

# Food Security & Nutrition

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## Challenges & Opportunities for World Health

Future of Food Webinar  
October 2014



## Future of Food Archived Webinars

1. Hungry and Overweight: How is it Possible?
2. Contributors and Effects of Food Insecurity: Nutrition and Beyond
3. School Meals and Community Partnerships: Creative Solutions against Food Insecurity
4. Point A to Point B: Improving Access to Healthy Foods in Food Banks
5. A Flavorful Pairing: Nutrition Education in Food Banks
6. Ready, Set, Go: Preparing and Delivering Effective Nutrition Education for Audiences Facing Food Insecurity
7. Making an Impact with Food Insecure Populations
8. Successful Synergies
9. U.S. Farming 101: Part 1
10. U.S. Farming 101: Part 2

# Academy Position Statement <sup>1</sup>

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“It is the position of the Academy of Nutrition and Dietetics that all people should have consistent access to an appropriately nutritious diet of food and water, coupled with a sanitary environment, adequate health services, and care that ensure a healthy and active life for all household members. The Academy supports policies, systems, programs, and practices that work with developing nations to achieve nutrition security and self-sufficiency while being environmentally and economically sustainable.”

**J Acad Nutr Diet. 2013;113:581-595**

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## Learning Objectives

- Identify at least two missing macro- or micro-nutrients in the diets of developing countries
- Explain the challenges and opportunities in nutritiously feeding a growing world population
- Describe at least one successful and promising intervention for improving global health and food security



# Today's Speakers



## **Amie N. Heap RD, MPH**

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## **Stacia Nordin, RD**

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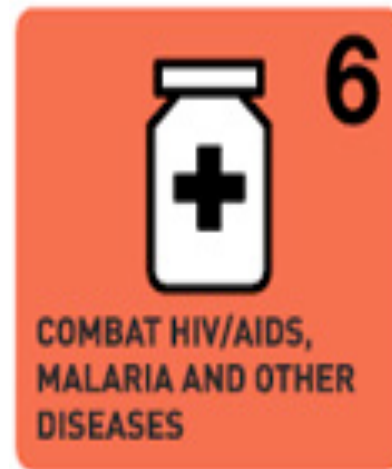
**Amie N. Heap RD, MPH**

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# Millennium Development Goals – 2015 <sup>2</sup>



# State of Global Health <sup>3</sup>

- **Undernutrition** is responsible for 3 million deaths –45%--of children under 5 each year.
- In 2011 there were 165 million children under 5 with **stunted growth**.
- **Suboptimal breastfeeding** results in more than 800,000 child deaths annually.
- Fetal growth restriction causes 12% of annual **neonatal deaths**.

*The Lancet – June 2013*

# Global Nutrition Status <sup>4-5</sup>

Area	Kcal/kg/d	%CHO	%Pro	%Fat
World	2780	63%	11%	26%
Developed countries	3420	53%	12%	34%
Developing countries	2630	67%	11%	23%
Sub-Saharan Africa	2240	72%	10%	19%
Central Asia	1820	75%	11%	26%

Area	Grams pro/person/d
World	77
Developed countries	103
Developing countries	70
Sub-Saharan Africa	55

FAO Statistics Division 2010, Food Balance Sheets, Food and Agriculture Organization of the United Nations

## Animal source contributions to the diet <sup>5-6</sup>

- Personal, cultural, religious, and access are reasons that animal source foods in the diet may be limited or prohibited.
- Small amounts of animal source foods can improve the nutritional status of low-income households.
- Meat, milk and eggs provide a variety of bio-available amino acids and nutrients such as iron, zinc, vitamin A, vitamin B12 and calcium in which many malnourished people are deficient.
- International guidelines suggest that the safe level of protein consumption is about 58 g per adult per day.
  - Standards do not differentiate between plant and animal sources.

# Micronutrients Deficiency Conditions and Their Worldwide Prevalence <sup>7</sup>

Micronutrient	Deficiency Prevalence	Major Deficiency Disorders
Iodine	2 billion at risk	Goiter, hypothyroidism, iodine deficiency disorders, increased risk of stillbirth, birth defects infant mortality, cognitive impairment
Iron	2 billion	Iron deficiency, anemia, reduced learning and work capacity, increased maternal and infant mortality, low birth weight
Zinc	Estimated high in developing countries	Poor pregnancy outcome, impaired growth (stunting), genetic disorders, decreased resistance to infectious diseases
Vitamin A	254 million preschool children	Night blindness, xerophthalmia, increased risk of mortality in children and pregnant women
Folate (Vitamin B6)	Insufficient data	Megaloblastic anemia, neural tube and other birth defects, heart disease, stroke, impaired cognitive function, depression
Cobolamine (Vitamin B12)	Insufficient data	Megaloblastic anemia (associated with Helicobacter pylori induced gastric atrophy

Adapted from Allen L et al.: Table 1.2 pp 6-10.2



## Micronutrients Deficiency Conditions and Their Worldwide Prevalence, cont'd <sup>7</sup>

Micronutrient	Deficiency Prevalence	Major Deficiency Disorders
Thiamine (Vitamin B1)	Insufficient data, estimated as common in developing countries and in famines, displaced persons	Beriberi (cardiac and neurologic), Wernicke and Korsakov syndromes (alcoholic confusion and paralysis)
Riboflavin (Vitamin B2)	Insufficient data, est. to be common in developing countries	Non specific – fatigue, eye changes, dermatitis, brain dysfunction, impaired iron absorption
Niacin (Vitamin B3)	Insufficient data, estimated as common in developing countries and in famines, displaced persons	Pellagra (dermatitis, diarrhea, dementia, death)
Vitamin B6	Insufficient data, estimated as common in developing countries and in famines, displaced persons	Dermatitis, neurological disorders, convulsions, anemia, elevated plasma homocysteine

