The 48th Asia-Pacific Academic Consortium for Public Health Conference 2016/9/17
Symposium 1 16:00-18:00 @ Teikyo University

Child poverty and child and family health in Japan : Measuring SES

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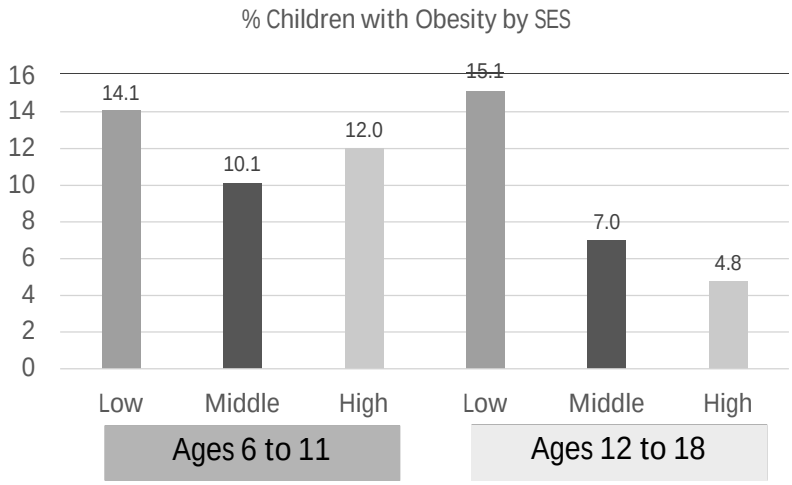
Percentage of Children with Obesity by SES (measured by household consumption 3 categories)



Source : Kachi, Otsuka & Kawada (2015) J Epidemiol 2015; 25(7): 463-469.

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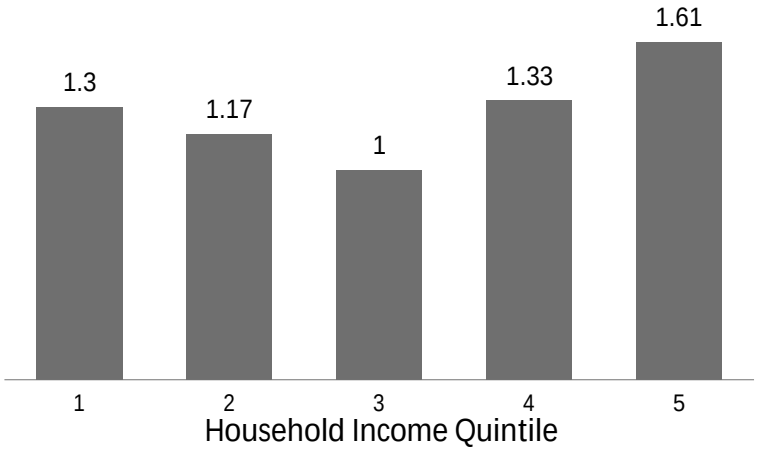
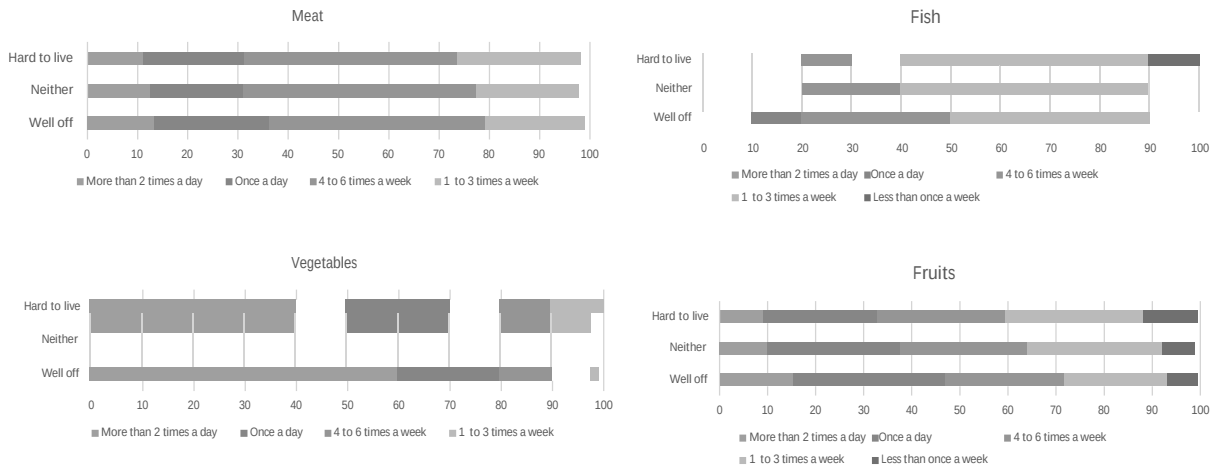
Odds Ratio of Tendency for Depression and Anxiety among Children by SES (measured by household income quintile)



