

## **Supplementary Materials**

### **Prevalence and incidence of obesity among children and adolescents in Guangdong: a prospective analysis from 2019-2022**

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## **Supplementary Methods**

### **Measurement procedures of height**

After pre-calibration and scrutiny, trained assessors used mechanical stadiometers to measure height. Children and adolescents stood barefoot on the mechanical stadiometers with heads and torso erect, eyes looking straight ahead, upper limbs hung naturally, and legs were straight. Their toes spread apart by about 60 degrees with heels together. Their heels, sacrum, and space between two scapulas were in contact with columns of mechanical stadiometers. Trained assessors slid horizontal pressure plate down to the top of the children and adolescents' head and recorded measurements with both eyes level with horizontal pressure plate.

### **Measurement procedures of weight**

After pre-calibration and scrutiny, trained assessors used electronic scales or lever scales to measure weights. Children and adolescents naturally stood on one of the two types of weighing scales. Trained assessors placed standard weights (10 kg, 20 kg, 30 kg) and moved sliding weight using level scales. After electronic scales displayed stability or lever scales were balanced, measurements of weight were recorded.

**Supplementary Table 1. Summary information for studies about the prevalence of obesity in China (from 2019 to 2024)**

	Author (year)	Journal	Study type	Population	Obesity definition	Time	Prevalence rate	Standardized
1	Jia Hu (1) (2021)	Obesity	Cross-sectional	Mean number of participants per year was 29,648, aged 6-17, Changshu city, which is a county-level city in Suzhou.	Overweight and obesity were defined according to the WHO Child Growth Standards.	2014-2020	Prevalence of obesity: 2019: 10.02 2020: 12.77	NA
2	Yunjuan Yang (2) (2022)	Front Nutr.	Cross-sectional	2019 (n = 24,166), Chinese National Surveys on Students' Constitution and Health (CNSSCH) in Yunnan	Working Group for Obesity in China (WGOC-BMI criteria)	2019	In 2019, total age-standardized prevalence of overweight was 9.13%; total age-standardized prevalence of obesity was 4.24%.	Age- and gender-standardized prevalence of the population was calculated using the 2010 China Census as a standard population.
3	Huan Chen (3) (2022)	BMC Public Health	Cross-sectional research	Elementary and secondary schools in Shanghai, 2019 students aged 6-16	WS/T 586–2018	From October to December 2020	The prevalence of overweight/obesity was 30.31%.	NA
4	Dongling Yang (4) (2022)	Pediatric Obesity	Surveillance	China, the Surveillance of Students' Common Diseases and Health Influencing Factors conducted in Shanghai; 6047 adolescents aged 11–16 years.	The age- and sex-specific BMI cut-offs defined by the World Health Organization (WHO)	During September and November of 2019 and 2020	The prevalence of obesity: 2019: 14.2% 2020: 15.4%	NA
5	Yan Yang (5) (2022)	Front Endocrinol (Lausanne)	XIGAO database	447481 from hospital information system, 208915 from mobile terminals, China (nationwide).	Body Mass Index Reference Norm for Screening Overweight and Obesity in Chinese Children and Adolescents	2017-2021	The prevalence of obesity was standardized by sex and age; 2019: 7.67%	Age-, sex- and region-standardized.

							2020: 9.53%	
							2021: 7.76%	
6	Xixi Jiang (6) (2023)	Bmc Public Health	Cross-sectional	7616 (84.92%) children and adolescents, Chengdu, aged 6 ~ 16.	Chinese school-age children and adolescents released by the National Health and Family Planning Commission in 2018 (WS/T 586—2018)	between 23 and 2019 and 13 January 2020	12.68% participants were overweight and 8.61% were obese.	NA
7	Xiyan Zhang (7) (2023)	Front Public Health	Cohort	2019 (baseline and the first follow-up) with 3,257 students from developing regions. The second follow-up was arranged in 2020 with the original 3,257 students from developing regions as well as 1,643 newly added students from developed regions. The third-year follow- up (2021) with a total of 6,506 students from the study sites (Peicounty, Yizheng, Changshu, and Dongtai). Eastern China Student Health and Wellbeing Cohort Study, Jiangsu Province (aged 6-18)	Screening for overweight and obesity among school- age children and adolescents (WST586- 2018)	2019-2021	Obesity prevalence in developed region: 2020 17.4%	NA
8	Dong Yanhui (8) (2023)	Zhonghua Yu Fang Yi Xue Za Zhi	Surveillance	China, the Chinese National Survey on Students Constitution and Health, 212711 children and adolescents aged 7-18 years	Body mass index reference norm for screening overweight and obesity in Chinese children and adolescents	2019	In 2019, the total prevalence of overweight and obesity was 23.4%, and the prevalence of single obesity was 9.6%.	NA
9	J. J. Dang (9)	Beijing Da	Chinese	N=5540 aged 9-18, eight provinces of	WS/T 586—2018	from	The prevalence of	NA

