



# THE 9TH ASIAN CONGRESS OF PEDIATRIC INFECTIOUS DISEASES

*Global Prospects, Local Progress and Eternal Promise for Children's Health*

*Think globally*

*Act locally*



*Start immediately*

*for children's health and happiness*

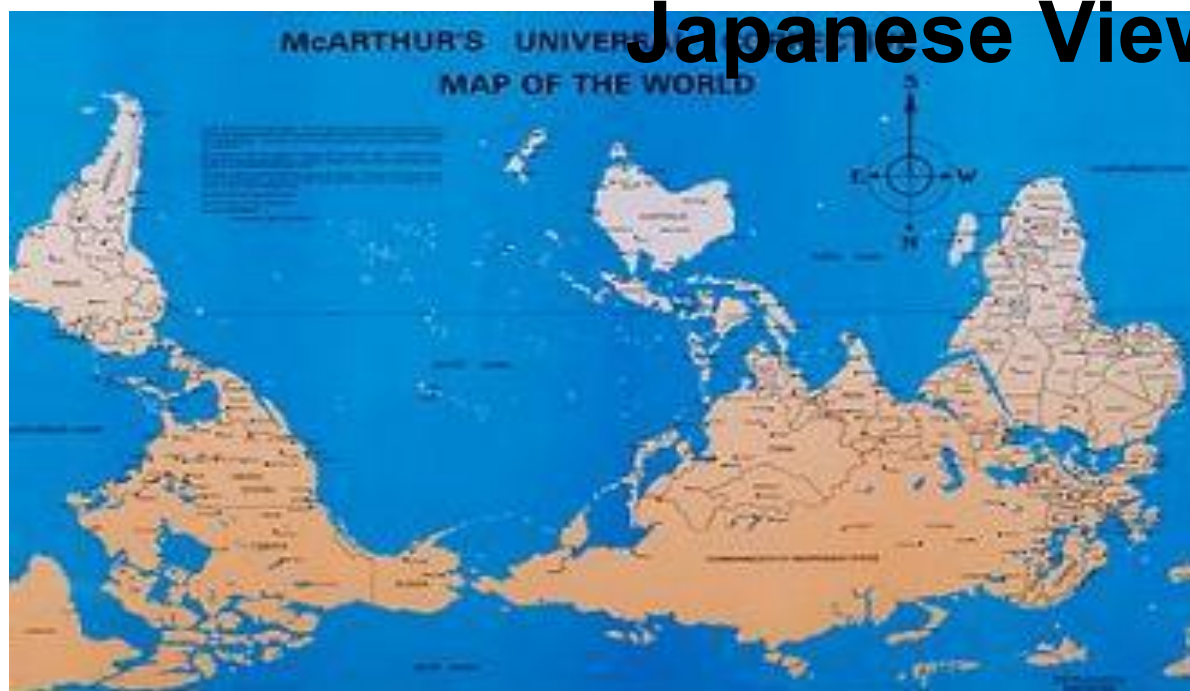
Hiroyuki Moriuchi

Nagasaki University

**Australian View**



**European View**



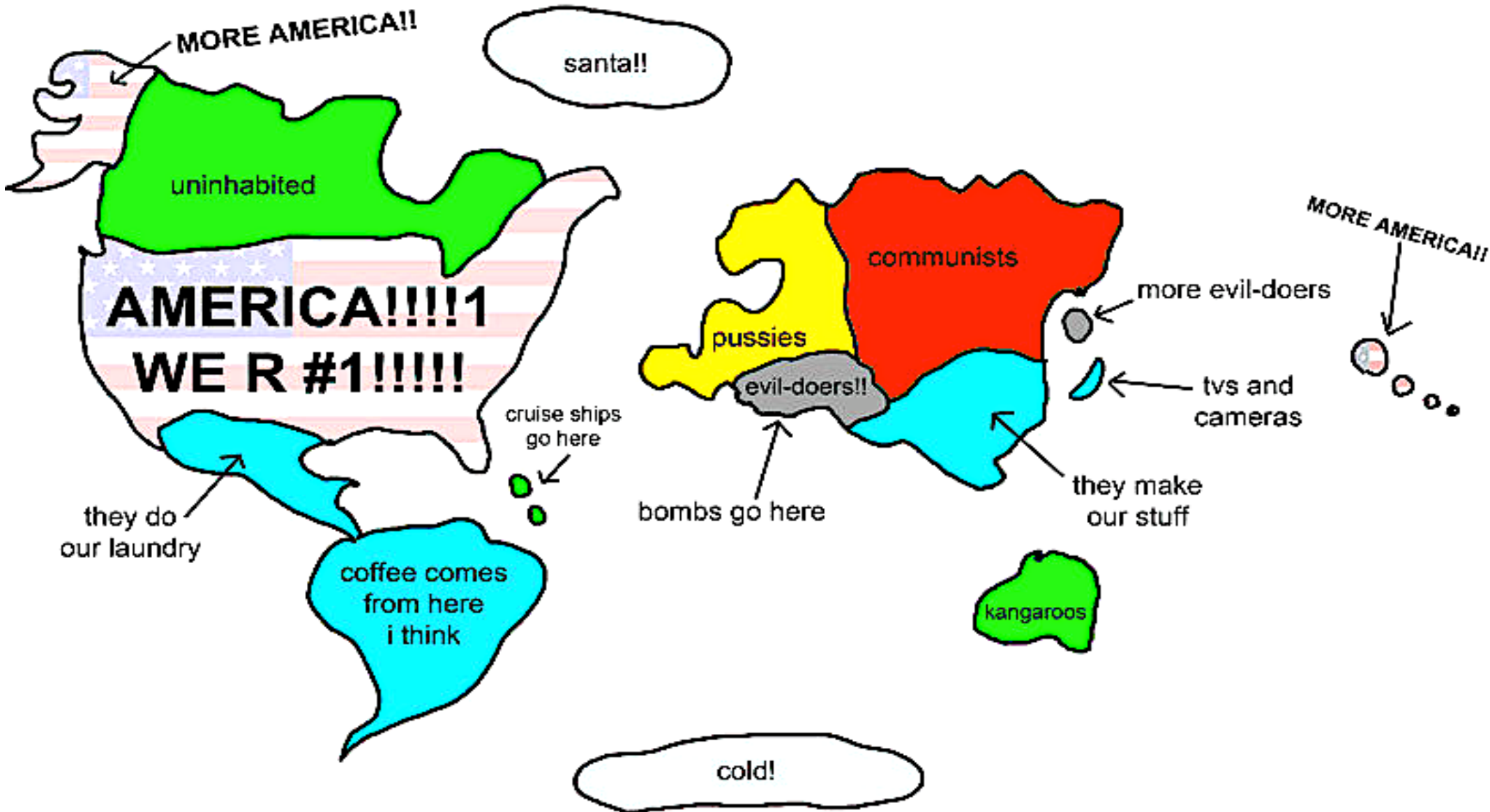
**Japanese View**



**Japanese View**



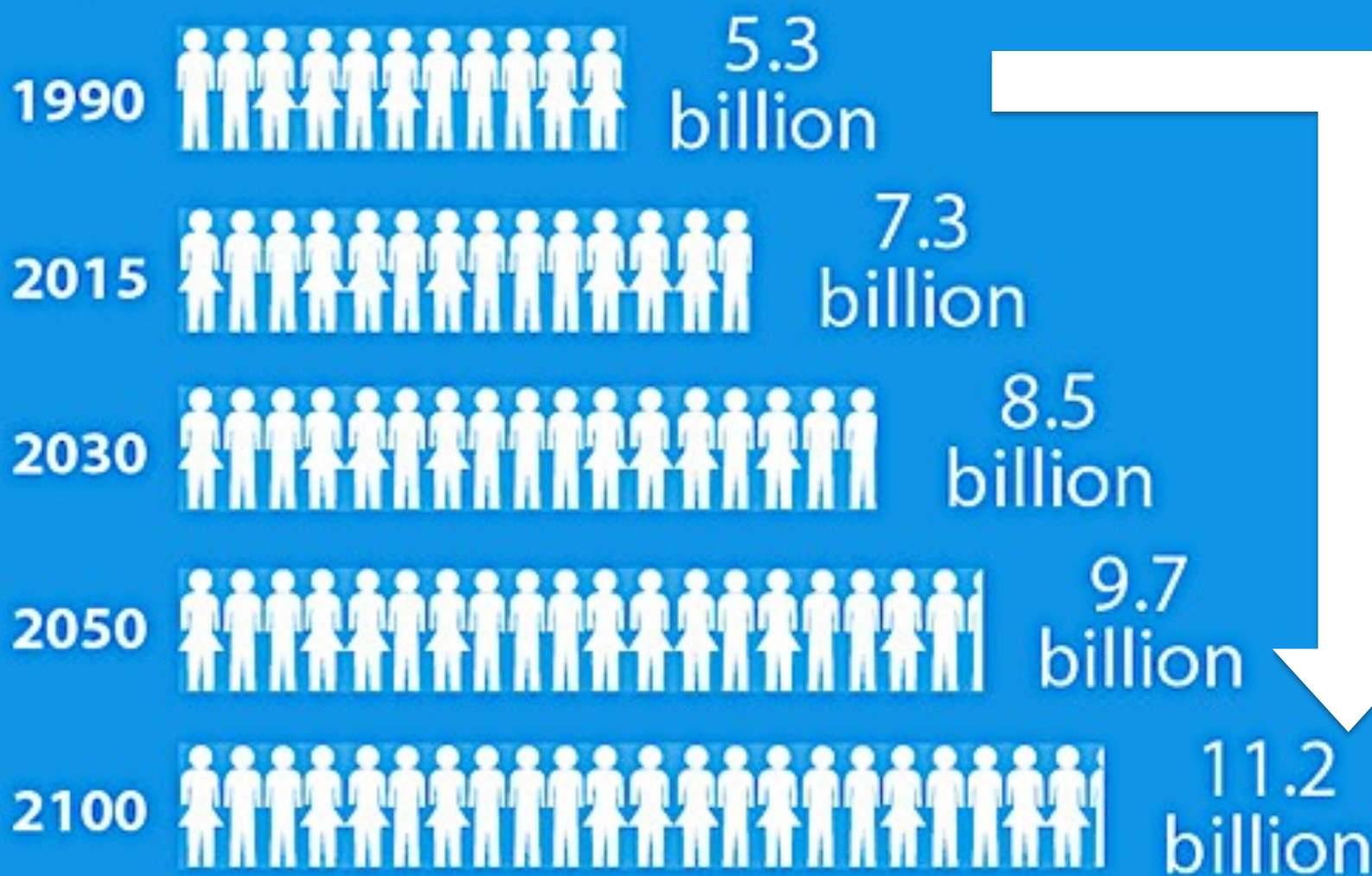
# THE WORLD ACCORDING TO AMERICANS





# World Population

Projected world population until 2100

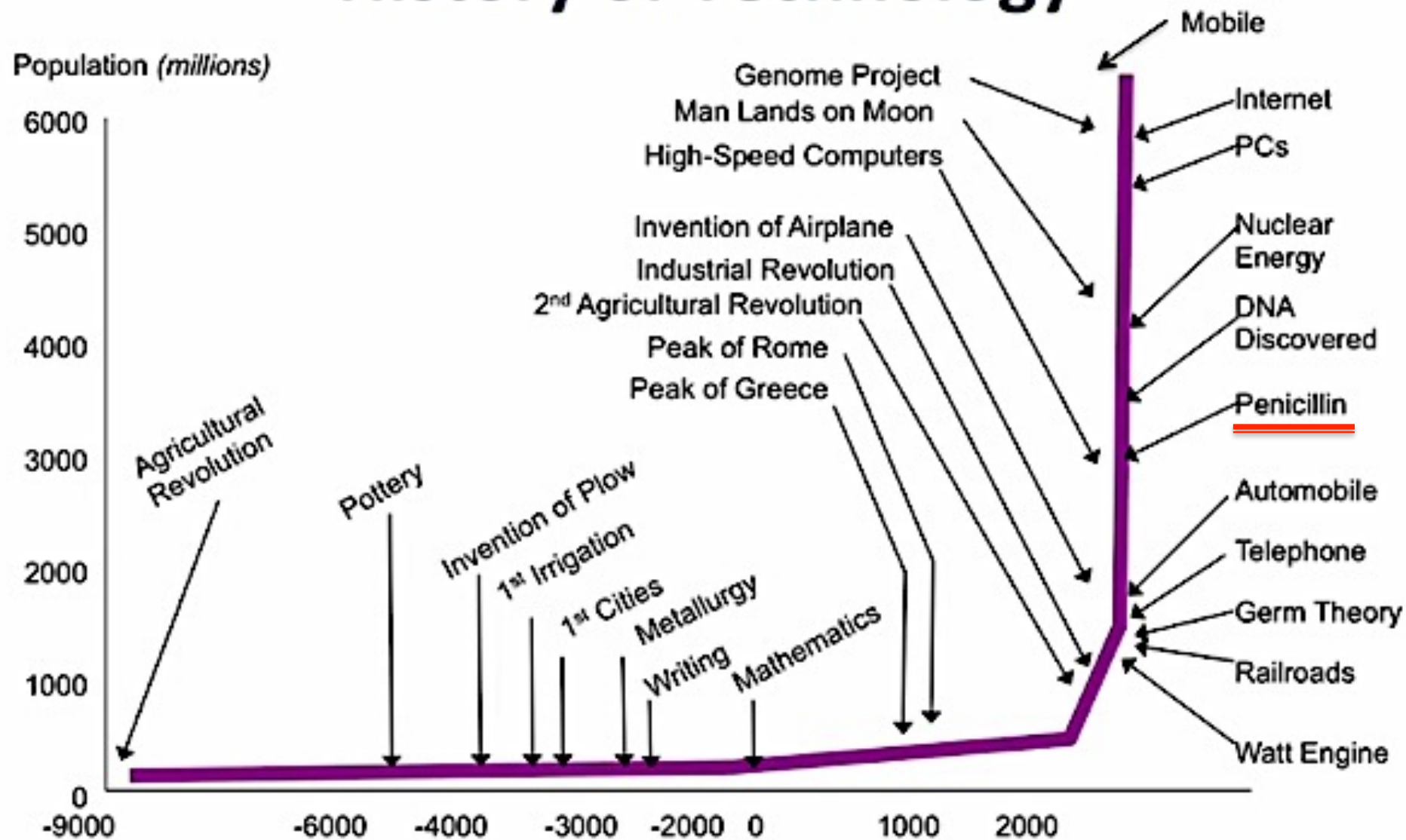


Source: United Nations Department of Economic and Social Affairs,  
Population Division, *World Population Prospects: The 2015 Revision*  
Produced by: United Nations Department of Public Information

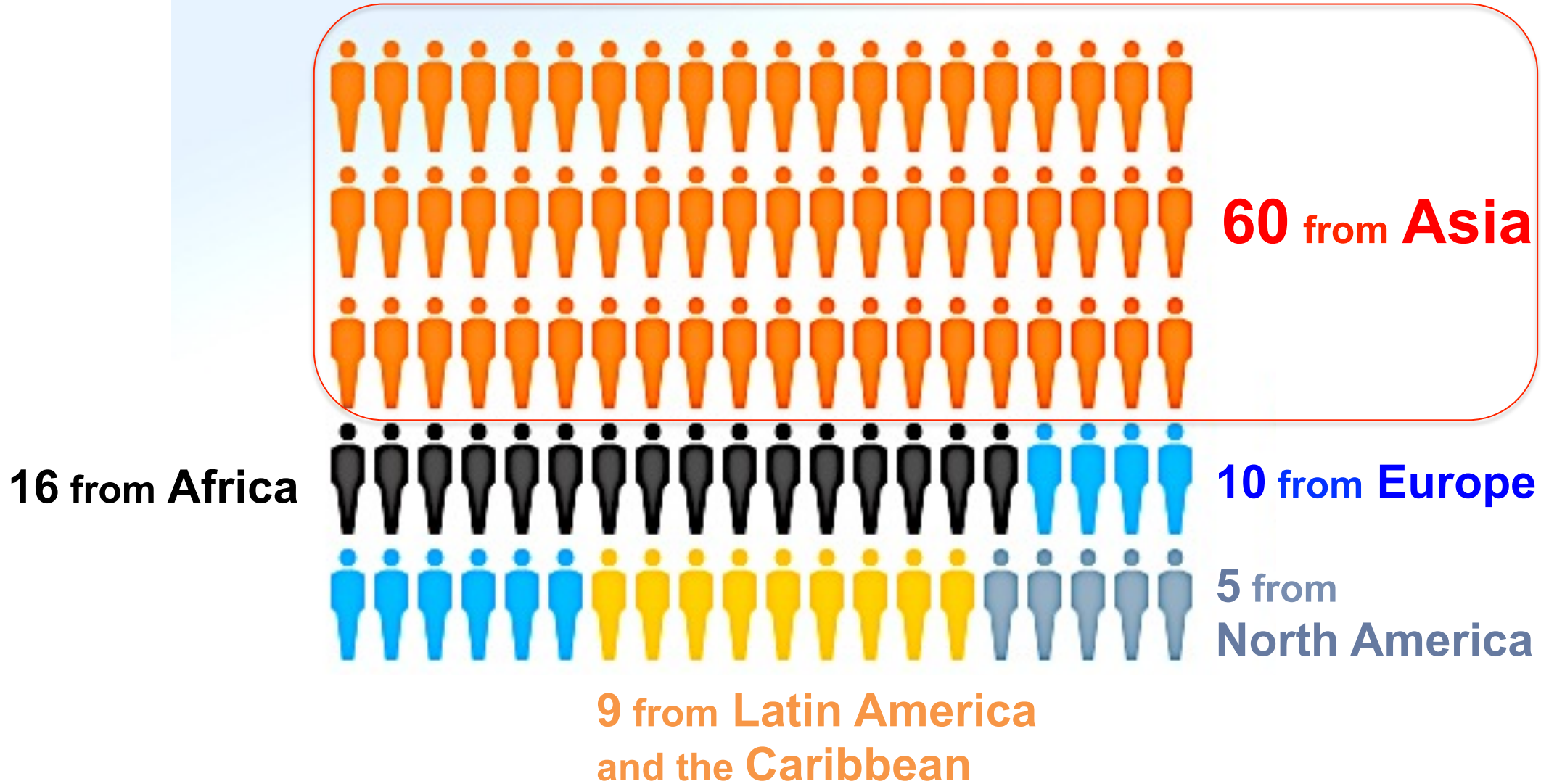


2015  
TIME FOR  
GLOBAL ACTION  
SUSTAINABLE DEVELOPMENT GOALS

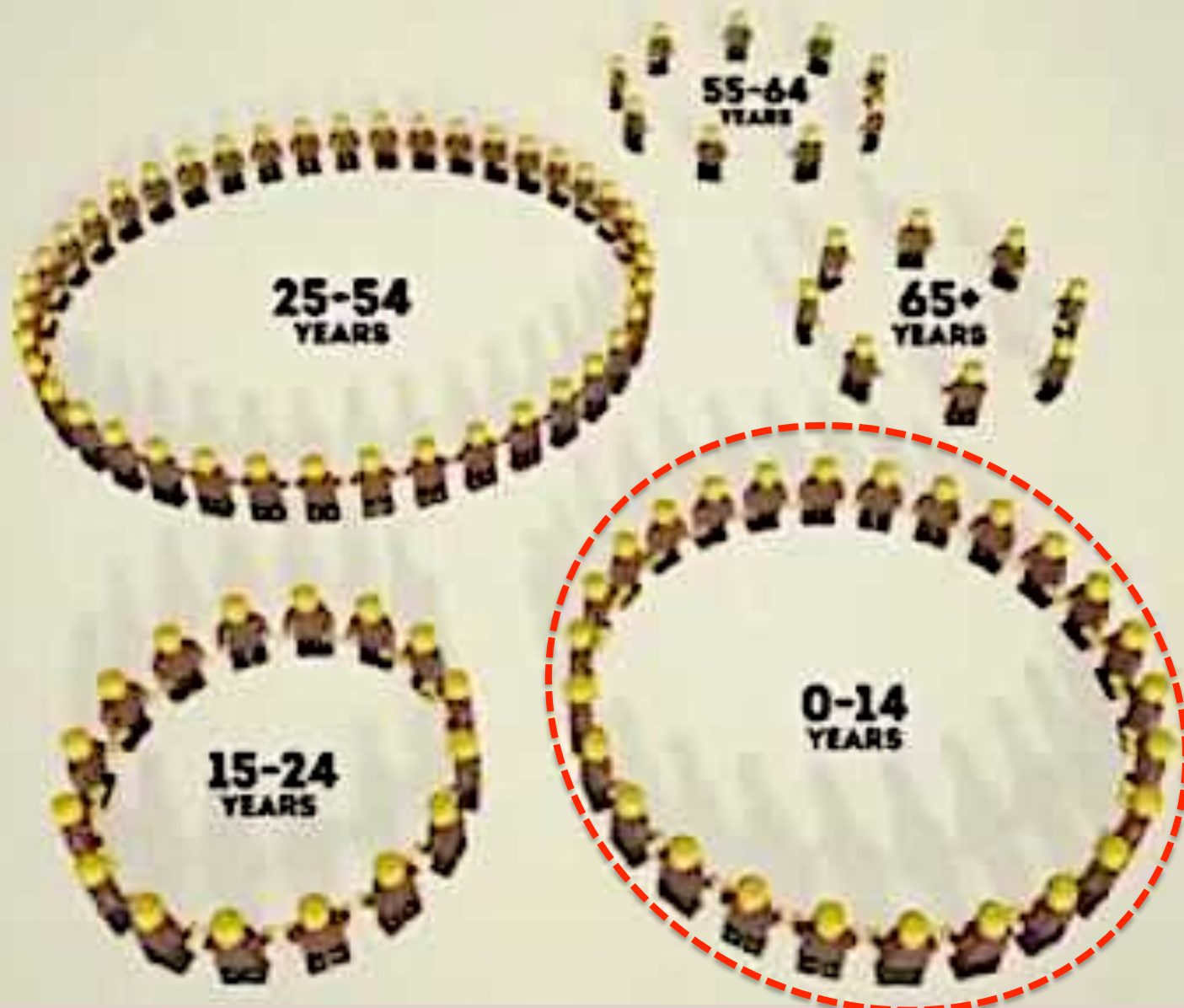
# Growth of World Population and the History of Technology



