

# NatCen

Social Research that works for society

# Overweight and obesity within households

An exploration of objective and subjective  
data from the Health Survey for England



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ESRA 2019 Zagreb, 18<sup>th</sup> July 2019



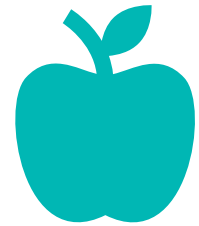
# Outline

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1. Background to the Health Survey for England
2. To what extent do people misreport their height and weight?
3. Does excess weight cluster within households?
4. Conclusions & limitations

# Health Survey for England

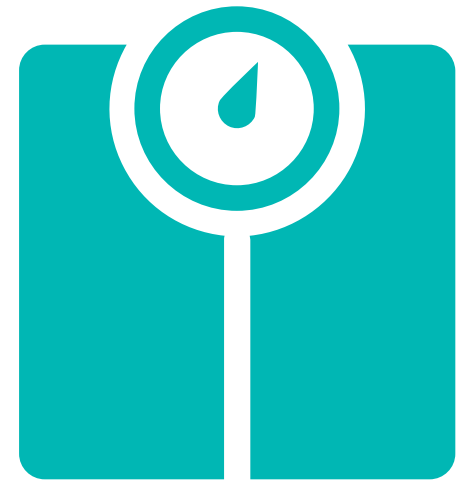
- Annual snapshot of the nation's health
- Cross-sectional
- Tracks trends over time
- Health Examination Survey
- Nationally representative sample
  - 8,000 adults and 2,000 children each year
- Commissioned by NHS Digital
- Carried out by Joint Health Surveys Unit (NatCen and UCL)



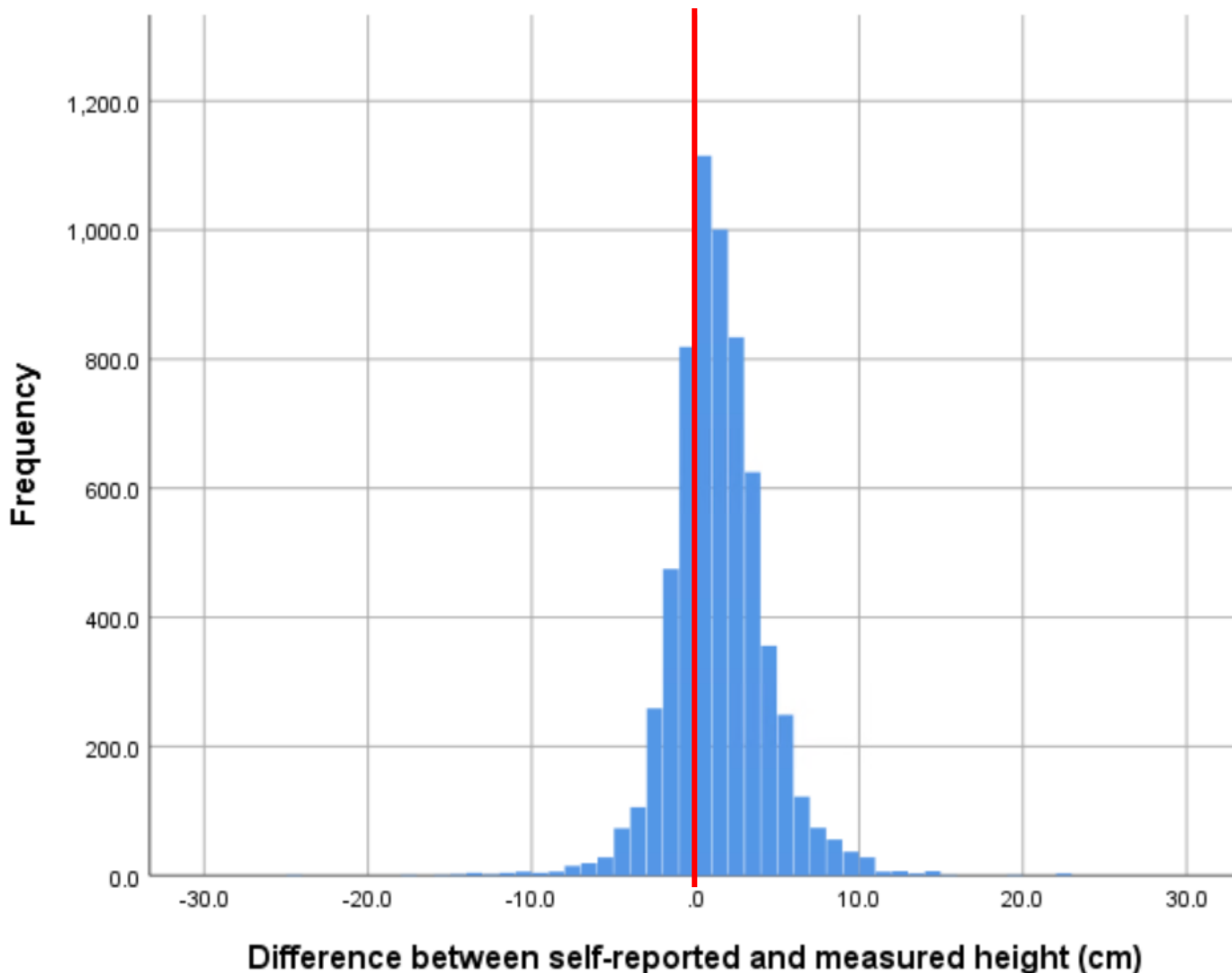
# HSE measurements of weight

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- **Qu:** How tall are you without shoes?
- **Qu:** How much do you weigh without clothes and shoes?
- Measured height (portable stadiometer)
- Measured weight (calibrated weighing scales)
- Measured waist circumference
- Measured hip circumference