Source: Kachi et al. (2016) "Socioeconomic disparities in psychological distress in a nationally representative sample of Japanese adolescents: a time trend study," Australian & New Zealand Journal of Psychiatry

Difference in Diet of 2-6 yr old children in Japan



- SES is measured by Self-rated Living Standard (5 categories from Hard to Well-off)

Data: Ministry of Health, Labor and Welfare (2016) 乳幼児栄養調査 平成27年度

Nutrition Intake of Children by SES (measured by parental income (low income vs. mid-high income))

School Days	**Non-school** days
(Lunch – school meal) None	(Lunch) • Total energy (—) * • Protein (—) *** • Fat (—) ** • Calcium (—) ** • Magnesium, Iron, Zinc, Vitamin A, Vitamin C (—) ***
(Dinner) ・Total energy intake (—) * ・Fat (—) * ・Magnesium (—) * - Vitamin A (—) **	(Dinner) • Total energy (—) ** • Protein (—) ** • Fat, Vitamin B2 (—) * • Magnesium, Fiber (—) ** • Iron (—) ***

Source : (submitted for review) Arai, Ishida, Nakanishi, Nozue, Abe, Yamamoto & Murayama

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However, the measurement of SES is problematic

- Reluctance (both government and academia) of asking about any indicator of SES (ex. income and education achievement)
- Difficulties in capturing household income correctly
  - Often categorical question is used
  - Not asking the "entire household income" (excluding non-earned income, incomes of households members)
  - Respondents not knowing exact income (especially those who are self-employed, farmers, etc.). Not capturing the monetary value of non-cash transfers.
  - Tendencies to forget transfers (e.g. child benefit etc.)

  ⇒ under-reporting of income
- Respondents' Denial to answer SES questions
  - Non-response rate can be quite high

Educational attainment or occupational status as SES is also problematic

- As more people get higher education and higher education is versified , educational attainment (e.g. high school graduates) by itself does not give much information about SES (we need to know more about schools).
- Occupational status is better, but is getting increasing harder to assess living standard by just occupational status (e.g. low-wage "regular (seiki) workers").
- Educational attainment and occupational status is especially problem for women.

the classification of SES is also problematic

- The living standard of Japanese people is not linear.
  - The living standards of most people (i.e. middle and upper SES) are not that different. However, those at the bottom suffer not being able to meet this standard.
  - Thus, treating the SES as a continuous variable does not capture inequalities.
- The cut-off for the "poor" is often not precise
  - Researchers often divide the SES into 3 classes (bottom, middle, top). The bottom SES is a mix of poor and the middle class.
  - The cut-off for the lowest strata is often too high.

Material Deprivation as an indicator for SES

- Material Deprivation (or relative deprivation (Townsend 1979)) can be used to supplement income data.
- European Union has adapted Low Income and Material deprivation as official indicators for "poverty".
- However, there is very limited data on deprivation in Japan.

Definition of "People at risk of poverty and social exclusion" by EU

Europe 2020 Strategy： Reducing those "at risk of poverty and social exclusion" by 20 million by the year 2020

Income Poverty
(>60% of median)

Material deprivation
(4 out of 9 items)

Work-less households
(those which worked less than 20% of time for all working age (20-59) household members)

1. Not being able to meet mortgage, rent, or utility bills
2. A holiday once a year
3. Protein once in 2 days
4. To be able to pay unexpected expense
5. Telephone (incl. mobile)
6. Color TV
7. Washing machine
8. Automobile
9. To be able to warm house

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Creating Material Deprivation Index

Q: Do you have (have access to) following items?

1. Yes 2. No, Can't have 3. No, Don't want

Item1 Bicycle

Item 2 Three meals a day

.....

- Following the methodology of Townsend (1979), Mack & Lansley (1985), Gordon & Pantazis (1997), Gordon(2013)

Data and Variables

Data: All (~3500) Grade 5 children (themselves + parent) in public schools in X city (Abe, to be published)

- Variables

1) Non-Possession of household items (e.g. TV, micro-wave oven, etc.)
2) Household economic stress (e.g. not being able to pay electricity bill, etc.)
3) Non-possession of child items (e.g. bicycle, books, toys, etc.)
   - 3 A) reported by parents
   - 3 B) reported by child

Finding Material Deprivation Index for Japanese children : Verification Steps (Gordon 2013)

1. Are the items relevant (to poverty) ?
2. Do they make significant combined index? (Cronbach's alpha)
3. Does the index explain health outcome?

