# INTEGRATED ANEMIA PREVENTION AND CONTROL

## NATIONAL ANEMIA WORKING GROUP MEETING

February 4, 2016

# OUTLINE

**What is anemia and why is it a problem?**

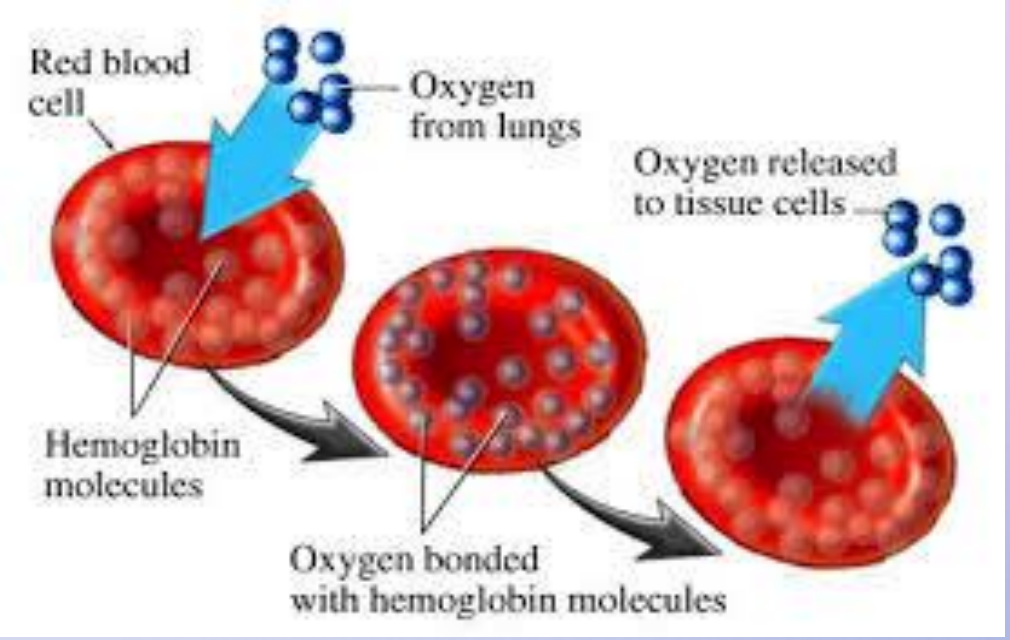
**What are the causes of anemia?**

**What are effective interventions to address these causes?**

**What is the anemia situation in Sierra Leone?**

# WHAT IS ANEMIA?

- Red blood cells transport oxygen from the lungs to cells
- RBCs contain a protein called hemoglobin that carries the oxygen
- Anemia - Greek word *anaimía* "want of blood"



# CONSEQUENCES OF ANEMIA

- ↑ risk of disease & disability
- ↓ economic productivity, and cost to society

- ↓ birth weight,
- ↑ preterm delivery
- ↑ maternal mortality

- ↓ Quality of life for adolescent
- ↓ academic performance

- ↓ development of domains – physical, cognitive & socio-emotional
- ↑ child mortality

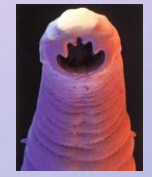
WHO 2001 Black 2013 Christian 2009
Kassebaum, 2014 Stoltzfus 2003

