Contents

2023 InBody Report

SEE WHAT YOU'RE MADE OF

InBody Report

Introduction

InBody Co., Ltd. started in 1996 in a small underground laboratory of a young scientist in Korea. InBody introduced the world's first body composition analyzer that implemented direct measurement by body part and multi-frequency measurement, and established awareness that the balance of body composition, such as body fat and muscle mass, is more important to health in an era when only weight and BMI were indices of health. It created a new market that did not exist before.

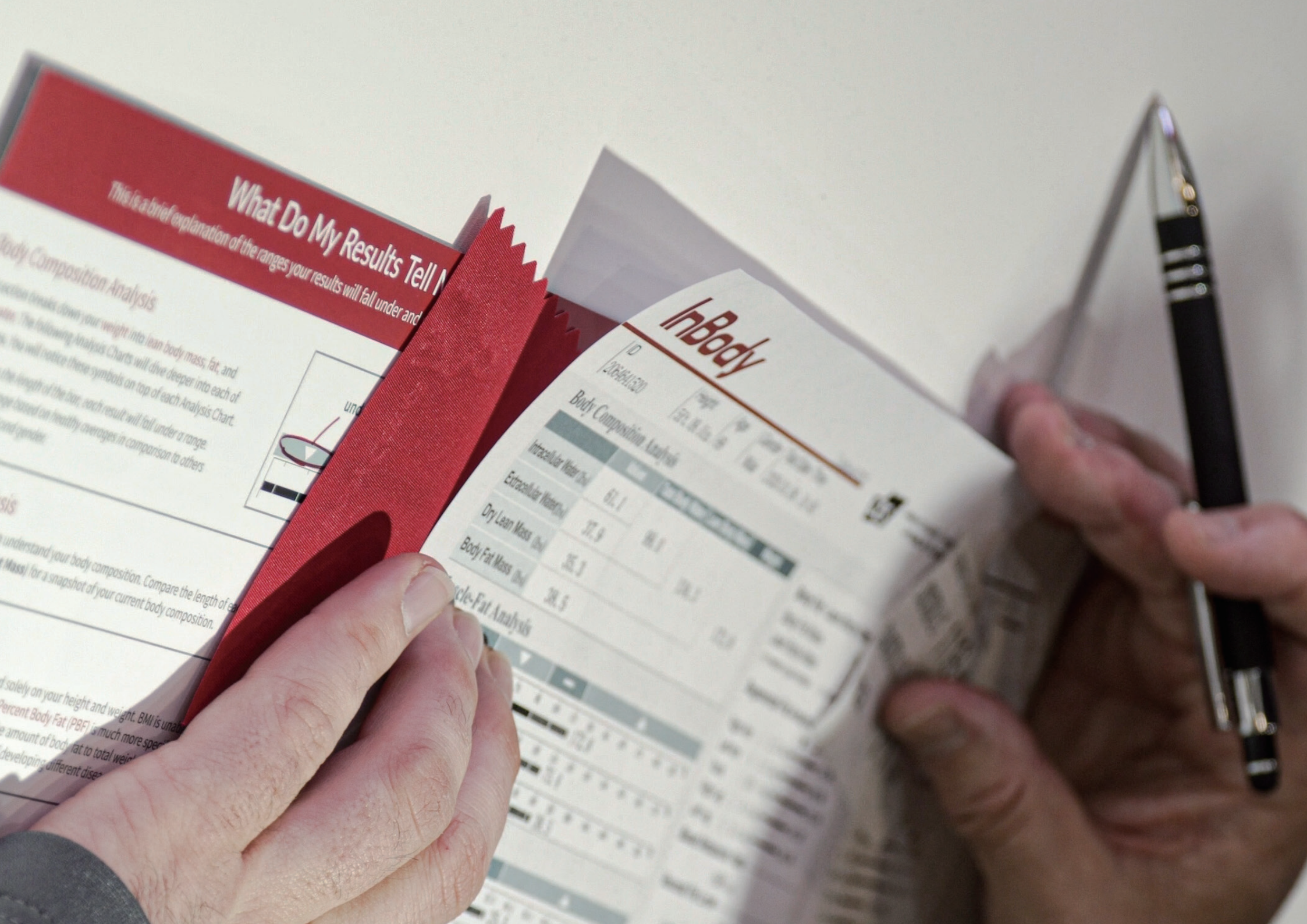
InBody, which has expanded beyond Korea to overseas markets, currently exports to over 110 countries through its nine subsidiaries, solidifying its position as a global healthcare company. InBody has been actively introduced in various research and medical fields and has established itself as a reliable device for researchers, having been used in more than 5,000 papers around the world. The small fruit that five young people started bearing in an underground laboratory in Seoul has now become a dream and a source of pride for the 1,000 employees who work together to grow the company, and it has also become the basis for healthy habits for people around the world.

