

肥胖也是一種「疫情」

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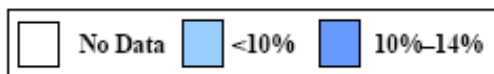
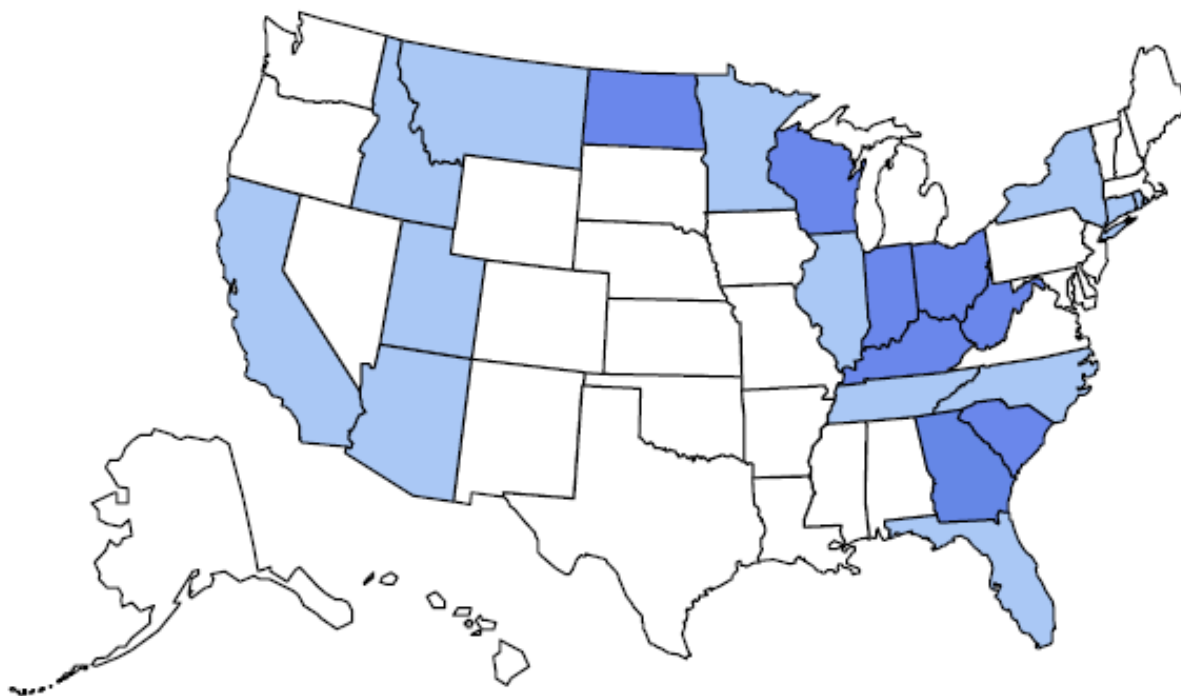
The Chinese University of Hong Kong

Obesity Trends in the USA 1985-2018

Obesity Trends* Among U.S. Adults

BRFSS, 1985

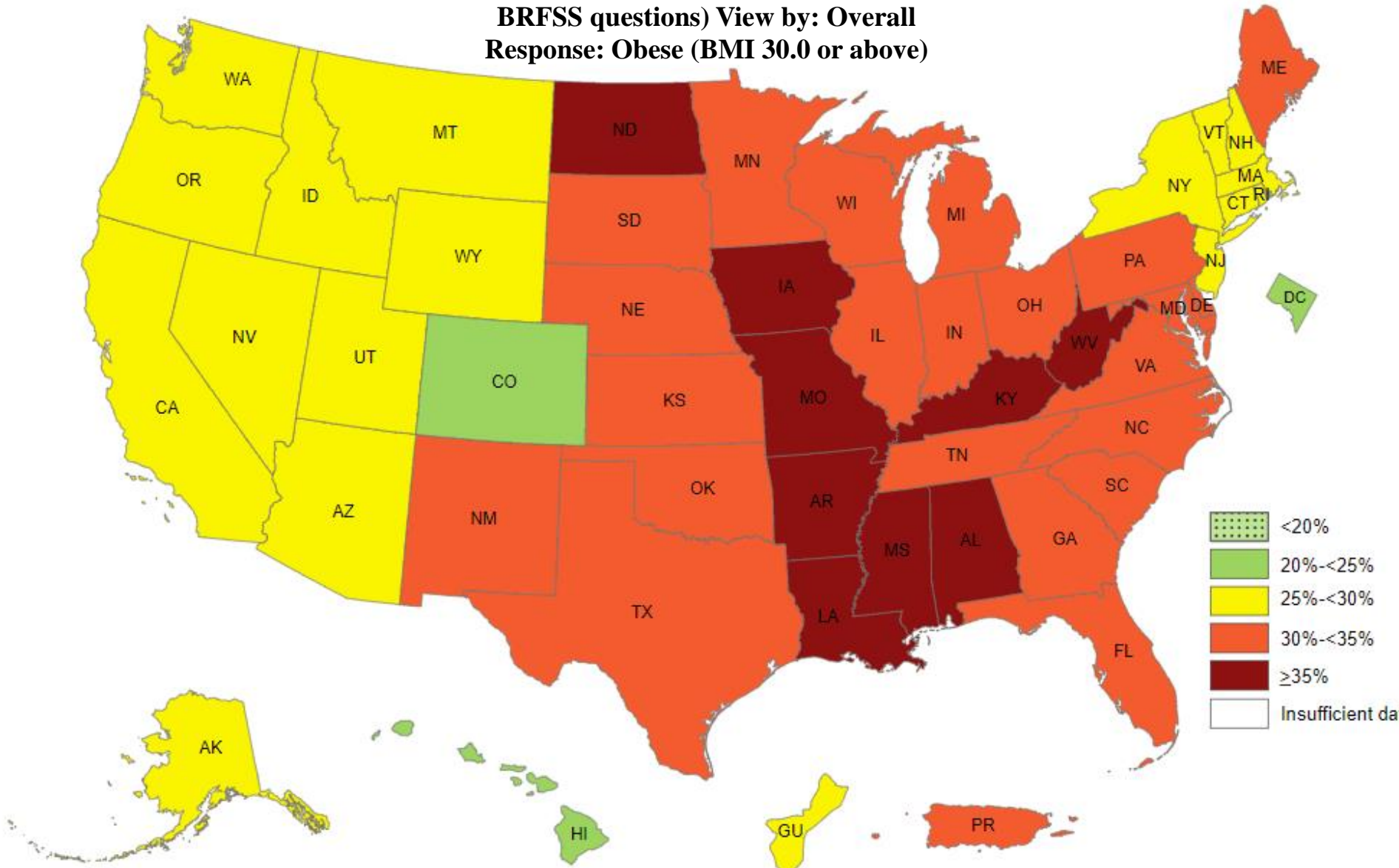
(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)