Material deprivation : household items

	Can't afford					
	All	Non-poor	poor	χ2	p	
Washing machine	0.2%	0.09%	0.41%	2.0076	0.1565	X
Rice cooker	0.4%	0.17%	1.65%	15.4549	<.0001	***
Vacuum cleaner	0.4%	0.26%	0.41%	0.1933	0.6602	X
Air conditioner (heater)	0.4%	0.30%	0.83%	1.7284	0.1886	X
Air conditioner (cooler)	0.5%	0.39%	0.83%	0.9892	0.3199	X
Micro-wave oven	0.3%	0.17%	0.83%	4.02	0.045	**
Telephone	1.1%	0.69%	2.48%	8.2636	0.004	***
Family's own bathroom	0.3%	0.17%	0%	0.4174	0.5183	X
Bed or Futon for all members of family	3.9%	3.49%	7.85%	11.1424	0.0008	***
Saving for emergency (50,000 yen)	12.6%	10.76%	30.99%	81.0594	<.0001	***

Material deprivation : Household Economic Stress

In the past year, has your household not be able to pay [ ]	Unable to pay … in the past year					
	All	Non-poor	poor	χ2	p	
Telephone	3.8%	2.99%	11.72%	45.0457	<.0001	***
Electricity	3.2%	2.47%	9.66%	36.585	<.0001	***
Gas	3.0%	2.22%	9.28%	38.4326	<.0001	***
Water	2.8%	2.39%	7.98%	23.8823	<.0001	***
Housing rent	2.6%	2.02%	7.33%	24.2649	<.0001	***

In the past year, has your hh not be able to afford [ ] that is required?	"Often" or "Sometimes"					
	All	Non-poor	poor	χ2	p	
Food	5.9%	4.6%	16.6%	58.7585	<.0001	***
Clothes	7.4%	5.9%	20.3%	67.8486	<.0001	***

- (7 Items) Cronbach's alpha = 0.81776

Material deprivation : Lack of child necessities (by parents)

	Can't afford					
	All	Non-poor	poor	χ2	p	
Pocket money	4.7%	7.9%	24.3%	37.06	<.0001	***
New (not second hand) clothes	3.6%	2.8%	10.2%	34.64	<.0001	***
Lessons (music, sports, etc.)	6.4%	5.7%	17.5%	43.78	<.0001	***
Juku (prep schools)	14.1%	17.4%	41.7%	59.68	<.0001	***
Birthday celebration	0.8%	0.7%	2.5%	9.08	0.0026	***
Family trip once a year	14.5%	12.9%	35.5%	84.61	<.0001	***
Christmas present	1.1%	0.8%	4.2%	21.33	<.0001	***
Money for New Year's Day	2.3%	2.0%	9.9%	45.70	<.0001	***
Parents' participation in school events	0.6%	0.7%	1.7%	2.65	0.1038	X

- Cronbach's alpha = 0.7404 `Birthday present" also does not support high alpha

Lack of Cultural Experiences (answered by parents)

	Can't afford to do it					
	All	Non-poor	poor	χ2	p	
Going swimming in ocean	2.6%	1.9%	9.2%	47.30	<.0001	***
Visiting museums (art, science, etc.)	3.4%	2.6%	11.3%	49.96	<.0001	***
Camping and BBQ outdoors	4.5%	3.6%	14.7%	60.25	<.0001	***
Visiting sports events or plays	6.2%	5.4%	15.4%	36.52	<.0001	***

- Cronbach's alpha = 0.5189

Material deprivation : Lack of child necessities (answered by parents)

	Can't afford to do it					
	All	Non-poor	poor	χ2	p	
Books appropriate for age	3.6%	2.5%	10.7%	47.06	<.0001	***
Sports equipment for children	1.3%	1.0%	3.3%	9.84	0.0017	***
Place to study at home	4.1%	3.4%	10.7%	29.48	<.0001	***

- (7 Items + 4 items + 3 items = 14) Cronbach's alpha = 0.844

Material deprivation (child items) by children (1)

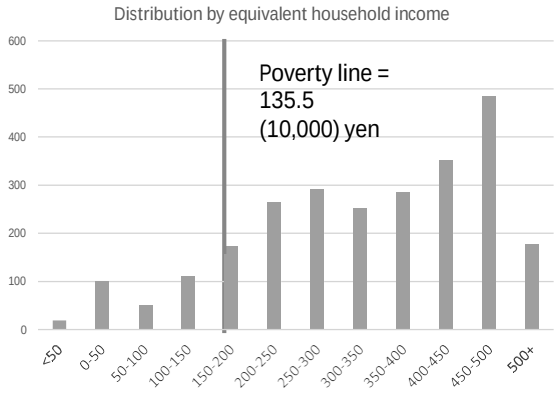
	Can't afford					
	All	Non-poor	poor	χ2	p	
Own books (exclude manga)	8.2%	7.5%	11.7%	4.39	0.0362	**
Own room (inc. with siblings)	25.7%	25.3%	29.9%	2.20	0.1382	X
Internet PC (at home)	20.1%	19.8%	22.7%	0.82	0.3655	X
Place to study (at home)	3.8%	3.5%	4.5%	0.60	0.438	X
Own study desk	17.9%	17.5%	19.1%	0.34	0.5601	X
Sports equipments (baseball, soccer etc.)	4.2%	3.9%	6.1%	2.03	0.154	X
Game machine	6.1%	5.6%	4.5%	0.46	0.4975	X

