrated Disease Surveillance Network (EAIDSNet)
  - Network for Communicable Disease Control in Southern Europe and Mediterranean (EpiSouth)
  - Middle East Consortium on Infectious Disease Surveillance (MECIDS)
  - Mekong Basin Disease Surveillance Network (MBDS)
  - Pan American Health Organization (PAHO)
  - Southern African Center for Infectious Disease Surveillance (SACIDS)
  - South-Eastern Europe Health Network (SEE)
  - Asian Partnership of Emerging Infectious Disease Research (APEIR)
  - Indonesia Zoonosis One (Indozoone)

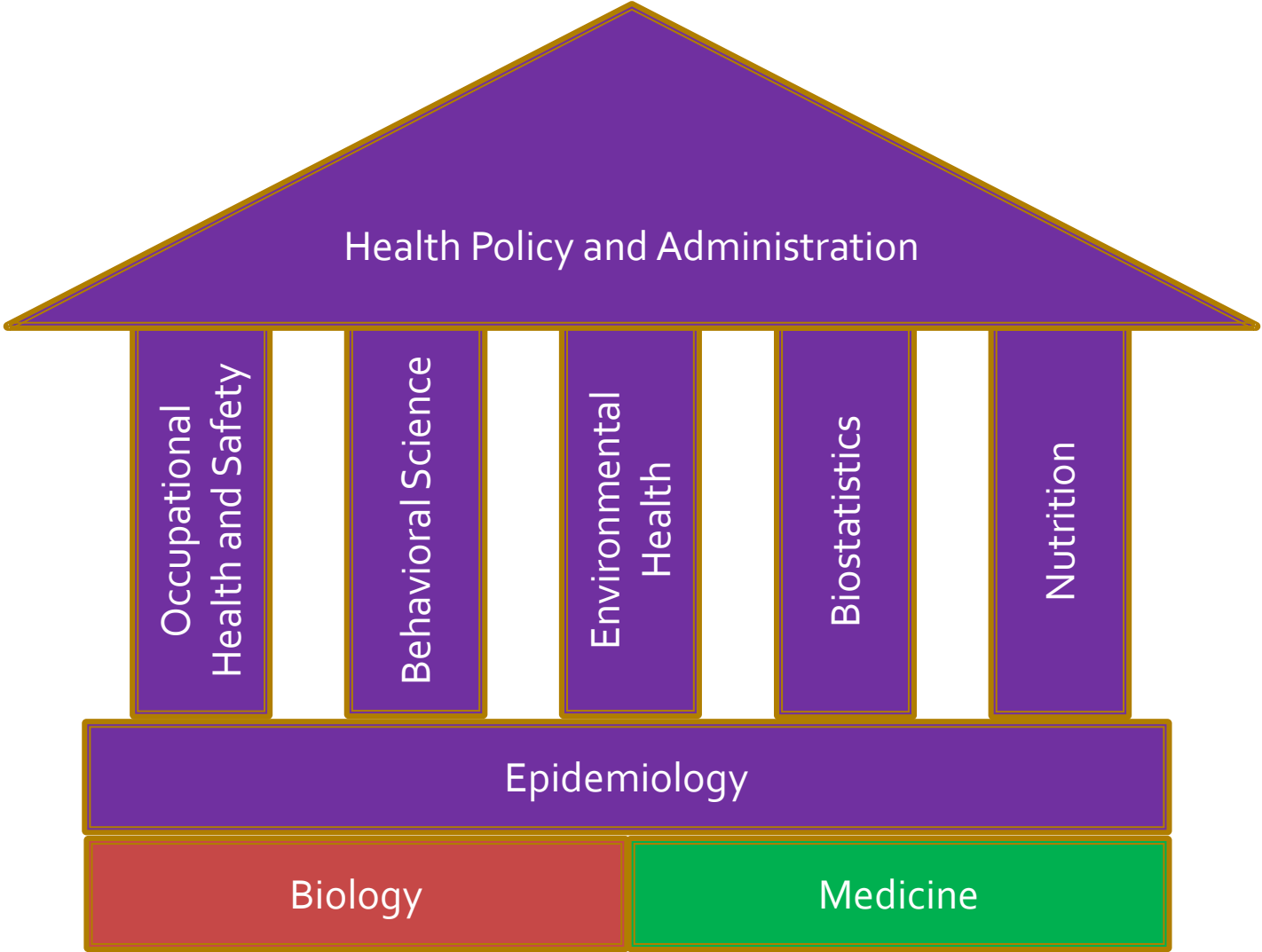
# What is Public Health?

