

Tackling Antimicrobial Resistance (AMR) in the Context of SDGs in Asia

Integrative Approach for Strategic Design toward
Sustainable Development Goals in Asia

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Benefits of antibiotics

- Infectious diseases accounted high morbidity and mortality before the discovery of antibiotics (Penicillin in 1942 by Alexander Fleming).
- Increase the life expectancy at birth (56.4 in 1920→nearly 80 in USA)
- Leading causes of death have changed from communicable diseases to non-communicable diseases (cancer etc.)
- Growth promotion of livestock

But...

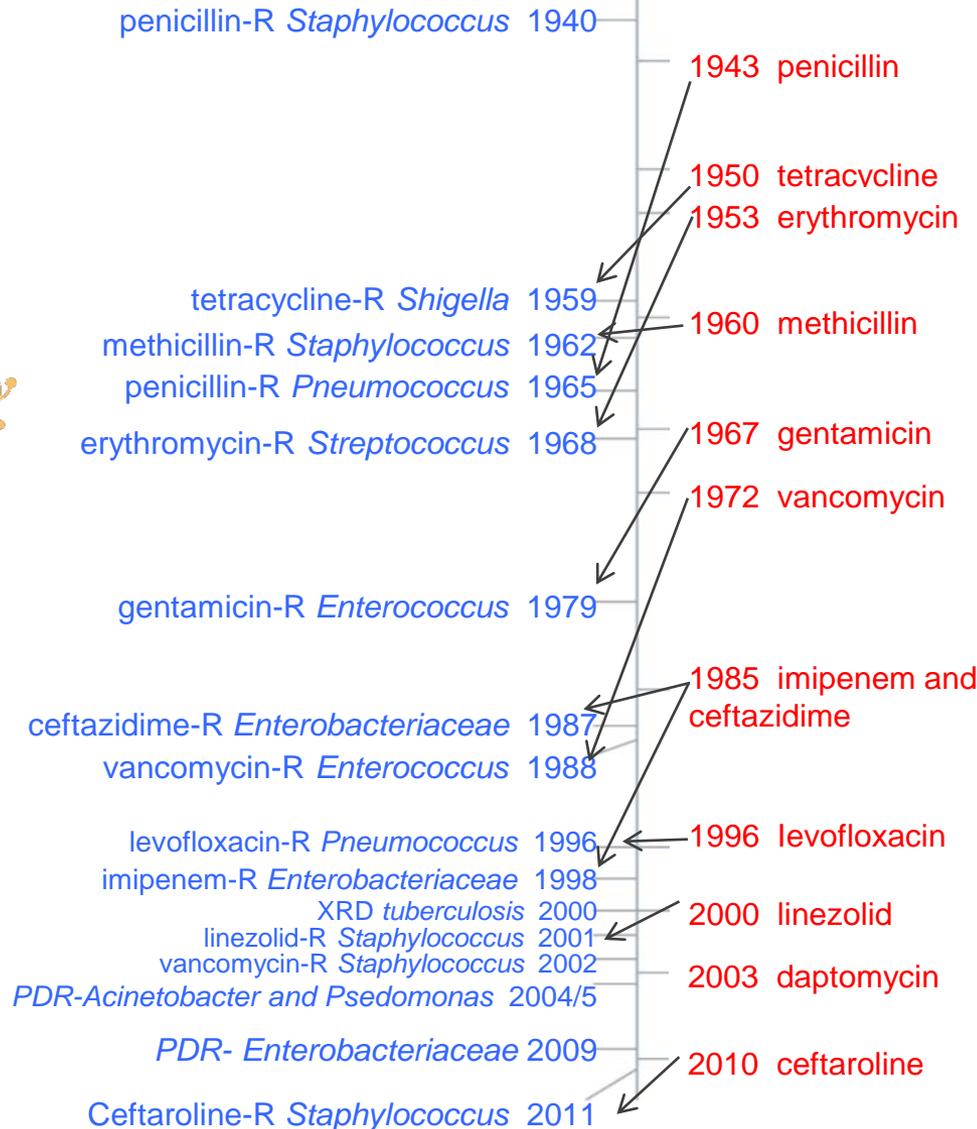
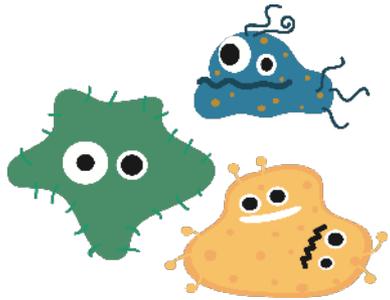
Antibiotics

