

**WCRP Conference for
Latin America and the Caribbean:
Developing, linking and applying climate knowledge**



Public Health and Climate Challenges and Opportunities

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Agenda

- Introduction
- Public Health Approach
- Opportunities - Challenges



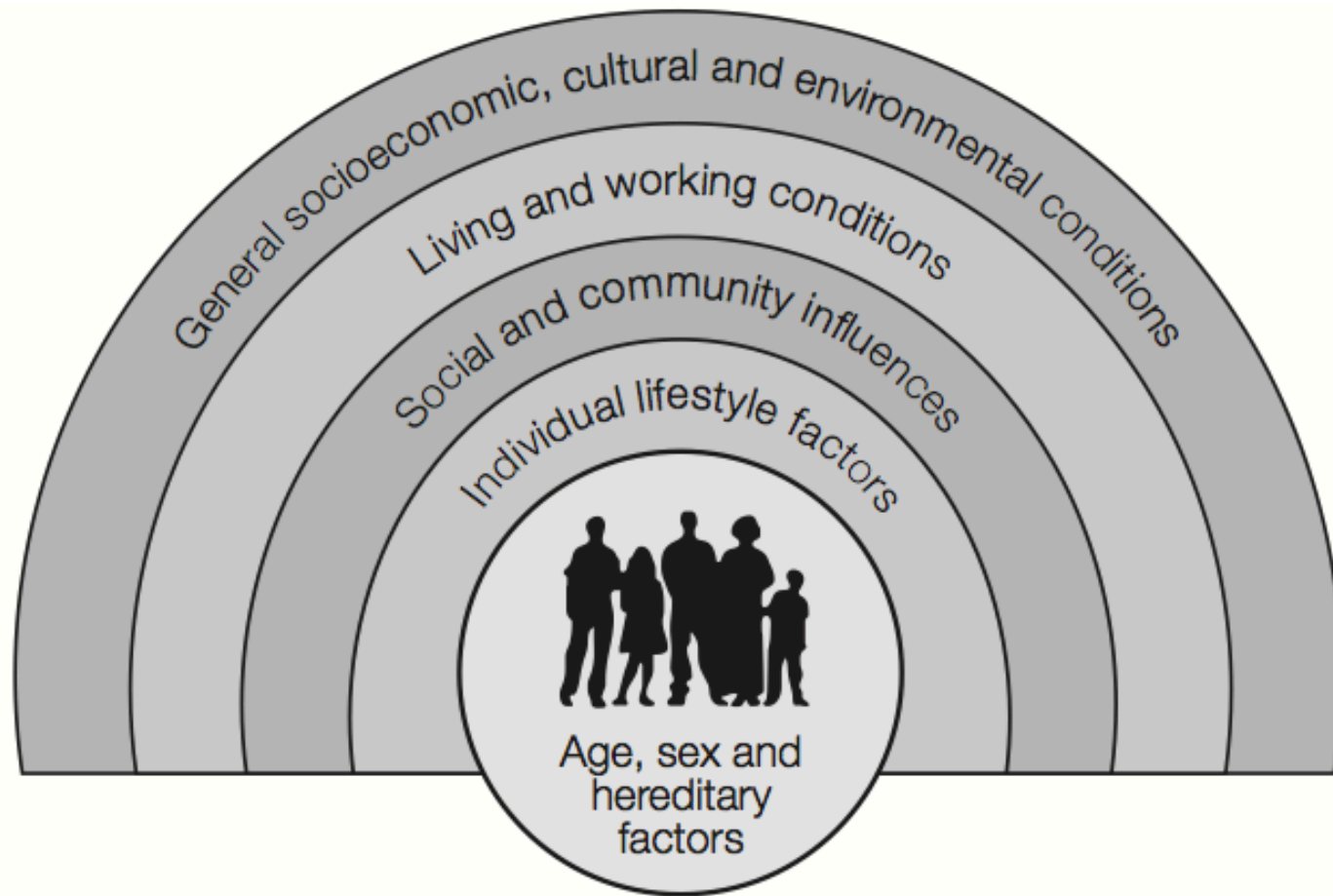
Public Health

Public Health is what we, as a society, do collectively to protect, promote and restore the people's health

or

The science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, public and private, communities and individuals.

