

**The Efficacy of Iron Pots and Steel
Pots in Reducing Prevalence of
Anemia in Vietnam:**
Report of midline findings

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Introduction

	Why iron pots?	Cautions
Efficacy	Consistent use of pots raised Hb 0.7 - 1.3 mg/dl.	Only three studies (in Malawi, Ethiopia, Brazil).
Effectiveness	Unknown.	Would depend on compliance.
Cost-effective	Unstudied, but probably relatively high.	Depends on life-span of pots.

	Obstacles	Possible Solutions
Weight	Heavy (from 3 to 12 kg).	Use steel (95% iron, 1-2kg).
Oxidation	Prone to rusting and discolouring.	Season with oil, use regularly, dry thoroughly, use steel.
Cooking properties	Slow to heat.	Iron retains heat – promote for use on foods that cook for long time.

Summary: Their efficacy is reasonably well-established. Iron pots will likely be effective if they are used daily. The conditions to ensure high compliance are not well studied.

Study Design

- Three villages from Hung Yen province, randomized to three groups: cast iron pots, blue steel pots, and (planned positive) control.
- Logistics difficulties prevented supplement distribution, and therefore from baseline to midline it was a negative control.
- Volunteer households were screened to select households with ≥ 1 anemic individual from the three target groups of WRA (women of reproductive age, 15-43 years), adolescent girls (11-14 years) and infants (6-24 months).
- Measured hemoglobin (Hb), Serum Ferritin (SF) and CRP at Baseline (Apr 04) and Midline (Sept 04)