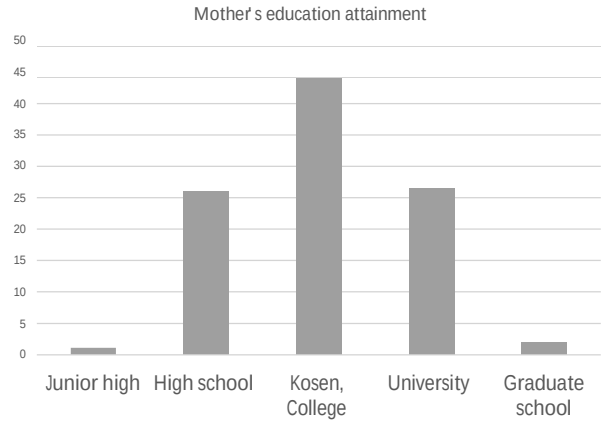
Material deprivation (child items) by children (2)

	Can't afford						
	All	Non-poor	poor	χ2	p		α
Toys that most friends have	13.2%	13.0%	14.8%	0.45	0.5013		
Bicycle	2.5%	2.2%	2.6%	0.18	0.6701		X
Pocket money	12.9%	11.9%	18.6%	7.73	0.0054	***	
Clothes like friends'	8.7%	8.5%	12.3%	2.59	0.1078		
At lest 2 fitting shoes	5.1%	5.0%	4.7%	0.037	0.8473		
Mobile phone	29.1%	29.1%	29.3%	0.0014	0.9701		
Mobile music player	62.9%	63.9%	51.5%	7.88	0.005	***	

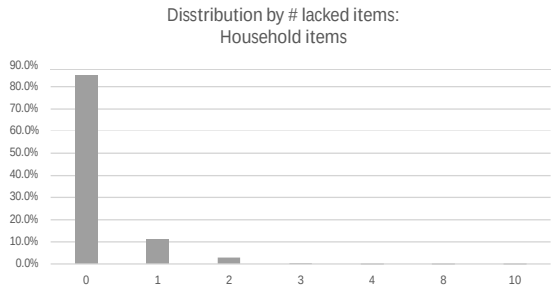
- (14 items) Cronbach's alpha = 0.662

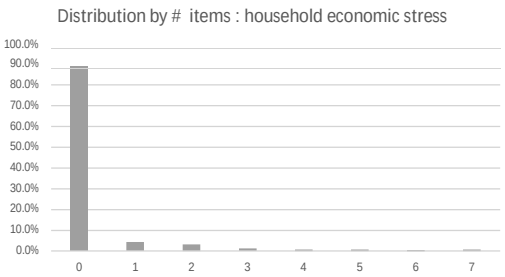
Distribution : Income and Educational attainment (mother)