	(2023)	Xue Xue Bao Yi Xue Ban	National Surveillance on Student Constitution and Health, CNSSCH	China			November 2019 to November 2020	baseline overweight and obesity among the children and adolescents in this study were 21.6%.	
10	Yujie Liu (10) (2023)	Nutrients	longitudinal study	2228 children and adolescents aged 6–19 years in Shanghai	Age- and sex-specific BMI standard developed by the World Health Organization (WHO) using the preferred standard deviation (SD) or z-score system: >1 (SD) represents overweight, and >2 SD represents obesity		Between 3 and 21 January 2020 (before the COVID-19 outbreak)	The prevalence of overweight and obesity was 20.5% and 10.2%.	NA
11	Wen-Hong Dong (11) (2023)	Front Public Health	retrospective study	2,162 children from 2019 and 2,646 from 2020 aged 3-18 years old were included, the Health Checkup Center of Children's Hospital, Zhejiang University School of Medicine.	WHO reference		2019-2020	Children in 2020 had a higher prevalence of overweight/obesity compare with children in 2019 (20.6 vs. 16.7%)	NA
12	Wen Shu (12) (2023)	J Am Heart Assoc.	Cohort	PROC (Beijing Child Growth and Health Cohort) study	We calculated sex- and age- specific BMI percentiles as per the US Centers for Disease Control and Prevention 2000 growth charts.		Baseline (2018–2019) and follow-up (2020–2021)	Prevalence of overweight/obesity was 26.8% at baseline and 38.2% at follow-up.	NA

13	Lili Peng (13) (2023)	Front Public Health	Cohort	Chengdu Positive Child Development (CPCD) 7- to 15-year-old primary and secondary school students (N=7645)	The nutritional status of children is measured by BMI with reference to the Chinese children's standard.	Baseline survey: December 2019, Wave 1 data (W1): June 2020 and the wave 2 (W2): June 2021	The prevalence of obesity decreased from 11.60% in W1 (2019) to 10.50% in W2 (2021).	NA
14	K.M. Yip (14) (2024)	Public Health	Retrospective longitudinal study	2765 students between grades 1 through 12, Hong Kong, China.	WHO reference	In 2018/19 and 2019/20	The prevalence of overweight/obesity increased significantly over three years, from 19.5 % in 2018/19, to 20.3 % in 2019/20, and 22.6 % in 2020/21.	NA

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**Supplementary Table 2. Baseline characteristics of 117,862 children and adolescents in 2019-2021 in Guangdong province**