Determinants of health



Source: Stahl, T, Wismar, M, Ollila, E, Lahtinen, E, Leppo, K. (2006). Health in All Policies: Prospects and potentials, Ministry of social Affairs and Health, Health Department, Finland.



Prevention is our language

- **Primary** prevention aims to prevent the onset of injury or illness; examples include immunization, smoking cessation efforts, and the use of bicycle helmets.
- **Secondary** prevention aims to diagnose disease early to control its advance and reduce the resulting health burden; examples include screening for hypertension, hyperlipidemia, and breast cancer.
- **Tertiary** prevention occurs once disease is diagnosed; it aims to reduce morbidity, avoid complications, and restore function.

Climate Knowledge for Public Health

ΠΕΡΙ ΑΕΡΩΝ ΥΔΑΤΩΝ ΤΟΠΩΝ

Ἰητρικὴν ὅστις βούλεται ὀρθῶς ζητεῖν, τάδε χρὴ ποιεῖν·
πρῶτον μὲν ἐνθυμεῖσθαι τὰς ὥρας τοῦ ἔτεος, ὃ τι δύναται
ἀπεργάζεσθαι ἐκάστη· οὐ γὰρ εἰκόσασιν ἀλλήλοισιν οὐδέν,
ἀλλὰ πολὺν διαφέρουσιν αὐταί τε ἐφ' ἐωυτέων καὶ ἐν τῇσι
μεταβολῇσιν· ἔπειτα δὲ τὰ πνεύματα τὰ θερμά τε καὶ τὰ
ψυχρά, μάλιστα μὲν τὰ κοινὰ πᾶσιν ἀνθρώποισιν, ἔπειτα
δὲ καὶ τὰ ἐν ἐκάστη χώρῃ ἐπιχώρια εἶοντα. δεῖ δὲ καὶ τῶν
ὑδάτων ἐνθυμεῖσθαι τὰς δυνάμεις ...

Hippocrates, c. 400 BC

Whoever wishes to pursue properly the science of medicine must proceed thus: first he ought to consider what effects each season of the year can produce – for the seasons are not all alike, but differ widely both in themselves and at their transitions; the next point is the hot winds and the cold, especially those that are universal, but also those that are peculiar to each particular region; and he must also consider the properties of the water ...

