

# 2021 OBESITY FACT SHEET

**KSSO** KOREAN SOCIETY  
FOR THE STUDY  
OF OBESITY

**h·well**  
**NHIS** National Health  
Insurance Service



# Welcome message

We would like to express our sincere congratulations on the publication of the 2021 Obesity Fact Sheet, which is the seventh annual edition since 2015. The 2021 Obesity Fact Sheet presents trends in the prevalence of obesity over the past 11 years according to age and sex, as well as the risk of major comorbidities such as type 2 diabetes, cardiovascular disease, and cancers, based on big data from the National Health Insurance Service (NHIS).

The prevalence of obesity and the risk of obesity-related comorbidities are presented according to age, sex, and the definition of obesity. The prevalence of obesity and abdominal obesity in the entire population has increased over the past 11 years. In particular, the prevalence of obesity has rapidly risen in individuals in their 20s and 80s, compared to other age groups. In addition, the prevalence of class III obesity in both men and women has significantly increased by nearly threefold. Regarding the risk of obesity-related comorbidities, the risk of developing type 2 diabetes, myocardial infarction, stroke, and cancers was higher in young and middle-aged individuals with obesity or abdominal obesity than that in the elderly. These findings suggest the need to better understand the characteristics of obesity according to age and sex and to establish individualized treatment strategies.

We would like to express sincere gratitude to Professor Yong Gyu Park (The Catholic University of Korea), Professor Kyungdo Han (Soongsil University), Ph.D Jin-hyoung Jeong (The Catholic University of Korea), and many other researchers for their dedication to this publication. We are especially thankful to the members of the Big Data Center of the NHIS for their generous support for this publication. We would also like to express our sincere appreciation to Professor Jang Won Son, Professor Byoungduck Han and Professor Ye Seul Yang, and the Big Data committee members. This Fact Sheet was made possible by the dedicated efforts of the Big Data Committee.

We hope that this Fact Sheet will be helpful for the treatment and management of obesity and obesity-related diseases in Koreans and will further serve as an inspiration for research on obesity and policy development. The Korean Society for the Study of Obesity has been participating in policymaking decisions to fulfill its responsibility of improving the health of the general population. We hope that this Fact Sheet will be a valuable resource for the establishment of national health policies in Korea.



Chairman of Korean Society for the Study of Obesity  
**Jae Heon Kang**



President of Korean Society for the Study of Obesity  
**Chang Beom Lee**

# 2021 Obesity fact sheet task force team

<b>Director</b>	Jang won son	The catholic university of korea
<b>Co-director</b>	Byoungduck han	Korea university
	Ye seul yang	The catholic university of korea
<b>Member</b>	Eun sook kim	The catholic university of korea
	Ga eun nam	Korea university
	Tae jung oh	Seoul national university
	Sungho won	Seoul national university
	Sunyong yoo	Chonnam national university
	Sunjae lee	Gwangju institute of science and technology
	Woojoo lee	Seoul national university
Kyungdo han	Soongsil university	
Sang-mo hong	Hanyang university	

<b>Published date</b>	2022. 1. 28
<b>Publisher</b>	Chang beom lee, President of korean society for the study of obesity
<b>Editor</b>	Jang won son, Director, Committee of big data
<b>Published by</b>	Korean society for the study of obesity
<b>ISBN</b>	979-11-976074-1-7 (95510)

# Contents

- 2 Welcome Message
- 3 2021 Obesity Fact Sheet Task Force Team
- 6 Data Source and Statistical Analysis ·  
Definitions of Obesity and Abdominal Obesity
- 7 Summary

## Prevalence of obesity in the last 11 years (2009-2019)

---

- 10 Prevalence of obesity in the last 11 years
- 11 Prevalence of abdominal obesity in the last 11 years
- 12 Prevalence of obesity in 2019
- 13 Prevalence of abdominal obesity in 2019

- 14 Prevalence of obesity by obesity class in the past 11 years
- 15 Prevalence of obesity by obesity class in men in the past 11 years
- 16 Prevalence of obesity by obesity class in women in the past 11 years
- 17 Prevalence of class II and class III obesity in 2009 vs. 2019
- 18 Age-specific obesity prevalence in the past 11 years
- 19 Age-specific abdominal obesity prevalence in the past 11 years
- 20 Age-specific obesity prevalence in 2019
- 21 Age-specific abdominal obesity prevalence in 2019
- 22 Prevalence of obesity in men in the last 11 years
- 23 Prevalence of obesity in women in the last 11 years
- 24 Prevalence of abdominal obesity by age in men in the last 11 years
- 25 Prevalence of abdominal obesity by age in women in the past 11 years
- 26 Prevalence of obesity by age in men and in women in 2019
- 27 Prevalence of abdominal obesity by age in men and in women in 2019

## Prevalence of major comorbidities in relation to obesity

---

- 29 Definition of comorbidity
- 30 Prevalence of type 2 diabetes
- 31 Prevalence of type 2 diabetes by age
- 32 Prevalence of myocardial infarction
- 33 Prevalence of myocardial infarction by age
- 34 Prevalence of stroke
- 35 Prevalence of stroke by age
- 36 Prevalence of major solid cancers in men
- 37 Prevalence of major solid cancers in women

- 38 Risk of diabetes and cardiovascular disease  
in the transitional period of life at the age of 40
- 39 Risk of diabetes and cardiovascular disease  
in the transitional period of life at the age of 66
- 40 Risk of major solid cancers in the transitional period  
of life at the age of 40
- 41 Risk of major solid cancers in the transitional period  
of life at the age of 66 years
- 42 Obesity infographic · 40s
- 43 Obesity infographic · 60s
- 44 Korean society for the study of obesity board

## Data Source and Statistical Analysis

**Data Source** The 2009-2019 national health checkup database of people aged  $\geq 20$  years by the National Health Insurance Service (NHIS) was analyzed.

**Data Presentation** The prevalence of obesity and abdominal obesity in the total population is presented, as well as prevalence by age and sex group. The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea. The incidence of obesity comorbidities was tracked from 2009 to 2019, and the prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.

## Definitions of Obesity and Abdominal Obesity

Obesity was defined as a body mass index (BMI, weight in kilograms divided by their height in meters squared)  $\geq 25.0$  kg/m<sup>2</sup>, in accordance with the Asia-Pacific criteria of the World Health Organization (WHO) guideline.<sup>1)</sup>

Obesity classes were defined using the 2018 KSSO Obesity Treatment Guideline.<sup>2)</sup>

1. **Class I obesity** BMI 25-29.9 kg/m<sup>2</sup>
2. **Class II obesity** BMI 30-34.9 kg/m<sup>2</sup>
3. **Class III obesity** BMI  $\geq 35$  kg/m<sup>2</sup>

Abdominal obesity was defined as a waist circumference (WC)  $\geq 90$  cm in males and  $\geq 85$  cm in females, according to the KSSO definition.<sup>3)</sup>

1) WHO. The Asia-Pacific perspective : Redefining obesity and its treatment. 2000

2) Seo MH, et al. 2018 Korean Society for the Study of Obesity Guideline for the Management of Obesity in Korea. J Obes Metab Syndr 2019;28:40-45.

3) Lee SY, et al. Appropriate waist circumference cutoff points for central obesity in Korean adults. Diabetes Res Clin Pract 2007;75:72-80.

## Summary

### 1. Trends in the prevalence of obesity in the past 11 years (2009-2019)

- The prevalence of obesity has steadily increased over the past 11 years.
- The prevalence of obesity in the total population was 36.3% in 2019; 46.2% in men and 27.3% in women.
- The prevalence of class III obesity (BMI  $\geq 35$  kg/m<sup>2</sup>) has increased by nearly threefold.
- The prevalence of obesity in people in their 20s and 80s was low compared to that in other age groups, but it has been rising relatively steeply.
- The prevalence of abdominal obesity increased in both sexes, but especially in men.
- In men, the prevalence of abdominal obesity increased regardless of age, and the increasing trend was most evident in individuals in their 20s and 30s.
- The increase in the prevalence of abdominal obesity in women was moderate compared to that in men, and the prevalence increased with age.

### 2. Risk of type 2 diabetes and cardiovascular disease in relation to obesity

- In individuals with obesity, the risk of type 2 diabetes was 2.6 times higher, and the risk was 5.9 times higher in those in their 20s and 30s.
- In individuals with obesity, the risk of myocardial infarction was 1.2 times higher, and the risk was 1.7 times higher in those in their 20s and 30s.
- In individuals with obesity, the risk of stroke was 1.1 times higher, and the risk was 1.7 times higher in those in their 20s and 30s.

## Summary

### 3. Risk of major solid tumors in relation to obesity

- For men with obesity or abdominal obesity, the risk of thyroid cancer was 1.5 times higher than in men with normal weight.
- The risk of colorectal cancer and liver cancer was 1.2 times higher in men with abdominal obesity than in men with normal weight.
- For women with obesity, the risk of thyroid cancer and liver cancer was 1.2 times higher than in women with normal weight.
- For women with abdominal obesity, the risk of thyroid cancer, colorectal cancer, and liver cancer was 1.2-1.3 times higher than in women with normal weight.

### 4. Risks of comorbidities in relation to obesity and abdominal obesity in transitional periods of life

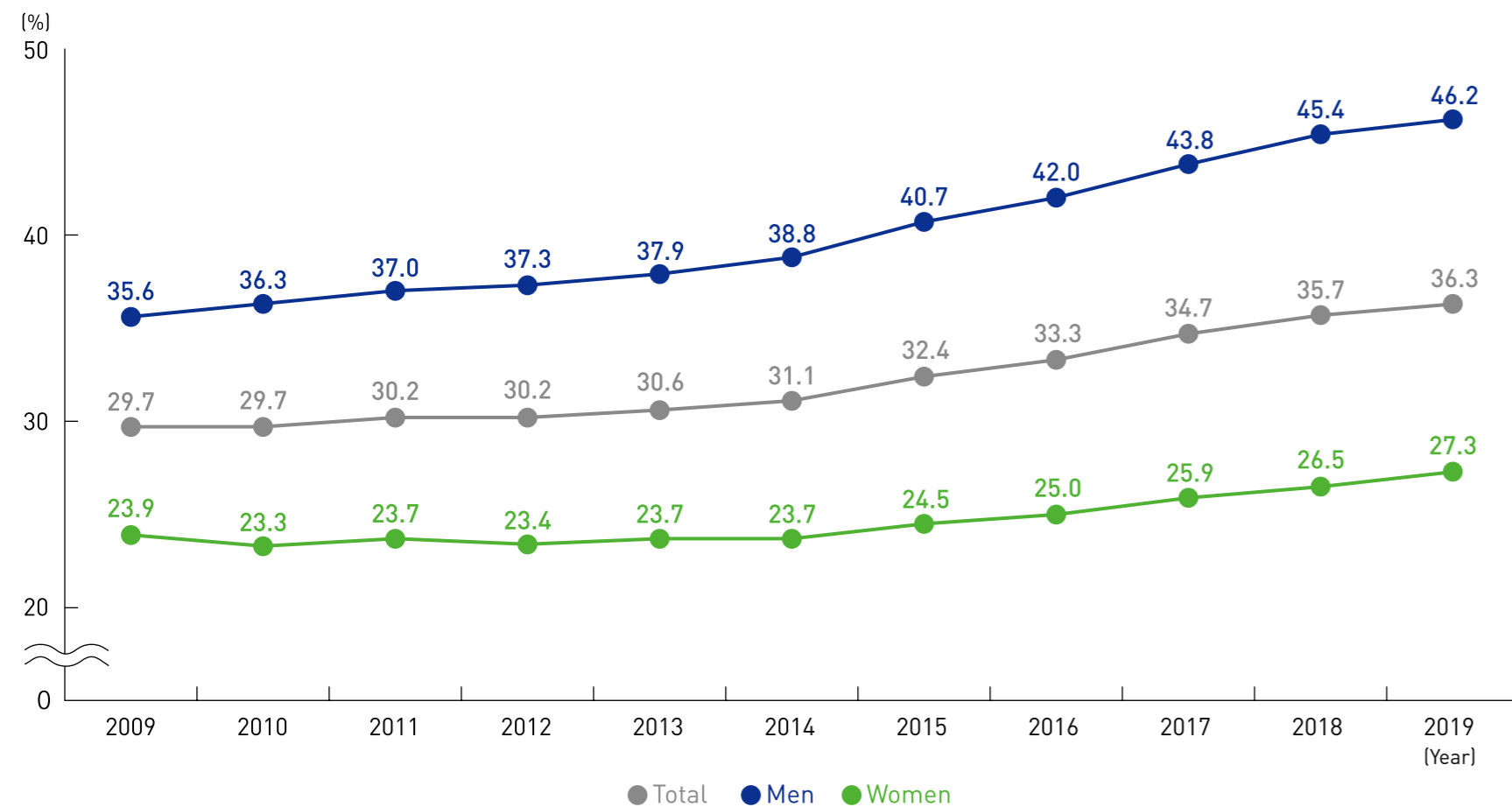
- Among 40-year-old obese people, the risk of type 2 diabetes, myocardial infarction, and stroke was higher by 5.1 times, 1.7 times, and 1.7 times, respectively.
- Among 40-year-old people with abdominal obesity, the risk of type 2 diabetes, myocardial infarction, and stroke was higher by 4.7 times, 1.8 times, and 1.7 times, respectively.
- Among 66-year-old obese people, the risk of type 2 diabetes, myocardial infarction, and stroke was higher by 1.8 times, 1.1 times, and 1.1 times, respectively.
- Among 66-year-old people with abdominal obesity, the risk of type 2 diabetes, myocardial infarction, and stroke was higher by 1.9 times, 1.2 times, and 1.2 times, respectively.
- Among 40-year-old people with obesity or abdominal obesity, the risk of liver cancer was 1.3-1.5 times higher than in those with normal weight
- Among 40-year-old men with obesity or abdominal obesity, the risk of prostate cancer was 1.2-1.4 times higher than in those with normal weight.
- Among 66-year-old people with obesity or abdominal obesity, the risk of thyroid cancer was 1.3 times higher than in those with normal weight.
- Among 66-year-old women with obesity or abdominal obesity, the risk of breast cancer was 1.2-1.4 times higher than in 40-year-old women in the transitional period of life.

## Prevalence of obesity in the last 11 years (2009-2019)



# Prevalence of obesity in the last 11 years

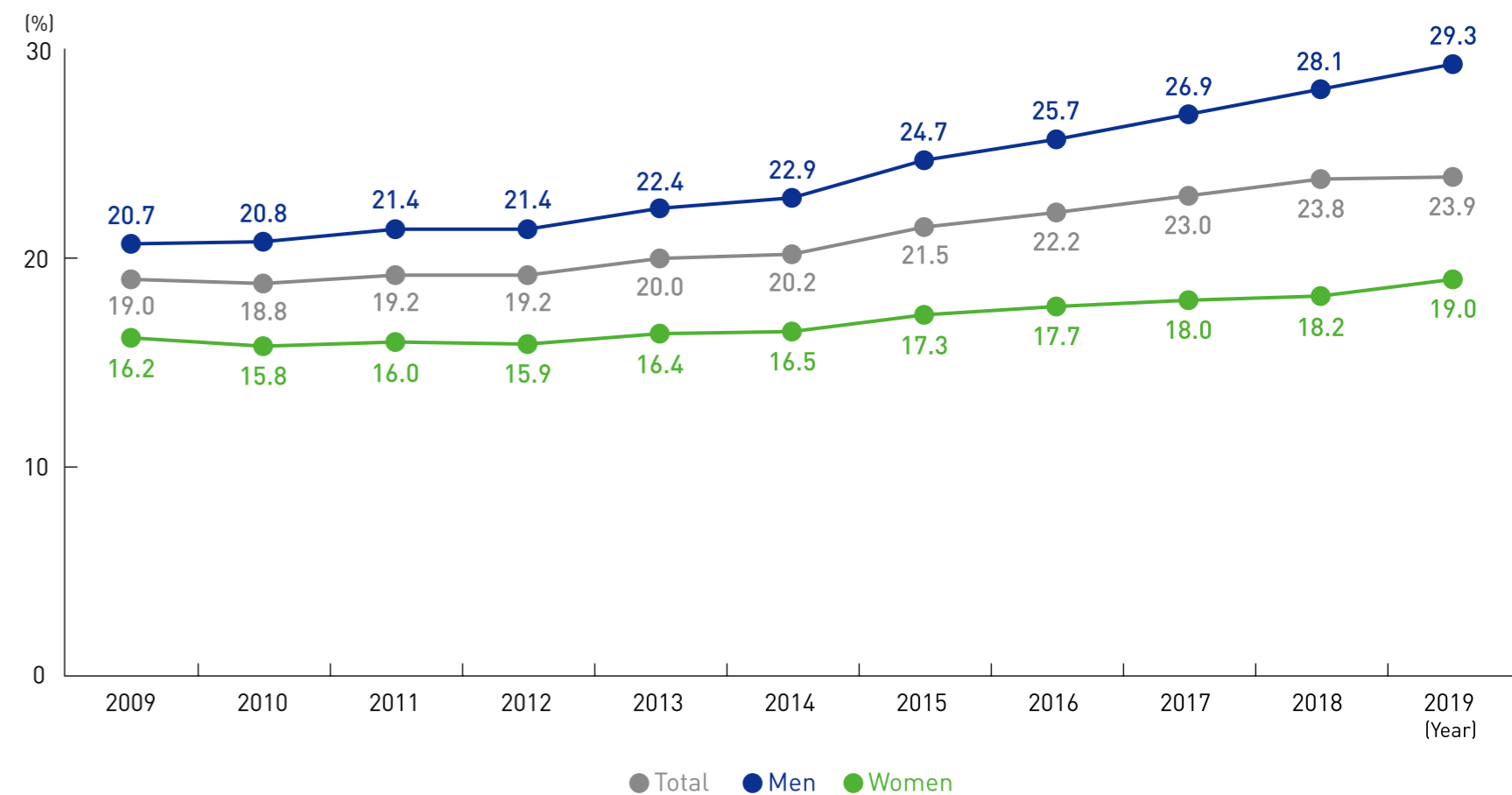
The prevalence of obesity has steadily increased over the past 11 years, especially in men.  
 In 2019, the prevalence of obesity was 36.3% in the total population: 46.2% in men and 27.3% in women.



· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

# Prevalence of abdominal obesity in the last 11 years

The prevalence of abdominal obesity has steadily increased over the past 11 years in both men and women, especially in men.

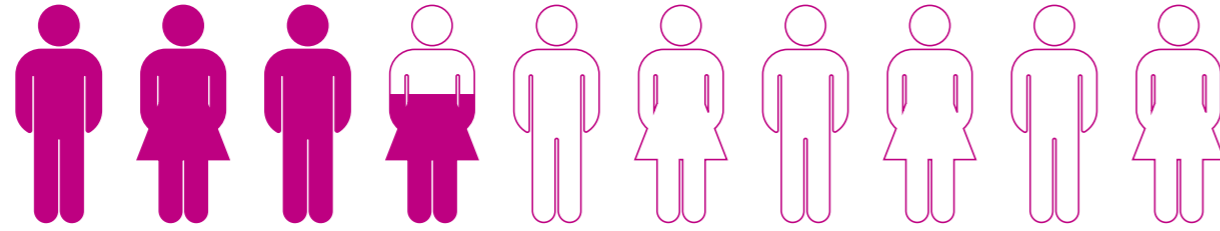


· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

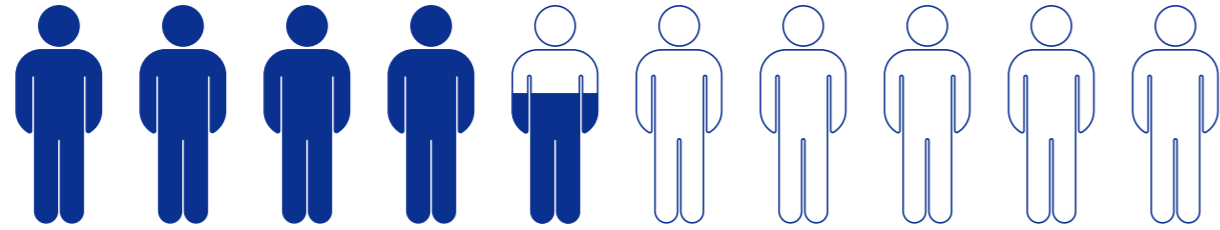
# Prevalence of obesity in 2019

[As of 2019]

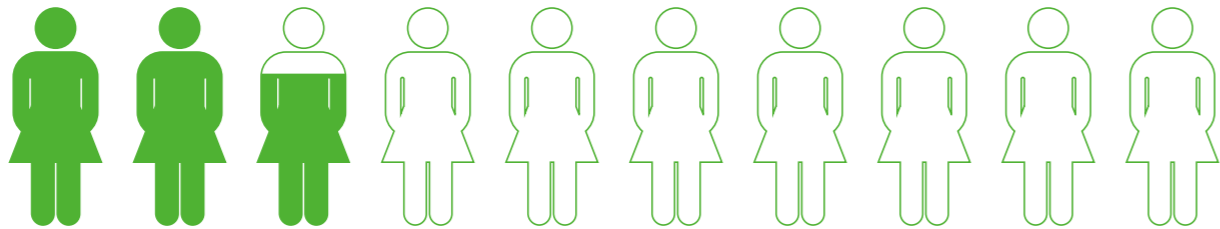
**36.3%**  
Total



**46.2%**  
Men



**27.3%**  
Women

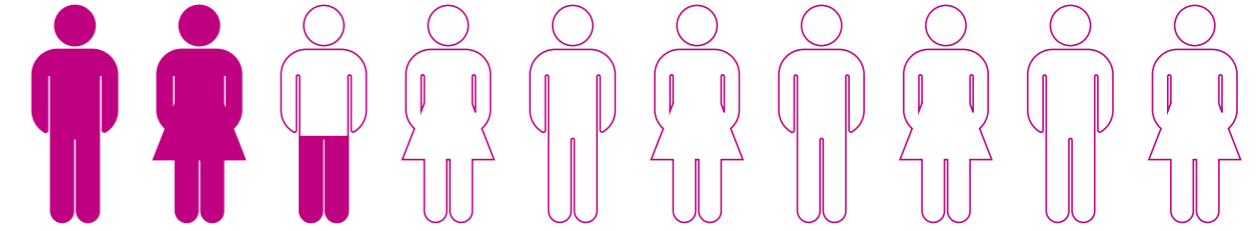


· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
· The 2009-2019 NHIS health checkup data were analyzed.

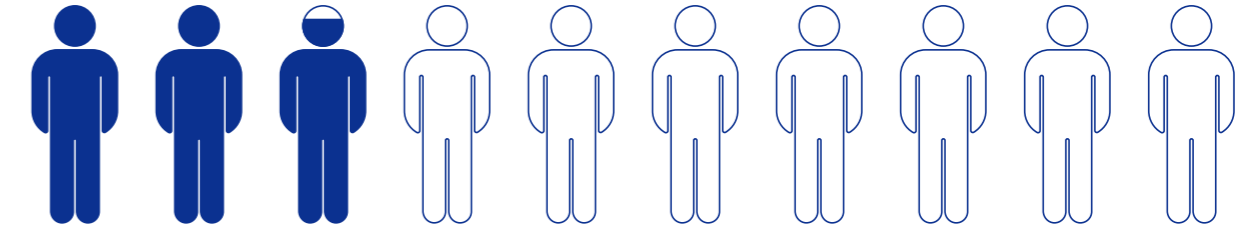
# Prevalence of abdominal obesity in 2019

[As of 2019]

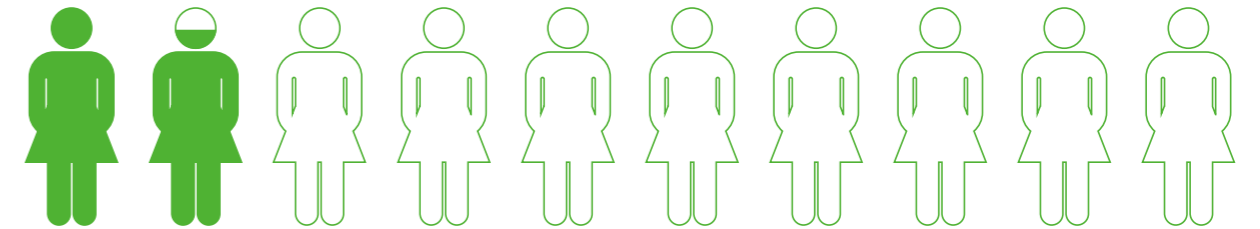
**23.9%**  
Total



**29.3%**  
Men



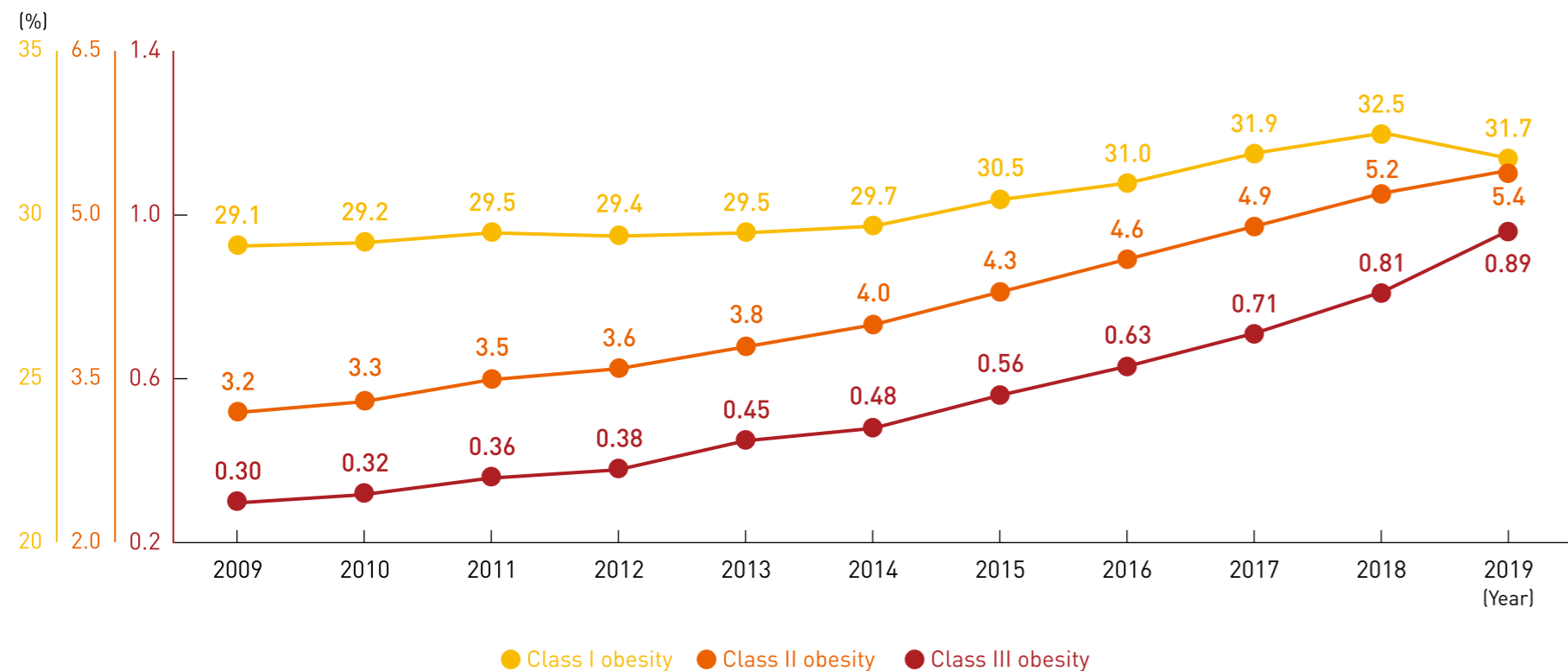
**19.0%**  
Women



· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
· The 2009-2019 NHIS health checkup data were analyzed.

# Prevalence of obesity by obesity class in the past 11 years

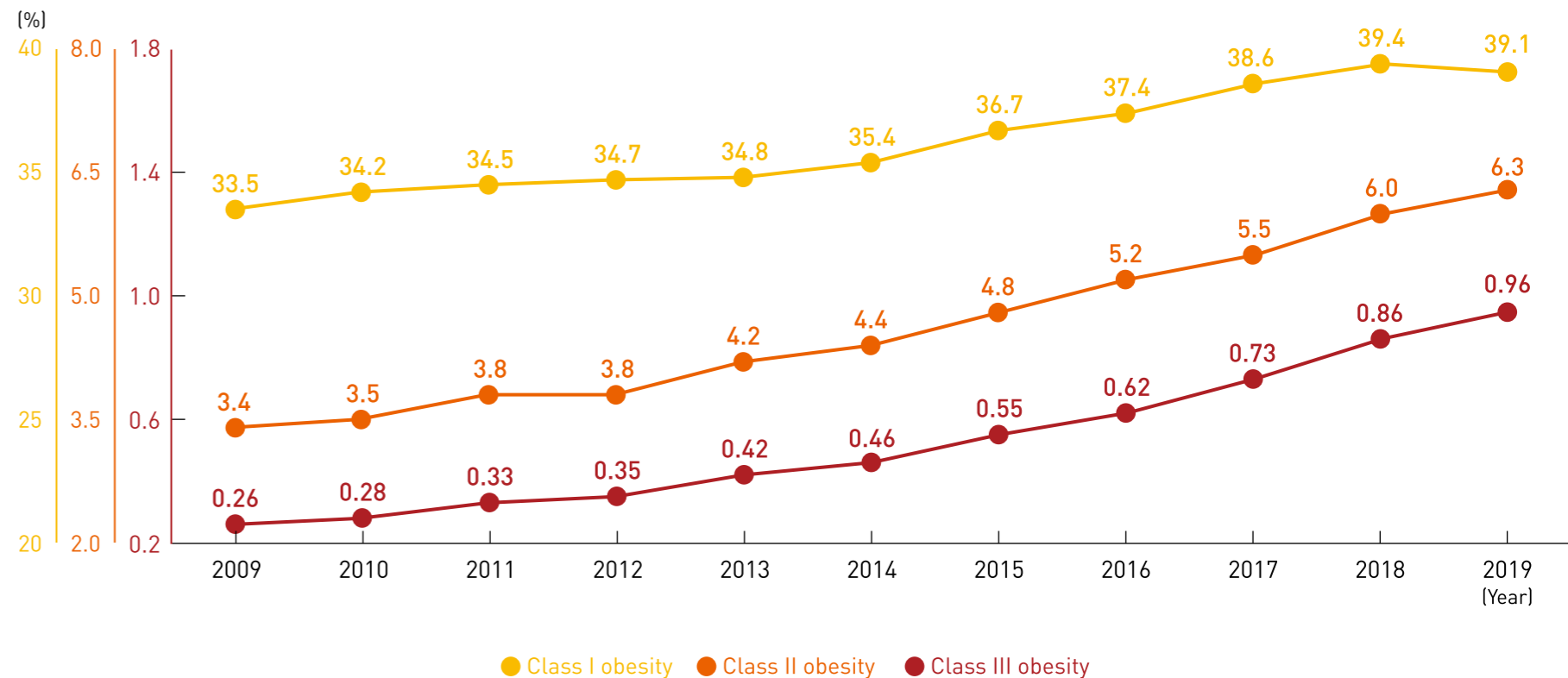
The prevalence of obesity in all classes has increased in the total adult population over the past 11 years. In particular, the prevalence of class III obesity has increased nearly threefold over the past 11 years from 0.30% to 0.89%.



· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

# Prevalence of obesity by obesity class in men in the past 11 years

The prevalence of obesity of all classes has increased in men in the past 11 years. In men, the prevalence of class II obesity doubled and the prevalence of class III obesity increased by 3.7 times over the past 11 years.

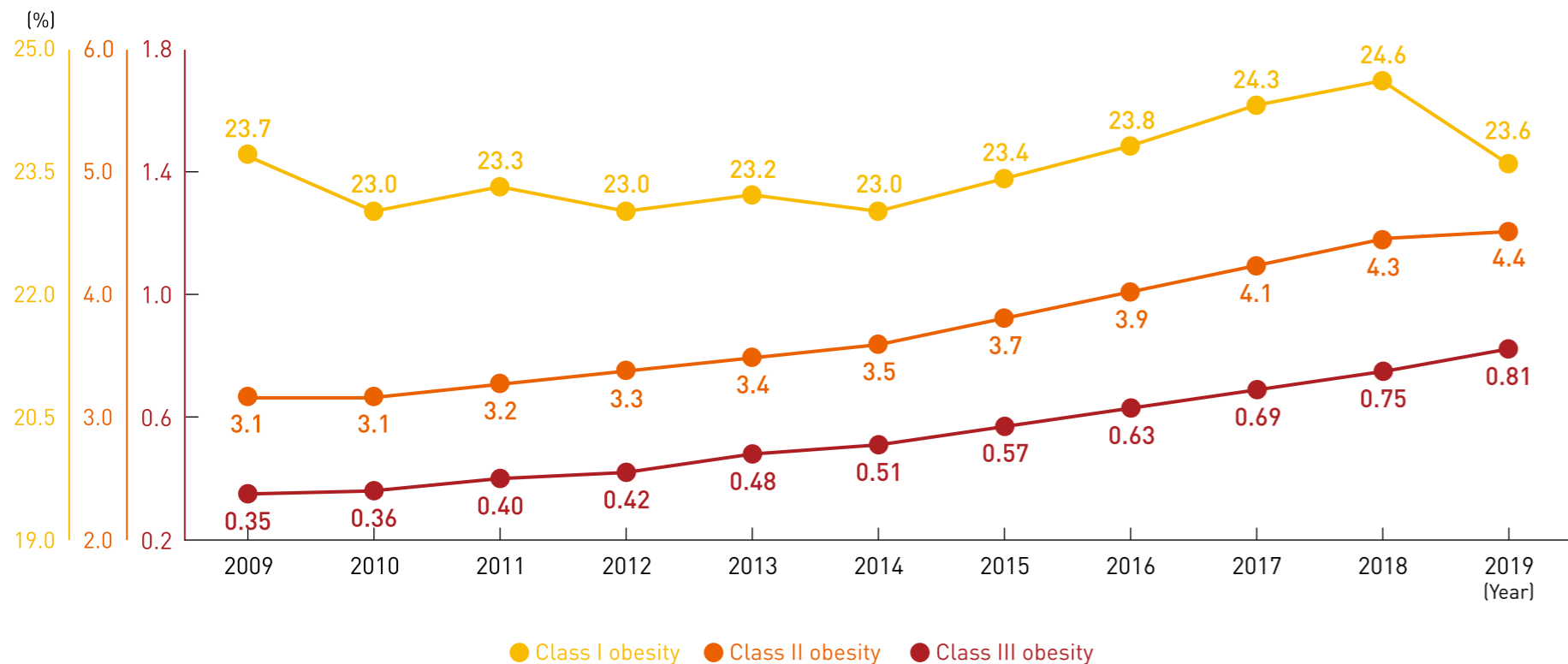


· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.



# Prevalence of obesity by obesity class in women in the past 11 years

Although the rate of increase was moderate compared to that in men, the prevalence of class II and III obesity steadily increased in women over the past 11 years. In particular, the prevalence of class III obesity increased by 2.3 times over the past 11 years.

