

## **Supplementary Material**

### **Relationships between Social Spending and Childhood Obesity in OECD Countries: An Ecological Study**

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**Table S1. Details of each dimension in social spending on family**

<b>Dimensions</b>	<b>Details</b>
<b>Family allowances (Cash benefits / Tax break)</b>	Family allowance
	Family income supplement
	Family allowance supplement
	Basic family payment
	Additional family payment
	Home child care allowance
	Family tax payment
	Family tax benefit (Part A and B)
	More help for families—one-off payments
	Parenting payment (Single and Partnered)
	Single Income Family Bonus (2008)
	Back to School Bonus (2008)
	Economic Security Strategy (2008)
	Single Income Family Supplement
Schoolkids Bonus	
<b>Maternity and parental leave (Cash benefits / Tax break)</b>	Maternity allowances
	Maternity immunization allowance
	Baby Bonus (previously Maternity payment)
	Parental Leave Pay
	Dad and Partner Pay
	Stillborn Baby Payment
<b>Early childhood education and care (ECEC) (Benefits in kind)</b>	National Partnerships on Early Childhood Education and Care - National Occasional Care
	Support for the Child Care System - Child Care Communications Campaign
	Child care support
	Child care for eligible parents undergoing training
	Support for child care
	Support for child care: specific purpose payment
	Child care benefit
	Child care (pre-primary education)
	Child care (pre-primary education - 4-5yo)
	Child Care Tax Rebate
	Support for the Child Care System - Child Care Services Support
	Support for the Child Care System - Job Education and Training
	Child Care Fee Assistance - Child Care Benefit
	Child Care Fee Assistance - Child Care Rebate
	National Partnerships on Early Childhood Education and Care - Indigenous Early Childhood Development Children and Family Centers
	National Partnerships on Early Childhood Education and Care - TAFE Fee Waivers for Child Care Qualifications
	National Partnerships on Early Childhood Education and Care - National Quality Agenda
	State/Territory Child Care Expenditure
	National Partnership on Universal Access to Early Childhood Education
	Early Childhood Education - 4 and 5 year olds in ISCED 1 (Primary school)

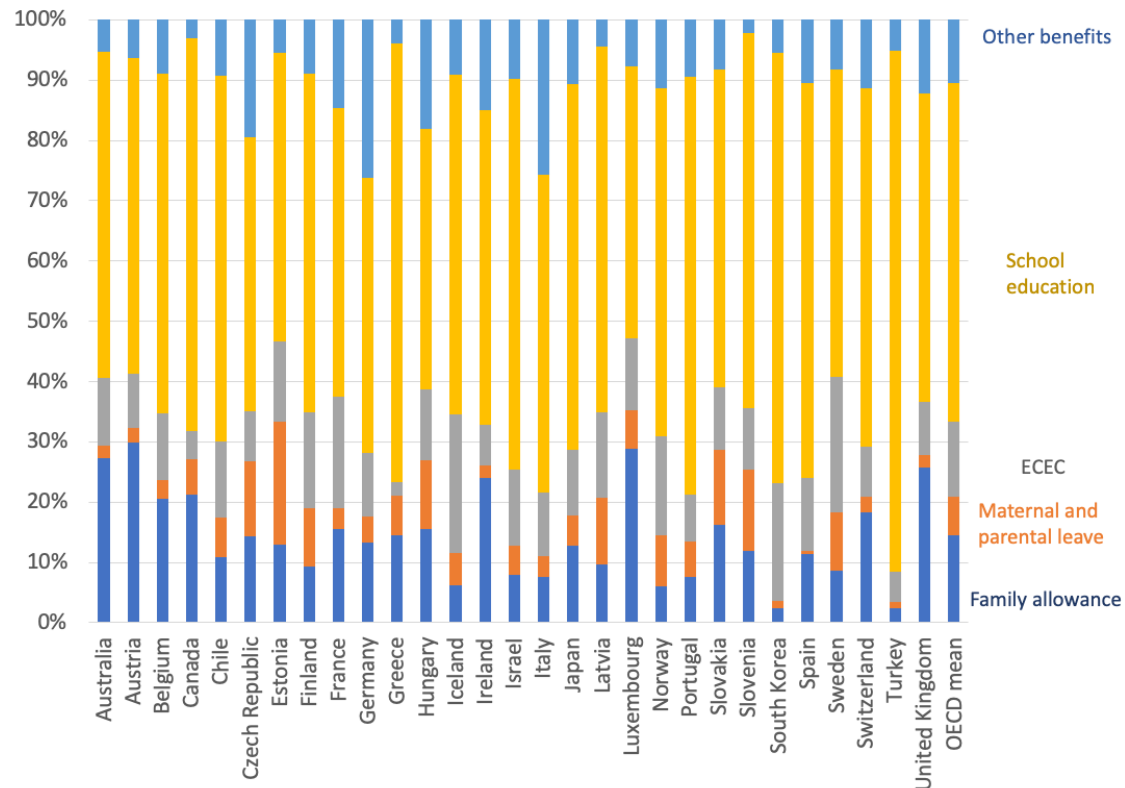
<b>Others (Cash benefits / Tax break)</b>	Supporting parent's benefit
	Sole parents pension
	Partner allowance (pension)
	Parenting allowance
	Assistance for Isolated Children
<b>Others (Benefits in kind)</b>	Home help / Accommodation
	Parenting
	Family support services scheme
	Child abuse prevention
	Family violence partnership
	Family violence regional activities
	Grants to family relationship support organizations
	Indigenous parenting and family well-being
	National illicit drug strategy
	Services for families with children
	Stronger families and communities strategy: families initiative
	Services for families with children: specific purpose payment
	Pre-school education
	Family and child welfare - State and Territory
	Child protection and out-of-home care services - State and Territory
	Family Support
	Find and Connect
Families and Children	