Adapted from Allen L et al.: Table 1.2 pp 6-10.2

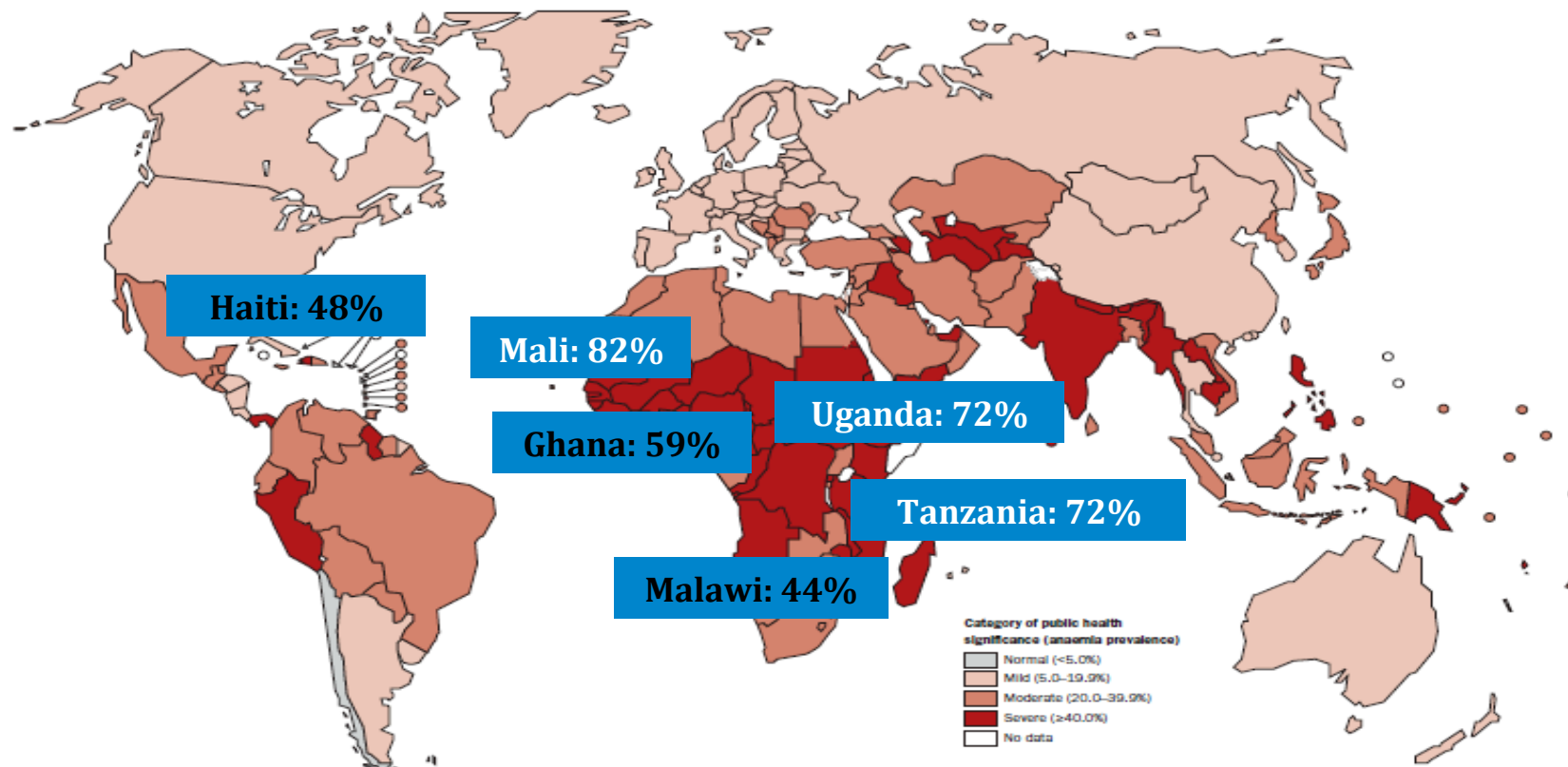


## Micronutrients Deficiency Conditions and Their Worldwide Prevalence, cont'd <sup>7</sup>

Micronutrient	Deficiency Prevalence	Major Deficiency Disorders
Vitamin C	Common in famines, displaced persons	Scurvy (fatigue, hemorrhages, low resistance to infection, anemia)
Vitamin D	Widespread in all age groups, low exposure to ultra violet rays of sun	Rickets, osteomalacia, osteoporosis, colo rectal cancer
Calcium	Insufficient data, estimated to be widespread	Decreased bone mineralization, rickets, osteoporosis
Selenium	Insufficient data, common in Asia, Scandinavia, Siberia	Cardiomyopathy, increased cancer and cardiovascular risk
Fluoride	Widespread	Increased dental decay, affects bone health

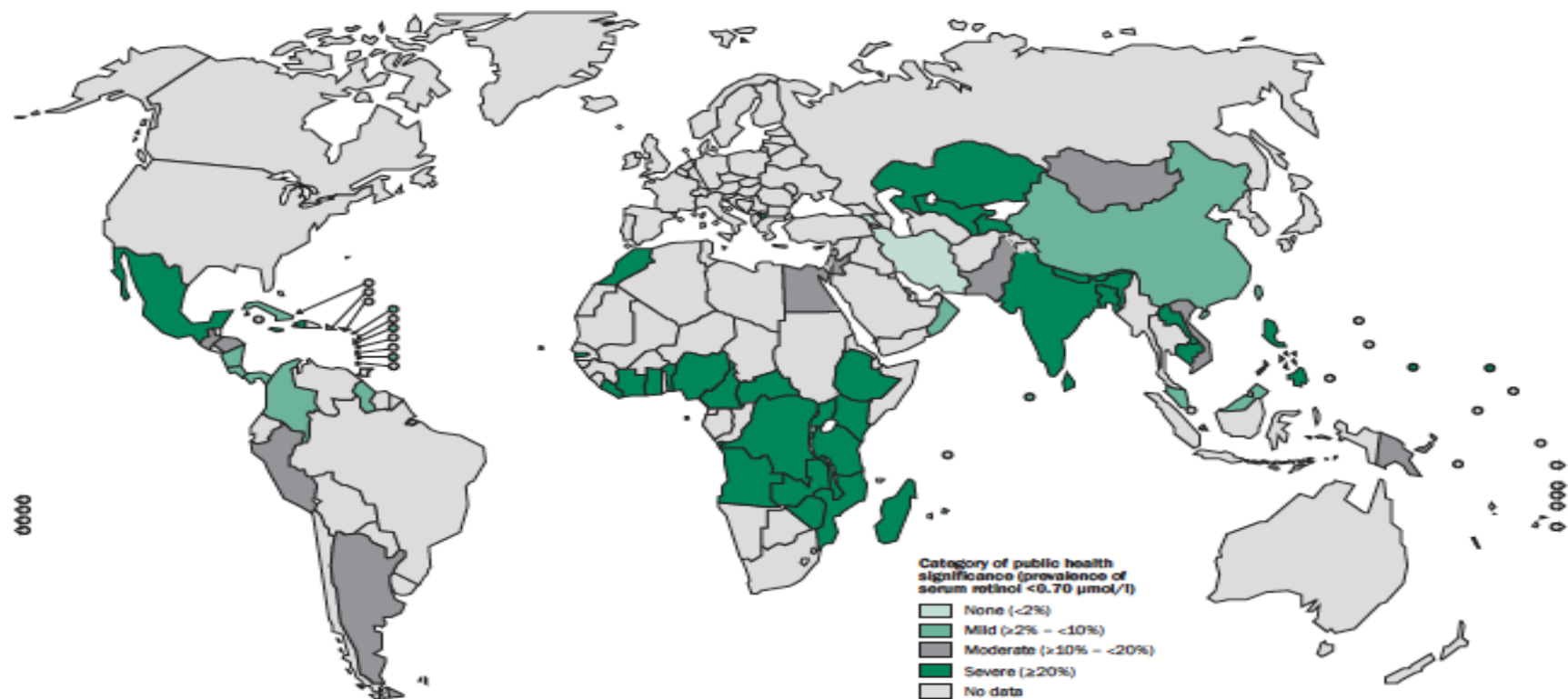
# Global Burden of Anemia in Women and Children <sup>8</sup>