Diagnosis accuracy and diversity of modern treatment methods also
ensure the most effective set of treatment for each patient individual
treatment is not toxic, has no contraindications to repeated use
the drug was high compared with standard therapy

A-cat-and-mouse game: Occurrence of AMR

Antibiotic Resistance Emerged

Antibiotic Introduced



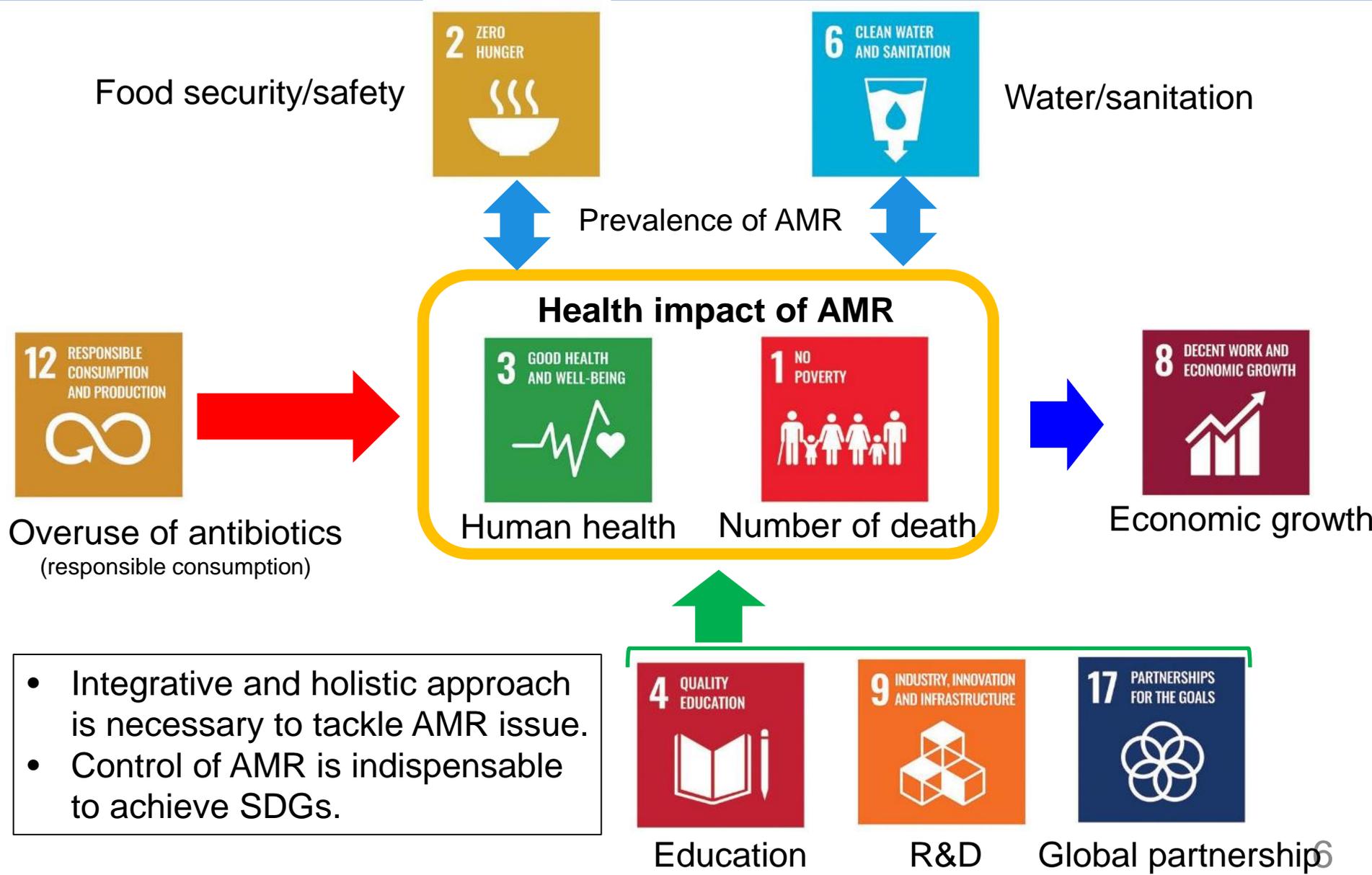
Relationship between SDGs and AMR

- Though AMR is recognized as one of the global health issues, **a specific indicator of AMR is not included yet in SDGs.**
- AMR is closely related to multiple indicators of SDGs.