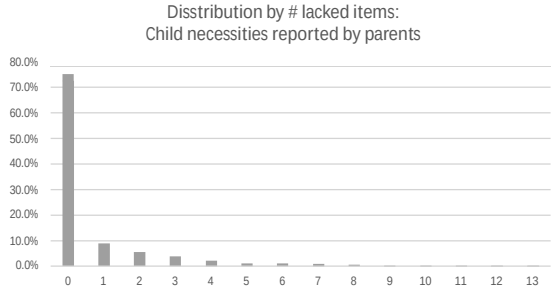


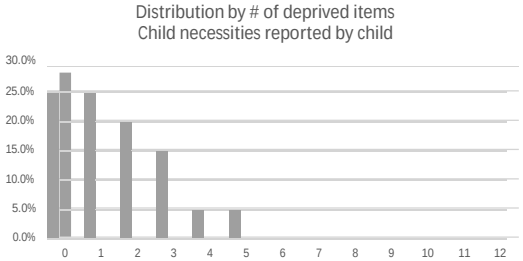


Distribution by # lacked (deprived) items

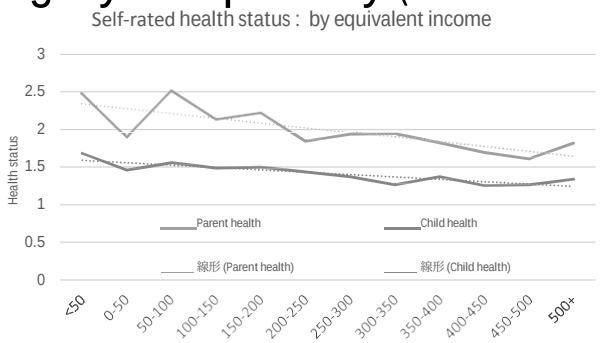


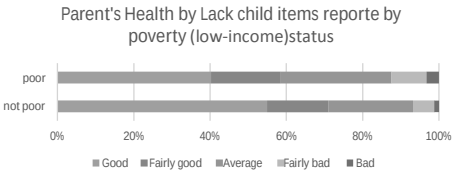


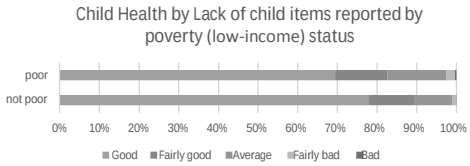




Health by :
Income category and poverty (low-income) status



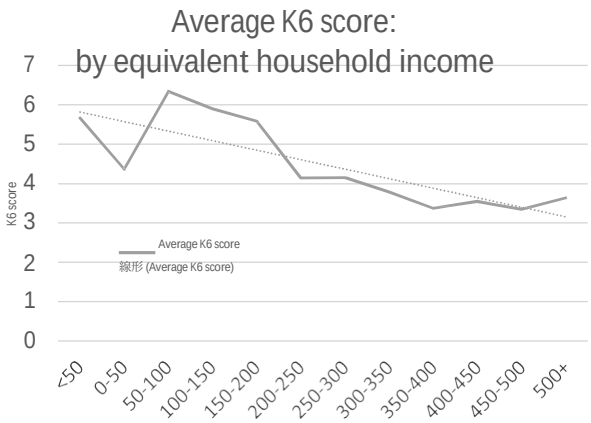


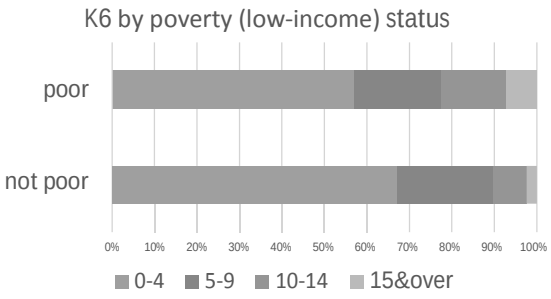


15.536 0.0037

25.3512 <.0001

K6 by:
Income category and poverty (low-income) status





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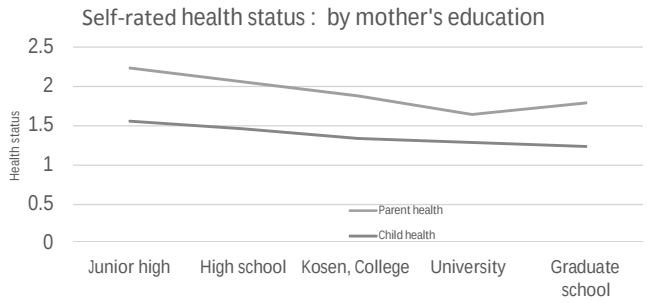
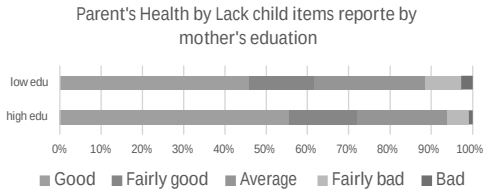
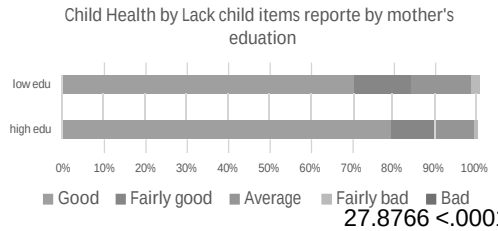
Health status by Mother's education attainment







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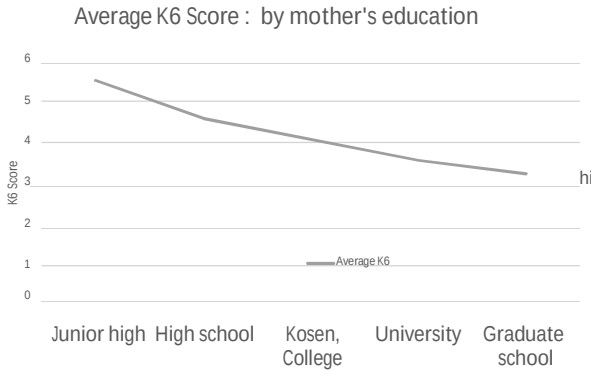
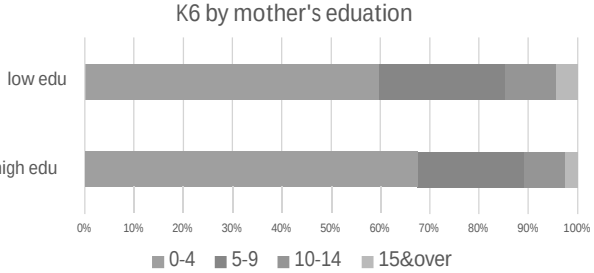
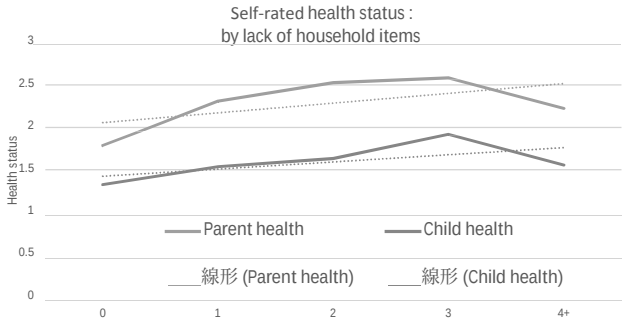
K6 by Mother's education attainment