**30%** of women and **47%** of children suffer from anemia.



# Global Burden of Vitamin A Deficiency In Children<sup>8</sup>

Countries and areas with survey data: Preschool-age children



# Infectious and Chronic Disease <sup>9</sup>

**35 million** people are living with HIV and AIDS

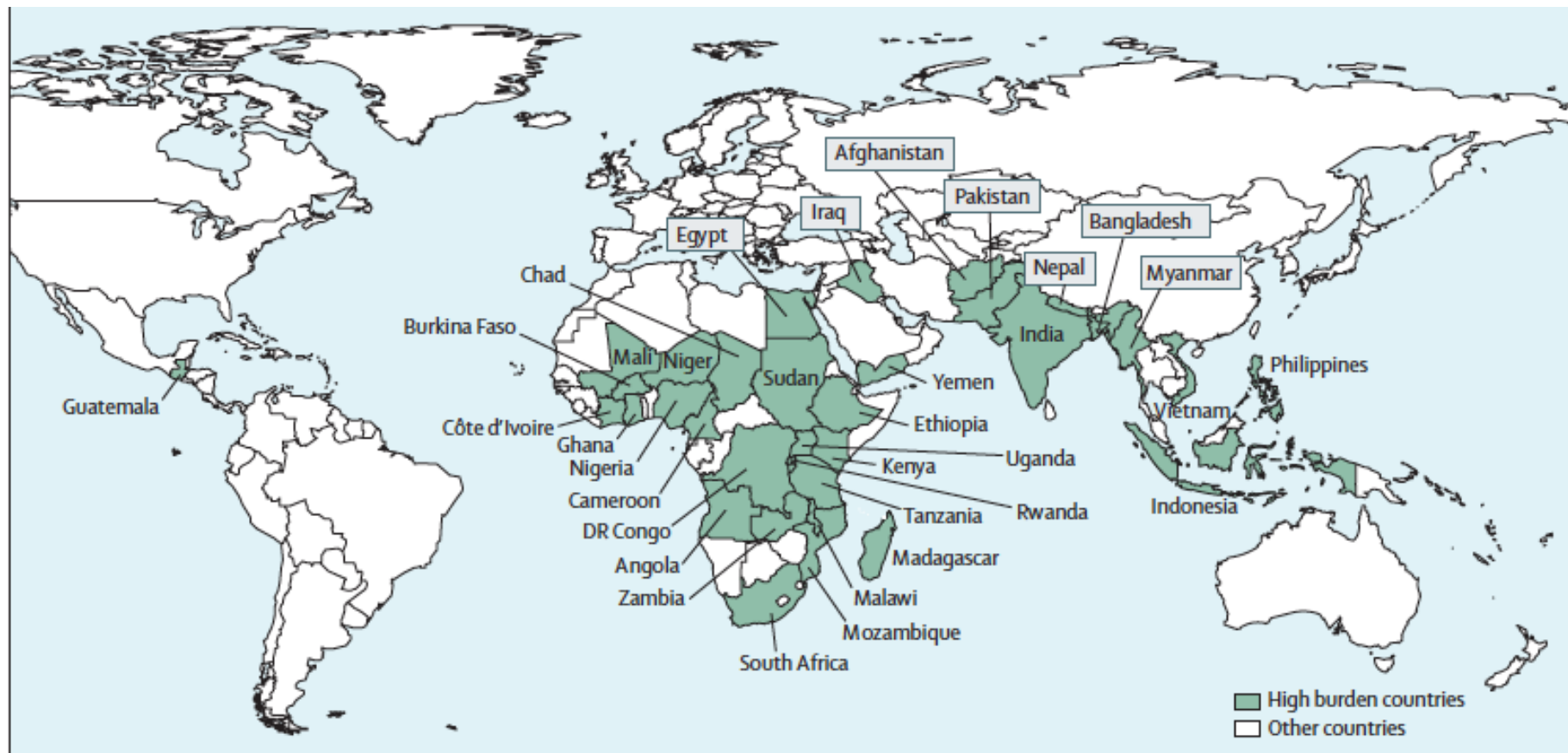


Deaths from NCDs rose by **8 million** in the past two decades



# Understanding the Context <sup>10</sup>

**34 countries** bear **90%** of the global burden of undernutrition



# Changing health concerns <sup>10</sup>

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- The proportion of overall disease burden attributable to childhood underweight remains the 8th risk worldwide.
- High body-mass index has increased globally to become the 6th risk worldwide.
- High blood pressure, high BMI and high fasting blood glucose have all increased significantly in terms of their impact on global health between 1990 and 2010.
- Deaths from NCDs rose by about 8 million between 1990 and 2010, accounting for two of every three deaths (34.5 million) worldwide by 2010

- A **shift in dietary consumption** and energy expenditure.
- Coincides with **economic, demographic and epidemiologic changes**.
- Contributes to **improved food security**, variety, gradual elimination of dietary deficiencies and overall nutrition status.
- Also contributes to the **dual burden of disease** which is a developmental challenge of epic proportion. This is an emerging health challenge that exists predominately in low to middle income countries.

# Global DALYS – 1990-2010

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	Cause	Rank	2010	Rank	1990
			DALYs (95% UI) <i>in thousands</i>		DALYs (95% UI) <i>in thousands</i>
Nutrition related	Ischemic heart disease	1	129,795 (119,218–137,398)	4	100,455 (96,669–108,702)
	Lower respiratory tract infections	2	115,227 (102,255–126,972)	1	206,461 (183,354–222,979)
	Stroke	3	102,239 (90,472–108,003)	5	86,012 (81,033–94,802)
	Diarrhea	4	89,524 (77,595–99,193)	2	183,543 (168,791–197,655)
	HIV–AIDS	5	81,549 (74,698–88,371)	33	18,118 (14,996–22,269)
	Malaria	6	82,689 (63,465–109,846)	7	69,141 (54,547–85,589)
	Low back pain	7	80,667 (56,066–108,723)	12	56,384 (38,773–76,233)
	Preterm birth complications	8	76,980 (66,210–88,132)	3	105,965 (88,144–120,894)
	Chronic obstructive pulmonary disease	9	76,779 (66,000–89,147)	6	78,298 (70,407–86,849)
	Road-traffic injury	10	75,487 (61,555–94,777)	11	56,651 (49,633–68,046)
	Major depressive disorder	11	63,239 (47,894–80,784)	15	46,177 (34,524–58,436)
	Neonatal encephalopathy*	12	50,163 (40,351–59,810)	10	60,604 (50,209–74,826)
	Tuberculosis	13	49,399 (40,027–56,009)	8	61,256 (55,465–71,083)
	Diabetes mellitus	14	46,857 (40,212–55,252)	21	27,719 (23,668–32,925)
	Iron-deficiency anemia	15	45,350 (31,046–64,616)	14	46,803 (32,604–66,097)
	Sepsis and other infectious disorders in newborns	16	44,236 (27,349–72,418)	17	46,029 (25,147–70,357)
	Congenital anomalies	17	38,890 (31,891–45,739)	13	54,245 (45,491–69,057)
	Self-harm	18	36,655 (26,894–44,652)	19	29,605 (23,039–37,333)
	Falls	19	35,406 (28,583–44,052)	22	25,900 (21,252–31,656)
	Protein-energy malnutrition	20	34,874 (27,957–41,662)	9	60,542 (50,378–71,639)
	Neck pain	21	32,651 (22,783–44,857)	25	23,107 (16,031–31,890)
	Cancer of the trachea, bronchus, or lung	22	32,405 (24,401–38,327)	24	23,850 (18,839–29,837)
	Other musculoskeletal disorders	23	30,877 (25,858–34,650)	29	20,596 (17,025–23,262)
	Cirrhosis of the liver	24	31,026 (25,951–34,629)	23	24,325 (20,653–27,184)
	Meningitis	25	29,407 (25,578–33,442)	18	37,822 (33,817–44,962)
Food Security & Nutrition					