Hippocrates

Father of Medicine

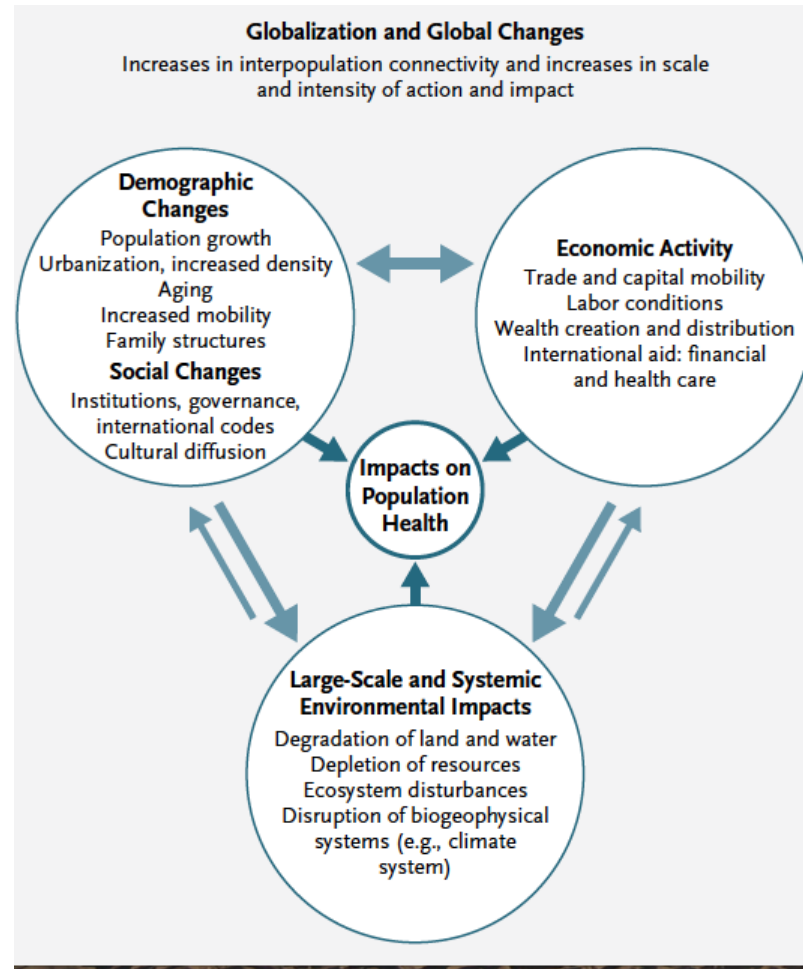
Born in 460 B.C. - Died in

377 B.C.

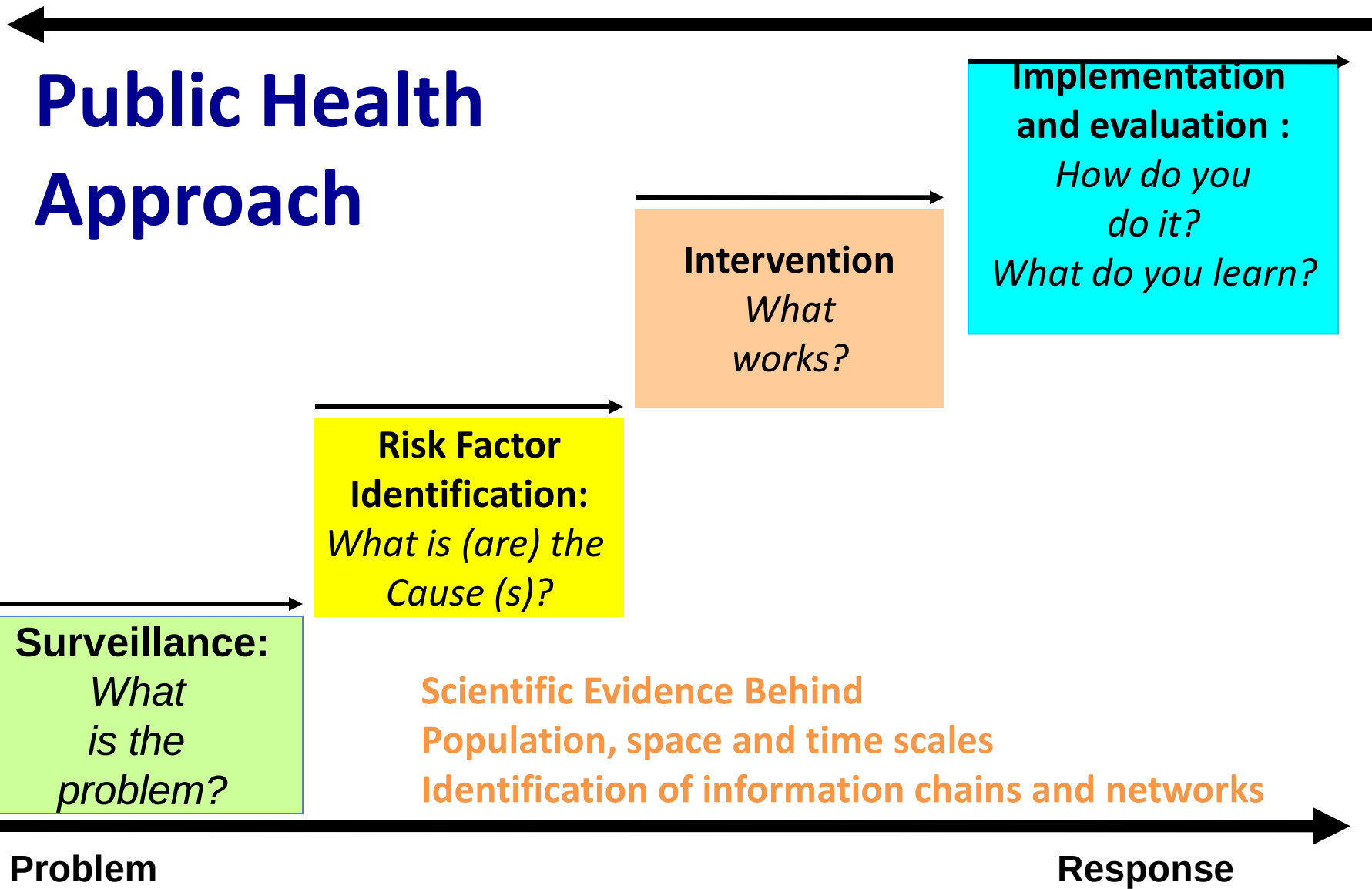
Airs, Waters Places".