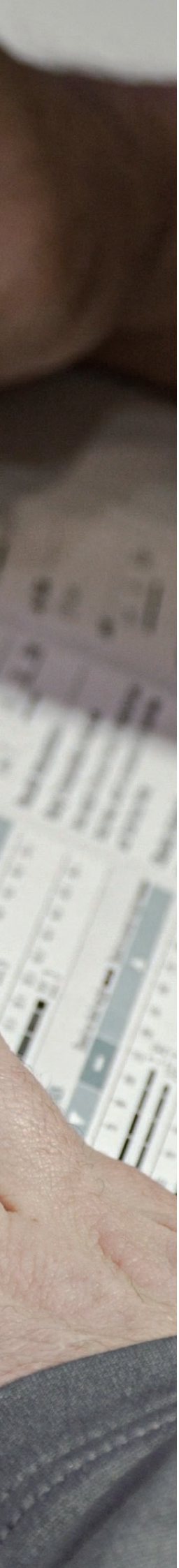
InBody's next step is creating a world where it is easier for everyone to know their body composition and understand their body. By following the flow of body composition, the balance of our entire body can reveal why we are sick or what we can do to become healthier.

The 2023 InBody Report was prepared in the hope that by analyzing and sharing the numerous body composition data that InBody has accumulated, it will be the beginning of a meaningful journey for everyone to know their body composition and lead a healthy life.

* The data used in this report were used solely for statistical purposes, to provide information, limited to the data for which personal information was agreed upon, and no information that can identify individuals is included in the data.