# CAUSES OF ANEMIA

**Deficient intake: iron, vit. A, zinc, folate, vit. $B^{12}$**

**Malaria:** Destruction and impaired production RBC

**Helminths:** Internal bleeding (loss of iron)



**Inflammation**

- Hepcidin
- Redistribution of iron and Vit. A

**Thalassemias, HbAS, HbSS, Hb-E, G6PD: ↑ Destruction & ↓ RBC production & ↓ lifespan**

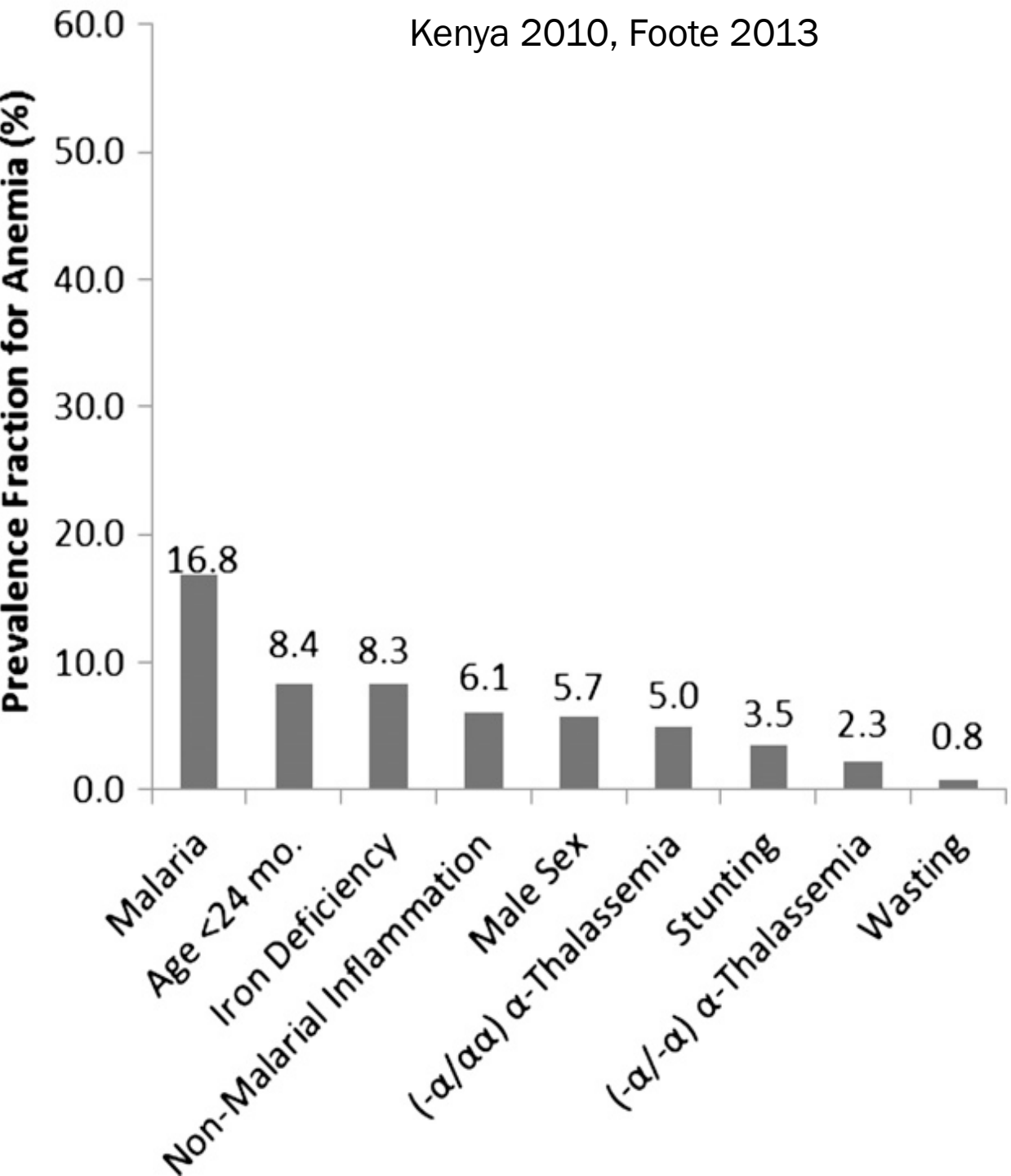
Cook, et al. 1994; Scott et al. 2007; Selhub et al. 2009; Ganz et al. 2011; George, et al. 2012; Pasricha et al. 2010; Suchdev et al. 2012

