

# Paying for performance and cost effectiveness of strategies to combat anemia in China

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		<input type="checkbox"/> Protocol
<b>Registration date</b> 19/10/2011	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan
		<input type="checkbox"/> Results
<b>Last Edited</b> 30/03/2017	<b>Condition category</b> Nutritional, Metabolic, Endocrine	<input type="checkbox"/> Individual participant data
		<input type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Anemia is a condition that develops when the blood lacks enough healthy red blood cells or haemoglobin (the part of the red blood cell that binds oxygen), causing the cells in the body to not get enough oxygen. It can be caused by a lack of iron in the diet (iron-deficiency anemia). Anemia affects millions of children in poor areas of China and severely constrains their ability to learn and progress through school. The aim of this study is to find out whether strengthened incentives in primary schools in rural China affect student nutrition, especially anemia. There is very little information available on anemia rates among Chinese children, so this study aims to provide new estimates of anemia prevalence among primary school age children in rural China. Early estimates suggest that prevalence rates are higher than previously believed, ranging between 20% and more than 50% in many rural counties. This study assesses the responses of educators (principals) in poor rural primary schools in China to pay-for-performance rewards for reducing anemia compared with pay-for-performance rewards for increasing test scores, and the health consequences of each. This study is thought to be the first to reward health improvement directly. For the purposes of comparison, the study also measures the responses to information campaigns and unconditional subsidy schemes to assess the health improvement benefits of each. The cost-effectiveness of the various incentive-based approaches for anemia reduction is also calculated. New research suggests that the size of the incentive is less important than the mere existence of the incentive. This study therefore compares the effectiveness of large and smaller incentives for anemia reduction.

### Who can participate?

All fourth and fifth grade students (mostly aged 8-12) in the participating schools

### What does the study involve?

Participating schools are randomly allocated into five groups. Principals of all of the participating schools receive information about the share of enrolled students who are anemic and learn effective methods for reducing anemia, including vitamin supplements and other diet changes. In addition, they receive information about the close link between anemia, school attendance and educational performance. Principals also receive a fixed per student subsidy to do with as they choose. They are be given a menu of options, including items/services that may help reduce anemia and/or raise student test scores. Group 1 schools receive only the

information and subsidy described above. Group 2 schools receive on top of the information and subsidy a monetary reward to reduce anemia rates. Group 3 schools receive on top of the information and subsidy a monetary reward to raise student test scores. Group 4 schools receive on top of the information and subsidy a monetary reward to reduce anemia rates and a monetary reward to raise student test scores. Group 5 schools receive on top of the information and subsidy a small monetary reward to reduce anemia rates. Blood haemoglobin levels measured by finger prick testing and math and Chinese test scores are compared between the five groups.

What are the possible benefits and risks of participating?

Student participants may experience better health and educational outcomes. Principals who participate in the study receive nutritional training and an unconditional cash subsidy. Some principals are also offered the chance to earn more money through the financial incentive program.

Where is the study run from?

The study takes place in Northwest China in randomly selected schools scattered across Gansu, Shaanxi and Qinghai provinces.

When is the study starting and how long is it expected to run for?

October 2011 to June 2012

Who is funding the study?

1. National Institutes for Health (NIH) (USA)
2. Stanford University (USA)

Who is the main contact?

Prof. Grant Miller

## Contact information

**Type(s)**

Scientific

**Contact name**

Prof Grant Miller

**Contact details**

117 Encina Commons  
Stanford  
United States of America  
94305

## Additional identifiers

**Protocol serial number**

NIH Award No.: 1 R01 HL106023-01

## Study information

## **Scientific Title**

Paying for performance and cost effectiveness of strategies to combat anemia in China: a randomised controlled trial

## **Study objectives**

There is low haemoglobin count among fourth and fifth grade students in poor areas of Northwest China, and that part of the problem is that principals lack information about the problem, they lack the funds necessary to address the problem, and lack incentive to take action.