Source: Behavioral Risk Factor Surveillance System, CDC.

2018

Weight classification by Body Mass Index (BMI) (variable calculated from one or more BRFSS questions) View by: Overall Response: Obese (BMI 30.0 or above)



Topics

1. Size of the problem
2. Actual harms associated with obesity
3. Factors affecting prevalence of obesity
4. Public health strategies to address obesity

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Globally

- In 2016, over 650 millions are obese & >115 millions suffer from obesity-related problems
- 1.9 billion overweight adults
- 38 million children under 5 are overweight (in 2019)



USA

71.6% in 2016/17

- 65% of American adults are over weight or obese (BMI \geq 25)
 - 33% women and 28% men are obese (BMI \geq 30)
 - ~16% adolescents (12-19) and 15% children (6-11) are obese
- 15.7% in 2005



OBESITY:

The percentage of the population older than 15 with a body-mass index greater than 30.

USA



31%

Mexico



24%

UK



23%

Slovak Republic



22%

Greece



22%

Australia



22%

New Zealand



21%

Hungary



19%

Czech Republic



15%

Canada



14%

Spain



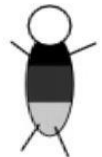
13%

Ireland



13%

Germany



13%

Portugal



13%

Finland



13%

Turkey



12%

Belgium



12%

Poland



11%

Netherlands



10%

Sweden



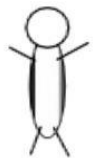
10%

Denmark



10%

France



9%

Austria



9%

Italy



9%

Norway



8%

Japan



3%

Korea



3%

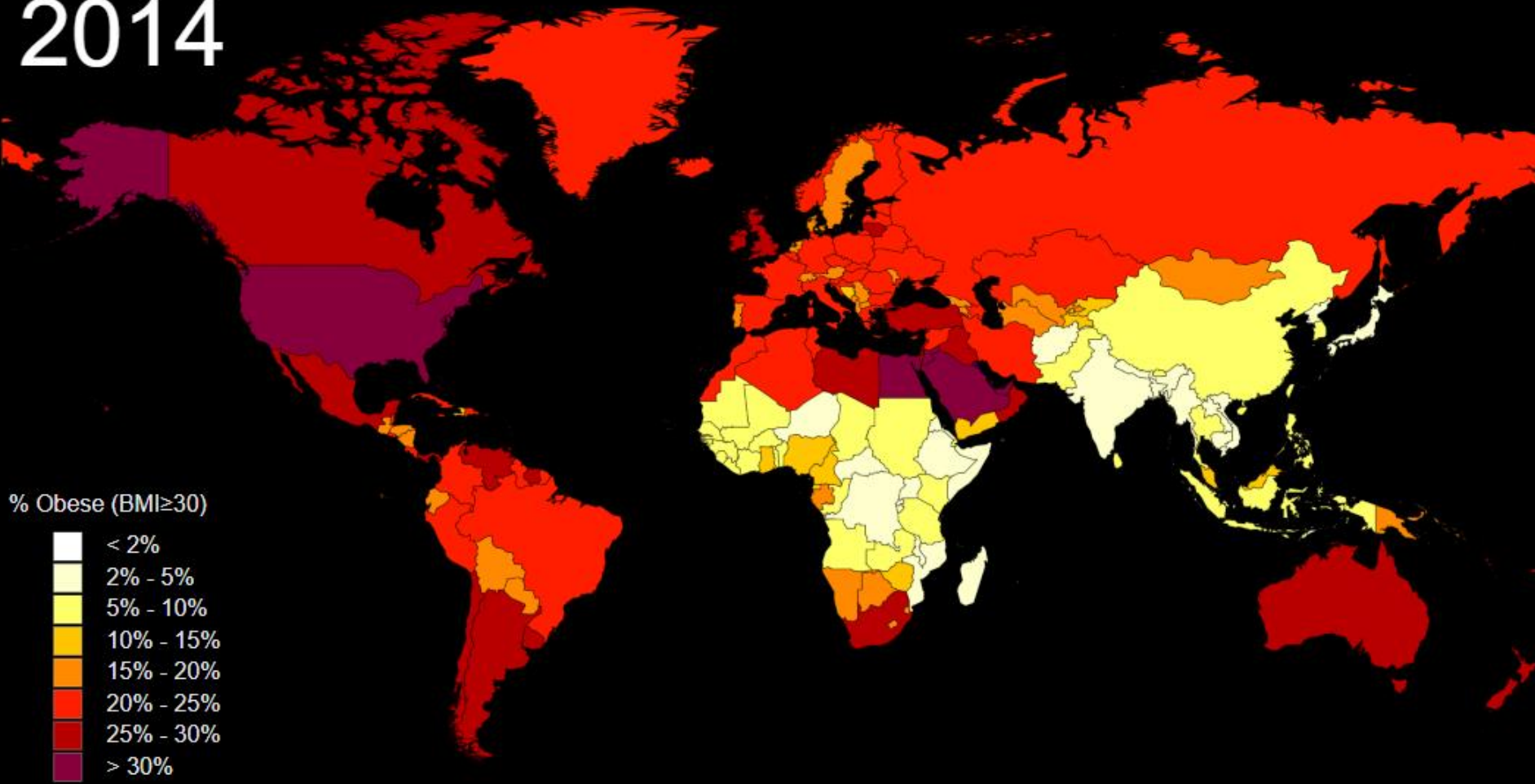
Data taken from:

<http://en.wikipedia.org/w/index.php?title=Image:8mi30chart.png&oldid=107854017>

Drawing by:

<http://www.WallingtonGrey.net>

2014



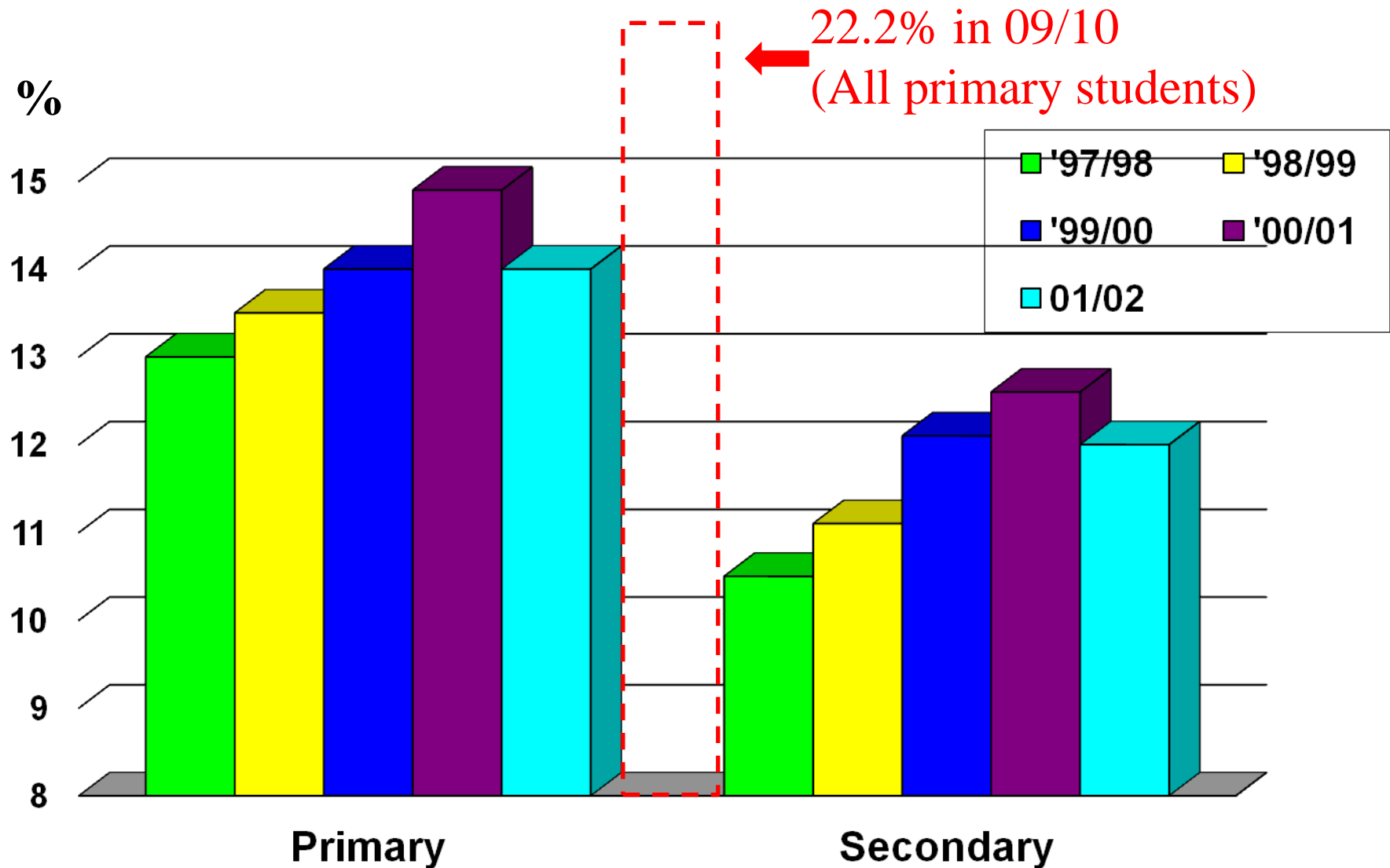
Developing countries

- The rate of increase in obesity has been more than 30% higher than that of developed countries
- In Africa, the number of overweight children under 5 has increased by nearly 24% percent since 2000.
- Almost half of the children under 5 who were overweight or obese in 2019 lived in Asia.

Source: WHO

Childhood obesity

Student Obesity in Hong Kong



CHEU, DOH, 2005.