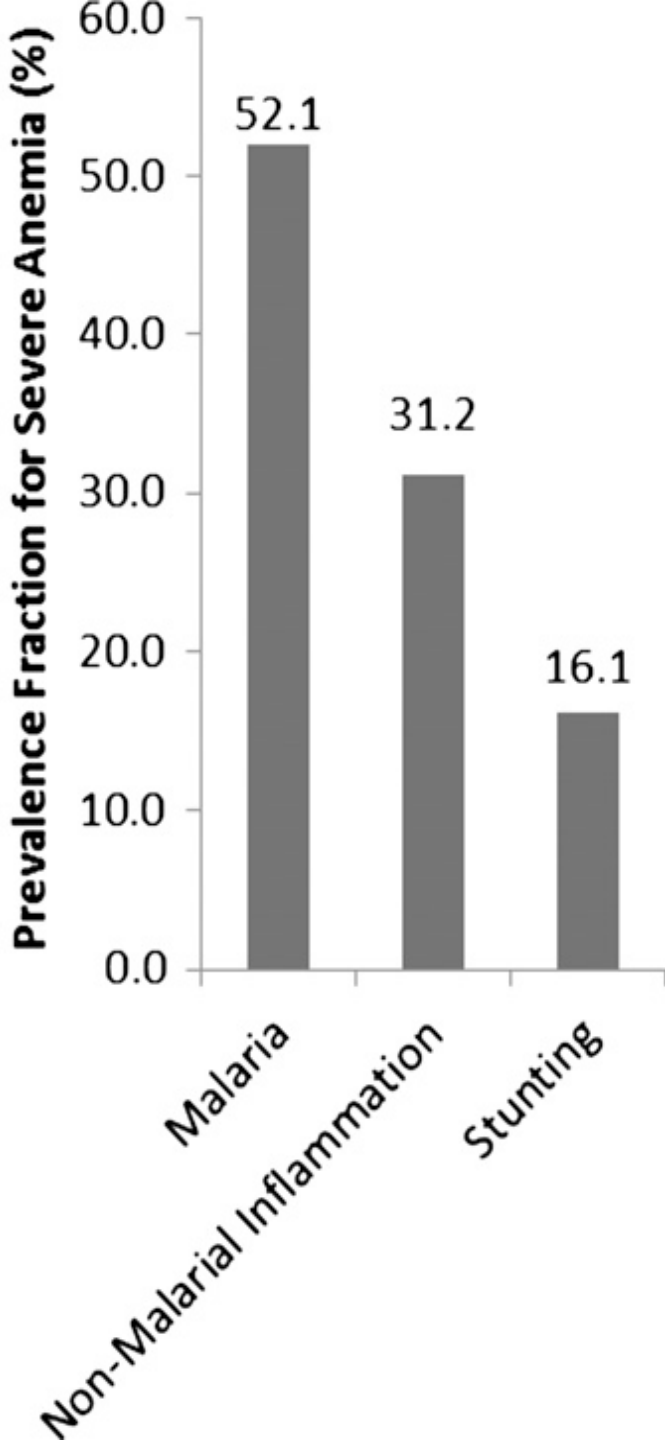
# GENETIC DISORDERS AND ANEMIA

| **CAMBODIA-women (n=420)** | |
|---|---|
| Genetic hemoglobin disorder | 54% |
| Anemia<br>With genetic disorder<br>Without genetic disorder | 30%<br>45%<br>11% |
| Low iron stores | 2% |

Karakochuk et al. 2015

Kenya 2010, Foote 2013



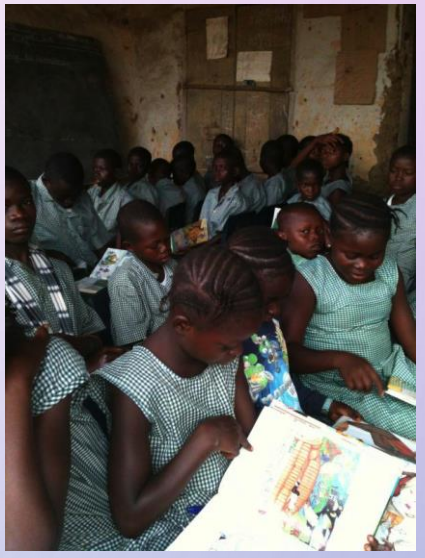
# Interventions for Anemia – strong evidence

- **SUPPLEMENTATION**
- **FORTIFICATION**
- **DEWORMING**
- **MALARIA – IPTP, LLIN,**
  **INDOOR RESIDUAL SPRAYING; PROMPT DIAGNOSIS AND TREATMENT**



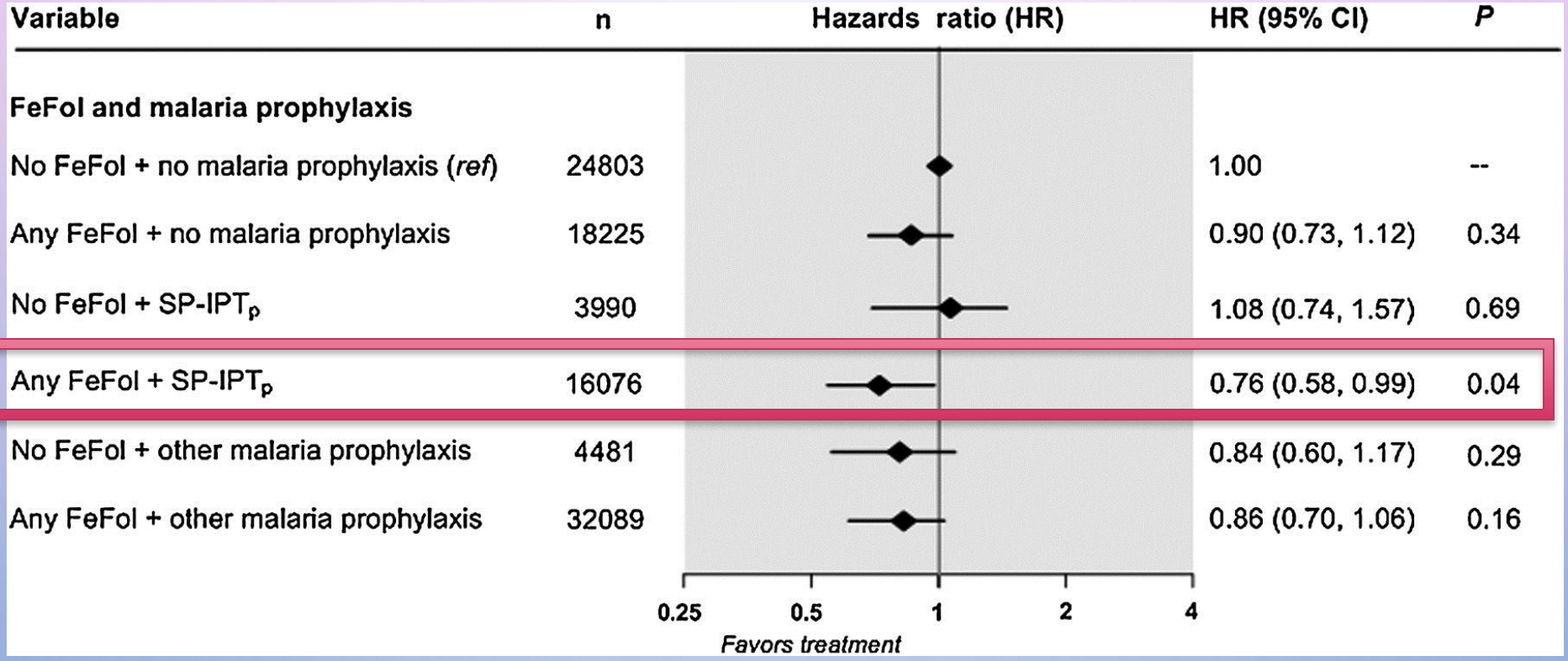
# Interventions for Anemia – indirect evidence

