

Introduction to Human Nutrition

The Nutrients

- Composition of foods
 - Six classes of nutrients
 - Nonnutrients

Body Composition



The Nutrients

- Chemical composition of nutrients
 - Inorganic vs. Organic nutrients

The Nutrients

- Inorganic nutrients
 - Minerals
 - Water

The Nutrients

- Organic nutrients
 - Carbohydrates
 - Lipids
 - Proteins
 - Vitamins

The Nutrients

TABLE 1-1

Elements in the Six Classes of Nutrients

Notice that organic nutrients contain carbon.

	Carbon	Hydrogen	Oxygen	Nitrogen	Minerals
Inorganic nutrients					
Minerals					✓
Water		✓	✓		
Organic nutrients					
Carbohydrates	✓	✓	✓		
Lipids (fats)	✓	✓	✓		
Proteins ^a	✓	✓	✓	✓	
Vitamins ^b	✓	✓	✓		

^aSome proteins also contain the mineral sulfur.

^bSome vitamins contain nitrogen; some contain minerals.

The Nutrients

- Essential nutrients
- Macronutrients vs. micronutrients

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.

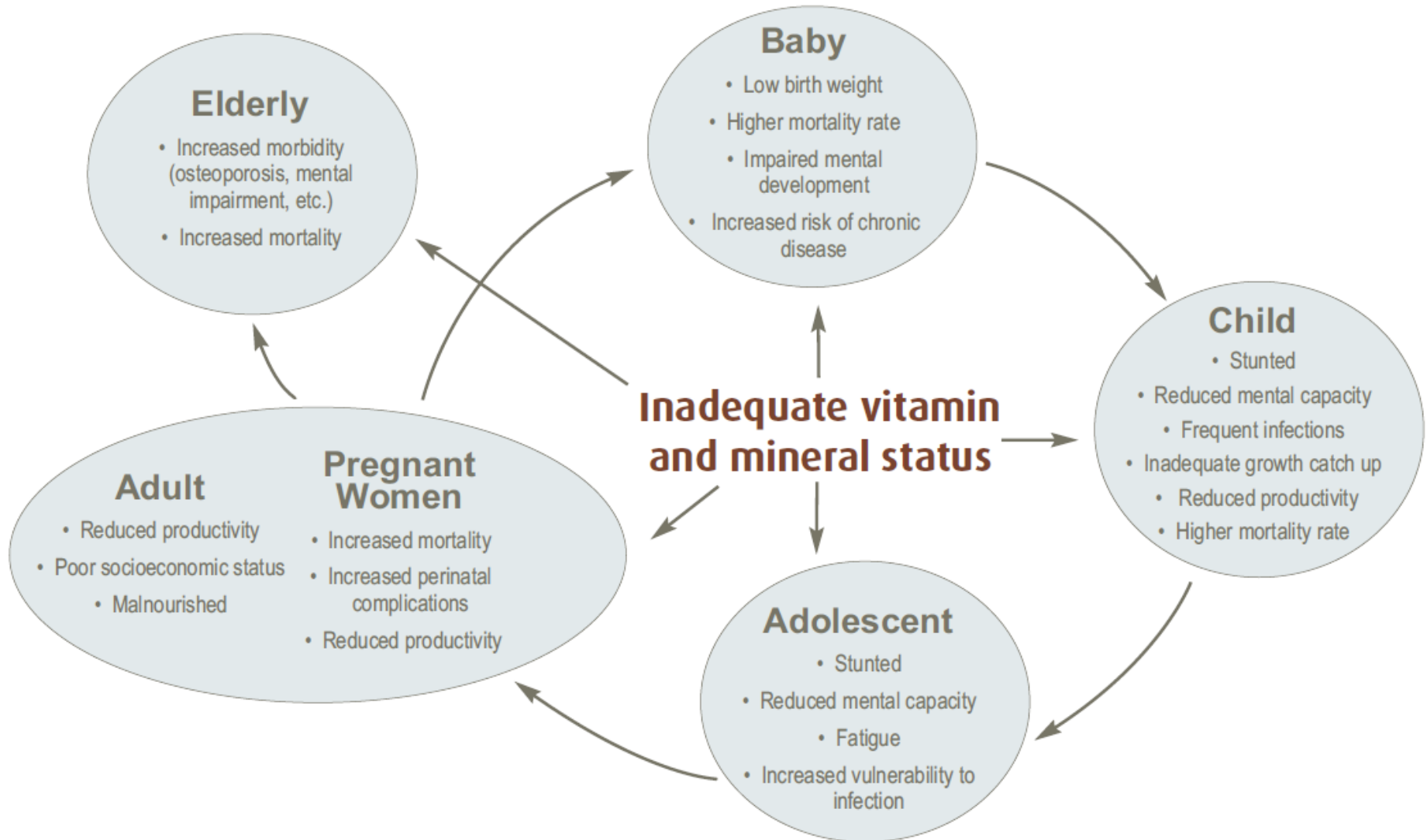
FAO. 2013. Food Systems for better Nutrition.