Cast Iron Pot

WRA n=52

Girls n=28

Infants n=21



Blue Steel Pot

WRA n=56

Girls n=38

Infants n=24



Control

WRA n=64

Girls n=55

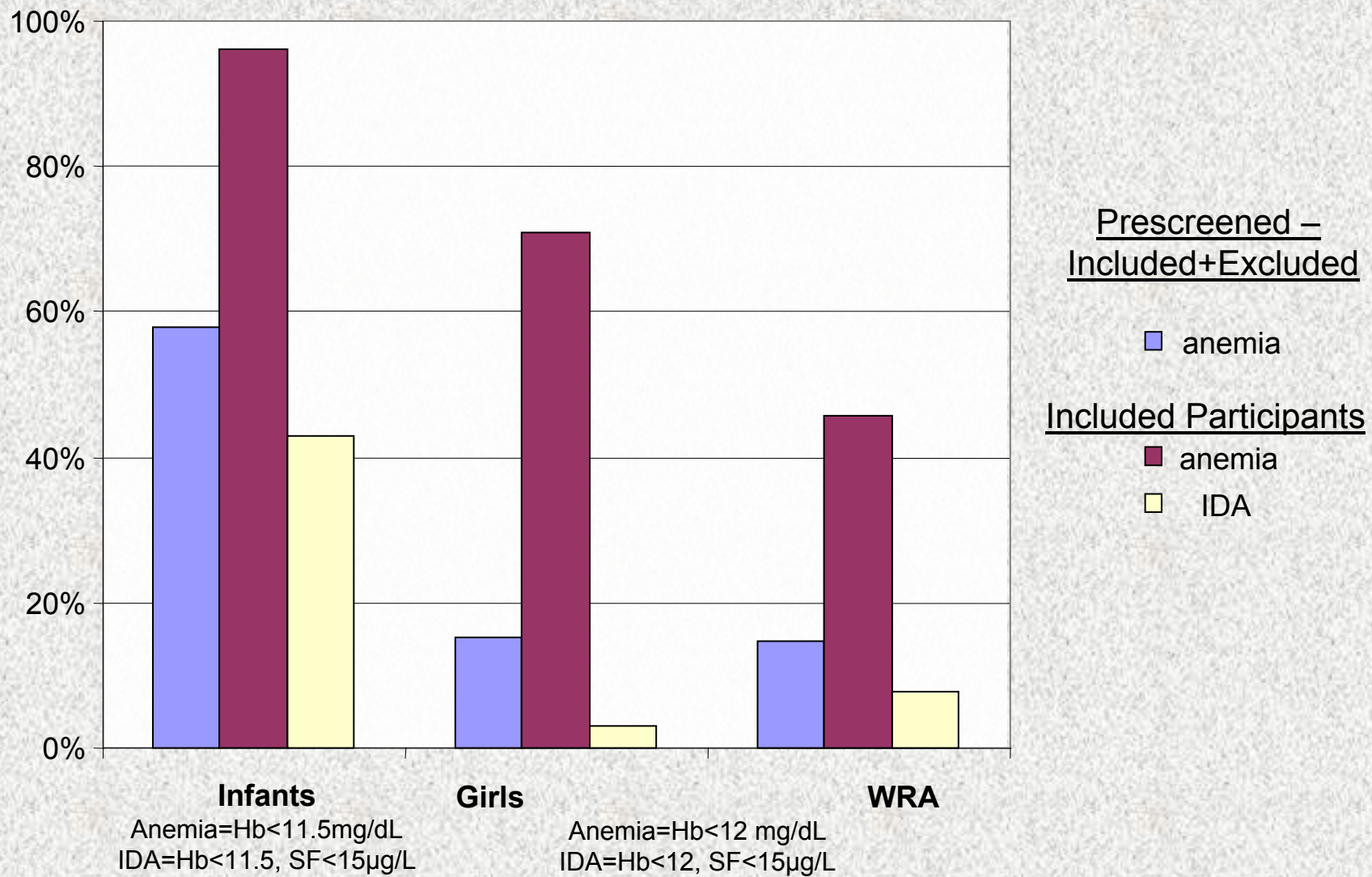
Infants n=20



HƯỚNG DẪN SỬ DỤNG
GÓI BỐ XUNG DINH DƯỠNG
(SPRINKLES)



Baseline Prevalence of Anemia and IDA



Cooking Pot Compliance

IEC and Monitoring

Logistics difficulties prevented IEC campaign, fortnightly monitoring and positive control during first 4 months.

The compliance reported below was achieved with *no promotion*.

Frequency of reported household use at 4 months:

Cast Iron Pot

Blue Steel Pot

≥ 7x per week

34%

38%

1-6x per week

36%

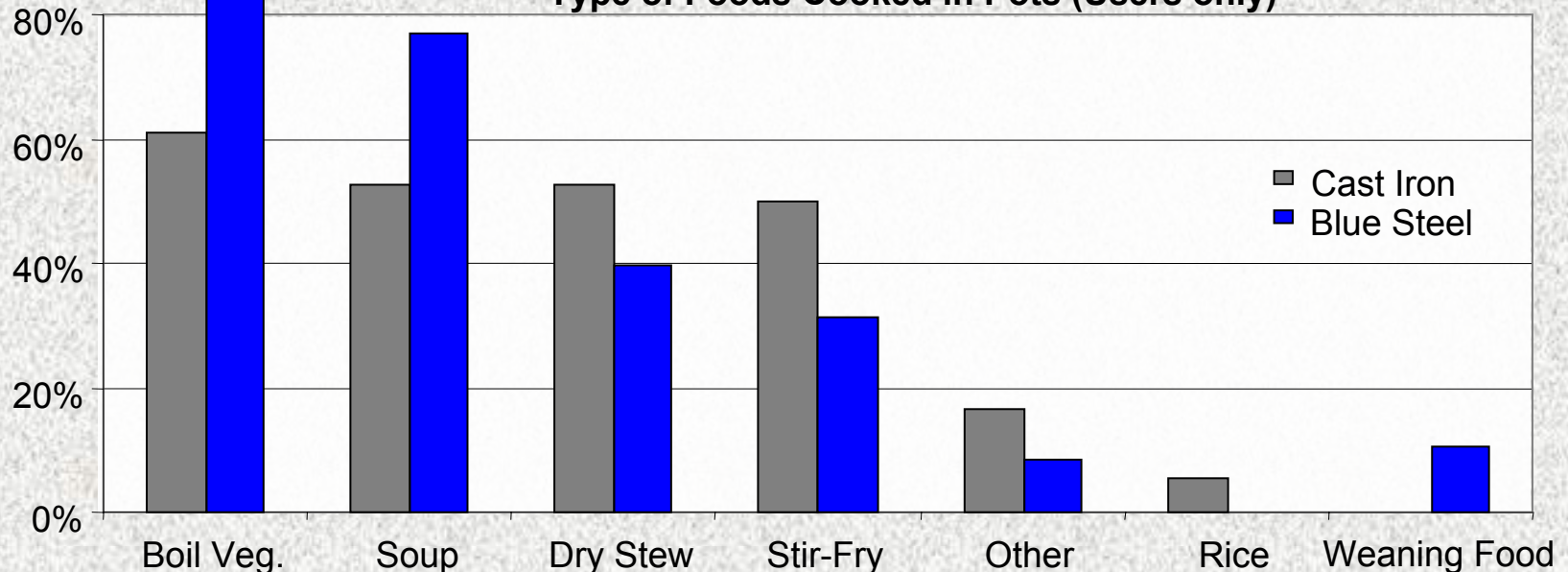
28%

never

30%

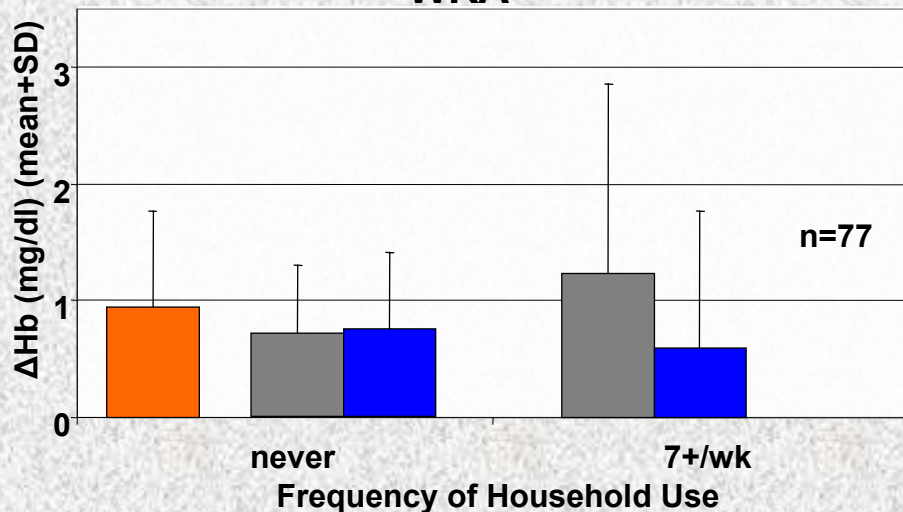
33%

Type of Foods Cooked in Pots (Users only)

