

**Changing Income and Consumption
Patterns of Asian Population :
Comparative Analysis of Household Survey Data
in China, India, Korea, and Nepal**

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Asian Population Forum 2016
Gucun Park Hotel, Shanghai
Oct 9-12, 2016

Motivation

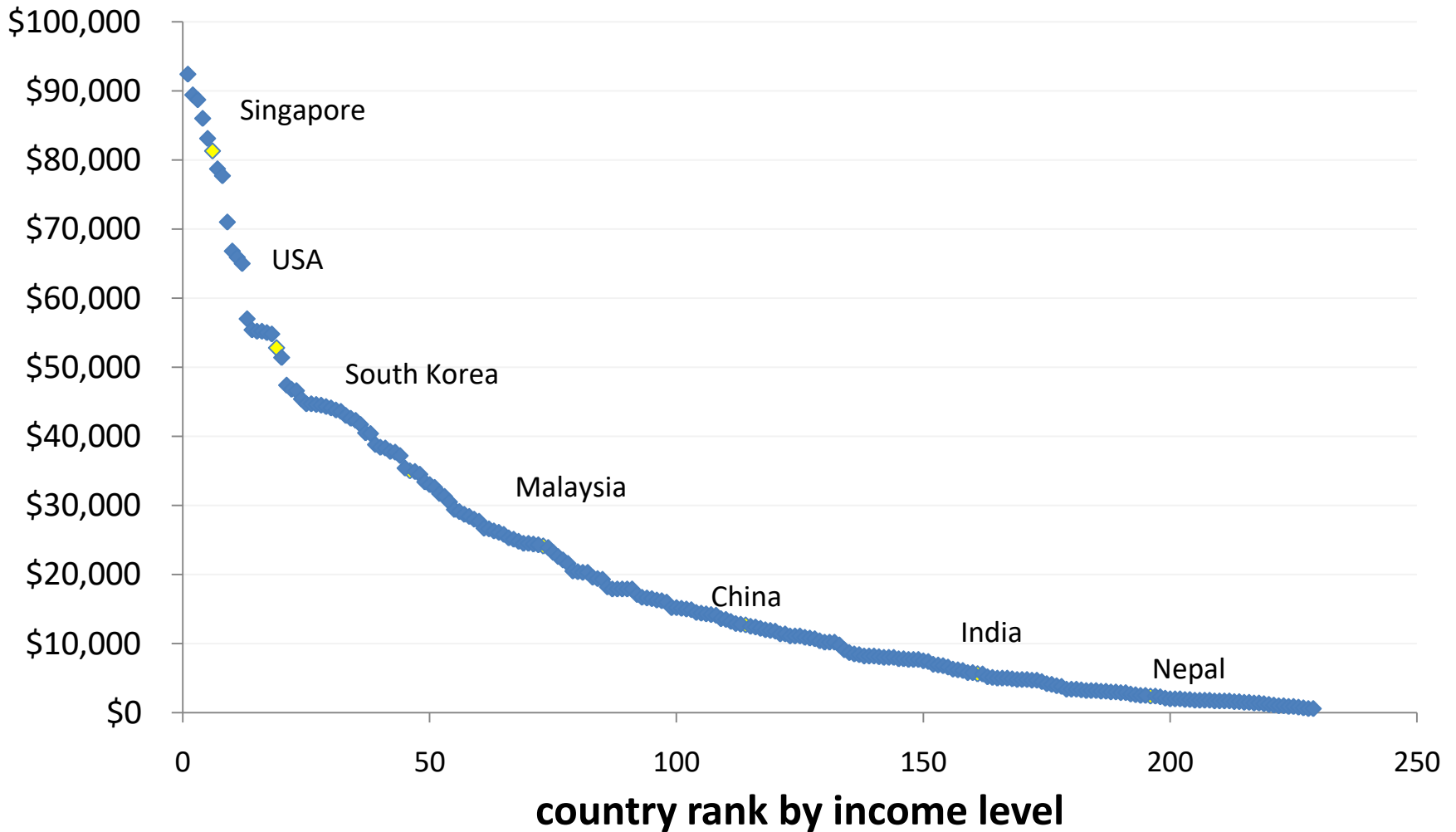
- Changes in consumption patterns affect resource use and climate change mitigation
- Variations in household consumption patterns are influenced by income level and demographic characteristics

Motivation

- Why four Asian countries
 - Control for the other factors (e.g. culture, geography, race) than income level and stage of demographic transition
 - Similar culture, but differ by income and urbanization level and demographic transition

Motivation

Comparison of GDP/cap
data source: World Bank Factbook (2010)



Motivation

- Aim to understand and model future changes in household consumption patterns with economic growth and demographic changes

Data sources: four National Household Surveys

- Nepal Living Standard Survey(NLSS)- 2003/2004
-- 4,008 households surveyed in two stages
- India National Sample Survey(NSS)- 2011/2012
-- 101,651 households surveyed in four stages
- China Family Panel Studies (CFPS)- 2010
--14,960 households surveyed in three stages
- Korea Household Income and Expenditure Survey- 2012
--10,401 households surveyed in three stages