2017 / 18

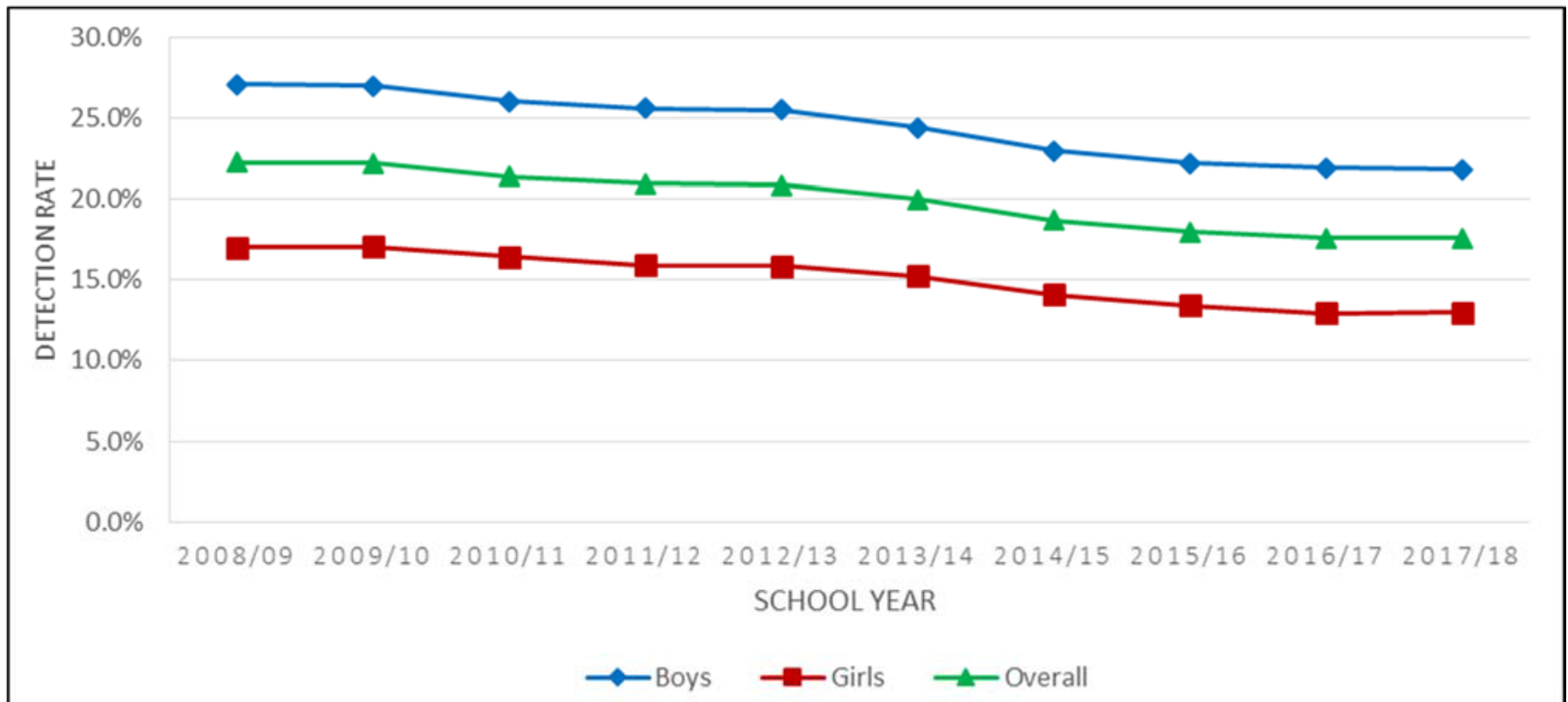
- Overweight and obesity rate of primary students is 17.6%

CHEU, DH, 2020

Overweight (including obese) is defined as weight $> 120\%$ of the median weight for height for male students with height between 55 and 175 cm and for female students with height between 55 and 165 cm; and BMI ≥ 25 for male students with height > 175 cm and for female students with height > 165 cm

HK latest figures

Overweight and obesity detection rate of [primary school](#) students by sex from school year 2008/09 to 2017/18



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Leading causes of death in HK

Heart disease

- 2nd commonest cause of deaths in HK
- Accountable for about 16.3% of all death

Stroke

- 3rd commonest cause of deaths in HK
- Accountable for 10.5% of all deaths

Type II DM

- 7th commonest cause of deaths in HK
- 1 in 10 aged 25 to 74 has type II DM in HK

Breast cancer

- 3rd commonest cause of female cancer death
- Possible relations to high fat diet

Colorectal cancer

- 2nd commonest cancer in HK
- Related to high animal protein & animal fat and low in fruit & vegetable diet



Physiological consequence of obesity

- Cardiovascular disease
- Stroke
- Type II DM
- Dyslipidaemia
- Hypertension
- Gallstones
- Certain cancers
- Reproductive problems
- Osteoarthritis
- Chronic low back pain
- Sleep apnoea
- Depression
- Low self esteem
- Eating disorder