# If Earth were a village with 100 people...



# IF 100 PEOPLE LIVED ON EARTH...



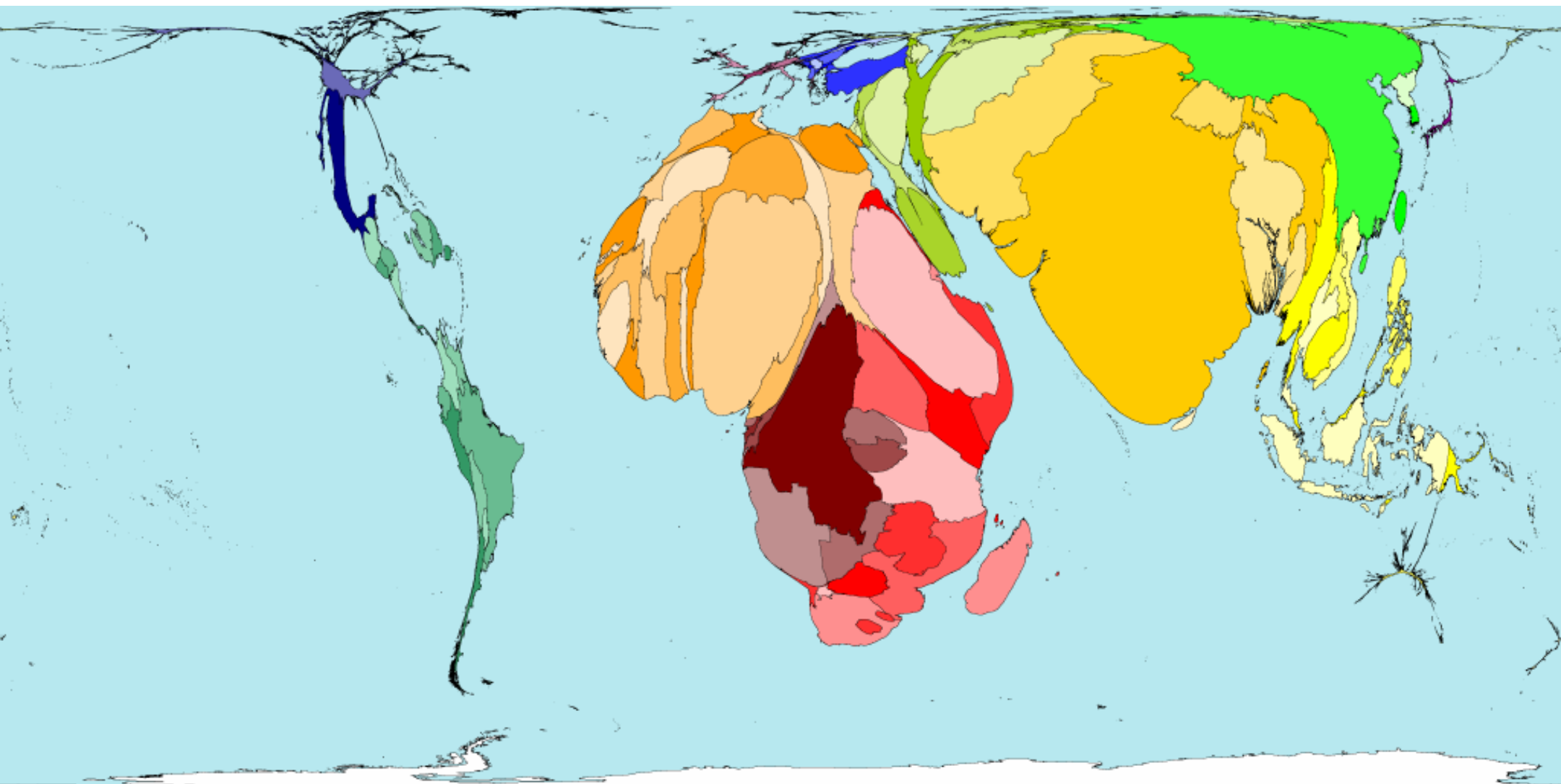
# The World of Children



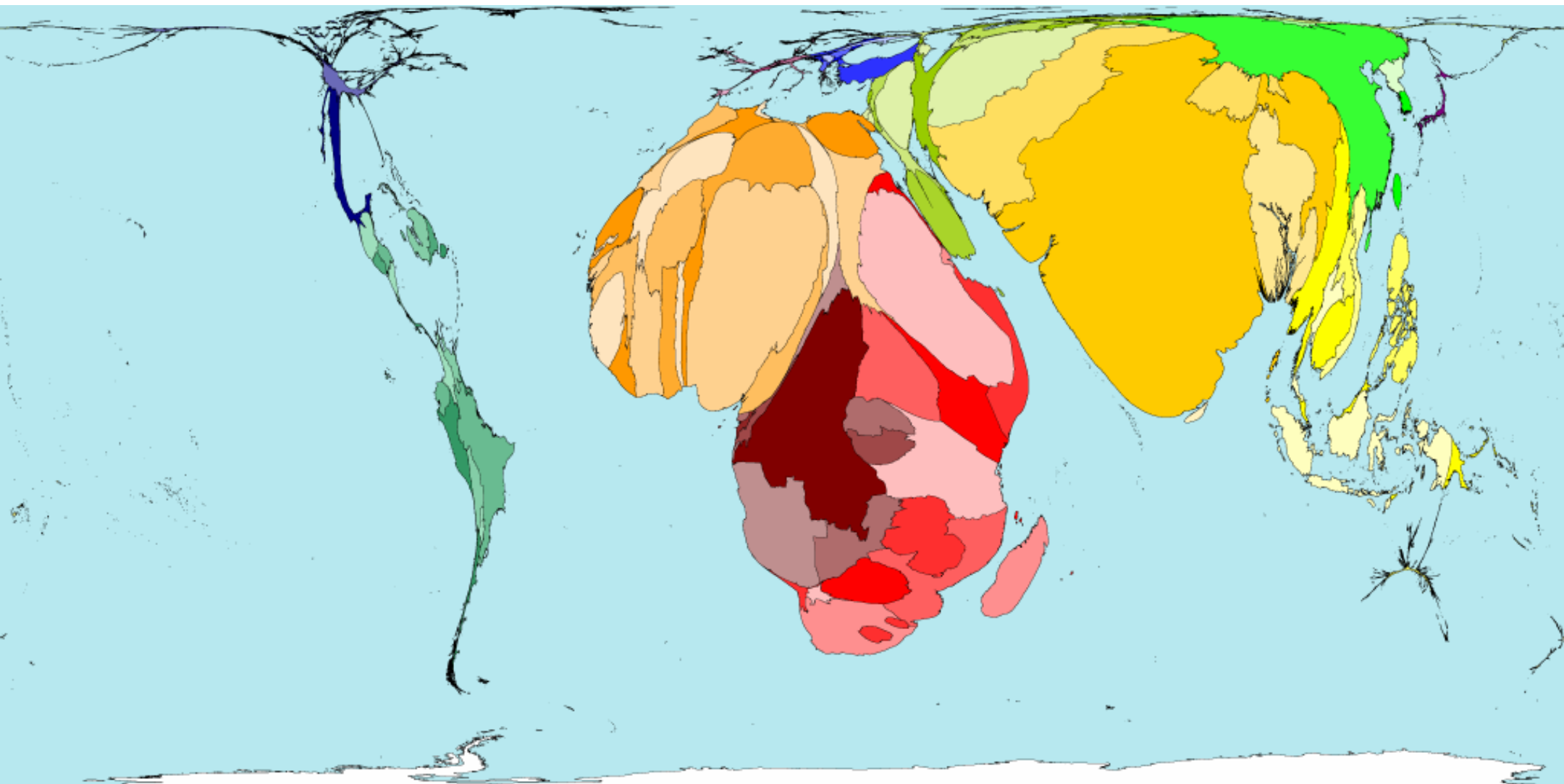
Projection based on a gridded cartogram transformation giving every child on the planet the same amount of space  
Map created 2011 by Benjamin D. Hennig, University of Sheffield using data from CIESIN, Columbia University

[www.viewsoftheworld.net](http://www.viewsoftheworld.net)

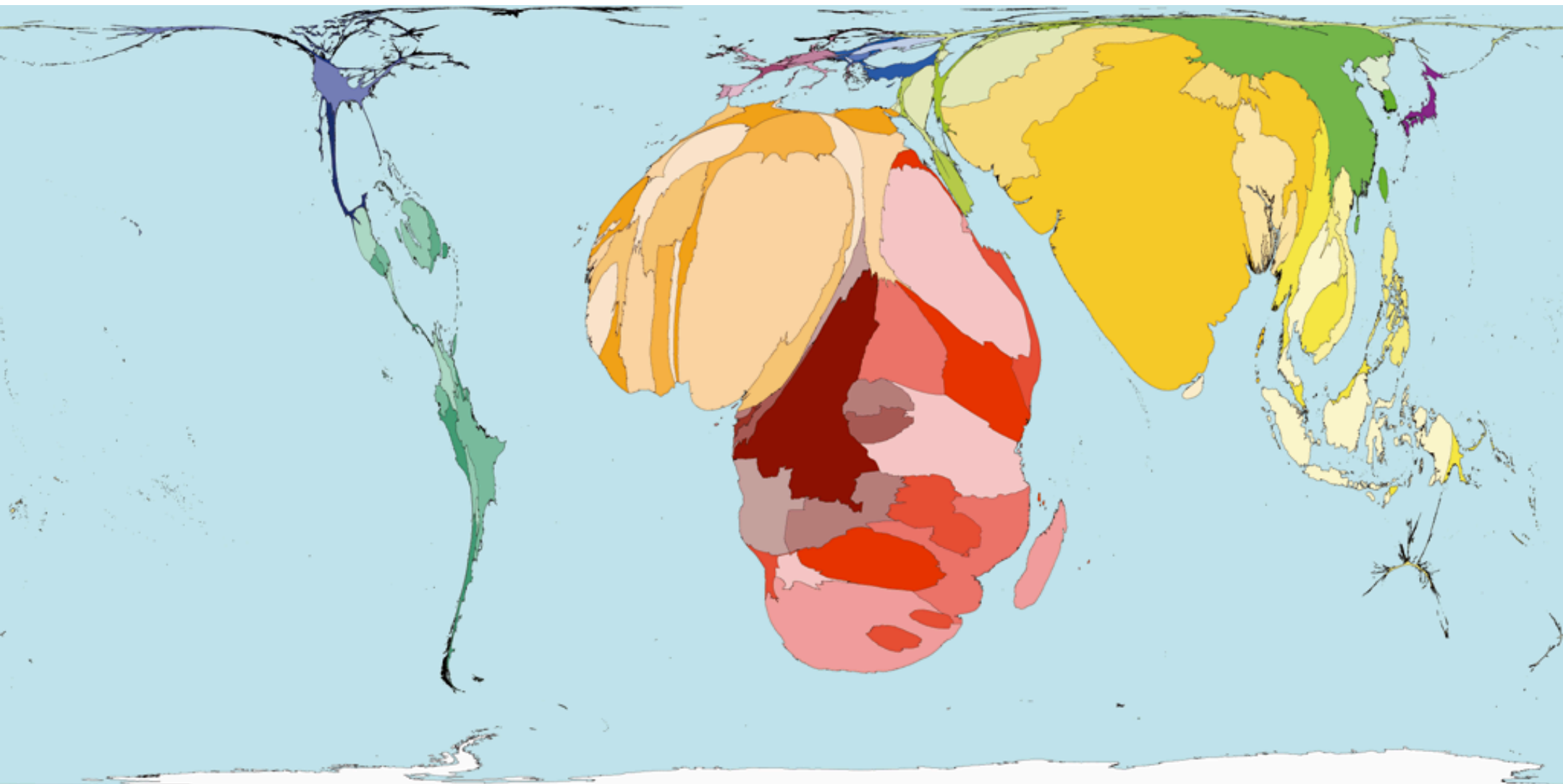
# All Infant Death



# All Aged 1-4 Deaths



# Infectious and Parasitic Disease Deaths



***Infection***



**Host**

**Environment**



**Microbe**



# Children in developing countries



## Unsafe environment

- Unsafe water
- Unsafe sanitation

## Poor medical access

- No vaccination
- Inappropriate antibiotic use  
→ emergence of resistant strains

## Malnutrition

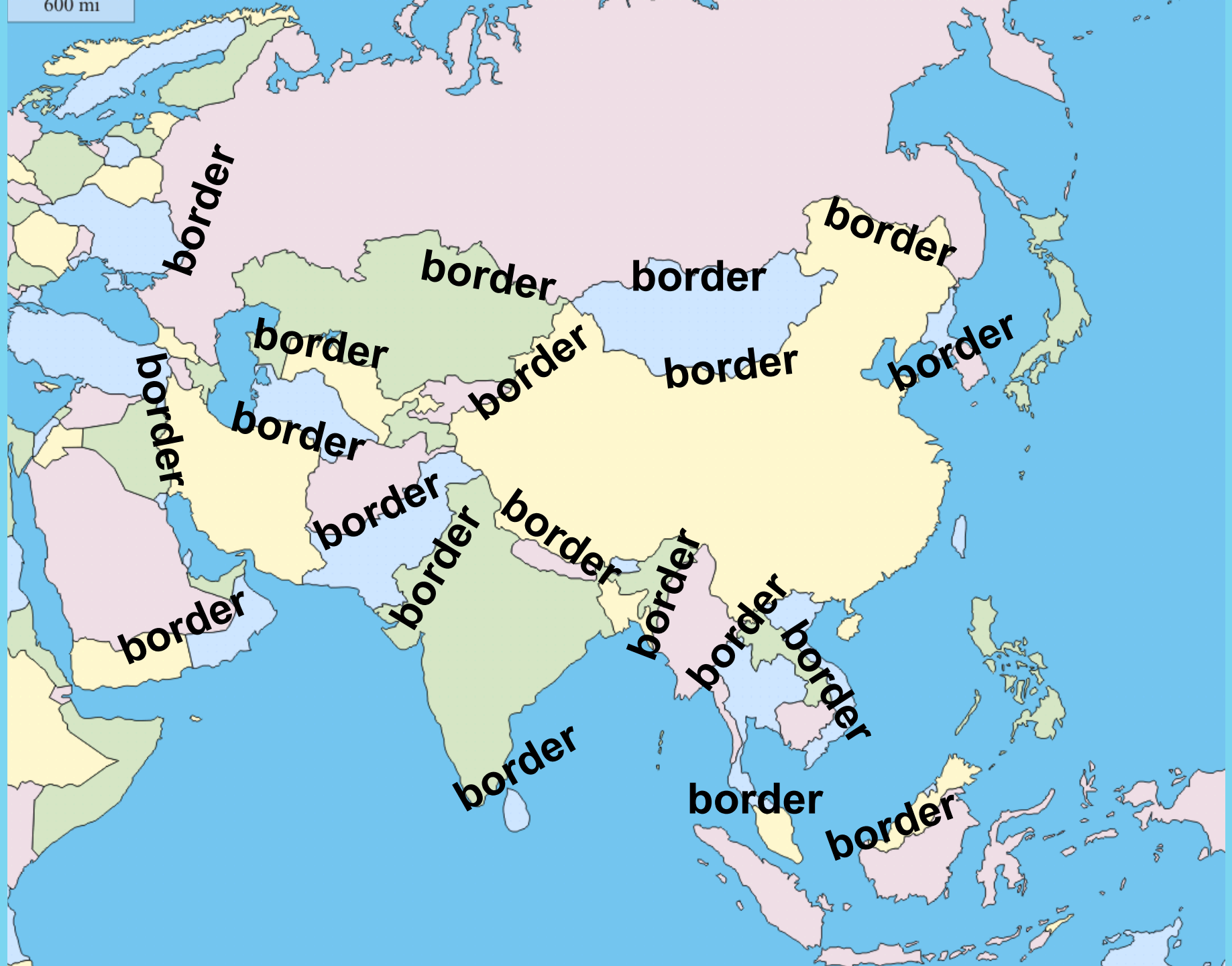
The major and long-lasting cause of immunodeficiency

## HIV/AIDS

The major and emerging cause of immunodeficiency

... are prone to infectious diseases

600 mi



# Bother Borders!



**Conflict**



**Co-operative activities**



BB NEWS

*Think globally*



**One World**

**One Health**

Can you see borders?



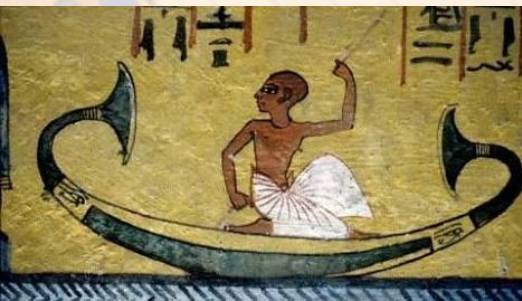
**One World**

Neither can microbes.

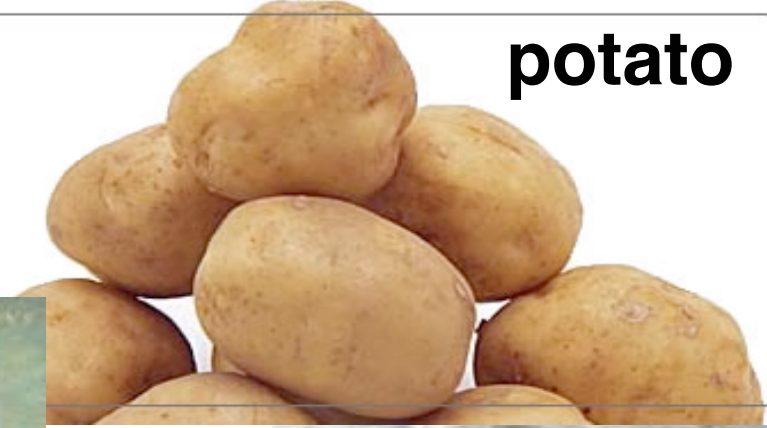




*Emerging infectious diseases are not just the present-day issues but historical events*



# Columbus brought from the New World **GOOD** things ...



potato



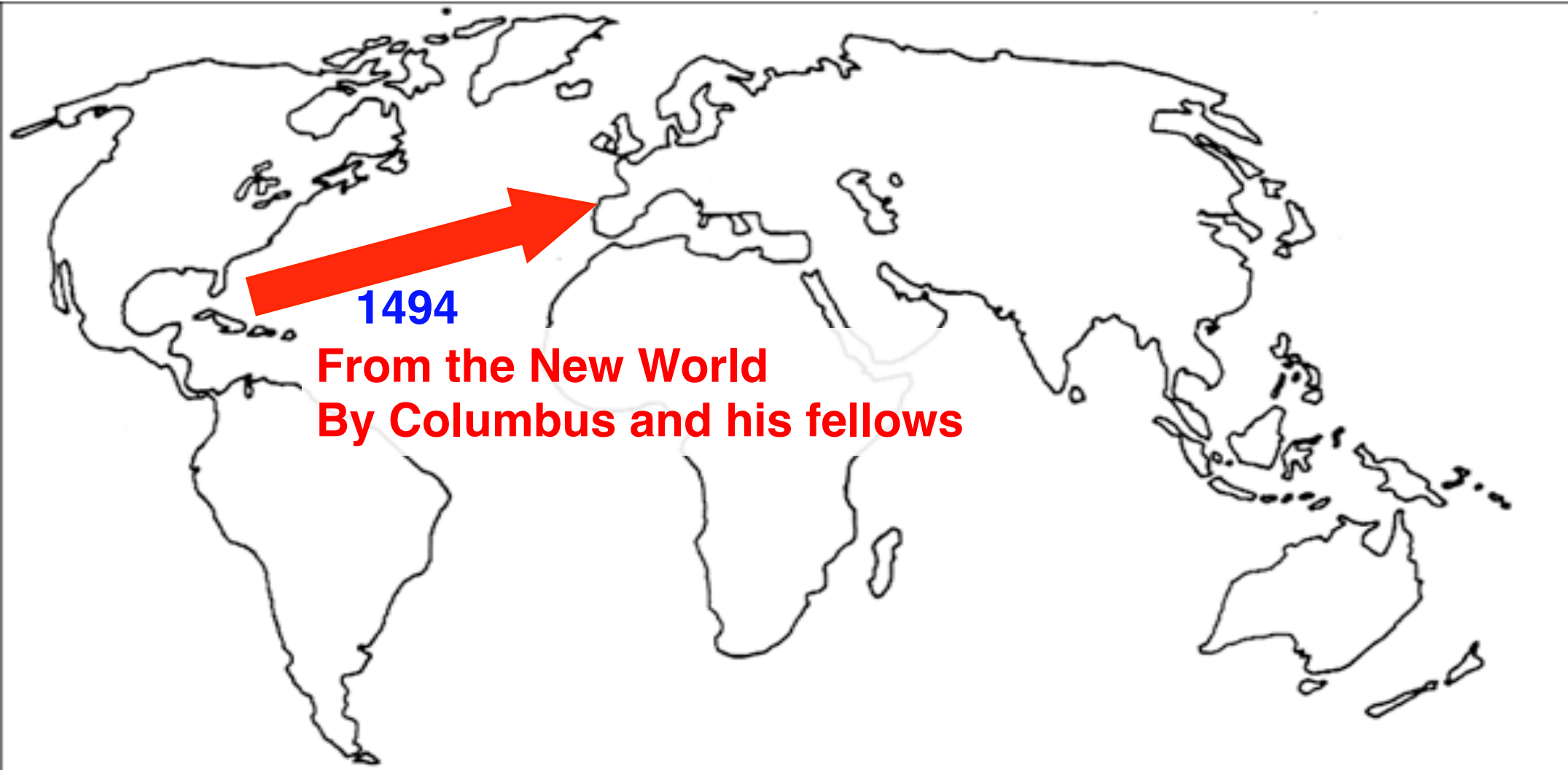
tobacco



syphilis

and **BAD** things

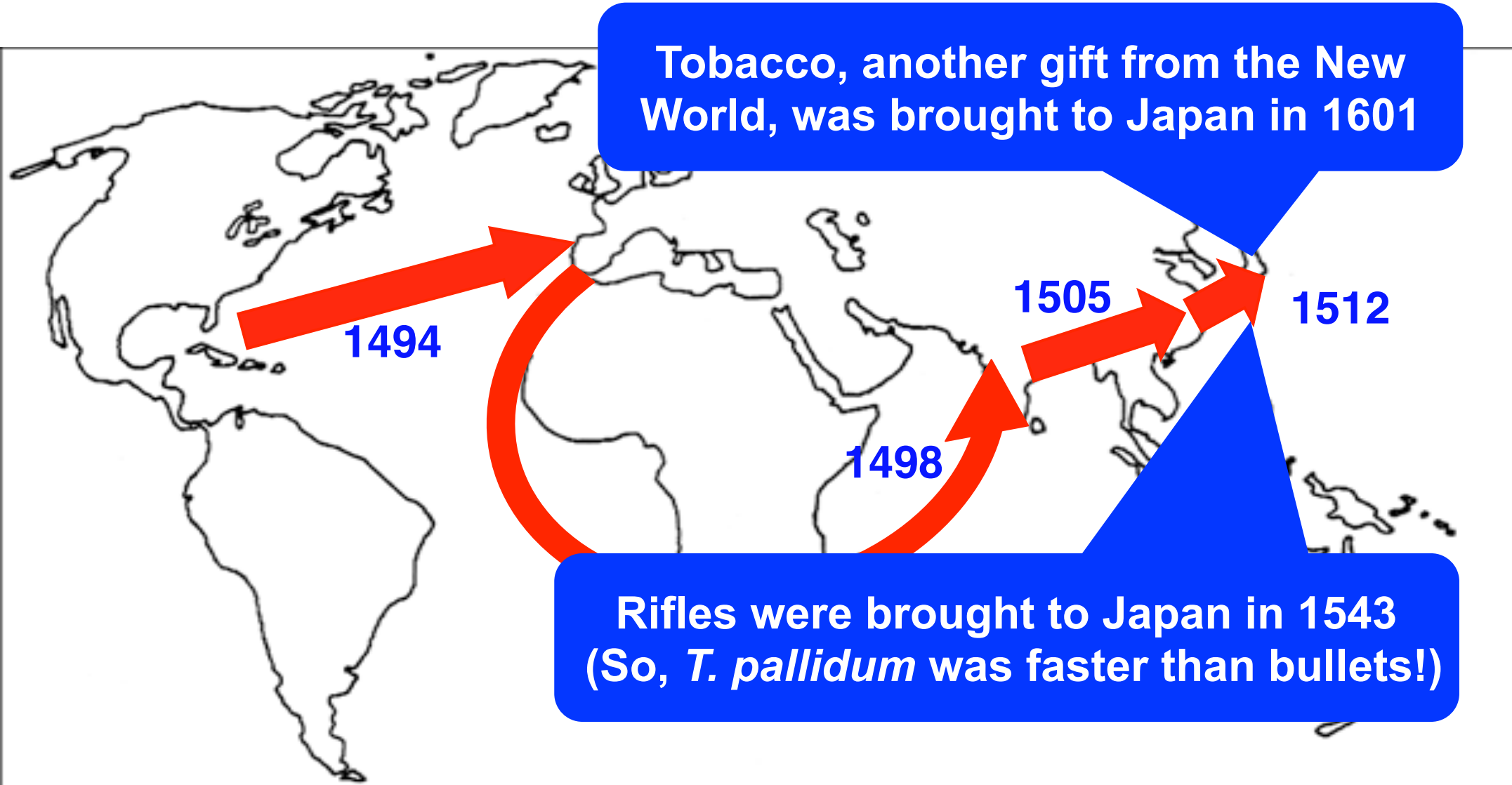
# Pandemic for syphilis?