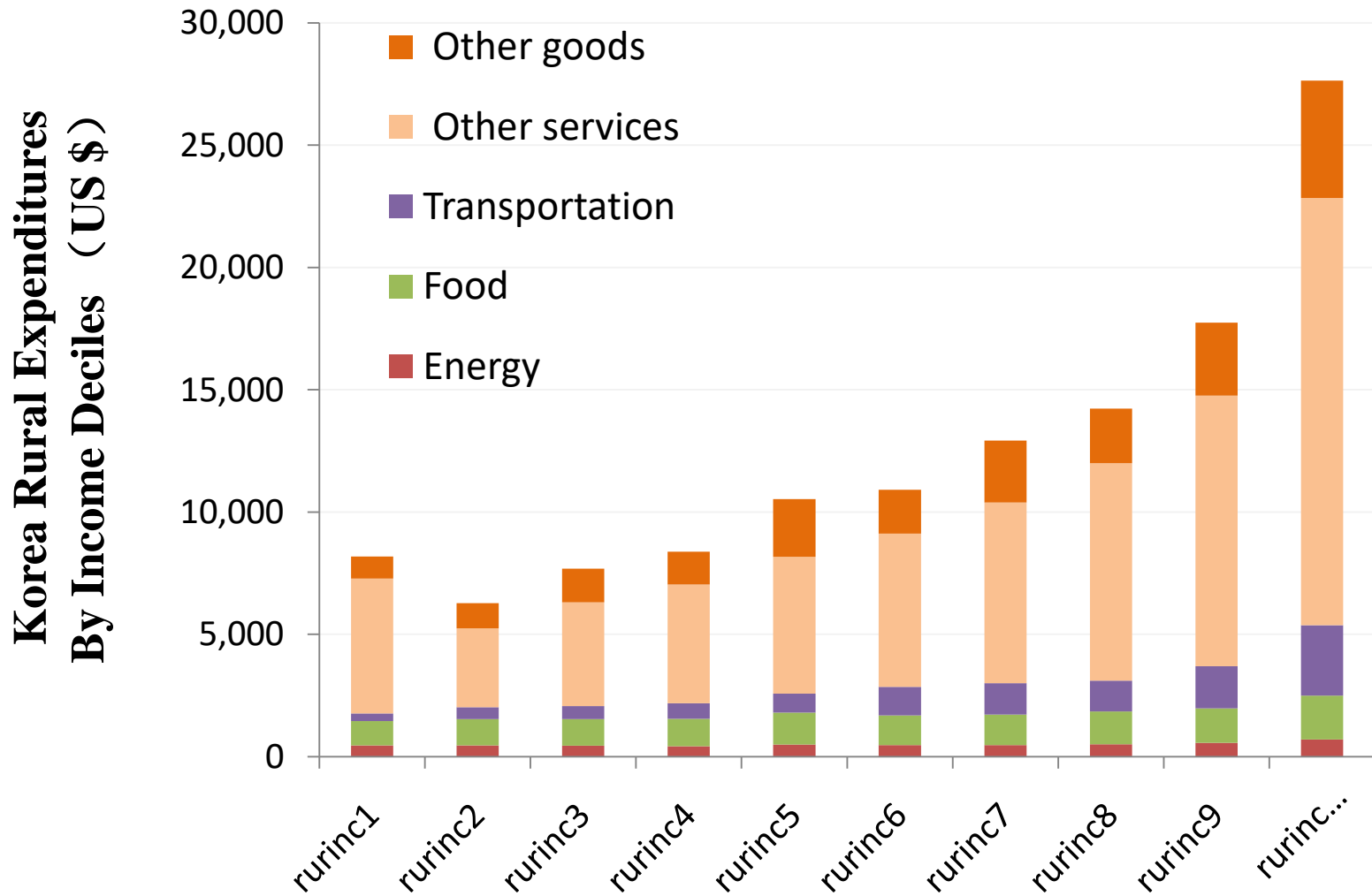
Primary Variables of Interest

Energy	Food	Transportation	Other services	Other goods
ELECTRICITY	RICE	TRANSP FUELS	MEDIC CARE	CLOTHING
NATURAL GAS	TOTAL CROPS	TRANSP EQUIP	EDUCATION	HH FACILITIES
PETROLEUM PRODDUCTS	BEEF	TRANSP SERVICES	EQUIP. RENTAL	MEDICINE
COAL	FISH	TOTAL TRANSP	ENTERTAINME NT SERVICE	ELE APPLIANCES
COAL PRODUCTS	ANIMAL PRODUCTS	TOTAL TRANSPORTATION	LAUNDRY	TOTAL OTHER GOODS
BIOMASS	NON-ANIMAL PRODUCTS		TOTAL OTHER SERVICES	
TOTAL ENERGY	TOTAL FOOD			
Income		Transfer		
SALARY INCOME		TRANS INC FROM PRIVATES		
ASSET INCOME		TRANS INC FROM GOVERNMENT		
NONMONETARY INCOME				
TOTAL INCOME				

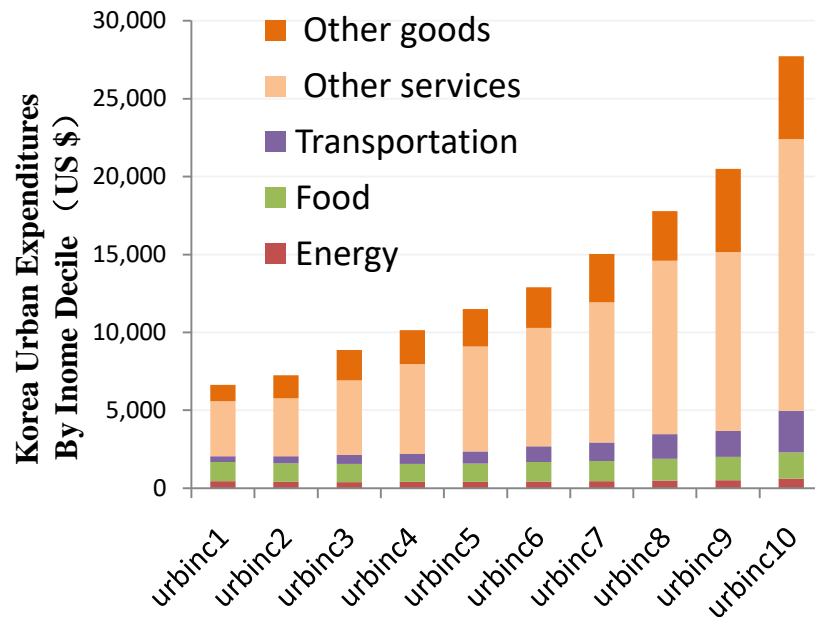
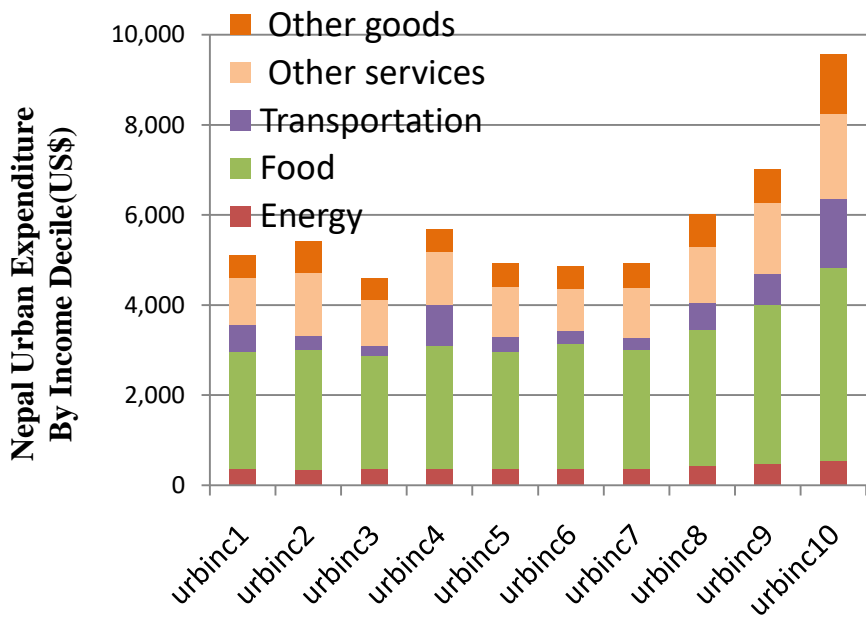
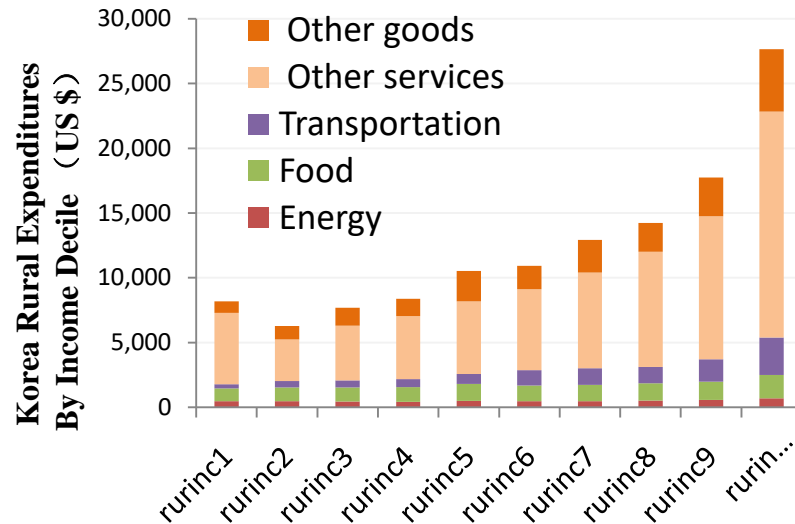
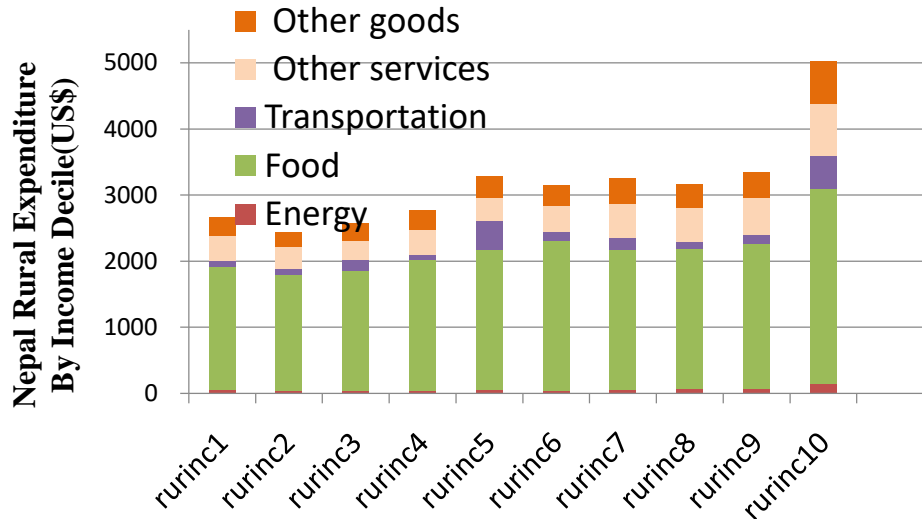
Influence on expenditure patterns of income and demographic variables

- Income effect
- Impact of demographic variables
 - urban/rural classification, household size, education, age.