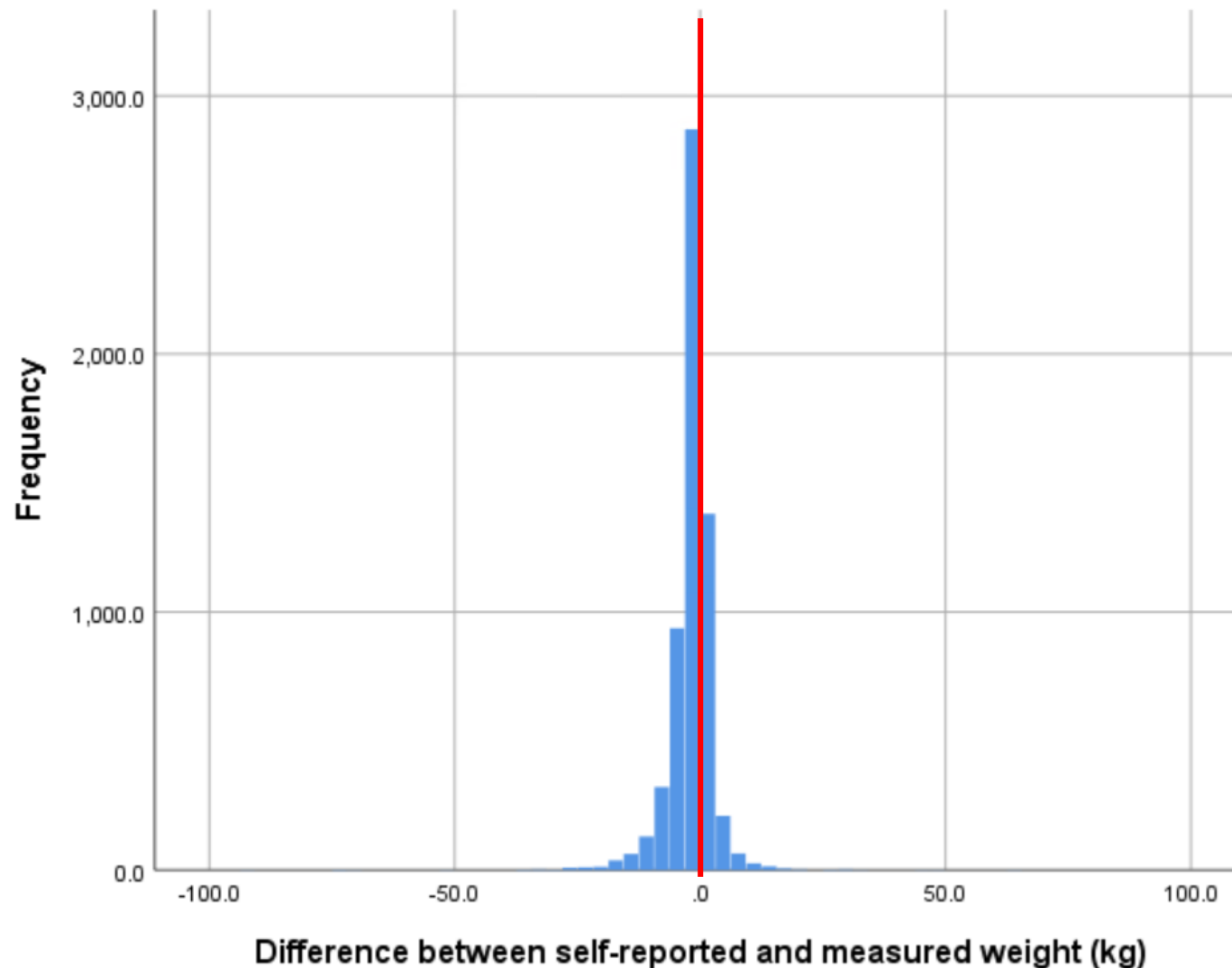


# Misreported height (cm), HSE 2016



Mean = 1.35  
SD = 2.95  
N=6,350

# Misreported weight (kg), HSE 2016

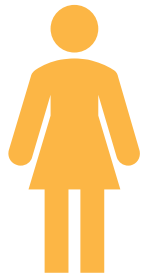


Mean = -1.81  
SD = 4.90  
N=6,113

# Over-estimated height



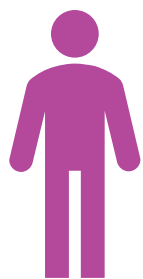
40% of men



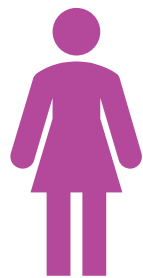
31% of women

overestimate their height  
by more than 2cm

# Under-estimated weight



52% of men