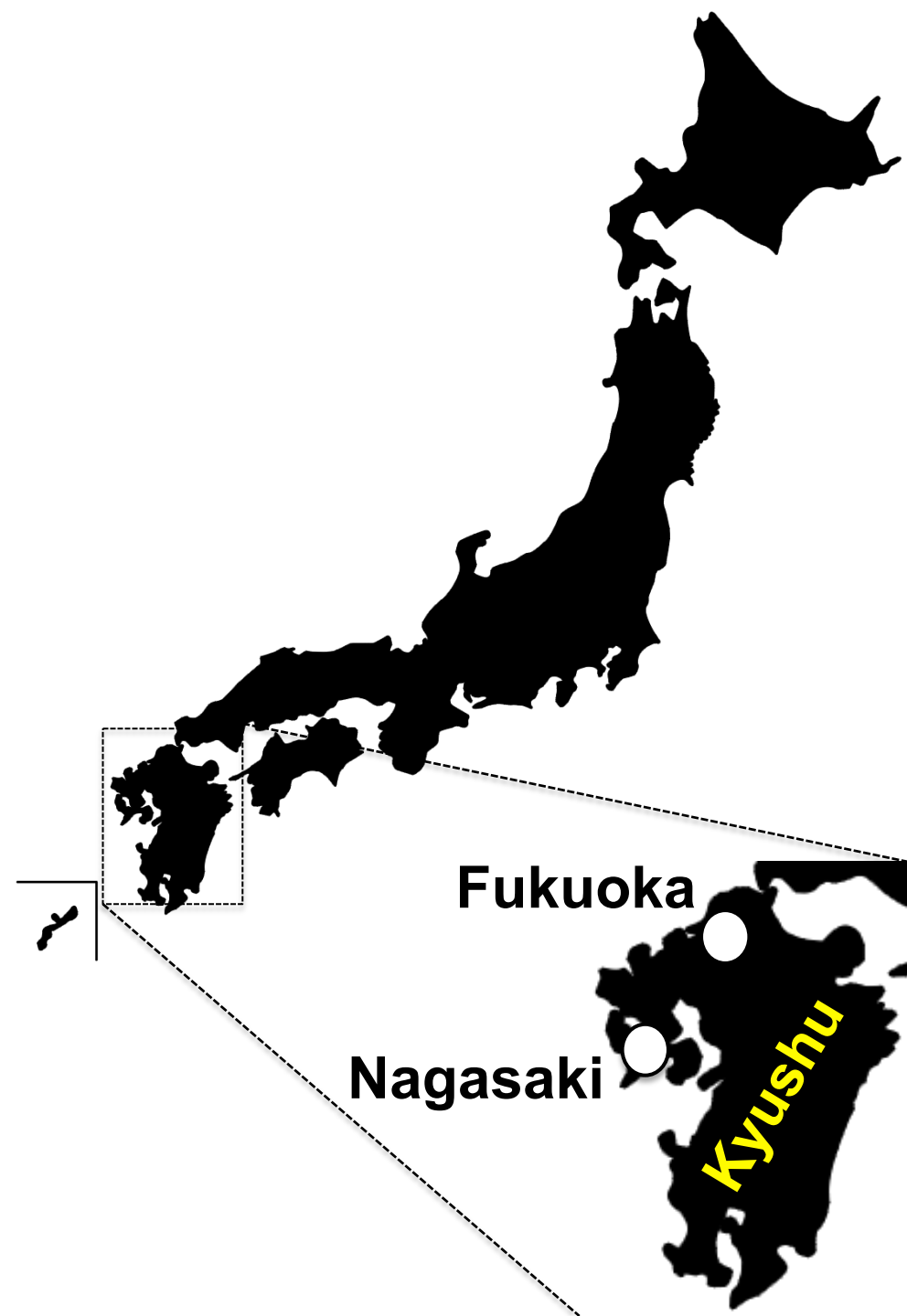
**1494**

**From the New World  
By Columbus and his fellows**

# Pandemic for syphilis?

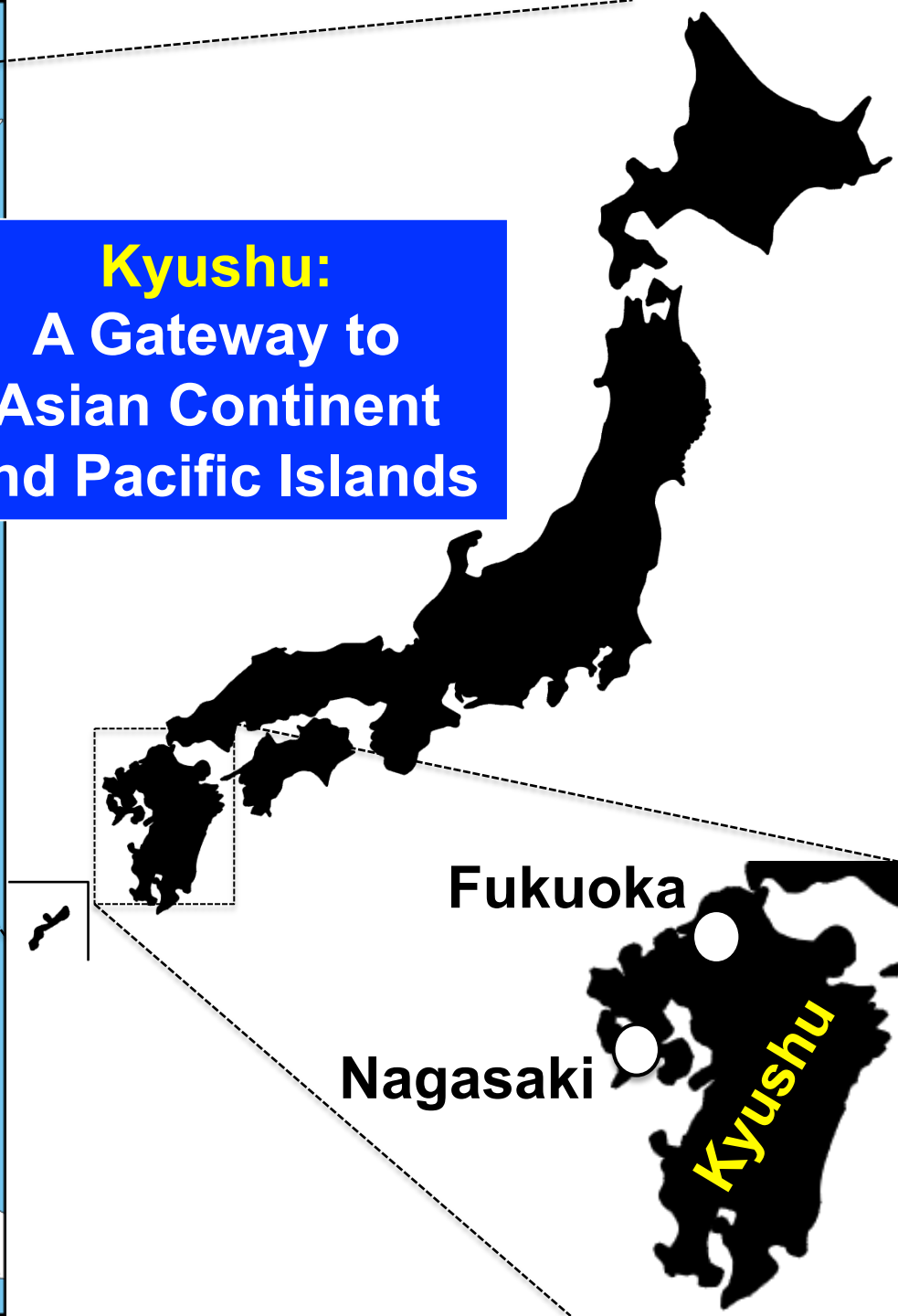


***18-year trip of syphilis to Japan***





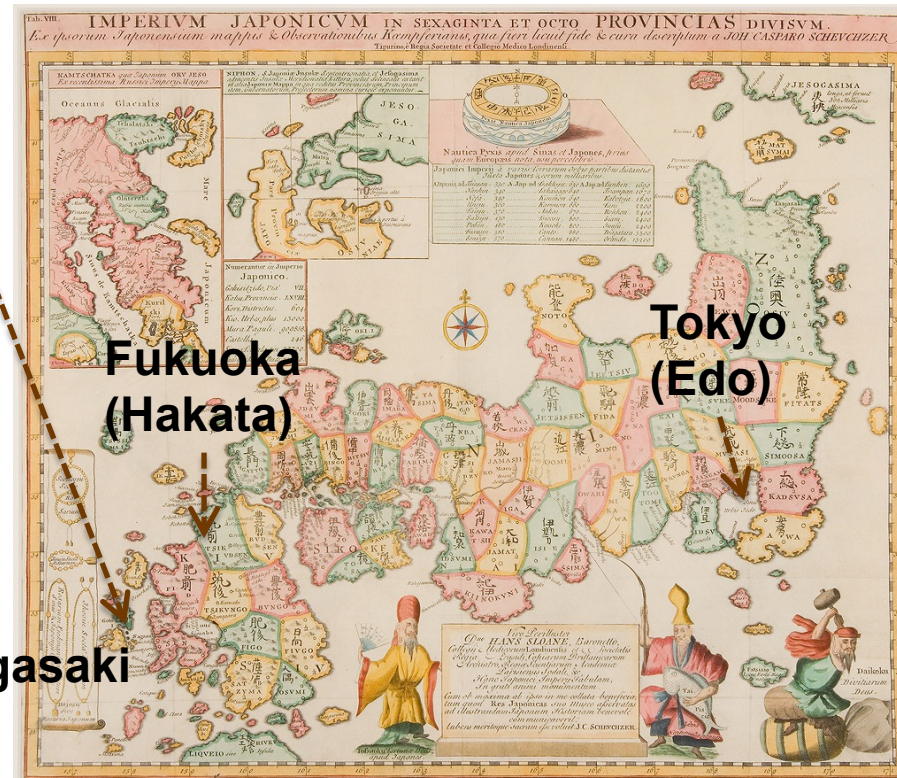
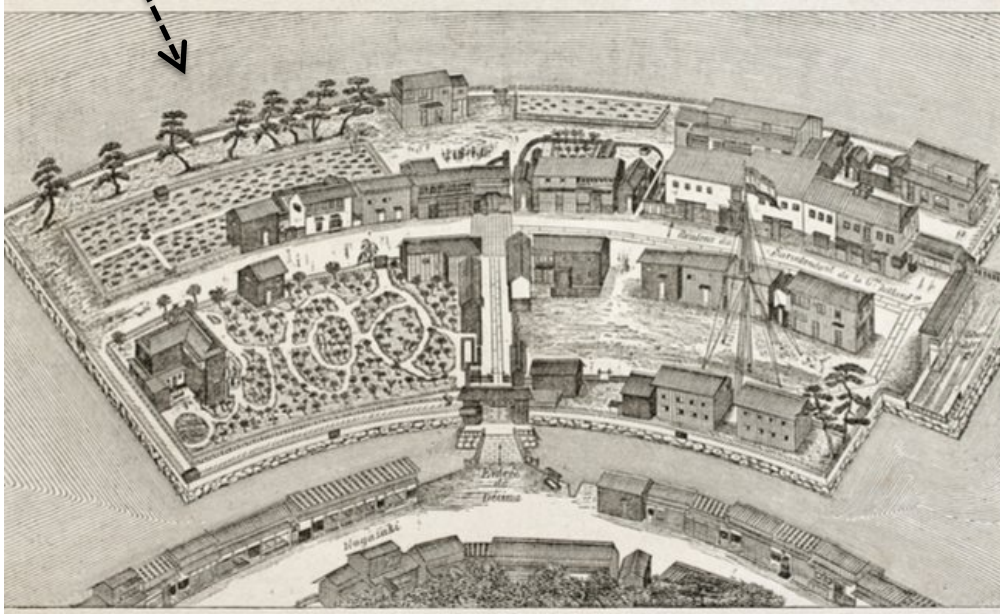
**Kyushu:**  
A Gateway to  
Asian Continent  
and Pacific Islands



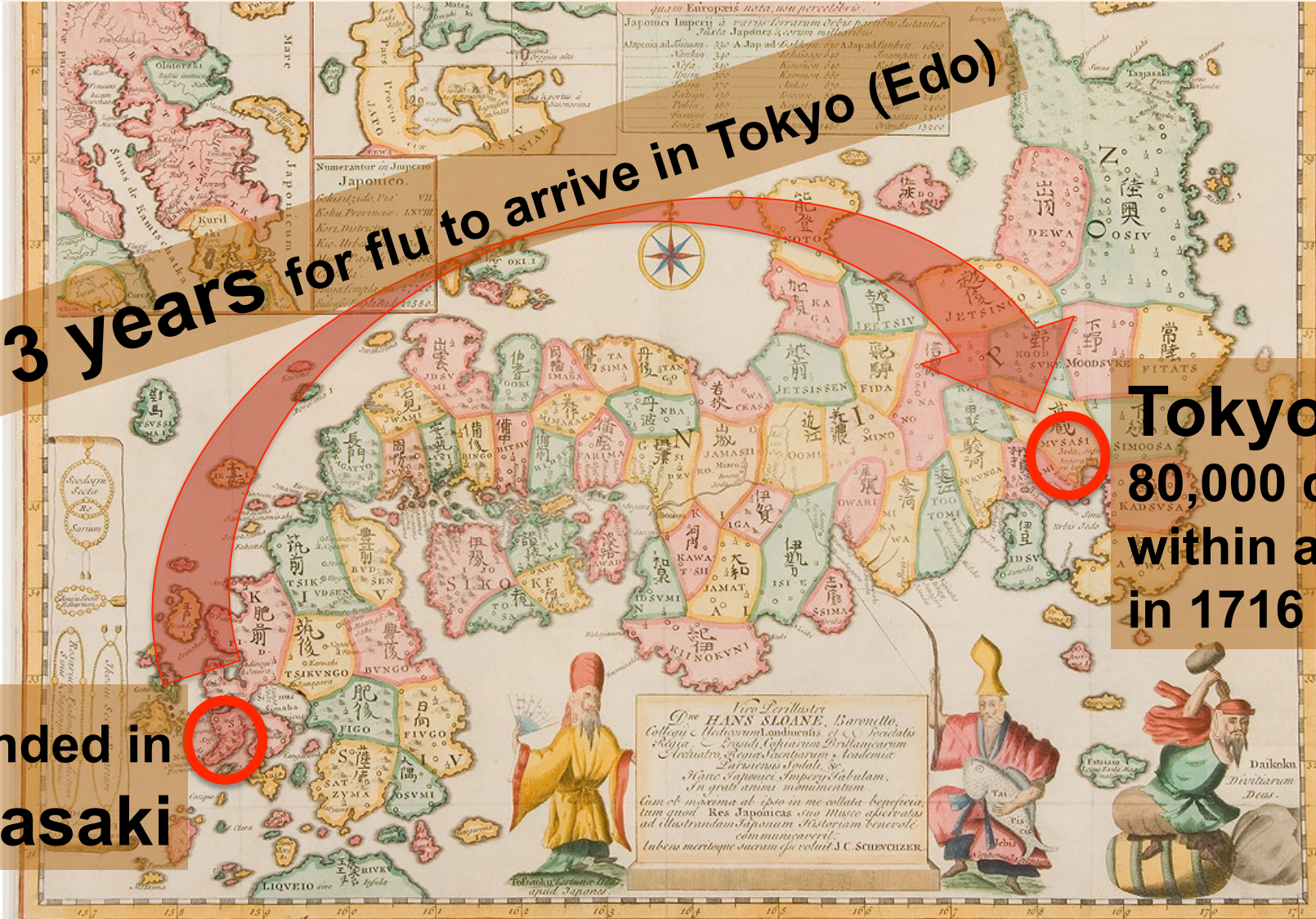
**Sakoku** (鎖国, "closed country") was the isolated foreign policy of the Japanese Tokugawa shogunate under which relations and trade between Japan and other countries were severely limited, nearly all foreigners were barred from entering Japan and common Japanese people were kept from leaving the country for a period of over 220 years (1633 – 1853).

The only European influence permitted was the Dutch factory at

Dejima (artificial island) in **Nagasaki**.



Under the *Sakoku* (“closed country”) policy, Japan had mostly avoided pandemic influenza; however, some of them invaded Japan through Nagasaki, Japan’s only window on the world during that period.



It took 3 years for flu to arrive in Tokyo (Edo)

Tokyo (Edo)  
80,000 deaths  
within a month  
in 1716

Flu landed in  
Nagasaki

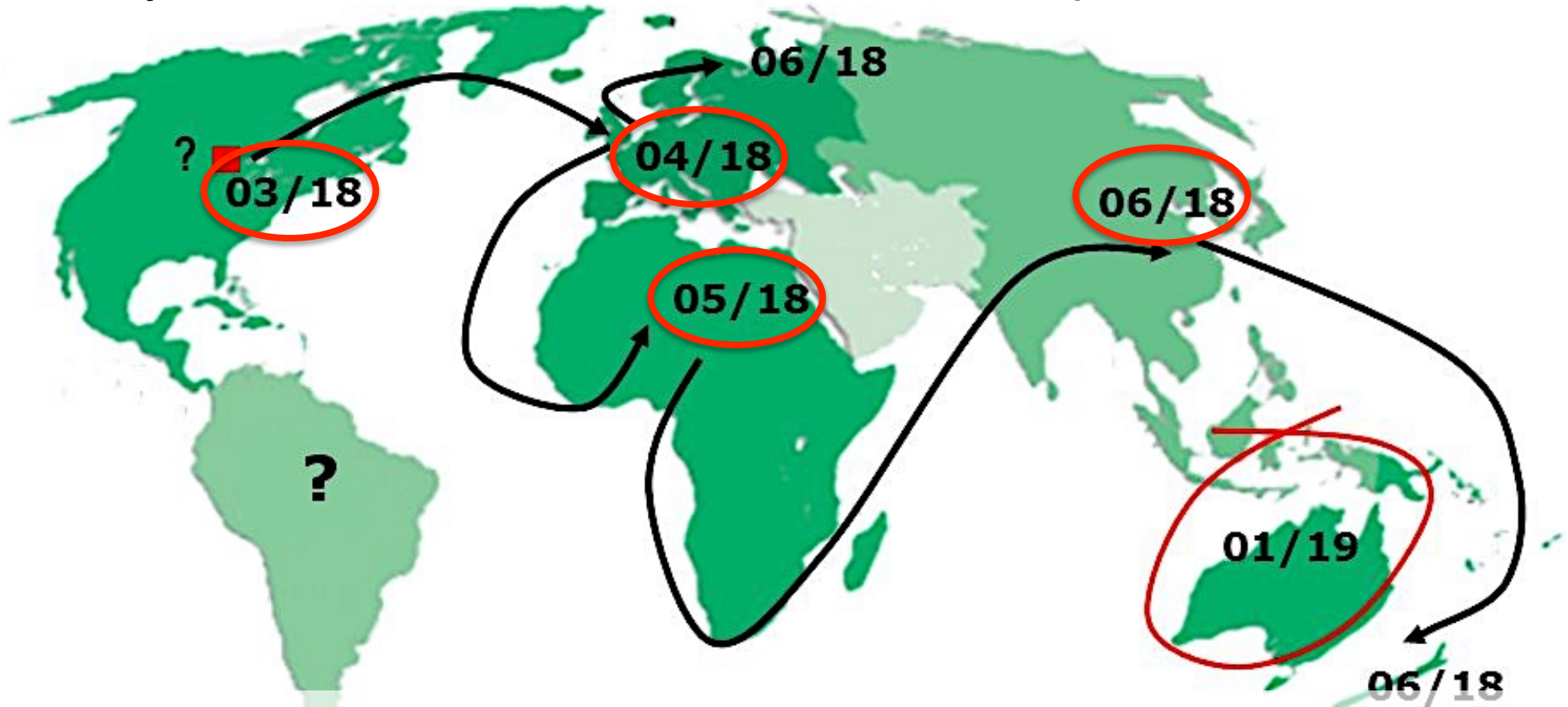
Viro Perillatior  
Dno HANS SLOANE, Baronetto,  
Collegii Medicorum Londinensis et Societatis  
Regiæ Londinensis Praesidentis  
Secretarius, Genes Cantuariæ, Academiæ  
Societatis et Socii, Sc  
Hanc Japonicæ Imperij Tabulam,  
In gratiæ animi monumentum  
Cum et maxima ab ipso in me collata beneficia  
tam quoad Res Japonicas suo Museo affectu  
ad illustrandam Japonicam Historiam benevolenti  
communiaverit.  
Lubens meritoque sacrum esse voluit J. C. SCHNEZCHER



# Pandemic Geographic spread: 1918-19



It took only **3 months** for the flu to reach Europe, Africa and Asia.