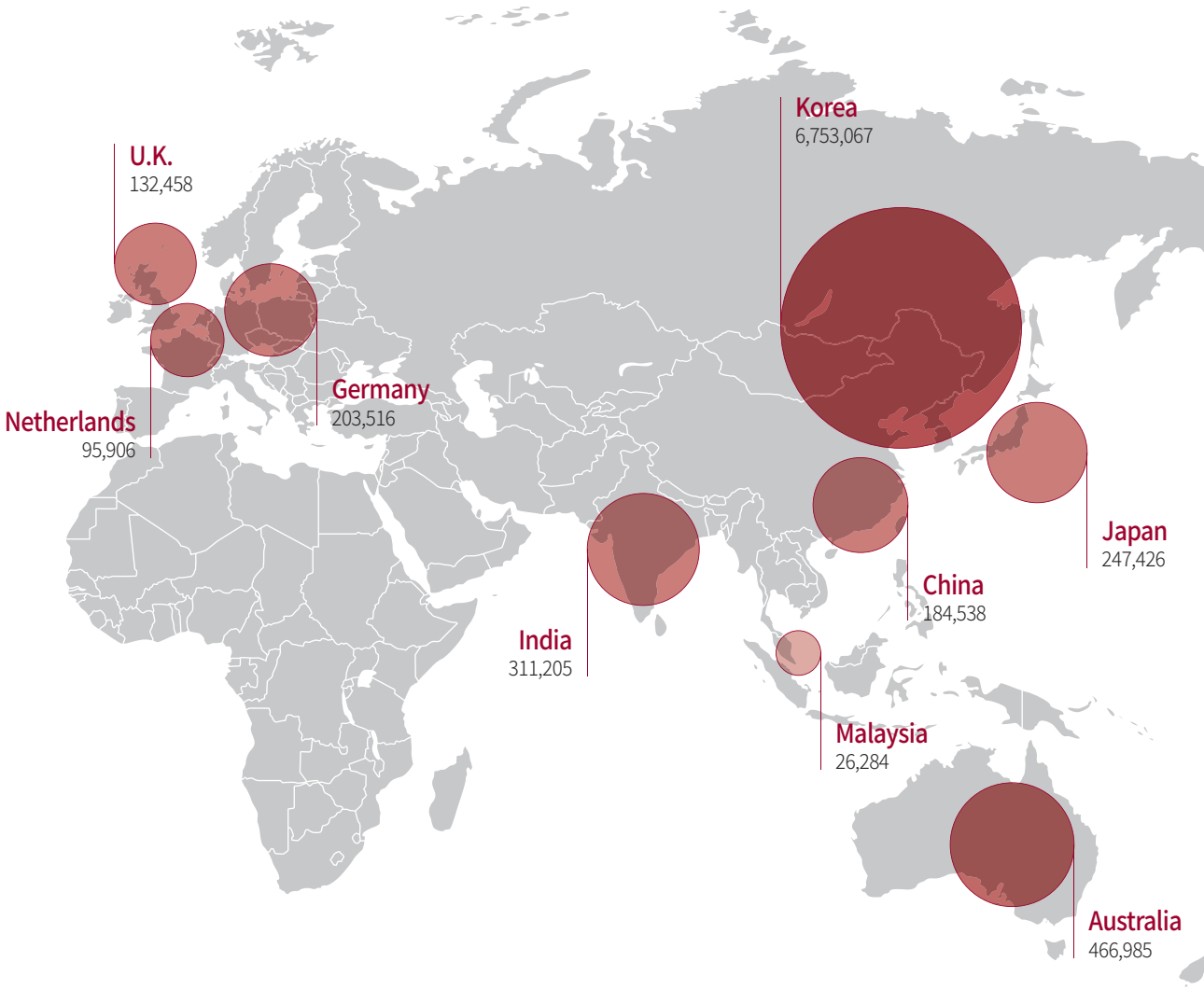
Contents


What Do My Results Tell
This is a brief explanation of the ranges your results will fall under and
Body Composition Analysis
InBody
Body Composition Analysis
Intracellular Water
Extracellular Water
Dry Lean Mass
Body Fat Mass



01
INTRO

The contents of this report were prepared based on InBody measurement data accumulated from around the world, and they cover body composition trends in various countries, gender, and age groups.
We would like to help all readers around the world who read this report check and compare where their body composition is currently positioned, and lead a healthy life through more systematic body composition management.