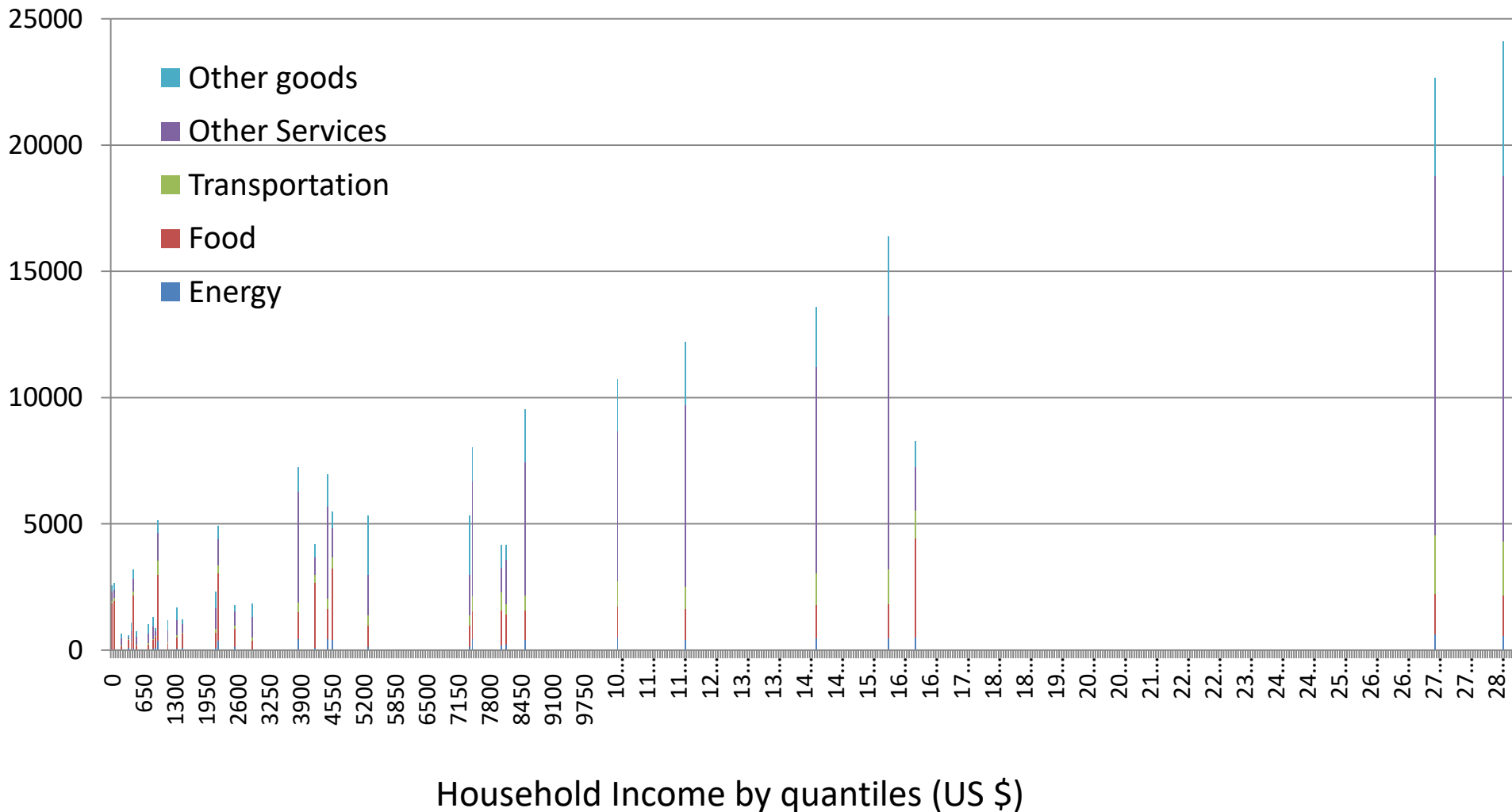
Expenditure of rural/urban households by income deciles



Expenditure of rural/urban households by income deciles

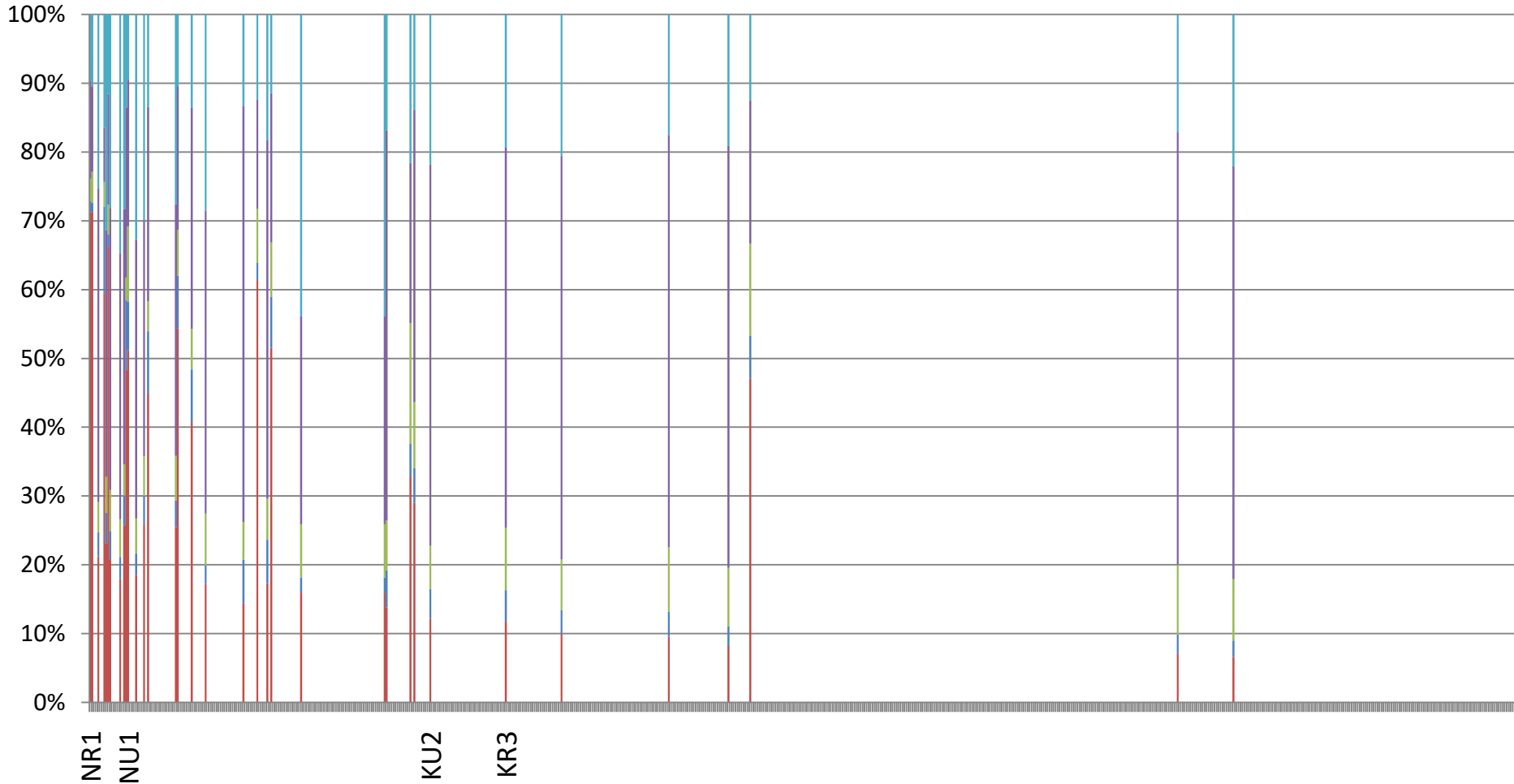


Expenditure by types of goods and services among rural/urban households by income quantiles(US \$)