**Source:** OECD's Social Expenditure Database (SOCX).

**Method S1. Technical appendix**

I regressed the average annual growth in social spending on the average annual growth in GDP per capita and calculated the residuals. Then, I calibrated them by adding the average of annual growth in social spending so that “cross-national mean of adjusted average annual growth in social spending” = “cross-national mean of unadjusted average annual growth in social spending.”

**Figure S1. Specific dimensions of social spending on children in OECD countries compared with the OECD averages in 2015**



**Source:** Authors' analysis of data from Organization for Economic Cooperation and Development (OECD) Social Expenditure Database (SOCX).

**Notes:** Specific dimensions of social spending on children are shown for 29 OECD countries for which the information on all the dimensions of social spending on children are available (Denmark, Mexico, Netherlands, New Zealand, Poland, and the United States are excluded). The OECD mean is calculated for these 29 countries. ECEC: Early childhood education and care.

**Table S2. Association between total or five dimensions of social spending on children (US dollars) and the prevalence of childhood obesity (%) for countries with lower vs. higher gross domestic product (GDP) per capita: Cross sectional analyses in 2015**

Types of social spending	Lower GDP per capita				Higher GDP per capita				P-for-interaction <sup>a</sup>
	Coefficients	95% CI		P value	Coefficients	95% CI		P value	
		Lower	Upper			Lower	Upper		
<b>Girls</b>									
Total social spending <sup>b</sup>	$0.05 \times 10^{-3}$	$-1.1 \times 10^{-3}$	$1.2 \times 10^{-3}$	0.93	$-0.2 \times 10^{-3}$	$-0.4 \times 10^{-3}$	$-0.02 \times 10^{-3}$	0.03	0.12
By dimension <sup>c</sup>									
Family allowance	$2.4 \times 10^{-3}$	$-1.6 \times 10^{-3}$	$6.3 \times 10^{-3}$	0.19	$-0.4 \times 10^{-3}$	$-2.5 \times 10^{-3}$	$1.8 \times 10^{-3}$	0.68	0.21
Maternal and parental leave	$-2.6 \times 10^{-3}$	$-6.8 \times 10^{-3}$	$1.5 \times 10^{-3}$	0.17	$0.5 \times 10^{-3}$	$-7.3 \times 10^{-3}$	$8.4 \times 10^{-3}$	0.87	0.33
ECEC	$-2.0 \times 10^{-3}$	$-5.9 \times 10^{-3}$	$2.0 \times 10^{-3}$	0.27	$-0.7 \times 10^{-3}$	$-4.8 \times 10^{-3}$	$3.5 \times 10^{-3}$	0.70	0.49
Education	$-0.5 \times 10^{-3}$	$-3.7 \times 10^{-3}$	$2.8 \times 10^{-3}$	0.74	$-0.3 \times 10^{-3}$	$-1.1 \times 10^{-3}$	$0.6 \times 10^{-3}$	0.49	0.61