- WATER, SANITATION & HYGIENE
- DIETARY INTERVENTIONS
- INFANT & YOUNG CHILD FEEDING
- FAMILY PLANNING
- FEMALE EDUCATION




*©HarvestPlus: A woman harvests high iron beans in Northern Province, Rwanda. Photo: HarvestPlus/Angoor Studios - See more at: http://bit.ly/1JVO3W0*

# INTEGRATION: COMBINED EFFECT OF IFA AND IPTP ON NEONTAL MORTALITY




Christiana R Titaley et al. Am J Clin Nutr 2010;92:235-243

# WHA – ANEMIA TARGETS

- REDUCE ANEMIA GLOBALLY BY 50% AMONG WOMEN OR PRODUCTIVE AGE BY 2025
  - REQUIRES A 15% REDUCTION
  - 1995 – 2011 (4% REDUCTION WRA, 5 % REDUCTION PREGNANT WOMEN)

ANEMIA IS WHERE COUNTRIES ARE FINDING IT MOST DIFFICULT TO MAKE PROGRESS

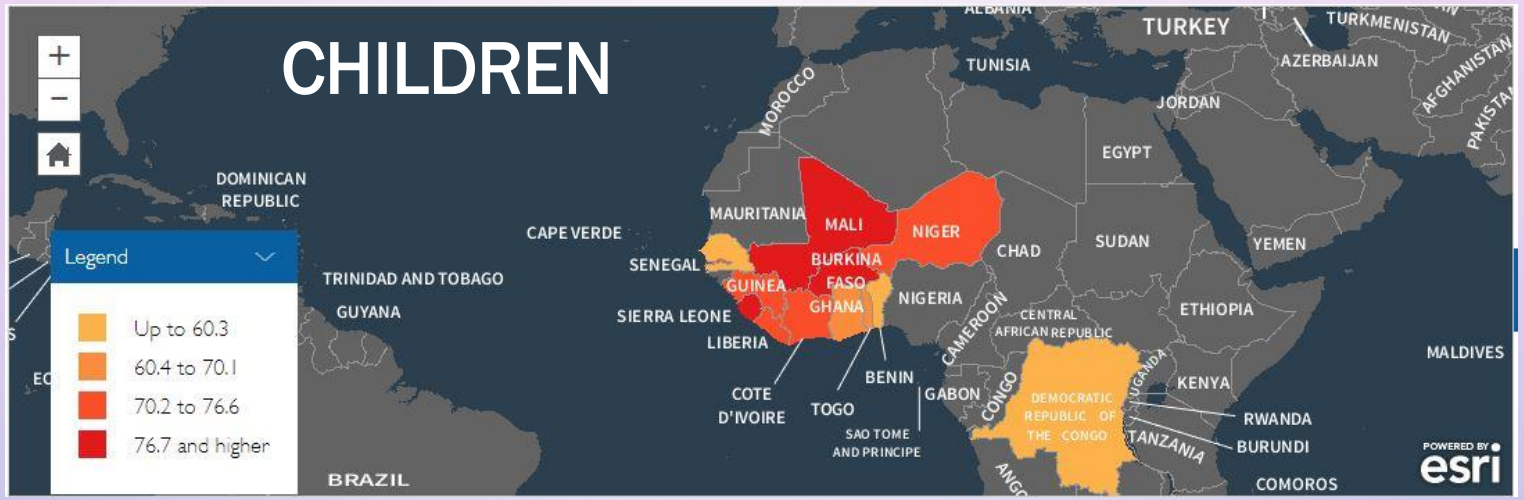
ONLY 5 OUT OF 185 COUNTRIES WITH ANEMIA DATA ARE ON COURSE TO REDUCE ANEMIA.