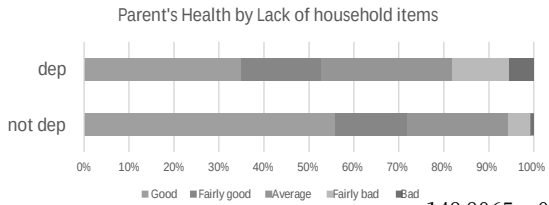


19.2953 0.0002

Health status by Lack of Household Items



Number of deprived items (out of 10 household items)



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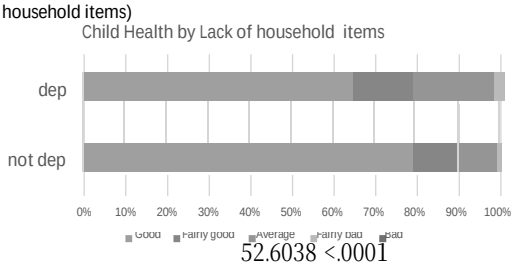

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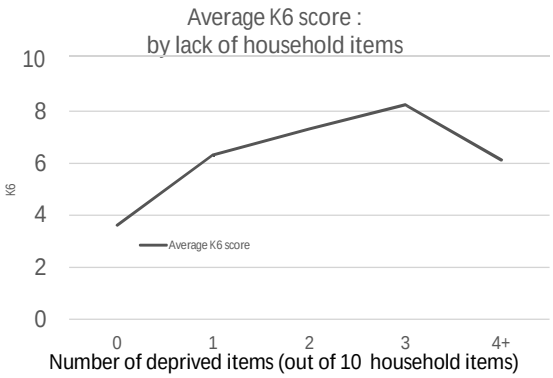
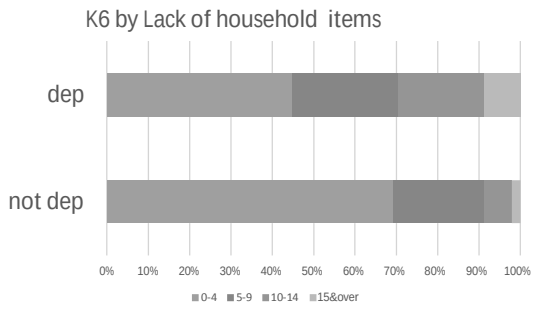
K6 by Lack of Household Items



Number of deprived items (out of 10 household items)



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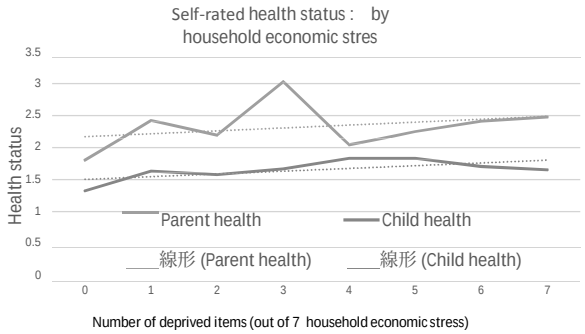
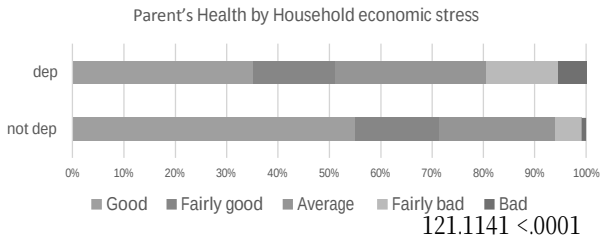
Health status by Household economic Stress





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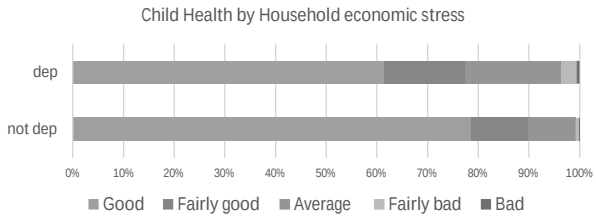

