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

**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 1,287 women
  - Age =50-99, M = 64.79 \( \pm \) 9.3
  - Years of education: M = 5.25 \( \pm \) 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

**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

**Results**

**Percentage of Population with Anemia**

**Binary Logistic Regression Odds Ratios Predicting Anemia**

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<tr>
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<th>South Africa</th>
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<td>Age</td>
<td>1.00 (.42)</td>
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<tr>
<td>Gender</td>
<td>0.83 (&lt;.001)</td>
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Note: Gender: 1 men, 2 women; Health: 1 good health, 5 poor health, Urban/Rural: 1 urban, 2 rural

**Acknowledgments**

This study would not be possible without:
- Funding: Support for SAGE was provided by the US National Institute on Aging through interagency agreements (OGHA 04034785, YA1323-08-CN-0020, and Y1-AG-1005-01) and through research grants (R01-AO034479 and R21-AO034263)
- The participants, the in-country SAGE staffs, Paul Kowal, Nimla Naidoo, and Somnath Chatterji

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