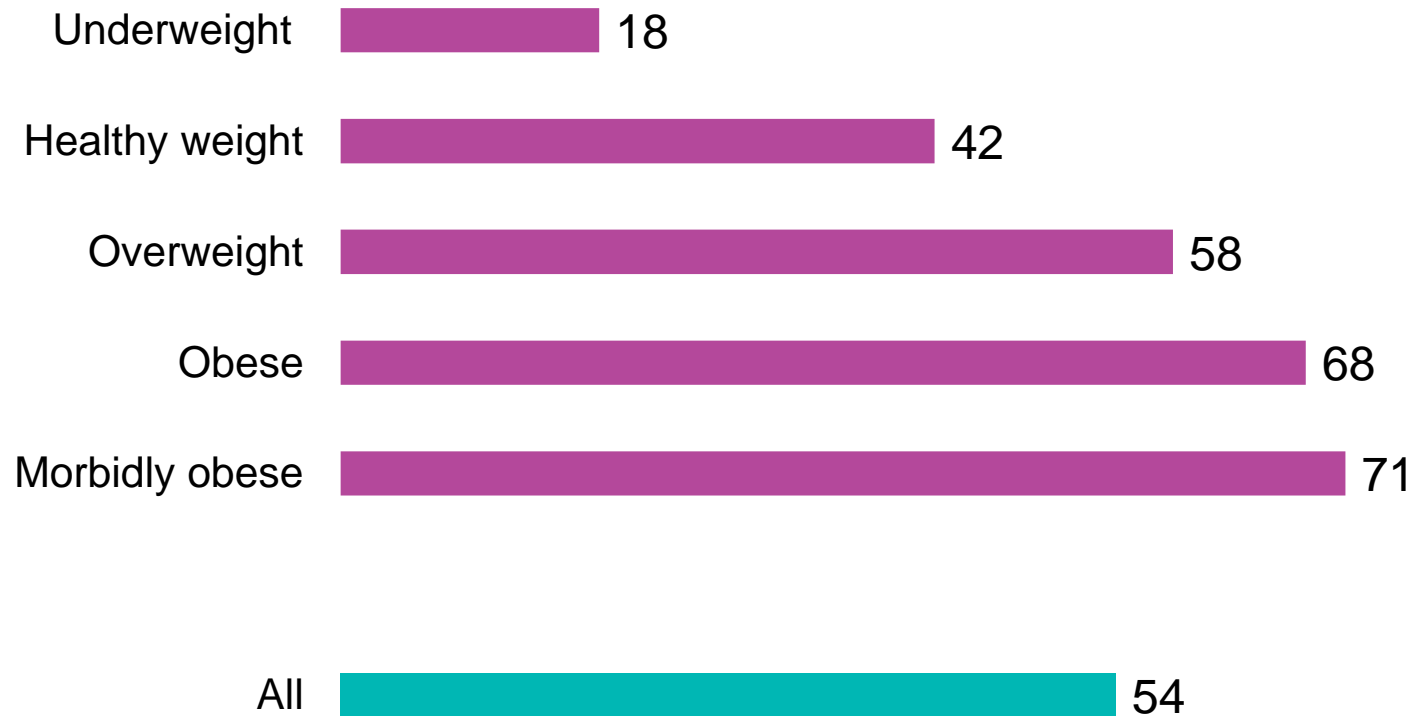


55% of women

underestimate their  
weight by more than 1 kg

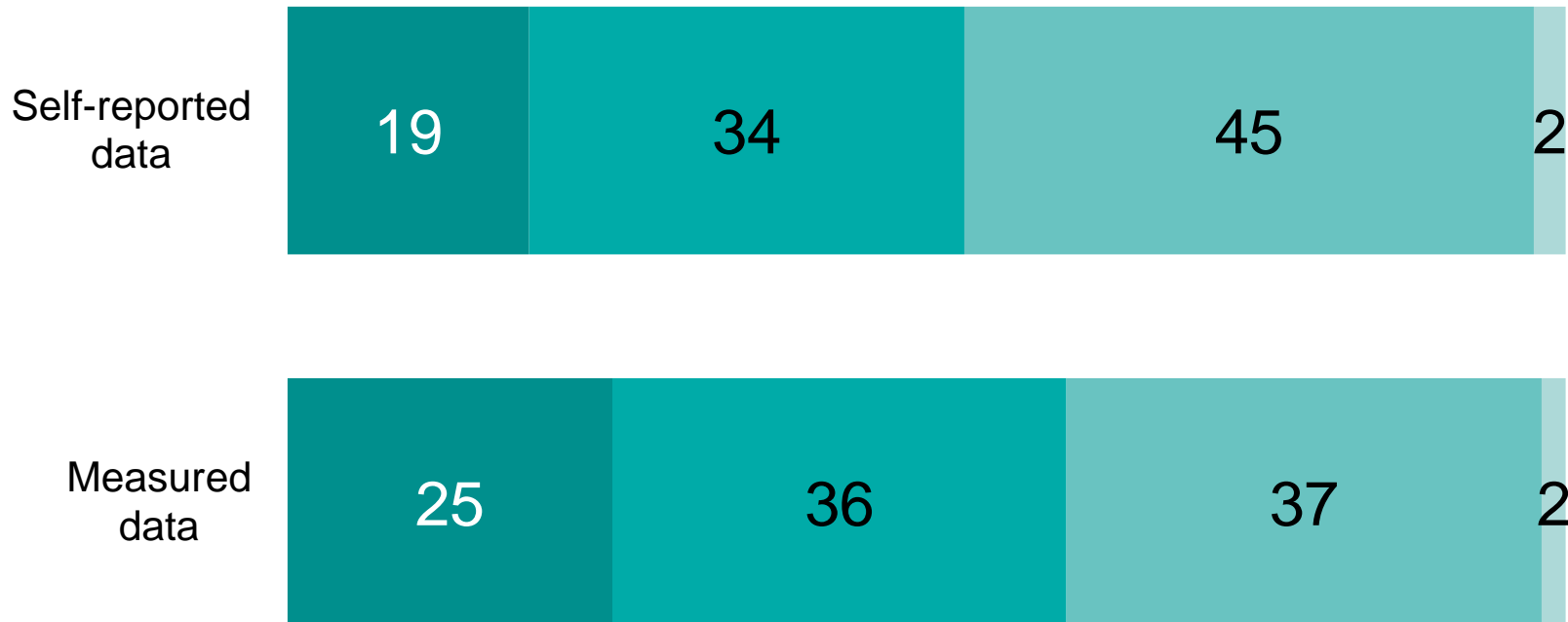


# % who underestimated weight by more than 1kg, by BMI category

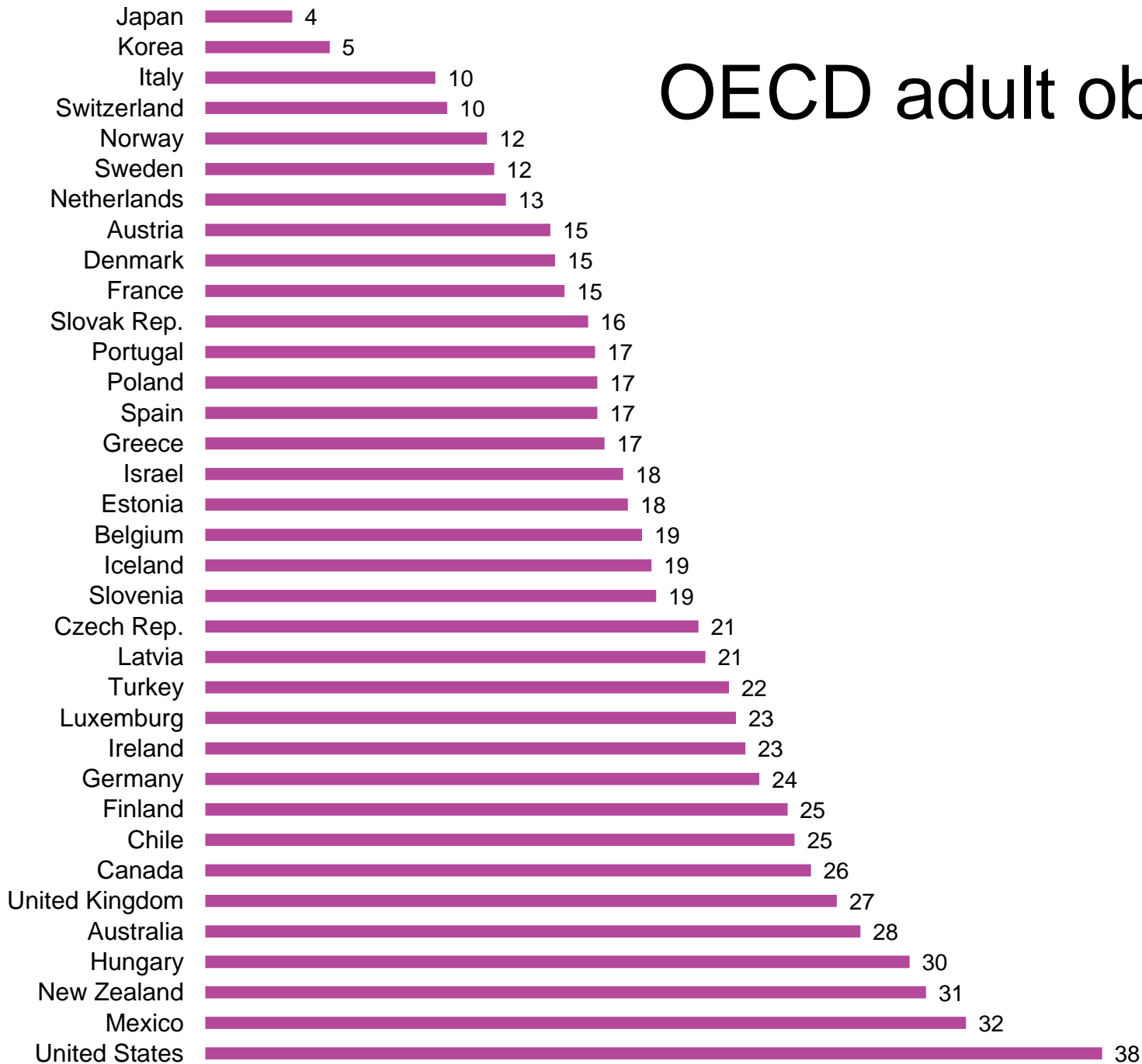


# BMI category (%) , by self-reported and measured weight

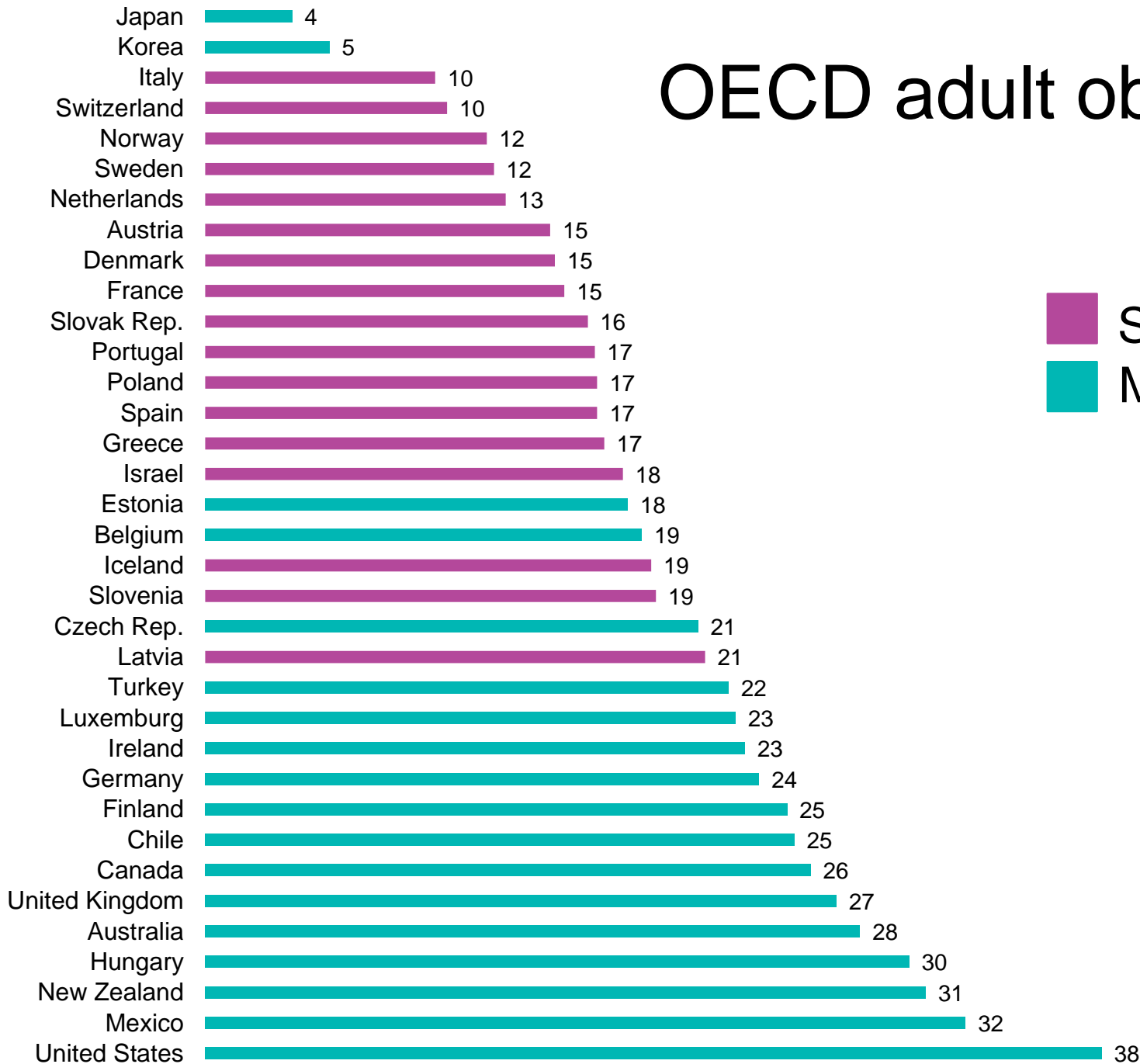
■ Obese ■ Overweight ■ Healthy weight ■ Underweight



# OECD adult obesity (2015)



# OECD adult obesity (2015)



Self-reported data  
Measured data

# The relationship between parent and child weight

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- Vast literature on childhood obesity
- Key characteristics associated with childhood overweight and obesity include:
  - Child age, ethnicity
  - Deprivation, urbanicity
  - Birthweight, breastfeeding
  - Home-ownership, maternal education
  - Parental weight



# Health Survey for England 2017

## Adult and child overweight and obesity

Published 4 December 2018

This report examines the prevalence of overweight and obesity among adults and children in England in 2017. It compares prevalence rates in different population groups by age, sex, region, household income and area deprivation, and looks at associated health risks. Children's BMI status is discussed in the context of their parents' weight.