Expenditure proportion of households by urban/rural income quantiles (%)

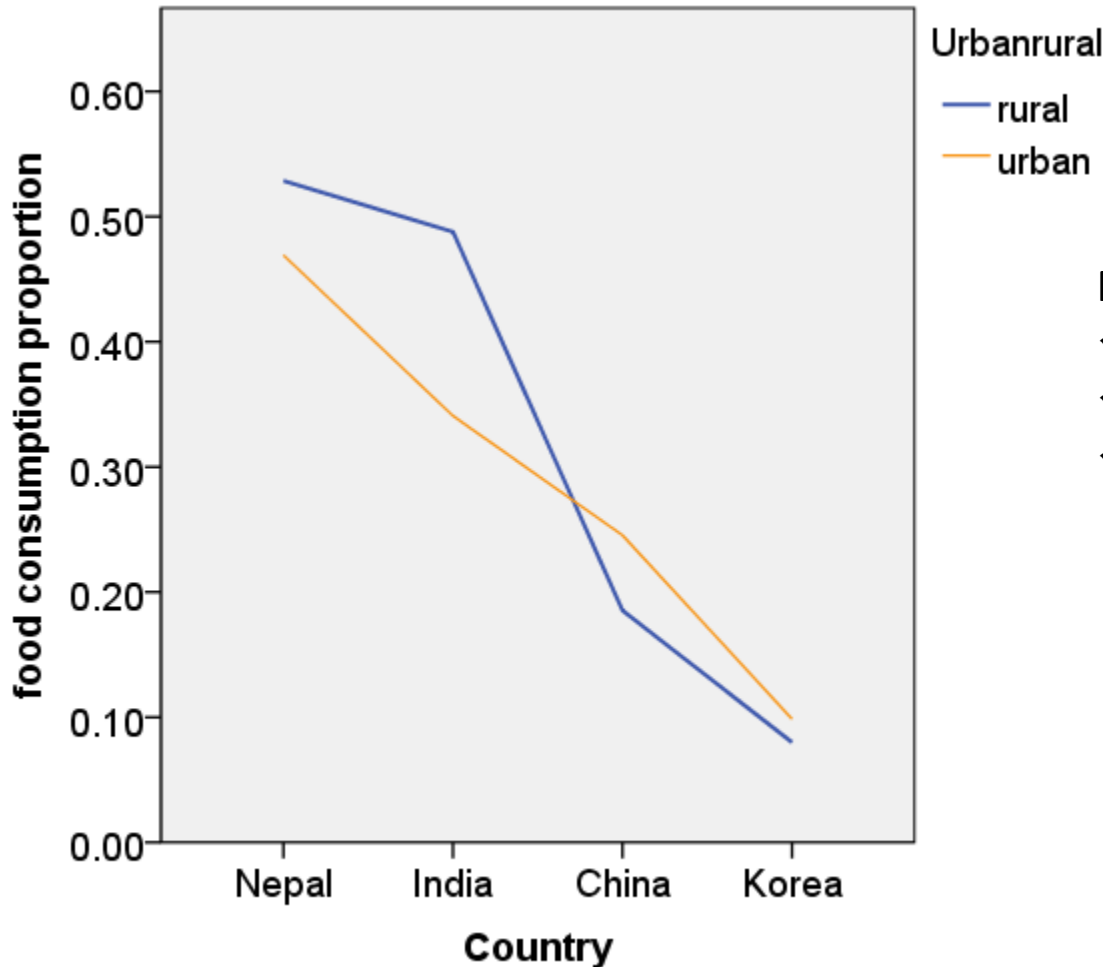
■ Food ■ Energy ■ Transportation ■ Other Services ■ Other goods



Income quantile groups of the four Asian Countries

Proportion of consumption by urban & rural classification

Food consumption proportion

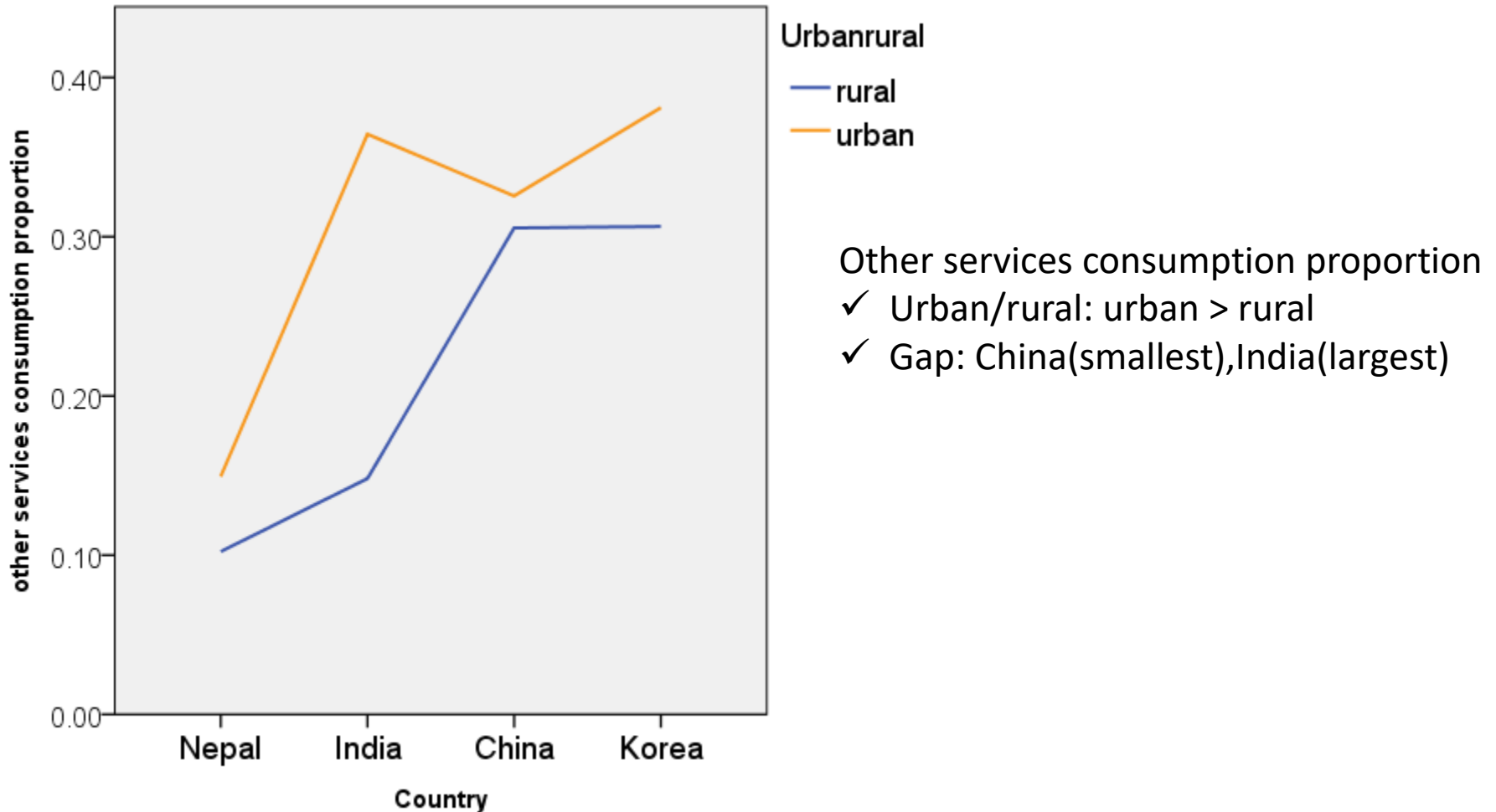


Food consumption proportion

- ✓ Nepal, India: rural > urban
- ✓ China, Korea: urban > rural
- ✓ Gap: Korea(smallest),India(largest)