Type II Diabetes Mellitus
as an example
of health consequences of obesity

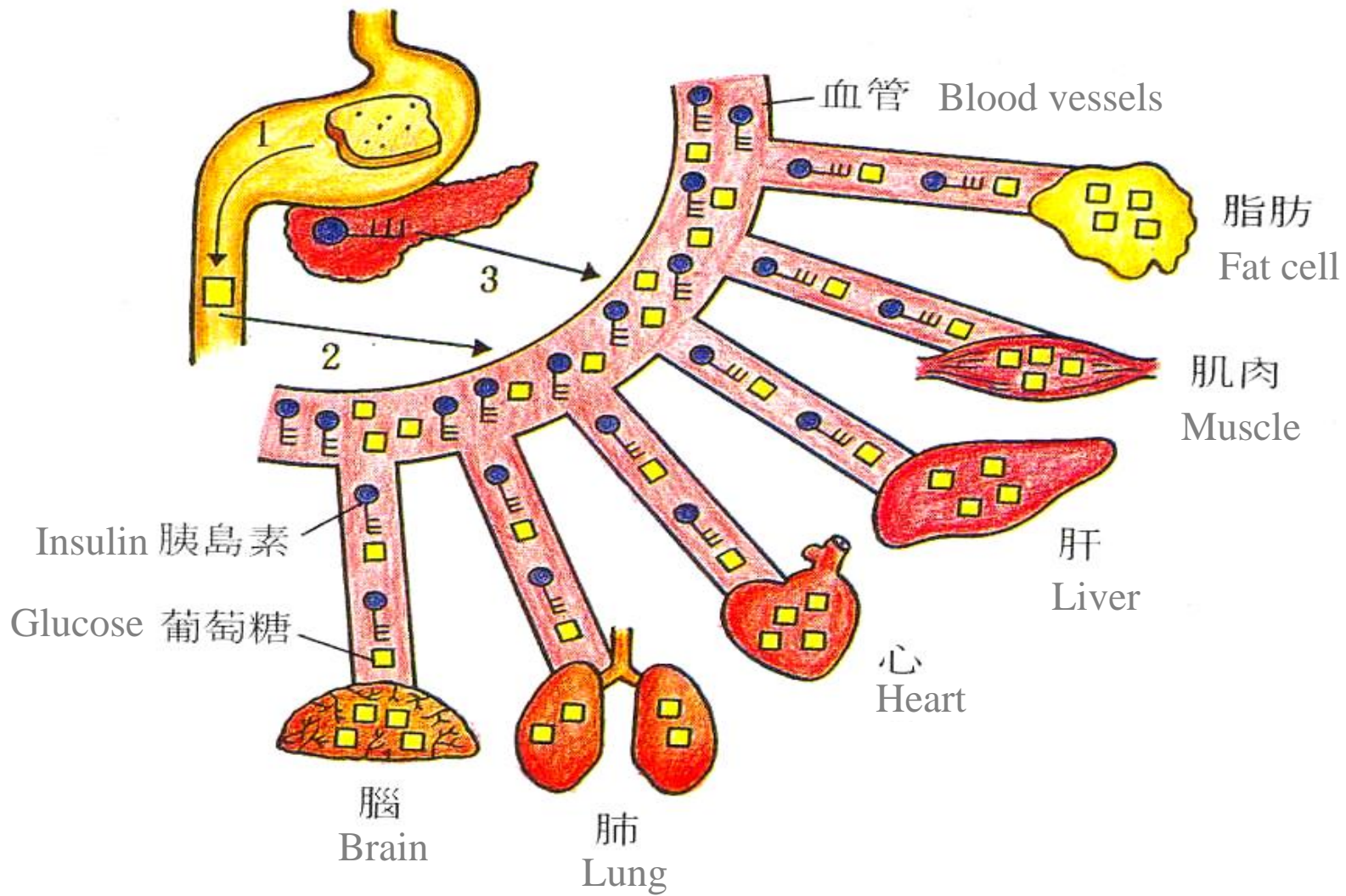
Diabetes Mellitus

Type I

- Insulin dependent DM
- Childhood onset
- Pancreatic cell destruction result in insulin insufficiency
- Treatment by insulin injection

Type II

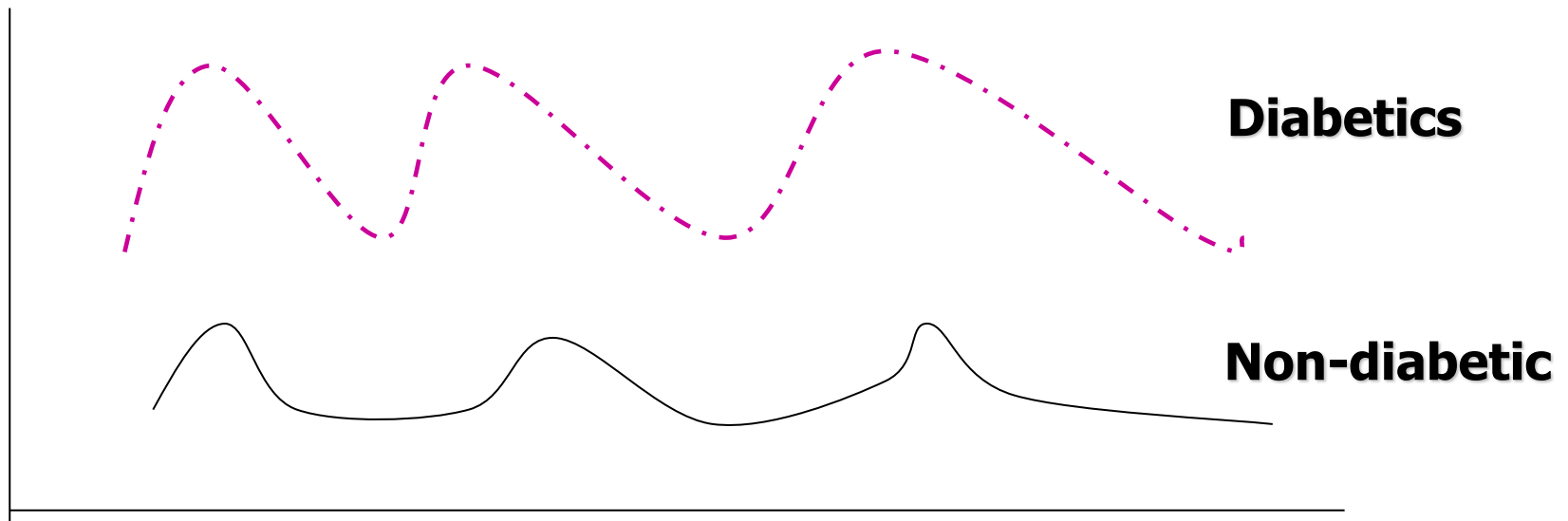
- Non-insulin dependent DM
- Adult onset
- Decreased in insulin sensitivity
- Treatment by lifestyle modification / OHA / insulin injection



Blood glucose levels

	Ideal	High
Fasting	4.4-6.1 mmol/L	>7.0 mmol/L
Postprandial	4.4-7.8 mmol/L	>11.1 mmol/L

