



Lesson 9

Food Science and technologies



45%

85 kids at the
end of my 15
minutes of
glory!

of all child deaths are associated
with poor nutrition



According to current stats...

1 billion insufficient kcals and nutrients (hunger)

2 billion sufficient kcals, but insufficient nutrients (hidden hunger)

3 billion sufficient kcals and nutrients (healthy)

1.4 billion excess kcals (some with insufficient nutrients) (overweight/obesity)

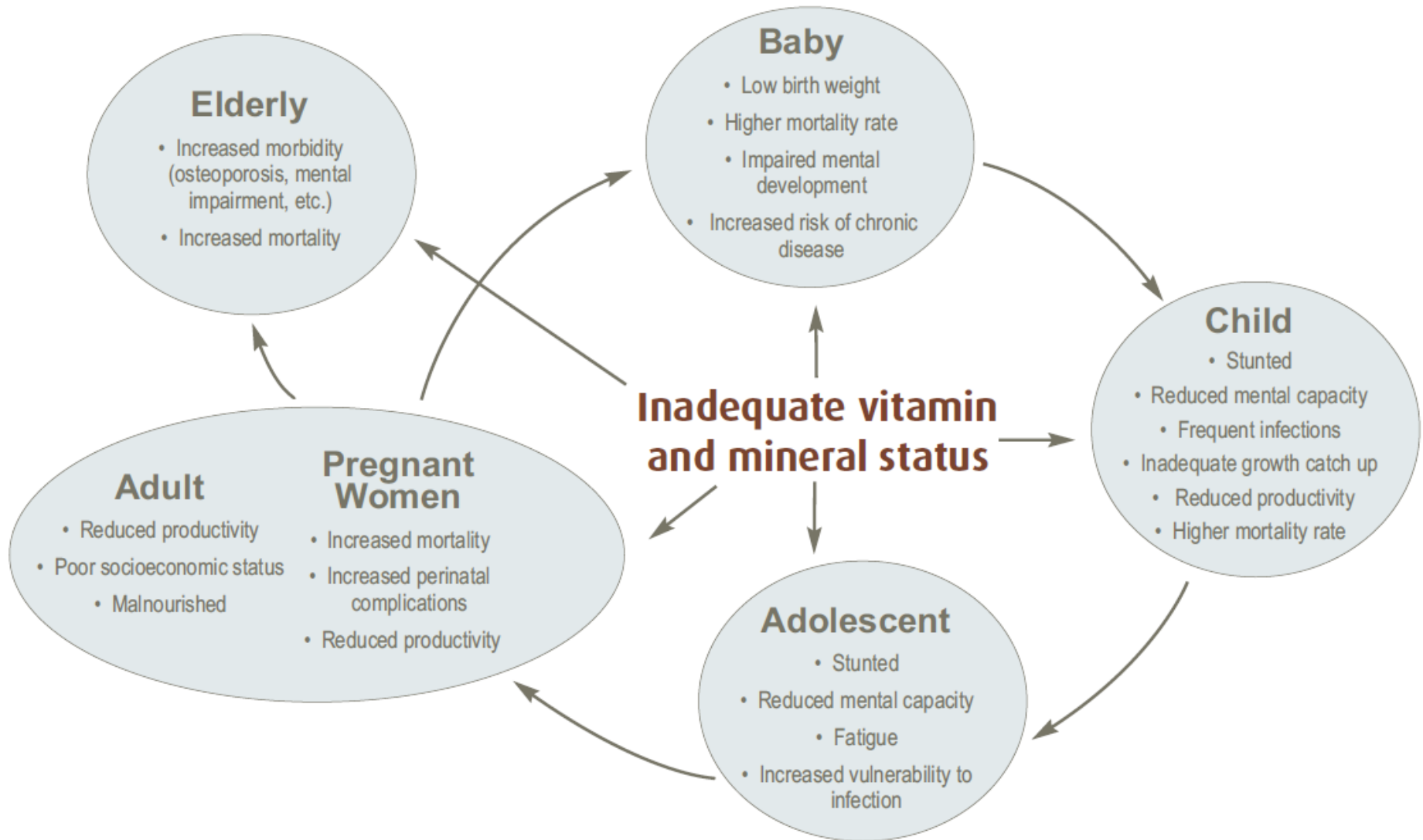
Black, R.E., et al., 2013. Maternal and Child Nutrition Study Group. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 382, 427–451.