The InBody Report of 2023: Methods for Processing Data

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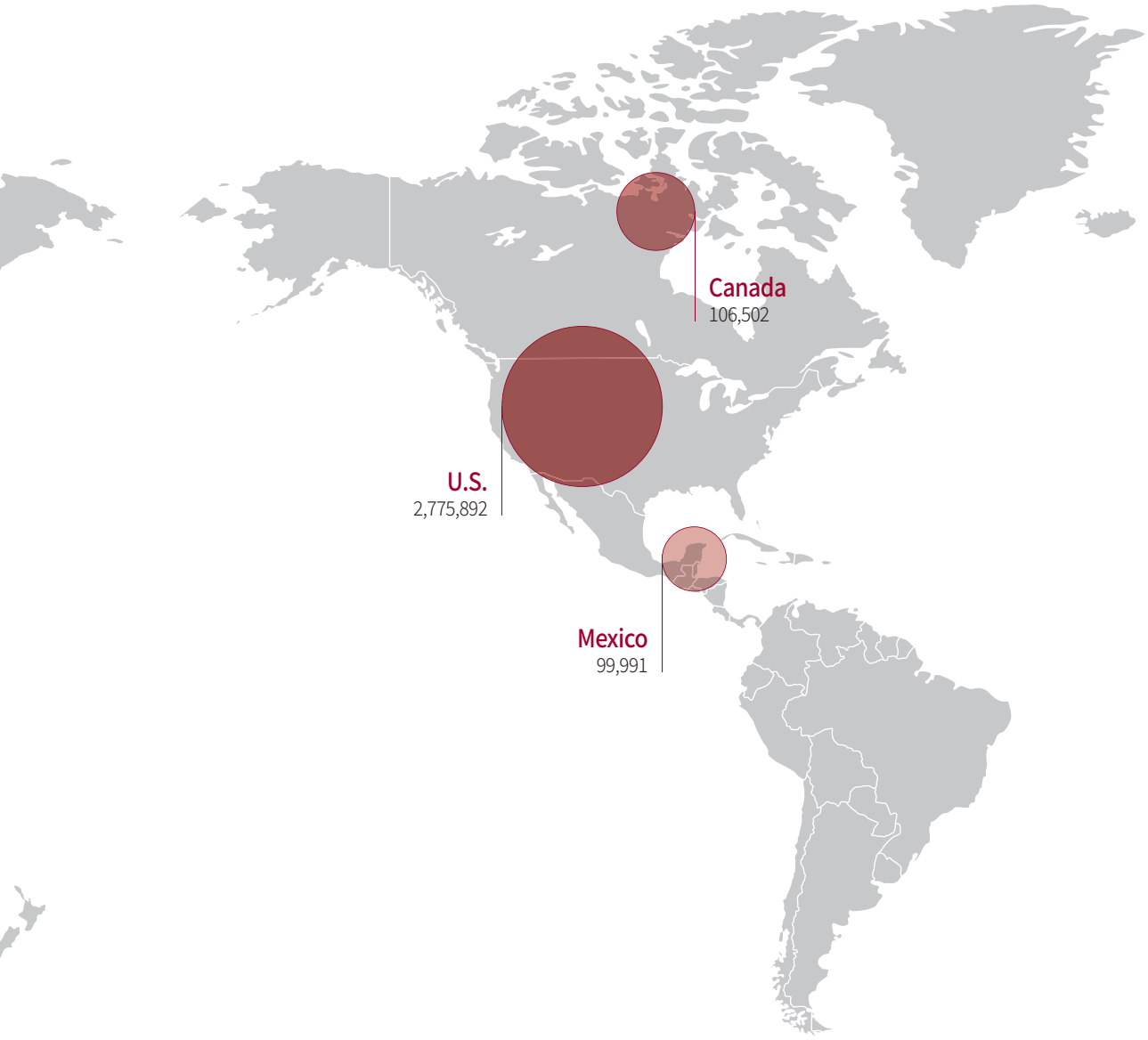
Currently, InBody Professional BCA devices are used to collect body composition data in real time and store it in the cloud. As of January 2023, over 83 million data have been accumulated. For the 2023 InBody Report, we analyzed 5 years' worth of data collected worldwide from 2017 to 2021. We processed the data to minimize input and measurement errors and provide general information. The report is based on data from 12 countries, including Korea, Japan, China, Canada, the U.S., and Australia, and focuses on adults over the age of 20 who have taken InBody tests and shown a high level of interest in their health.



	Netherlands	Germany	Malaysia	Mexico	U.S.	U.K.	India	Japan	China	Canada	Korea	Australia
Men	40,540	89,855	10,456	36,528	1,130,993	59,649	182,353	94,686	81,855	54,028	2,409,881	158,088
Women	55,366	113,661	15,828	63,463	1,644,899	72,809	128,852	152,740	102,683	52,474	4,343,186	308,897
Total	95,906	203,516	26,284	99,991	2,775,892	132,458	311,205	247,426	184,538	106,502	6,753,067	466,985

- Amount of data from 12 countries that have undergone data pre-processing

* Data from China is the data after 2019.

* We selected the 12 countries based on the amount of accumulated body composition data collected by InBody Professional BCA devices in each country.

What is the Biggest Interest Among Fitness Enthusiasts?

Since the outbreak of COVID-19, interest in health, particularly in relation to muscle mass has grown. The amount of muscle mass one possesses often plays a crucial role in determining their ability to recover from diseases. This is because muscle mass is vital for leading a more active daily life.

The 2023 InBody Report has identified muscle mass of people around the world as the main focus, and highlights the trends, changes, and shifts in health based on the measurements of muscle mass taken by InBody across the globe.