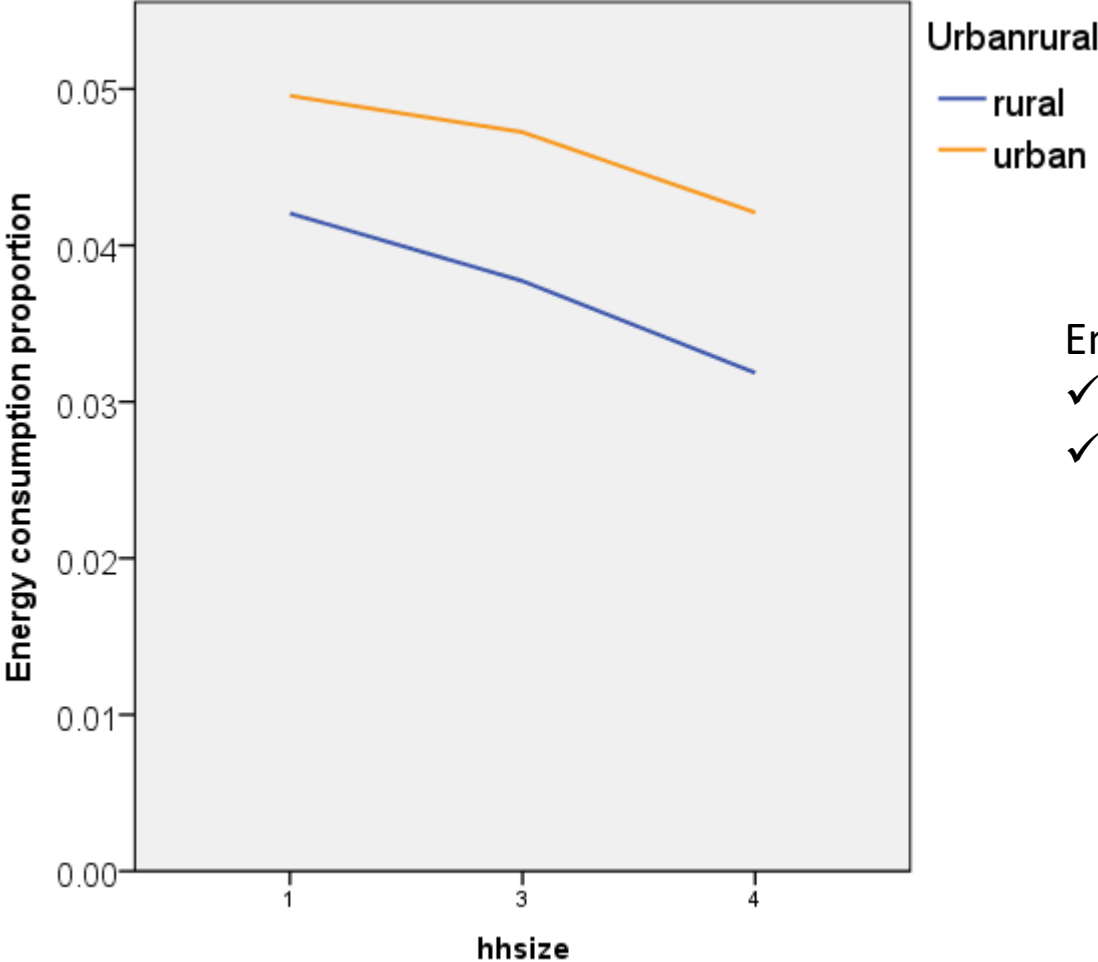
Proportion of consumption by urban & rural classification

other services consumption proportion



Proportion of consumption by household size

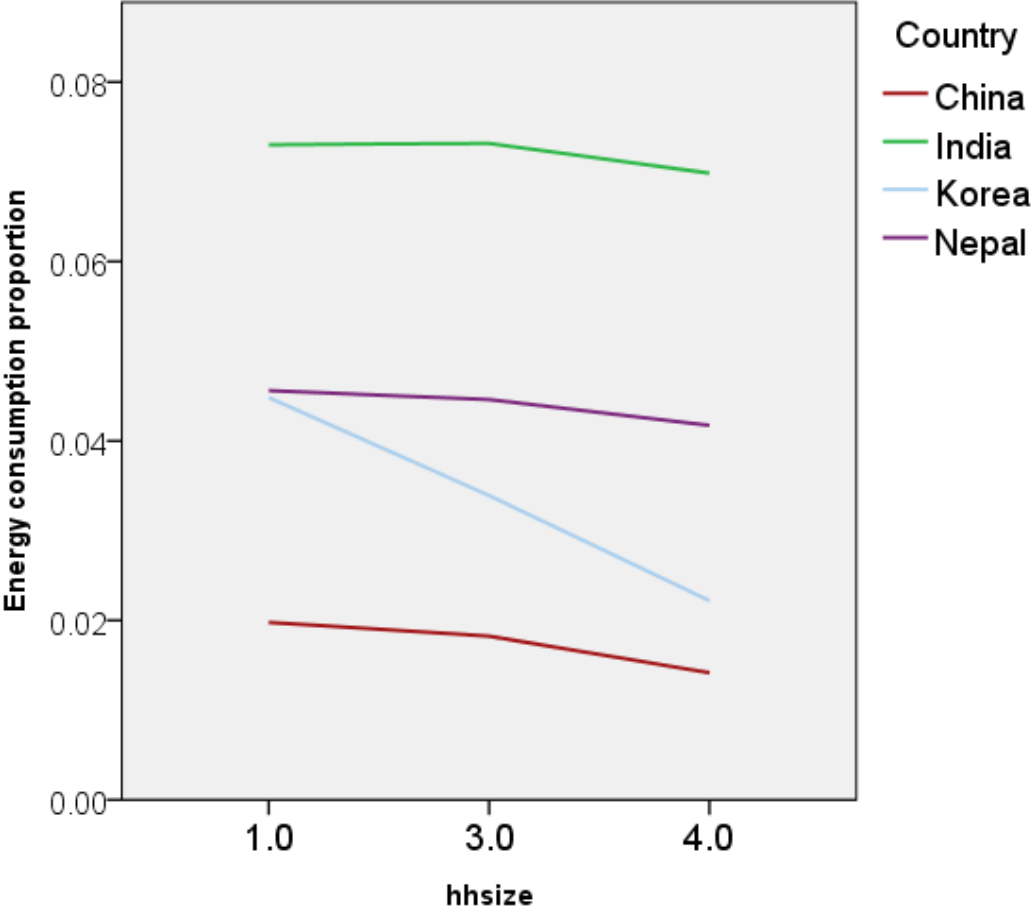
Energy consumption proportion



- Energy consumption proportion
- ✓ Urban/rural: urban > rural
- ✓ Household size: negative effect