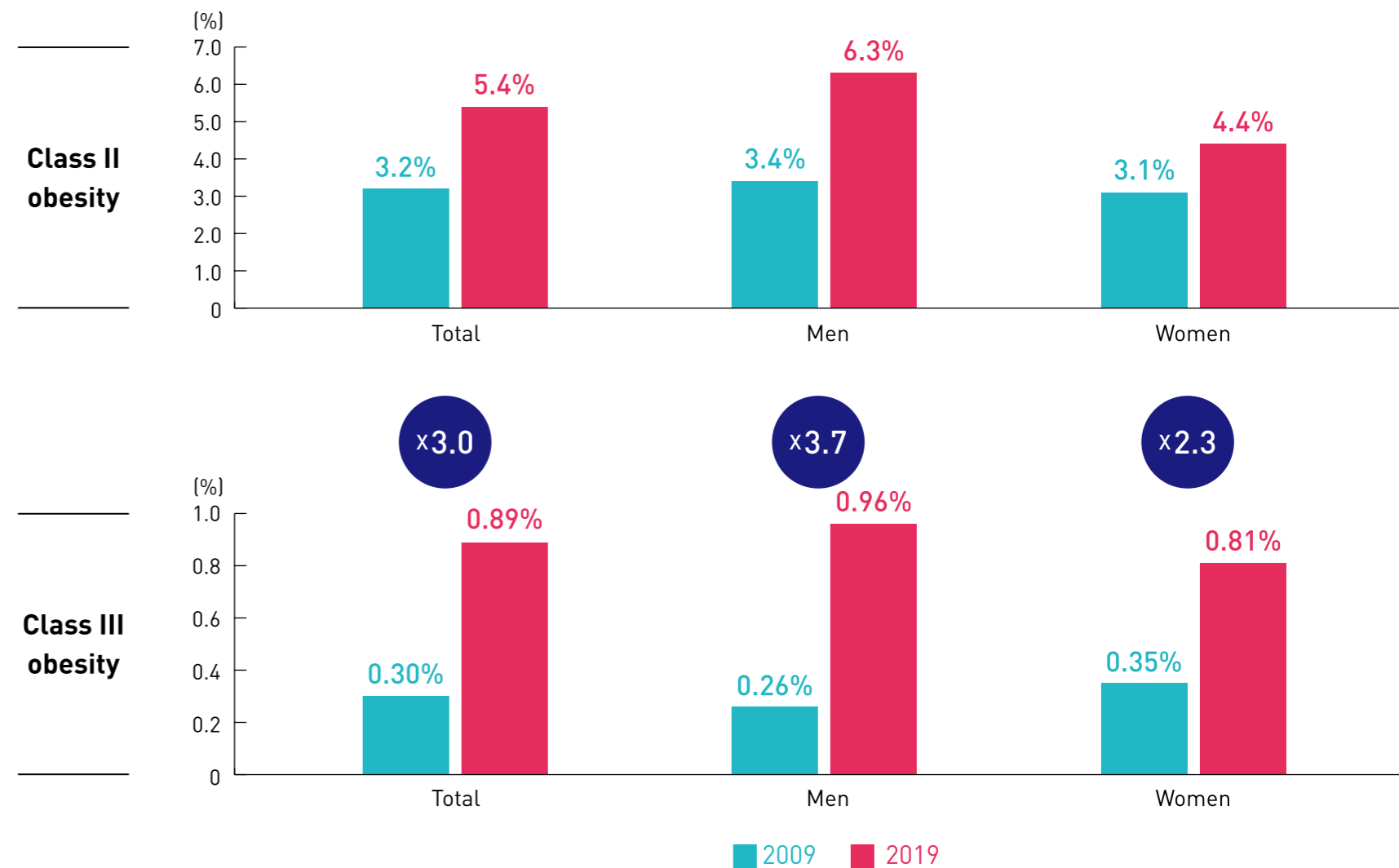


· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

Class I obesity BMI 25-29.9 kg/m<sup>2</sup>  
 Class II obesity BMI 30-34.9 kg/m<sup>2</sup>  
 Class III obesity BMI ≥ 35 kg/m<sup>2</sup>

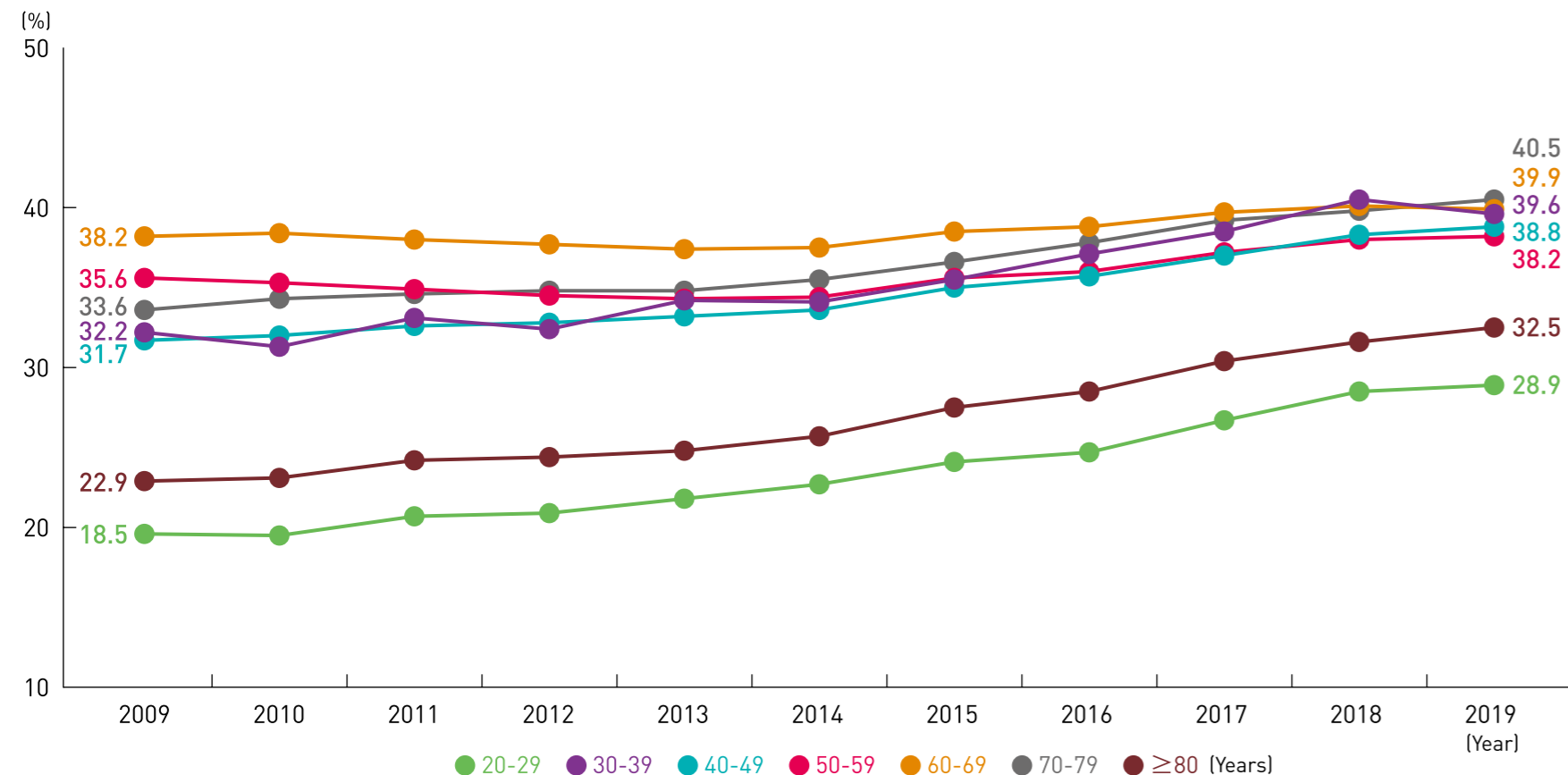
# Prevalence of class II and class III obesity in 2009 vs. 2019

Class I obesity BMI 25-29.9 kg/m<sup>2</sup>  
 Class II obesity BMI 30-34.9 kg/m<sup>2</sup>  
 Class III obesity BMI ≥ 35 kg/m<sup>2</sup>



# Age-specific obesity prevalence in the past 11 years

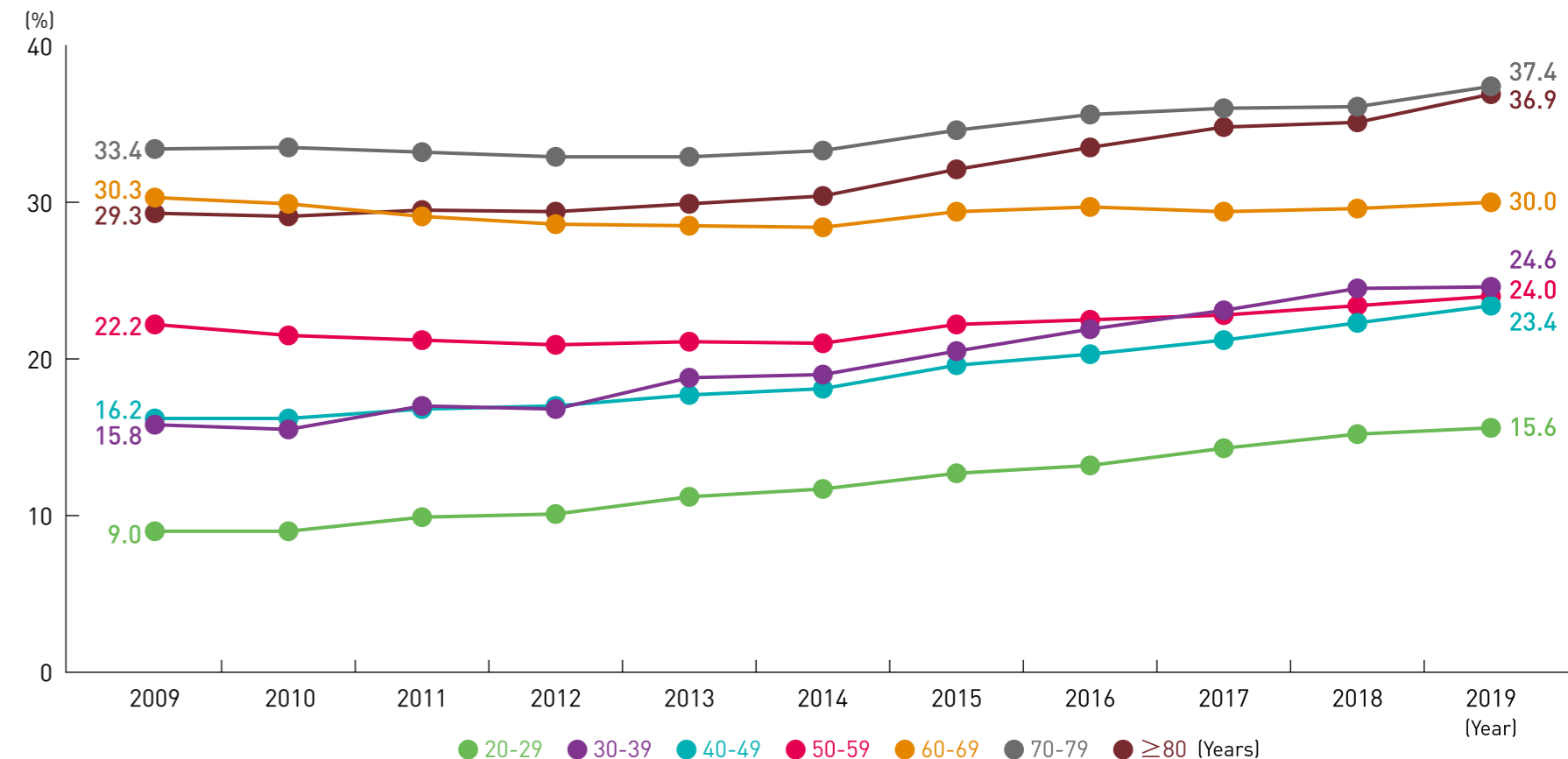
Over the past 11 years, the prevalence of obesity showed an increasing trend in all age groups. The prevalence of obesity itself was low in people in their 20s and over 80 years when compared to that in other age groups, but it increased steadily and rapidly. In 2019, the prevalence of obesity in those in their 20s was 28.9%, and it was 32.5% in those 80 years or over. In 2019, the prevalence of obesity was the highest in those in their 70s, at 40.5%.



· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

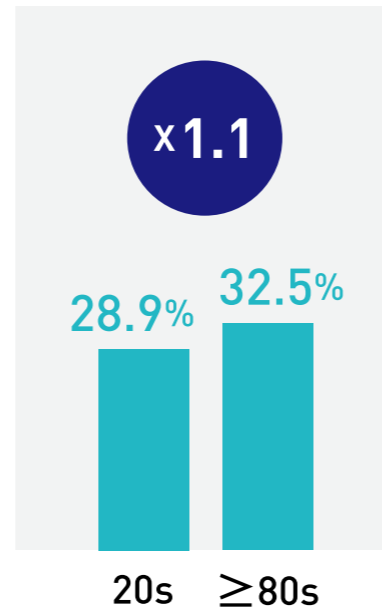
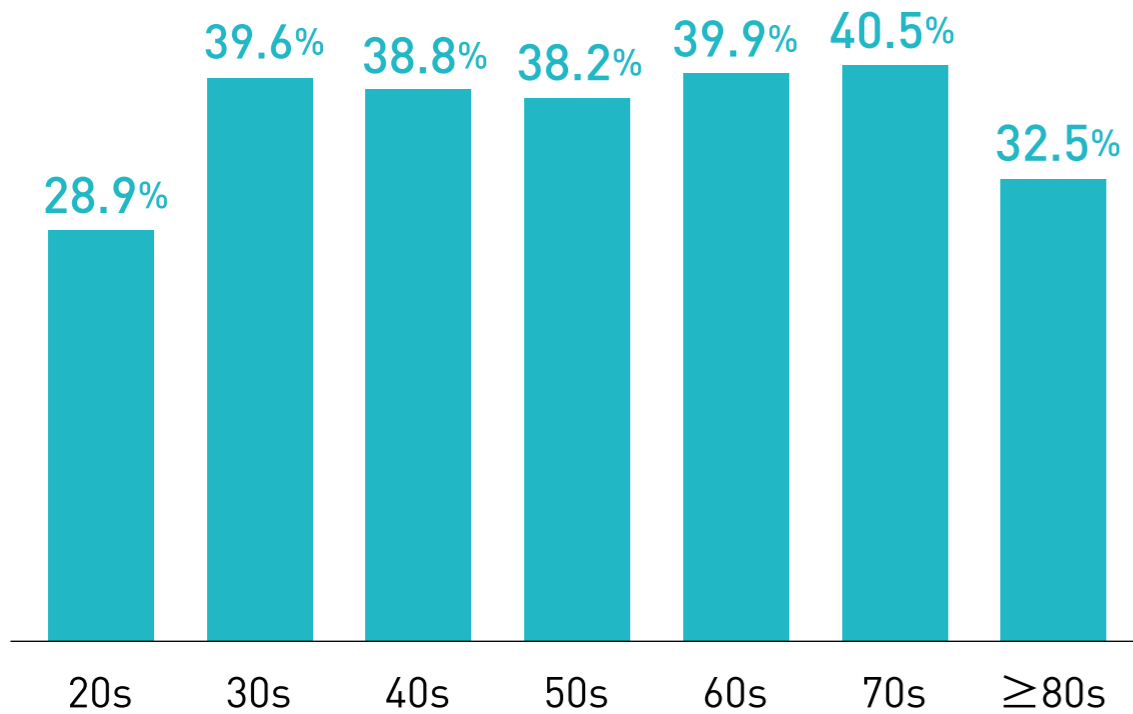
# Age-specific abdominal obesity prevalence in the past 11 years

In the past 11 years, the prevalence of abdominal obesity steadily increased in all age groups except for those in their 60s, and the prevalence significantly increased in those in their 20s and 30s. Unlike the prevalence of obesity, the prevalence of abdominal obesity was high even among those 80 years or over. The prevalence of abdominal obesity showed an increasing trend with age.