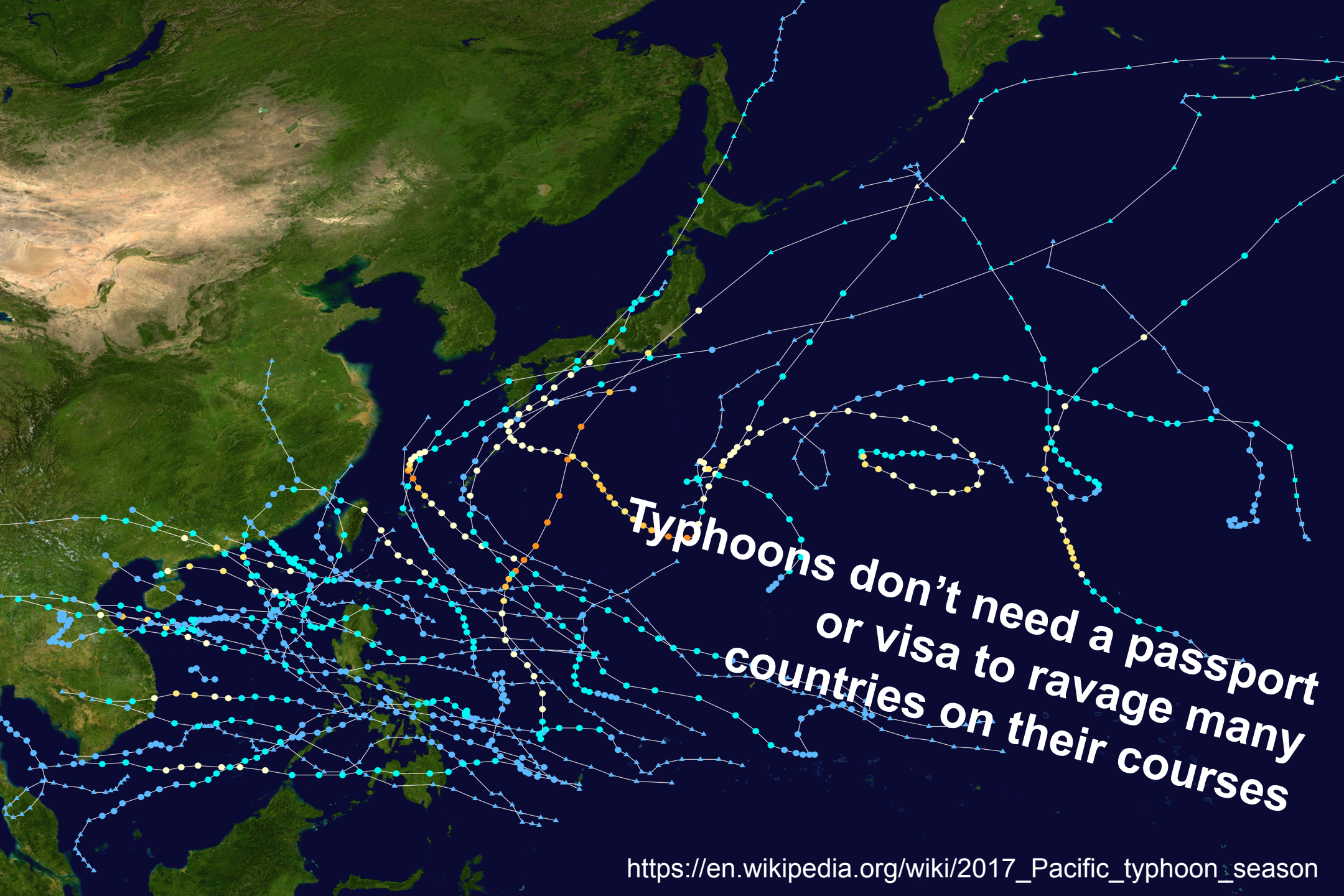
Spanish flu infected 500 million people around the world and resulted in the deaths of 50-100 millions (3-5% of the world's population), making it one of the deadliest natural disasters in human history.

**Unusual weather and natural disasters**



**One World**

**also ignore national borders**



**Typhoons don't need a passport  
or visa to ravage many  
countries on their courses**

# TSUNAMI

December 26, 2004

WorldAtlas.Com

ASIA

Tsunamis never respect territorial sees

Bangladesh

India

Myanmar

Thailand

Phuket Is

Malaysia

Sri Lanka

Maldives

Seychelles

Somalia  
AFRICA

Madagascar  
AFRICA

INDIAN O

©GraphicMaps.com

Countries most at



**Hurricane Katrina  
(USA 2005)**



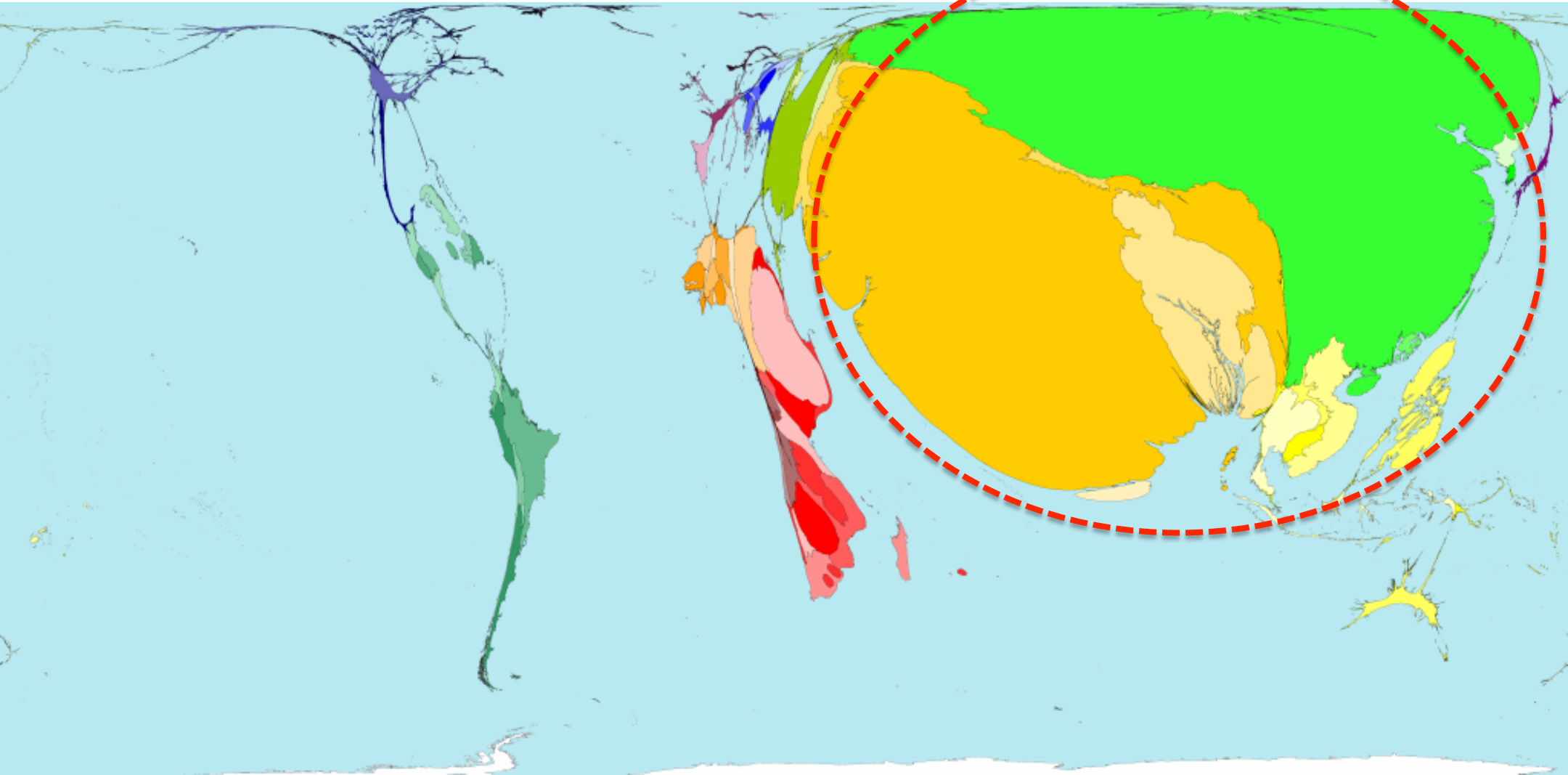
**Great Eastern Japan  
Earthquake (2011)**



**Even the most developed countries are vulnerable to natural disaster**



# Affected by Disasters





**After a disaster come infection outbreaks**



The primary victims of such incidents are the weakest among us, particularly children in developing countries

Population displacement from nonendemic to endemic areas

Overcrowding (close and multiple contacts)

Stagnant water after flood and heavy rains

Insufficient/contaminated water and poor sanitation condition

High exposure and proliferation to disease vectors

Insufficient nutrient intake/malnutrition

Low vaccination coverage

Injuries



## Risk Factors of Communicable Diseases Following Natural Disasters

Diarrhea (cholera; dysentery)  
Leptospirosis  
Hepatitis

**Water-borne diseases**

Population displacement from nonendemic to endemic areas

Overcrowding (close and multiple contacts)

Stagnant water after flood and heavy rains

Insufficient/contaminated water and poor sanitation condition

High exposure and proliferation to disease vectors

Insufficient nutrient intake/malnutrition

Low vaccination coverage

Injuries



## Risk Factors of Communicable Diseases Following Natural Disasters

ARI (pneumonia; flu)

Measles

Meningococcal disease

TB

**Air-borne/droplet diseases**

Population displacement from nonendemic to endemic areas

Overcrowding (close and multiple contacts)

Stagnant water after flood and heavy rains

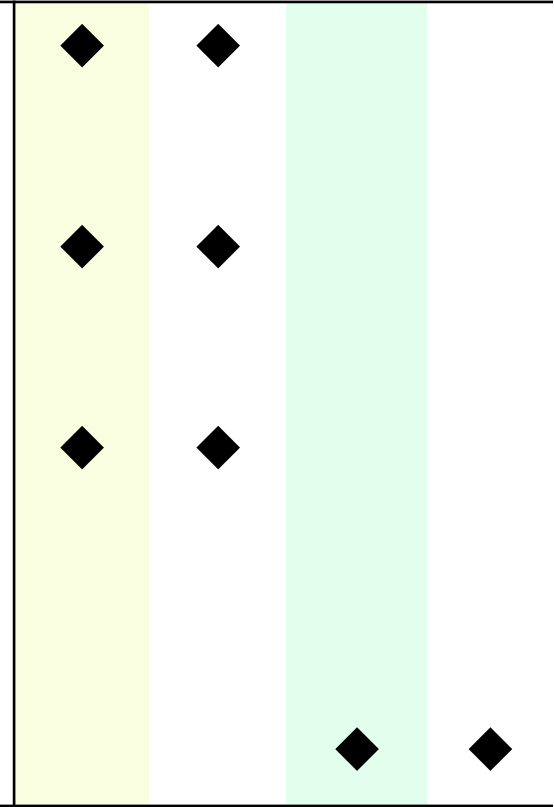
Insufficient/contaminated water and poor sanitation condition

High exposure and proliferation to disease vectors

Insufficient nutrient intake/malnutrition

Low vaccination coverage

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## Risk Factors of Communicable Diseases Following Natural Disasters

Malaria

Dengue fever

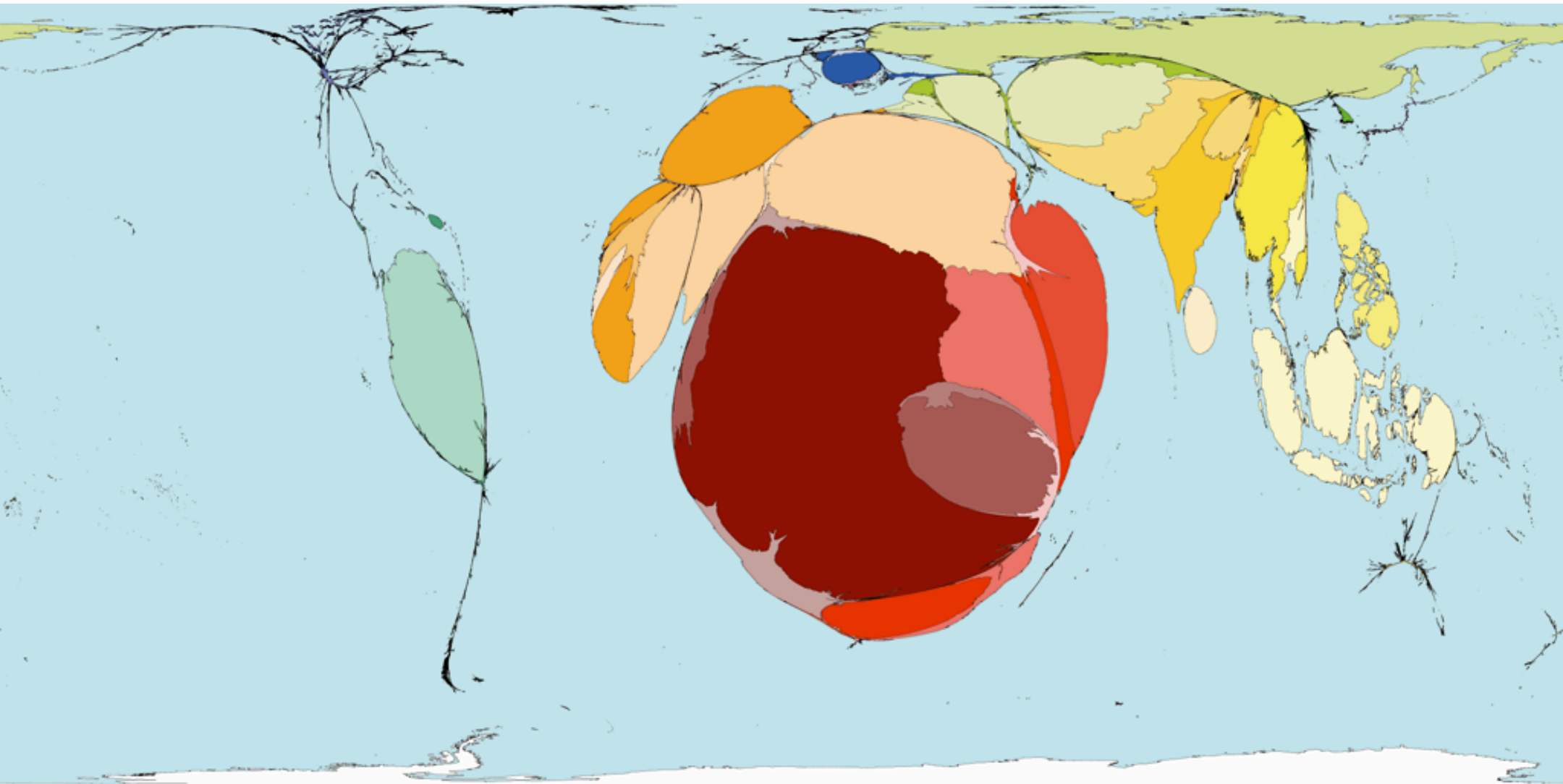
Tetanus

Cutaneous mucormycosis

**Vector-borne diseases**

**Wound infection**

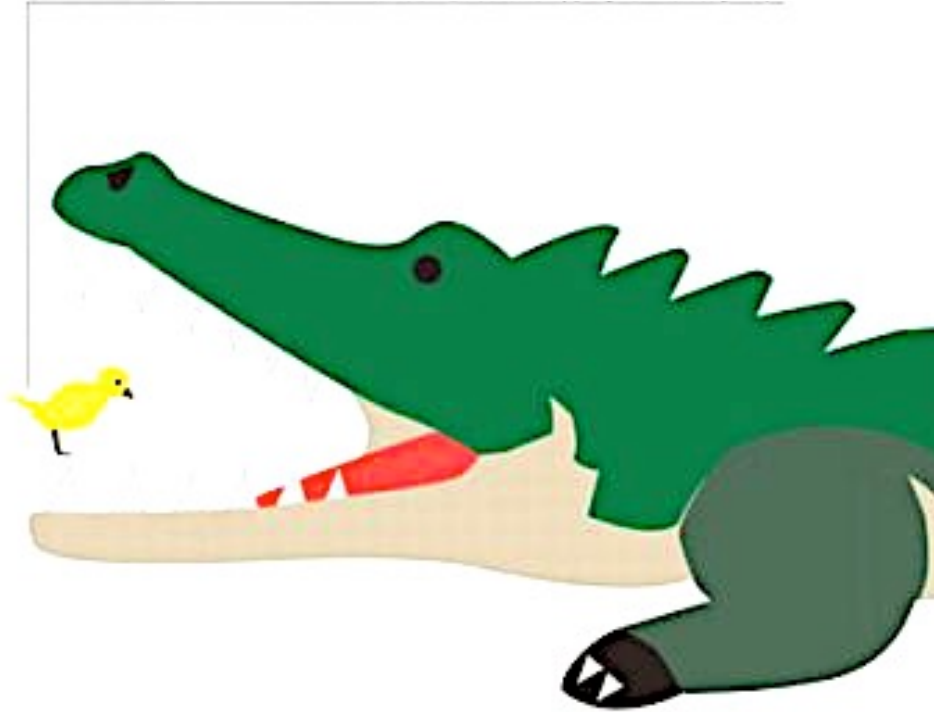
# War Deaths



If the world were a village of 100 people

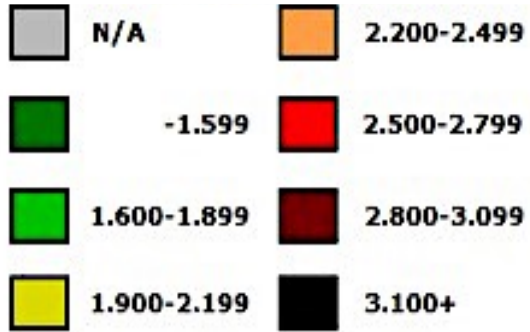
# FEAR

**20** live in fear of death by bombardment, armed attack, landmines, or of rape or kidnapping by armed groups

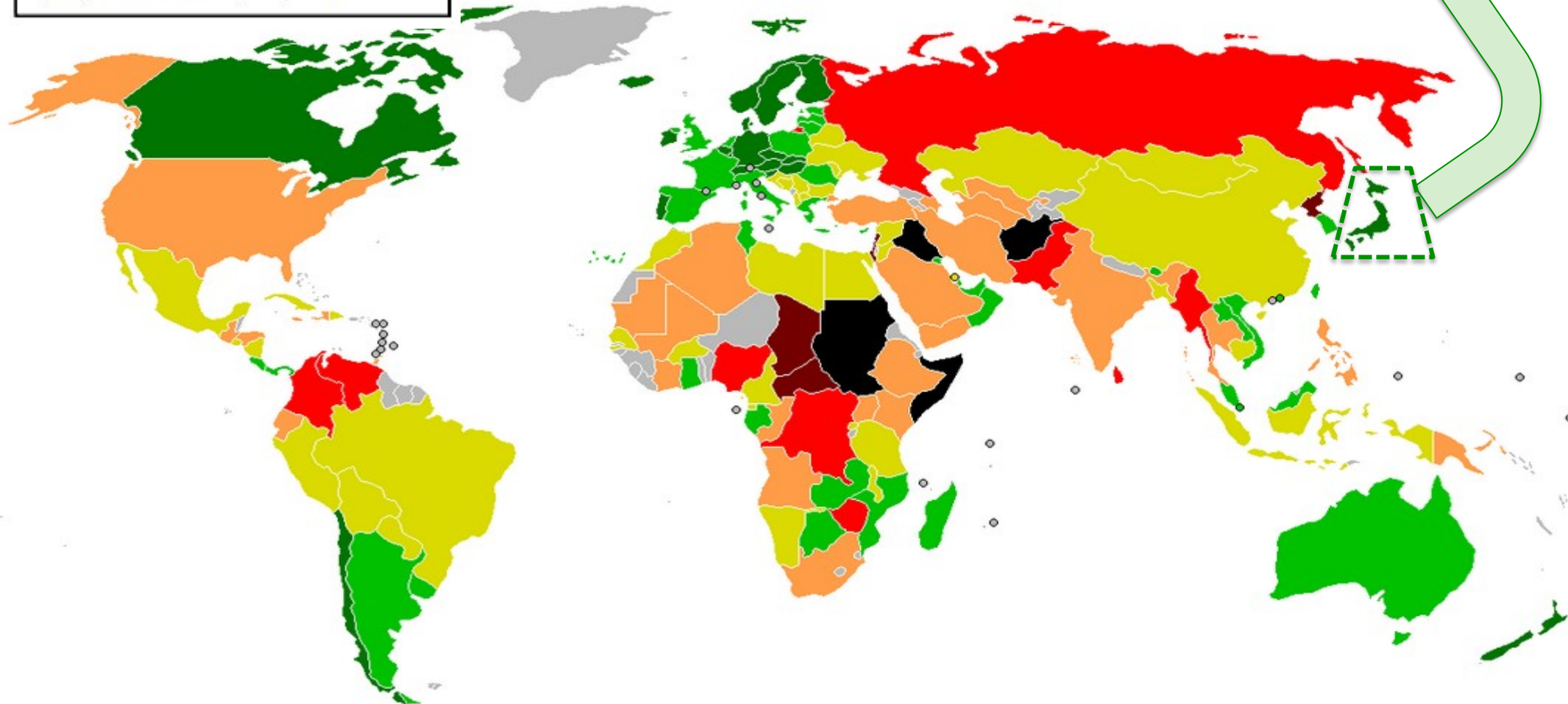


**80** don't

# Global Peace Index



Japan is regarded as one of the most peaceful countries, but . . .





**Professional “pushers”** at Tokyo Shinjuku Station in 1967



© Alamy Stock Photo

*Still crazy after all these years . . . What a peaceful country!*

“Women Only!”