SUSTAINABLE DEVELOPMENT GOALS



Each SDG goal and AMR is closely interlinked



- Integrative and holistic approach is necessary to tackle AMR issue.
- Control of AMR is indispensable to achieve SDGs.

Question

Are antibiotics effective against cold and flu?

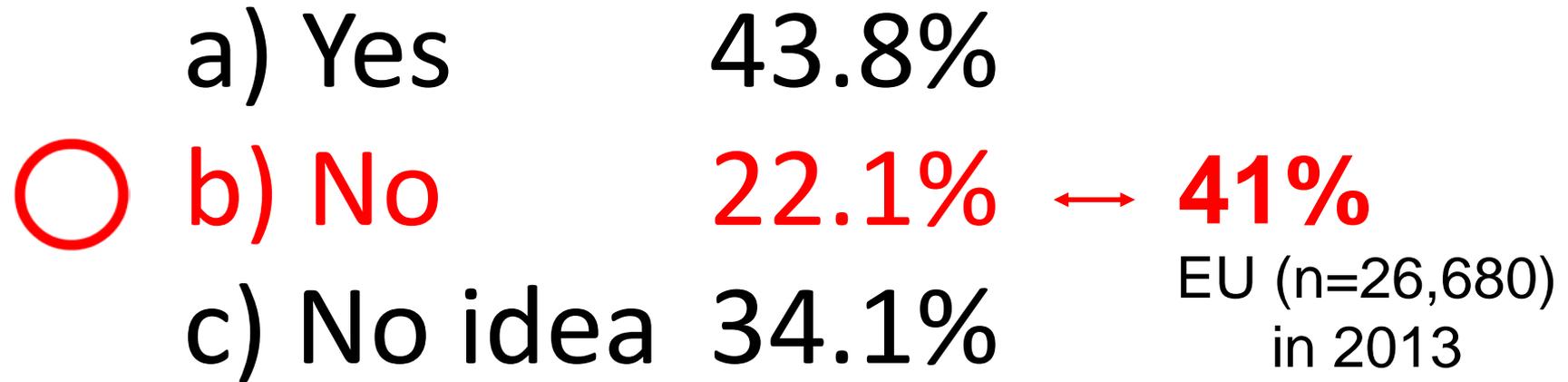
a) Yes

b) No

c) No idea

Question

Are antibiotics effective against cold and flu?



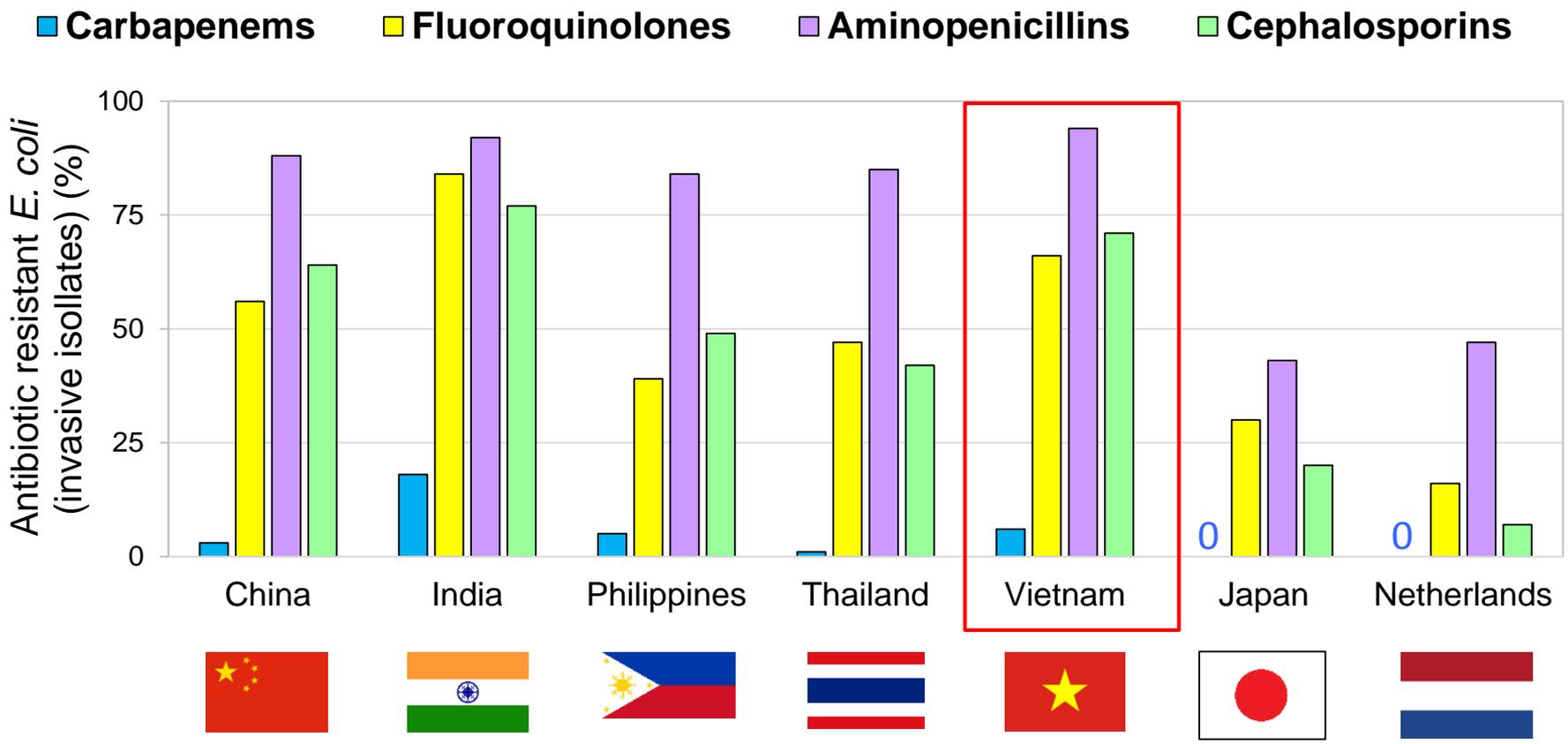
Public awareness must be increased!