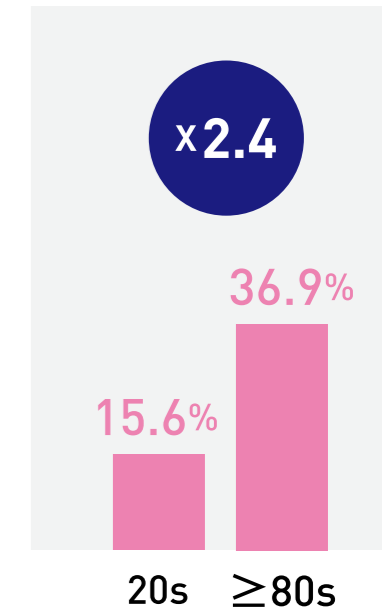
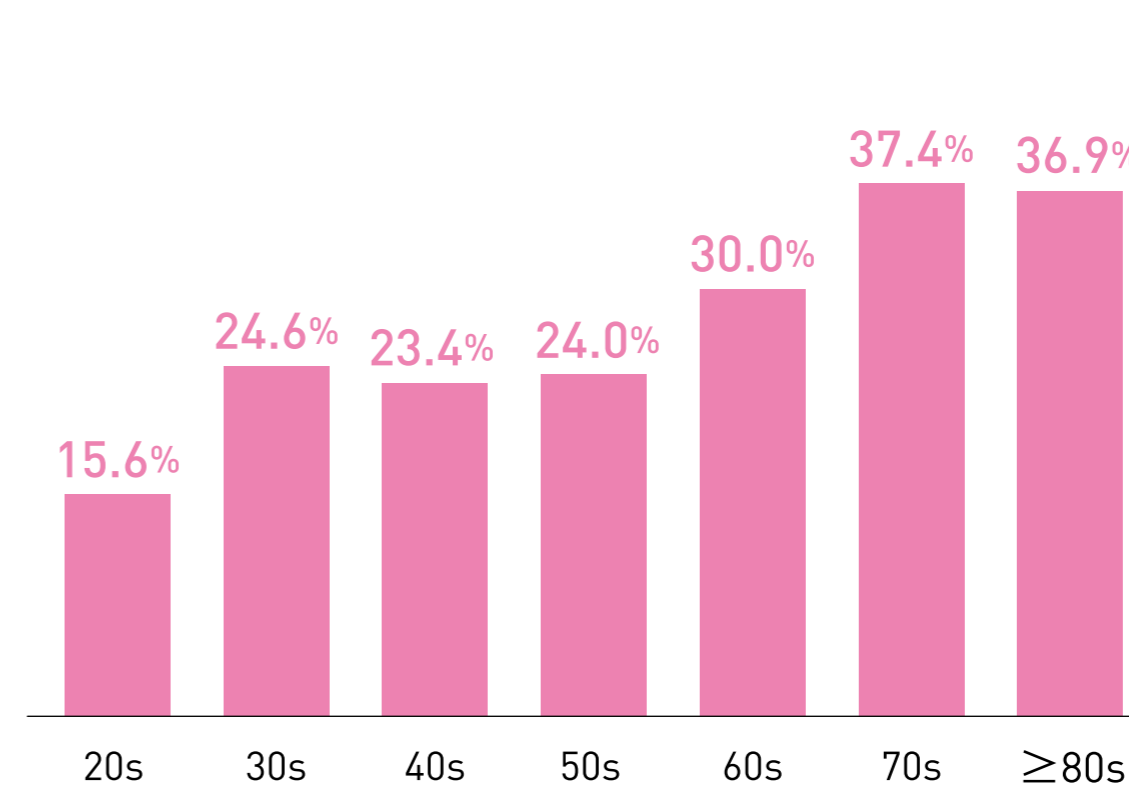
· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

## Age-specific obesity prevalence in 2019



· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

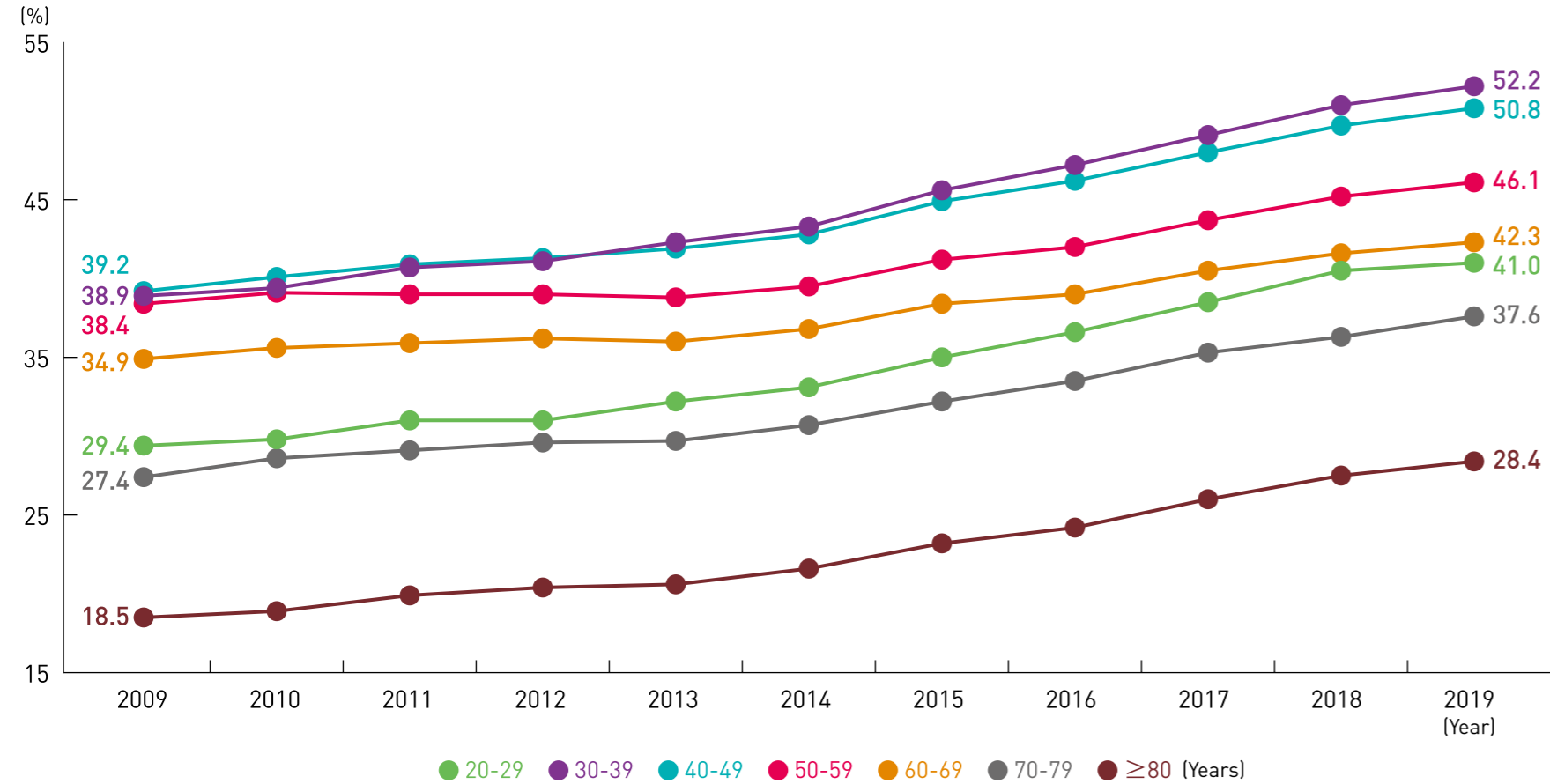
## Age-specific abdominal obesity prevalence in 2019



· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

# Prevalence of obesity in men in the last 11 years

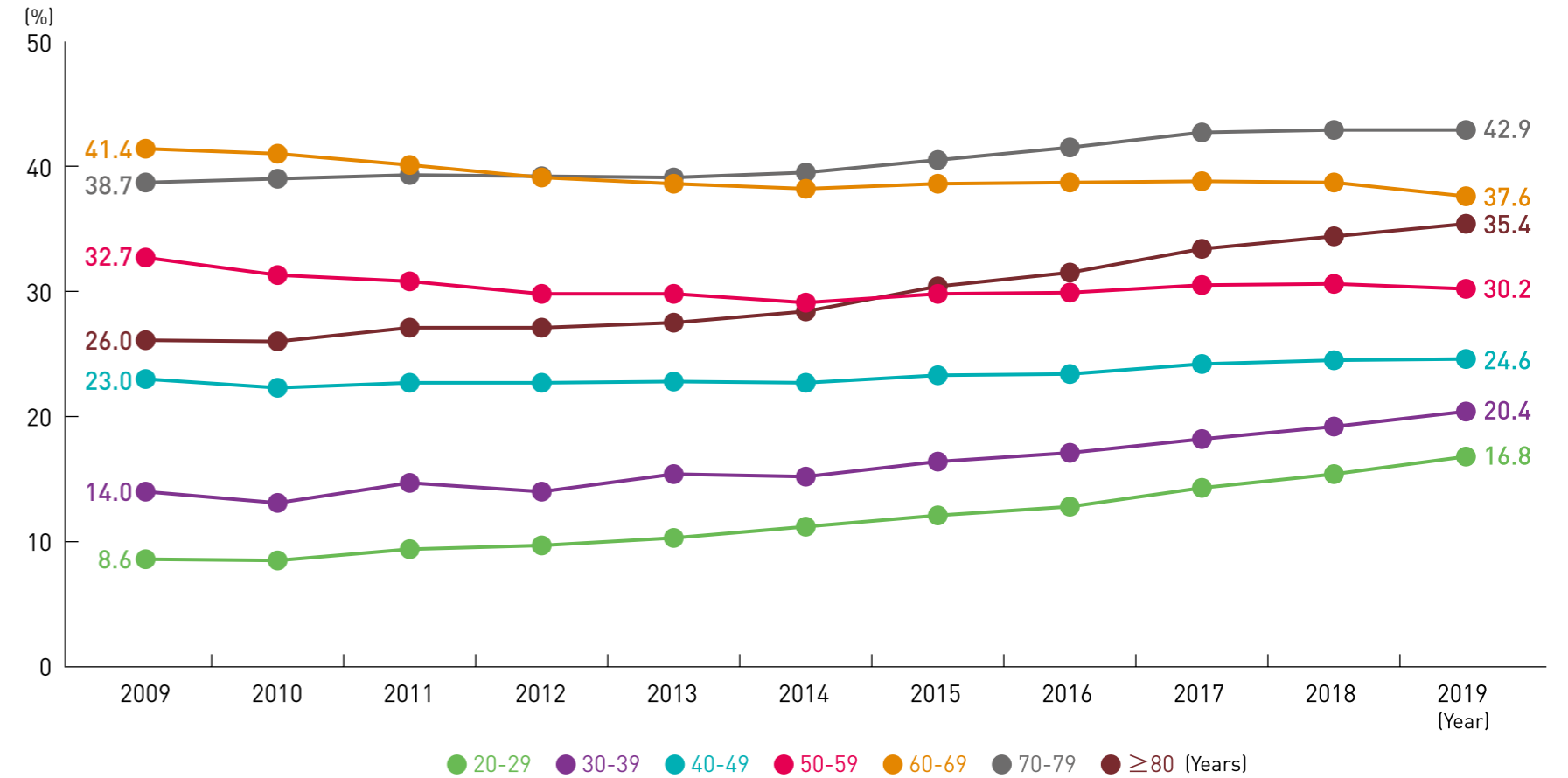
In men, the prevalence of obesity increased in all age groups, especially in those 80 years or older. However, compared to other age groups, the prevalence of obesity among those 70 years or older was relatively low. In 2019, more than half of men in their 30s and 40s were obese.



· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

# Prevalence of obesity in women in the last 11 years

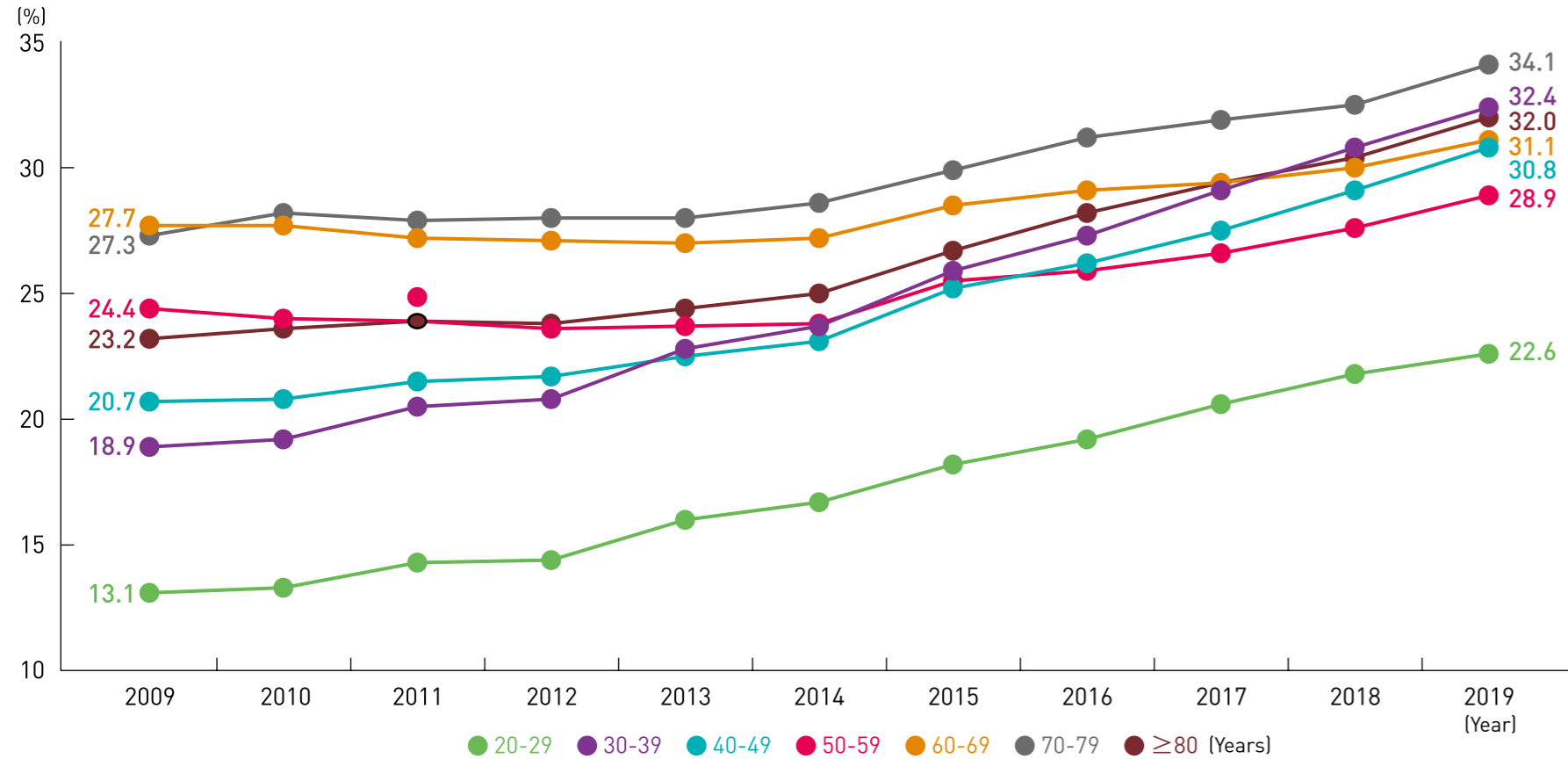
Compared to men, the change in the prevalence of obesity in women was generally more gradual, but it increased significantly in women in their 20s and 30s. In women in their 20s, the prevalence of obesity nearly doubled in 10 years. In those in their 50s and 60s, the prevalence of obesity decreased. Unlike men, the prevalence of obesity among elderly women in their 60s and 70s was significantly higher than that among women in their 20s and 30s.



· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

## Prevalence of abdominal obesity by age in men in the last 11 years

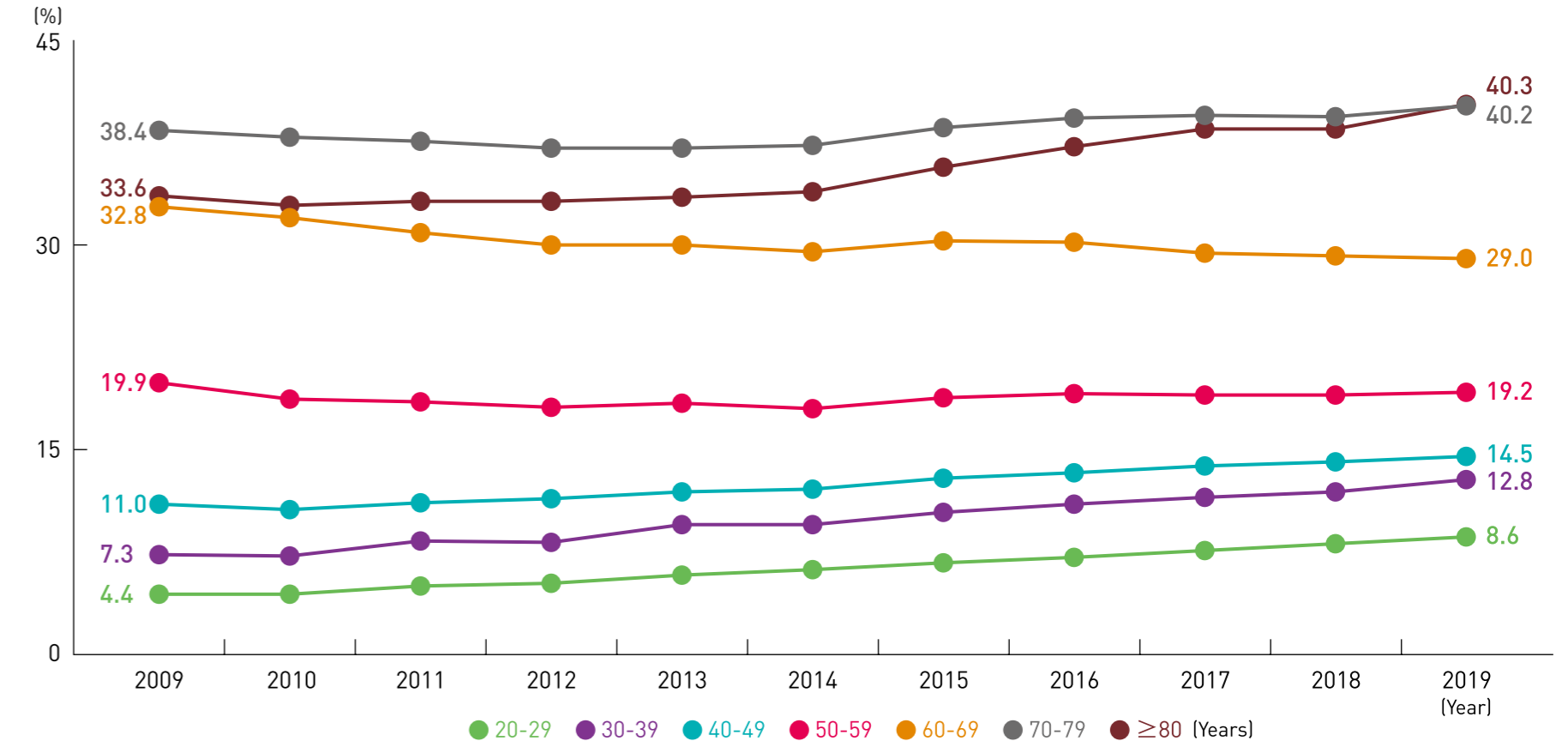
In men, the prevalence of abdominal obesity increased in all age groups for the past 11 years, and the increasing trend was most evident in those in their 20s and 30s. Overall, the prevalence of abdominal obesity significantly increased during the transition period from the 20s to the 30s. In men, the prevalence of abdominal obesity in those in their 30s became higher than that in those in their 40s starting in 2018.



· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

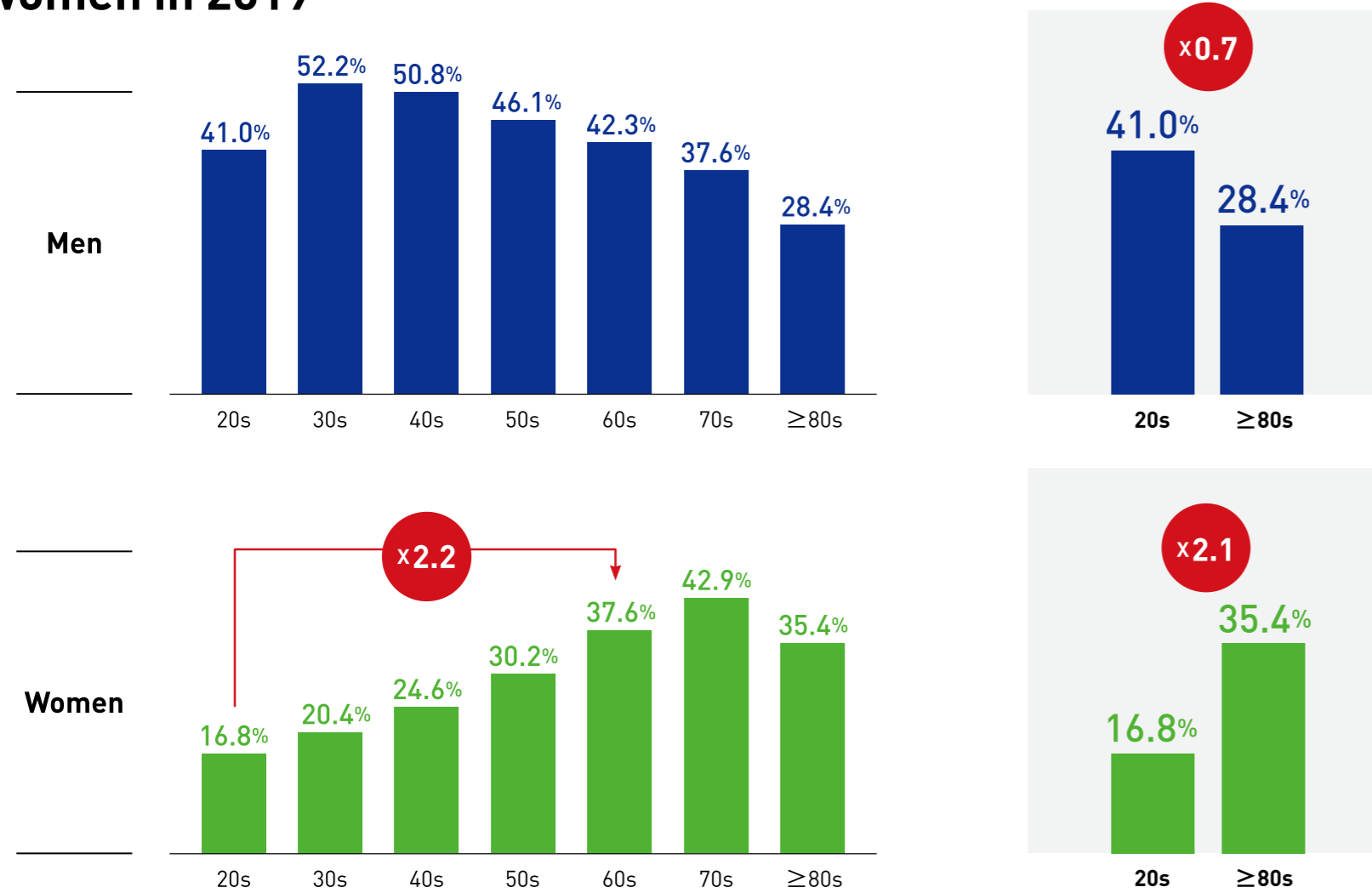
## Prevalence of abdominal obesity by age in women in the past 11 years

The increase in the prevalence of abdominal obesity among women over the last 11 years was more moderate than that among men, and the prevalence of abdominal obesity increased with age. In those in their 20s, the prevalence of abdominal obesity nearly doubled in the past 11 years, although it decreased in those in their 60s. Unlike men, the prevalence of abdominal obesity among elderly women in their 60s and 70s increased significantly compared to that in women in their 20s and 30s.



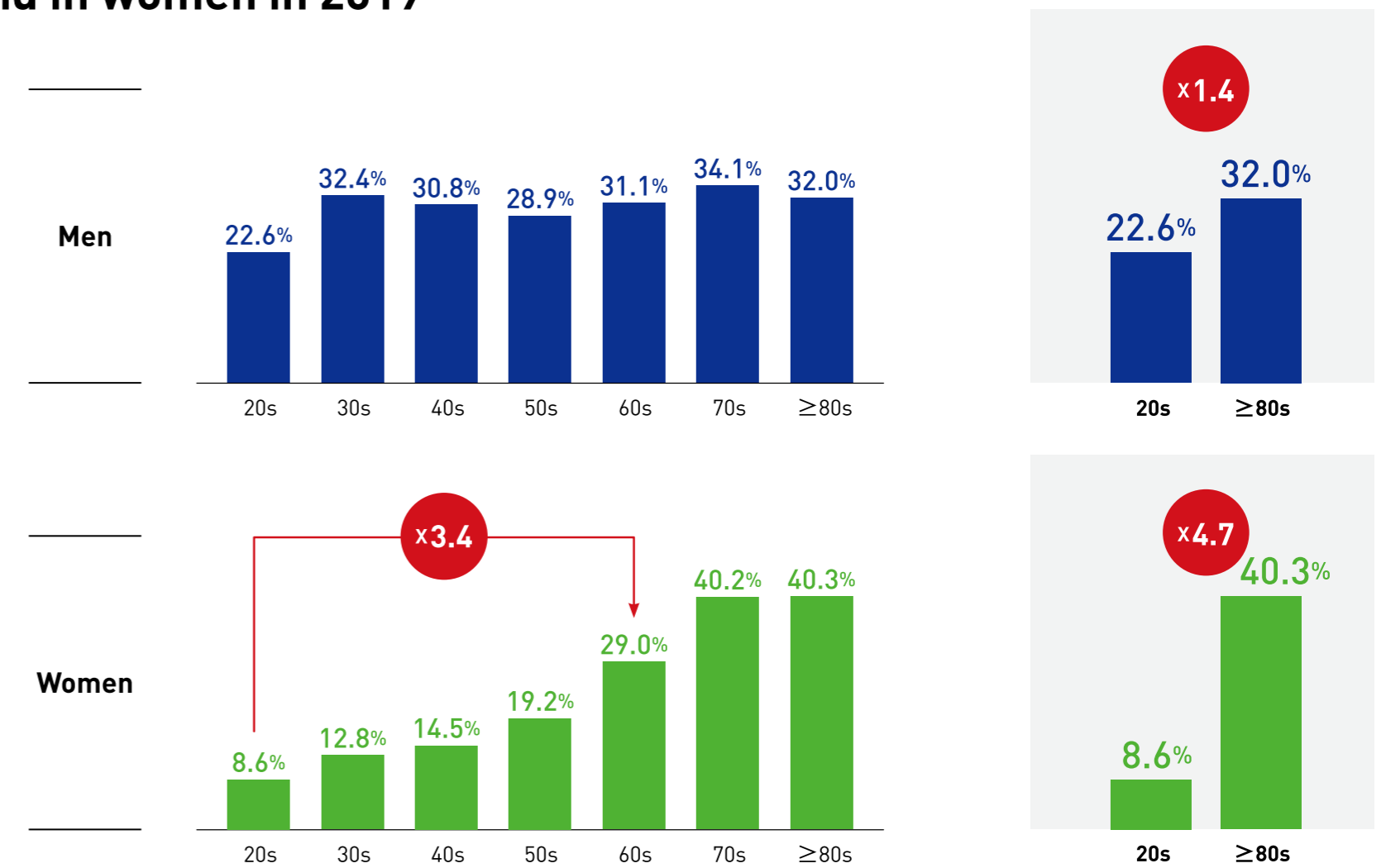
· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

## Prevalence of obesity by age in men and in women in 2019



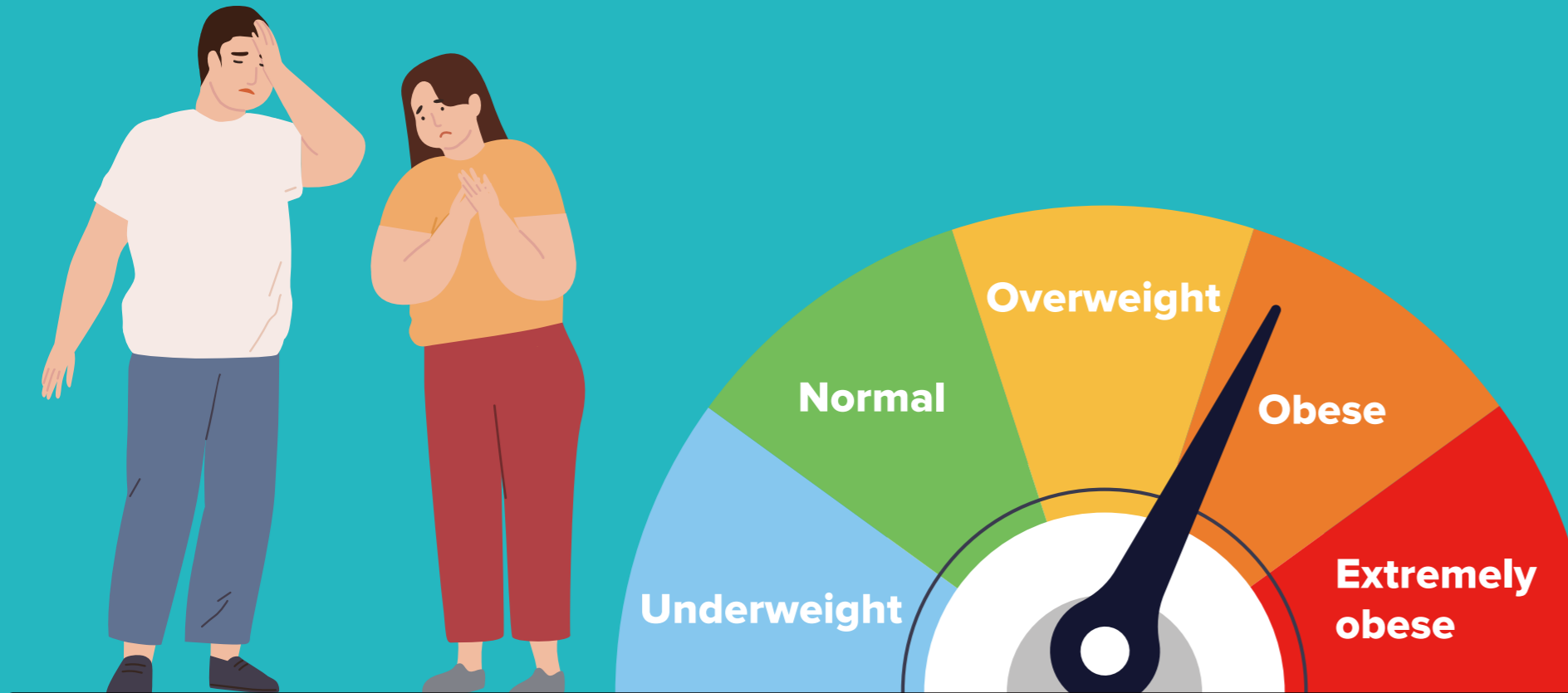
· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

## Prevalence of abdominal obesity by age in men and in women in 2019

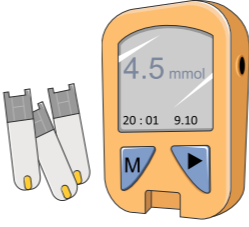
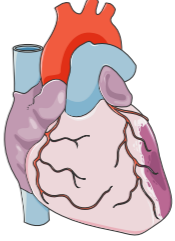
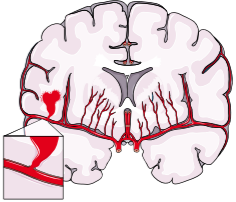
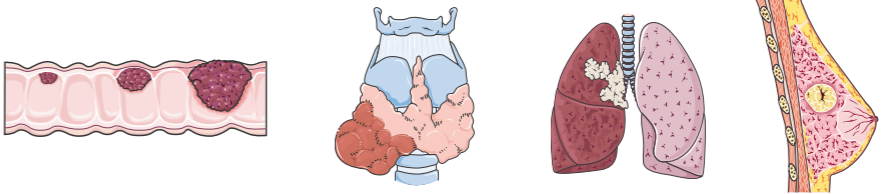


· The prevalence was standardized by age and sex, based on the 2010 Population and Housing Census data from the Statistics of Korea.  
 · The 2009-2019 NHIS health checkup data were analyzed.

# Prevalence of major comorbidities in relation to obesity



## Definition of comorbidity

 <p><b>Type 2 diabetes</b>            (ICD-10: E11-E14) and            (diabetes medication prescription)            (Exclusion criteria: diagnosis of diabetes mellitus before 2009 or fasting blood glucose level of 126 mg/dL or higher)</p>	 <p><b>Myocardial infarction</b>            (ICD-10: I21, I22) and            (hospitalization due to myocardial infarction)            (Exclusion criterion: diagnosis of myocardial infarction or stroke before 2009)</p>	 <p><b>Stroke</b>            (ICD-10: I63, I64) and            (hospitalization due to stroke)            and (brain MRI or CT)            (Exclusion criterion: diagnosis of myocardial infarction or stroke before 2009)</p>
 <p><b>Solid cancer</b>            (ICD-10: C) (Stomach cancer C16 / Colorectal cancer C18, C19, C20 / Liver cancer C22 / Thyroid cancer C73 / Lung cancer C33, C34 / Prostate cancer C61 / Breast cancer C50)(Exclusion criterion: diagnosis of a solid cancer before 2009)</p>		

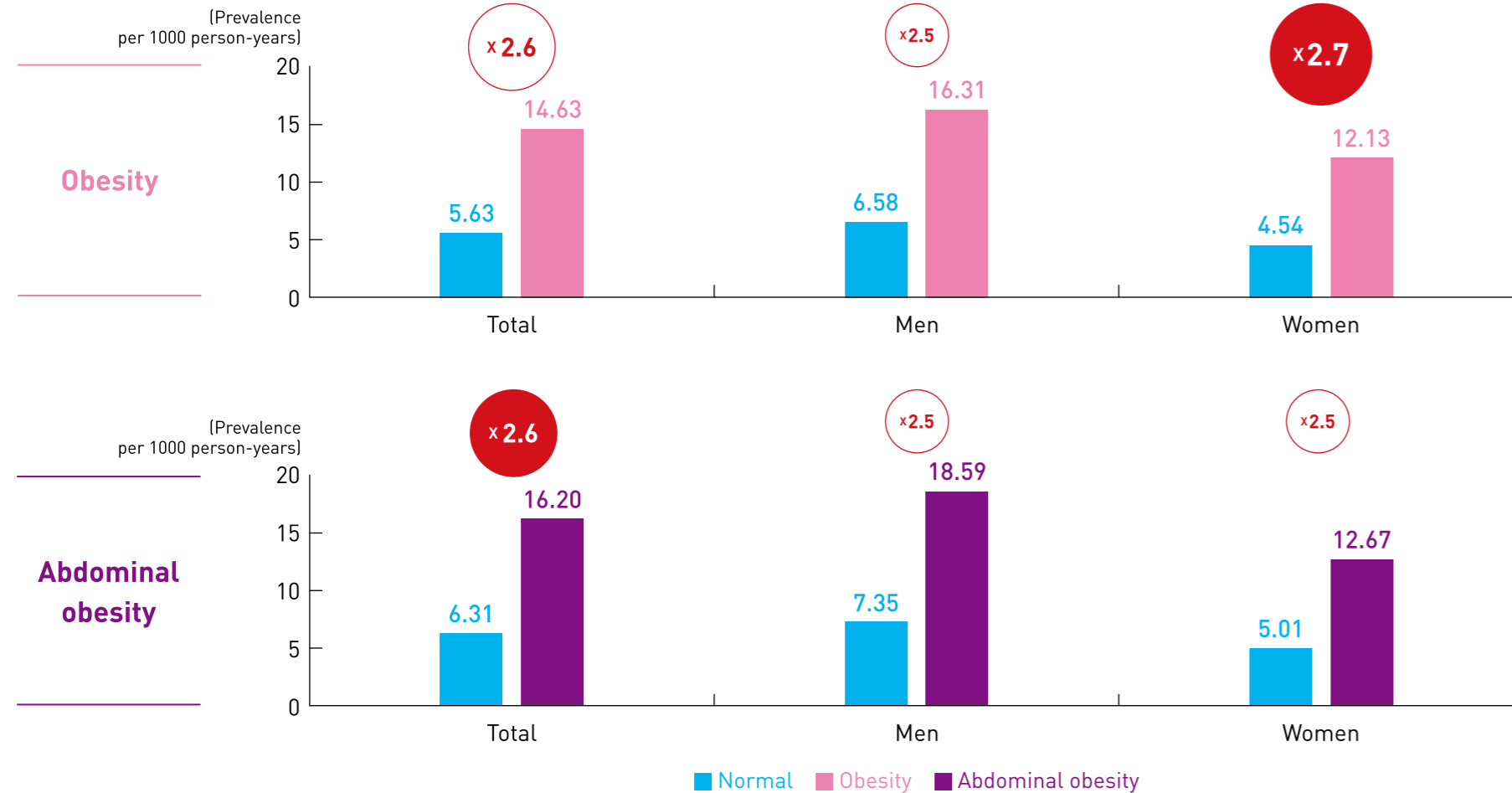
ICD, international classification of diseases; MRI, magnetic resonance imaging; CT, computed tomography

# Prevalence of type 2 diabetes

The risk of diabetes was 2.6 times higher in obese people than in those with normal weight. Compared to adults without abdominal obesity, the risk of type 2 diabetes was 2.6 times higher in adults with abdominal obesity.