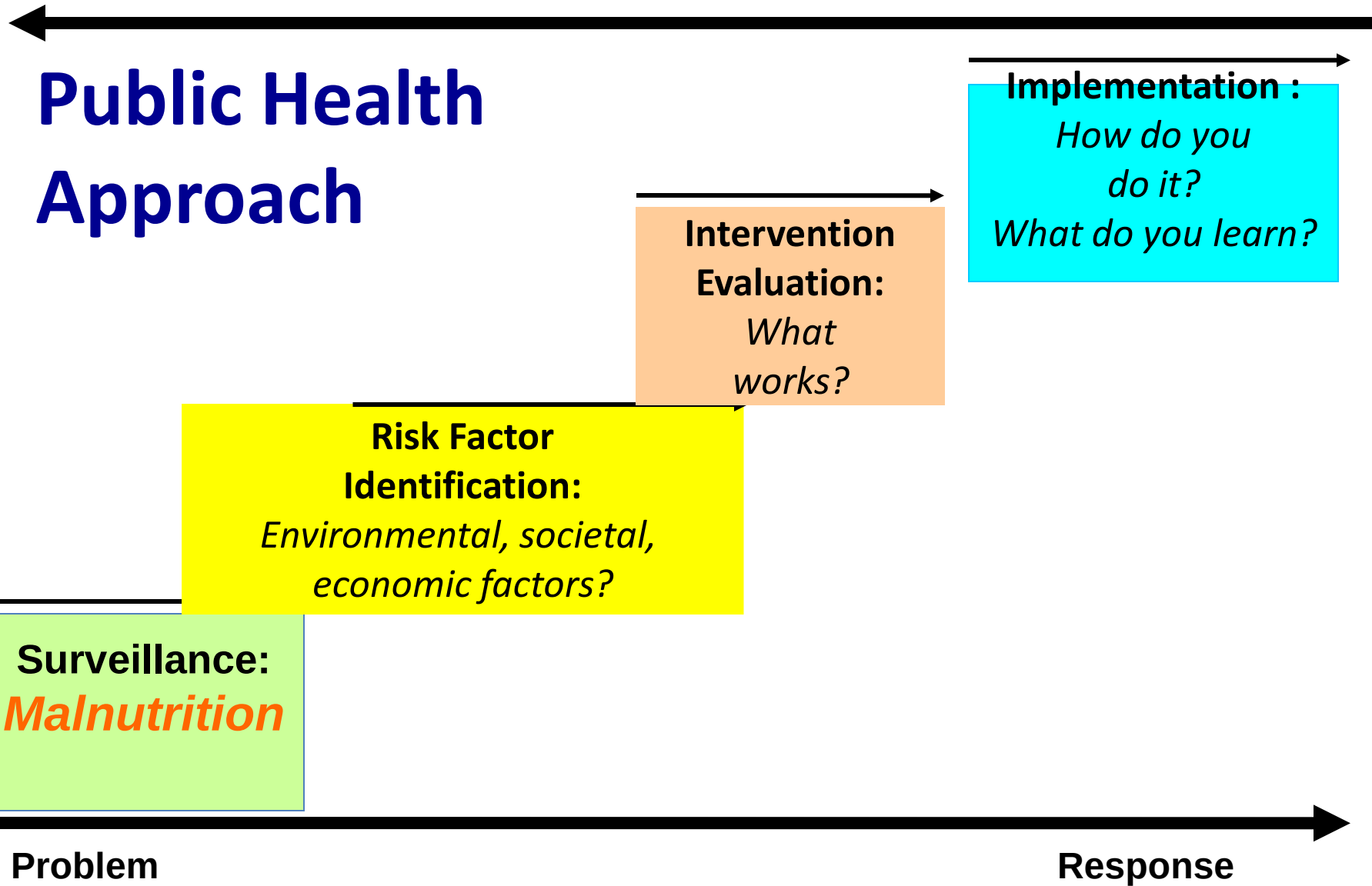


Public Health as a final path...