Resistance of *Escherichia coli* to 3rd gen cephalosporins

Cephalosporins: Critically important antimicrobials



Antibiotic resistant *E. coli* from inpatients of all ages



- Many Asian countries are at high risk for AMR.

AMR issue in Vietnam

News

Vietnam losing war on bacteria due to overuse of antibiotics: doctors

By VnExpress November 21, 2016 | 02:31 pm GMT+7

Many patients now only respond to the strongest, most expensive antibiotics available.

It is almost as easy to buy antibiotics in Vietnam as it is to buy a candy at a convenience store, and doctors warn that this trend is putting the entire healthcare system at risk.



<Social change>

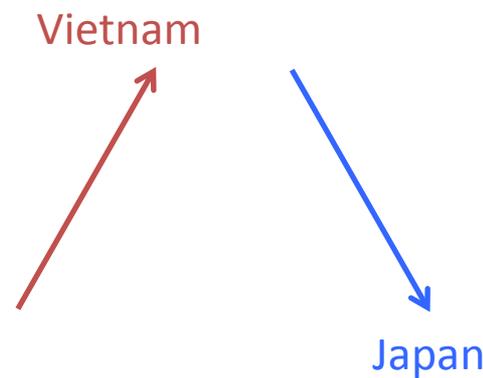
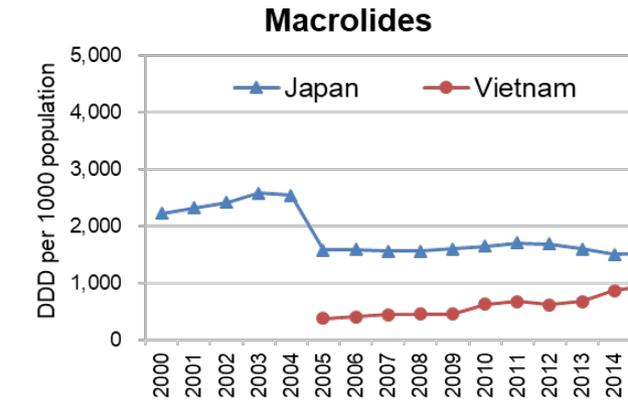
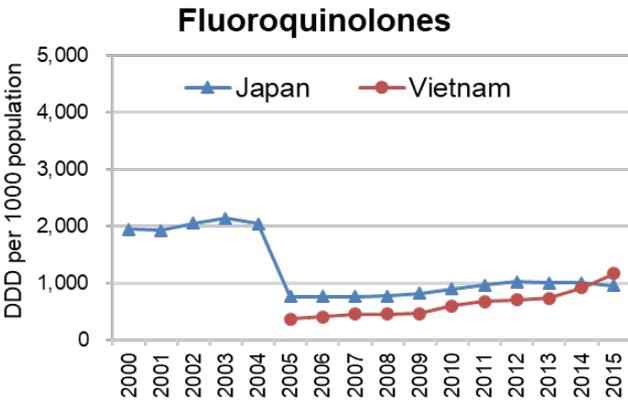
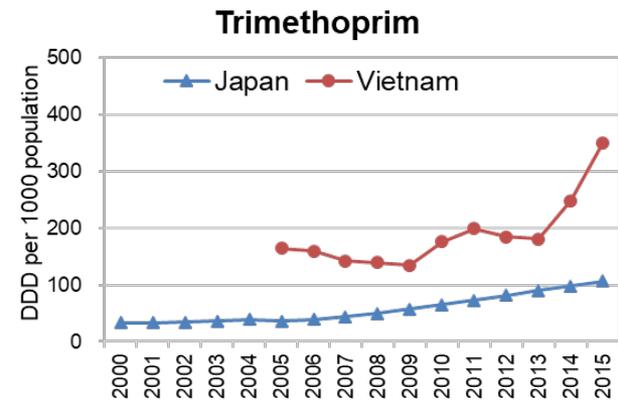
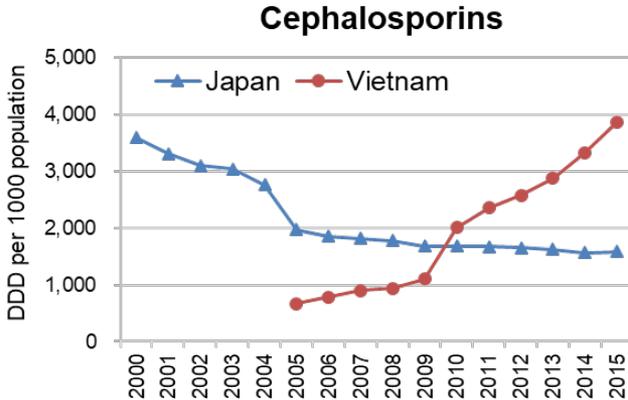
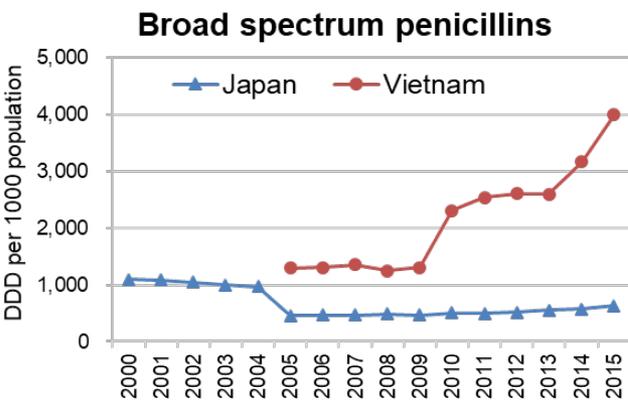
- Sales amount of antibiotics in Vietnam **doubled** from 2009 to 2018¹⁾.
- Antibiotics are sold **without prescription** at 88% pharmacies in urban area²⁾.

<Prevalence of AMR>

- ESBL-producing *E. coli* were detected from **45.5% of food** samples³⁾.
- **51% of healthy residents** carry ESBL-producing *E. coli*⁴⁾.