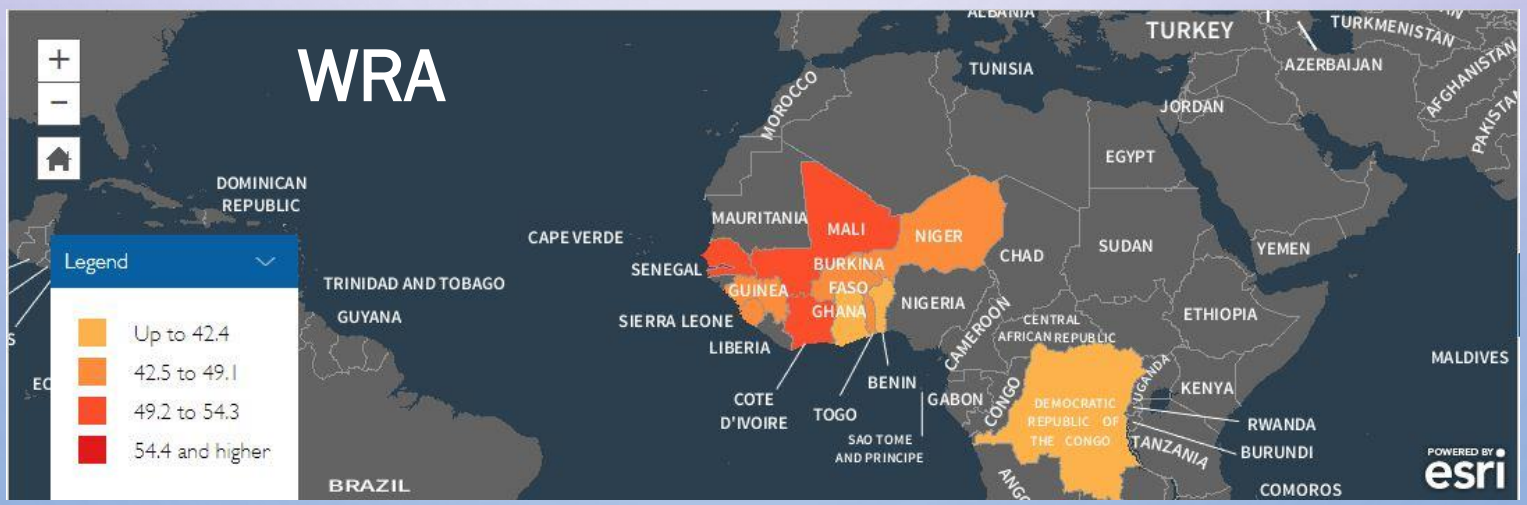
# KEY LESSONS LEARNED FROM UGANDA

- INCREASE DISTRICT INVOLVEMENT
- STREAMLINE WITH OTHER COORDINATING BODIES
- INCREASED INTEGRATION ACROSS INTERVENTIONS

"we need move away from these conference rooms to the field where the people are"