Source: . Globalization, Climate Change, and Human Health. Anthony J. McMichael. N Engl J Med 368;14 nejm.org april 4, 2013



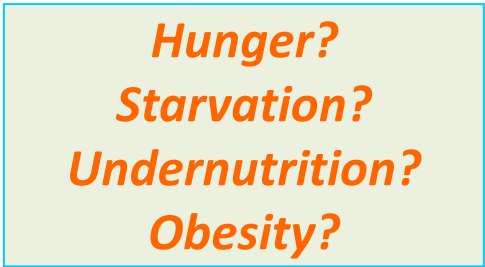




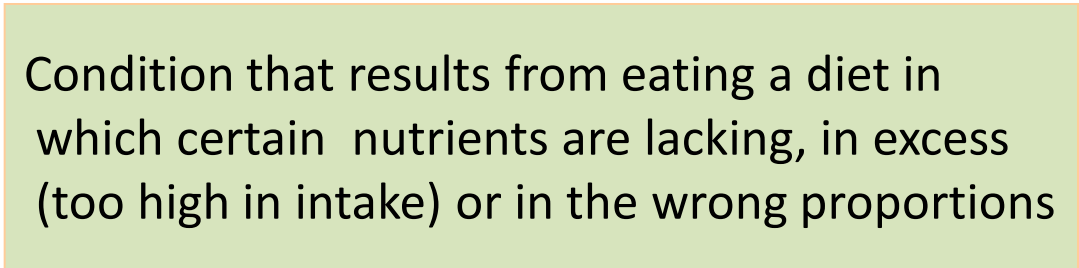
Public Health Approach



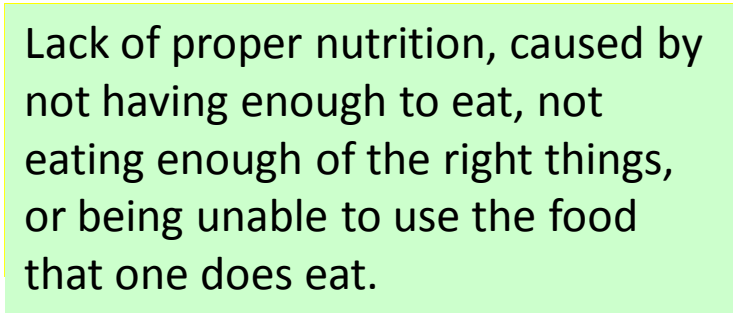
Population
Time and space
scale



Hunger?
Starvation?
Undernutrition?
Obesity?



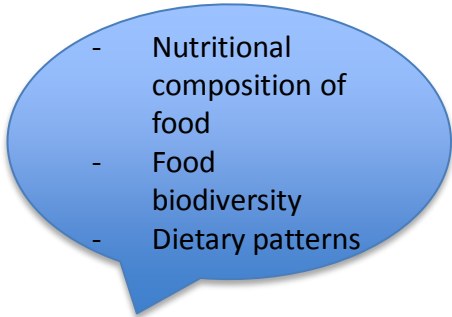
Condition that results from eating a diet in which certain nutrients are lacking, in excess (too high in intake) or in the wrong proportions



Lack of proper nutrition, caused by not having enough to eat, not eating enough of the right things, or being unable to use the food that one does eat.



Malnutrition

- 
- Nutritional composition of food
 - Food biodiversity
 - Dietary patterns



Problem

Response



Public Health Approach

Economic
Income /consumption

Environmental
water quality, biodiversity, land use (food supply)
pollutants in water streams, ocean water,
climate variability /change