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

WHO, 2013. Global Nutrition Policy Review: What Does It Take to Scale Up Nutrition Action? WHO, Geneva, Switzerland.

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.

What Works?

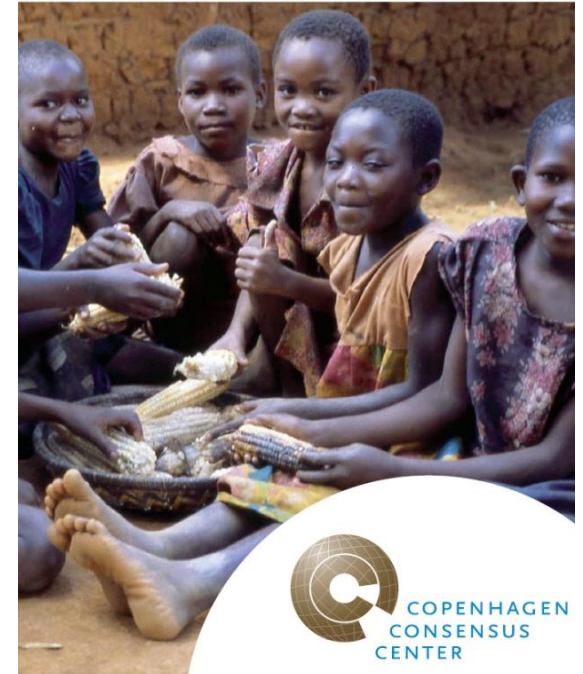
- Supplementation
- Fortification
- Biofortification
- Dietary diversification



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





Nutrition driving the SDGs

The Vicious Cycle

- Poverty
- Ignorance
- Poor nutrition
- Malnutrition
- Infectious disease
- Poor agricultural practices
- Poor health systems
- Others

Traditional/cultural beliefs

- About children
- About pregnancies
- About the rich
- About the bride (to be)
- Food taboos