FAO. 2013. Food Systems for better Nutrition.

Keats, S., Wiggins, S., 2014. Future Diets: Implications for Agriculture and Food Prices. ODI Report. Overseas Development Institute, London.

United Nations Children's Fund (UNICEF), 2013. Improving child nutrition: The achievable imperative for global progress. UNICEF, New York, NY.

Consequences of Hidden Hunger throughout life



Adapted from the United Nations Administrative Committee on Coordination Sub-Committee on Nutrition (ACC/SCN), Fourth Report on the World Nutrition Situation, 2000, Geneva: ACC/SCN in collaboration with IFPRI.

Source: MI Global Report, 2009. Investing in the Future. A united call to action on vitamin and mineral deficiencies

What Works?

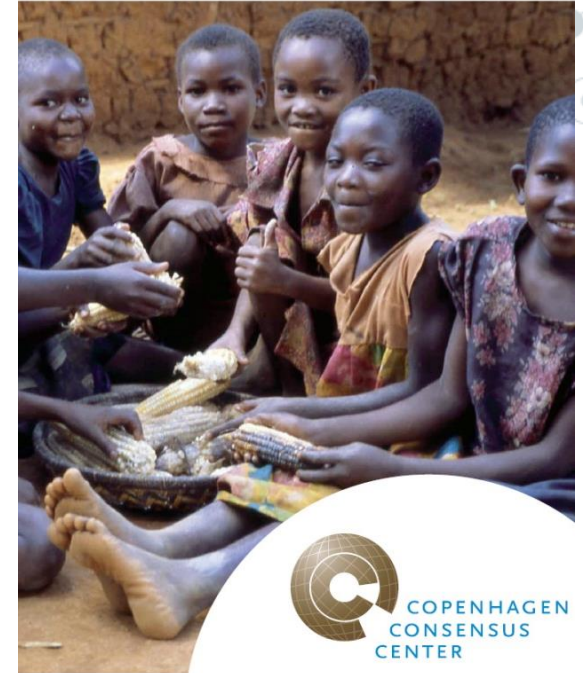
- Supplementation
- Fortification
- Biofortification
- Dietary diversification



Copenhagen Consensus 2008


If you have \$75 Billion...

- Nobel laureates in economy
- Set priorities to face global challenges
- Four solutions associated with nutrition:
 - Supplementation (vit.A & Zn)
 - Fortification (iron and iodine)
 - Biofortification of staples
 - Community-based nutrition promotion