# ANEMIA IN WEST AFRICA

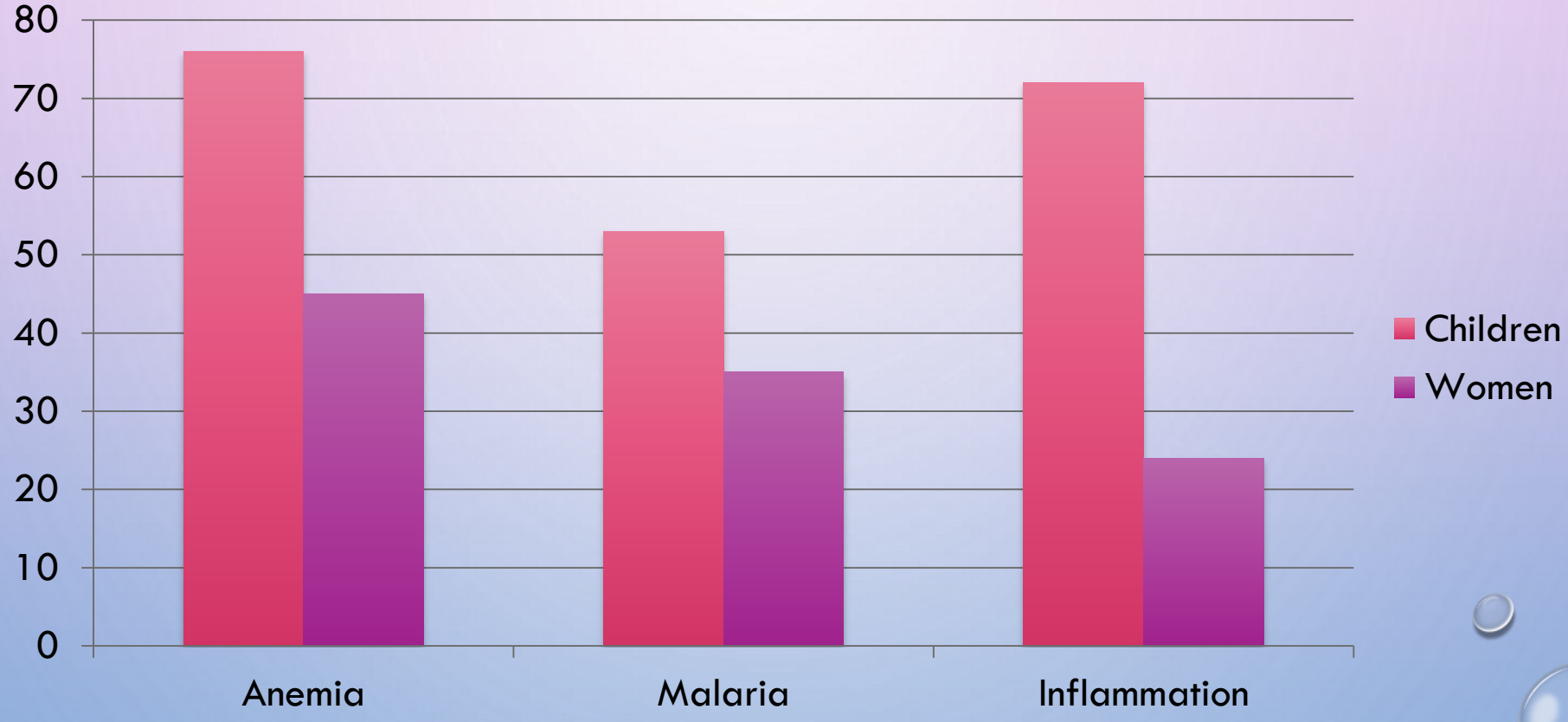



Data compiled using DHS STATcompiler at http://www.statcompiler.com/

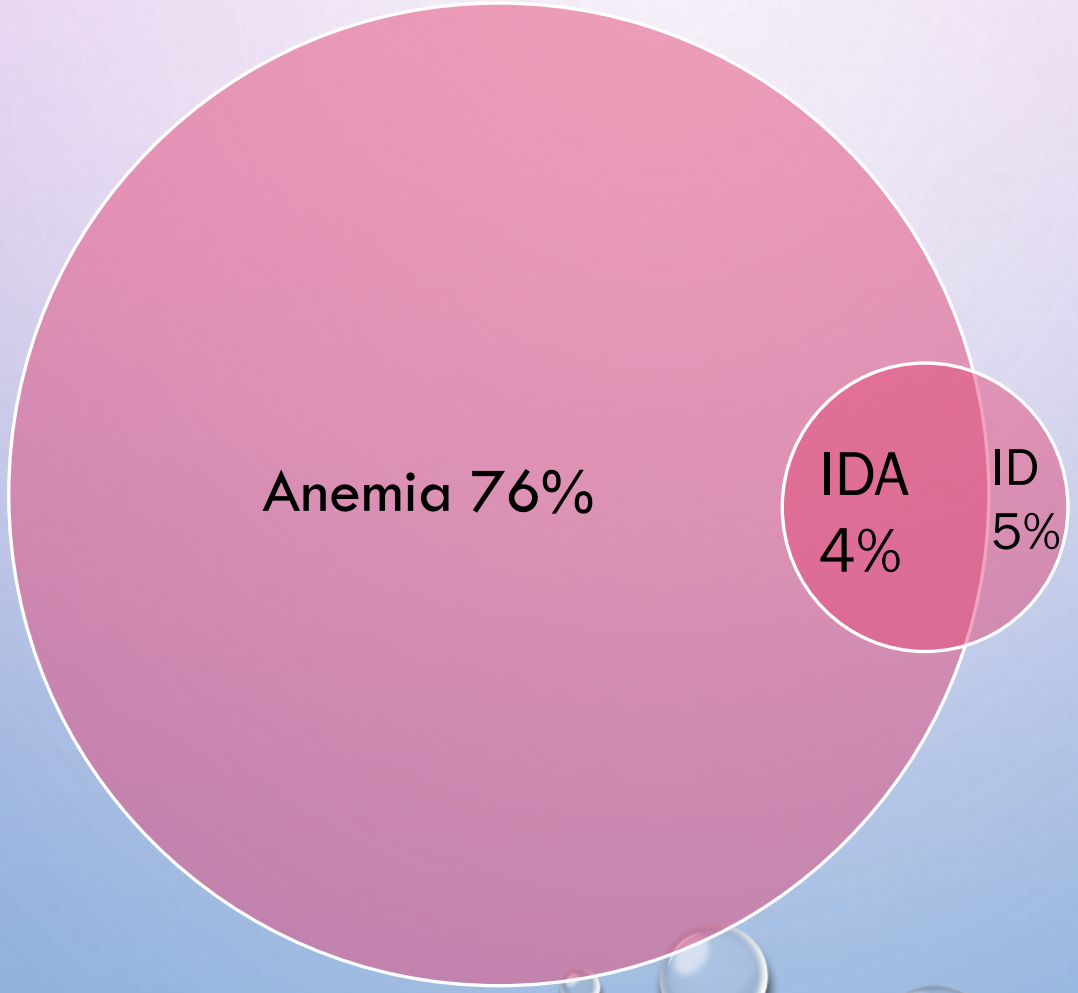

*Ministry of Health and Sanitation (Sierra Leone), UNICEF, Helen Keller International, and WHO. 2013 Sierra Leone Micronutrient Survey. Freetown, Sierra Leone; 2015.*