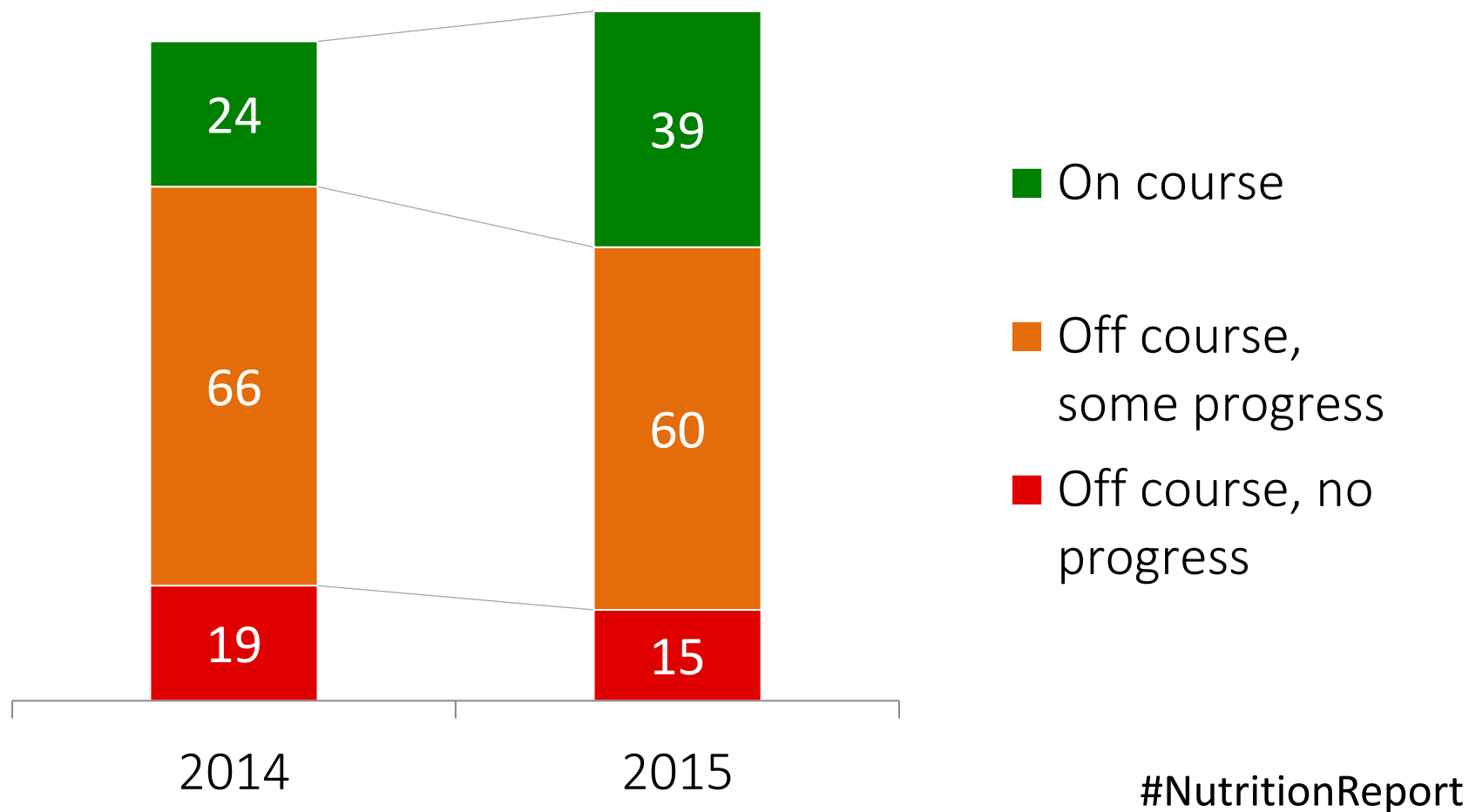
Nutrition and development

- Breastfeeding
- Complimentary feeds
- *Growth monitoring and promotion*
- *Micronutrient supplementation* should include vitamin A for non-pregnant and pregnant women
- *Micronutrient fortification*
- *Supplementary feeding, using external supplies*
- *ORT*
- *Deworming*
- **Special groups: OVCs, IDPS**

- Malnutrition: under and over nutrition- the magnitude
- Assessment of nutritional status