### Key findings

- The majority of adults in England in 2017 were overweight or obese; 67% of men and 62% of women. This included 27% of men and 30% of women in England who were obese. 2% of men and 5% of women were morbidly obese.
- 35% of men and 49% of women had a very high waist circumference.
- Diabetes prevalence was associated with central obesity, measured by waist circumference. 12% of men and 9% of women with a very high waist circumference had either diagnosed or undiagnosed diabetes. This compared to 6% of men and 2% of women with high waist circumferences and 4% of men and 1% of women with a desirable waist circumference.
- In 2017, 30% of children aged 2 to 15 in England were overweight or obese, including 17% who were obese.
- Children's overweight and obesity was associated with that of their parents. 28% of children of obese mothers were also obese, compared with 17% of children whose mothers were overweight but not obese, and 8% of children whose mothers were neither overweight nor obese. Similarly, 24% of children of obese fathers were themselves obese, compared with 14% of children whose fathers were overweight but not obese, and 9% of children whose fathers were neither overweight nor obese.
- Parents of overweight and obese children often thought that their child was the right weight. The majority of children who were overweight but not obese were described as being about the right weight by their mothers (90%) and fathers (87%). Around half of parents of obese children (47% of mothers and 52% of fathers) also said their child was about the right weight.

<https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2017>

# Methodological considerations

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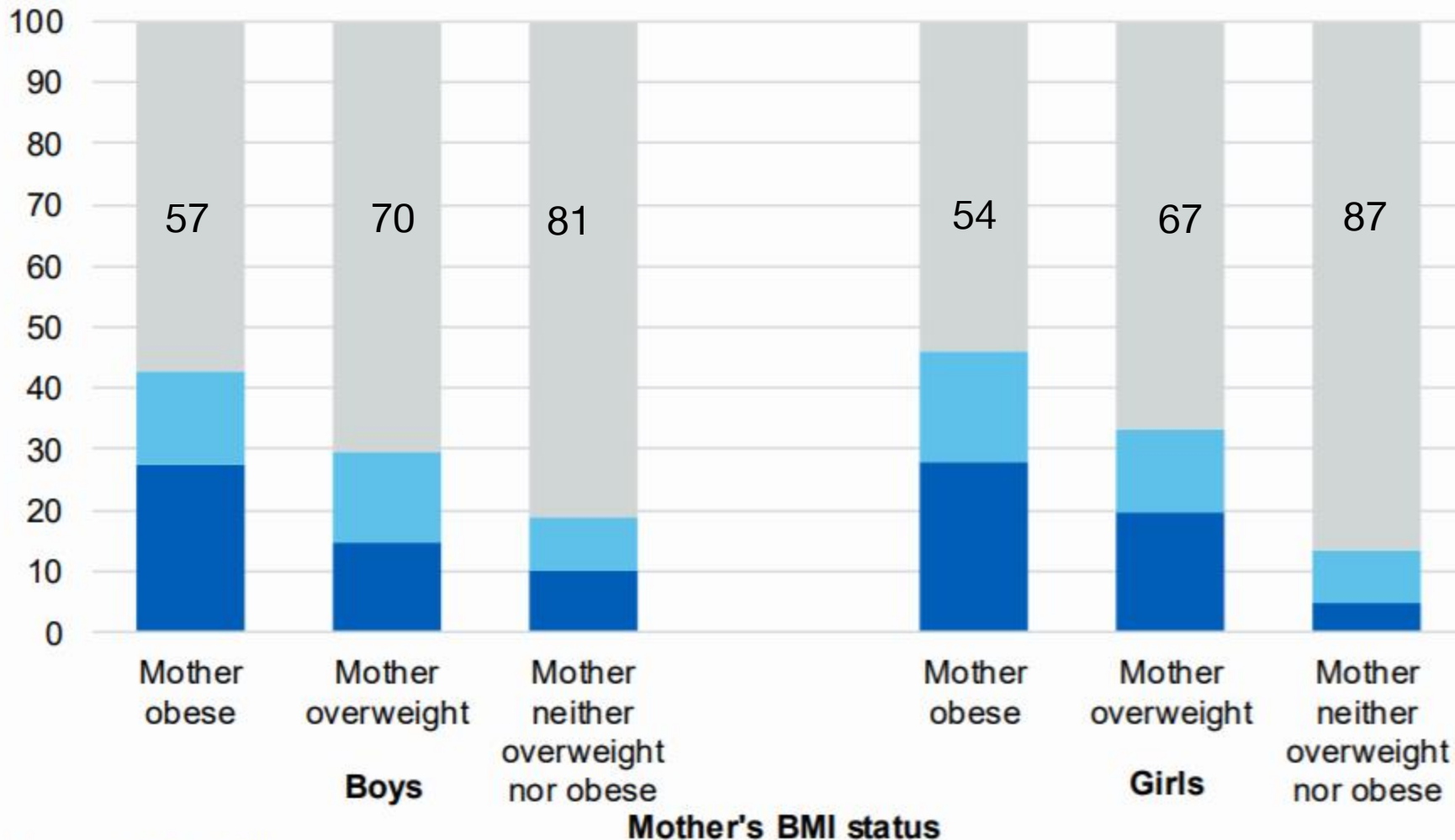
1. Defining childhood overweight and obesity
  - BMI calculated in the same way as adults ( $\text{kg}/\text{m}^2$ ) but different thresholds applied
  - UK National BMI centiles classification 1990 (UK90)
  - 85th percentile (overweight) and 95th percentile (obese) of the reference population
2. Data combines 2015 & 2016 (n=2,477 children aged 2-15)
3. Mother and father analyses examine different populations