*Think globally*



**One World**

**One Health**

# The “One Health” Concept

- A global strategy for managing risks at the **Animal-Human-Ecosystems** interface



Food and Agriculture  
Organization of the  
United Nations



World Health  
Organization

**Tripartite agreement of 3 Directors General**

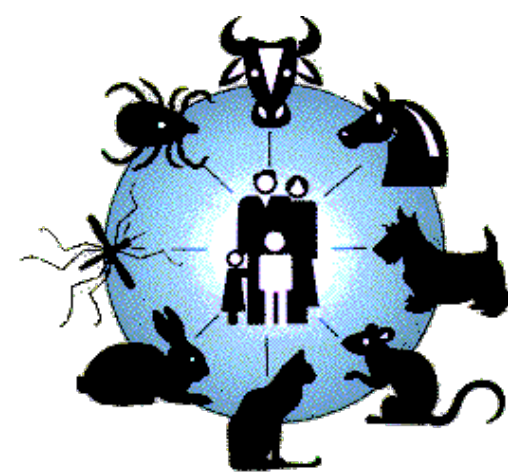
**3 Priorities**

**Zoonotic  
influenzas**

**Rabies**

**Antimicrobial  
resistance**

**Zoonoses are not rare.**  
**Zoonoses are not exotic.**



**Human being can be infected with  
1400 species of microbes, among  
which 800~900 species can be  
transmitted between human being  
and other animals.**

**Zoonoses are common infections.**

# From domestic animals ...



From wild animals ....



Ahhhhhh !!!...





**And from pet animals**

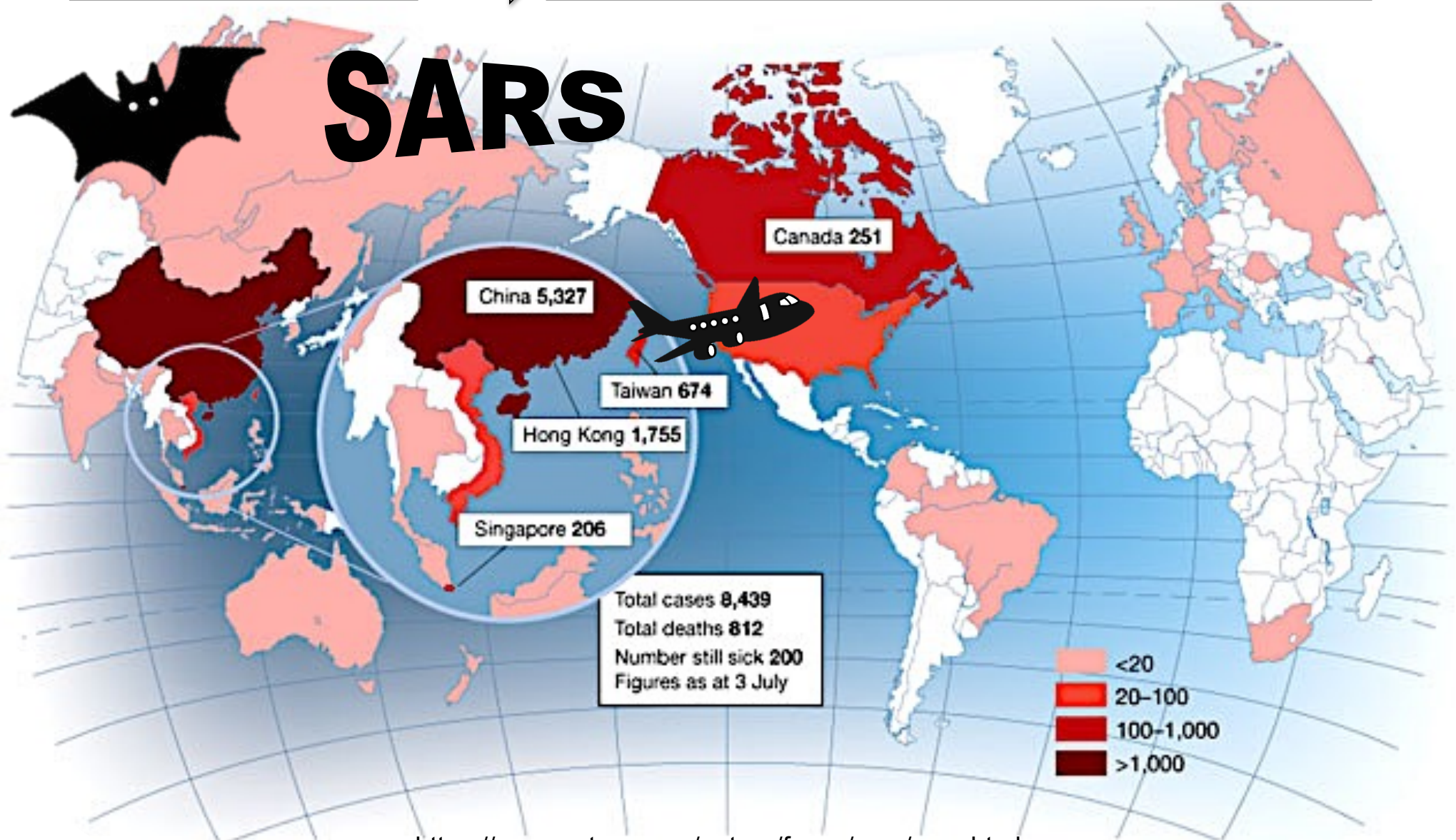
November 2002

July 2003

Southern China

37 countries (8,098 cases, 774 deaths)

# SARS



**SARS**

**Swine Flu**

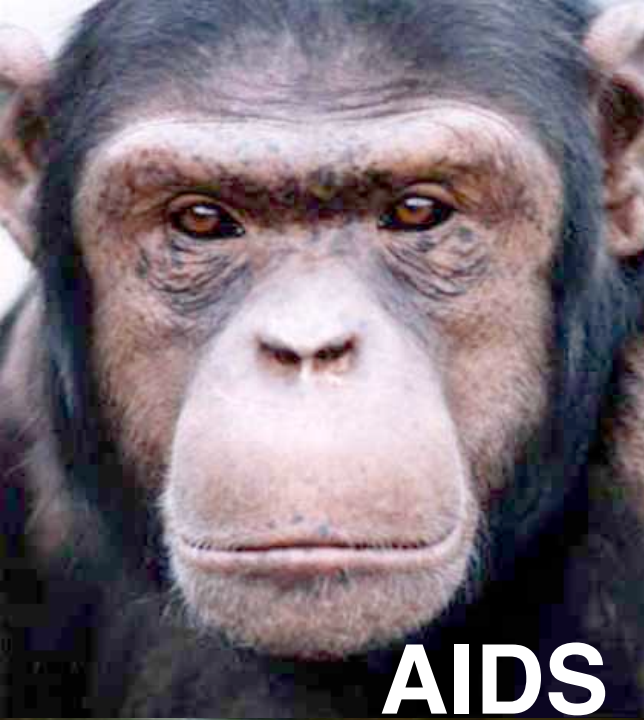
**If we talk about “emerging infections”,**

**AIDS**

**Avian Flu**

**BSE (→vCJD)**

**West Nile Fever**



**AIDS**



**SARS**



**Swine Flu**



**BSE**



**Avian Flu**

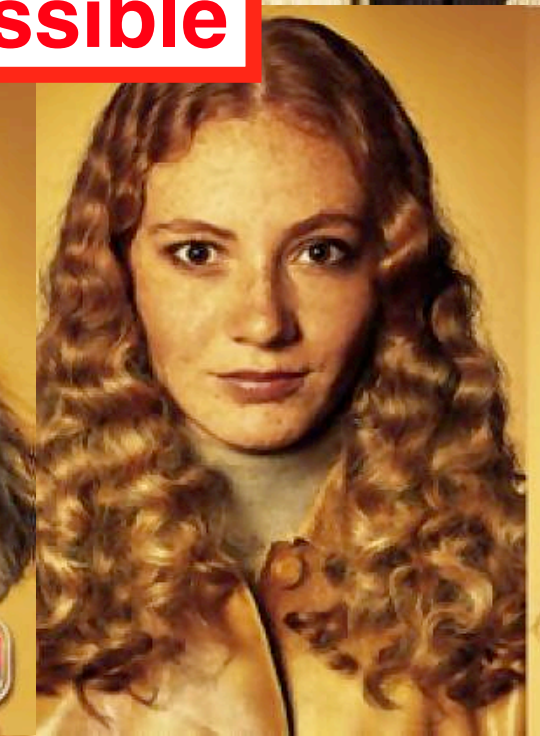


**West Nile Fever**

**They are all zoonoses!!**



**Transmissible**





# The “One Health” Concept

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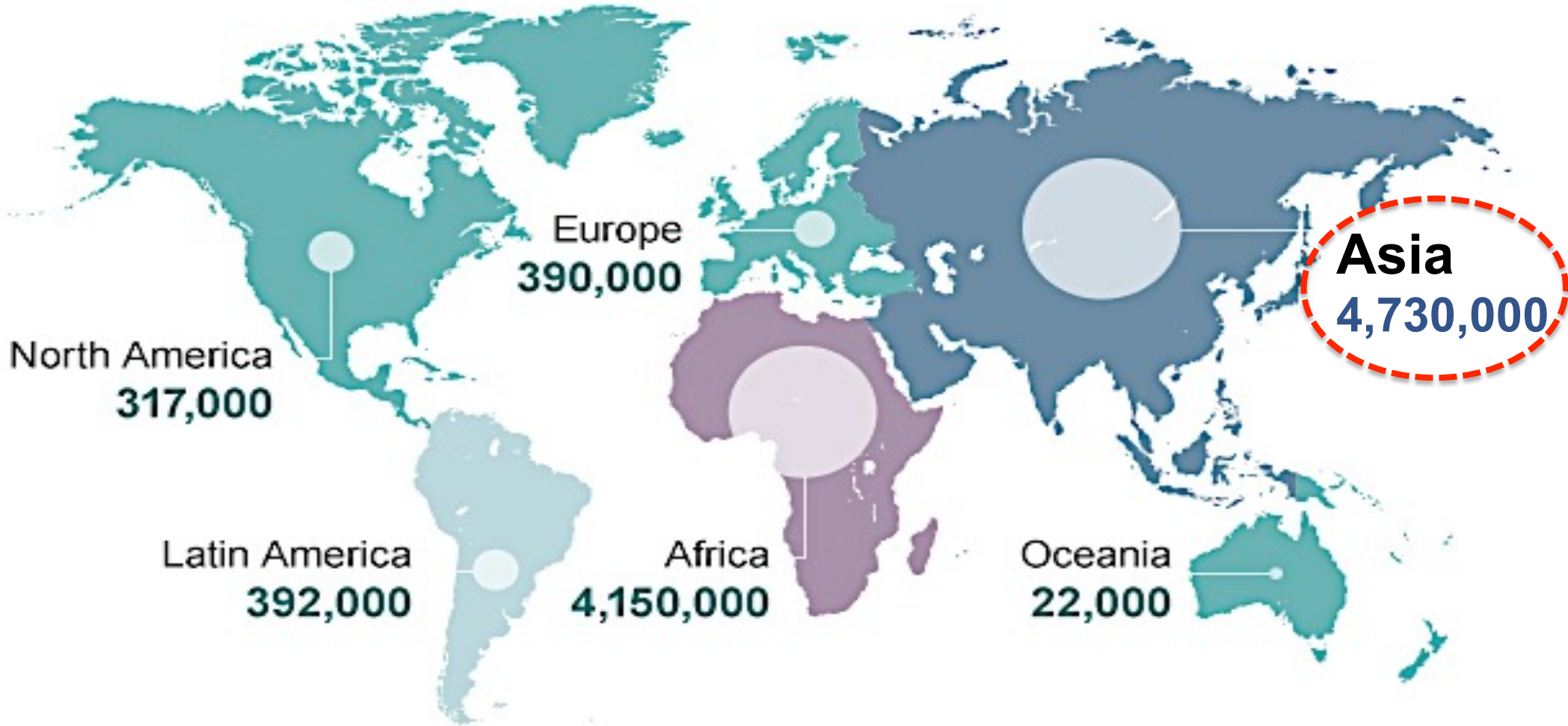
**3 Priorities**

**Zoonotic  
influenzas**

**Rabies**

**Antimicrobial  
resistance**

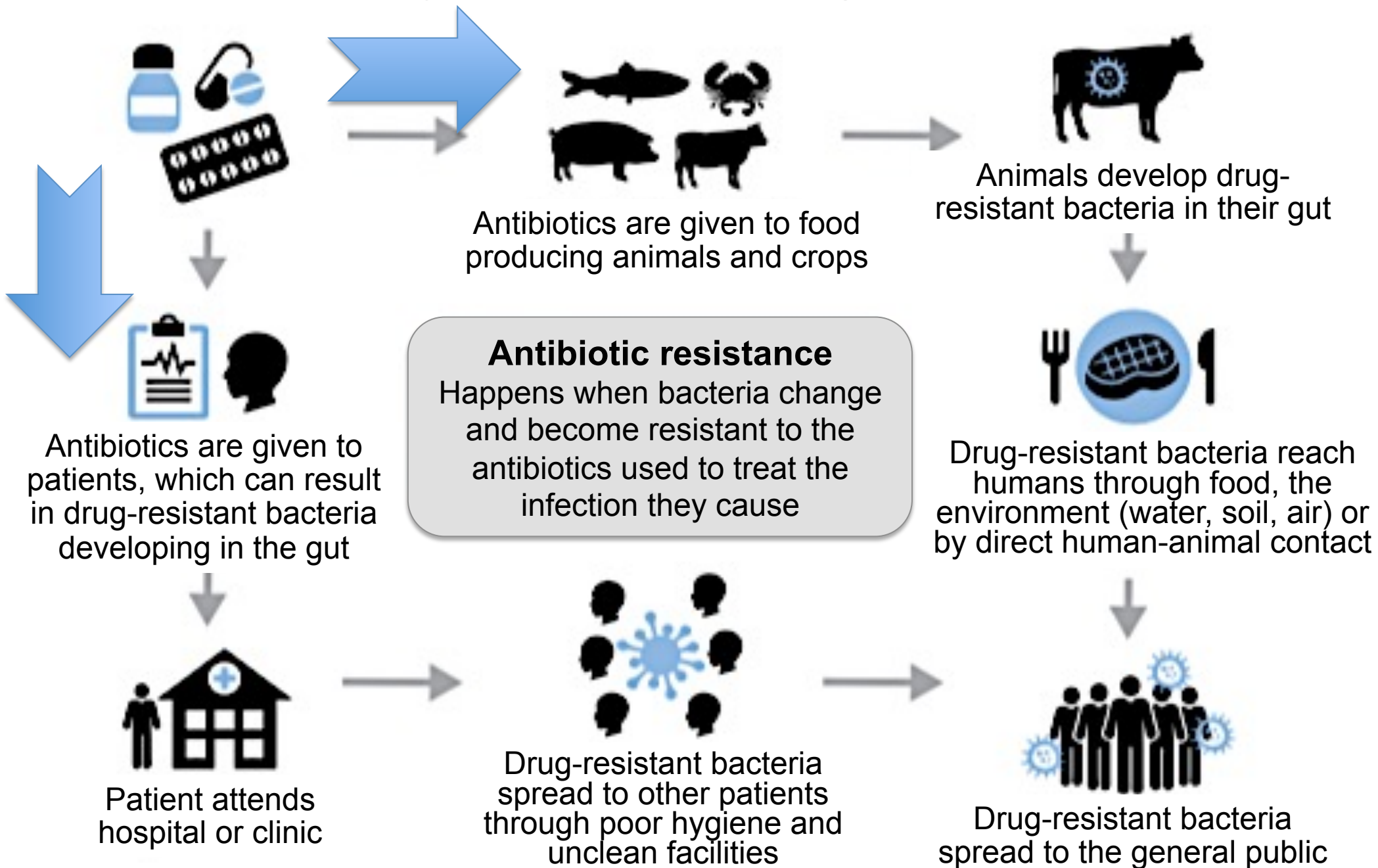
# Deaths attributable to AMR every year by 2050



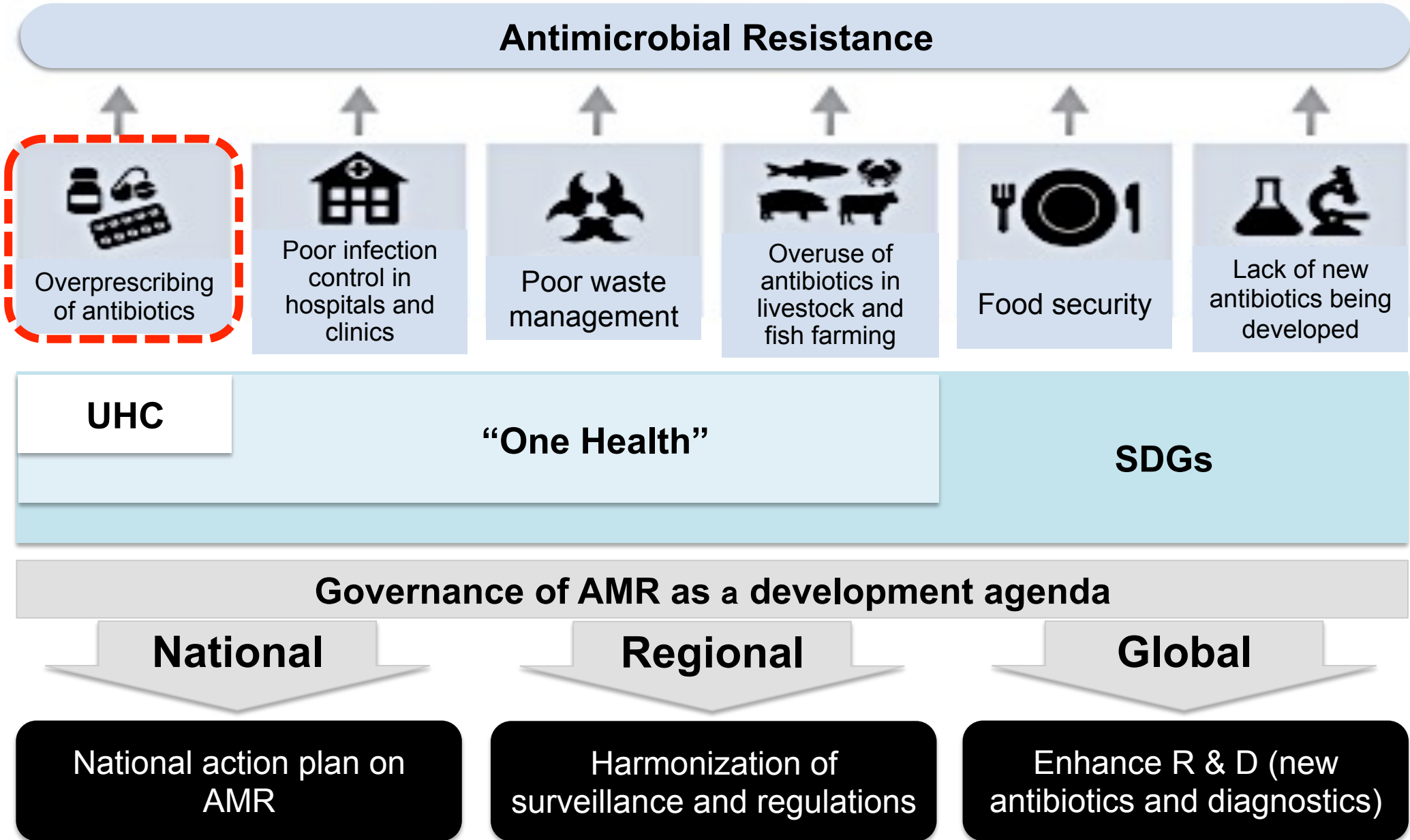
Source: Review on Antimicrobial Resistance 2014

Antimicrobial resistance (AMR) has been high on the world health agenda. **Unchallenged AMR could cost 10 million lives and as much as \$8 trillion each year by 2050.**

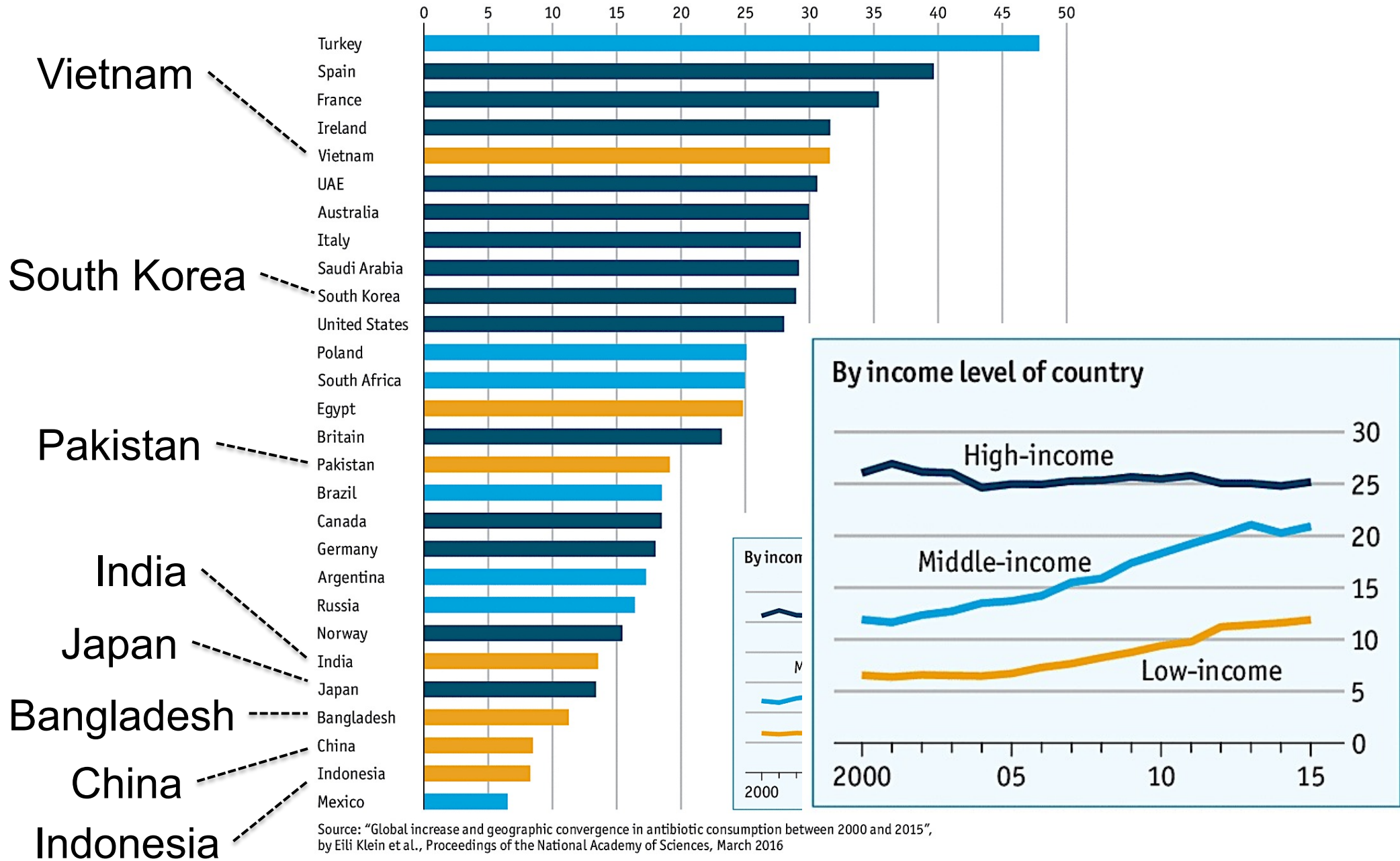
# Illustration of the key drivers in the emergence and spread of AMR