# Post-2015 Nutrition Targets <sup>12</sup>



40% REDUCTION IN THE  
NUMBER OF CHILDREN  
UNDER-5 WHO ARE STUNTED



NO INCREASE IN  
CHILDHOOD OVERWEIGHT



50% REDUCTION  
OF ANAEMIA IN WOMEN OF  
REPRODUCTIVE AGE



INCREASE THE RATE  
OF EXCLUSIVE BREASTFEEDING  
IN THE FIRST 6 MONTHS UP TO  
AT LEAST 50%



30% REDUCTION IN  
LOW BIRTH WEIGHT

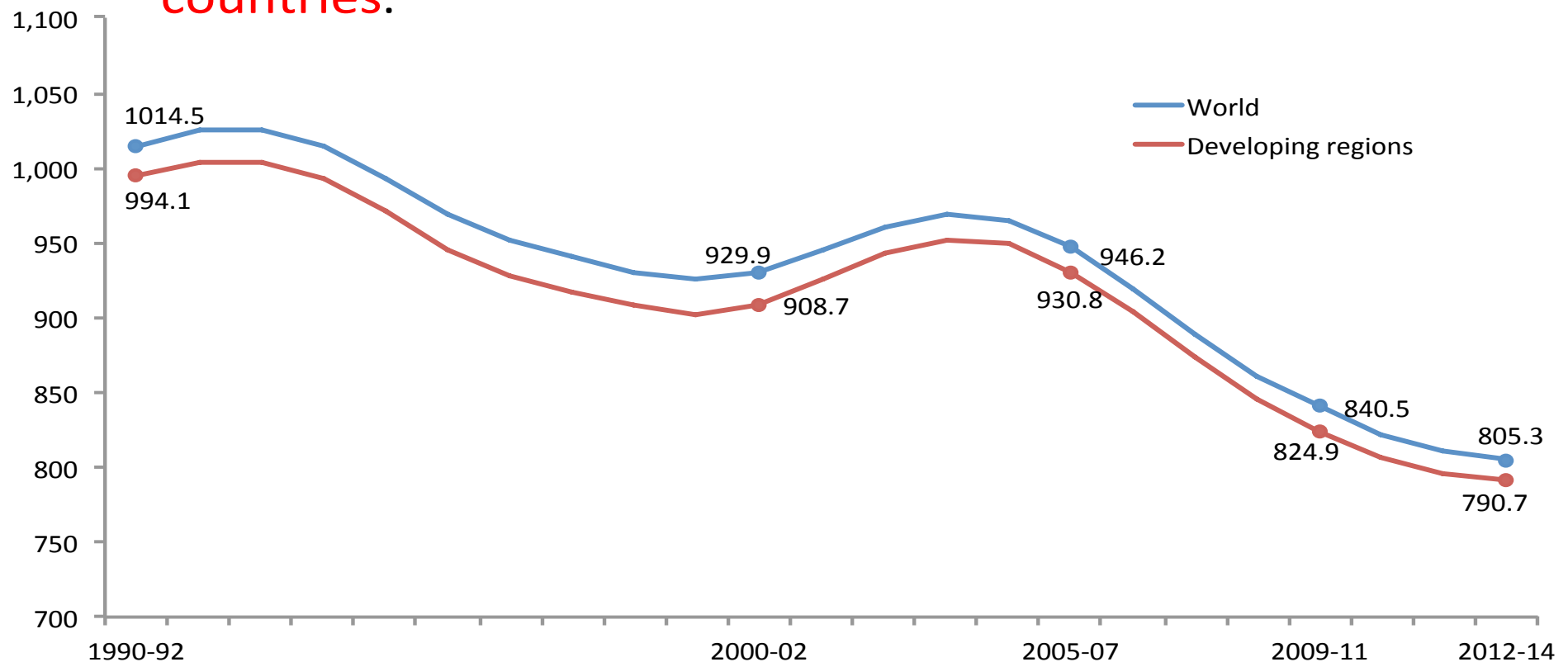


REDUCE AND MAINTAIN  
CHILDHOOD WASTING  
TO LESS THAN 5%

**GLOBAL**  
*To improve maternal, infant  
and young child nutrition*  
**TARGETS**

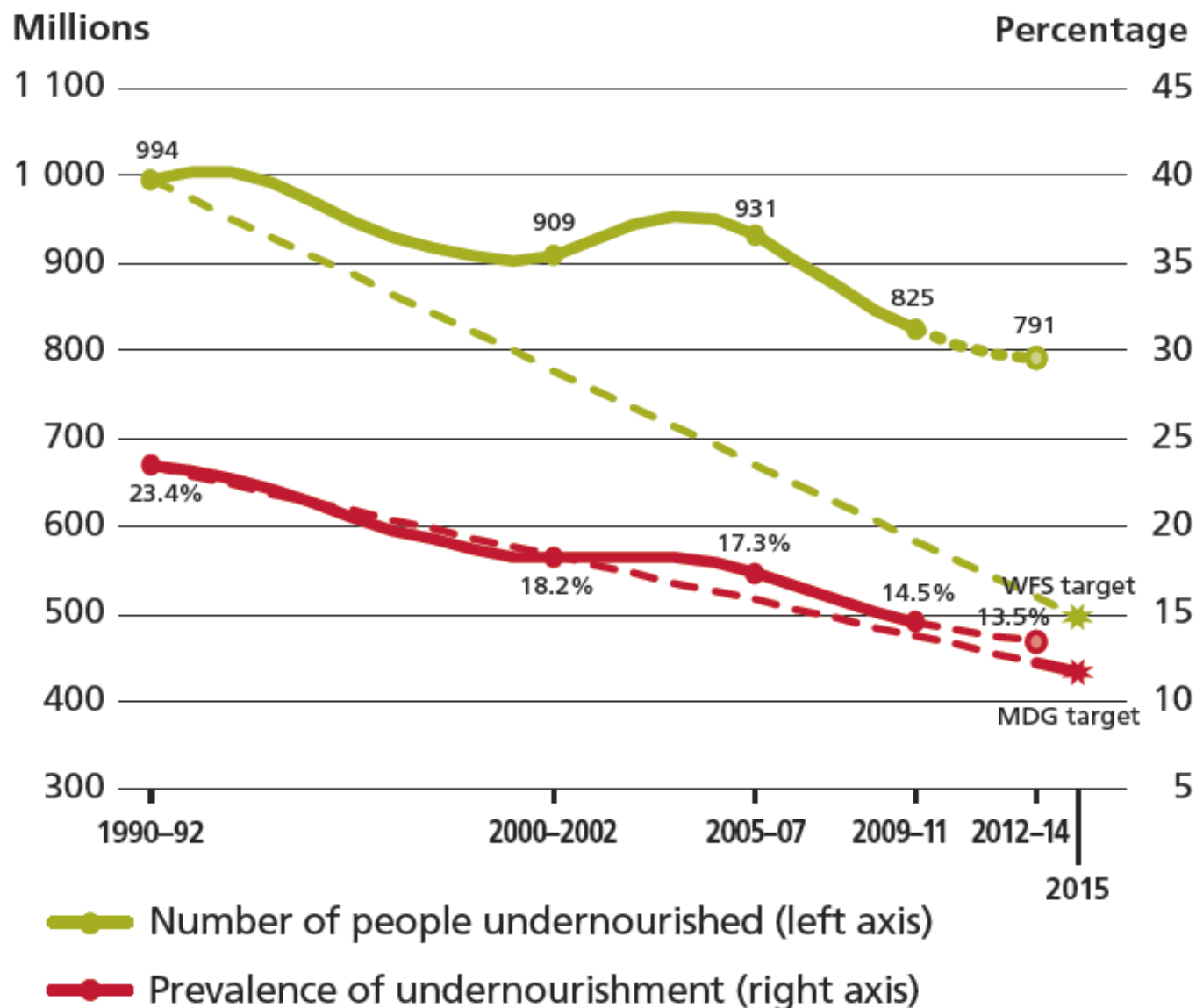
# Undernourishment around the world <sup>13</sup>