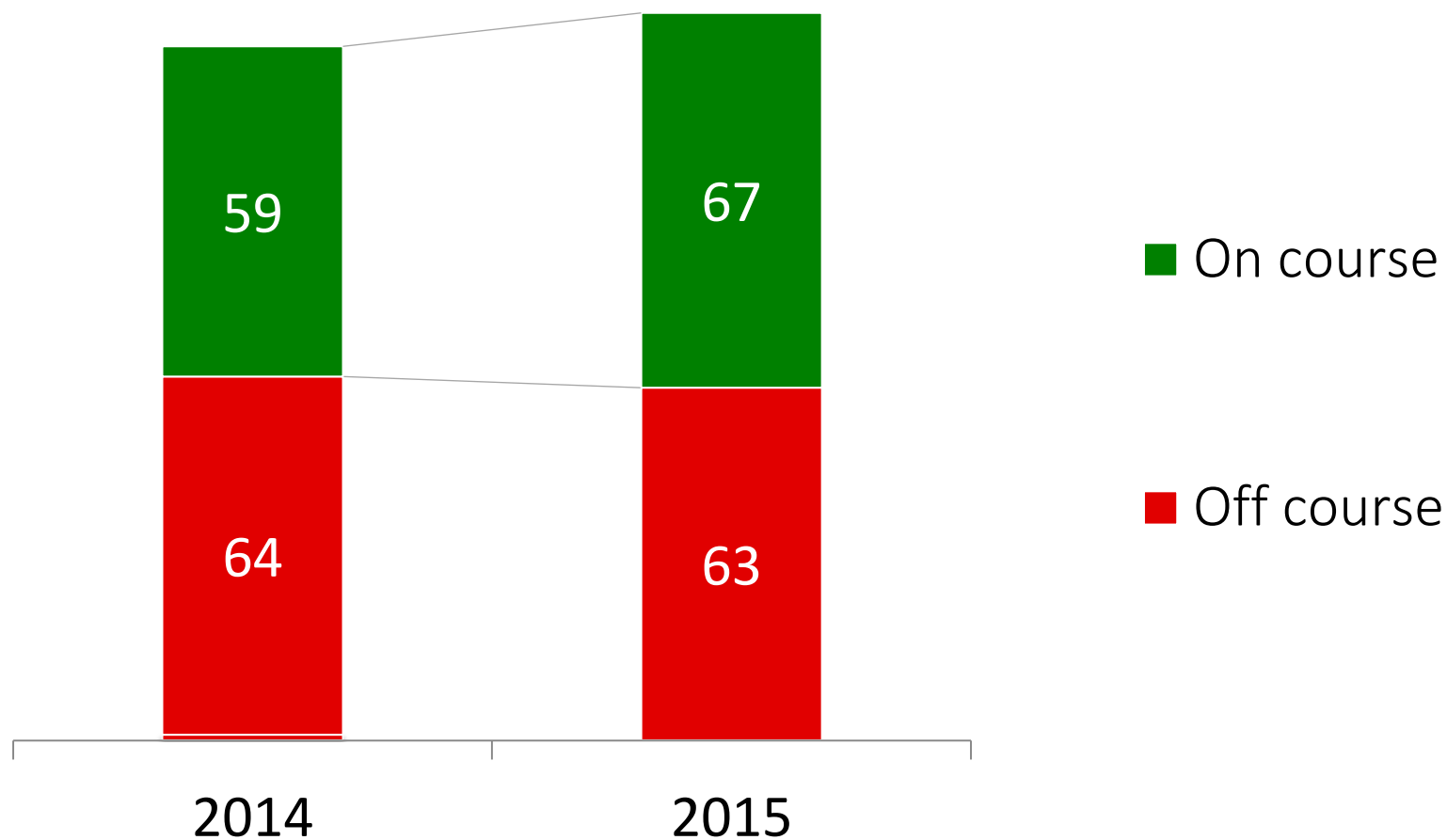
Progress on stunting reduction

Number of countries on course to meet global (WHA) targets



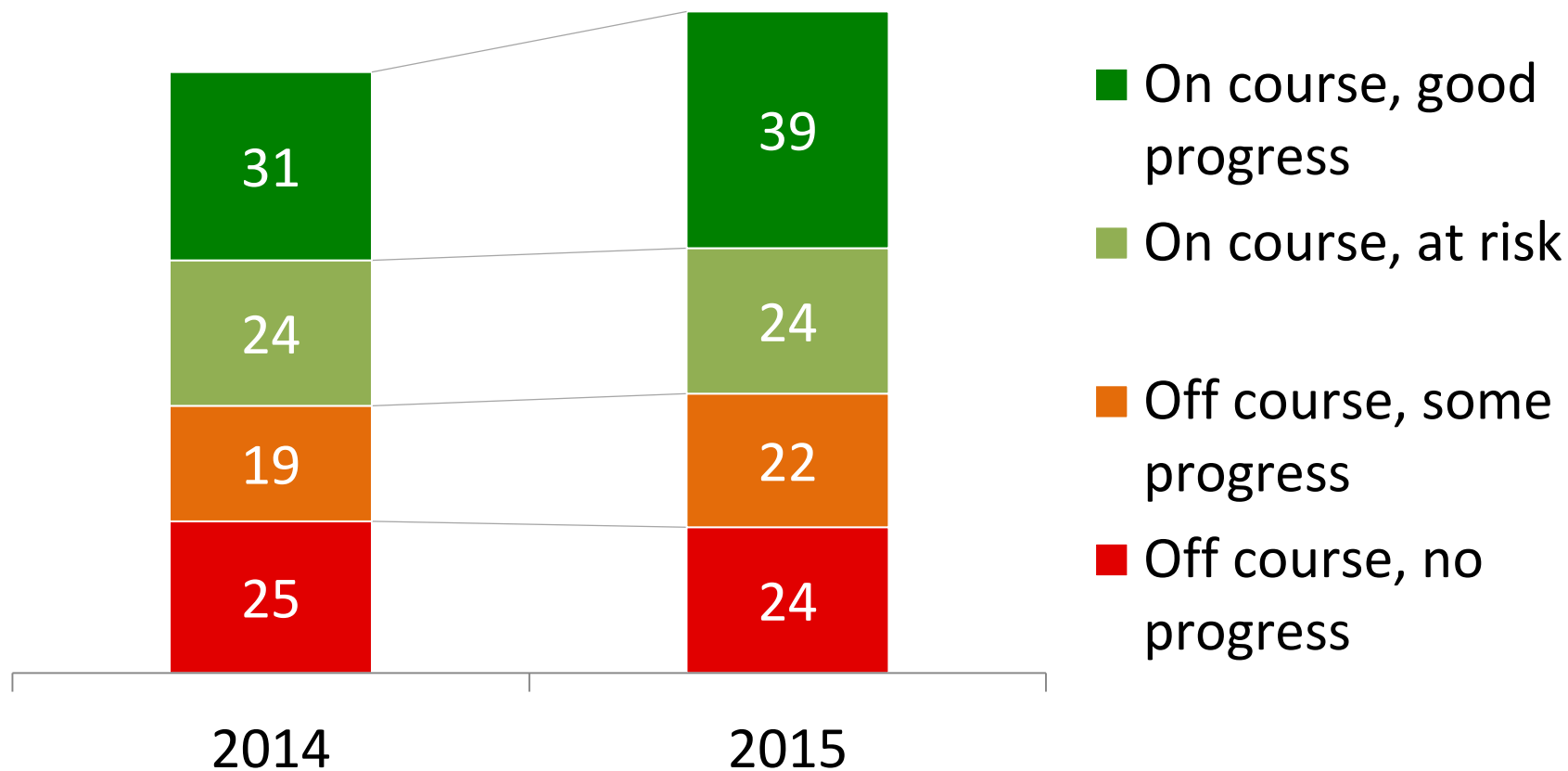
Some progress on wasting reduction

Number of countries on course to meet global (WHA) targets