**Figure 11: Child overweight and obesity by mother's BMI status and sex of child (2016 and 2017)**

Base: Aged 2-15

Per cent

- Child obese
- Child overweight
- Child neither overweight nor obese



Source: NHS Digital



# Statistical analysis

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- Logistic regression models of child excess weight
  1. Unadjusted
  2. Adjusted for child age and ethnicity
  3. Adjusted for area deprivation (IMD), tenure and parent education
- Analysis used weighted data and took account of complex survey design
- Separate models for mothers and fathers

# Child and parent characteristics

<b>Children with resident mother</b>	<b>Weighted count</b>	<b>Weighted %</b>
Healthy weight	1747	72.6%
Excess weight	658	27.4%
<b>Mothers</b>	<b>Weighted count</b>	<b>Weighted %</b>
Healthy weight	1048	43.6%
Overweight	769	32.0%
Obese	587	24.4%
<b>Children with resident father</b>	<b>Weighted count</b>	<b>Weighted %</b>
Healthy weight	1136	73.1%
Excess weight	418	26.9%
<b>Fathers</b>	<b>Weighted count</b>	<b>Weighted %</b>
Healthy weight	463	29.8%
Overweight	694	44.7%
Obese	397	25.6%

# Logistic regression model of child excess weight by mother's weight

		Unadjusted odds ratios	Adjusted odds ratios	Adjusted odds ratios
Mother's weight	Healthy weight (ref.)	1.00	1.00	1.00
	Overweight	1.75*	1.70*	1.69*
	Obese	3.98*	3.87*	3.72*
Child's age	2-4 (ref.)		1.00	1.00
	5-7		0.94	0.92
	8-10		1.41*	1.37
	11-12		1.66*	1.61*
	13-15		1.63*	1.57*
Child's ethnicity	White (ref.)		1.00	1.00
	Black		1.10	1.05
	Asian		1.29	1.24
	Mixed/multiple		1.59*	1.56*
	Any other		0.72	0.72
IMD quintile	Least deprived (ref.)			1.00
	2nd			1.25
	3rd			1.02
	4th			1.32
	Most deprived			1.23
Mother's education	Degree (ref.)			1.00
	Less than degree			1.19
Tenure	Owner-occupier (ref.)			1.00
	Renter/other			0.93

\*sig at 95%

# Logistic regression model of child excess weight by father's weight

		Unadjusted odds ratios	Adjusted odds ratios	Adjusted odds ratios
Father's weight	Healthy weight (ref.)	1.00	1.00	1.00
	Overweight	1.52*	1.46*	1.48*
	Obese	2.34*	2.26*	2.27*
Child's age	2-4 (ref.)		1.00	1.00
	5-7		0.94	0.95
	8-10		1.30	1.31
	11-12		1.49	1.47
	13-15		1.63*	1.60*
Child's ethnicity	White (ref.)		1.00	1.00
	Black		2.11*	2.09*
	Asian		1.47	1.47
	Mixed/multiple		1.46	1.51
	Any other		0.65	0.72
IMD quintile	Least deprived (ref.)			1.00
	2nd			1.19
	3rd			0.78
	4th			1.28
	Most deprived			0.93
Father's education	Degree (ref.)			1.00
	Less than degree			1.15
Tenure	Owner-occupier (ref.)			1.00
	Renter/other			1.10

\*sig at 95%

# Conclusions, limitations

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- Use of objective measures when examining weight very important
- The relationship between parent and child excess weight not attenuated by child characteristics or family socio-economic circumstances
- Obesity interventions must take a family approach
- Research into childhood obesity must consider parent weight
- Limitations:
  - BMI imperfect measure of weight
  - Measures not in the model (e.g. food environment)
  - No data from non-resident fathers

# Acknowledgments

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- Byron Davis and Liz Fuller (NatCen) and Alison Neave (NHS Digital) for their work on the HSE Adult and Child overweight and obesity report
- NatCen survey interviewers
- Health Survey for England participants