Characteristics	Overall	Boys	Girls	<i>P</i>
Numbers of students, N (%)	117,862	62,122 (52.71)	55,740 (47.29)	
Age, years, N (%)				0.002
6-9	56,652 (48.07)	30,145 (48.53)	26,507 (47.55)	
10-14	43,180 (36.64)	22,493 (36.21)	20,687 (37.11)	
15-19	18,030 (15.30)	9484 (15.27)	8546 (15.33)	
Educational levels, N (%)				<0.001
Elementary school (1-3 grades)	46,419 (39.38)	24,698 (39.76)	21,721 (38.97)	
Elementary school (4-6 grades)	26,214 (22.24)	14,105 (22.71)	12,109 (21.72)	
Middle school (7-9 grades)	27,145 (23.03)	13,861 (22.31)	13,284 (23.83)	
High school and above (10-14 grades)	18,084 (15.34)	9458 (15.22)	8626 (15.48)	
Ethnicity, N (%)				0.634
Han	112,869 (98.47)	59,522 (98.45)	53,347 (98.49)	
Others	1754 (1.53)	935 (1.55)	819 (1.51)	
Residence, N (%)				0.911
Urban	51,965 (56.36)	27,288 (56.35)	24,677 (56.38)	
Rural	40,229 (43.64)	21,140 (43.65)	19,089 (43.62)	
Obesity status, N (%)				
Normal weight	81,313 (68.99)	39,305 (63.27)	42,008 (75.36)	<0.001
Underweight	13,928 (11.82)	8295 (13.35)	5633 (10.11)	
Overweight	12,802 (10.86)	7926 (12.76)	4876 (8.75)	
Obesity	9819 (8.33)	6596 (10.62)	3223 (5.78)	
Sugar-sweetened beverage consumption, N (%)				<0.001
Never	11,155 (17.68)	5507 (16.75)	5648 (18.69)	
<1/day	46,288 (73.36)	23,913 (72.75)	22,375 (74.03)	
≥1/day	5652 (8.96)	3449 (10.49)	2203 (7.29)	
Dessert consumption, N (%)				<0.001
Never	4042 (10.62)	2563 (13.06)	1479 (8.02)	
<1/day	29,722 (78.07)	15,214 (77.50)	14,508 (78.69)	
≥1/day	4306 (11.31)	1855 (9.45)	2451 (13.29)	
Fried food consumption, N (%)				<0.001
Never	13,942 (22.10)	7258 (22.08)	6684 (22.11)	
<1/day	45,980 (72.88)	23,756 (72.29)	22,224 (73.53)	
≥1/day	3166 (5.02)	1850 (5.63)	1316 (4.35)	
Fruit consumption, N (%)				<0.001
Never	2213 (3.51)	1391 (4.23)	822 (2.72)	
<1/day	18,324 (29.04)	9753 (29.67)	8571 (28.36)	
1/day	26,814 (42.50)	13,475 (40.99)	13,339 (44.13)	
≥2/day	15,748 (24.96)	8253 (25.11)	7495 (24.80)	
Vegetable consumption, N (%)				
Never	2784 (4.41)	1654 (5.03)	1130 (3.74)	<0.001
<1/day	8088 (12.82)	4202 (12.78)	3886 (12.86)	



1/day	22,379 (35.47)	11,599 (35.29)	10,780 (35.66)	
≥2/day	29,845 (47.30)	15,414 (46.90)	14,431 (47.74)	
Moderate-to-vigorous physical activity frequency, day/week, N (%)				<0.001
0-1	18,651 (29.56)	8289 (25.21)	10,362 (34.28)	
2-3	21,442 (33.98)	10,716 (32.60)	10,726 (35.48)	
4-5	11,392 (18.05)	6166 (18.76)	5226 (17.29)	
6-7	11,617 (18.41)	7703 (23.43)	3914 (12.95)	
Smoking status, N (%)				<0.001
No	59,950 (95.10)	30,602 (93.17)	29,348 (97.19)	
Yes	3091 (4.90)	2244 (6.83)	847 (2.81)	
Alcohol use, N (%)				<0.001
No	51,216 (81.26)	25,575 (77.89)	25,641 (84.92)	
Yes	11,814 (18.74)	7260 (22.11)	4554 (15.08)	
Sleep duration, hour/day, mean (SD)	8.28 (1.89)	8.33 (1.96)	8.23 (1.81)	<0.001

SD: Standard deviation.

