

論文の内容の要旨

論文題目 Changes, risk factors and inequalities in child malnutrition in Central Asian countries: national and sub-national level analysis

(中央アジア諸国における小児栄養不良の変化とリスク要因および格差に関する研究：国および地方レベルの分析)

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Introduction

Malnutrition, which includes stunting, wasting, underweight and overweight, in the Central Asian region is a major public health challenge. Investigation of malnutrition in under-5 children and other issues remains difficult due to existing barriers including the lack of data, as well as language barriers. According to existing literature the number of children who are stunted is continuously decreasing in Central Asian region due to governmental commitments to address malnutrition. However, malnutrition in under-5 children remains a challenge for some of the countries in the region. For example, in Tajikistan the prevalence of stunting in under-5 children is still more than 20% and risk of becoming stunted is still high.

The objectives of this study are: (1) to examine the prevalence of malnutrition in under-5 children within and between the countries in the countries of Central Asia; (2) to identify risk factors of malnutrition in under-5 children in the region; (3) to estimate adjusted prevalence to the underlying risk factors across the regions of the countries to

assess the regional variations that were not explained by the risk factors; and (4) to investigate the socioeconomic inequalities in malnutrition in under-5 children in the countries.

Methods: The study used data from children under the age of 5 years in the Multiple Indicator Cluster Survey (MICS) and Demographic and Health Survey (DHS) datasets for Kazakhstan, Kyrgyzstan, Turkmenistan and Tajikistan from 2005-2006 (n=13,530) and 2014-2017 (n=19,412). Data on Uzbekistan was not available. First, the prevalence of each type of malnutrition (stunting, wasting, underweight and overweight) was estimated for the entire region, and in each country at the national and sub-national levels separately in 2005-2006 and 2014-2017. Next, multivariate logistic regression analysis was performed to identify the risk factors of each type of malnutrition for the Central Asian region. Based on the regression models, the adjusted prevalence of malnutrition was estimated for assessment of regional variations that could be attributed to risk factors. Finally, concentration curves were constructed to explore the nature of socioeconomic inequalities for each type of malnutrition for the Central Asian region and for each country.

Results: Between 2005-2006 and 2014-2017, the prevalence of malnutrition among under-5 children in the Central Asian region decreased from 22.7% to 12.8% for stunting ($p < 0.05$: chi-squared test), from 5.9% to 4.0% for wasting ($p < 0.05$), from 8.0% to 4.2% for underweight ($p < 0.05$) and from 10.5% to 6.3% for overweight ($p < 0.05$). This reduction in prevalence was consistent across countries; however, in Turkmenistan, prevalence of overweight increased from 4.5% to 5.9% ($p < 0.05$). The highest prevalence

of undernutrition was found in Tajikistan, specifically the prevalence of stunting and underweight was, respectively, 17.6% and 7.6% in 2014-2017. Several risk factors of each type of malnutrition in under-5 children in the Central Asian region were identified. For example, older children were more likely to be stunted while younger children were more likely to be wasted and underweight, after adjustment for covariates. Children who had mothers with no, primary or secondary education had significantly ($p < 0.01$) higher odds of being stunted and children from poorest households had higher odds of being stunted and children from rural areas had lower odds of being stunted. After adjusting for the risk factors identified in the multivariate logistic regression model, the adjusted prevalence of malnutrition for 2014-2017 varied among sub-national regions within each country. For example, prevalence of stunting varied from 2.2% to 11.2% across sub-national regions in Kazakhstan and from 7.0% to 20.4% in Kyrgyzstan. The largest regional variations in prevalence of wasting were found in Kyrgyzstan, where prevalence of wasting varied from 0.8% to 6.9% across regions. Largest regional variations in overweight were found in Turkmenistan (2.1%-14.1%). Socioeconomic inequalities were present in stunting and were concentrated to the poor population; the magnitude of inequalities in stunting remained largely similar in 2014-2017 vs. 2005-2006. Socioeconomic inequalities in wasting were found only in Tajikistan with inequalities in wasting concentrated to the richer population in 2014-2017. In 2005-2006, there were no socioeconomic inequalities identified in overweight in under-5 children. However, in 2014-2017, overweight tended to be concentrated to the richer population.

Conclusion: Between 2005-2006 and 2014-2017, there was an overall reduction in the prevalence of malnutrition among under-5 children in the Central Asian region. However,

in Turkmenistan, prevalence of overweight increased. The major risk factor was child age for all malnutrition conditions, while area of residence and level of mother's education were also important risk factors for stunting. Even after adjusting for the identified risk factors, regional variations in the prevalence across sub-national regions within countries remained. Although prevalence of malnutrition among under-5 children decreased in the last decade, socioeconomic inequalities persisted, suggesting that socioeconomic status of the households is an important aspect to consider when designing interventions aiming to improve nutritional status among children.

Implications: This study suggest that major efforts should be directed to combat malnutrition among under-5 children, specifically undernutrition, in Tajikistan which pulls down the average prevalence of the Central Asian region due to high prevalence rates of malnutrition. Scaling up nutrition interventions should target the most vulnerable groups of populations, such as older children for stunting condition, younger children for wasting and underweight conditions, children with mothers who have no, primary or secondary education for stunting condition and poor households. Existing regional variations unexplained by risk factors investigated suggest the necessity to research other factors such as environmental conditions and infrastructural development in order to be able to address the issue of malnutrition itself as well as regional variations in under-5 children more effective. Existing socioeconomic inequalities in malnutrition also suggest the importance of targeting interventions to poor populations. However, in Tajikistan, efforts in reducing socioeconomic inequalities in wasting should be concentrated to the richer populations and regions.