Anemia, poor health, and socioeconomic status among older adults in the Study on global AGEing and adult health (SAGE)

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Introduction

- Anemia affects major portions of the population in many low- and middle-income countries
- SES has not been linked to anemia despite the impact of diet, however it has been linked to heart disease and diabetes
- Previous SAGE studies on health-related biomarkers in South Africa have indicated high rates of disease
- There is limited information on anemia prevalence and its determinants in older adults in low- and middle-income countries, and the present study addresses this knowledge gap

SAGE

- WHO's SAGE: Study on Global AGEing and Adult Health Longitudinal study of determinants of aging in 6 middle-income countries: China, Mexico, Russia, Ghana, South Africa, and India
- Health biomarkers, including hemoglobin, were collected on a subset of participants in China, Mexico, and South Africa

Objectives & Hypotheses

- Describe the anemia rates for 14,848 adults 50 years and older in South Africa, China, and Mexico
- Investigate the association between anemia and SES in the three countries
- **Hypothesis 1:** Lower individual wealth will be associated with greater anemia
- **Hypothesis 2**: Lower education levels will be associated with greater anemia

Methods

Participants

- China: 5,072 men and 5,539 women; Mexico: 774 men and 1,253 women; South Africa: 923 men and 1287 women
- Age =50-99, $M = 64.79$, $SD = 9.3$,
- Years of education: $M = 5.25$, $SD = 4.4$

Variables

- Hb: Finger-prick (China) or arterial (Mexico) blood biomarkers, spotted onto filter paper, analyzed using ELISA
- Anemia cut-offs: Men= 13 g/dL, Women= 12 g/dL (WHO, 2011)
- Health: Self-report question, *"In general, how would you rate your health today?"*; 1 to 5, with 1 being *"very good"* and 5 being *"very bad"*
- Wealth: A composite of various aspects such as income, assets, valuable housing characteristics which would be of monetary value

Results

Percentage of Population with Anemia
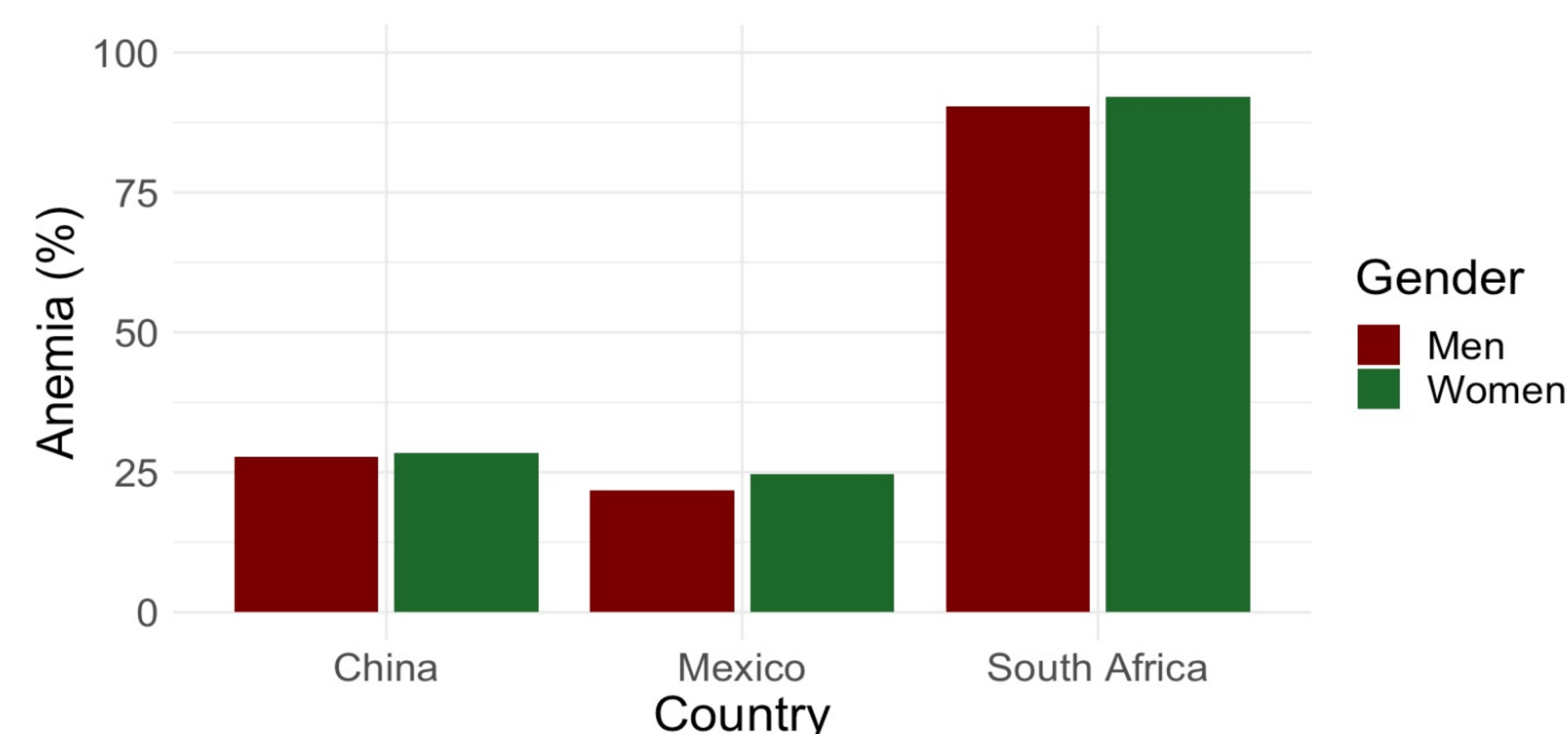
Binary Logistic Regression Odds Ratios Predicting Anemia

	China		Mexico		South Africa	
	OR	*p*	*OR*	*p*	*OR*	*p*
Age	1.00	.42	**1.03**	**<.001**	1.00	.62
Gender	**0.83**	**<.001**	1.12	.34	1.27	.14
Marriage	0.93	.18	1.03	.81	0.93	.30
Urban/rural	**0.32**	**<.001**	0.97	.78	1.13	.50
Wealth	**0.86**	**.007**	**0.62**	**.001**	**0.68**	**.03**
Education	**0.92**	**<.001**	1.07	.66	1.02	.43
Health	**1.09**	**.003**	0.99	.36	1.17	.12

Note. Gender: 1 men, 2 women, Health: 1 good health, 5 poor health, Urban/Rural: 1 urban, 2 rural

Key Findings

- The rates of anemia were 28%, 24%, and 91% in China, Mexico, and South Africa, respectively
- **Hypothesis 1:** Low wealth predicted the presence of anemia in all countries
- **Hypothesis 2**: Low education predicted the presence of anemia in China, but not in Mexico or South Africa

Discussion

- Rates of anemia in older adults in these three countries are of moderate to high public health significance (WHO, 2011). The public health significance of Anemia in South Africa is very high
- Education, age and gender, urban v rural, income and self-rated health all significantly affected anemia rate
- One reason for the increased anemia rate in South Africa is the prevalence of HIV and the national representation of the data
- However, significant variables predicting anemia rates differ depending on the country
  - In South Africa income is the only variable significantly impacting anemia
  - Income and age significantly impact anemia rates in Mexico
  - Gender, urban/rural, income, self-rated health, and education all significantly impact anemia rates in China

Acknowledgments