Others	$-0.5 \times 10^{-3}$	$-3.1 \times 10^{-3}$	$2.1 \times 10^{-3}$	0.67	$-0.01 \times 10^{-3}$	$-1.9 \times 10^{-3}$	$1.9 \times 10^{-3}$	0.99	0.78
<b>Boys</b>									
Total social spending <sup>b</sup>	$-0.1 \times 10^{-3}$	$-1.5 \times 10^{-3}$	$1.4 \times 10^{-3}$	0.92	$-0.2 \times 10^{-3}$	$-0.5 \times 10^{-3}$	$-0.1 \times 10^{-3}$	0.04	0.07
By dimension <sup>c</sup>									
Family allowance	$3.1 \times 10^{-3}$	$-0.2 \times 10^{-3}$	$6.3 \times 10^{-3}$	0.06	$-0.4 \times 10^{-3}$	$-2.0 \times 10^{-3}$	$1.3 \times 10^{-3}$	0.58	0.33
Maternal and parental leave	$-4.8 \times 10^{-3}$	$-8.6 \times 10^{-3}$	$-1.0 \times 10^{-3}$	0.02	$1.3 \times 10^{-3}$	$-5.4 \times 10^{-3}$	$8.0 \times 10^{-3}$	0.64	0.41
ECEC	$-2.3 \times 10^{-3}$	$-5.7 \times 10^{-3}$	$1.3 \times 10^{-3}$	0.17	$-1.3 \times 10^{-3}$	$-4.2 \times 10^{-3}$	$1.7 \times 10^{-3}$	0.32	0.64
Education	$-2.2 \times 10^{-3}$	$-4.8 \times 10^{-3}$	$0.4 \times 10^{-3}$	0.09	$-0.3 \times 10^{-3}$	$-1.2 \times 10^{-3}$	$0.7 \times 10^{-3}$	0.54	0.35
Others	$-1.3 \times 10^{-3}$	$-3.5 \times 10^{-3}$	$1.0 \times 10^{-3}$	0.22	$0.1 \times 10^{-3}$	$-1.5 \times 10^{-3}$	$1.6 \times 10^{-3}$	0.92	0.99

We divided OECD countries in half according to GDP per capita in 2000 and repeated the regression analyses for each group. See Table 2 in the main text of the manuscript for more details.

<sup>a</sup> We formally tested the interaction between the level of GDP per capita in 2000 (lower vs. upper) and social spending on children using a Wald test.

<sup>b</sup> We regressed the prevalence of childhood obesity on total social spending on children. These analyses were conducted for 18 countries with lower GDP per capita in 2000 and 17 countries with higher GDP per capita in 2000.

<sup>c</sup> We regressed the prevalence of childhood obesity on five dimensions of social spending on children. These analyses were conducted for 17 countries with lower GDP per capita in 2000 and 16 countries with higher GDP per capita in 2000. Mexico and United States of America were excluded because either dimension of social spending is not available.

**Table S3. Association between changes in total or five dimensions of social spending on children (US dollars) and the prevalence of childhood obesity (%) for countries with lower vs. higher gross domestic product (GDP) per capita: Longitudinal analyses from 2000 to 2015**