# Illustration to demonstrate the need for multi-sectional approaches for the containment of AMR within the larger scope of achieving the SDGs



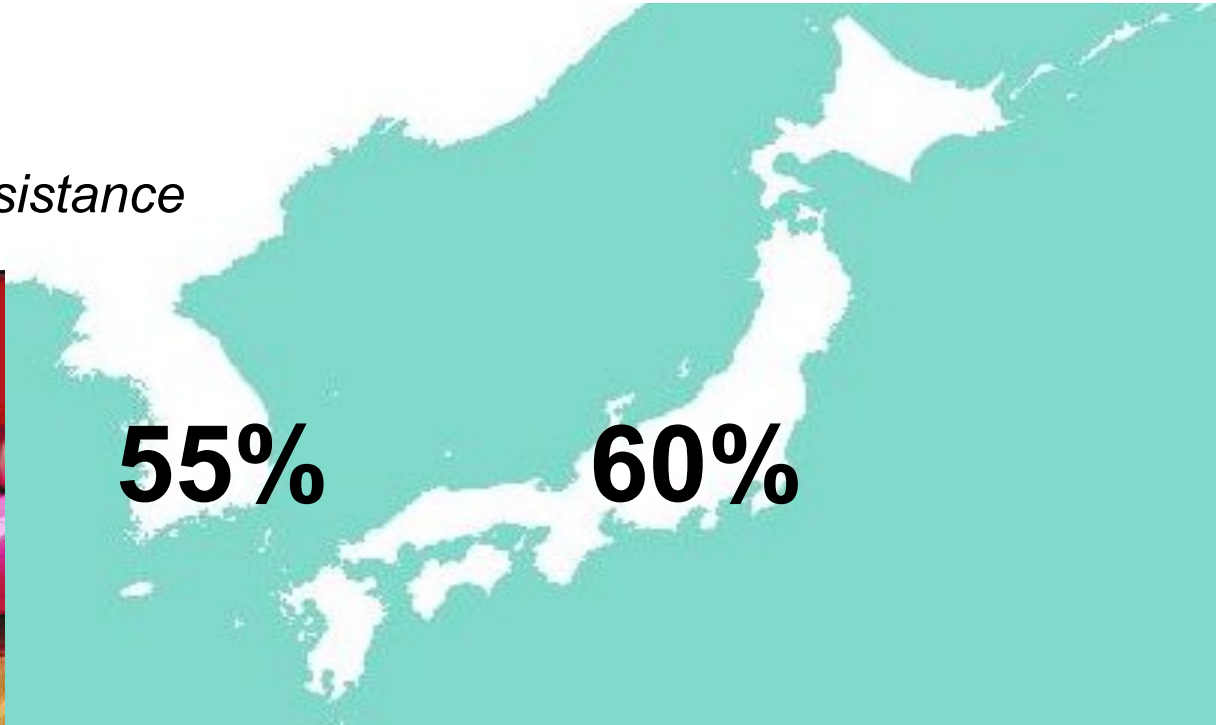
# Daily dosage of antibiotics per 1,000 population, 2015



Source: "Global increase and geographic convergence in antibiotic consumption between 2000 and 2015", by Eili Klein et al., Proceedings of the National Academy of Sciences, March 2016

# Antibiotic usage rates for common cold are very high in both Korea and Japan

*International Symposium on Antimicrobial Agents and Resistance*



According to a survey based on a sampling of 1,000 Korean adults, **51% think antibiotics are effective for common cold symptoms**, and 28% arbitrarily took leftover antibiotics home to treat common cold symptoms (Korean FDA, 2011).



# Over-the-Counter (OTC) Antibiotics

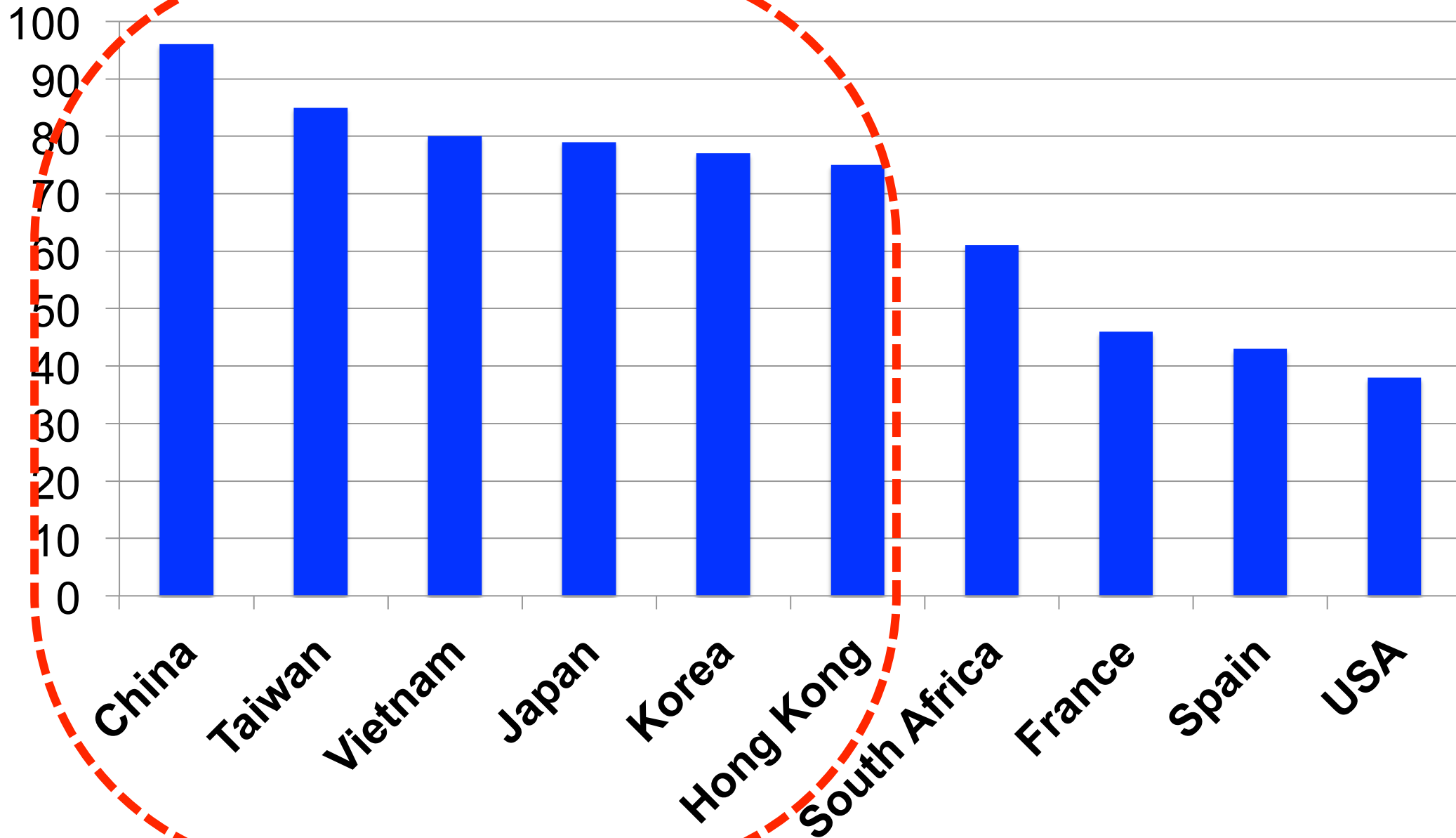
# Is it possible to purchase antibiotics without prescription?



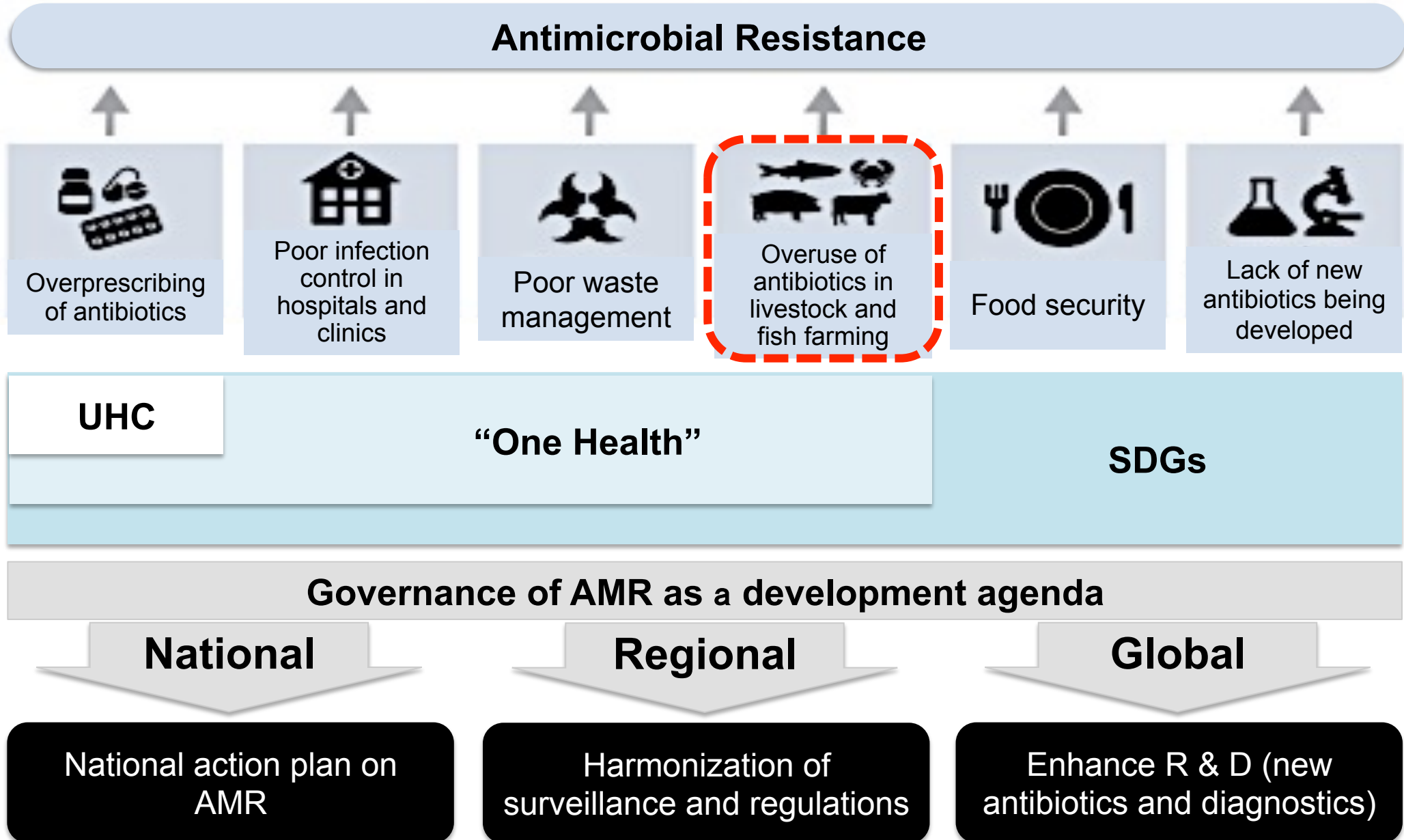
APEC Health Working Group  
October 15, 2011



# Rate of antibiotics-resistant Pneumococci



# Illustration to demonstrate the need for multi-sectional approaches for the containment of AMR within the larger scope of achieving the SDGs



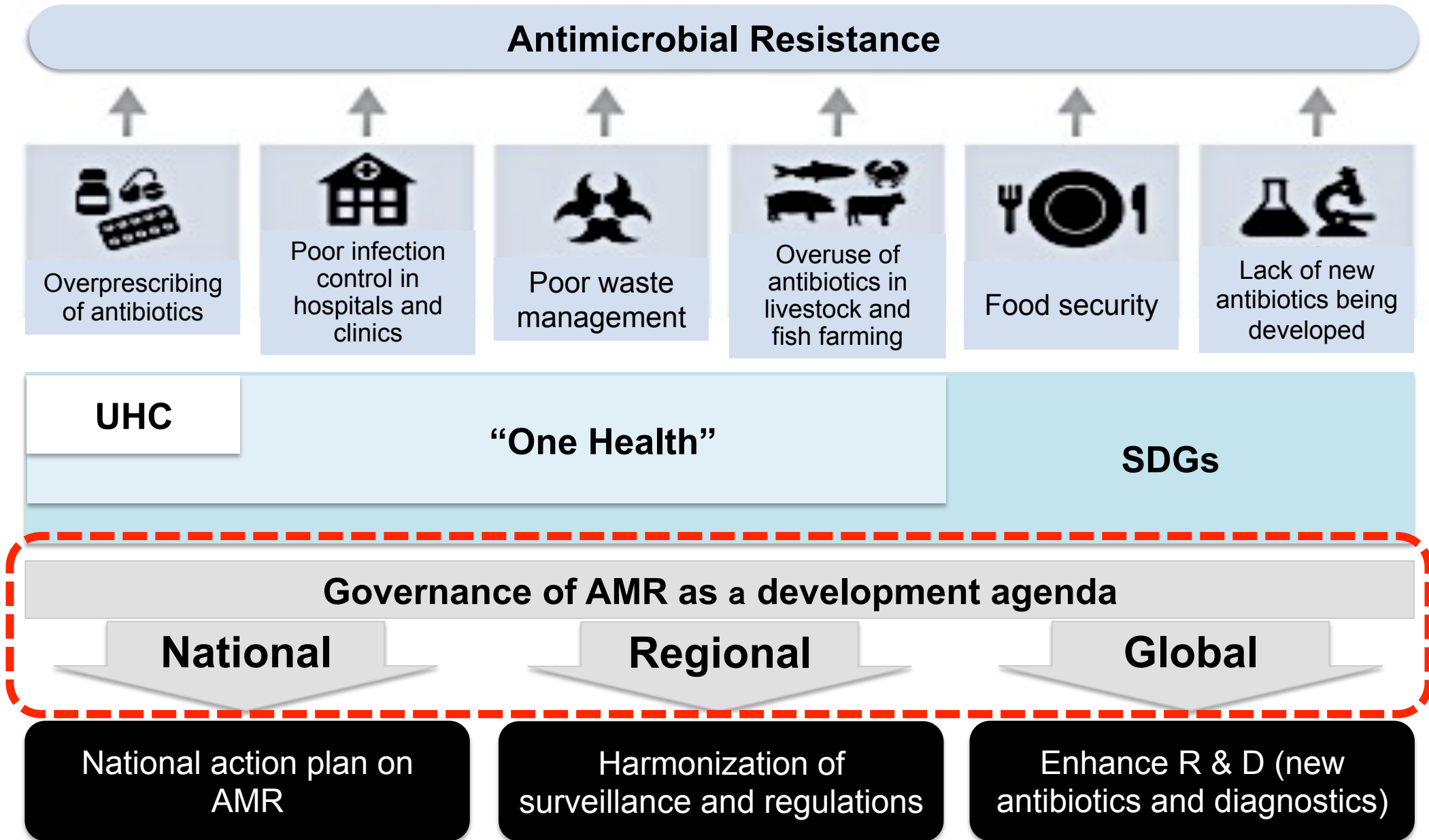
***We should manage both human and animals as a whole***



**80 %** Of All U.S.  
Antibiotics are Used On  
**Factory Farm Animals**



# Illustration to demonstrate the need for multisectional approaches for the containment of AMR within the larger scope of achieving the SDGs



*Act locally*



**AMR**

**LRIs**

**Diarrhea**



# **Antimicrobial resistance in the Asia Pacific region: a development agenda**



**World Health  
Organization**

**Western Pacific Region**

**Not only health workers but also everyone can and should do**

# ANTIBIOTIC RESISTANCE



## WHAT CAN HEALTH WORKERS DO?



*Antibiotic Resistance happens when bacteria change and become resistant to the antibiotics used to treat the infections they cause. This is compromising our ability to treat infectious diseases and undermining many advances in medicine.*

*We must handle antibiotics with care so they remain effective for as long as possible.*

- ✓ Are your hands, instruments & environment clean?
- ✓ Do you only prescribe & dispense antibiotics when they are needed, according to current guidelines?
- ✓ Do you report drug-resistant infections to surveillance teams?
- ✓ Do you talk to patients about how to take antibiotics correctly, antibiotic resistance & the dangers of misuse?
- ✓ Do you talk to patients about preventing infections (e.g. vaccination, hand washing, safer sex, covering nose & mouth when sneezing)?

#AntibioticResistance

[www.who.int/waaw](http://www.who.int/waaw)



World Health Organization

# ANTIBIOTIC RESISTANCE



Antibiotic resistance happens when bacteria change and become resistant to the antibiotics used to treat the infections they cause. This is compromising our ability to treat infectious diseases and undermining many advances in medicine.

We must handle antibiotics with care so they remain effective for as long as possible.

## WHAT YOU CAN DO



- 1 Only use antibiotics when prescribed by a certified health professional
- 2 Always take the full prescription, even if you feel better
- 3 Never use left over antibiotics
- 4 Never share antibiotics with others
- 5 Prevent infections by regularly washing your hands, avoiding close contact with sick people and keeping your vaccinations up to date

[www.who.int/drugresistance](http://www.who.int/drugresistance)

#AntibioticResistance



World Health Organization

**AMuRo** Rei is a fictional character introduced in anime series Gundam in 1979. Amuro is a mechanic who becomes the pilot of the mecha known as RX-78-2 Gundam to protect himself from the Zeon forces invading his space colony during the war. Later, he becomes an Earth Federation pilot in the war. (interrupted)



Wikipedia

*“There is something we can do”*

Ministry of Health, Labor and Welfare, Japan

人・抗生物質 新時代  
抗生物質 抗菌薬  
New Century of Antibiotics, Antimicrobials and Antimicrobials

抗生物質・抗菌薬が効かなくなる未来に立ち向かえ!

# AMR対策

いきまあーす!

みんなにも  
できることがあるんだ

あなたにできること

- 感染を防ぐために、日頃から手洗い・咳エチケットをする
- 医療機関などで、 症状を医師に詳しく伝える
- 分からないことは医師や薬剤師に聞く
- 量と期間を守って最後まで抗生物質・抗菌薬を服用する

※AMRとは、病原体が変化して抗生物質・抗菌薬が効かなくなることです

かしく過して、明日につなぐ  
一歩前進を上手に実践しよう

詳しくはこちら

厚生労働省  
Ministry of Health, Labour and Welfare

AMR  
Antimicrobial Resistance Center

非売品

*Act locally*

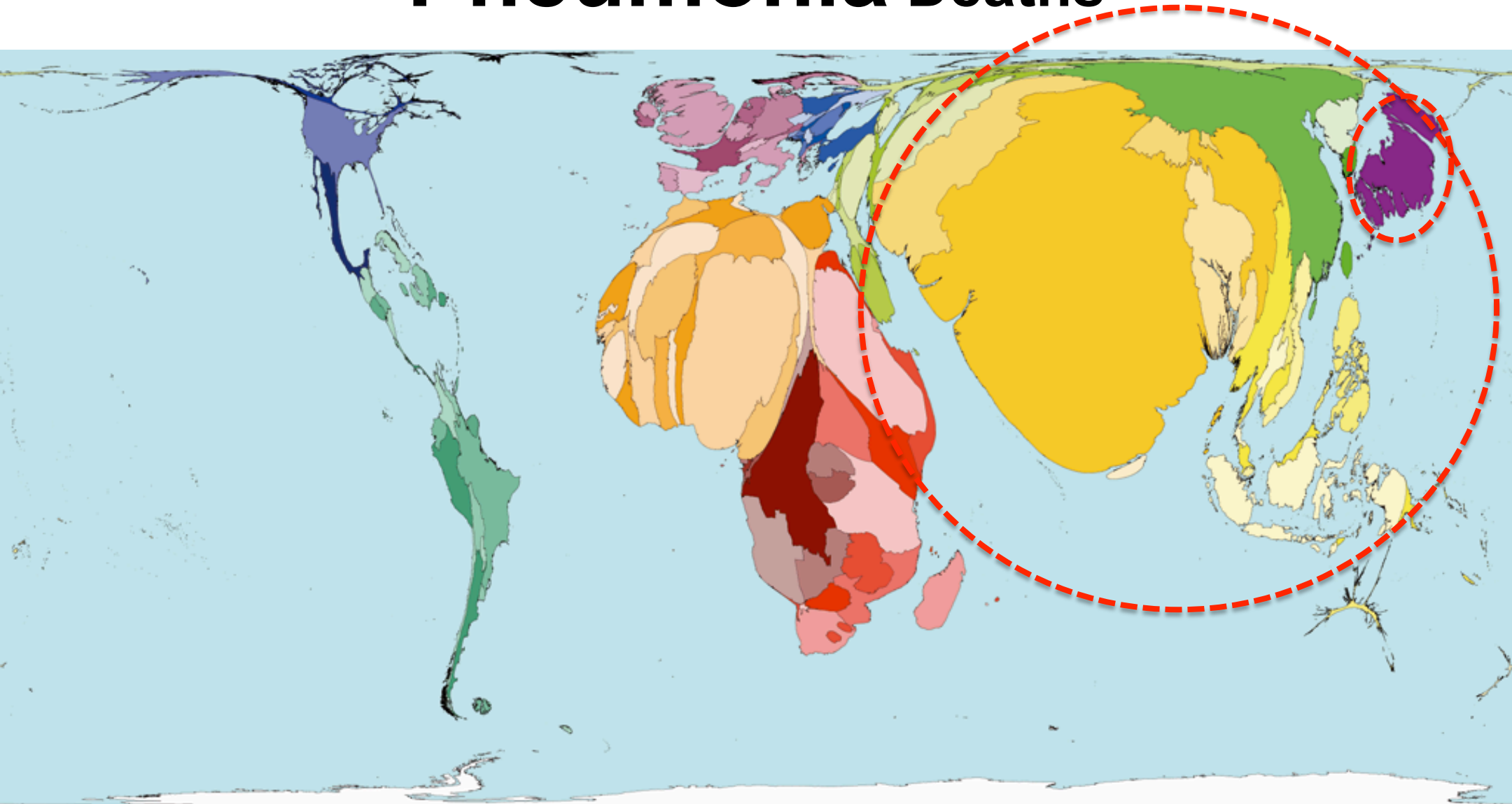


**AMR**

**LRIs**

**Diarrhea**

# Pneumonia Deaths



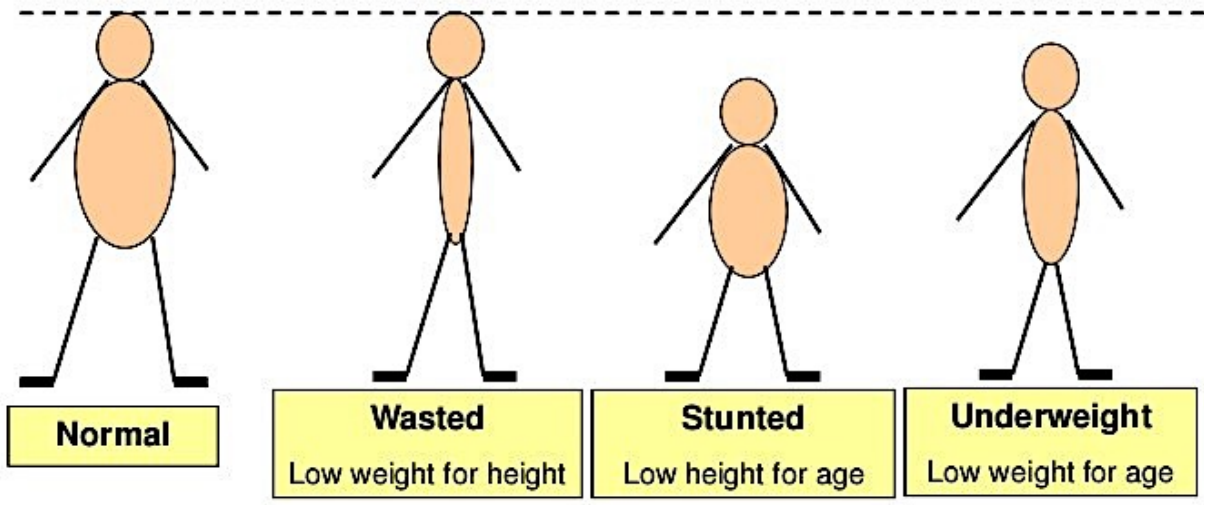
# Global deaths, fatal attributable fraction, and episodes due to each LRI etiology in **children under 5 years, 2016**