# X2.6 times

Risk of diabetes



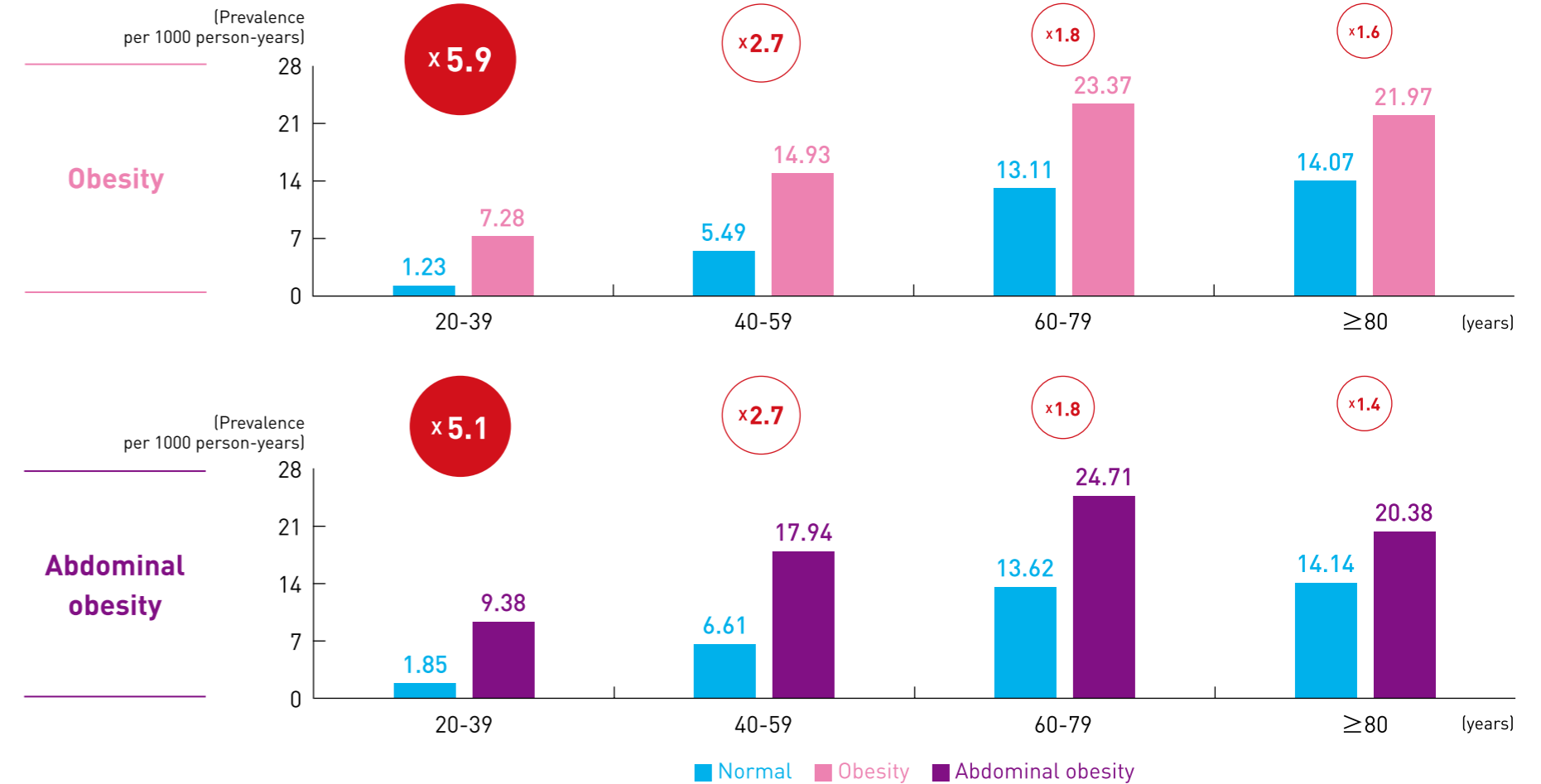
The prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.

# Prevalence of type 2 diabetes by age

At younger ages, a more pronounced increase was found in the risk of diabetes in people with obesity and abdominal obesity compared to those with normal weight.

# X5.9 times

Risk of diabetes in those in their 20s and 30s with obesity

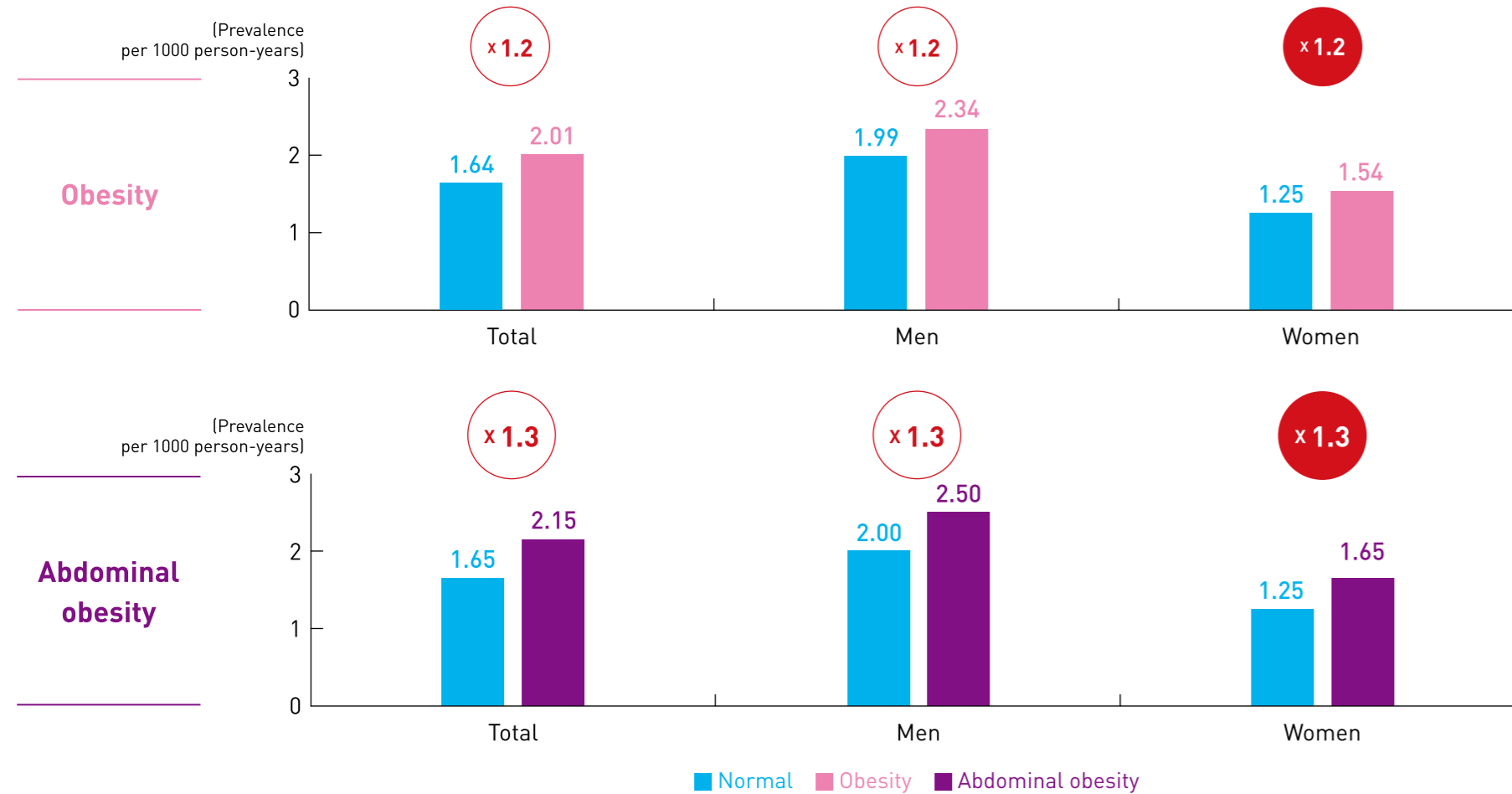


The prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.



# Prevalence of myocardial infarction

The risk of myocardial infarction was 1.2 times higher in obese people than in those with normal weight. It was 1.3 times higher in adults with abdominal obesity than in adults without abdominal obesity.



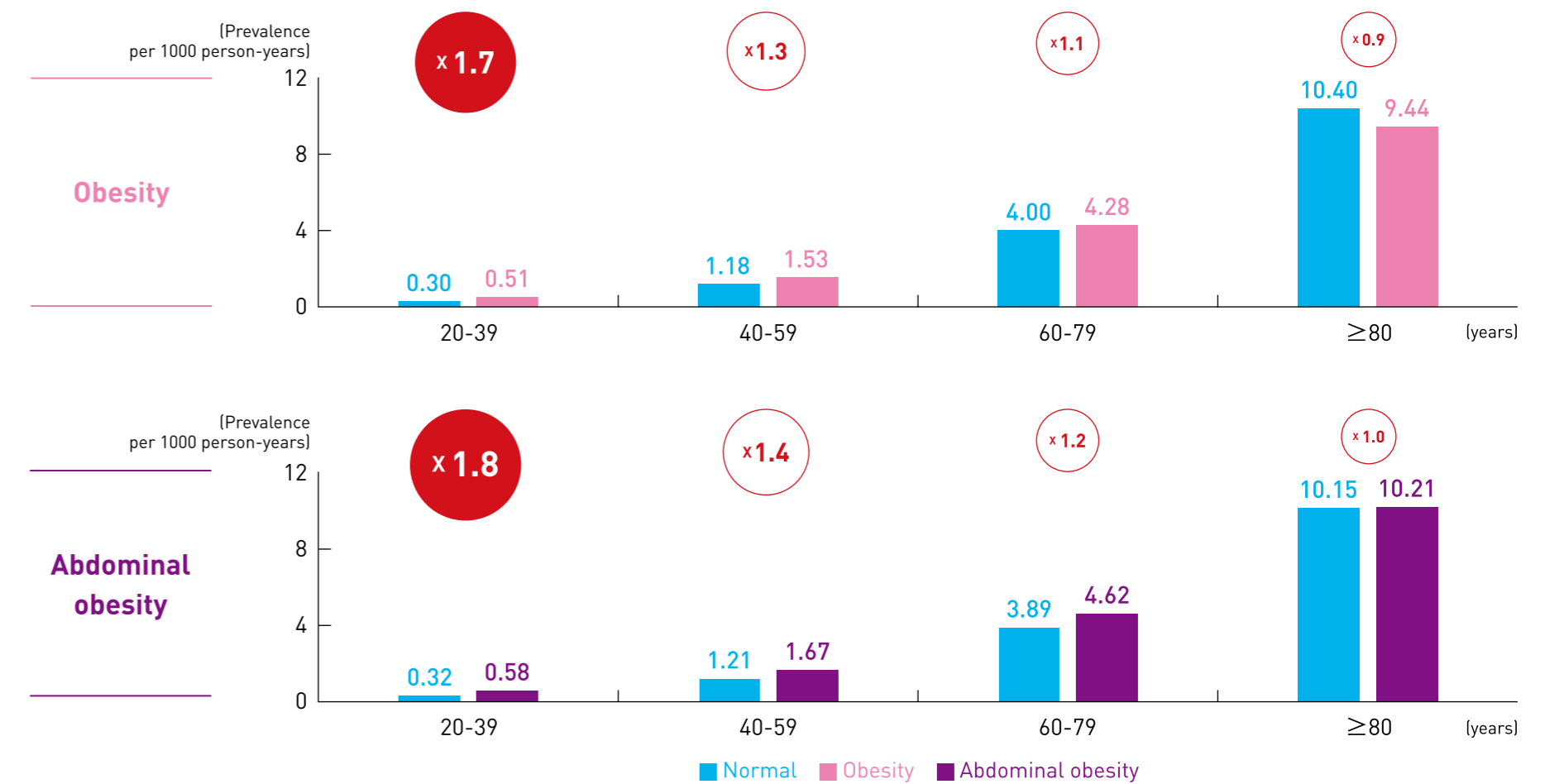
The prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.

# X 1.3 times

Risk of myocardial infarction

# Prevalence of myocardial infarction by age

At younger ages, a more pronounced increase was found in the risk of myocardial infarction in people with obesity and abdominal obesity compared to those with normal weight.

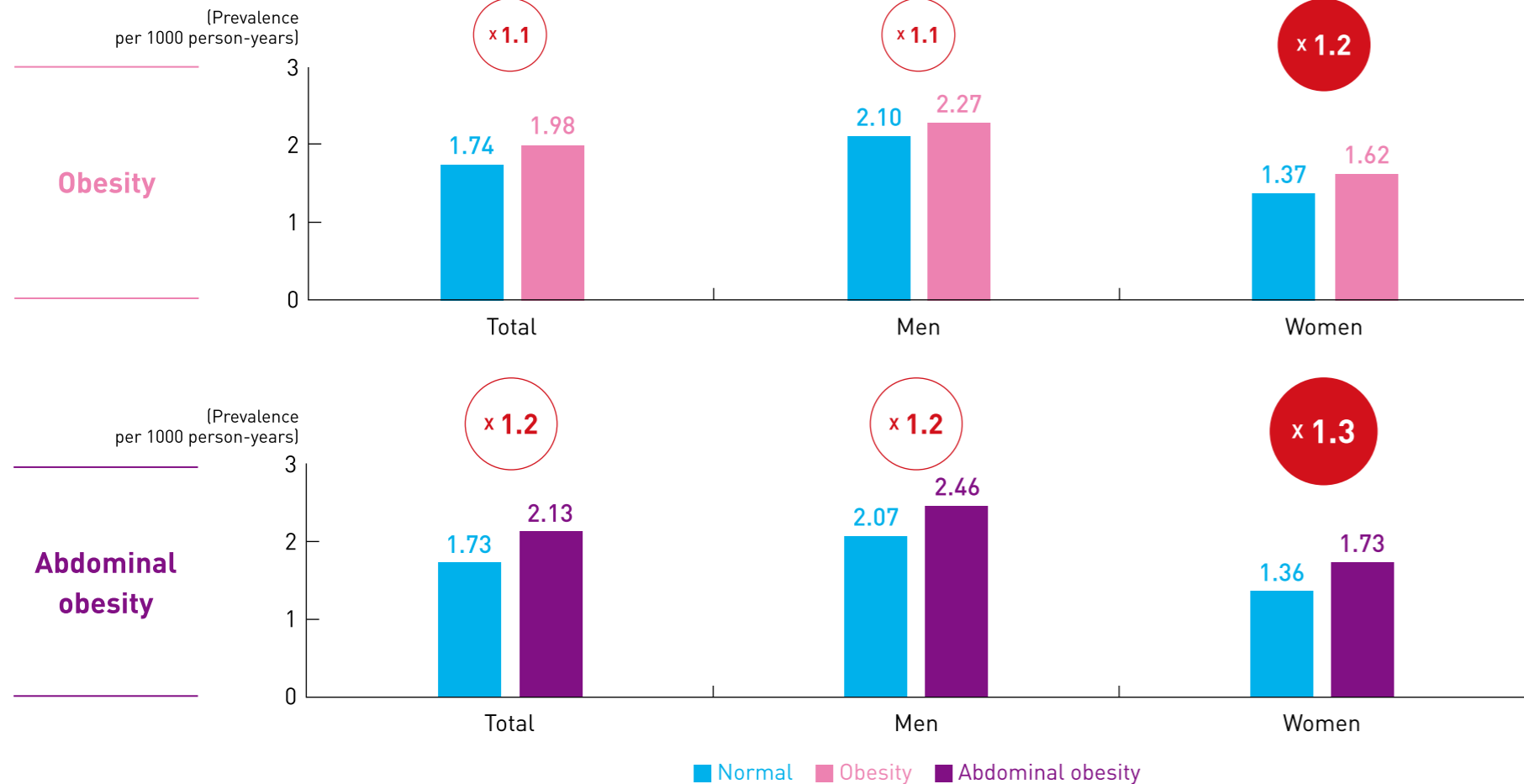


The prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.

# Prevalence of stroke

The risk of stroke was 1.1 times higher in obese people than in those with normal weight.  
The risk was 1.2 times higher in adults with abdominal obesity than in adults without abdominal obesity.