## **Ethics approval required**

Old ethics approval format

## **Ethics approval(s)**

1. Stanford University, Institutional Review Board, 11/11/2010, IRB Number 348, Protocol ID: 19748
2. Xi'an Jiaotong University, Institutional Review Board, 28/11/2010, IRB Number 00003556, Protocol ID: 19748

## **Study design**

Interventional cluster-randomised single-blind multicentre controlled trial

## **Primary study design**

Interventional

## **Study type(s)**

Quality of life

## **Health condition(s) or problem(s) studied**

Iron-deficiency anemia

## **Interventions**

### **1. Information + Subsidy (65 schools)**

All principals of the sample schools will receive both information about anemia and an earmarked operating budget subsidy. They will receive information about the share of enrolled students who are anemic and learn efficacious methods for reducing anemia (including vitamin supplementation and other dietary changes). In addition, they will receive information about the close link between anemia, school attendance and educational performance according to findings published in the academic literature. Principals will also receive a fixed per student subsidy to do with as they choose. They will be given a menu of options, including items/services that may help reduce anemia and/or raise student test scores.

### **2. Information + Subsidy + Anemia Reduction Incentive (65 schools)**

Principals in this subset of schools will receive - on top of the information and subsidy treatments - a monetary reward to reduce anemia rates.

### **3. Information + Subsidy + Test Score Incentive (65 schools)**

Principals in this subset of schools will receive - on top of the information and subsidy treatments - a monetary reward to raise student test scores.

### **4. Information + Subsidy + Dual Incentive (65 schools)**

Principals in this subset of schools will receive - on top of the information and subsidy

treatments - a monetary reward to reduce anemia rates AND a monetary reward to raise student test scores.

#### 5. Information + Subsidy + Small Anemia Reduction Incentive (40 schools)

Principals in this subset of schools will receive - on top of the information and subsidy treatments - a small monetary reward to reduce anemia rates.

#### **Intervention Type**

Other

#### **Phase**

Not Applicable

#### **Primary outcome(s)**

Haemoglobin concentrations, obtained by finger prick testing using HemoCue 201+ point of-care diagnostics

#### **Key secondary outcome(s)**

1. Scores on standardized subject tests of math and Chinese. Both subject tests will be administered by a team of enumerators.

1.1. The math test is based on questions drawn from a pool of questions that were originally created for The Trends in International Mathematics and Science Study (TIMSS).

1.2. The Chinese test is based on questions originally created for inclusion in the local, curriculum-based examinations.

#### **Completion date**

10/06/2012

## **Eligibility**

#### **Key inclusion criteria**

Male and female fourth and fifth grade elementary school students attending randomly selected public elementary schools in poor rural areas of Northwestern China

#### **Participant type(s)**

Other

#### **Healthy volunteers allowed**

No

#### **Age group**

Child

#### **Sex**

All

#### **Key exclusion criteria**

1. Wealthy, urban areas as they are not known to have large nutrition problems
2. Students found to be extremely anaemic - these will be excluded and sent directly to a doctor for treatment
3. Students identified as having thalassaemia

**Date of first enrolment**

24/10/2011

**Date of final enrolment**

10/06/2012

## Locations

**Countries of recruitment**

China

United States of America

**Study participating centre**

117 Encina Commons

Stanford

United States of America

94305

## Sponsor information

**Organisation**

Stanford University (USA)

**ROR**

<https://ror.org/00f54p054>

## Funder(s)

**Funder type**

Government

**Funder Name**

National Institutes of Health (ref: 1 R01 HL106023-0)

**Alternative Name(s)**

US National Institutes of Health, Institutos Nacionales de la Salud, NIH, USNIH

**Funding Body Type**

Government organisation

**Funding Body Subtype**

National government

**Location**

United States of America

**Funder Name**

Stanford University

**Alternative Name(s)**

Stanford, Leland Stanford Junior University, SU

**Funding Body Type**

Government organisation

**Funding Body Subtype**

Universities (academic only)

**Location**

United States of America

## **Results and Publications**

**Individual participant data (IPD) sharing plan**

**IPD sharing plan summary**