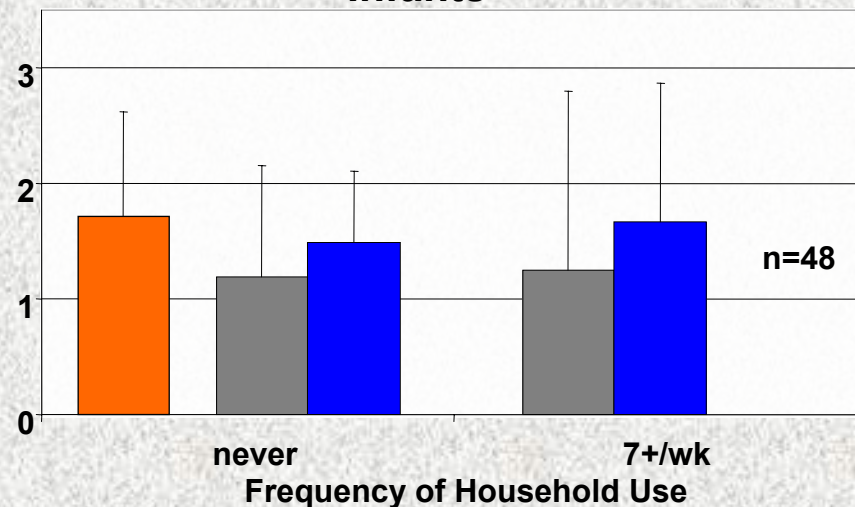


Change in Hb, by Treatment and Compliance

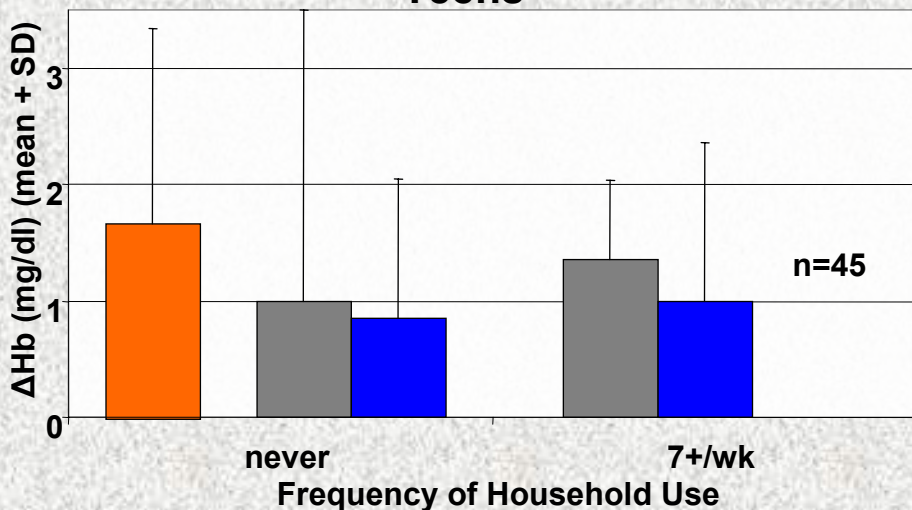
WRA