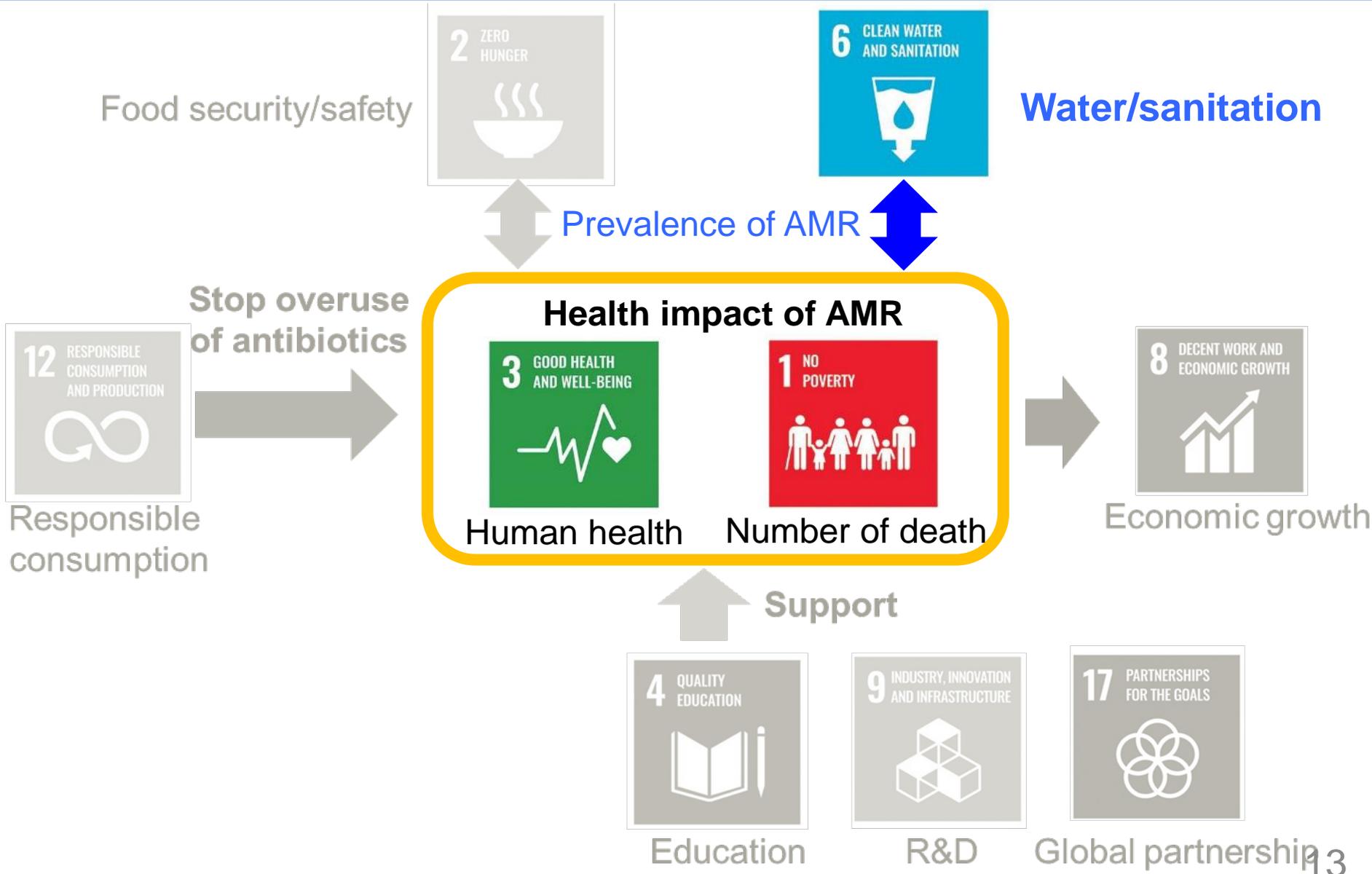
Antibiotic consumption in Japan and Vietnam