The COVID-19 Pandemic began in 2020, causing a significant change in people's daily lives. Social distancing measures have brought most indoor and outdoor activities to a halt. Activities like exercising, dining out, and watching movies with others have significantly decreased. Those who were infected with COVID-19 or had close contact with an infected person had to go through quarantine life, making outdoor activities impossible. As people's lifestyles change, their behaviors and interests have also shifted. Since the outbreak, many people have gradually started to stay indoors and focus on self-care. With vaccines and treatments yet to be fully developed, people are now more focused on maintaining a healthy lifestyle through diet and exercise than ever before.

In daily life, we often discuss our health status through phrases such as "You look healthy these days" or "I'm not feeling well these days." However, as we become more attentive to our health, we start to question what exactly constitutes good health.

Defining a person's healthy status is challenging because being underweight does not necessarily equate to good health. However, if we consider the body condition of a person with the right weight and the right amount of muscle mass, we can say that such a person has a healthy body composition. People interested in maintaining their health recognize that a certain level of muscle mass correlates with physical strength, endurance, and vitality, and they make a conscious effort to increase muscle mass by exercising in outdoor parks, fitness centers, and home gyms. Despite the COVID-19 pandemic, participation in sports and exercise for daily life has returned to pre-pandemic levels. Furthermore, having a sufficient amount of muscle mass has become increasingly important for recovery from illness, making it a crucial aspect of maintaining good health. Thus, the term "muscle" has become an essential keyword for achieving a healthy lifestyle.

In the 2023 InBody Report, "muscle mass of people around the world" was selected as the main keyword. This report aims to examine trends in muscle mass across different countries, age groups, and genders, as well as changes in muscle mass values due to COVID-19. Using data measured with InBody, we aim to identify the current health trends and predict future developments for 2023.

A List of Body Composition Terminologies

The human body is composed of various components such as fat, protein, and minerals, collectively referred to as body composition. In this report, we use several terms related to body composition. To help readers understand these terms more easily, we have organized them into related categories.

1. BMI

BMI stands for Body Mass Index and is a measure of body weight relative to height. It is calculated by dividing one's weight in kilograms by the square of their height in meters (kg/㎡). BMI is commonly used in nutritional science and sports medicine to assess the degree of apparent obesity.

2. PBF PBF(%)=(Body Fat Mass(kg) / Weight(kg)) × 100

PBF stands for Percentage Body Fat. It measures the amount of fat mass in the body by dividing body fat mass by weight and multiplying by 100. While the Body Mass Index (BMI) is determined only by weight and height, it cannot accurately diagnose obesity because it fails to reflect changes in both muscle and body fat mass. Therefore, in the case of bodybuilders, obesity can be diagnosed if there is a high amount of muscle mass and low body fat. However, PBF is an index that is often used to determine whether someone is overweight as it indicates the amount of body fat present. PBF has different standards for men and women due to different body structures. The standard range of PBF for men is 10 to 20%, and for women, it is 18 to 28%.

3. FFM FFM(kg)=Weight(kg)−Body Fat Mass(kg)

FFM stands for Fat Free Mass, which is also known as lean mass. Although people may have the same weight, some appear thinner while others appear heavier. Our body components can be divided into two categories: fat and non-fat. The fat stored in our body is referred to as body fat, while the remaining weight after subtracting body fat is known as lean mass. Lean mass consists of elements that make up the human body, such as muscles, bones, organs, brain, and water, excluding body fat. Muscle is the most important component of lean mass, as it contributes to a higher basal metabolic rate. Therefore, having a higher proportion of lean mass in the body can be beneficial for metabolism and overall health.

4. BFM BFM(kg)=Weight(kg)−Fat Free Mass(kg)

BFM stands for Body Fat Mass. As mentioned earlier, body weight is the sum of body fat mass and lean mass (FFM). Having a high amount of body fat increases the risk of cardiovascular diseases such as diabetes, high blood pressure, and hyperlipidemia.

5. SMM

SMM stands for Skeletal Muscle Mass. There are three types of muscles that make up our body: myocardium, smooth muscle, and skeletal muscle. Myocardium refers to the muscles of the heart, and smooth muscle refers to the muscles present in organs. Myocardium and smooth muscle are involuntary muscles that we cannot control on our own, but skeletal muscle is attached to bones or tendons and contracts voluntarily to create movement. When we talk about building muscle with exercise, we are usually referring to building skeletal muscle.