Some progress on Under 5 overweight reduction

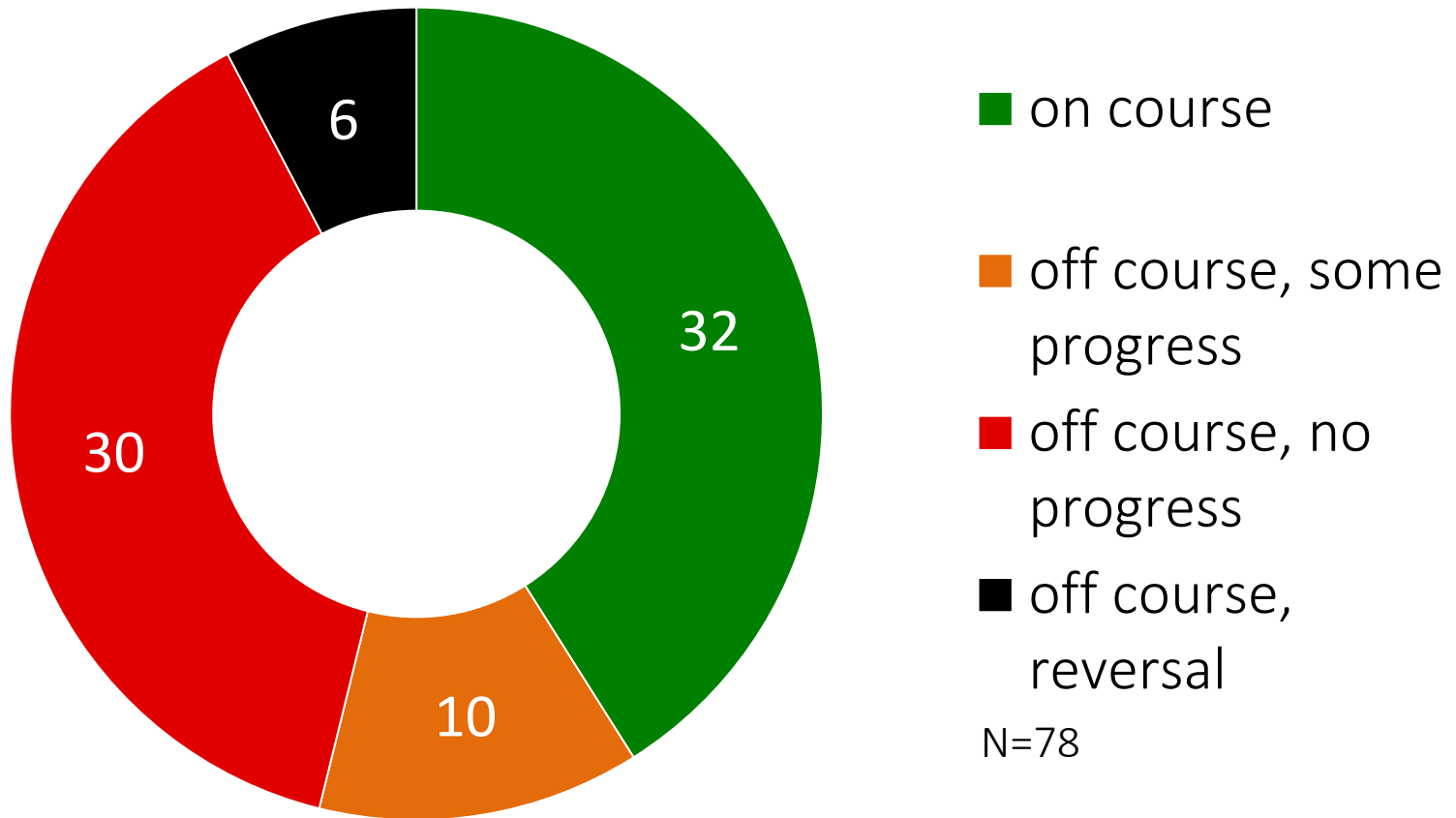
Number of countries on course to meet global (WHA) targets



Exclusive Breastfeeding Rates

Less progress. Not much data. Reversals even.