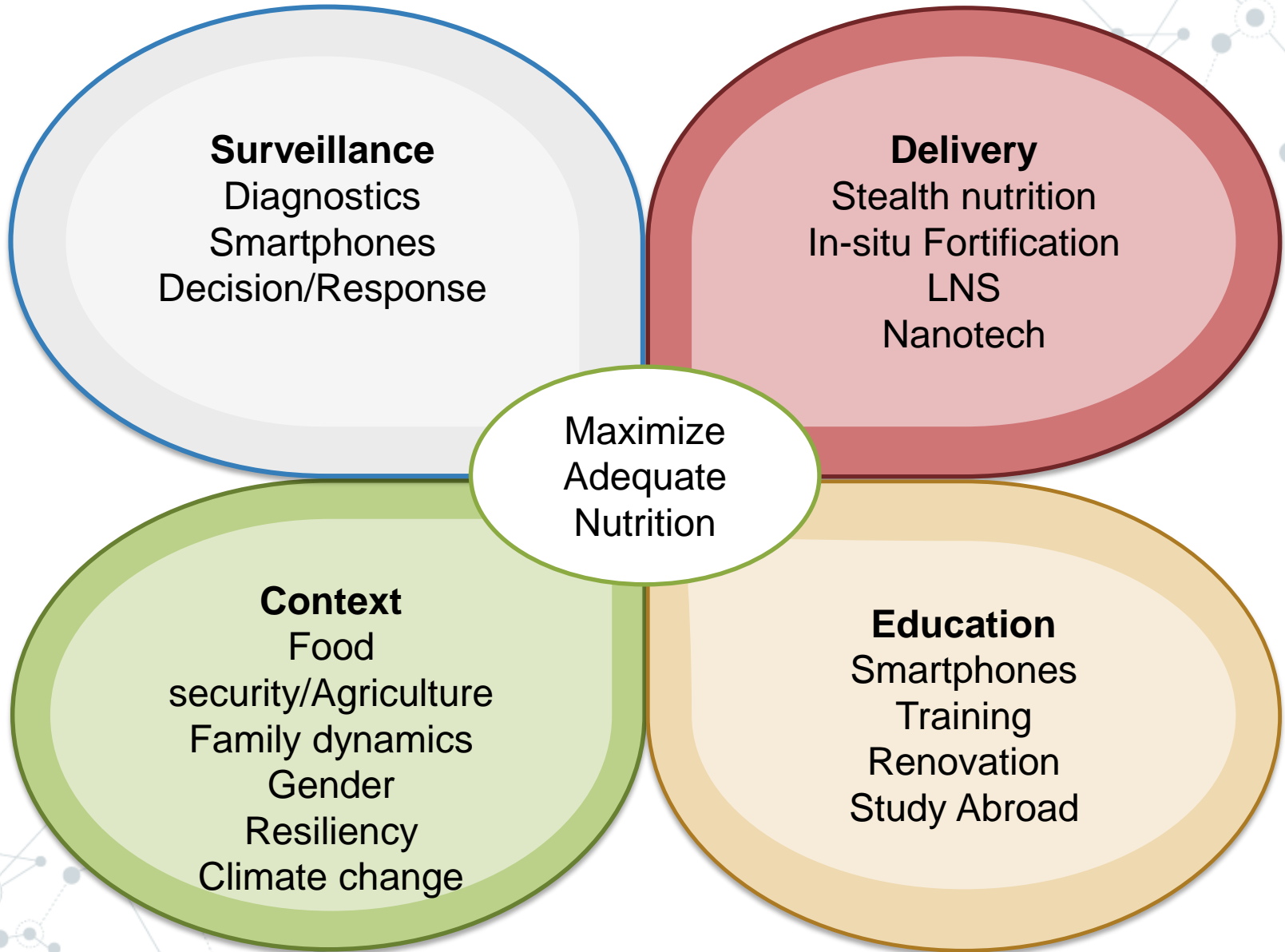


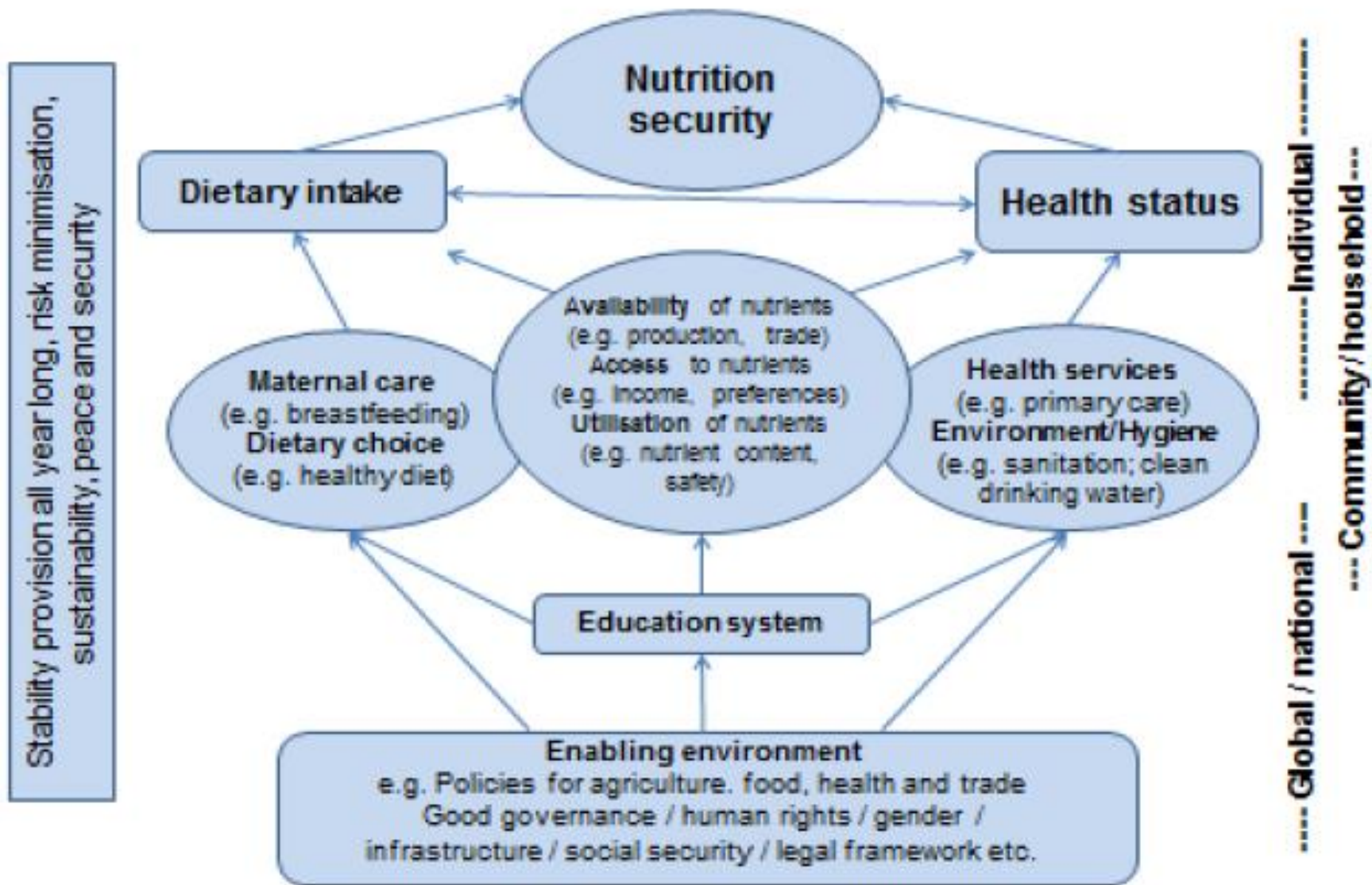


So, What is the problem?

- ◎ Understand the context
 - Linkages Ag-Nutrition-Health
 - Limited resources
 - Limited communication
 - ◎ Nutrition is not part of national agendas