Infants



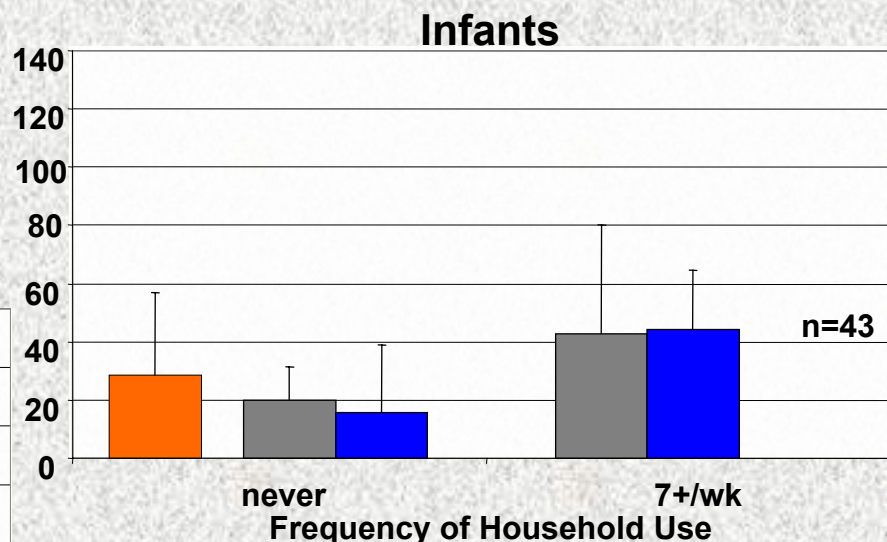
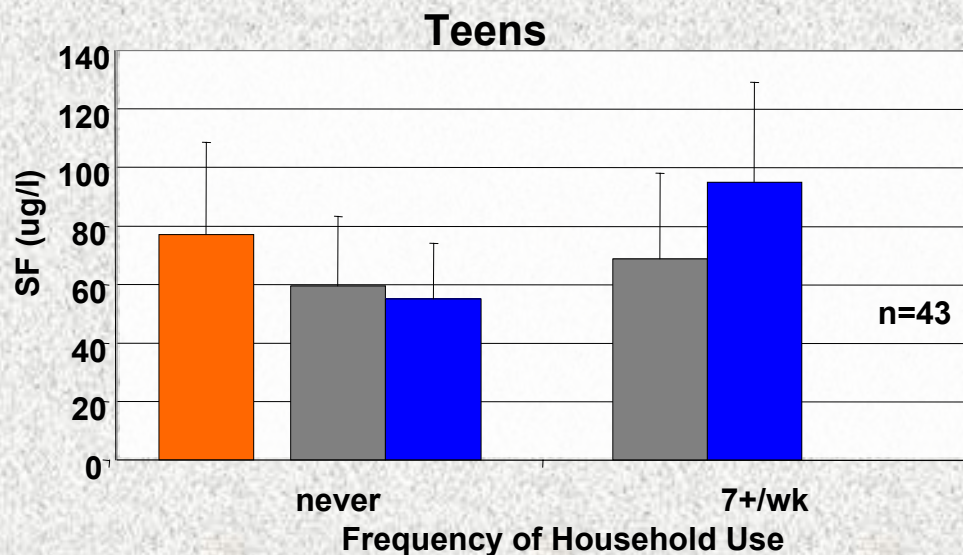
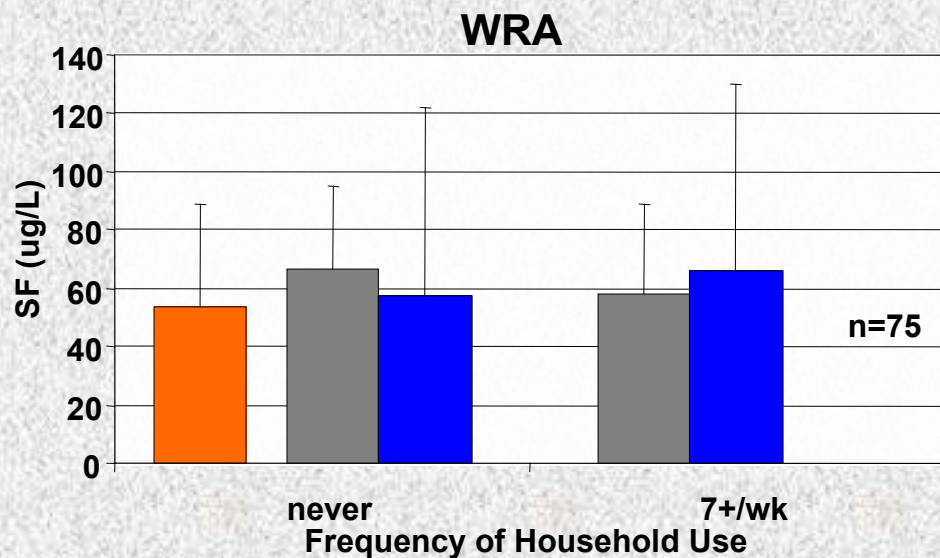
Teens