**Supplementary Table 3. Age-specific prevalence of obesity and overweight by sex for 117,862 children and adolescents between the age of 6 and 19 years in 2019-2021 in Guangdong province**

Sex and age	Obesity		Overweight	
	Prevalence, % (95% CI)	OR (95% CI)	Prevalence, % (95% CI)	OR (95% CI)
<b>Overall, age, years</b>				
6	9.60 (9.17, 10.05)	Ref. (1.00)	9.71 (9.27, 10.16)	Ref. (1.00)
7	8.80 (8.35, 9.27)	0.91 (0.84, 0.98) *	9.00 (8.54, 9.48)	0.92 (0.85, 0.99) *
8	9.03 (8.53, 9.55)	0.93 (0.86, 1.01)	10.20 (9.68, 10.75)	1.06 (0.98, 1.14)
9	9.79 (9.29, 10.31)	1.02 (0.95, 1.10)	11.27 (10.74, 11.83)	1.18 (1.10, 1.27) ***
10	10.45 (9.92, 11.01)	1.10 (1.02, 1.19) *	12.56 (11.98, 13.16)	1.34 (1.24, 1.44) ***
11	8.38 (7.54, 9.30)	0.86 (0.76, 0.98) *	12.19 (11.19, 13.26)	1.29 (1.16, 1.44) ***
12	8.40 (7.95, 8.88)	0.86 (0.80, 0.94) ***	12.85 (12.29, 13.42)	1.37 (1.28, 1.47) ***
13	6.26 (5.81, 6.74)	0.63 (0.57, 0.69) ***	11.24 (10.64, 11.86)	1.18 (1.09, 1.27) ***
14	4.38 (3.73, 5.13)	0.43 (0.36, 0.51) ***	9.87 (8.90, 10.94)	1.02 (0.90, 1.15)
15	6.15 (5.60, 6.75)	0.62 (0.55, 0.69) ***	11.22 (10.49, 12.00)	1.18 (1.07, 1.29) ***
16+	5.37 (4.97, 5.80)	0.53 (0.49, 0.59) ***	10.29 (9.74, 10.86)	1.07 (0.99, 1.15)
<b>Boys, age, years</b>				
6	11.31 (10.67, 11.99)	Ref. (1.00)	9.69 (9.10, 10.32)	Ref. (1.00)
7	11.23 (10.55, 11.96)	0.99 (0.90, 1.09)	9.68 (9.04, 10.36)	1.00 (0.90, 1.11)
8	11.51 (10.75, 12.31)	1.02 (0.92, 1.13)	11.35 (10.60, 12.15)	1.19 (1.08, 1.32) **
9	12.50 (11.75, 13.30)	1.12 (1.02, 1.23) *	13.68 (12.89, 14.50)	1.48 (1.34, 1.63) ***
10	13.44 (12.63, 14.29)	1.22 (1.10, 1.34) ***	16.28 (15.40, 17.21)	1.81 (1.65, 2.00) ***
11	11.14 (9.86, 12.55)	0.98 (0.85, 1.14)	14.98 (13.52, 16.56)	1.64 (1.43, 1.88) ***
12	11.13 (10.41, 11.9)	0.98 (0.89, 1.08)	16.99 (16.12, 17.89)	1.91 (1.73, 2.09) ***
13	7.36 (6.69, 8.09)	0.62 (0.55, 0.70) ***	14.03 (13.13, 14.98)	1.52 (1.37, 1.69) ***
14	6.21 (5.16, 7.46)	0.52 (0.42, 0.64) ***	10.54 (9.17, 12.09)	1.10 (0.93, 1.30)
15	8.36 (7.49, 9.32)	0.71 (0.62, 0.82) ***	12.38 (11.33, 13.51)	1.32 (1.16, 1.49) ***
16+	7.33 (6.69, 8.02)	0.62 (0.55, 0.70) ***	12.06 (11.26, 12.91)	1.28 (1.15, 1.42) ***
<b>Girls, age, years</b>				
6	7.71 (7.14, 8.31)	Ref. (1.00)	9.72 (9.09, 10.39)	Ref. (1.00)
7	5.96 (5.42, 6.56)	0.76 (0.67, 0.87) ***	8.21 (7.58, 8.90)	0.83 (0.74, 0.93) **
8	6.28 (5.68, 6.93)	0.80 (0.70, 0.92) **	8.93 (8.23, 9.69)	0.91 (0.81, 1.02)
9	6.60 (6.00, 7.26)	0.85 (0.74, 0.97) *	8.45 (7.77, 9.18)	0.86 (0.76, 0.96) *
10	7.05 (6.41, 7.74)	0.91 (0.80, 1.03)	8.31 (7.61, 9.05)	0.84 (0.75, 0.95) **
11	5.00 (4.06, 6.13)	0.63 (0.50, 0.79) ***	8.77 (7.53, 10.21)	0.89 (0.74, 1.07)
12	5.64 (5.11, 6.21)	0.72 (0.63, 0.82) ***	8.64 (7.99, 9.33)	0.88 (0.78, 0.98) *
13	5.07 (4.50, 5.72)	0.64 (0.55, 0.74) ***	8.21 (7.48, 9.01)	0.83 (0.73, 0.94) **
14	2.43 (1.78, 3.31)	0.30 (0.21, 0.41) ***	9.16 (7.84, 10.67)	0.94 (0.78, 1.13)
15	3.76 (3.15, 4.47)	0.47 (0.38, 0.57) ***	9.97 (8.98, 11.05)	1.03 (0.90, 1.18)
16+	3.17 (2.74, 3.68)	0.39 (0.33, 0.47) ***	8.30 (7.59, 9.07)	0.84 (0.74, 0.95) **