Defined daily doses (DDD) per 1,000 individuals



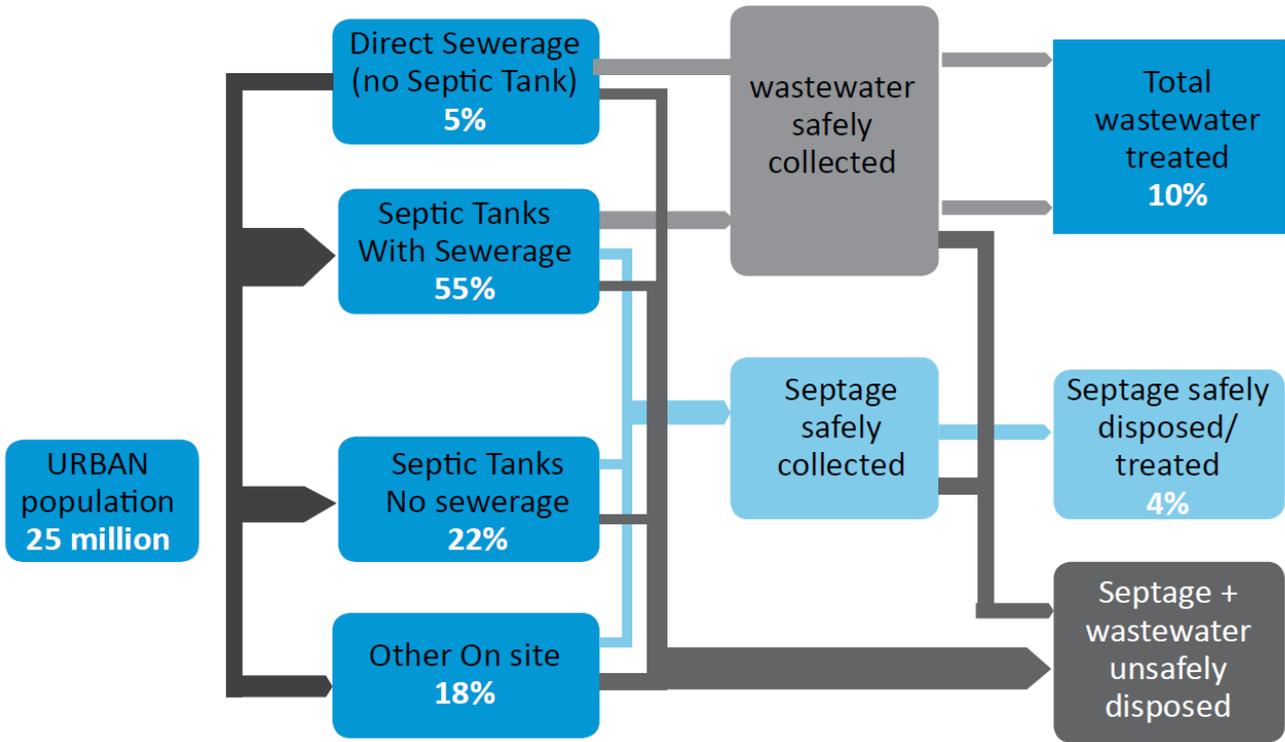
- Antibiotic consumption per 1,000 individuals in **Vietnam** is increasing!

Each SDG goal and AMR is closely interlinked