 - ◎ Data on micronutrient status are absent (beyond hemoglobin) and collection is expensive
- 

Our Mission





Food Security

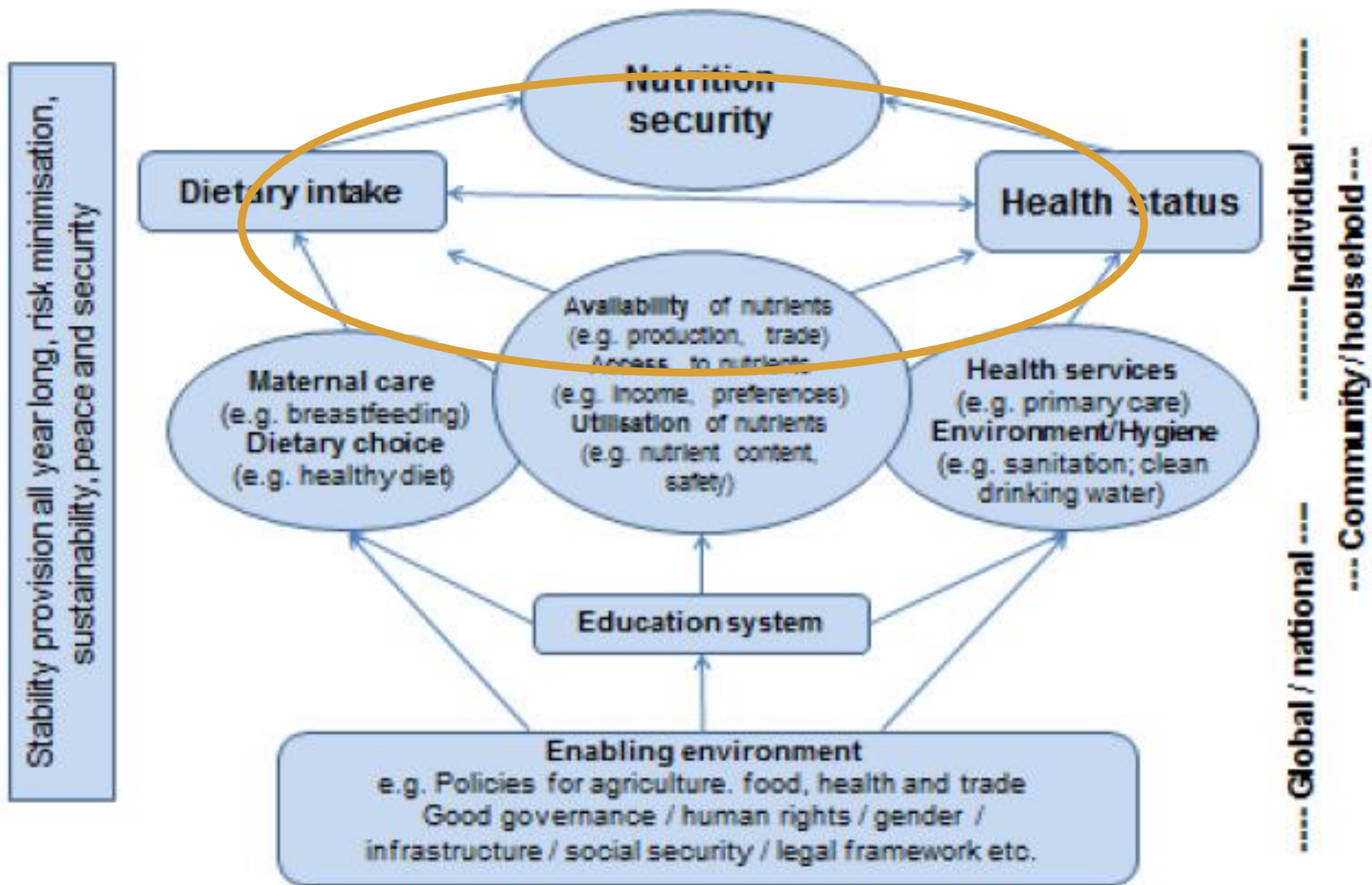
“All people, at all times, have physical, economic and social access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life”