OR: Odds ratio; CI: confidence interval.

**Supplementary Table 4. Cumulative incidence rates of obesity by baseline characteristics for 108,043 children and adolescents in 2019-2021 and followed-up till 2022 in Guangdong province**

Characteristics	Number of obesity (rate, %)		
	Overall	Boys	Girls
Crude	3269 (3.03)	2123 (3.82)	1146 (2.18)
ASIR <sup>†</sup>	2855 (2.64)	1860 (3.35)	995 (1.90)
Age, years			
6-9	2116 (4.12)	1353 (5.08)	763 (3.09)
10-14	867 (2.19)	584 (2.90)	283 (1.45)
15-19	286 (1.68)	186 (2.12)	100 (1.21)
Educational levels			
Elementary school (1-3 grades)	1776 (4.21)	1143 (5.21)	633 (3.12)
Elementary school (4-6 grades)	706 (3.00)	445 (3.63)	261 (2.31)
Middle school (7-9 grades)	502 (1.99)	352 (2.79)	150 (1.19)
High school and above (10-14 grades)	285 (1.67)	183 (2.10)	102 (1.22)
Ethnicity			
Han	3154 (3.05)	2046 (3.85)	1108 (2.20)
Others	52 (3.30)	35 (4.26)	17 (2.26)
Residence			
Urban	1501 (3.16)	981 (4.04)	520 (2.24)
Rural	1018 (2.73)	670 (3.50)	348 (1.92)
Obesity status			
Normal-weight	750 (0.92)	469 (1.19)	281 (0.67)
Underweight	63 (0.45)	44 (0.53)	19 (0.34)
Overweight	2456 (19.18)	1610 (20.31)	846 (17.35)

<sup>†</sup>Rates were directly standardized for age using data from the seventh national population census of China conducted in 2020. ASIRs: Age-standardized incidence rates.

**Supplementary Table 5. Age-specific incidence density rates of obesity by sex for 108,043 children and adolescents between the age of 6 and 19 years in 2019-2021 and followed-up till 2022 in Guangdong province**