# Contact

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# Logistic regression model of child excess weight, by mother's weight

		Unadjusted Odds ratios	Adjusted Odds ratios (+ child age and ethnicity)	Adjusted Odds ratios (+ deprivation, tenure and mother's education)
Mother's weight	Healthy weight (ref.)	1.00	1.00	1.00
	Overweight	1.75*	1.70*	1.69*
	Obese	3.98*	3.87*	3.72*



# Logistic regression model of child excess weight, by mother's weight

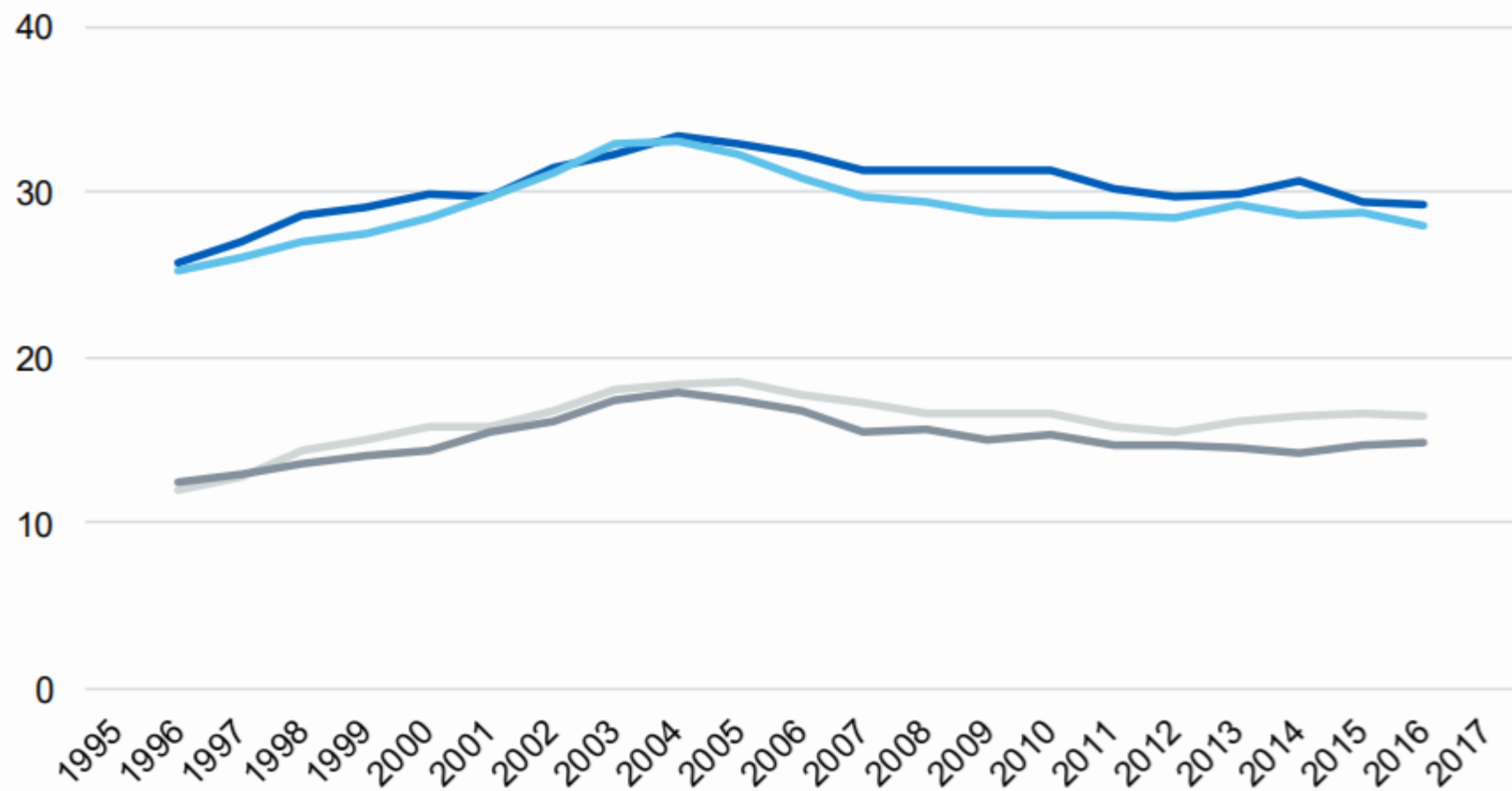
		Unadjusted Odds ratios	Adjusted Odds ratios (+ child age and ethnicity)	Adjusted Odds ratios (+ deprivation, tenure and father's education)
Father's weight	Healthy weight (ref.)	1.00	1.00	1.00
	Overweight	1.52*	1.46*	1.48*
	Obese	2.34*	2.26*	2.27*

**Figure 10: Child overweight and obesity prevalence, 1995-2017, by sex (three year moving average)**

Base: Aged 2-15

Per cent

- Boys overweight, including obese
- Boys obese
- Girls overweight, including obese
- Girls obese



Source: NHS Digital

# Over-estimated height, by age and sex

Base: Adults 16+

Men Women