C.E.A. Winslow (1920)

“...the science and art of disease prevention, prolonging life, and promoting health and well-being through organized community effort for the sanitation of the environment, the control of communicable infections, the organization of medical and nursing services for the early diagnosis and prevention of disease, the education of the individual in personal health and the development of the social machinery to assure everyone a standard of living adequate **for the maintenance or improvement of health**”



# Connecting the Field of Sciences on EID

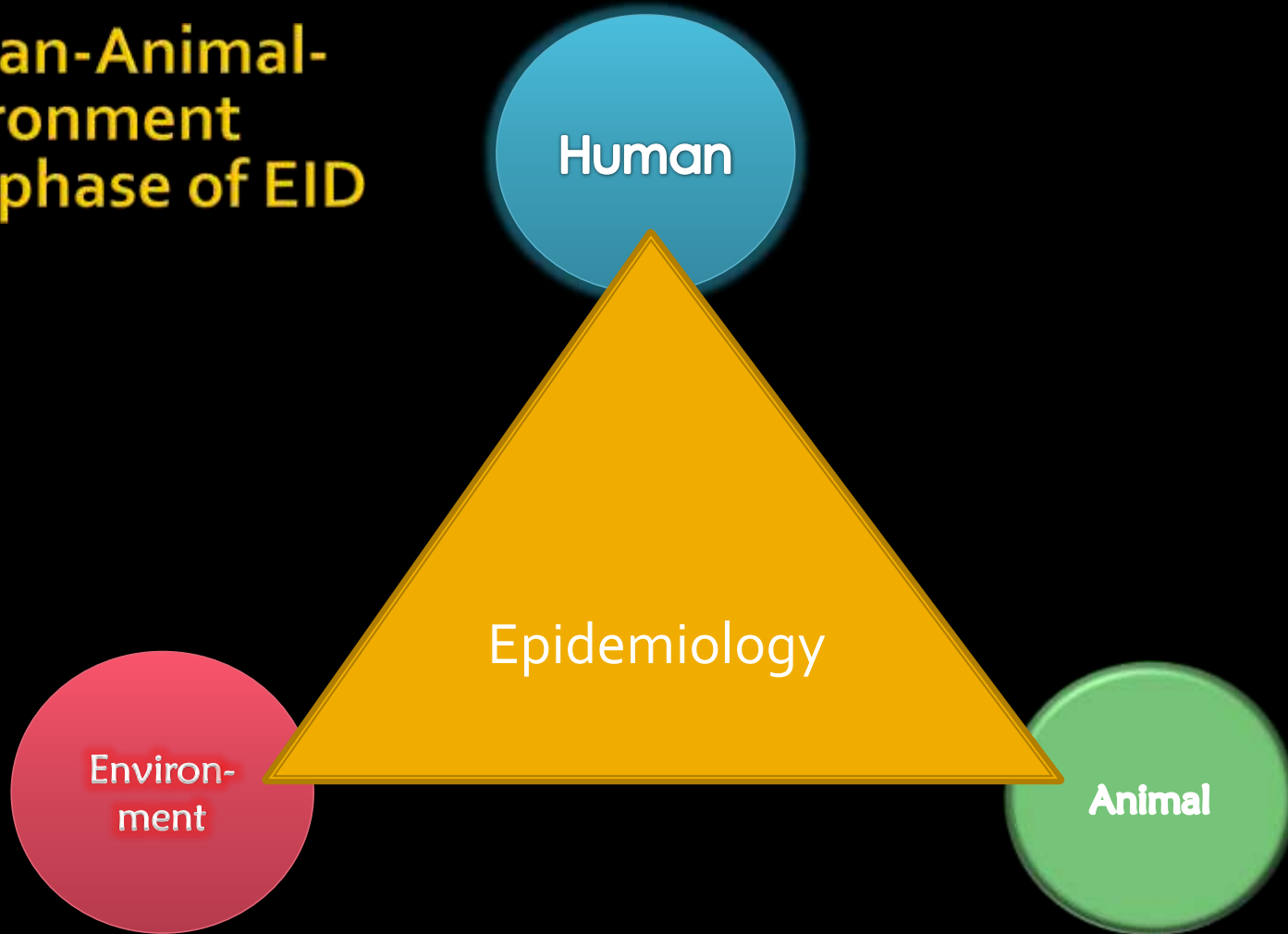


# EcoHealth

Ecohealth extends traditional **environmental health** by studying the relationship between health and explicitly ecological factors such as biodiversity and ecosystem “services”

Cited from: Lebel J, Rapport DJ (2003) in Butler CD, Friel S (2006)  
“Time to regenerate: Ecosystems and health promotion”. PLoS Med 3(10):  
e394. DOI: [10.1371/journal.pmed.0030394](https://doi.org/10.1371/journal.pmed.0030394)

# Human-Animal- Environment Interphase of EID



distribution and determinants of events  
in specified populations

# Conclusion

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Public health is an applied science, which  
EcoHealth is an extension of public health  
(Environmental Health)

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