Proportion of consumption by household size

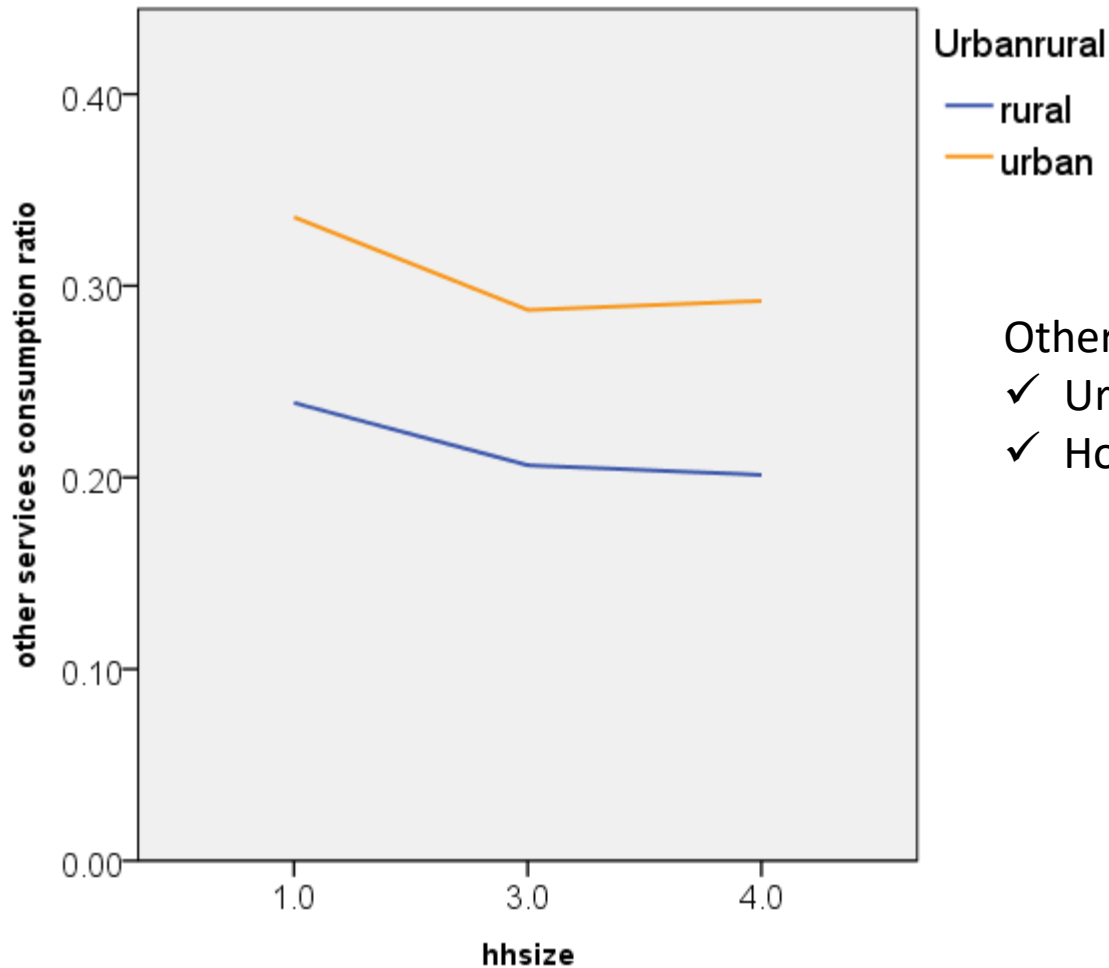
Energy consumption proportion



Energy consumption proportion
✓ Household size: negative effect

Proportion of consumption by household size

other services consumption proportion



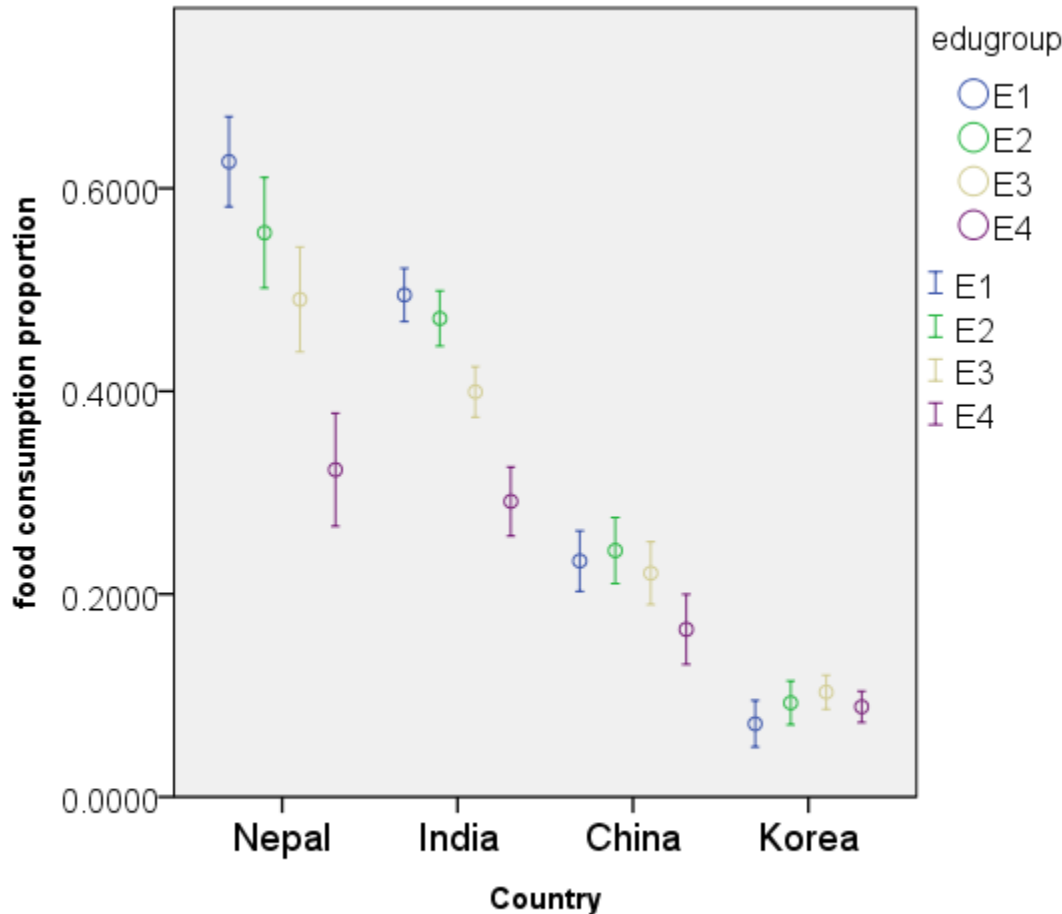
Other services consumption proportion

✓ Urban/rural: urban > rural

✓ Household size: negative effect

Proportion of consumption by education

Food consumption proportion

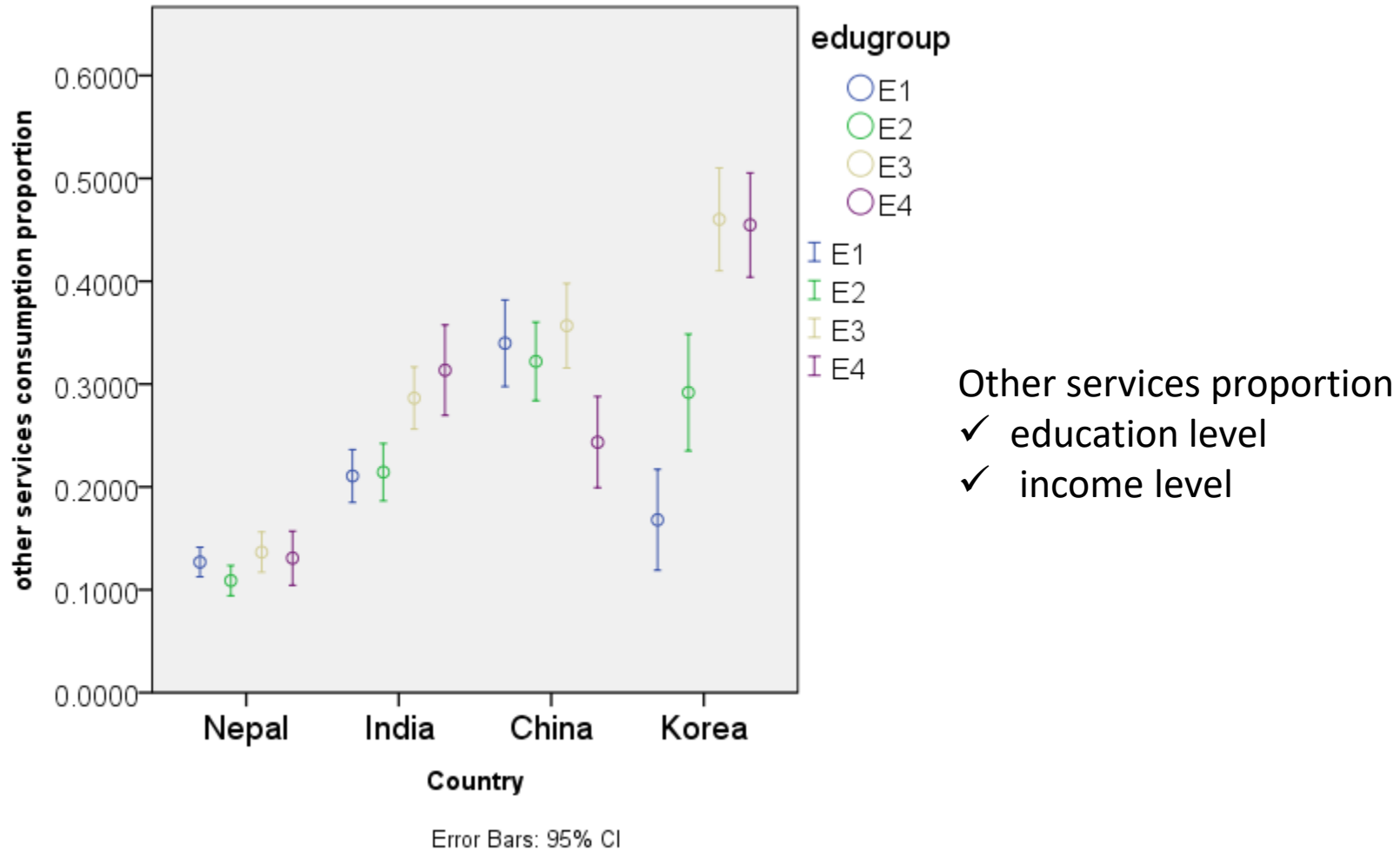


Error Bars: 95% CI

Food consumption proportion
✓ education level,
✓ income level

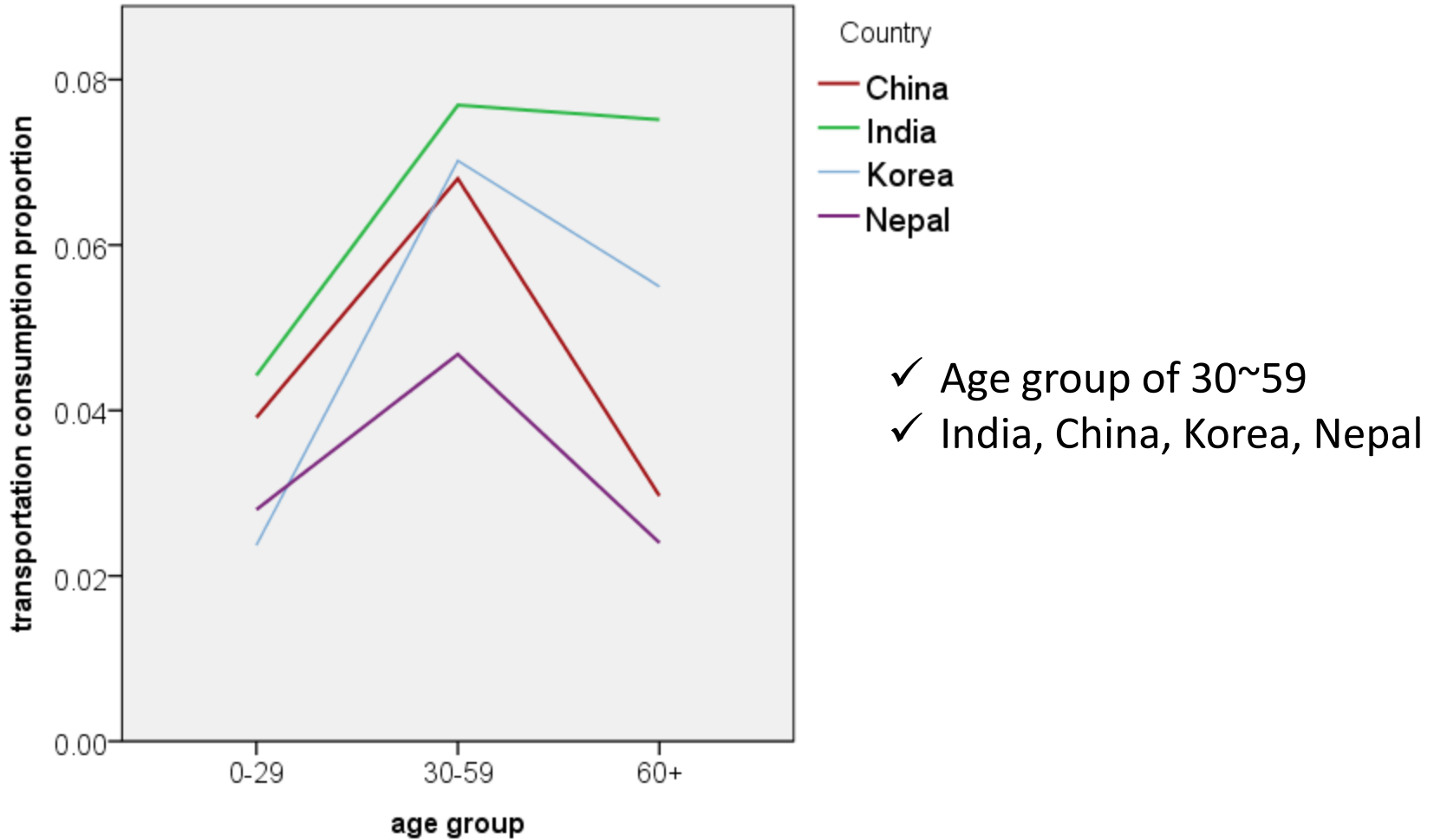
Proportion of consumption by education

Other Services



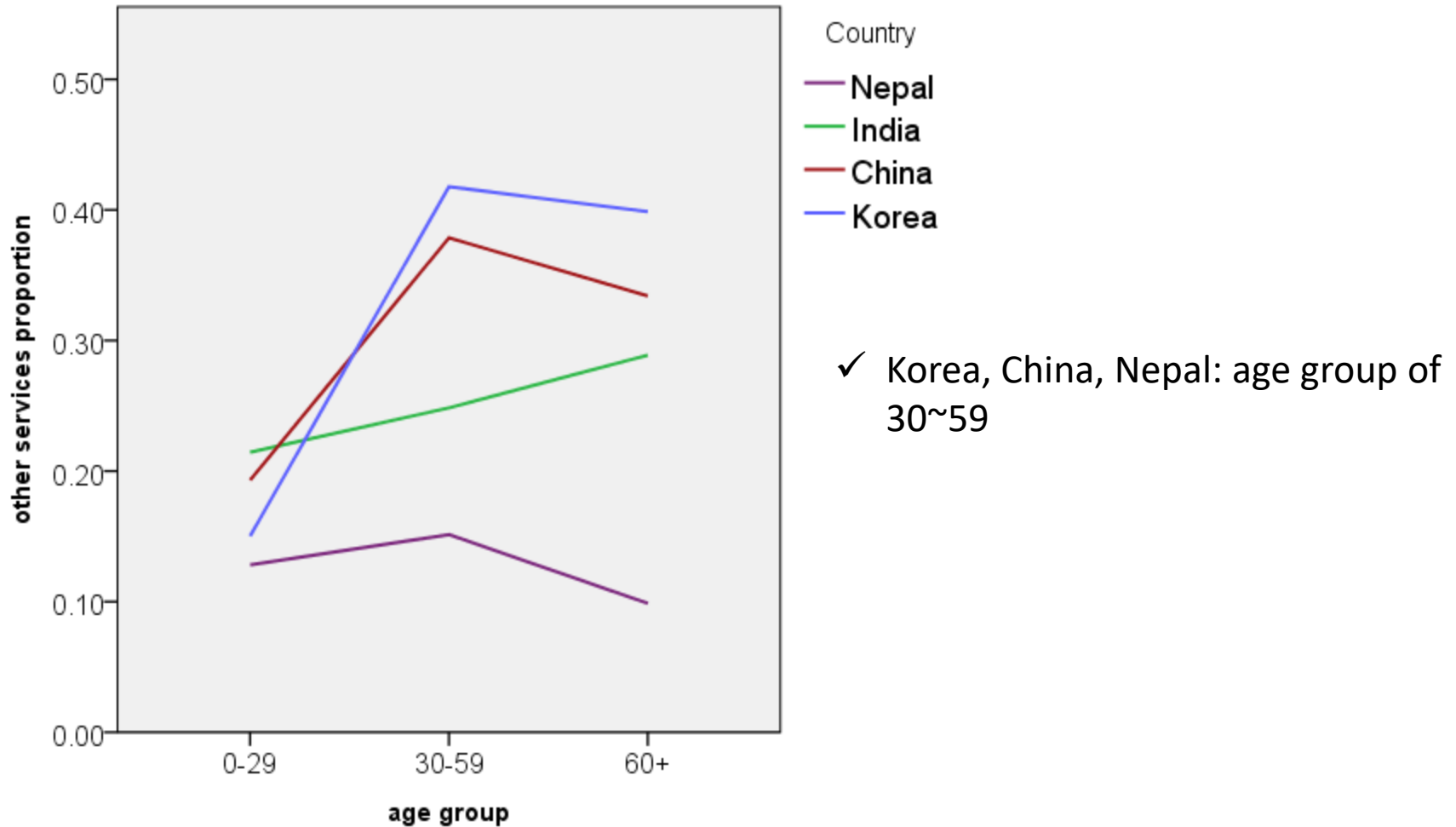
Proportion of consumption by age

Transportation consumption proportion



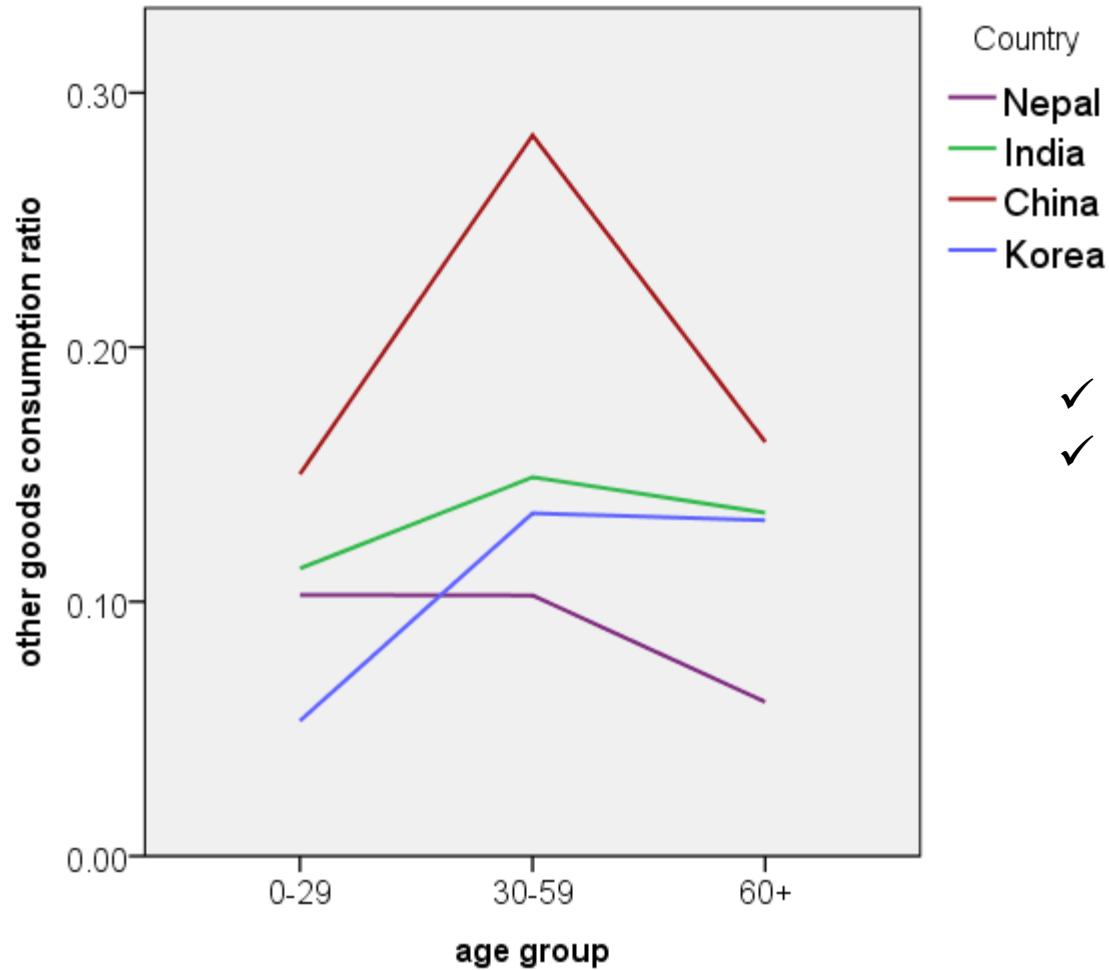
Proportion of consumption by age

Other Services consumption proportion



Proportion of consumption by age

Other goods consumption proportion



- ✓ China: largest share
- ✓ Age group of 30~59

Generalized Linear Model Analysis

Parameter	Food		Energy		Transportation		Other goods		Other services	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.
(Intercept)	0.763	0.000	0.044	0.000	-0.006	0.637	0.166	0.000	0.098	0.000