**X 1.2 times**  
Risk of stroke

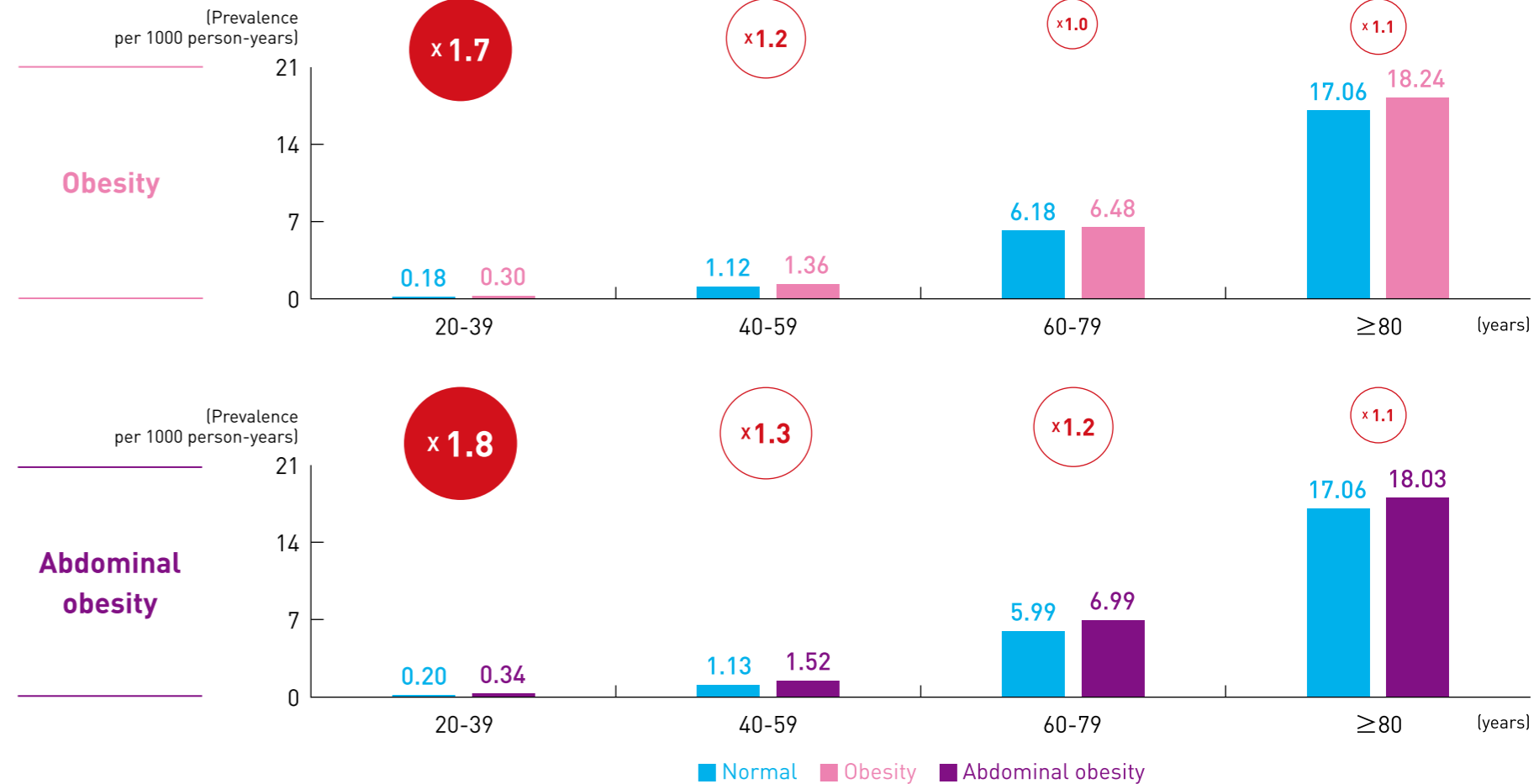


The prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.

# Prevalence of stroke by age

At younger ages, a more pronounced increase was found in the risk of stroke among people with obesity and abdominal obesity compared to those with normal weight.

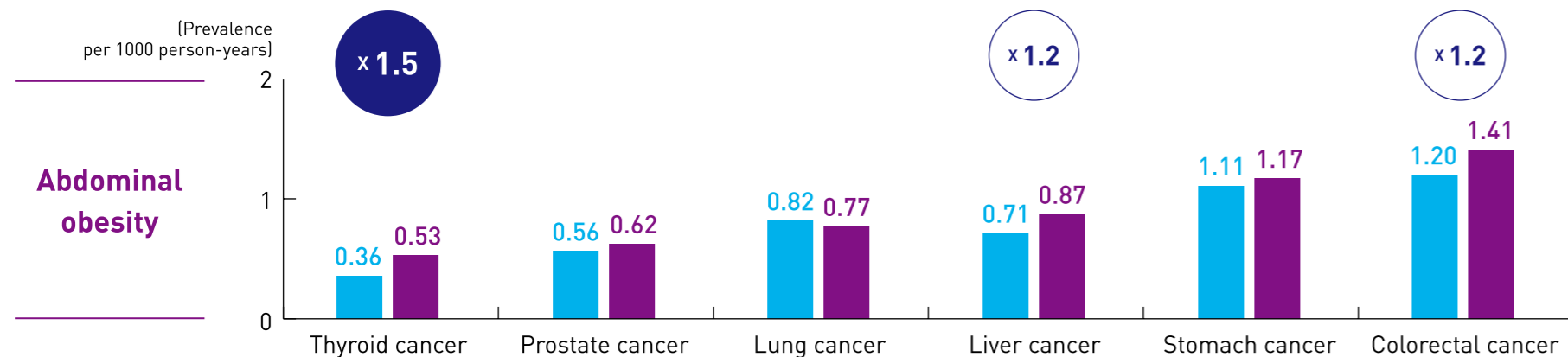
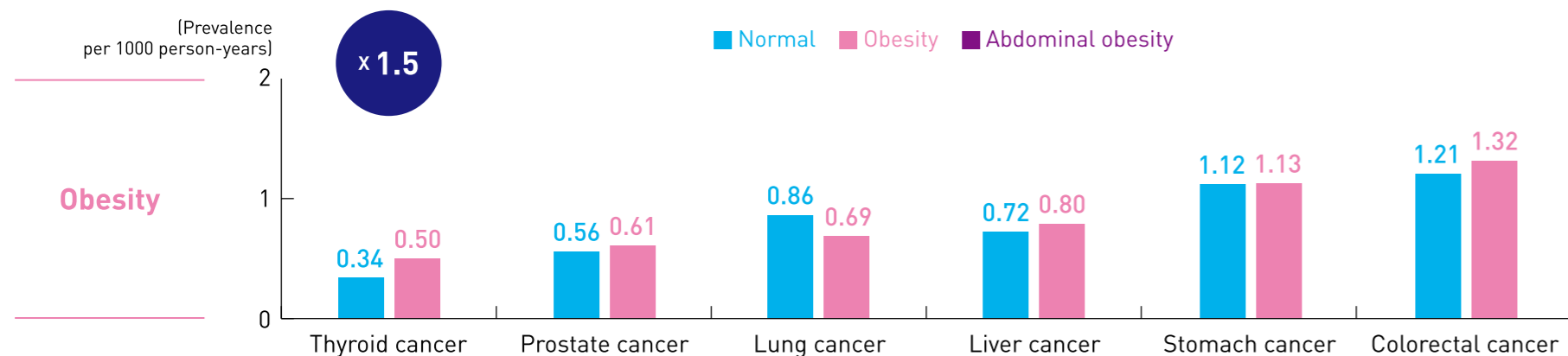
**X 1.8 times**  
Risk of stroke in those in their 20s and 30s with abdominal obesity



The prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.

# Prevalence of major solid cancers in men

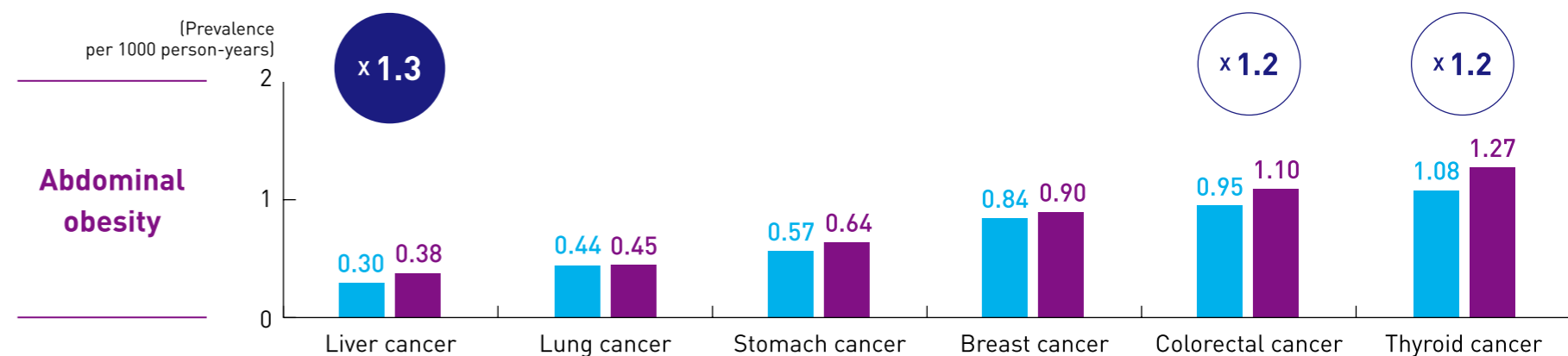
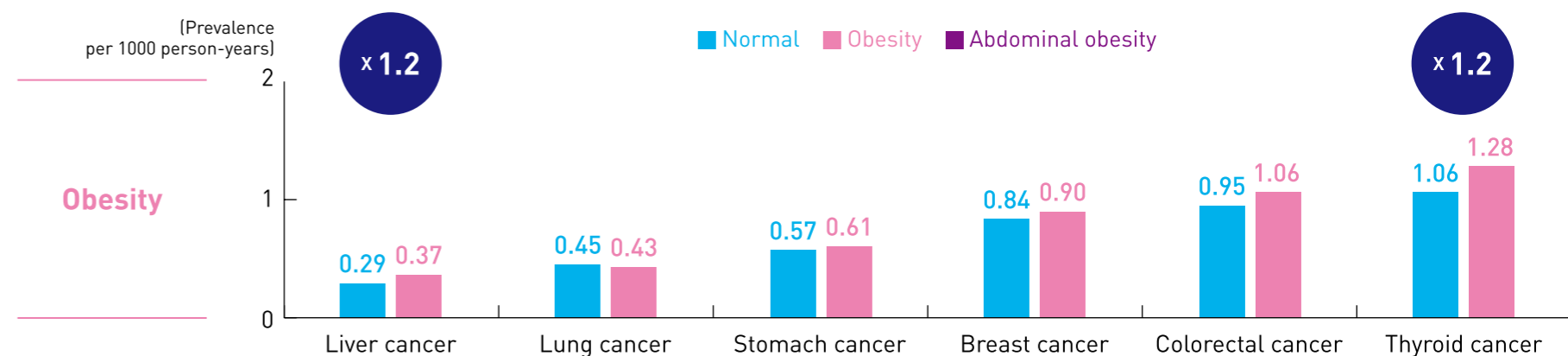
In obese men, the risk of thyroid cancer was 1.5 times higher than in those with normal weight.  
 In men with abdominal obesity, the risk of thyroid cancer was 1.5 times higher than in those with normal weight.  
 The risk of liver and colorectal cancer was also 1.2 times higher.



· The prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.  
 · The major solid tumors were based on 2018 national cancer registration statistics data in the total population and stratified by age

# Prevalence of major solid cancers in women

In obese women, the risk of liver cancer and thyroid cancer was 1.2 times higher than that of women with normal weight.  
 In women with abdominal obesity, the risk of liver cancer, colorectal cancer, and thyroid cancer was 1.2-1.3 times higher than in those with normal weight.



· The prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.  
 · The major solid tumors were based on 2018 national cancer registration statistics data in the total population and stratified by age

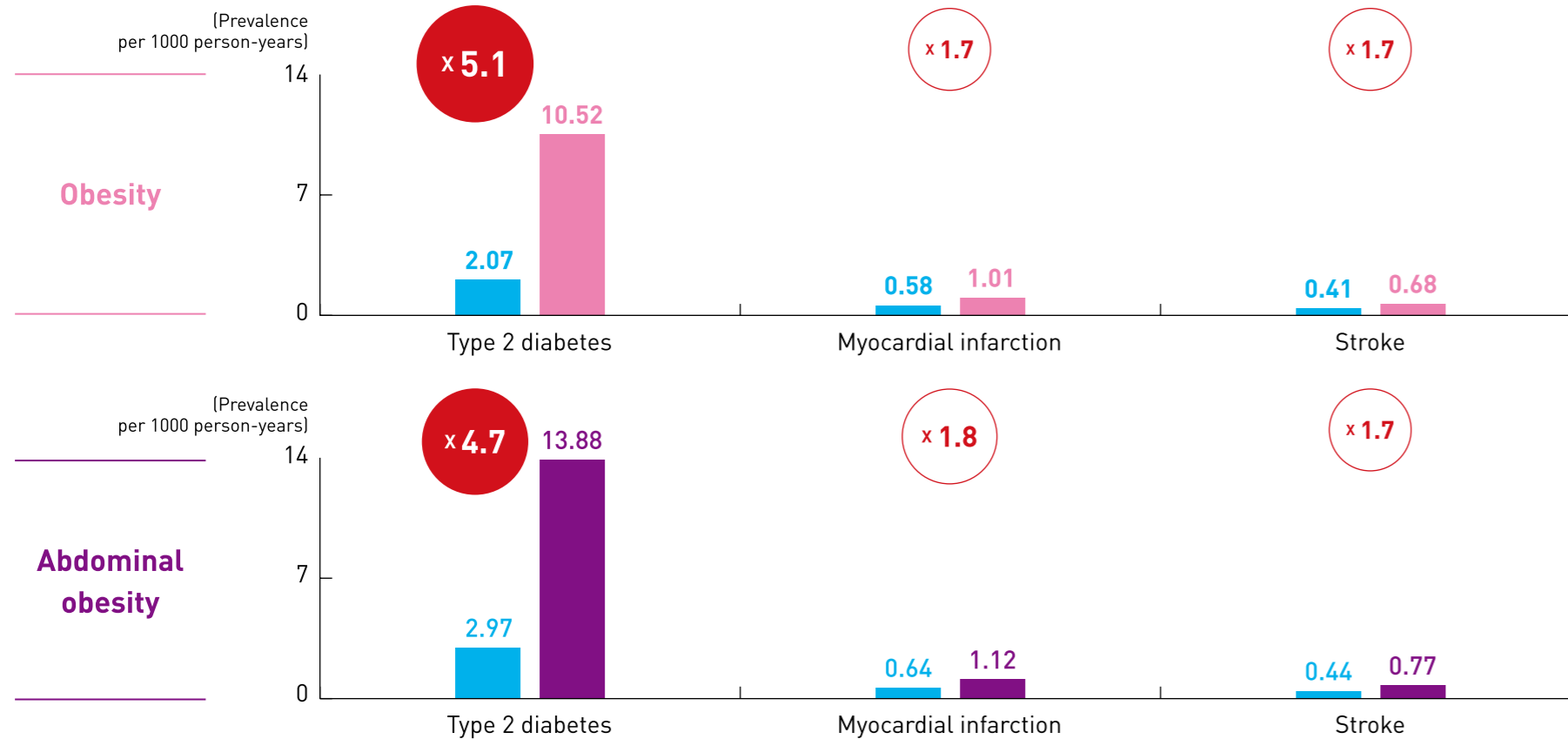
## Risk of diabetes and cardiovascular disease in the transitional period of life at the age of 40

The risk of diabetes was 5.1 times higher and the risk of myocardial infarction and stroke was 1.7 times higher in obese 40-year-olds than in normal-weight 40-year-olds.

Compared to 40-year-olds without abdominal obesity, the risk of diabetes in 40-year-olds with abdominal obesity was 4.7 times higher, the risk of myocardial infarction was 1.8 times higher, and the risk of stroke was 1.7 times higher.

# x5.1 times

Risk of diabetes in 40-year-olds with obesity



The prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.

■ Normal ■ Obesity ■ Abdominal obesity

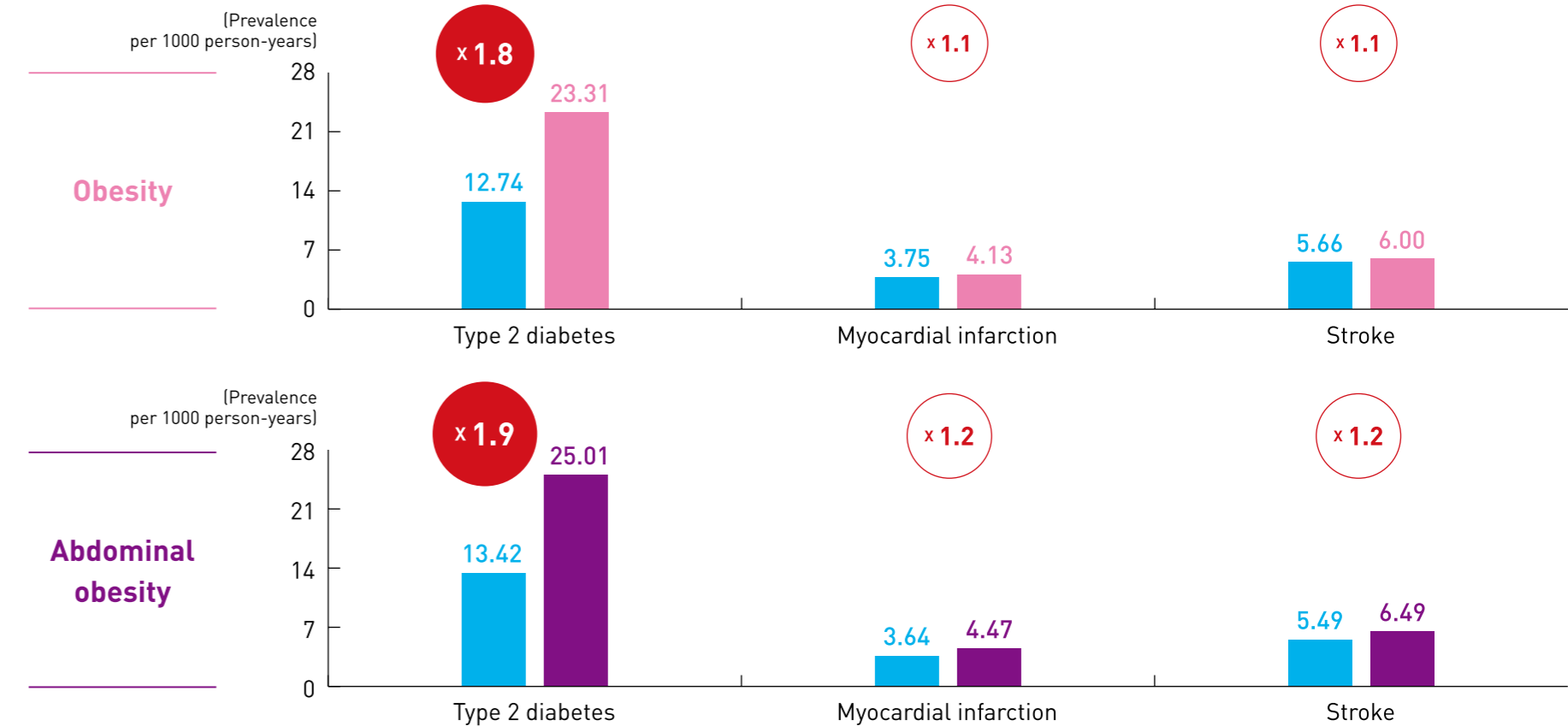
## Risk of diabetes and cardiovascular disease in the transitional period of life at the age of 66

The risk of diabetes was 1.8 times higher and the risk of myocardial infarction and stroke was 1.1 times higher in obese 66-year-olds than in normal-weight 66-year-olds.