6. SMI SMI(kg/㎡)= Appendicular Skeletal Muscle Mass(kg)/ Height²(㎡)

SMI stands for Skeletal Muscle Mass Index. SMI is calculated by dividing the muscle mass of the limbs excluding the trunk by the square of the height (㎡), and is an important diagnostic index. In 2016, the World Health Organization (WHO) classified sarcopenia as a disease, making SMI a key tool in diagnosing the condition. Sarcopenia refers to the gradual loss of muscle mass and strength that occurs with aging. If SMI is less than 7.0 kg/m² for males or less than < 5.7kg/m² for females, it is considered as sarcopenia.


COVID
19
Coronavirus
Vaccine

02
MAIN

1) Global Body Composition Trends Over Time
2) Impact of COVID-19 on Body Composition
3) Body Composition Trends Across Gender and Age Groups

I . Global Body Composition Trends Over Time

Even if the body weight is the same, the distribution of body composition among individuals differs. This means that people with the same weight can have varying amounts of muscle mass and fat mass. Your heredity and living environment can determine whether you are prone to gaining more muscle or fat. In this chapter, we will examine the muscle mass and body fat mass of individuals across 12 countries, confirmed using InBody big data.

II . Impact of COVID-19 on Body Composition

As our lifestyles have changed due to COVID-19, so too have our weight, muscle mass, and body fat. The impact of COVID-19 on body composition has varied depending on each country's response, the number of InBody tests administered, and the number of people tested. In this chapter, we will examine the effects of COVID-19 on body composition.

III. Body Composition Trends Across Gender and Age Groups

We have confirmed that body composition varies across countries, influenced by heredity and culture. However, even within the same race and culture, differences in body composition can occur based on gender and age. In this chapter, we will examine the trends in body composition by gender and age.

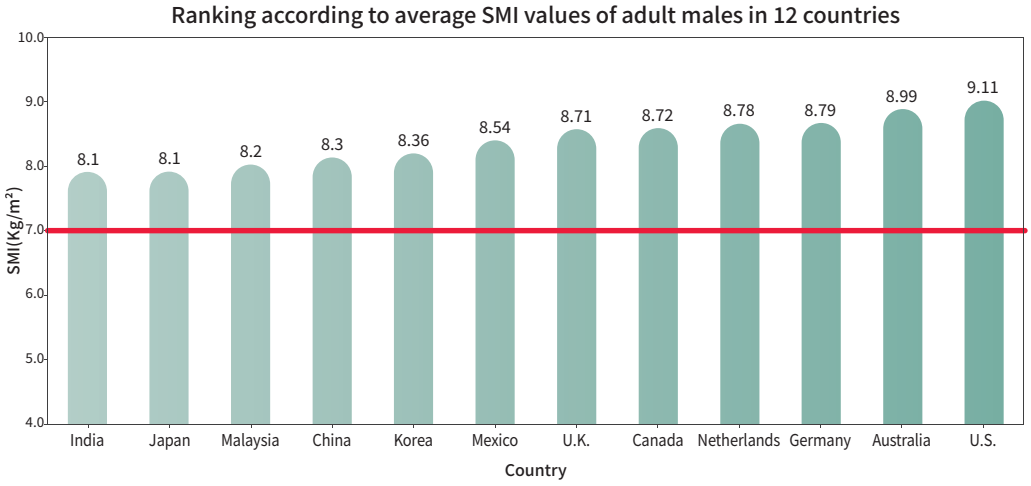
Average Muscle Mass for Men and Women by Country (2017-2021)

Before delving into the contents of the InBody Report, let's first examine the data on average muscle mass and average body fat percentage for each country, as measured by InBody. This information is presented in the graph below.