- Graphs show LSMeans (+1 SD), adjusted for differences in baseline Hb.
- There are *no significant treatment or compliance effects*, although *all groups increased from baseline*.
- Results for those with use 1-6x/wk not shown.

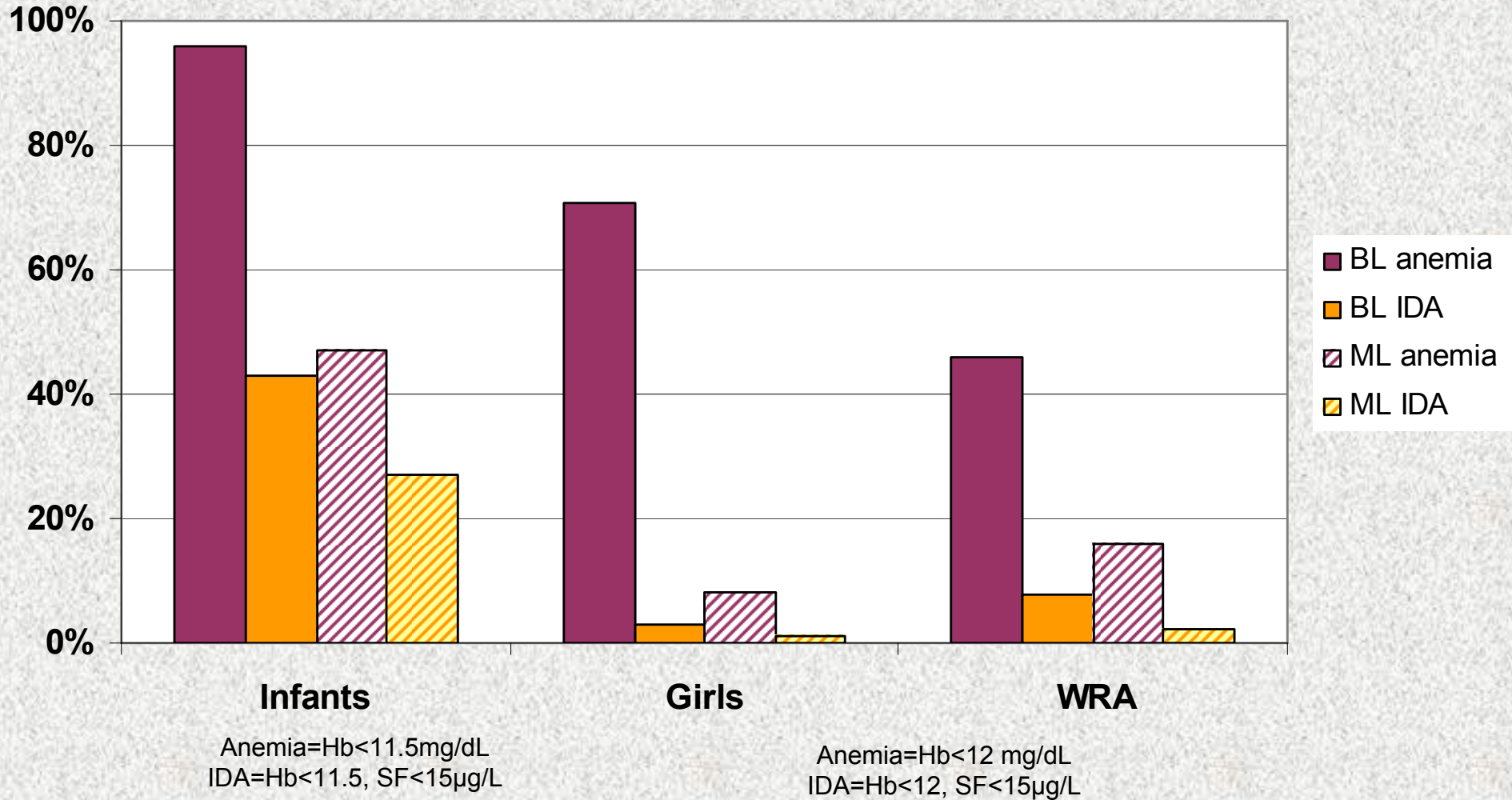
RESULTS-4

SF at Midline, by Treatment and Compliance



- Graphs show LSMeans (+1 SD), adjusted for differences in baseline SF.
- There are no significant treatment or compliance effects
- Results for those with use 1-6x/wk not shown