- **805 million people** estimated to be suffering from chronic hunger in 2012–14, down 100 million in the last decade.
- The vast majority, **791 million**, live in **developing countries**.

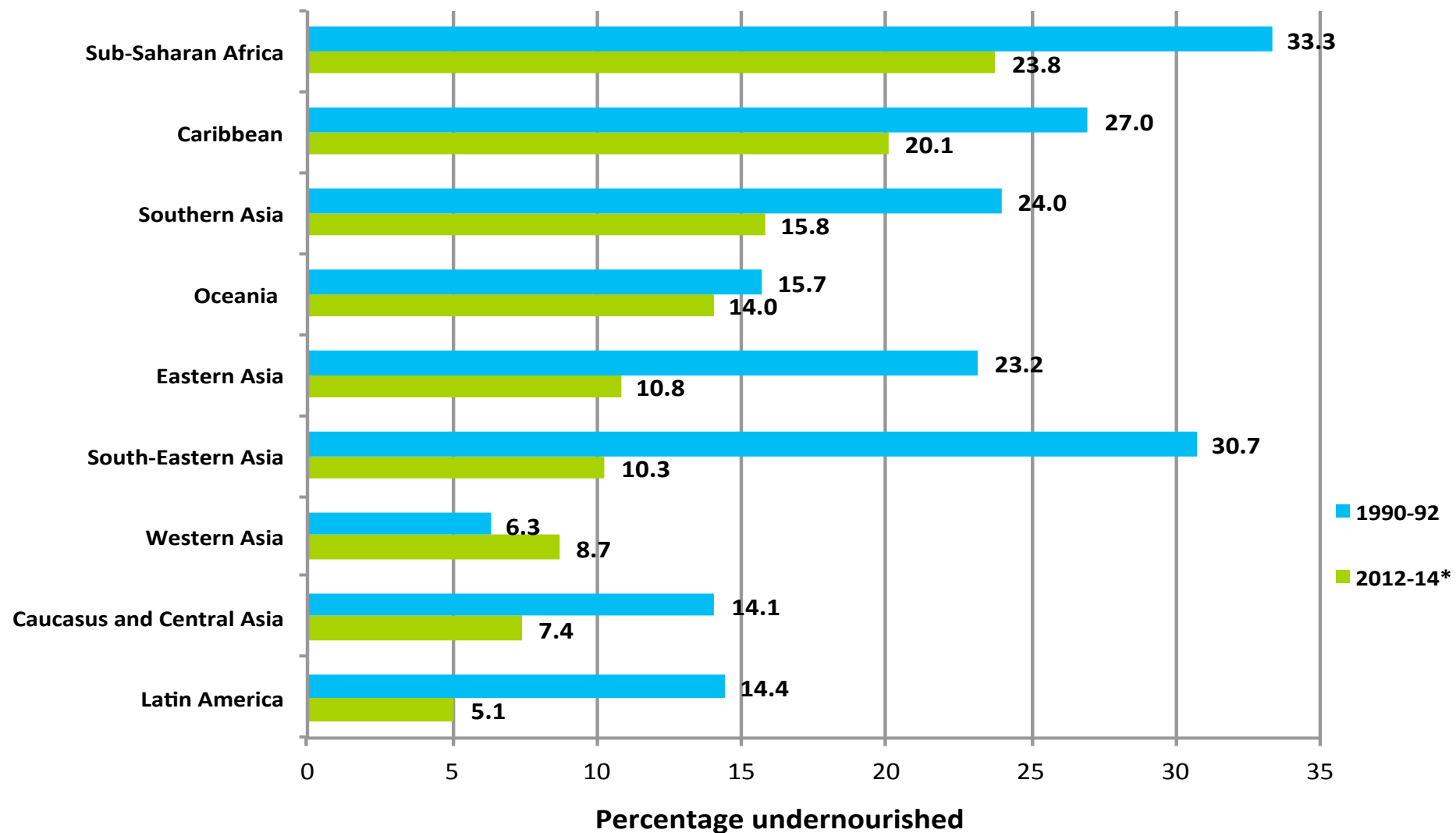


# International hunger targets <sup>13</sup>

- The MDG 1c hunger target can be reached, with additional effort.
- WFS goal out of reach



# Progress in most regions, but uneven<sup>13</sup>



## Part One: Key findings<sup>13</sup>

- About 805 million people chronically undernourished in 2012–14. **Decline of 209 million** since 1990-92, and by 100 million in last decade.
- Majority of hungry live in **developing countries**, where over one in eight, or **13.5 percent** of the population, remain chronically undernourished.
- The MDG 1c hunger target is **within reach**, but large differences across developing regions remain.
  - East Asia, South-East Asia, Latin America and the Caribbean have achieved the MDG hunger target. LAC are on track to reach WFS goal.
  - Insufficient progress in sub-Saharan Africa, South and West Asia.