Untreated wastewater in Vietnam

Figure 1. Status of urban wastewater management in Vietnam ¹⁾



Wastewater treatment (2017) **12%** ²⁾

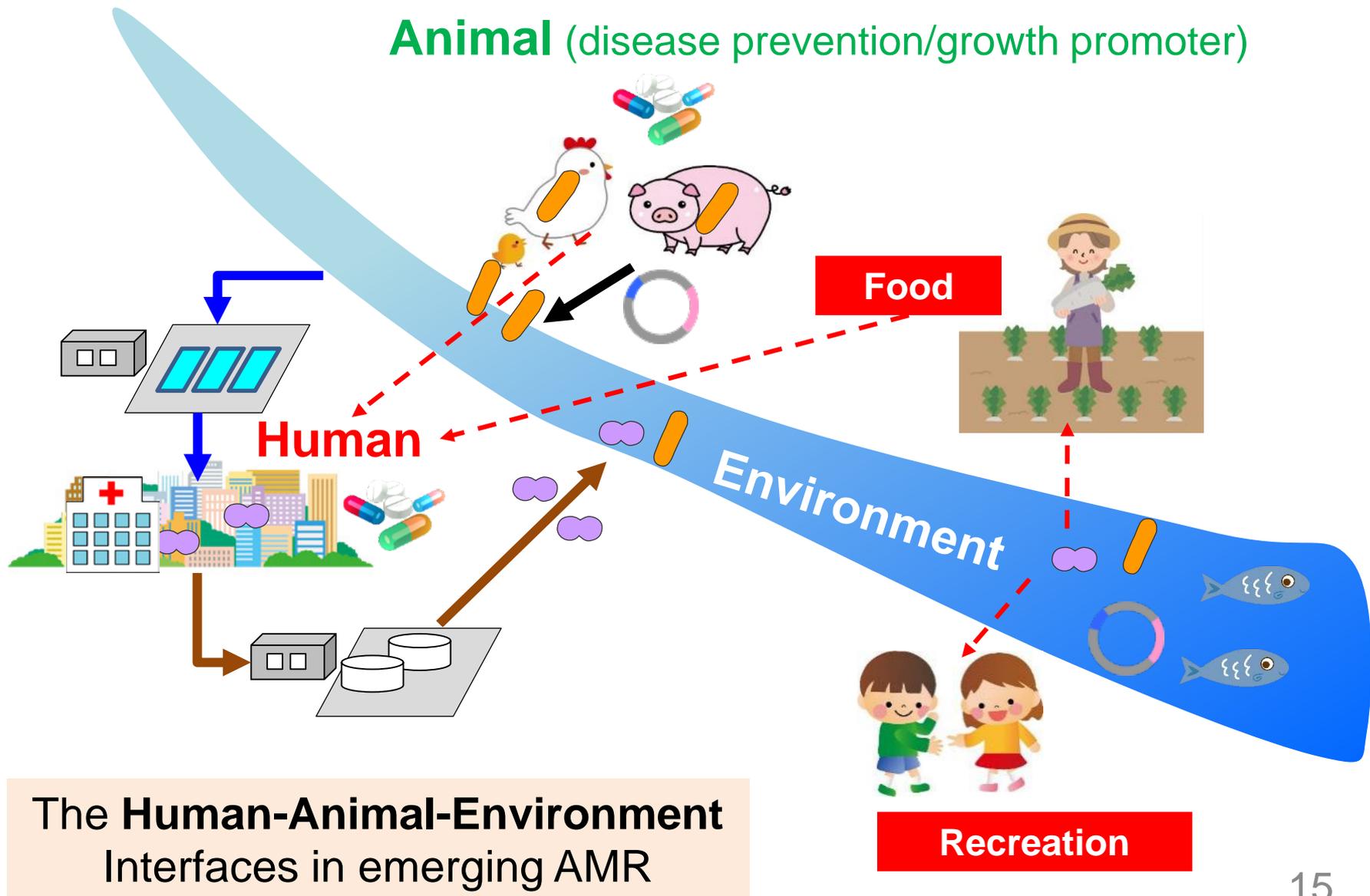
Untreated or treated by only septic tank: **90%**