Societal
access to adequate food,
diet quality, diet diversity,
disease

**Risk Factor
Identification:**
*Environmental, societal
economic factors?*

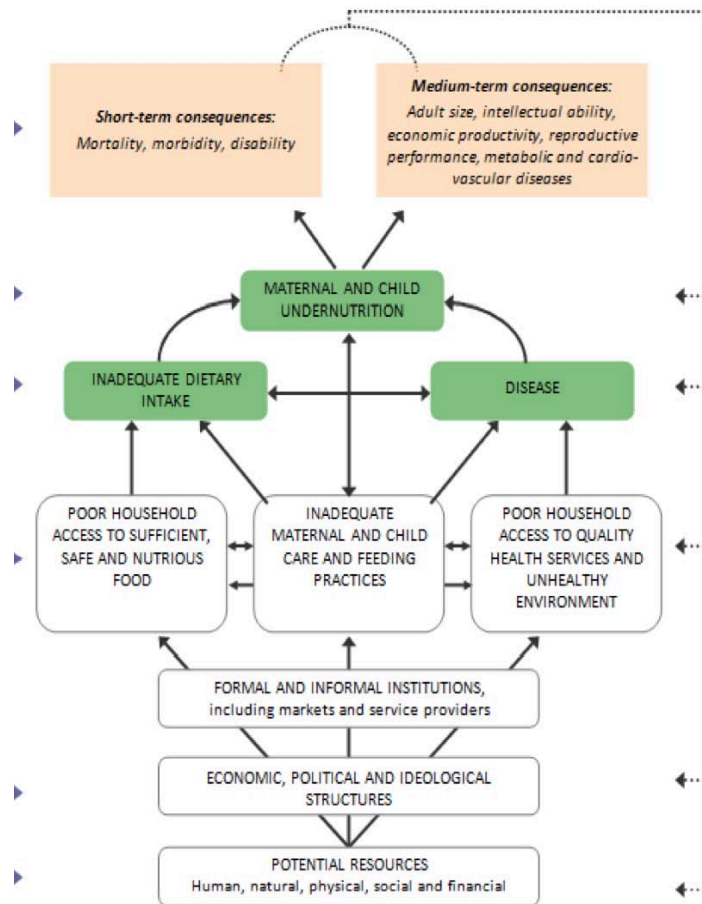
The measurement
of each depends
on assumptions
about **time and
space** scale and
populations

Problem

Response



Pathways between societal, economic setting and nutrition



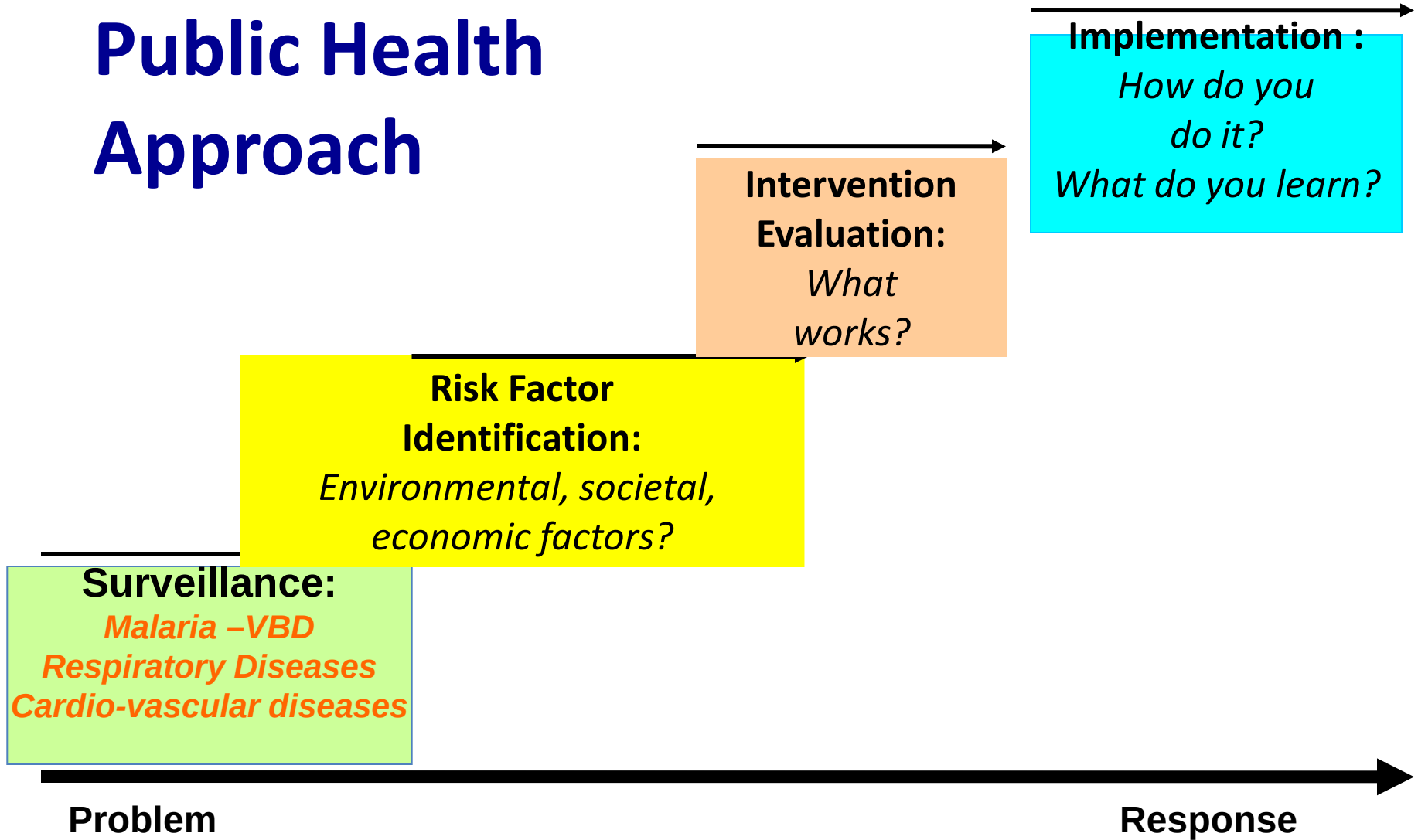
Research Questions to be addressed...