Baseline and Midline Anemia and IDA



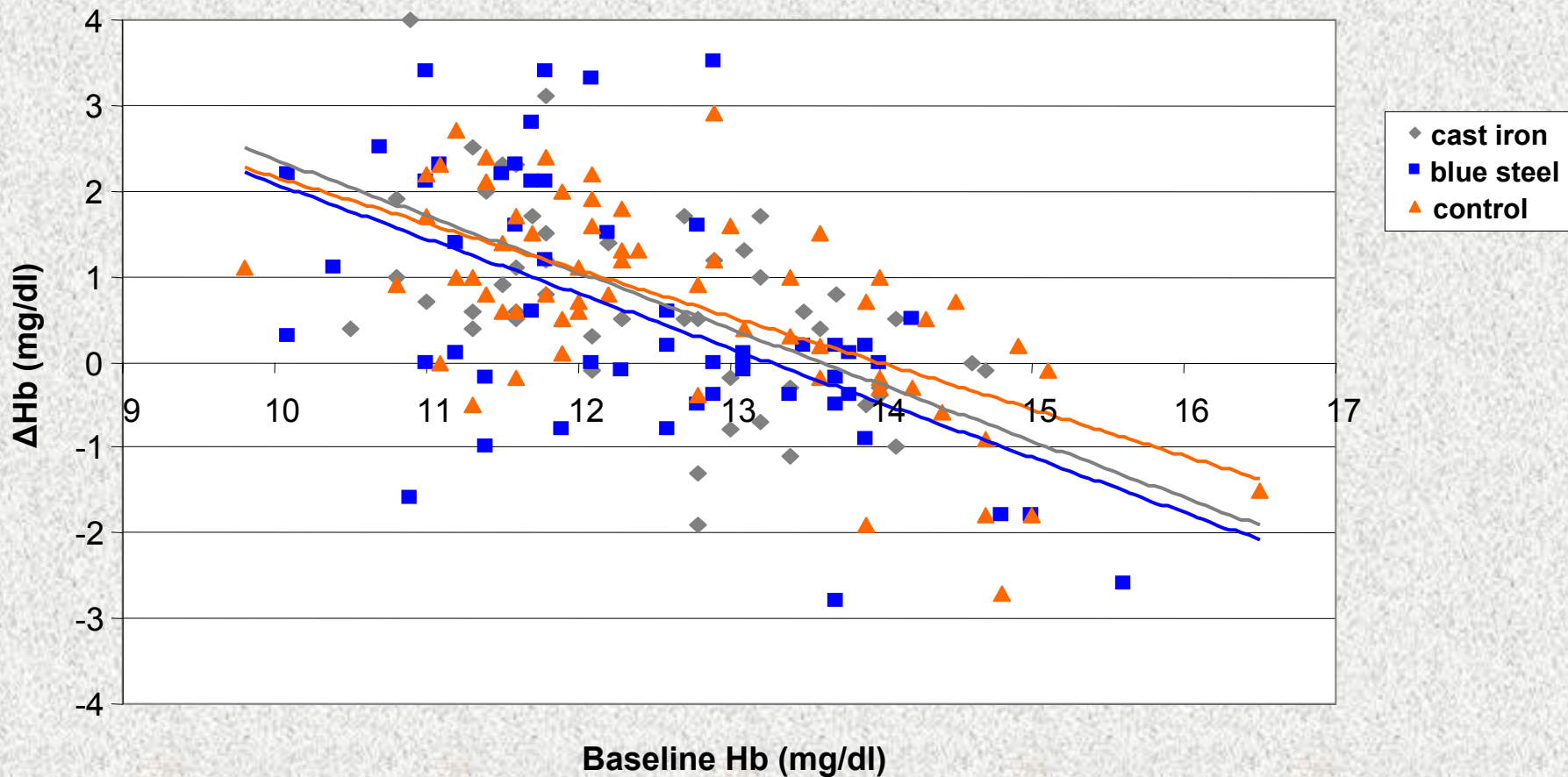
Discussion-1

**There is no treatment effect, yet there is study-wide improvement.
Why?**

- **no evidence of seasonal changes in environment, or diet**
- **no evidence of increased self-treatment**
- **Likely due to “*regression-to-the-mean*” effect**
 - 1. There is day-to-day intra-individual variation in hemoglobin level.**
 - 2. We screened to include sufficient number of anemic individuals, to be more efficient by only studying “potential responders”.**
 - 3. A sub-sample of anemic individuals will include a disproportionate number who are at the low end of their “personal hemoglobin range”. On a subsequent measure they will be more likely to have a greater Hb level.**
 - **This is a statistical phenomenon and unrelated to treatment efficacy. The magnitude and importance of Hb regression-to-the-mean in anemia research has not been described.**

Regression-to-the-mean in Hemoglobin levels in Vietnamese Women

Change in Hb vs Baseline Hb



Conclusions

- 1. Anemia, and especially IDA, is very low in these Vietnamese women and adolescent girls, and higher in infants.**
- 2. Compliance has been moderately high with iron pots, despite no IEC program.**
- 3. There is no effect (yet) observable of the iron pots. Trial is continuing for 3 months more, and IEC is now in place. Three previously published trials (Brazil, Ethiopia, Malawi) all showed positive results.**
- 4. Regression-to-the-mean may be responsible for an overall increase of ~0.6 mg/dl and an average increase >1 mg/dl in anemic women (i.e., an effect as good as can be expected from the most efficacious single treatment).**
- 5. The occurrence of regression-to-the-mean in this and other anemia research projects may mask or exaggerate treatment effects.**

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