Blood glucose level



Short term complications - hyperglycaemia



嚴重劇渴
Severe thirsty



呼吸快而深
Increase
breath rate



噁心、嘔吐
Nausea & vomiting

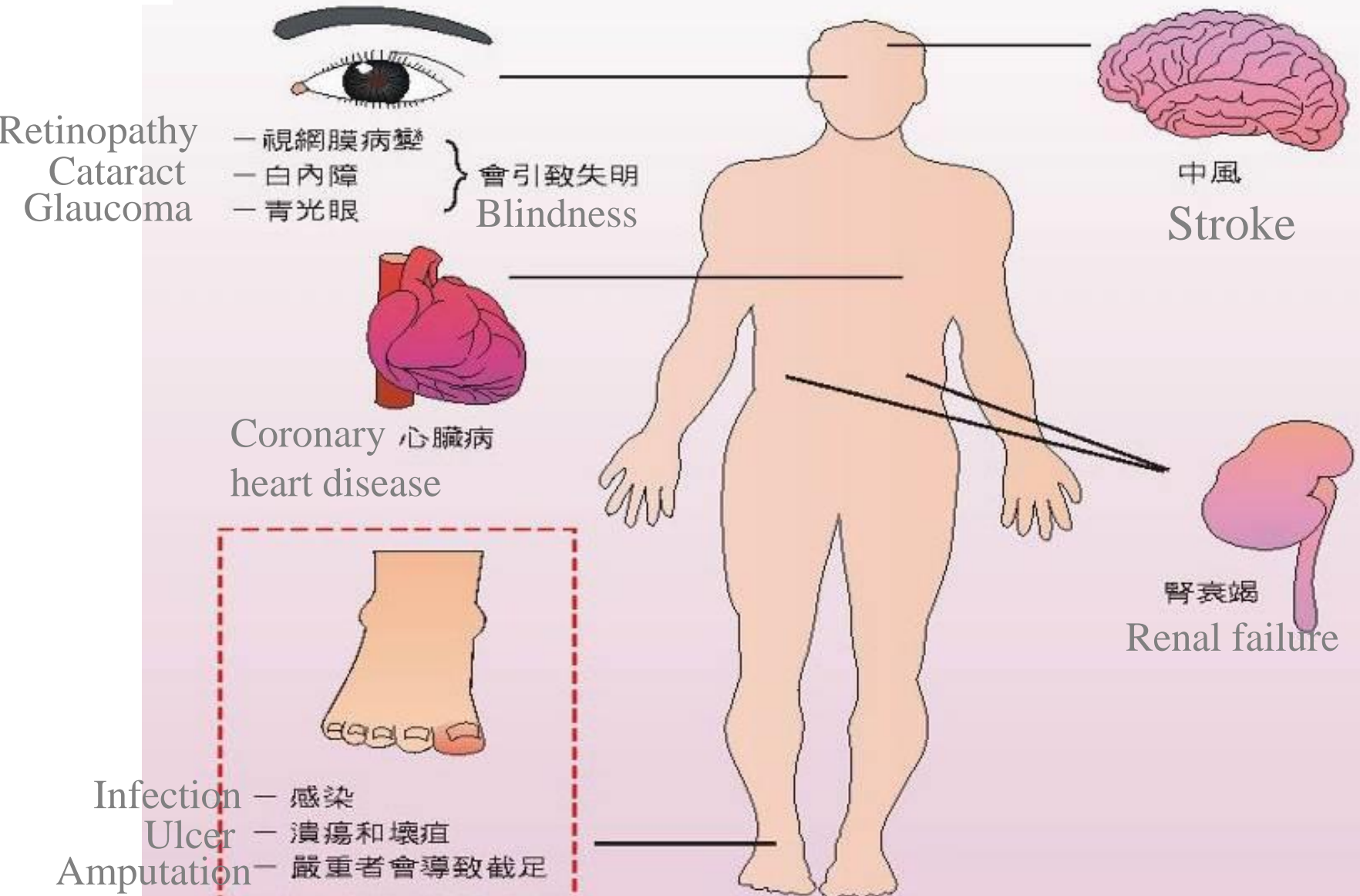


神智不清或昏迷
Coma



血糖、尿酮升高
Increase in blood glucose and ketone

Long term complications



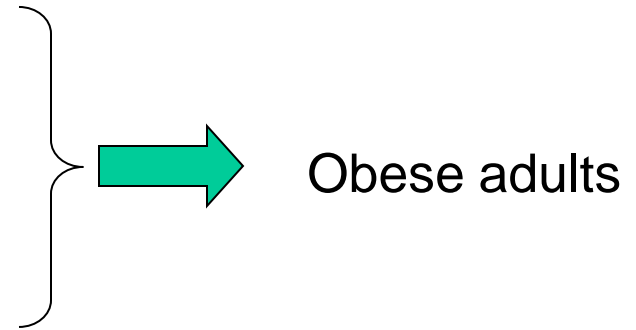
The significances

- **Diabetes is so far incurable**
- **Drugs and insulin can be lifelong**
- **Complications are life-threatening and greatly reduce QOL (e.g. renal dialysis for its failure)**
- **Onset age of Type II DM can be as early as 20s**

Problems associated with **Childhood obesity** (1)

- Risk of becoming obese adults

- 10% obese infants¹
- 33% obese preschool children¹
- 50% obese school-age children¹
- 80% obese adolescents²



¹Serdula PZ et al, Do obese children become obese adults? A review of literature. Prev Med. 1993;22:167.

²Kolata G. Obesity in childhood: a growing problem. Science 1986; 232:20.

Problems associated with Childhood obesity (2)

- As many as **80%** of obese adolescents have been found to have elevated systolic or diastolic blood pressure, and **97%** already had **known risk factors for heart disease**, including elevated serum triglyceride and cholesterol level and decreased high-density lipoprotein (HDL) cholesterol level.¹
- Obese children experience discrimination by teachers and even parents, but that manifested by peers can be particularly damaging to the child's self esteem.²

¹Becque MD et al. Coronary risk incidence of obese adolescents: reduction with exercise plus diet intervention. Pediatrics 1988;81:605 1988)

²Hill AJ, Silver EK. Fat, friendless and unhealthy: 9-year old children's perception of body shape stereotypes. Int J Obesity 1995;19:423. 1995)

Risk factor profiling in 2115 HK adolescents

- 32.2% hypertension
- 10.9% high TG
- 9% central obesity
- 2.4% low HDL-C
- 0.3% IFG
- 13% albuminuria
- 31.7% had 1 risk factor
- 7.8% had 2 risk factors
- 2.1% had 3 risk factors
- 0.3% had 4 risk factors

Ozaki R. et al. Overweight, family history of diabetes and attending schools of lower academic grading are independent predictors for metabolic syndrome in Hong Kong Chinese adolescents. *Archives of Disease in Childhood*. 92(3):224-8, 2007 Mar.