- Does climate variability/change influence the type of food production (more or less diversified)?
- Does climate variability and change influence malnutrition trends?
- How can we combine multiple traits in crops so that they are nutrient dense and tolerant to drought/flooding?
- How can we ensure that climate variability and change adaptation agricultural policies include better nutrition as well as increased production as the desirable outcome?

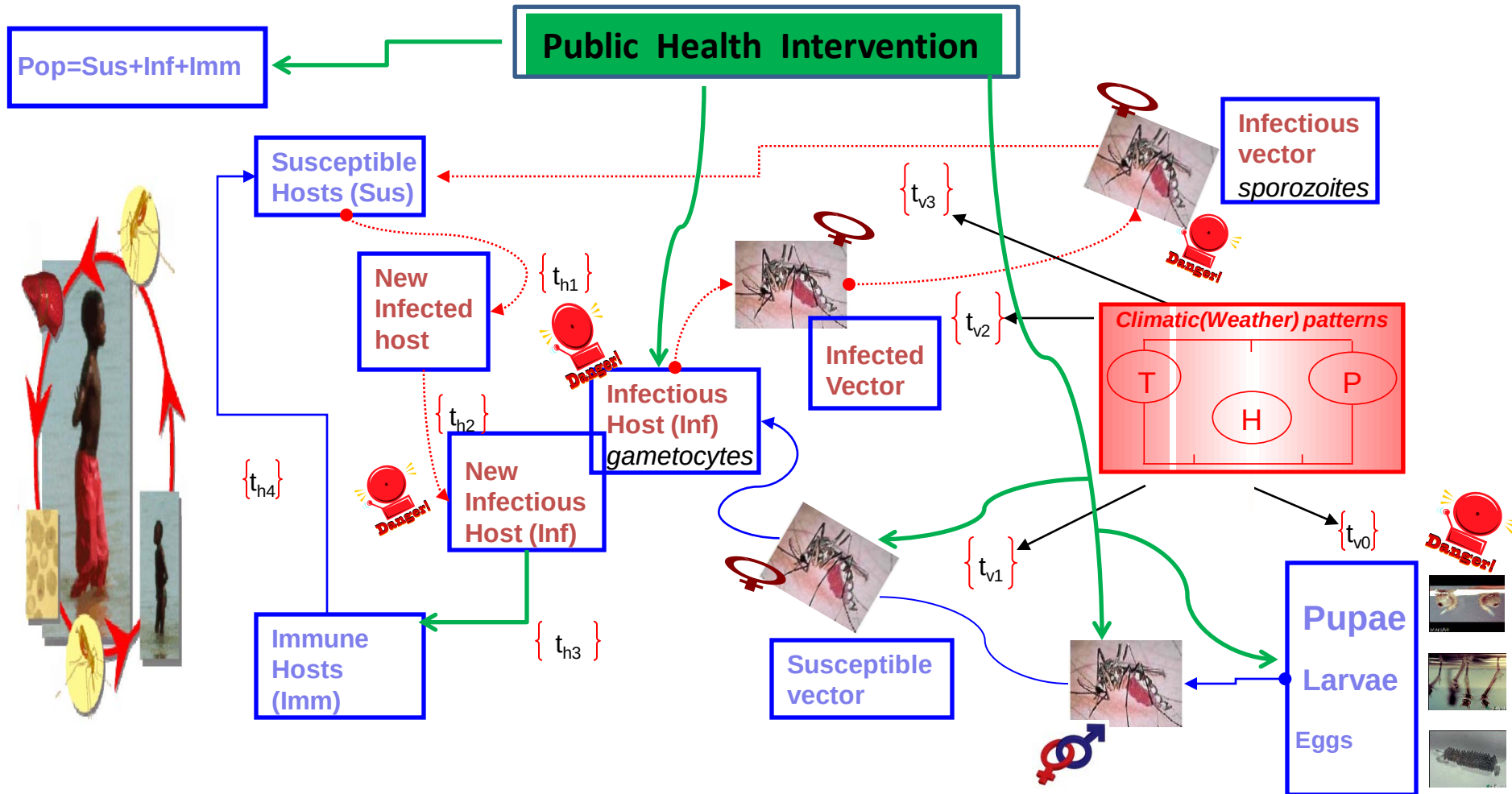
Research Questions to be addressed..