[Country=China]	-0.393	0.000	-0.040	0.000	0.005	0.204	0.196	0.000	0.120	0.000
[Country=India]	-0.236	0.000	0.021	0.000	0.043	0.000	0.122	0.000	0.034	0.000
[Country=Korea]	-0.426	0.000	-0.008	0.008	0.021	0.000	0.356	0.000	0.070	0.000
[Country=Nepal]										
[Urbanrural=rural]	0.052	0.000	-0.008	0.000	0.005	0.090	-0.087	0.000	0.008	0.205
[Urbanrural=urban]										
[edugroup=E1]	0.087	0.000	0.012	0.000	-0.023	0.000	-0.044	0.001	-0.014	0.147
[edugroup=E2]	0.078	0.000	0.013	0.000	-0.019	0.000	-0.038	0.002	-0.002	0.823
[edugroup=E3]	0.041	0.000	0.005	0.046	-0.007	0.063	0.001	0.930	-0.001	0.883
[edugroup=E4]										
[hhsized=1]	0.013	0.069	0.006	0.003	-0.012	0.000	0.003	0.746	-0.030	0.000
[hhsized=3]	0.010	0.170	0.007	0.000	-0.002	0.513	-0.010	0.314	-0.006	0.372
[hhsized=4]										
[age3gp=1.00]	-0.042	0.000	-0.010	0.000	-0.001	0.866	-0.022	0.055	0.022	0.011
[age3gp=2.00]	-0.017	0.009	-0.011	0.000	0.012	0.000	0.006	0.506	0.032	0.000
[age3gp=3.00]										
lginc	-0.028	0.000	0.002	0.066	0.008	0.000	0.008	0.051	0.001	0.830
Maximum likelihood estimate.	0.010		0.001		0.002		0.018		0.010	

Generalized Linear Model Analysis

- Compared with Nepal, Korea, China and India households tend to spend less on food, but more on transportation and other services.
- Compared with rural households, urban households have lower food consumption proportion, but have higher expenditure proportion on energy and other goods.
- Compared with less educated householders, higher educated households consume less on food and energy. Education level influence people's choice on satisfactory needs and higher-level consumption categories.
- Compared with smaller households, larger households have higher food consumption proportion.
- Compared to younger householders, older households have more food and energy consumption share, but lower other service consumption proportion.

Conclusions

- Income levels and demographic factor equally affect consumption patterns
 - With income growth, households spend less on food and energy, but more on other service, transportation, and other goods
 - Urbanization, education expansion, shrinking household size make significant difference, not much from aging

Future work

- The association between household characteristics (e.g. by income, age, education, urbanization, household size) and consumption pattern → improvements of future emissions projections and impacts, adaptation, and vulnerability research on climate change.
- Better understanding of lifestyles and consumption behavior differences → effective GHG emissions reduction policies

Thank you!

Welcome to your comments and suggestions!

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