Overweight children in HK perceived themselves :

- to have significantly more body fat than normal weight children
- with poorer appearance, sports competence, endurance, coordination and flexibility

Also,

- with lower overall physical self-concept
- with lower self-esteem

Sung RY. Yu CW. So RC. Lam PK. Hau KT. Self-perception of physical competences in preadolescent overweight Chinese children. *European Journal of Clinical Nutrition*. 59(1):101-6, 2005



WHO definition of Health

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

WHO 1948

Mortality ratios according to variations in weight

Weight group	Build and blood Pressure Study 1959		American Cancer Society Study		Build and Blood Pressure Study 1979	
	Male	Female	Male	Female	Male	Female
20% underweight	95	87	110	110	105	110
10% underweight	90	89	100	95	94	97
10% overweight	113	109	107	108	111	107
20% overweight	125	121	121	123	120	110
30% overweight	142	130	137	138	135	125
40% overweight	167	--	162	163	153	136
50% overweight	200	--	210	--	177	149
60% overweight	250	--	--	--	210	167

Van Itallie TB. Obesity: adverse effects on health and longevity. Am J Clin Nutr 1979;32:2723.

Topics

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4. Public health strategies to address obesity

Causes of obesity

1. Genetic factors
2. Dietary causes
 - Over consumption of food
 - Diet composition
 - Frequent consumption of energy-dense and high fat foods
 - Unhealthy life style and eating habits
 - Alcohol consumption
3. Behavioral causes
 - Physically inactive
 - Sedentary lifestyle



Causes of obesity

4. Psycho-social causes

- Culture, economics and geographical location

5. Physiological causes

- Eating disorder
- Endocrine disorders (e.g. insulin and thyroid hormone)
- Drug (e.g. corticosteroids, tricyclic antidepressants)



Topics

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Global

- Global Strategy on Diet, Physical Activity and Health (WHO 2004) (recognized again in a 2011)

Regional / National

- Healthy People 2020 (USA)
- Mexico Initiative of Beverages
- Singapore Healthy Meals in Schools Programme (HMSP)

Local

- Eat Smart @ School
- Eat Smart @ Restaurant
- Weight management programs from private sectors or public sectors
- Nutrition education program provided by NGO
- Exercise promotion (Hong Kong)

Global Strategy on Diet, Physical Activity and Health (WHO 2004)

Four major objectives

- 1. To reduce the **risk factors** for non-communicable diseases that stem from unhealthy diets and physical activity by means of essential public health action and health promoting and disease preventing measures.
- 2. To increase the overall awareness and understanding of the influences of diet and physical activity on health and of the positive impact of preventive interventions.

<http://www.who.int/dietphysicalactivity/en/>

- 3. To encourage the development, strengthening and implementation of global, regional, national and community policies and action plans to improve diets and comprehensive, and activity engage all sectors, including civil society, the private sector and the media
- 4. To monitor scientific data and key influences on diet and physical activity; to support research in a broad spectrum of relevant areas, including evaluation of interventions; and to strengthen the human resources needed in this domain to enhance and sustain health.

Healthy People 2020 (USA)

- **NWS–9: Reduce the proportion of adults who are obese.**
Target: 30.5 percent. Baseline: 33.9 percent of persons aged 20 years and older were obese in 2005–08 (age adjusted to the year 2000 standard population).

Healthy People 2020 (USA)

- **NWS–10 Reduce the proportion of children and adolescents who are considered obese. NWS–10.1 Reduce the proportion of children aged 2 to 5 years who are considered obese. Target: 9.6 percent. Baseline: 10.7 percent of children aged 2 to 5 years were considered obese in 2005–08.**

Healthy People 2020 (USA)

- NWS–10.2 Reduce the proportion of children aged 6 to 11 years who are considered obese. Target: **15.7 percent**.

Baseline: 17.4 percent of children aged 6 to 11 years were considered obese in 2005–08.

Healthy People 2020 (USA)

- NWS–10.3 Reduce the proportion of adolescents aged 12 to 19 years who are considered obese. Target: **16.1 percent**.
Baseline: 17.9 percent of adolescents aged 12 to 19 years were considered obese in 2005–08.

Healthy People 2020 (USA)

- NWS–10.4 Reduce the proportion of children and adolescents aged 2 to 19 years who are considered obese.
- Target: 14.5 percent.
- Baseline: 16.1 percent of children and adolescents aged 2 to 19 years were considered obese in 2005–08.

By

- Education
- Food labeling and advertisement
- Food assistance program
- Health care and training
- Transportation and urban development
- Taxes
- Policy development

Comparison of Healthy people 2020

Aim vs Result

	Baseline	Aim	Result (2017-18)
Adults who are obese	33.9%	30.5%	42.4%
Children aged 2 to 5 years who are obese	10.7%	9.6%	13.9%
Children aged 6 to 11 years who are obese	17.4%	15.7%	18.4%
Adolescents 12 to 19 years who are obese	17.9%	16.1%	20.6%
Young people 2 to 19 years who are obese	16.1%	14.5%	18.5%

(Source: Centers for disease control and prevention, US)

Mexico Initiative of Beverages

- Remove all whole milk, shift to 1.5 % and later to skim milk in all government programs
- Ban all sugary drinks in school, encouraged water and skim milk
- Taxation of per gram in sugar and per gram of fat in beverages (since 1 Jan 2014)
 - an average of 6% reduction in purchases of the sugar-sweetened beverages as compared with 2013.
 - an approximately 7% increase in purchases of non-taxed beverages