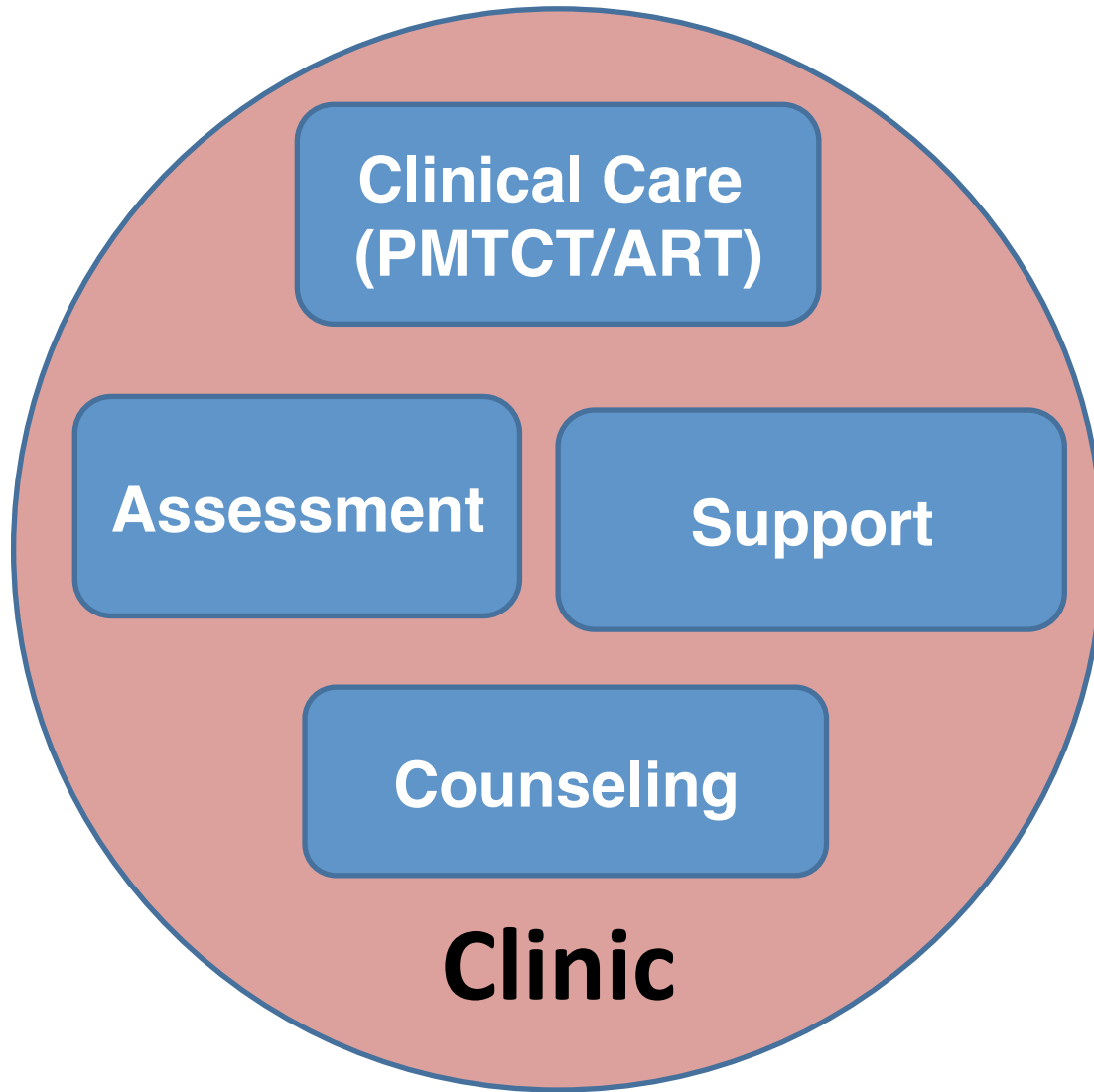
## Part Two: Key findings<sup>13</sup>

- Food **availability** major element of food insecurity in poorer regions, notably sub-Saharan Africa and parts of South Asia.
- **Access** to food has improved quickly in countries showing rapid economic progress, notably East and South-East Asia.
- Access has improved in South Asia and Latin America with **social protection**.
- **Utilization** remains single greatest challenge, despite progress over past two decades.
- **Stability** remains a challenge in regions heavily reliant on international food markets, such as Near East, North Africa and Caribbean.

# Strengthening the enabling environment to improve food security and nutrition<sup>13</sup>

- Sustained political commitment at highest level crucial – legal frameworks can help that all work responsibly.
- Broad participation in policy formulation and implementation necessary to consider all views and empower poor and vulnerable.
- Coherence and integration of policy instruments to ensure complementarities to maximize impacts and benefits.
- Institutional and governance mechanisms promoting cooperation and coordination among ministries and facilitating policy coherence essential.

# NACS Program





“There is a deeply worrying gulf between country needs and global actions. But what is most different—an *extraordinary opportunity* as well as a severe challenge—is the political urgency *of nutrition*. ”

*The Lancet – June 2013*



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# Food Security vs. Nutrition Security<sup>1, 14-16</sup>

**Food Security** = “All people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. The four pillars of food security are **availability, access, utilization, and stability.**”

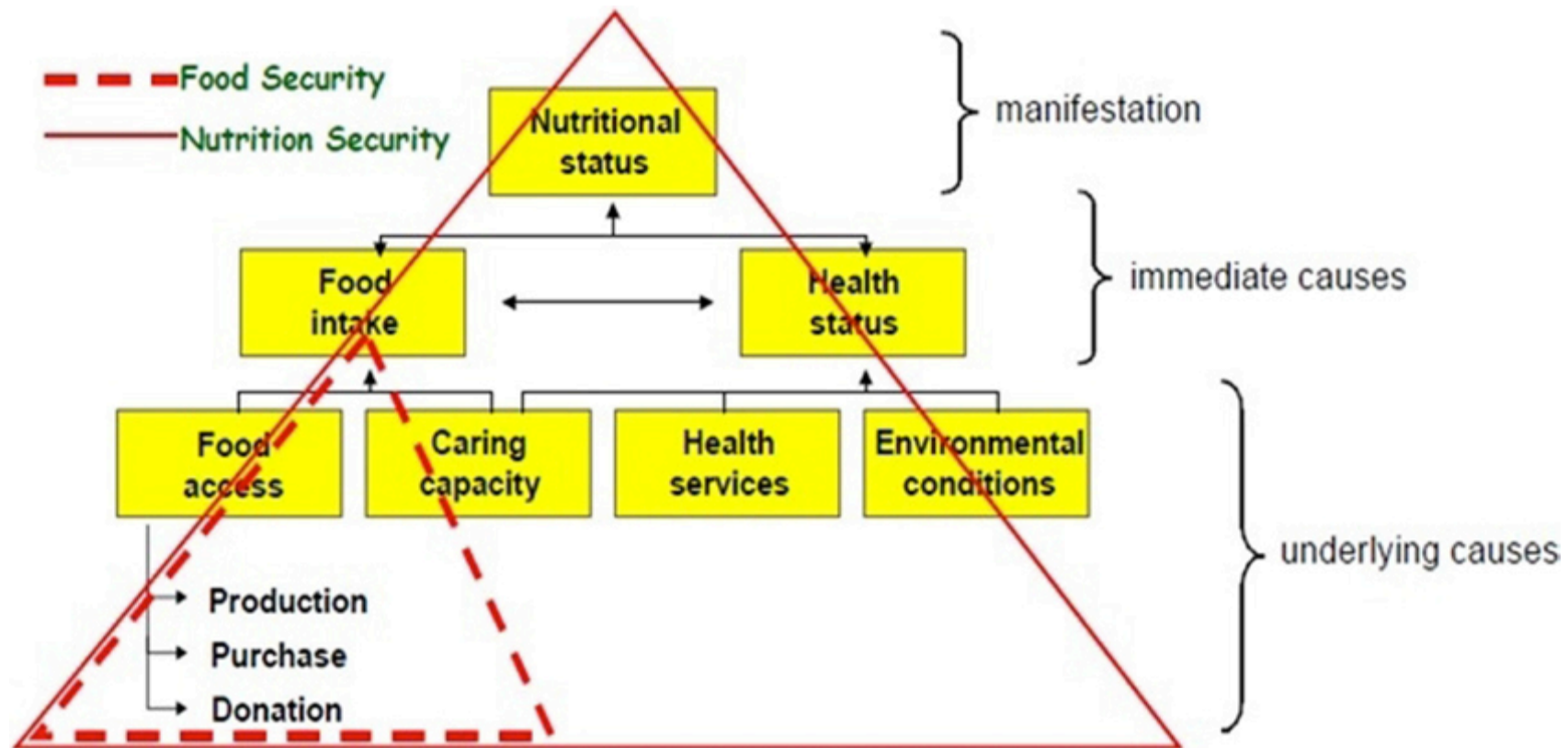
**Nutrition Security** = Food Security + Water + Healthy conditions