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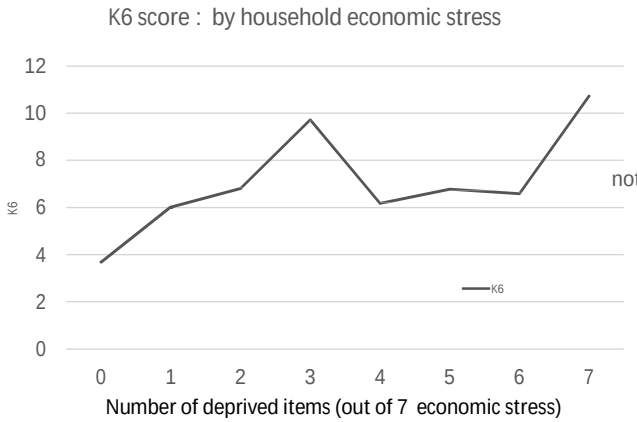
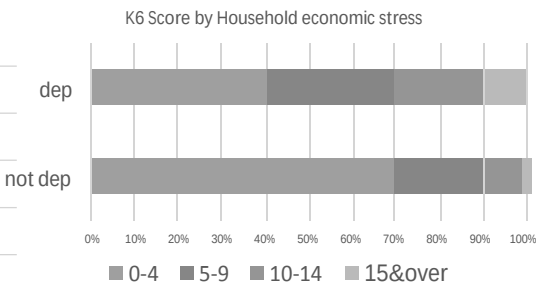
K6 by Household economic Stress





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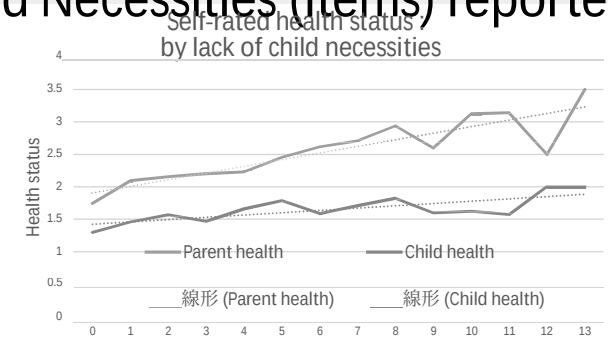
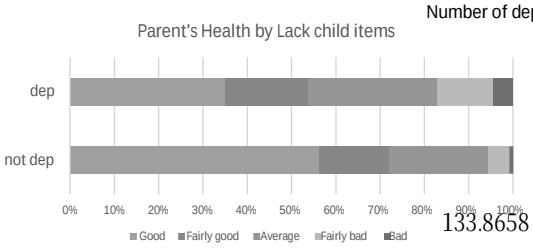
Health status by:
Lack of Child Necessities (items) reported by parents





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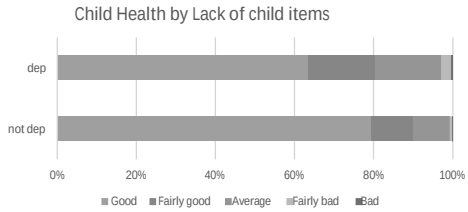

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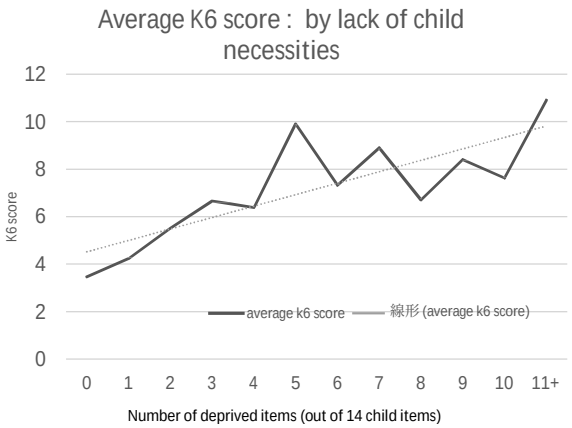
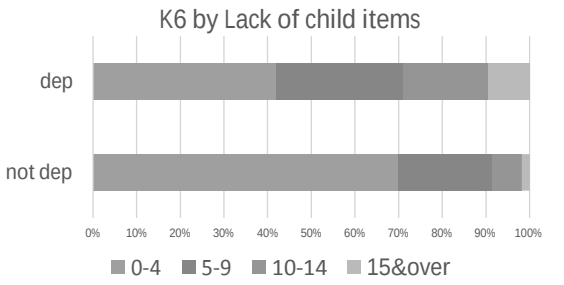
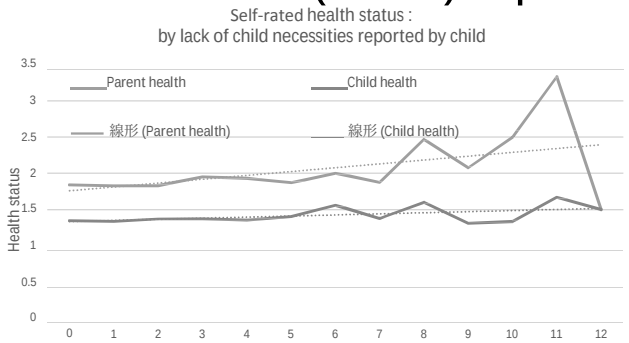
K6 by:
Lack of Child Necessities (items) reported by parents