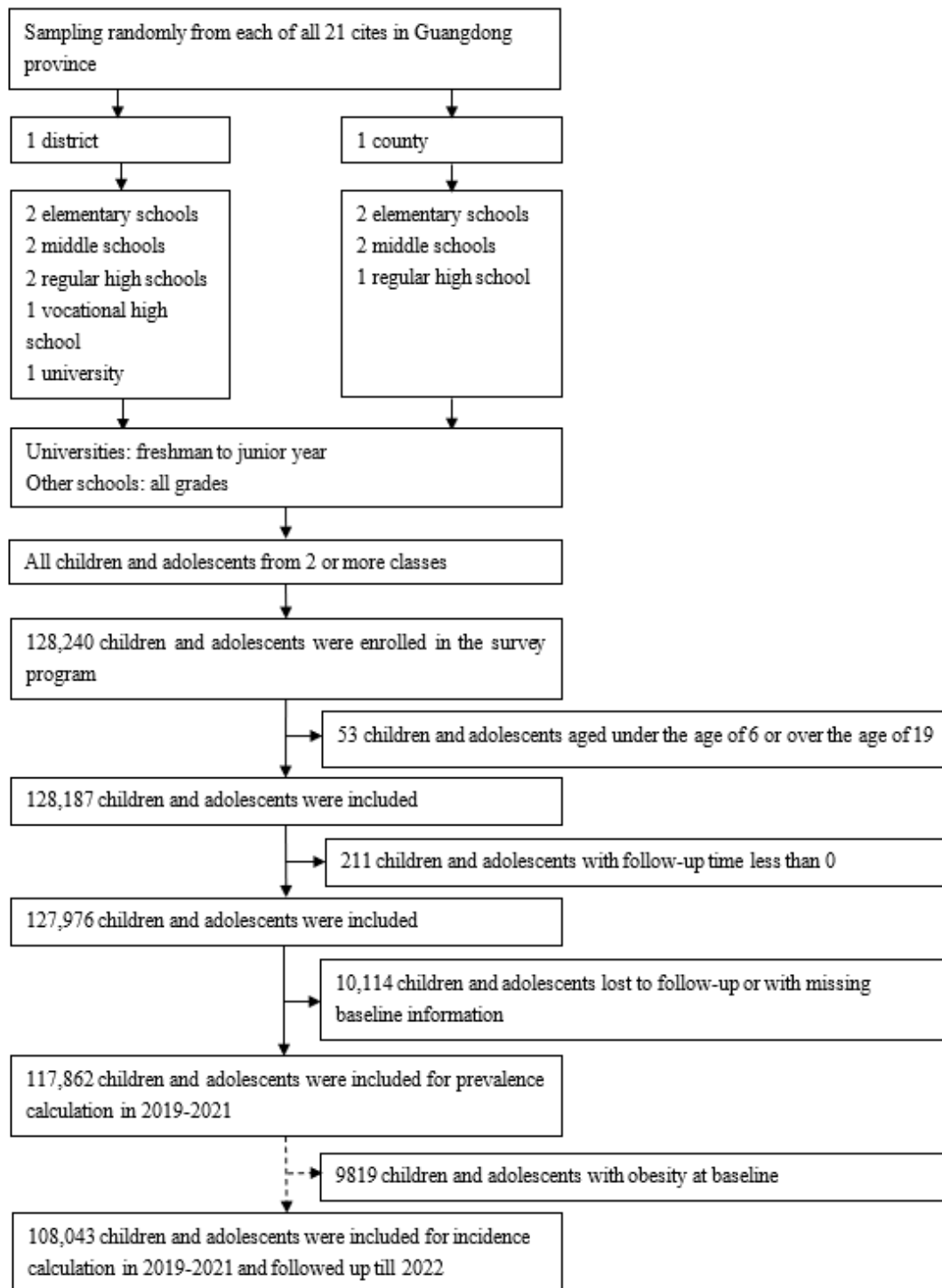
	Rate, cases per 1000 person-years (95% CI)			Baseline obesity status	
	Sex Overall	Boys	Girls	Normal-weight or underweight	Overweight
6	20.51 (18.89, 22.27)	25.29 (22.81, 28.04)	15.43 (13.47, 17.69)	8.12 (7.07, 9.32)	132.05 (119.17, 146.31)
7	25.70 (23.79, 27.76)	32.39 (29.45, 35.63)	18.47 (16.20, 21.06)	9.05 (7.90, 10.36)	204.61 (186.32, 224.7)
8	22.15 (20.26, 24.21)	27.64 (24.71, 30.91)	16.48 (14.23, 19.10)	7.15 (6.06, 8.43)	154.43 (138.92, 171.67)
9	22.06 (20.05, 24.28)	26.35 (23.36, 29.73)	17.30 (14.78, 20.23)	5.00 (4.03, 6.19)	150.94 (135.63, 167.97)
10	20.87 (18.57, 23.45)	26.09 (22.58, 30.15)	15.21 (12.49, 18.52)	4.94 (3.82, 6.39)	123.03 (107.96, 140.20)
11	16.81 (13.57, 20.82)	19.50 (14.82, 25.66)	13.86 (9.85, 19.49)	5.05 (3.33, 7.67)	96.37 (75.13, 123.60)
12	12.51 (11.00, 14.22)	16.87 (14.40, 19.77)	8.37 (6.72, 10.42)	1.93 (1.35, 2.74)	79.66 (69.40, 91.44)
13	16.74 (14.61, 19.17)	23.59 (20.11, 27.67)	9.46 (7.30, 12.26)	2.73 (1.91, 3.91)	122.66 (105.90, 142.07)
14	13.45 (10.42, 17.36)	20.13 (15.03, 26.95)	6.51 (3.86, 10.99)	2.28 (1.19, 4.39)	112.65 (85.38, 148.63)
15	15.49 (13.12, 18.29)	19.07 (15.46, 23.53)	11.78 (8.98, 15.46)	2.39 (1.53, 3.75)	116.43 (97.36, 139.24)
16+	11.68 (9.93, 13.72)	15.28 (12.55, 18.60)	7.86 (5.92, 10.42)	0.89 (0.48, 1.65)	102.33 (86.56, 120.99)
IRR	0.94 (0.93, 0.95) ***	0.95 (0.93, 0.96) ***	0.92 (0.91, 0.94) ***	0.83 (0.81, 0.85) ***	0.94 (0.93, 0.96) ***