## Food Security

*Every food group*

*Every day*

*for an active, healthy life.*



## Factors Contributing to Nutrition Insecurity<sup>17-20</sup>

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# Scaling Up Nutrition (SUN) *movement*<sup>21</sup>

First 1,000 days of life

## Healthy Eating & Living:

### 1. Healthy Diverse Diets

- Parents
- Pregnant & Lactating Women

### 2. Infant Young Child Feeding:

- Exclusive breastfeeding (0 - 6 mo.)
- Complementary feeding (6 - 24 mo.)

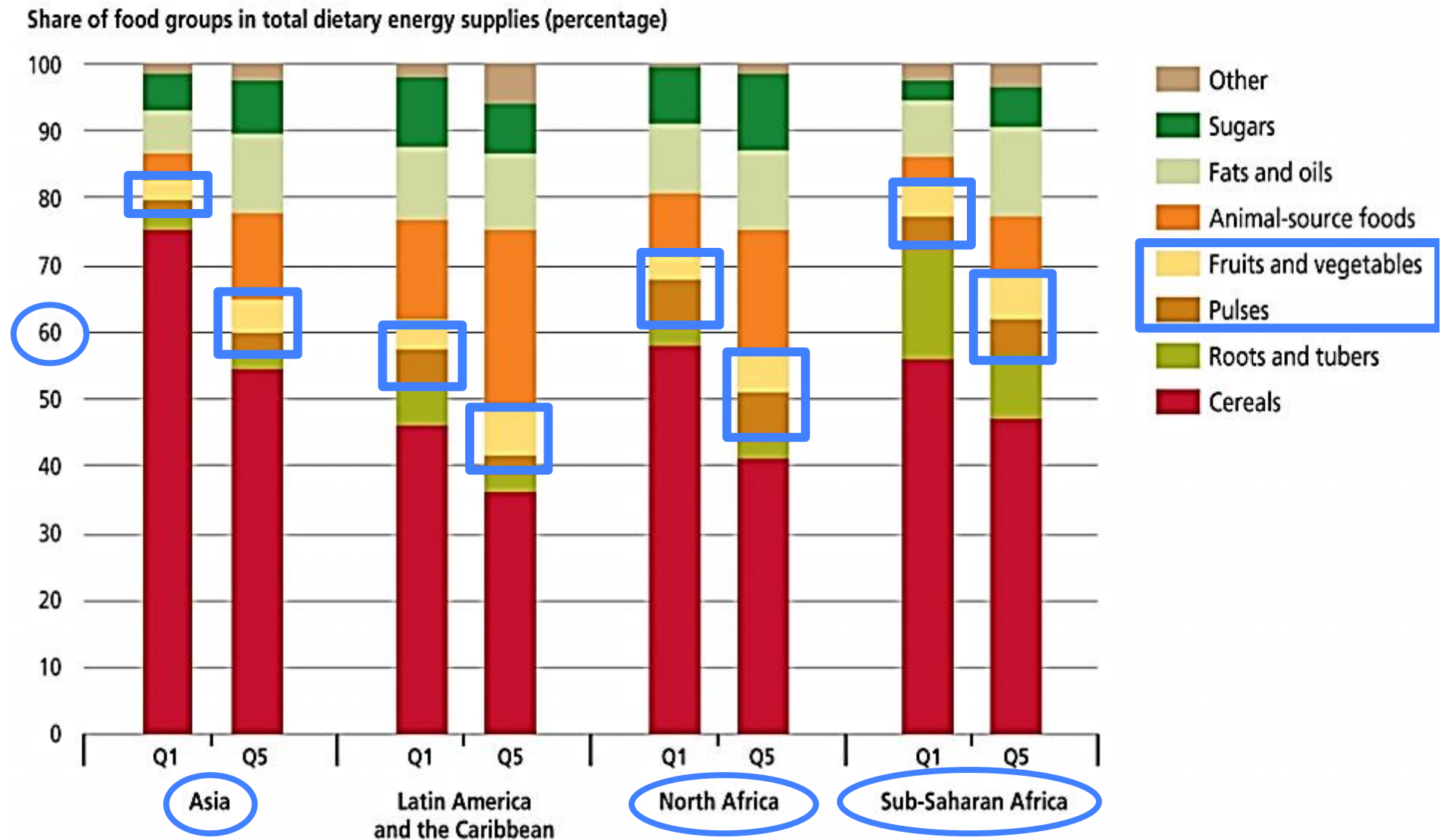
### 3. Water, Hygiene & Sanitation

## Treatments / supplements

*Depending on country's situation:*

4. Vitamin A supplementation
5. Zinc supplementation for diarrhoea
6. Multiple micronutrient powders
7. Deworming
8. Iron & folate supplements
9. Iodised oil capsules
10. Salt iodisation
11. Iron fortification of staple
12. Prevent & treat Undernutrition
13. Treat Severe Acute Malnutrition

## As incomes rises, (Q5) Dietary Diversity increases ... But to what? <sup>22</sup>



Note: Data refer to households of lowest and highest income quintiles in 47 developing countries.

Source: FAO, analysis of household surveys.



## Problem: Mono-Cultures <sup>23</sup>



Problem:  
**Mono-cultures**  
with very few species

- Only 2% of identified edible plants are used for human consumption.
- 3 crops (wheat, rice, and maize) provide more than half of calories globally derived from plants.
- 30 crops provide 95% of calories/protein.