Rivera, et al. Salud Publica Mex 2008:50, 173-195

Singapore Healthy Meals in Schools Programme (HMSP)

The proportion of overweight children in mainstream schools, aged 6 to 18 years, has increased from 11% in 2013 to 13% in 2017

Canteen vendors at schools must now serve healthier food options to kids, and will need to observe the following guidelines:

- *must contain food from these four food groups: brown rice/wholemeal bread, fruit, vegetables, and meat/ vegetarian protein (e.g. tofu)..*
- *when preparing food, use skinless poultry/ lean meat.*
- *when high-fat ingredients are used in preparing food and beverages (e.g. coconut cream), at least half of the required amount of such ingredients should be replaced with a low-fat alternative (e.g. low-fat yogurt).*
- *fattening and oily sauces/ soup should not be served unless upon request.*
- *snack stalls must only sell homemade snacks or commercial snacks that have the Healthier Choice Symbol (HCS) or HCS equivalent.*
- *canteen area must have at least two regularly maintained water coolers.*
- *beverages and desserts sold in canteens should contain less sugar*

Other children's health programs in Singapore

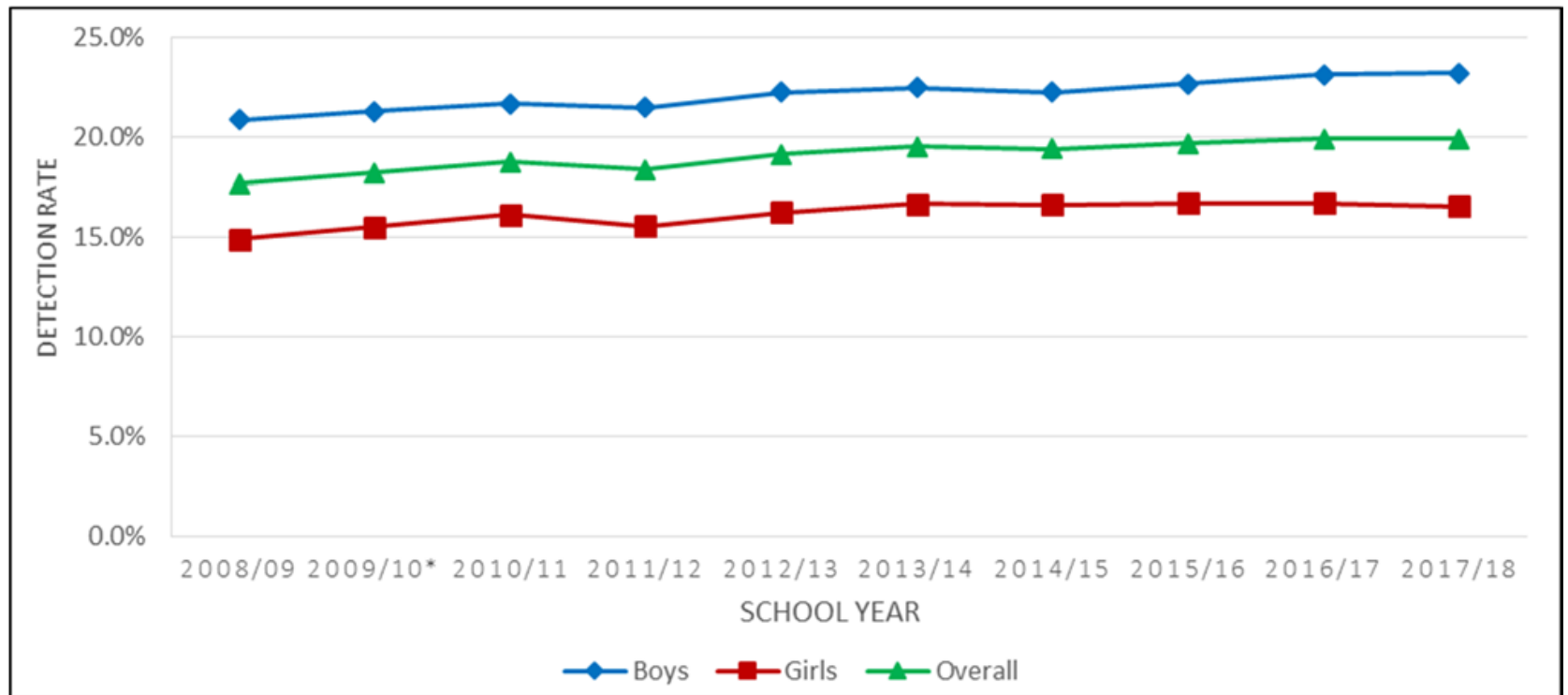
- the Health Promotion Board (HPB) launched its pilot Active and Healthy Weekends program between January and April 2017, where over 2,200 parents and children participated in its family fitness activities held at various community sites.
- to address mental health, the HPB and MOE have started providing mental health training courses to school educators. The HPB also launched a microsite to educate parents about the importance of adequate sleep in children.

Hong Kong

- Eat Smart @ School
- Eat Smart @ Restaurant
- Weight management programs from private sectors or public sectors
- Nutrition education program provided by NGO
- Exercise promotion

HK latest figures

Overweight and obesity detection rate of **secondary school** students by sex from school year 2008/09 to 2017/18



HK latest figures

- According to the Population Health Survey (PHS) 2014/15, **29.9%** (24.4% of females and 36.0% of males) of persons aged 15-84 were **obese** (i.e. $\text{BMI} \geq 25.0 \text{ kg/m}^2$) and another **20.1%** (19.3% of females and 20.9% of males) were **overweight** (i.e. $23.0 \text{ kg/m}^2 \leq \text{BMI} < 25.0 \text{ kg/m}^2$). Obesity was most common among females aged 65-84 (34.3%) and among males aged 45-54 (51.1%).

Source: Department of Health, HKSAR

Thank you