- What is the connection between food supply indicators diet quality?
- What is the connection between agricultural or food policies and dietary patterns?.
- How to evaluate policies that affect the supply, availability, access, affordability, convenience, and desirability of diverse, nutritious foods?

Public Health Approach



Malaria Transmission Mechanism (MTM)



See for instance: Ruiz, D., Poveda, G., Velez, I.D., Quiñones, M.L., Rua, G.L., Velazquez, L.E., Zuluaga, J.S. *Modelling entomological-climatic interactions of Plasmodium Falciparum malaria transmission in two Colombian endemic-regions: contributions to a National Malaria Early Warning System*. Malaria Journal, 2006, 5:66.

Research Paradigms on VBD - climate

1. Understanding how the spatio-temporal scales of human mediated processes link with disease dynamics
2. Understanding how human alteration of the environment mediates climate-disease relationships
3. Linking climate change with how disease hosts utilize resources in human environments

Understanding social, economic and environmental drivers of disease

Human ecology

Intervening in disease systems



Where climate information could be used ?

- I. improve understanding of the **pathways**
- II. estimate populations at risk (**risk mapping**)
- III. estimate **seasonality** of public health events and timing of interventions
- IV. monitor and predict **year-to-year variations** (including early warning systems)
- V. monitor and predict **longer term trends** (climate change impacts and vulnerability assessments)
- VI. improve assessment of the **impact of interventions** (by removing climate as a confounder)

What are the practical implications of such an approach ?

- **Preventive Focus:** Anticipation of actions that reduce the impact of adversity
- **Multi-level Analysis:** Attention to multiple levels of influence ranging from the structural and cultural through to the community and the individual (health determinants)
- **Systems Orientation:** Mapping influences within ecologically-nested systems

What are the practical implications of such an approach ?

- **Participative Analysis** : Use of participative analysis to map systems in a particular context
- **Leverage Points**: Attention to key influences on developmental outcomes
- **Planned Synergies** : Interventions anticipate linkages to reinforce impact

Challenges

- Increase the public health community's capacity to understand the role of climate information to protect, promote and restore the people's health (More applied research , more multidisciplinary work, more steady working groups).
- Improve in all sectors the capacity to develop transparent ,reliable, information systems suitable to support the decision process. Better surveillance information systems in health are critical (key factors: time, scale dimensions, GIS)

Challenges

Improve the capacity of Met-Services to support climate related research in other sectors: health, agriculture, water management, energy, etc., based on the idea that climate/weather information and research is important but what really matters is the need to match the supply of climate services with the demand of them (What? Why?? Scope?)

Thank you!

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