The risk of diabetes was 1.9 times higher and the risk of myocardial infarction and stroke was 1.2 times higher in 66-year-olds with abdominal obesity than in 66-year-olds without abdominal obesity.

# x1.8 times

Risk of diabetes in 66-year-olds with obesity

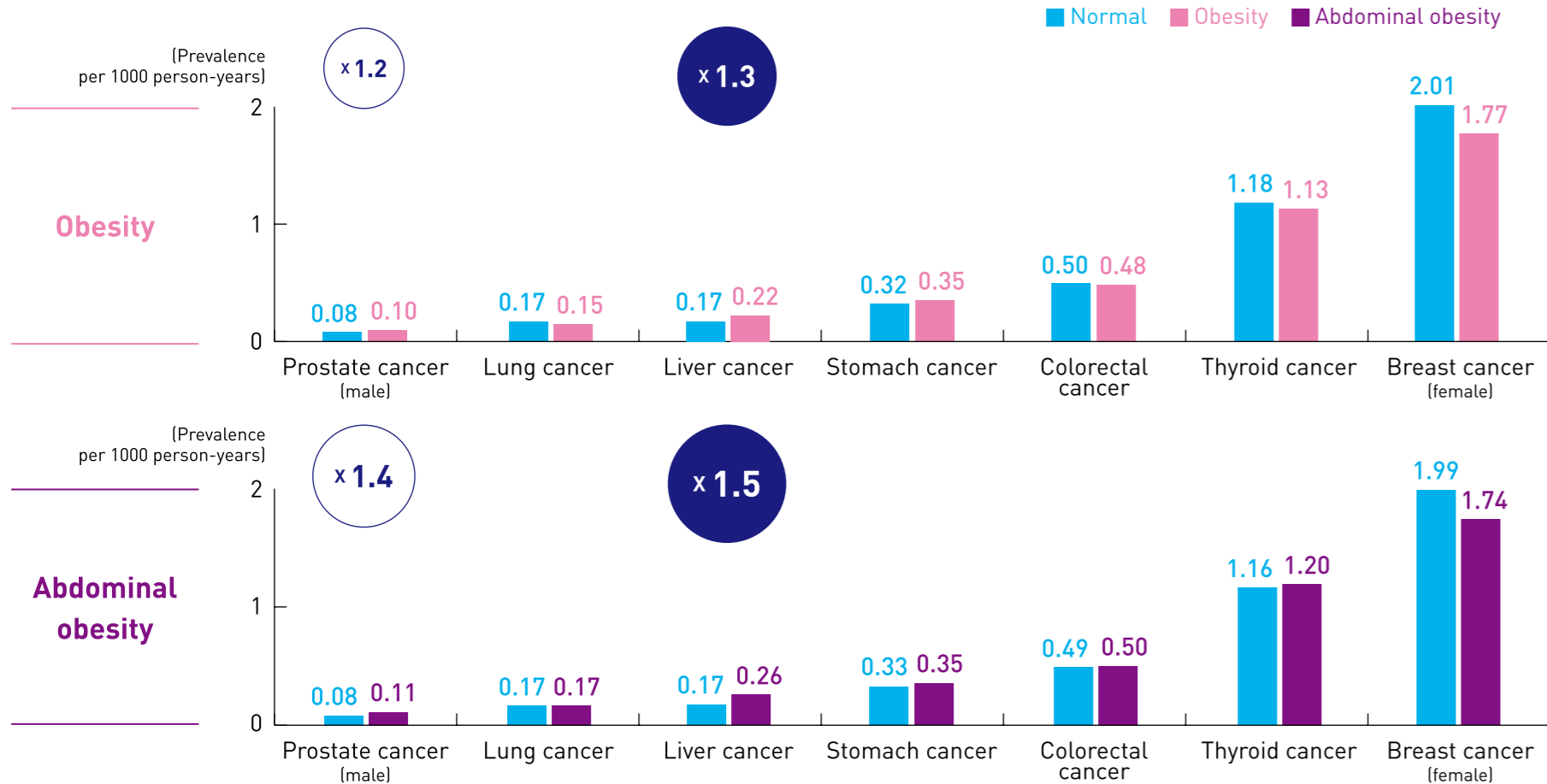


The prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.

■ Normal ■ Obesity ■ Abdominal obesity

## Risk of major solid cancers in the transitional period of life at the age of 40

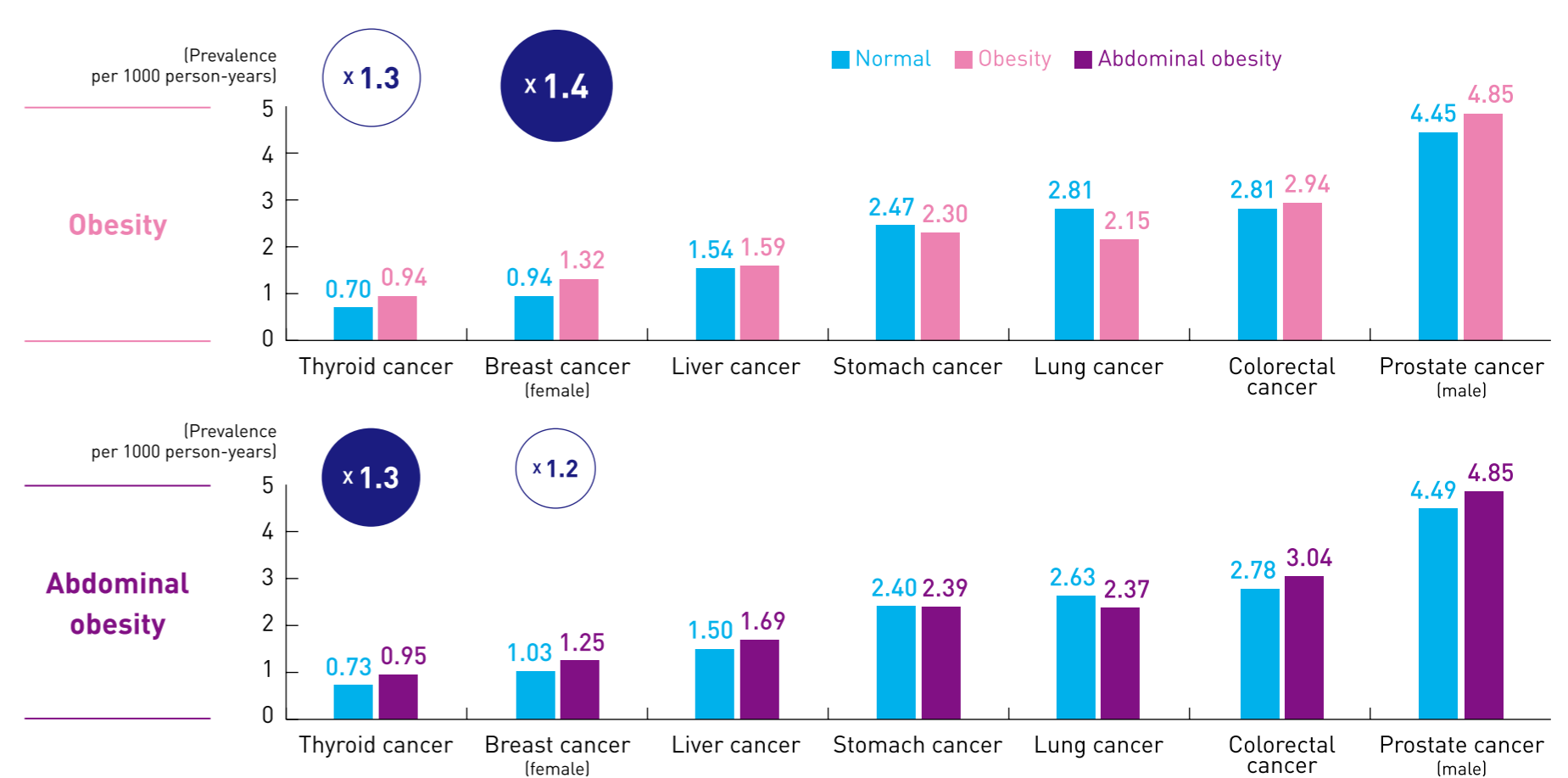
The risk of liver cancer was 1.3-1.5 times higher in 40-year-old people with obesity or abdominal obesity than in people with normal weight in the transitional period of life at the age of 40 years.  
In men, the risk of prostate cancer was 1.2 to 1.4 times higher.



· The prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.  
 · The major solid tumors were based on 2018 national cancer registration statistics data in the total population and stratified by age

## Risk of major solid cancers in the transitional period of life at the age of 66 years

The risk of thyroid cancer was 1.3 times higher in 66-year-old people with obesity or abdominal obesity than in those with normal weight at the age of 66 years in the transitional period of life.  
In women, the risk of breast cancer was 1.2-1.4 times higher, unlike those in the transitional period of life at the age of 40 years.



· The prevalence per 1000 person-years was calculated using Poisson regression adjusted for sex and age.  
 · The major solid tumors were based on 2018 national cancer registration statistics data in the total population and stratified by age

# Obesity infographic · 40s

Mid-life transition,  
40 years old



Up to  
39%  
of people are  
obese (2019)

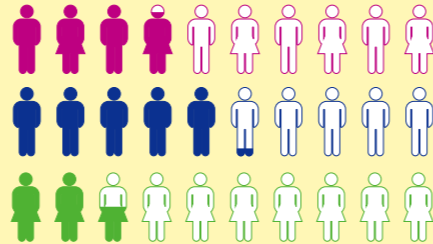
Prevalence  
of obesity

(2019)

38.8% Total

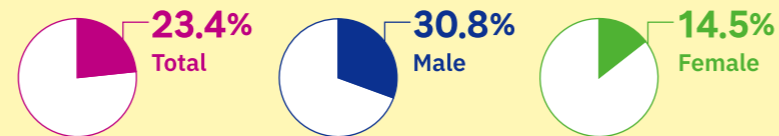
50.8% Male

24.6% Female



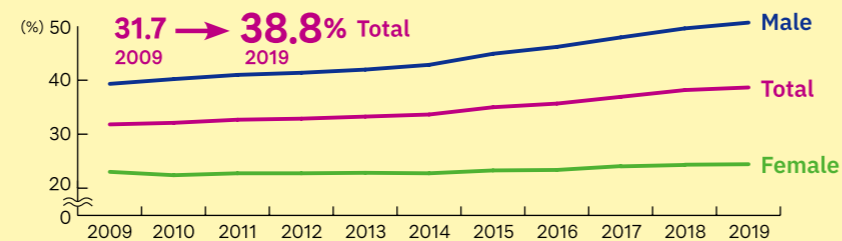
Prevalence  
of abdominal obesity

(2019)



Prevalence  
of obesity  
in the last 11 years

(2009-2019)



The data of the 2009-2019 NHI Corporation medical checkups were analyzed.

Obesity-related  
health problems (2019)



Diabetes

X 5.1



Myocardial  
infarction

X 1.7



Stroke

X 1.7



Liver cancer

X 1.3

Poisson regression models for person-years and expected rate

# Obesity infographic · 60s

Elderly-life transition,  
66 years old



Up to  
40%  
of people are  
obese (2019)

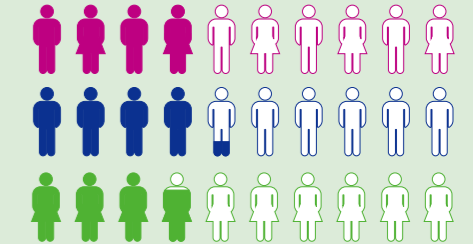
Prevalence  
of obesity

(2019)

39.9% Total

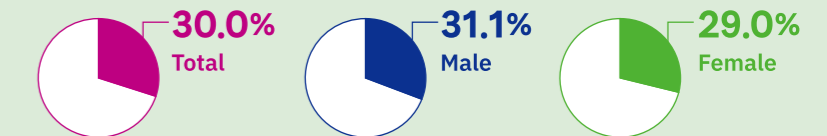
42.3% Male

37.6% Female



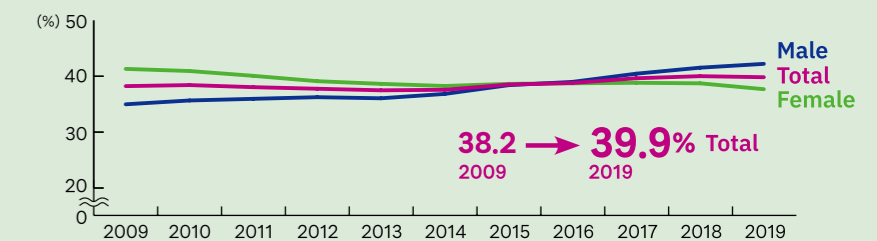
Prevalence  
of abdominal obesity

(2019)



Prevalence  
of obesity  
in the last 11 years

(2009-2019)



The data of the 2009-2019 NHI Corporation medical checkups were analyzed.

Obesity-related  
health problems (2019)



Diabetes

X 1.8



Myocardial  
infarction

X 1.1



Stroke

X 1.1



Thyroid cancer

X 1.3

Poisson regression models for person-years and expected rate

# Korean society for the study of obesity board

Chairman	Jae-heon kang	sungkyunkwan university	Family medicine
Vice-chairman	Sung rae kim	the catholic university of korea	Endocrinology
	Seon mee kim	Korea university	Family medicine
	Wook song	Seoul national university	Physical education
President, board of directors	Chang beom lee	Hanyang university	Endocrinology
Director, committee of general affairs	Kiyoung lee	Gachon university	Endocrinology
Director, committee of academic affairs	Soo lim	Seoul national university	Endocrinology
Director, committee of publications	Eun-jung rhee	Sungkyunkwan university	Endocrinology
Director, committee of training	Junghwan kim	Eulji university	Family medicine
Director, committee of research	You-cheol hwang	Kyung hee university	Endocrinology
Director, committee of education	Yang-hyun kim	Korea university	Family medicine
Director, committee of public relations	Jae hyuk lee	Hanyang university	Endocrinology
Director, committee of strategic planning	Cheol-young park	Sungkyunkwan university	Endocrinology
Director, committee of external affairs and policy	Kyoung-kon kim	Gachon university	Endocrinology
Treasurer	Jun goo kang	Hallym university	Endocrinology
Director, committee of information	Won jun kim	University of ulsan	Endocrinology
Director, committee of international relations	Yang im hur	Inje university	Family medicine
Director, committee of private practice	Minsu park	Seoul nd clinic	
Director, committee of health insurance and legislation	Ga eun nam	Korea university	Family medicine
Director, committee of it integrated metabolic syndrome	Sang youl rhee	Kyung hee university	Endocrinology
Director, committee of clinical guidelines	Jee hyun kang	Konyang university	Family medicine
Director, committee of clinical nutrition	Jeong hyun lim	Seoul national university hospital	Food service and nutrition care
Director, committee of academic nutrition	Jung eun lee	Seoul national university	Food&nutrition
Director, committee of exercise	Jong hee kim	Hanyang university	Physical education
Director, committee of behavioral therapy	Tae kyung lee	Chuncheon national hospital	Psychiatry
Director, committee of bariatric surgery	Yong jin kim	H plus yangji hospital	Surgery
Director, committee of childhood and adolescence	Young-jun rhie	Korea university	Pediatrics
Director, committee of big data	Jang won son	The catholic university of korea	Endocrinology
Director without portfolio	Seungjoon oh	Kyunghee university	Endocrinology
Auditor	Sung soo kim	Chungnam national university	Family medicine
	Dae jung kim	Ajou university	Endocrinology

# 2021 OBESITY FACT SHEET



KOREAN SOCIETY  
FOR THE STUDY  
OF OBESITY

Room 1010, Renaissance tower, 14 Mallijae-ro, Mapo-gu, Seoul, Korea  
82-2-364-0886,0887 [www.kosso.or.kr](http://www.kosso.or.kr)



9 791197 607417 95510  
ISBN 979-11-976074-1-7