Number of countries on course to meet global (WHA) targets



Countries experiencing a reversal: Cuba, Egypt, Kyrgyzstan, Mongolia, Nepal and Turkey

But... number of countries that
have reduced
adult obesity rates

ZERO

Number of countries at various stages of progress against global targets on nutrition

Missing data
 Off course, little/no progress
 Off course, some progress
 On course, at risk
 On course



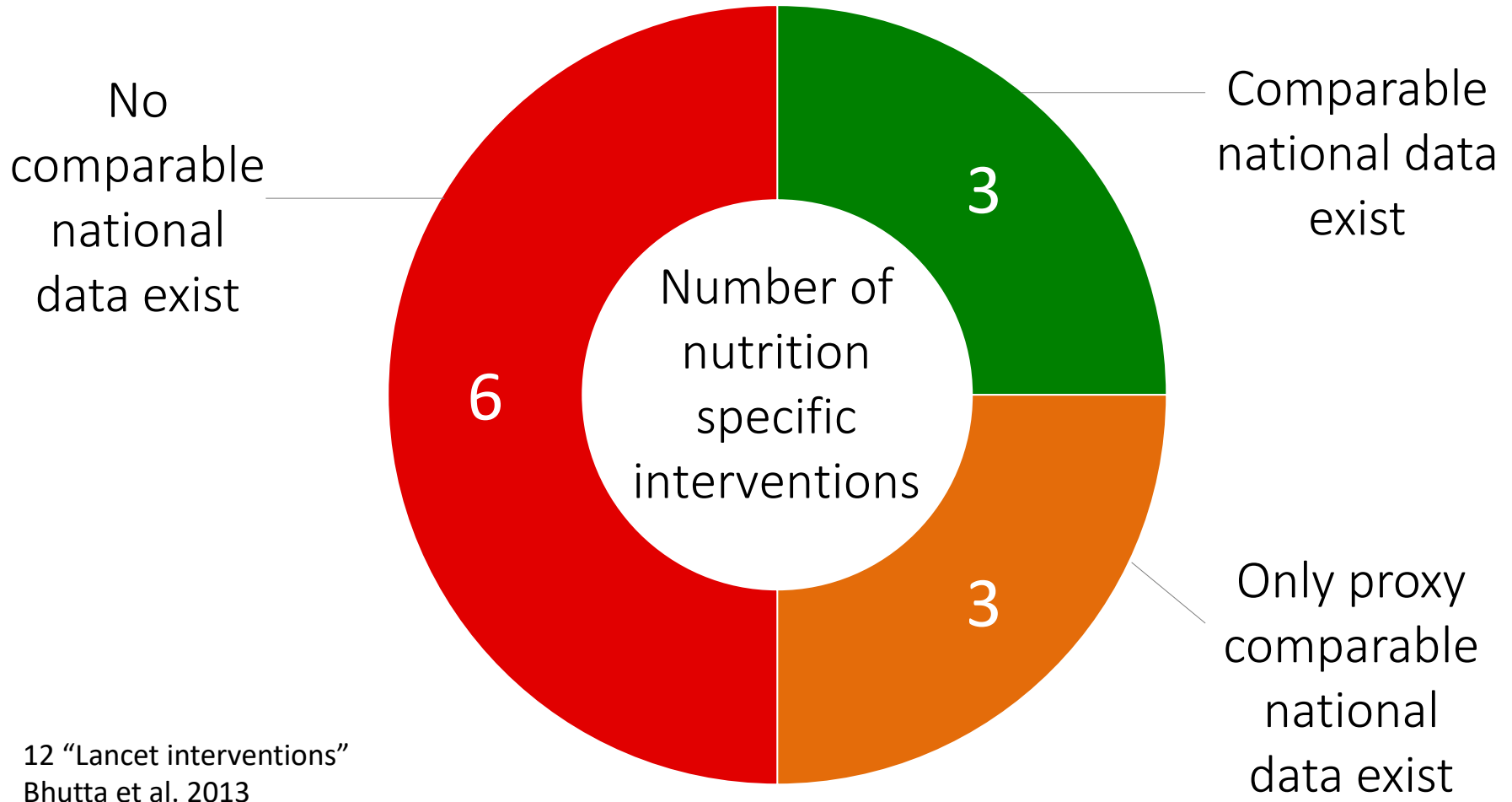
Global Target



Nutrition Policies/Progress on Nutrition Actions

Undernutrition interventions?