(The World Food Summit 1996)

Nutrition Security

“All people at all times have physical, social and economic access to food, which is safe and consumed in sufficient quantity and **quality** to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life”

(Committee on World Food Security, 2012)





Lack of quality data

To assess progress, Identify
actions, Improve
accountability



Global Targets 2025

2012 World Health Assembly







**IT'S HARD TO MEET NUTRITION
GOALS IF YOU DON'T HAVE
DATA ON NUTRITION**

49%

of countries do not have enough data to
assess if they are on course/off course of
global targets





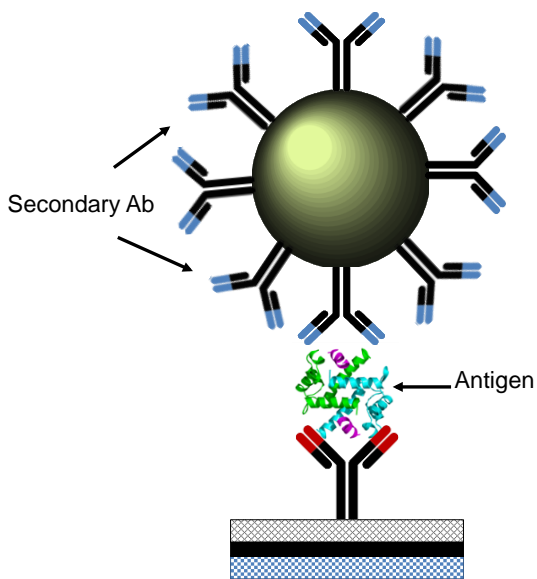
4 of these indicators require
very simple measurements
(height and weight)

**We decided to focus on
micronutrient status**

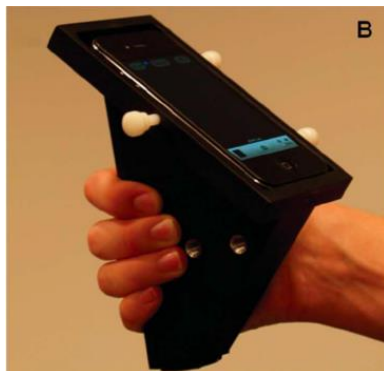


Optical Biosensor for assessment of micronutrient status and Support evidence-based nutrition

Immunofunctionalized Iron oxide nanoparticle (ION)



Peterson et. al., 2014



Gallegos et. al., 2013



Anemia



ACTIONS & IMPACT



Scientific
Decision
multi-criteria



Summary

- ◎ **Food and Nutrition security should be at the top of our agendas**
- ◎ We need solutions that bridge the incredible potential from interdisciplinary research: engineering, nutrition, food science, economics, ag. sci., extension, social work, community development, natural resources, and informatics
- ◎ Advances in diagnostic technologies should provide the critical data to assess progress, identify actions, improve accountability



Thank you!

Opportunity is missed by most people because it is dressed in overalls and looks like work.

-Thomas A. Edison

So, let's start to work!