# PREVALENCE OF ANEMIA AND KEY RISK FACTORS IN SIERRA LEONE, NATIONALLY




SLMS 2013

# PREVALENCE OF ANEMIA, ID AND IDA IN SIERRA LEONE CHILDREN, NATIONALLY

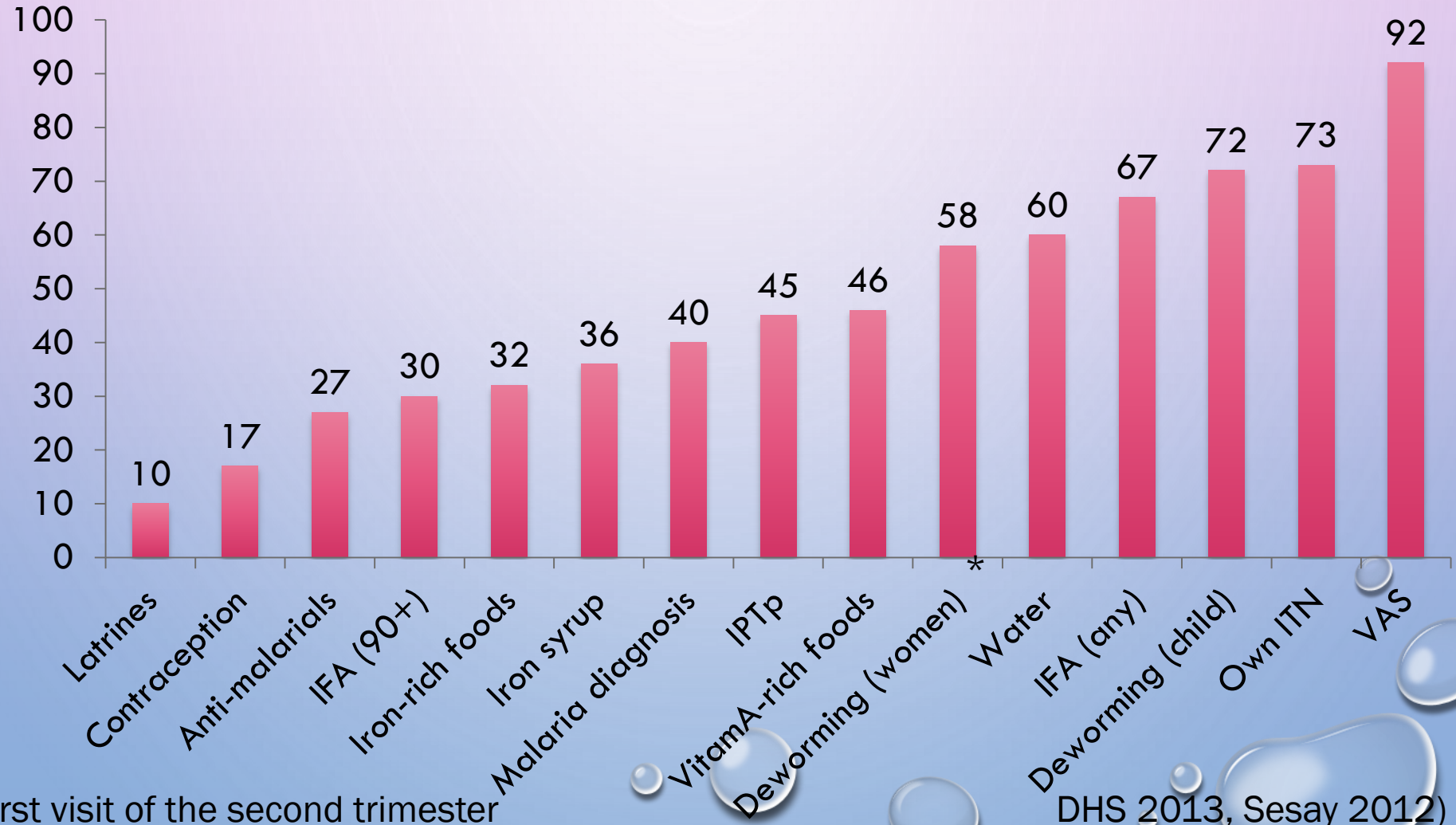



SLMS 2013

# CONTEXT SPECIFIC CAUSES OF ANEMIA SHOULD DRIVE INTERVENTIONS

| Causes | | Interventions |
|---|---|---|
| Malaria related-Anemia |  | MALARIA PREVENTION & TREATMENT |
| Micronutrient deficiencies, stunting |  | NUTRITION PROGRAMS |
| Tropical enteropathy, nutrient malabsorption diarrhea |  | WATER TREATMENT & HYGIENE |
| Blood loss |  | DEWORMING |

# COVERAGE ANEMIA-RELATED INTERVENTIONS IN SIERRA LEONE, NATIONALLY




*first visit of the second trimester

DHS 2013, Sesay 2012)