We don't know enough about scaling up



12 "Lancet interventions"
Bhutta et al. 2013

But few middle-to-low income countries have implemented policies to improve food environments



High income

63 %



Upper middle

27 %



Lower middle

10 %



Low income

0 %

Share of 67 countries that have implemented policies, by income level

Every country will need to increase its spending on nutrition policies & programs



Domes

Countries: How much of their budgets are allocated to nutrition?

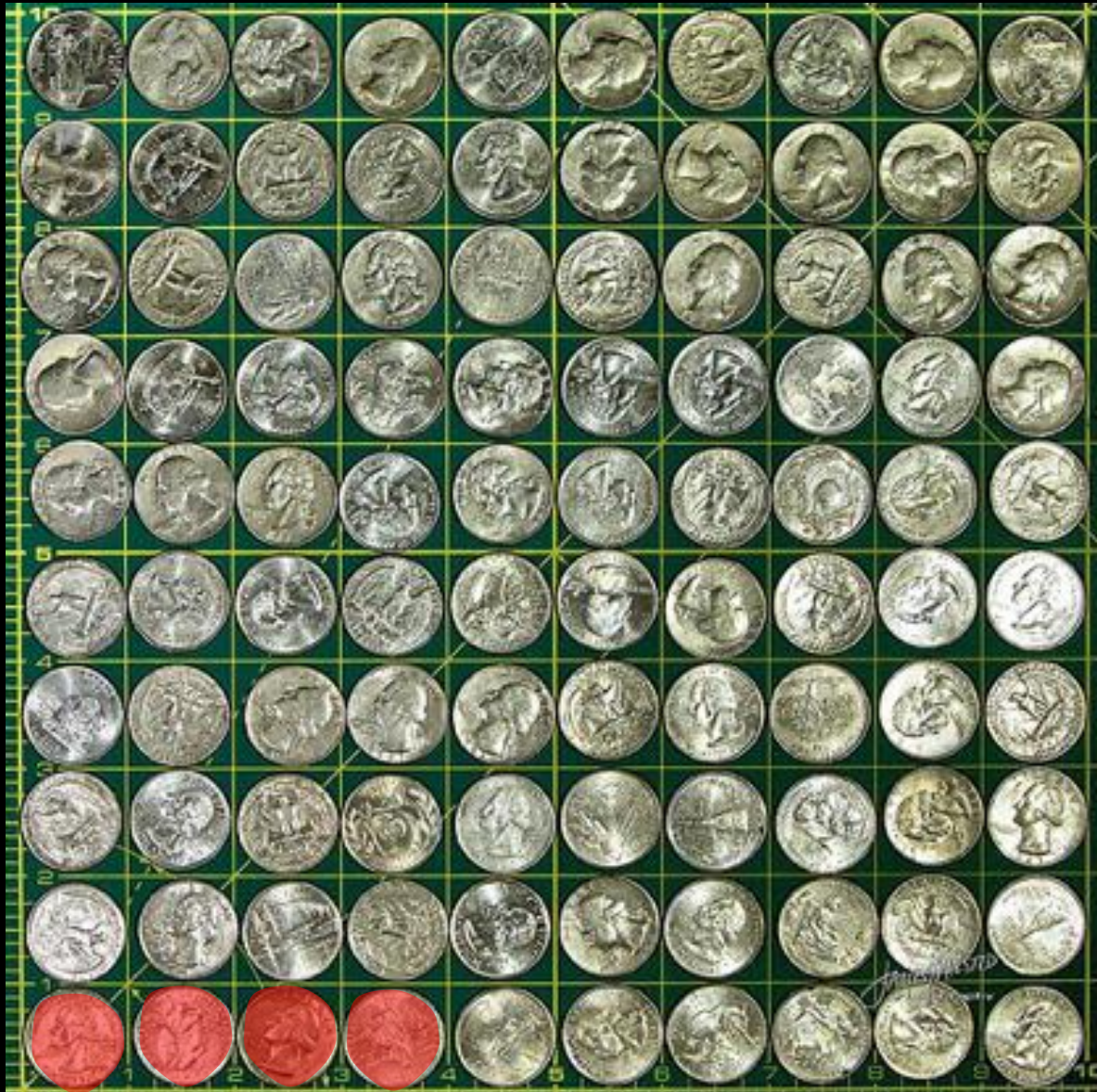
A close-up photograph of a white circular speed limit sign with the number '30' in large black digits. The sign is mounted on a red background, and the image is slightly blurred to create a sense of motion or depth.