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ . CI: Confidence interval; IRR: incidence rate ratio.

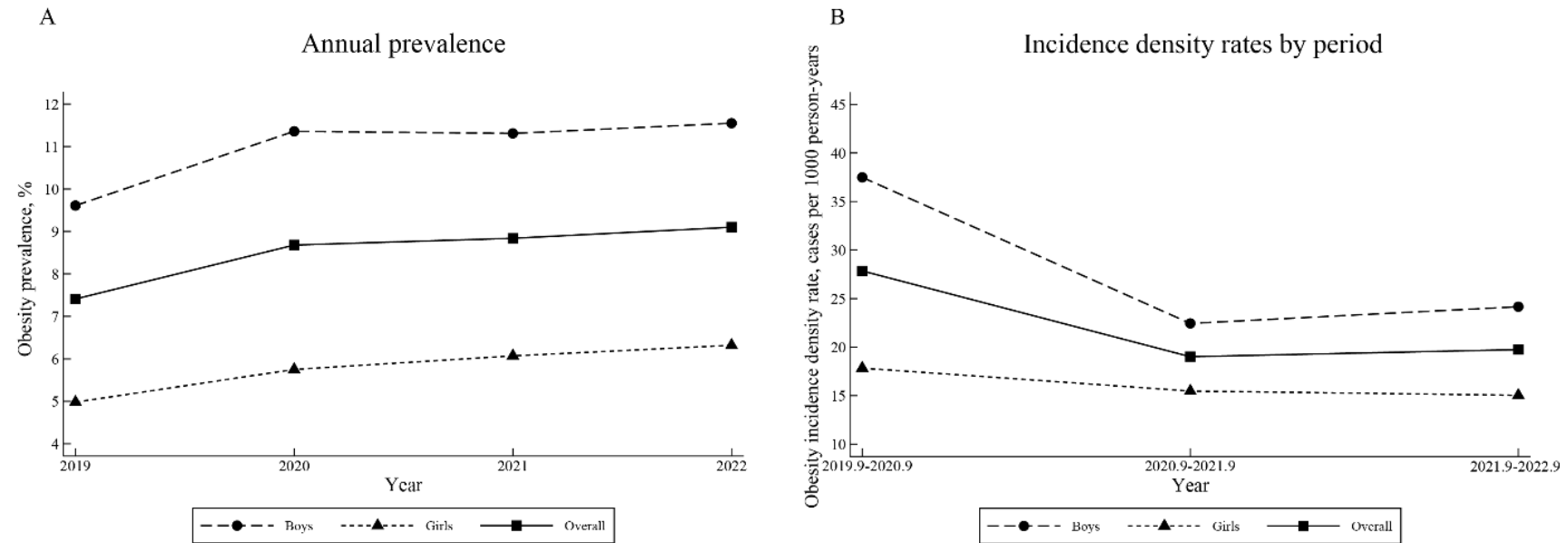
**Supplementary Table 6. Incidence density rates of obesity by period for 35,947 children and adolescents from 2019 to 2020, 36,976 children and adolescents from 2020 to 2021, 60,486 children and adolescents from 2021 to 2022 in Guangdong province**