Types of social spending	Lower GDP per capita				Higher GDP per capita				P-for-interaction <sup>a</sup>
	Coefficients	95% CI		P value	Coefficients	95% CI		P value	
		Lower	Upper			Lower	Upper		
<b>Girls</b>									
Total social spending <sup>b</sup>	$-0.3 \times 10^{-2}$	$-0.9 \times 10^{-2}$	$0.3 \times 10^{-2}$	0.30	$-0.4 \times 10^{-2}$	$-1.1 \times 10^{-2}$	$0.3 \times 10^{-2}$	0.26	0.46
By dimension <sup>c</sup>									
Family allowance	$-5.8 \times 10^{-2}$	$-13.4 \times 10^{-2}$	$1.7 \times 10^{-2}$	0.11	$-0.7 \times 10^{-2}$	$-3.1 \times 10^{-2}$	$1.6 \times 10^{-2}$	0.46	0.38
Maternal and parental leave	$1.7 \times 10^{-2}$	$-3.1 \times 10^{-2}$	$6.4 \times 10^{-2}$	0.42	$-0.5 \times 10^{-2}$	$-3.4 \times 10^{-2}$	$2.4 \times 10^{-2}$	0.67	0.58
ECEC	$1.2 \times 10^{-2}$	$-4.9 \times 10^{-2}$	$7.3 \times 10^{-2}$	0.65	$1.6 \times 10^{-2}$	$-4.2 \times 10^{-2}$	$7.3 \times 10^{-2}$	0.52	0.11
Education	$0.6 \times 10^{-2}$	$-1.1 \times 10^{-2}$	$2.4 \times 10^{-2}$	0.41	$1.4 \times 10^{-2}$	$-2.5 \times 10^{-2}$	$5.3 \times 10^{-2}$	0.39	0.90
Others	$-1.0 \times 10^{-2}$	$-3.5 \times 10^{-2}$	$1.4 \times 10^{-2}$	0.33	$-1.3 \times 10^{-2}$	$-4.0 \times 10^{-2}$	$1.5 \times 10^{-2}$	0.29	0.91
<b>Boys</b>									
Total social spending <sup>b</sup>	$-0.3 \times 10^{-2}$	$-1.3 \times 10^{-2}$	$0.7 \times 10^{-2}$	0.52	$-0.2 \times 10^{-2}$	$-1.3 \times 10^{-2}$	$0.8 \times 10^{-2}$	0.64	0.36
By dimension <sup>c</sup>									
Family allowance	$-5.5 \times 10^{-2}$	$-19.7 \times 10^{-2}$	$8.6 \times 10^{-2}$	0.38	$-0.8 \times 10^{-2}$	$-4.5 \times 10^{-2}$	$3.0 \times 10^{-2}$	0.62	0.61
Maternal and parental leave	$1.4 \times 10^{-2}$	$-7.7 \times 10^{-2}$	$10.4 \times 10^{-2}$	0.73	$0.1 \times 10^{-2}$	$-5.1 \times 10^{-2}$	$5.2 \times 10^{-2}$	0.97	0.41
ECEC	$0.7 \times 10^{-2}$	$-9.2 \times 10^{-2}$	$10.7 \times 10^{-2}$	0.86	$1.1 \times 10^{-2}$	$-8.8 \times 10^{-2}$	$11.0 \times 10^{-2}$	0.78	0.29
Education	$0.1 \times 10^{-2}$	$-3.1 \times 10^{-2}$	$3.3 \times 10^{-2}$	0.92	$1.0 \times 10^{-2}$	$-5.1 \times 10^{-2}$	$7.1 \times 10^{-2}$	0.68	0.91
Others	$-0.2 \times 10^{-2}$	$-4.7 \times 10^{-2}$	$4.4 \times 10^{-2}$	0.93	$-0.7 \times 10^{-2}$	$-5.7 \times 10^{-2}$	$4.3 \times 10^{-2}$	0.74	0.44

We divided OECD countries in half according to GDP per capita in 2000 and repeated the regression analyses for each group. See Table 3 in the main text of the manuscript for more details.

<sup>a</sup> We formally tested the interaction between the level of GDP per capita in 2000 (lower vs. upper) and changes in social spending on children using a Wald test.

<sup>b</sup> We regressed the change in the prevalence of childhood obesity on the change in total social spending on children. The analyses were conducted for 17 countries with lower GDP per capita in 2000 and 16 countries with higher GDP per capita in 2000.

<sup>c</sup> We regressed the change in the prevalence of childhood obesity on the changes in five dimensions of social spending on children. The analyses were conducted for 16 countries with lower GDP per capita in 2000 and 15 countries with higher GDP per capita in 2000.