**LRIs** caused **652,572 deaths** (95%UI: 586,475-720,612) in children under 5 years in 2016.

	Number (95% UI)	Deaths	Fatal attributable fraction (%)	Deaths per 100,000 people	Millions of episodes	Incidence per 1,000 people
<b><u><i>S. pneumoniae</i></u></b>		341,029 (195,289-493,551)	52.25 (29.95-73.00)	54.0 (30.9-78.1)	44.69 (20.87-73.68)	70.7 (33.0-116.6)
<b>Hib</b>		48,011 (13,404-88,744)	7.36 (2.06-13.63)	7.6 (2.1-14.0)	6.08 (1.39-13.72)	9.6 (2.2-21.7)
<b>RSV</b>		41,026 (22,922-65,851)	6.29 (3.58-10.17)	6.5 (3.6-10.4)	10.74 (6.70-16.56)	17.0 (10.6-26.2)
<b>Influenza</b>		8,360 (4,905-13,806)	1.28 (0.77-2.09)	1.3 (0.8-2.2)	5.75 (3.42-9.34)	9.1 (5.4-14.8)

Normal height for age

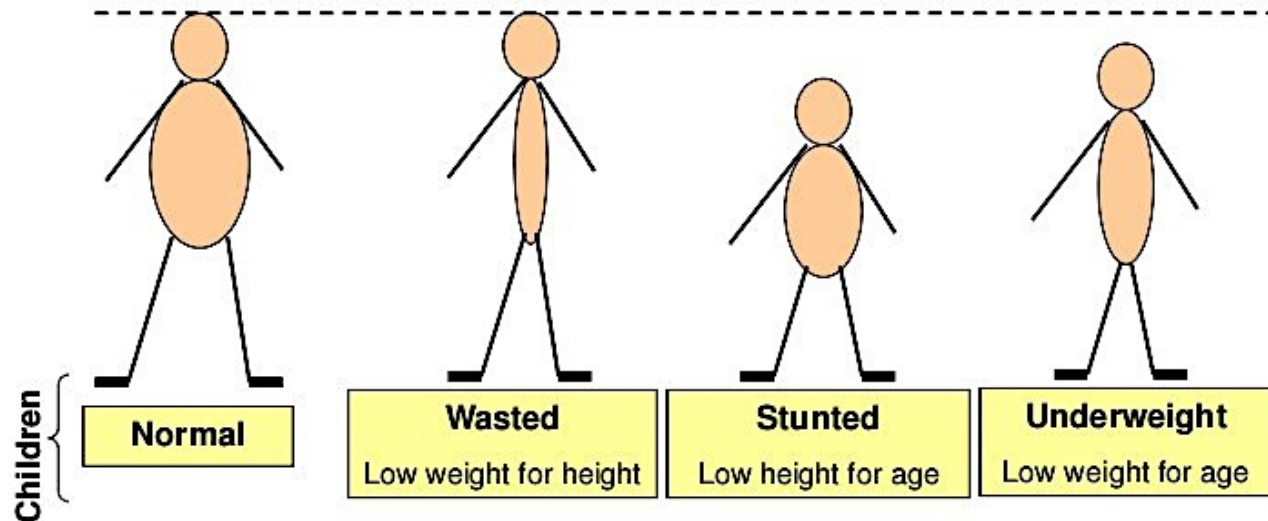
Children



# Risk Factors for Lower Respiratory Infection Mortality



Normal height for age



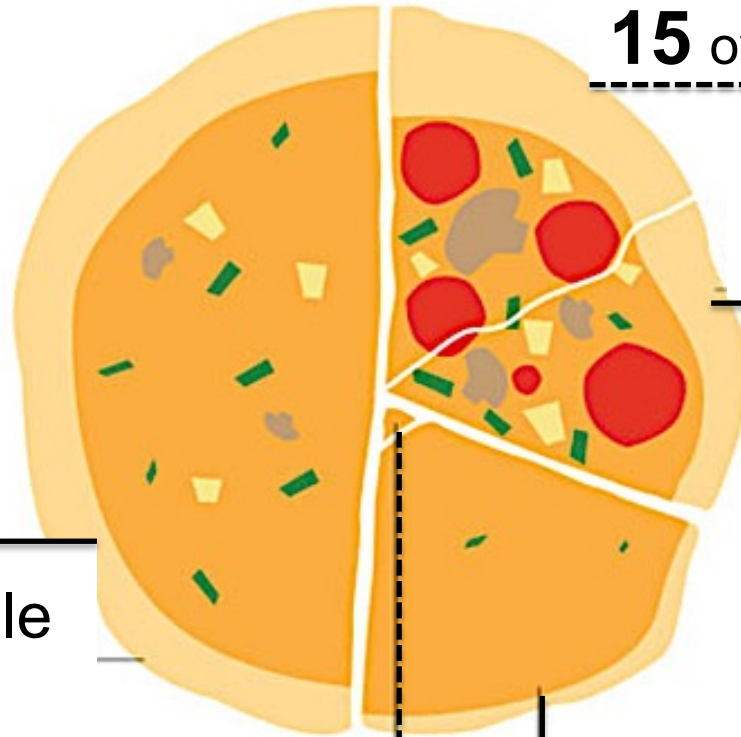
Risk Factors for  
a wide range of  
Infectious Diseases

## Child Wasting, Stunting and Underweight

**Childhood wasting** remains **the leading risk factor for LRI mortality** among **children under 5**, responsible for **61.4%** (95% UI: 45.7-69.6) **of LRI deaths** in 2016.

If the world were a village of 100 people

# FOOD



**15** overweight

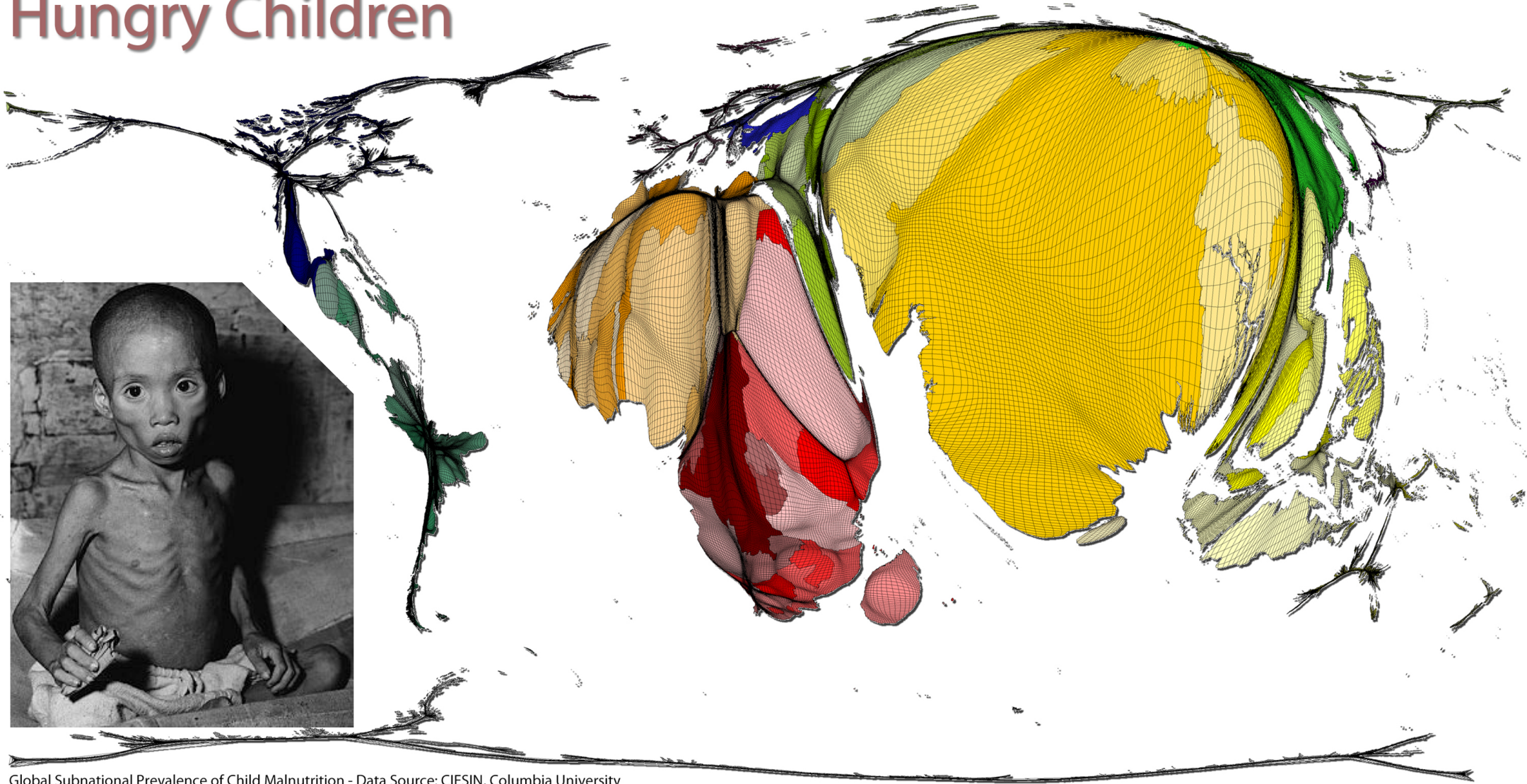
**30** always have enough to eat

**50** don't have reliable source of food and hungry some/all time

**20** undernourished

**1** dying of starvation

# Hungry Children



Global Subnational Prevalence of Child Malnutrition - Data Source: CIESIN, Columbia University  
Map created by Benjamin D. Hennig - [www.viewsoftheworld.net](http://www.viewsoftheworld.net)

<https://ffl.org/emergency-relief/world-hunger/>

Increasing breastfeeding to near-universal levels could save **more than 800,000 lives every year.**

In addition, **nearly half of all diarrheal diseases** and **one-third of all respiratory infections** in children in low- and middle-income countries could be prevented with increased rates of breastfeeding.



## Non-Exclusive Breastfeeding

<https://mypositiveparenting.org/2016/11/26/introducing-complementary-foods/exclusive-breastfeeding-2/>

***Encourage and support***

**From birth  
to 6 months:  
Exclusive  
breastfeeding**



Nevertheless, only 1 in 3 infants under 6 months are exclusively breastfed.

**Children** are more susceptible to **air pollution** because they breathe more often, taking in more pollutants, and are closer to the ground, where some pollutants have higher concentrations.

## Household Air Pollution from Solid Fuels



## Ambient Particulate Matter Pollution



*Educate parents  
Appeal to politicians  
and stakeholders*

## Second-Hand Smoke

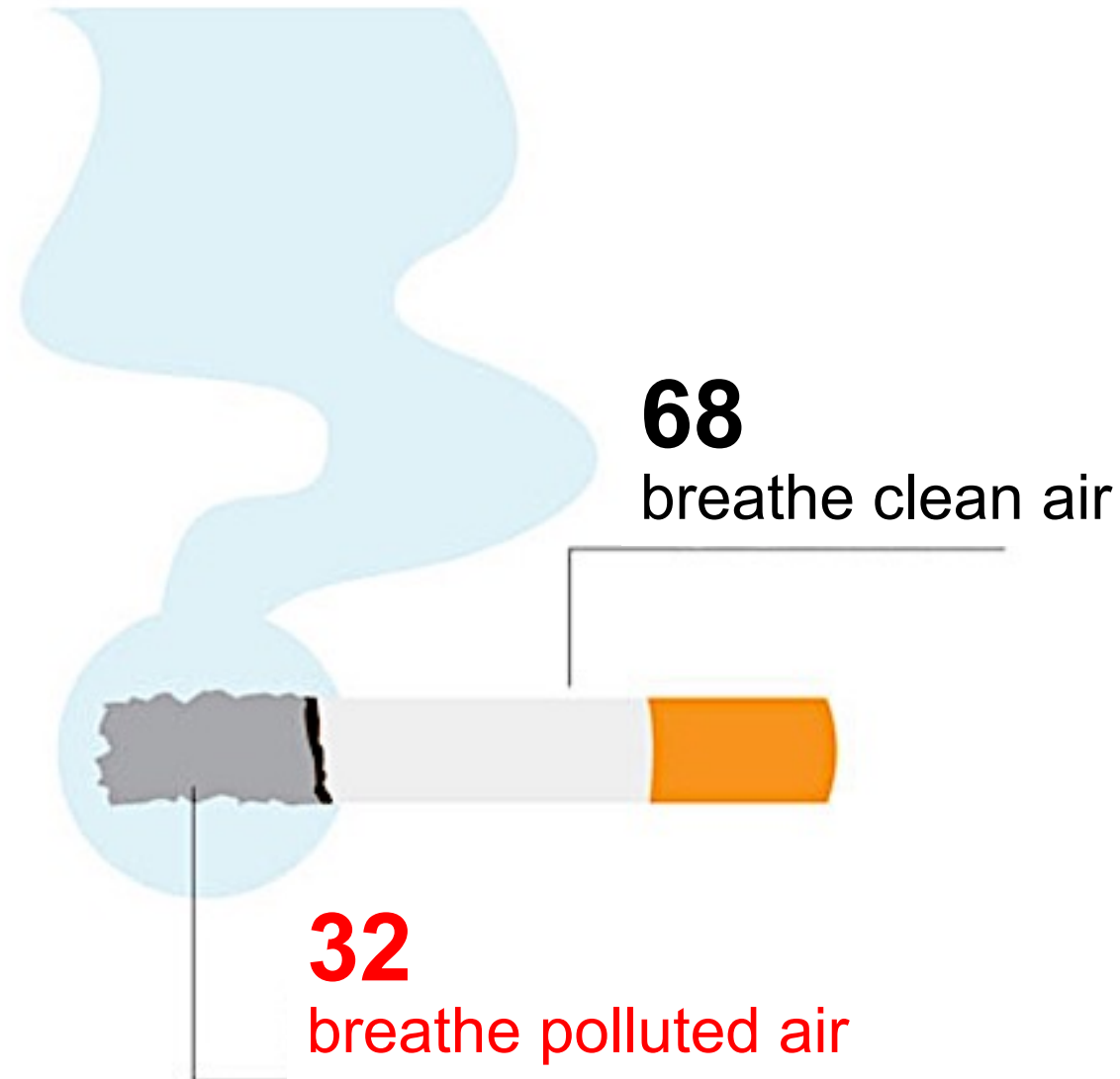


If the world were a village of 100 people

## Air pollution

- causes **acute lower respiratory infections (LRIs)**
- triggers **asthma** and **childhood cancer**
- effects **neurological development** and **cognitive ability**
- Increases risk of **chronic conditions** (e.g., **cardiovascular disease**) in adulthood.

# AIR



- **93%** of world's children under 15 years old breathe air that is so polluted it puts their health and development at serious risk.
- **600,000** children have died from acute lower respiratory infections caused by polluted air.
- Air pollution is one of the leading threats to health in children under 5, accounting for almost **one in 10 deaths** among this age group.



**WHO**

1<sup>st</sup> Conference on Air  
Pollution and Health  
(Geneva, 2018)



*Act locally*

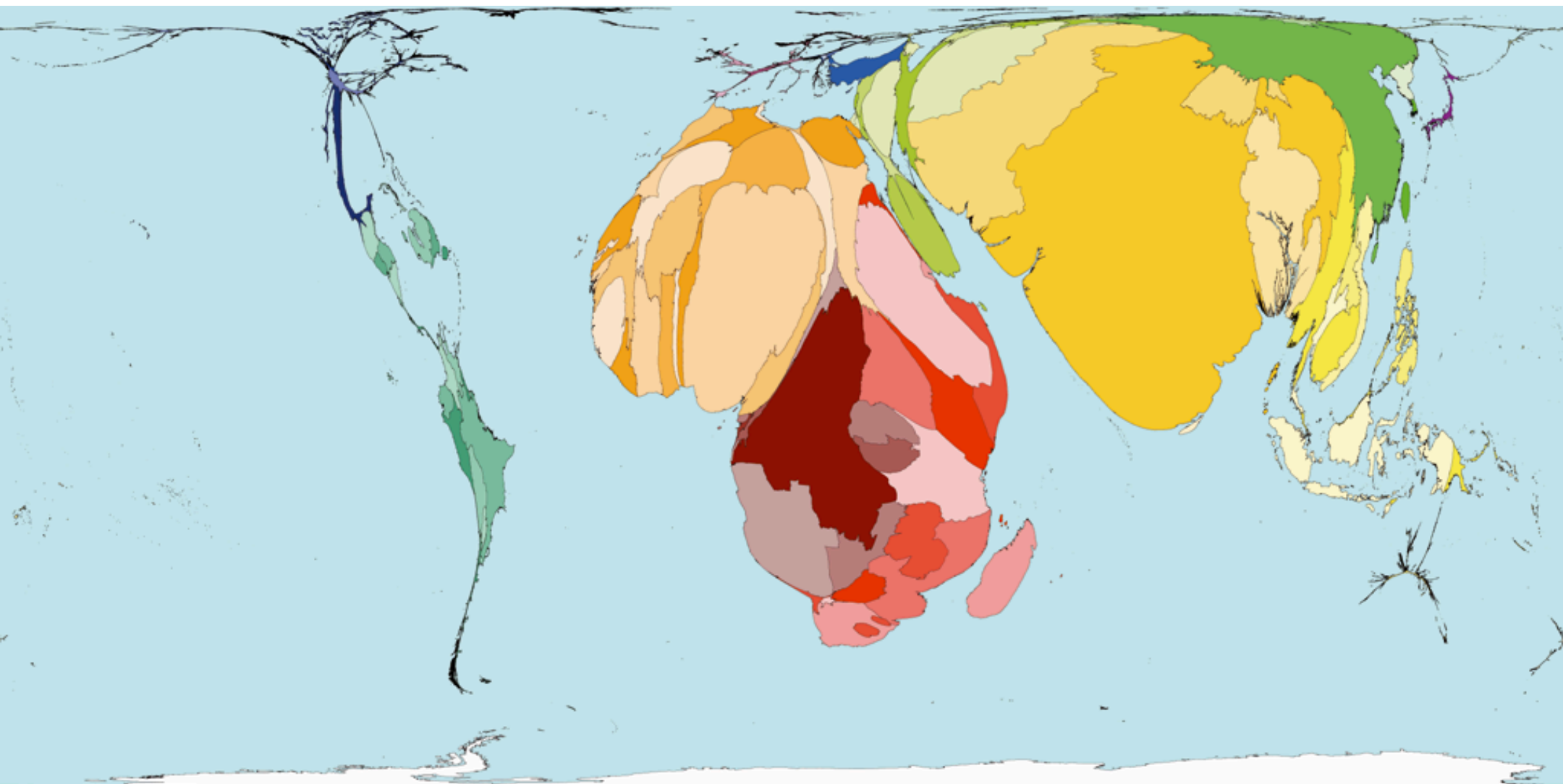


**AMR**

**LRIs**

**Diarrhea**

# Diarrhea Deaths



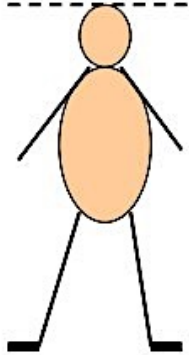
# Global deaths, fatal attributable fraction, and episodes due to each diarrhea etiology in **children under 5 years, 2016**

**Diarrhea** caused **446,000 deaths** (390,894-504,613) in children under 5 years in 2016.

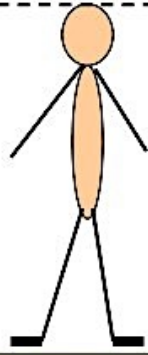
	Deaths	Fatal attributable fraction (%)	Deaths per 100,000 people	Millions of episodes
<b><u>Rotavirus</u></b>	128,515	28.78	20.3	258.20
<b>Shigella</b>	63,713	14.28	10.1	74.77
<b>Adenovirus</b>	52,613	11.78	8.3	75.27
<b><i>Vibrio cholerae</i></b>	52,232	11.71	8.3	0.90
<b><i>Cryptosporidium</i> spp</b>	48,301	10.83	7.6	44.84
<b><i>Campylobacter</i> spp</b>	40,854	9.15	6.5	88.35
<b>Non-typhoid <i>Salmonella</i></b>	37,410	8.38	5.9	64.00
<b>Enterotoxigenic <i>E. coli</i></b>	18,669	4.19	3.0	75.16
<b>Norovirus</b>	10,629	2.38	1.7	76.8

Normal height for age

Children

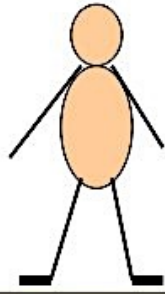


Normal



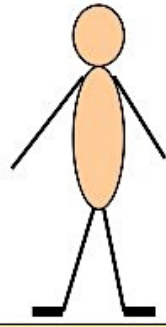
Wasted

Low weight for height



Stunted

Low height for age



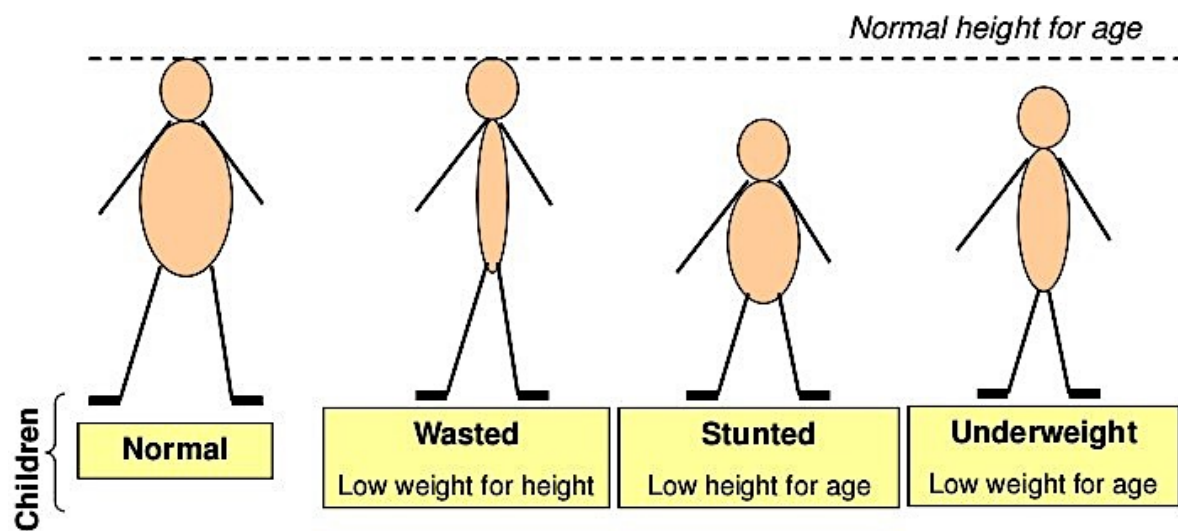
Underweight

Low weight for age



# Risk Factors for Diarrhea Mortality





**Child wasting, unsafe water, and unsafe sanitation** were the leading risk factors for diarrhea, responsible for 80.4%, 72.1%, and 56.4% of diarrheal deaths in children under 5 years, respectively, in 2016.