	Rate, cases per 1000 person-years (95% CI)		
	2019-2020	2020-2021	2021-2022
All	27.85 (26.22, 29.57)	19.01 (17.63, 20.49)	19.74 (18.73, 20.81)
IRR	1.67 (1.53, 1.84) ***	Ref. (1.00)	1.02 (0.93, 1.11)
ASIRs <sup>†</sup>	24.31 (22.72, 25.98)	17.24 (15.82, 18.76)	17.95 (16.88, 19.06)
Sex			
Boys	37.49 (34.87, 40.31)	22.44 (20.37, 24.72)	24.16 (22.61, 25.82)
Girls	17.83 (16.01, 19.84)	15.47 (13.74, 17.42)	15.03 (13.78, 16.39)
Age, years			
6-9	34.16 (31.60, 36.94)	24.10 (21.89, 26.53)	24.37 (22.77, 26.09)
10-14	24.92 (22.49, 27.61)	14.70 (12.80, 16.87)	15.87 (14.42, 17.45)
15-19	13.60 (10.76, 17.19)	13.28 (10.43, 16.90)	13.87 (11.66, 16.51)
Educational levels			
Elementary school (1-3 grades)	32.75 (29.95, 35.80)	24.42 (21.97, 27.15)	24.61 (22.82, 26.55)
Elementary school (4-6 grades)	32.10 (28.78, 35.81)	19.65 (17.00, 22.72)	20.73 (18.76, 22.89)
Middle school (7-9 grades)	22.73 (19.71, 26.22)	11.93 (9.72, 14.63)	13.01 (11.30, 14.99)
High school and above (10-14 grades)	13.69 (10.83, 17.30)	13.44 (10.56, 17.11)	14.04 (11.81, 16.70)
Ethnicity			
Han	27.74 (26.11, 29.47)	19.01 (17.60, 20.53)	19.89 (18.85, 20.99)
Others	38.73 (23.73, 63.22)	21.36 (11.11, 41.04)	21.43 (14.48, 31.71)
Residence			
Urban	29.27 (26.99, 31.75)	17.68 (15.76, 19.83)	18.74 (17.25, 20.35)
Rural	24.53 (22.07, 27.26)	18.74 (16.56, 21.22)	16.98 (15.30, 18.84)
Obesity status			
Normal-weight	6.36 (5.50, 7.36)	3.91 (3.23, 4.73)	4.95 (4.38, 5.59)
Underweight	4.24 (2.84, 6.32)	2.92 (1.70, 5.03)	2.78 (1.86, 4.14)
Overweight	210.52 (196.90, 225.08)	128.37 (118.20, 139.41)	126.59 (119.31, 134.31)
No. of cases	1064	683	1379
No. of children and adolescents	35,947	36,976	60,486

<sup>†</sup>Rates were directly adjusted for age using data from the seventh national population census of China conducted in 2020. \* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ . IRR: Incidence rate ratio; ASIRs: standardized incidence rates; CI: confidence intervalx.



**Supplementary Figure 1.** Survey design, enrollment, and follow-up of study participants. This figure shows 117,862 children and adolescents aged from 6 to 19 years in 2019-2021 and 108,043 children and adolescents followed up till 2022. Vocational high school grades 1 through 3 were equivalent to regular high school grades 10 through 12.



**Supplementary Figure 2.** Annual prevalence and incidence density rates of obesity by period in Guangdong province. This figure shows the annual prevalence of obesity (A) by sex for 45,874 children and adolescents in 2019, 64,611 children and adolescents in 2020, 91,447 children and adolescents in 2021, and 73,637 children and adolescents in 2022. This figure shows the incidence density rates of obesity by period and sex (B) for 35,947 children and adolescents in 2019.9-2020.9, 36,976 children and adolescents in 2020.9-2021.9, 60,486 children and adolescents in 2021.9-2022.9.