- What is the current situation of AMR in water environment in Hanoi?
- How AMR is associated with fecal pollution?

1) Vietnamese Wastewater Review, Executive summary (2013), 2) Vietnam's Voluntary National Review on The Implementation of The SDGs (2018)

“One Health” Framework



Potential vicious circle of AMR in Vietnam

Healthy residents in Vietnam carry colistin resistant *E. coli*.

Yamamoto 2018

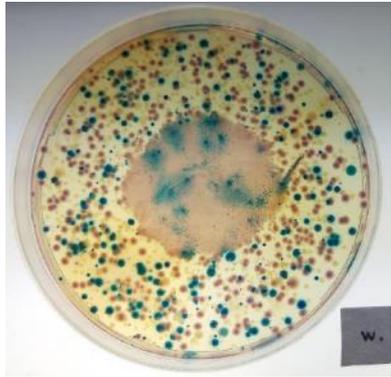


Epidemiological survey
-Water-Food-Health-

Untreated domestic/livestock wastewater



- Close contact with animals
- Poor sanitation and hygiene
- Fresh vegetable in food culture



Detection of colistin-resistant bacteria from vegetable

Pollution of agricultural products



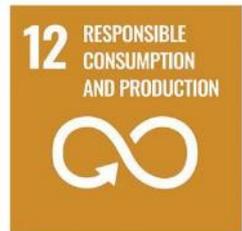
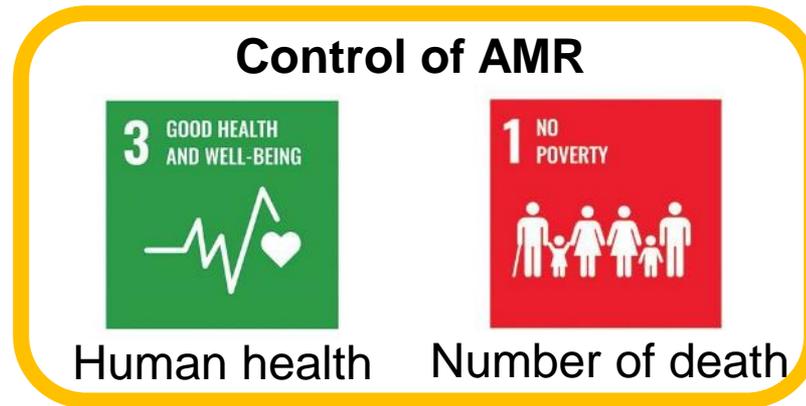
Take-home message

- Avoid contamination of food
- Monitoring of AMR



- Reduce untreated wastewater discharge
- Monitoring of AMR

One-Health



- Stop overuse of antibiotics



Sustainable economic growth

- Integrative and holistic approach is necessary to tackle AMR issue.
- Control of AMR is indispensable to achieve SDGs.



Education



R&D



Global partnership 17