# WHO RECOMMENDATIONS FOR MNP

**WHERE?**

**ANEMIA >20%**

**WHO?**

**CHILDREN 6-23 MO**

**WHY?**

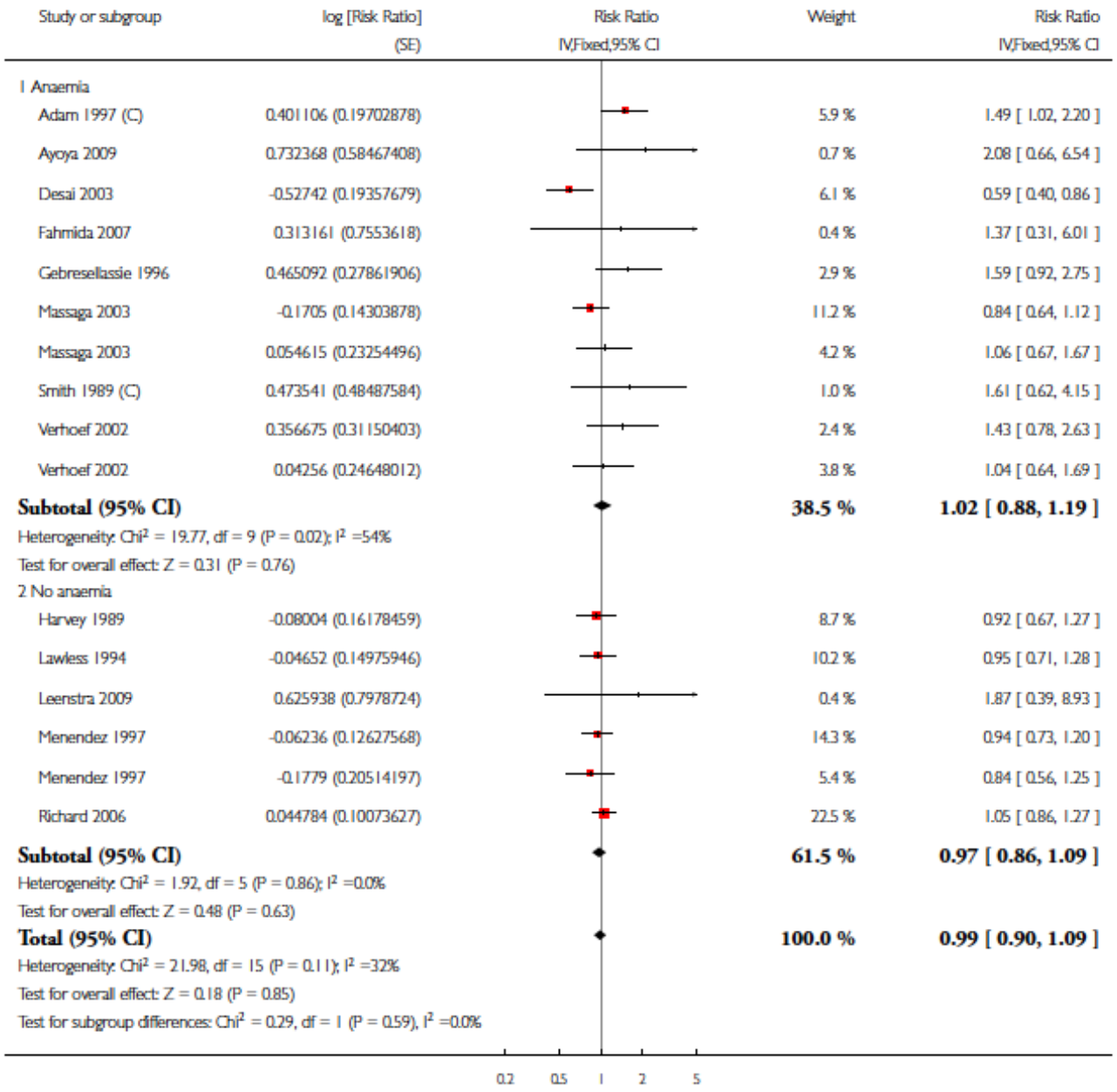
**REDUCE IRON DEFICIENCY AND ANEMIA**


De-Regil et al. 2011

Review: Oral iron supplements for children in malaria-endemic areas

Comparison: 1 Iron versus placebo or no treatment

Outcome: 1 Clinical malaria (by anaemia at baseline)



# MNP SAFETY CONSIDERATIONS

## Safety of iron: Pemba trial

Context matters

| Tanzania | Ghana |
|---|---|
| Trial halted because of increased hospitalizations and death in the groups supplemented with iron and zinc | No increased risk of malaria with bednet distribution and prompt diagnosis and treatment of a malaria |
| **Kenya** | **Cote d'Ivoire** |
| Increased pathogenic gut microbiota profile | Increased pathogenic gut microbiota profile |
| **South Africa** | **Pakistan** |
| No difference in gut microbiota profile | Increase risk for diarrhea |

Sazawal S et al. 2006, Zlotkin et al. 2013, Jaegg et al. 2014; Dostal et al. 2014; Zimmermann et al. 2010, Soofi et al. 2013

# CAUSES OF ANEMIA – FUTURE DIRECTIONS

**HIGH IRON GROUND WATER**

**→*.51 (MASONFONYIA) TO 1.2 (GBANGIENE)***

**GENETICS**

**→UNDERWAY**

# THANK YOU

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