If the world were a village of 100 people

# **WATER**

**17** don't have clean/safe water



**83** have clean/safe water

# Poor Sanitation



<http://archive.worldmapper.org/display.php?selected=183>

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***Encourage and support***

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to 6 months:  
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Nevertheless, only 1 in 3 infants under 6 months are exclusively breastfed.

**No. 1 child-killer  
among LRI pathogens**



**Vaccine preventable pathogens**

**Low Coverage of Hib  
and Pneumococcal  
Conjugate Vaccines**

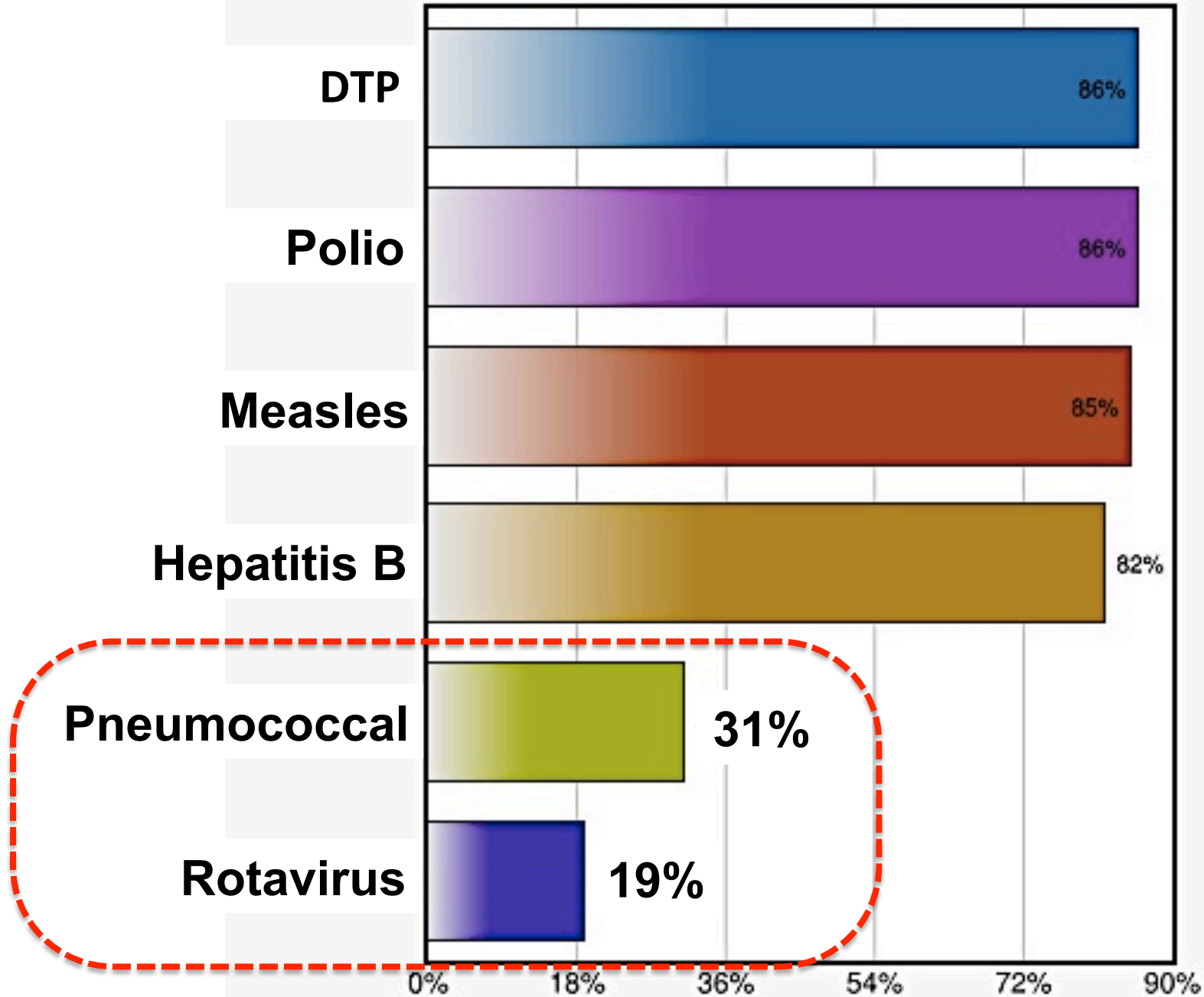
**Low Coverage of  
Rotavirus Vaccines**



**No. 1 child-killer  
among diarrhea pathogens**

Annual number of deaths due to VPD in 2005	<5 years	All ages
Vaccines included in the national immunization program (NIP) in most countries		
Measles	540,000	610,000
Invasive Hib disease	390,000	390,000
Pertussis	290,000	290,000
Tetanus	200,000	210,000
Yellow fever	15,000	30,000
Diphtheria	4,000	5,000
Polio	<1,000	<1,000
Hepatitis B	<1,000	600,000
Vaccines approved but not necessarily included in the NIP in many countries		
Japanese encephalitis	5,000	14,000
Meningococcal disease	10,000	26,000
Cervical cancer	<1,000	275,000
Rotaviral gastroenteritis	400,000	450,000
Pneumococcal diseases	720,000	1,610,000
	<b>2,600,000</b>	<b>4,500,000</b>

# World immunization coverage



# Immunization coverage / Fact sheet

Updated September 2016



## Key facts

- Immunization prevents illness, disability and death from vaccine-preventable diseases including cervical cancer, diphtheria, hepatitis B, measles, mumps, pertussis (whooping cough), pneumonia, polio, rotavirus diarrhoea, rubella and tetanus.
- Global vaccination coverage is generally holding steady.
- Uptake of new and underused vaccines is increasing.
- Immunization currently averts an estimated 2 to 3 million deaths every year. An additional 1.5 million deaths could be avoided, however, if global vaccination coverage improves.
- An estimated 19.4 million infants worldwide are still missing out on basic vaccines.

# Immunization coverage / Fact sheet

Updated September 2016



## Key facts

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hepatitis B, measles, meningitis (including pneumococcal meningitis), pneumo-

- Global

- Uptake

- Immun

every year

however, if global vaccination coverage improves.

Around 60% of these children live in 10 countries: Angola, the Democratic Republic of the Congo, Ethiopia, India, Indonesia, Iraq, Nigeria, Pakistan, the Philippines, and Ukraine.

- An estimated 19.4 million infants worldwide are still missing out on basic vaccines.

# Vaccine Preventable Deaths

## *Killing by Omission?*

Even though we **know** we can save those children with vaccines, have we made our utmost efforts for delivering vaccines to them?



*If not, we should feel guilty about it.*

# Low Coverage of Oral Rehydration Solution and Zinc Treatment

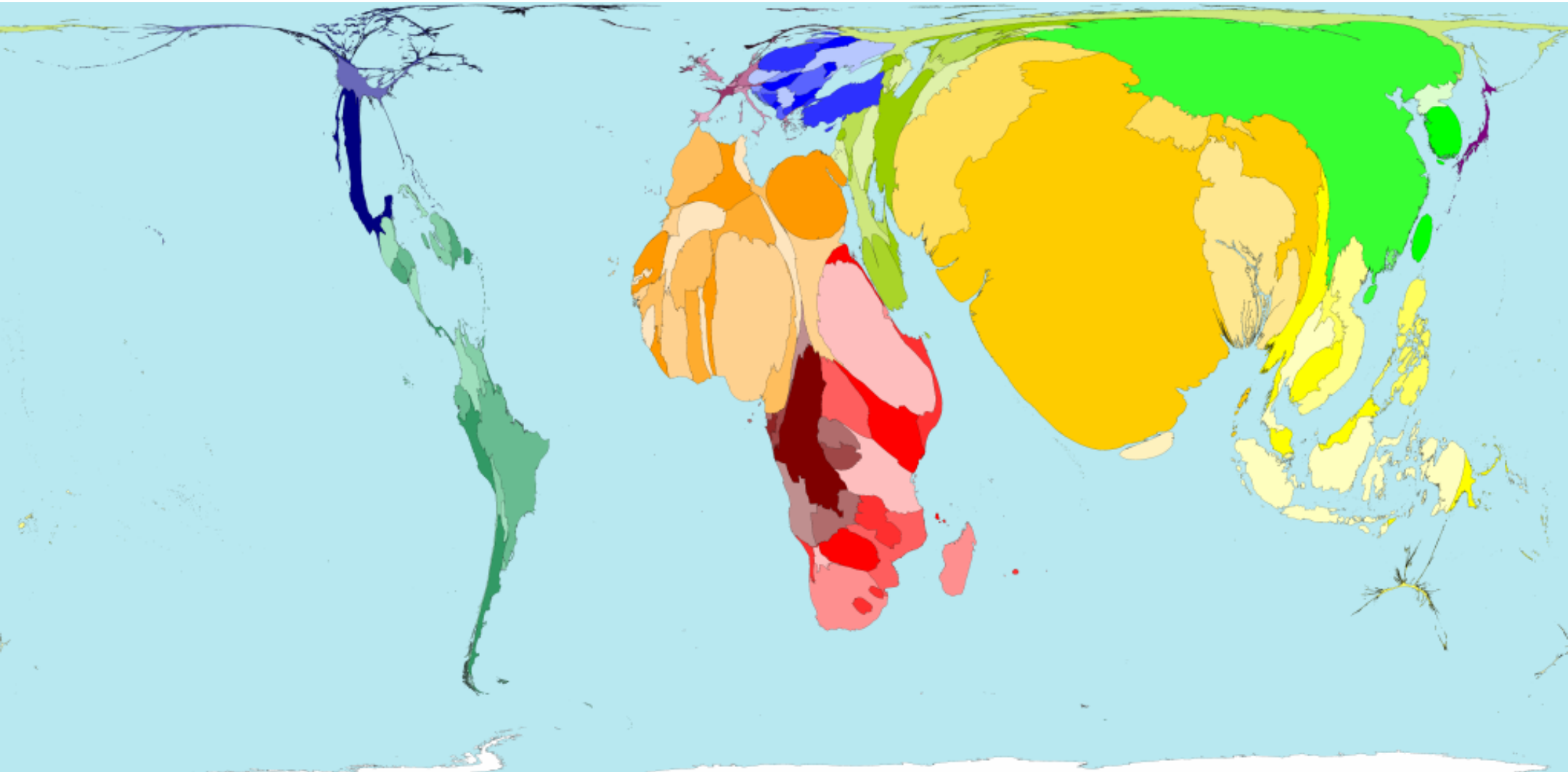


## Risk Factors for Diarrhea Mortality

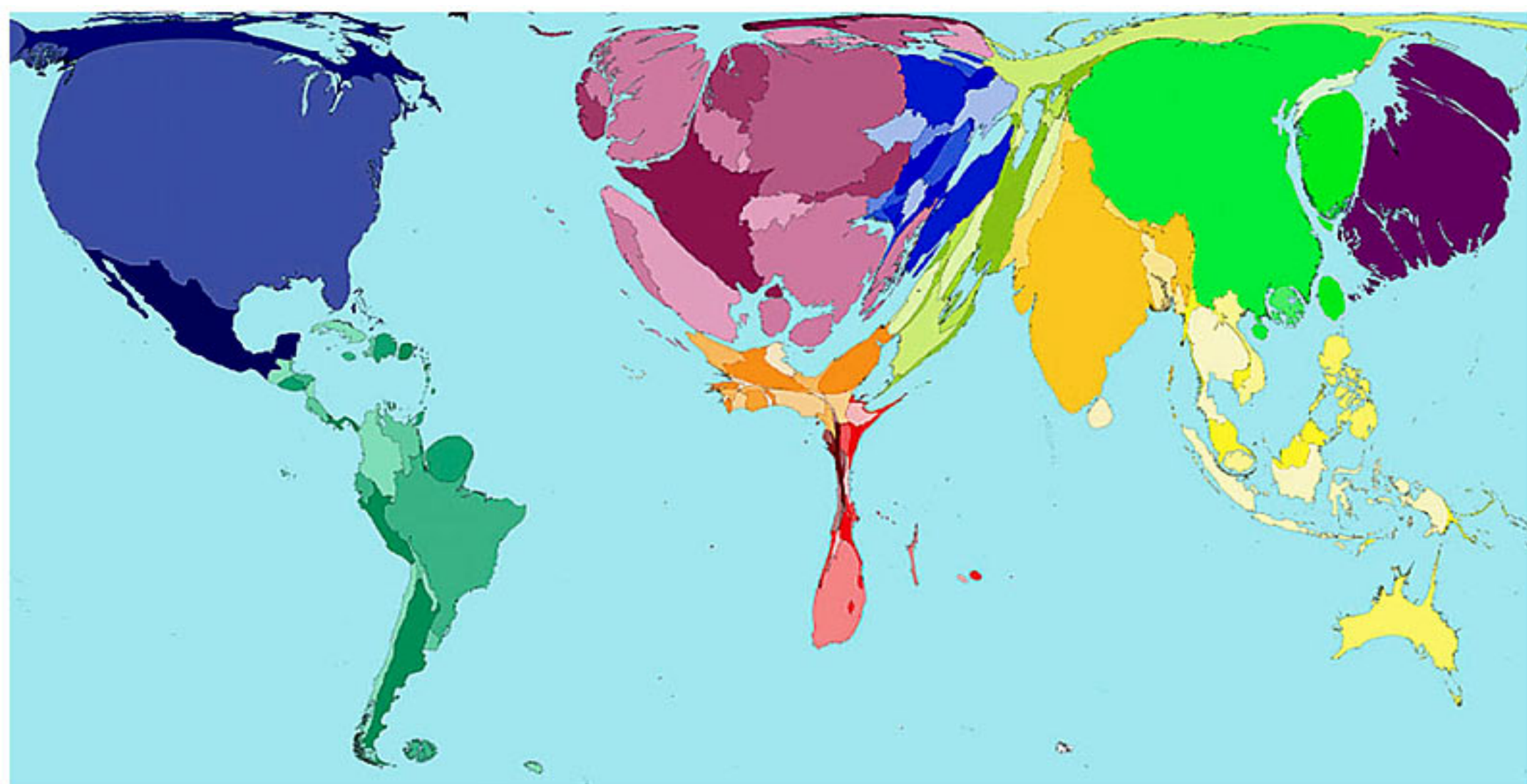
**No Access to Handwashing Facility**

***We are responsible for delivering them to those in need***

# World map according to **poverty**



# World map according to **wealth**



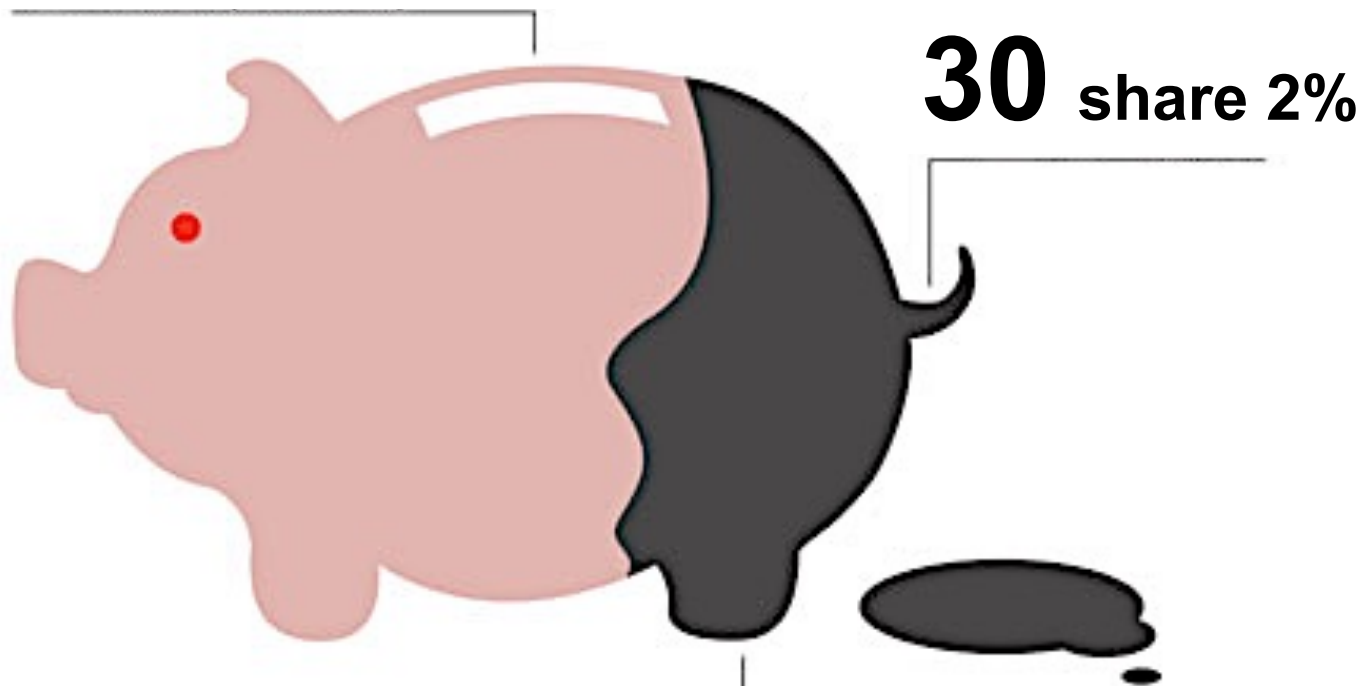
Wealth of Nations (2002)

<http://www.dailymail.co.uk/news/article-439315/How-world-really-shapes-up.html>

If the world were a village of 100 people

# MONEY

**6** own 59% (all from USA)



**30** share 2%

**74** own 39%

# How many Earths do we need

If the world's population lived like . . . .

**Earth** is not a paradise with inexhaustible natural resources but a ship with limited supplies



Socioeconomic conditions

Emerging pathogens

AMR

Cultures and Customs

Re-emerging pathogens

Old familiar, but unignorable pathogens

Religions

Medical resources/access

Pathogens that lead to malignancies

Educational opportunities

Pathogens transmitted from mother to child

Child protection

Wars and Fears



600 mi

**Who wants change?**



**Who wants *to* change?**



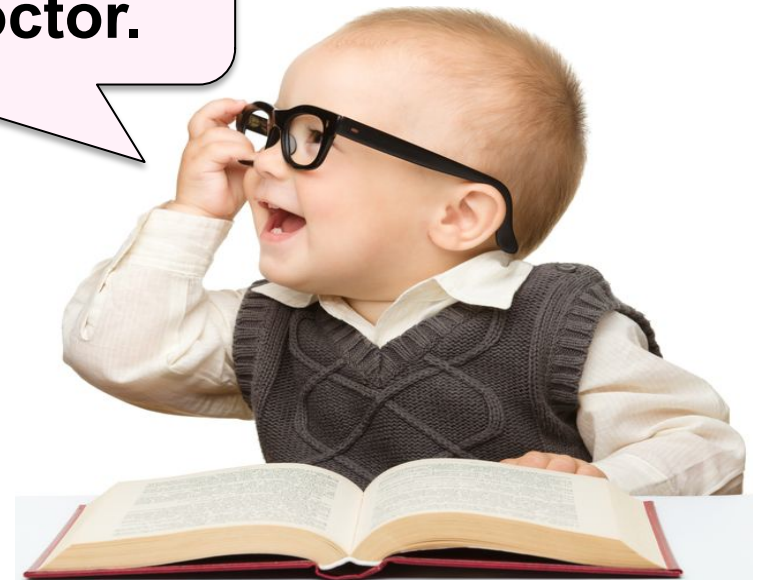


**Who wants to *lead the change*?**

**Why don't we do?**

**We pediatricians are advocates for children**

**I am a children's doctor,  
not a childish doctor.**





**Children exposed to dangerous pathogens**

**Children too vulnerable to fight even the least virulent microbes**



**ASIAN SOCIETY FOR  
PEDIATRIC INFECTIOUS DISEASES**



# THE 9TH ASIAN CONGRESS OF PEDIATRIC INFECTIOUS DISEASES

*Global Prospects, Local Progress and Eternal Promise for Children's Health*

Let's develop human resources, to provide young doctors and researchers, who are responsible for the next generation, with opportunities for learning and discussion in the **ACPID**.

We have a lot of excellent sessions in this Congress.

***Diversity in Asia is important and advantageous for development.***

Let's listen to a range of voices, especially those of the young generation, in various countries and regions through the activities of **ASPID**.

# For Children's Health



# and Happiness