30

SUN member
countries stepped
up in 2015

Bangladesh, Benin, Burundi, Burkina Faso, Cameroon, Chad, Comoros, Congo DRC, Costa Rica, Côte d'Ivoire, Ghana, Guatemala, Indonesia, Kenya, Lesotho, Madagascar, Maharashtra, Mauritania, Nepal, Pakistan, Peru, Philippines, South Sudan, Tajikistan, The Gambia, Togo, Uganda, Vietnam, Yemen, Zambia

Donors? 4% of spending to nutrition



Donor disbursements to nutrition in 2013

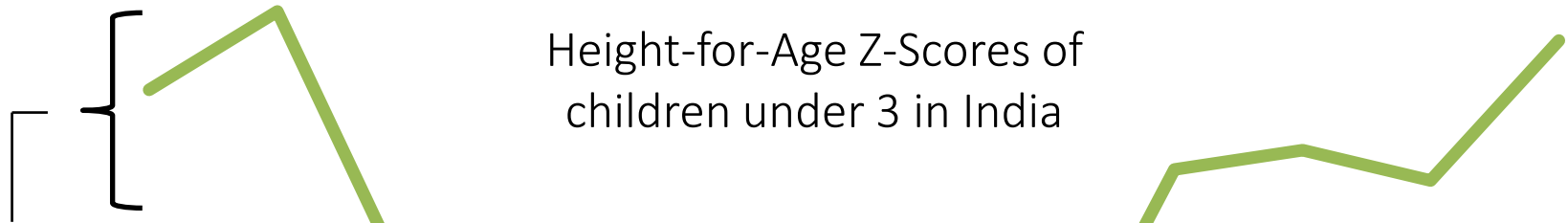
Total: \$5bn

- Specific: \$1bn
- Sensitive: \$4bn

Nutrition status is already shaped by seasons. What havoc will climate change cause?

Jan Feb Mar April May June July Aug Sept Oct Nov Dec

Height-for-Age Z-Scores of
children under 3 in India



0.2 is the median
impact of
complementary
feeding
interventions

NFHS Data
— 2005-6



A man in a dark blue shirt and tan pants stands in a field of tall grass, blowing a yellow horn. The scene is set against a clear blue sky. A semi-transparent white banner is overlaid across the middle of the image, containing the text "Calls to Action".

Calls to Action

Calls to Action

A person in a dark shirt and red sash is blowing a large, golden horn in a field of tall grass. The background is a soft-focus landscape with a clear sky.

1. Elevate nutrition across the SDGs
2. Strengthen national accountability on nutrition
3. Strengthen the Nutrition for Growth commitments
4. Implement actions to address malnutrition
5. Find more funding for nutrition action
6. Build alliances between nutrition & climate communities
7. Develop indicators for nutrition friendly food systems
8. Build a greater shared understanding of the roles and responsibilities of business in nutrition
9. Identify the data gaps that hinder action—and fill them

Developing effective food and nutrition policies and programmes

Reducing malnutrition

Preventing food insecurity

Challenges

- generating the requisite political will,
- developing realistic policies and
- taking concerted actions nationally and internationally

Response

- 1992 International Conference on Nutrition and
- the 1996 World Food Summit –
- countries have developed national nutrition plans and policies

Strategic areas-9

- mainstream nutrition goals into development policies and programmes,
- improve household food and nutrition security,
- protect consumers through improved food quality and safety,
- prevent and manage infectious diseases,
- promote breastfeeding,
- care for the socioeconomically deprived and nutritionally vulnerable,
- prevent and control specific micronutrient deficiencies,
- promote appropriate diets and healthy lifestyles, and
- assess, analyse and monitor nutrition situations.

Nutrition programmes

- Ministry of Agriculture
- Ministry of health
- Ministry of education
- Donors: FAO, UNICEF, World Nutrition programs
- Home grown school feeding programme, O meal
- Nutrition in emergencies, IDPs
- Nutrition education and resrach

Assessment of policies

- Reasons for formulation and enactment
- Implementation
- Factors
- Outcomes
- M and E

Use the O meal programme in Osun state as an example