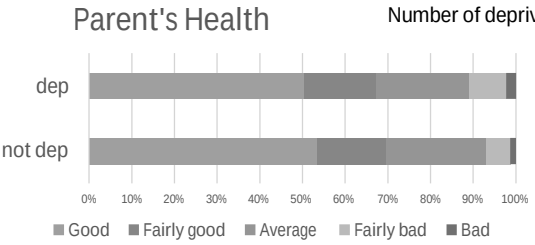


227.6503<.0001

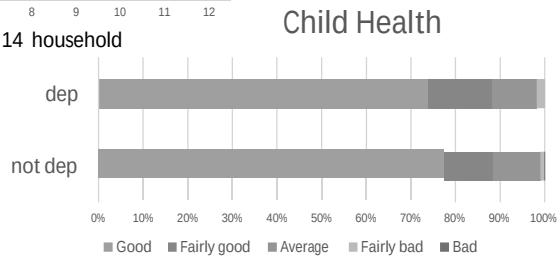
Health status by:
Lack of Child Necessities (items) reported by children



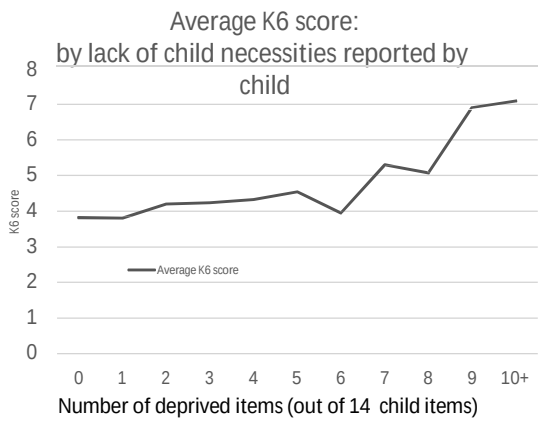
9.08 0.0591

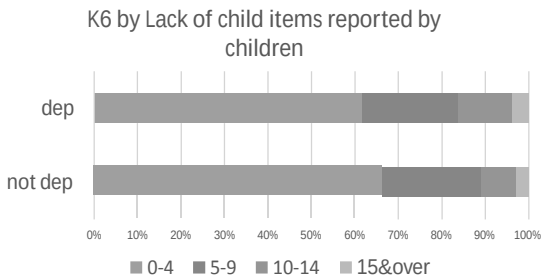


10.92 0.03



K6 by Lack of Child Necessities (items) reported by children





12.2149 0.0067

- ff

Summary

Index	%missing obs.	%sample	Parent's health χ2 of cross tabulation		Child health χ2 of cross tabulation		Parent K6 χ2 of cross tabulation	
Education attainment	9%							
Low-educated (Junior high school)		27.1%	45.63	<.0001	27.88	<.0001	19.30	0.0002
Equivalent household income	26%							
Low-income		9.4%	25.35	<.0001	15.54	0.0037	34.80	<.0001
Number of household items lacking (0-10)	4%							
Household item deprivation (# >= 1)		14.7%	148.81	<.0001	52.60	<.0001	192.58	<.0001
Household economic stress (0-7)	4%							
Economic stress (# > 0)		11.1%	121.11	<.0001	73.50	<.0001	186.04	<.0001
Number of child items lacking (by parents) (0-14)	4%							
Child item deprivation (# >= 2)		15.9%	133.87	<.0001	72.81	<.0001	227.65	<.0001
Number of child items lacking (by child) (0-14)	1%							
Child item deprivation (# >= 4)		15.0%	10.92	0.0275	9.08	0.0591	12.21	0.0067

Conclusion

- Material deprivation can be a useful measurement tool for measuring SES.
- It can supplement often imprecise and missing traditional SES variables such as income and education attainment, and often it is better predictor of poverty than other traditional SES variables.
- However, the choice of items is tricky;
  - Variables from child-filled questionnaire might be capturing something other than poverty
  - Lack of Household items need more consideration

Limitations and Future Analysis

- Needs detailed analysis controlling for other factors that affect health (especially parent's health)
- Needs to investigate if the same indices are effective in explaining other dimensions (such as school performance, happiness, friends, etc.)