# Successful Examples <sup>1</sup>

Position of the Academy of Nutrition and Dietetics: Nutrition Security in Developing Nations: Sustainable Food, Water, and Health. *JAND*. 2013; 113 (4); 581-595.

[www.eatright.org/About/Content.aspx?id=8358](http://www.eatright.org/About/Content.aspx?id=8358)

<b>Treatment (locally made)</b>	<ul style="list-style-type: none"> <li>• <b>Valid International</b> <a href="http://www.ValidInternational.org">www.ValidInternational.org</a></li> </ul>
<b>Integrated Systems</b>	<ul style="list-style-type: none"> <li>• <b>NeverEndingFood Permaculture</b> <a href="http://www.NeverEndingFood.org">www.NeverEndingFood.org</a></li> </ul>
<b>Food &amp; Water Security</b>	<ul style="list-style-type: none"> <li>• <b>HKI Homestead Food Production Program</b> <a href="http://www.HKI.org">www.HKI.org</a></li> <li>• <b>Educational Concerns for Hunger Organization</b> <a href="http://www.EchoNet.org">www.EchoNet.org</a></li> <li>• <b>Save and Grow</b> <a href="http://www.FAO.org">www.FAO.org</a></li> <li>• <b>USAID Feed the Future</b> <a href="http://www.USAID.gov">www.USAID.gov</a></li> <li>• <b>Ontario Gleaners</b> <a href="http://ontariogleaners.org/1279">http://ontariogleaners.org/1279</a></li> <li>• <b>Urban Harvest</b> <a href="http://www.urbanharvest.co.za">www.urbanharvest.co.za</a></li> </ul>
<b>Information &amp; Financial systems</b>	<ul style="list-style-type: none"> <li>• <b>Food Tank</b> <a href="http://www.FoodTank.org">www.FoodTank.org</a></li> <li>• <b>Microloan foundation</b> <a href="http://www.microloanfoundation.org.uk">www.microloanfoundation.org.uk</a></li> </ul>
<b>Natural Resources</b>	<ul style="list-style-type: none"> <li>• <b>Bioversity International</b> <a href="http://www.bioversityinternational.org">www.bioversityinternational.org</a></li> </ul>



- Delivers scientific evidence, management practices and policy options to use and safeguard agricultural and tree biodiversity to attain sustainable global food and nutrition security
- Holistic approach to link biodiversity, nutrition, & health
- Bio-diversity in the thousands-millions: trees, plants, animals
- For human and environmental health & resilience
- Education for Consumption & Income Generation
- Seed Banks, National Herbarium & Botanical Gardens



## High Diversity = High potential for good Health

- 200 of 600 available foods grown at Never Ending Food in Malawi.
- Teach others about permaculture, Designs for Sustainable Living.
- Systems provide for human needs through sustainable practices (i.e. use of resources, composting toilets and water harvesting).





## Organizations supporting financial systems:

26-27



### Food Tank

Our Vision: Building a global community for safe, healthy, nourished eaters.

Our Values: Educate. Inspire. Advocate. Change.

Our Mission: Food Tank is focused on building a global community for safe, healthy, nourished eaters. We spotlight environmentally, socially, and economically sustainable ways of alleviating hunger, obesity, and poverty and create networks of people, organizations, and content to push for food system change.

### Microloan Foundation



#### Our Vision

Our vision is to help millions of people help themselves out of poverty by providing them with the opportunity to start small, self-sustainable businesses.

In 2013 we disbursed over £4 million of small loans to women in Malawi and Zambia.

Organization supporting food & water security:  
**Bangladesh Homestead Food Production Program**<sup>1, 28</sup>

## **Helen Keller International**

Integrates treatments, nutrition education, gardens & livestock production

- **ESSENTIAL NUTRIITION ACTIONS (ENA)**- Integrated package of cost-effective nutrition actions proven to reduce maternal and child under-nutrition and associated mortality and morbidity.
- **AWARENESS:** 2+ billion people suffer from under-nutrition caused by a lack of basic nutrients in their food. Under-nutrition stunts both physical & mental health.
- **TREATMENT:** Providing low-cost vitamin + mineral supplements to millions of hard-to-reach, deeply vulnerable people.
- **FOOD PRODUCTION & CONSUMPTION:** Encouraging people and communities to make simple changes. Promotes Homestead Food Production to create nutritional self-sufficiency for small communities in Africa and Asia through the establishment of thousands of women-tended gardens.





Organization supporting food & water security:  
**Educational Concerns for Hunger Organization**<sup>1,29</sup>



Academy of Nutrition  
and Dietetics  
**Foundation**  
Future of Food Initiative

Gardens, orchards, development worker training,  
seed bank & multiplication, support



HOME

DONATE

GET INVOLVED

LEARN

RESOURCES

INSIDE ECHO



ECHO exists to reduce hunger and improve the lives of small-scale farmers worldwide. We work to identify, validate, document and disseminate best practices in sustainable agriculture and appropriate technology.

We provide agricultural and appropriate technology training to development workers in more than 165 countries. [Read More](#)

## Organizations supporting food & water security: 1, 30-31

### Feed the Future

US Government Improving  
Nutrition through Agriculture  
Value Chains



### Save & Grow

Agro-Ecology:  
Agriculture that works with  
Ecological processes to  
strengthen the earth and people.





## Organizations supporting food & water security: 1, 32-33

### Ontario Gleaners

Volunteers process donated produce into nutritious soup mixes and/or dried fruit packages for donating to areas in need.



### Urban Harvest

Helps South Africans grow their own food, supporting a healthier, happier and more sustainable way of life for everyone.

Through corporate social investments (CSI) the unique school community food-garden model ensures highly productive gardens & inspiring 'garden champions' that generate food, incomes and skills.





## Organization supporting local treatments: 1,34

## Ready to Use Therapeutic Foods (RUTFs): Fortified spread Fat-Milk-Legume



Thanks to an appropriate management scheme, from being severely malnourished (weight 4.75 kg), this 2-year old girl not only gained 32% more weight in 3 weeks (weight 6.28), but she also gained an appetite for living.

<http://www.who.int/nutrition/topics/malnutrition/en/>



# Knowledge & Skills are Powerful!



## **Mbongozi Primary School**

teachers, students, parents, community members:  
Proud to know, practice and share all the food groups.

# What can you do?

## 1. Start with yourself

- **Observe** Research, study, read, listen: Standing Committee on Nutrition [www.UNSCN.org](http://www.UNSCN.org)
- **Learn** Try, do, implement, apply, diversify everything
- **Share** Write, speak, show, demonstrate, gift

## 2. Join together

*See AND position paper for more ideas*

- AODA
- HEN
- FCP-Agriculture
- NEP
- SNEB
- WPHNA

**No one can do Everything  
But, Everyone can do Something**





## **Food Production & Our Environmental Responsibility**

**Monday, December 8, 2014**  
1-2pm CST

### **Presenters**

Jude Capper, PhD, Livestock Sustainability Consultant  
Carlos Saviani, Vice President Animal Protein, World Wildlife Fund

### **Register**

[www.eatright.org/foundation/kidseatright](http://www.eatright.org/foundation/kidseatright)

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