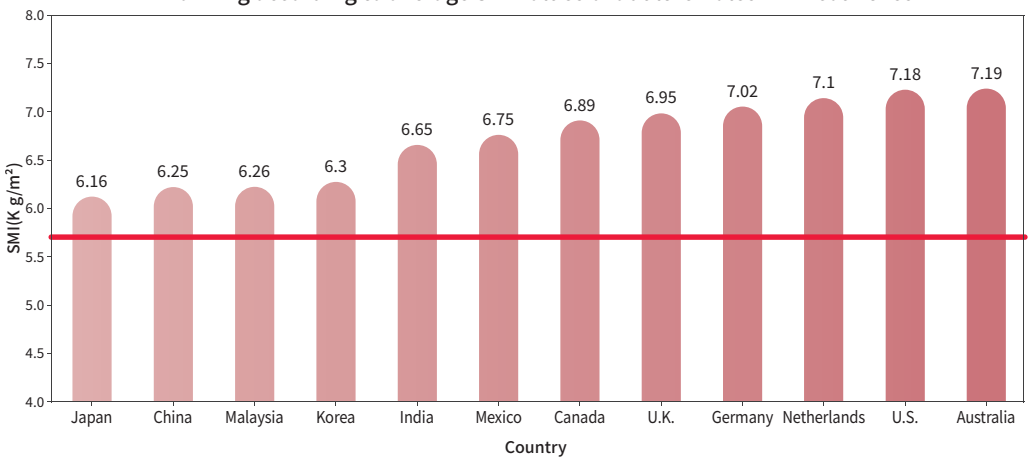
Of the various measures used to evaluate muscle mass, the skeletal muscle mass index (SMI) is obtained by dividing muscle mass by the square of height (m^2). This value provides an objective assessment of muscle mass by accounting for the proportional increase in muscle mass with height. A higher SMI value indicates greater muscle mass. As shown in the graph below, the U.S., Australia, Netherlands, Germany, Canada, and the U.K. rank among the top six countries with the highest muscle mass across genders. Overall, Western countries exhibit slightly more developed skeletal muscle mass compared to Asian countries. The good news is that the SMI averages for each country far exceed the sarcopenia threshold depicted in the graph.

Differences in muscle mass between countries are the result of genetic and environmental factors. Interestingly, there exists significant variation in muscle mass values even within a single country, with notable differences observed across gender and age groups.

Data source: InBody cloud server (global big data)
Target: Adult males between the ages of 20 and 80 by country
Period: January 2017 - December 2021
SMI (kg/m^2) = Appendicular Skeletal Muscle Mass (kg) / Height^2 (m^2)
Sarcopenia was classified as a disease by WHO in 2016.
In the case of men, when SMI is less than 7 kg/m^2, it is classified as sarcopenia.



Data source: InBody cloud server (global big data)
Target: Adult females between the ages of 20 and 80 by country
Period: January 2017 - December 2021
In the case of women, when SMI is less than 5.7 kg/m^2, it is classified as sarcopenia.



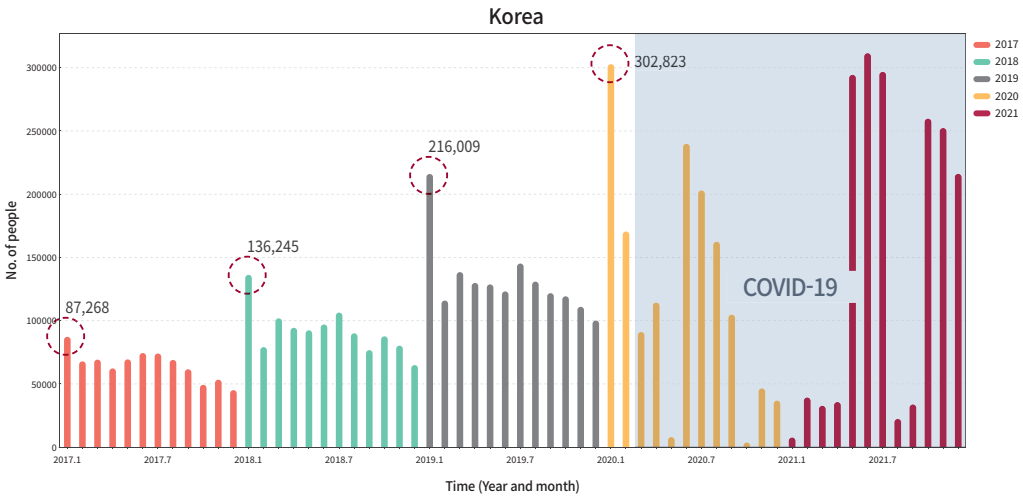
Global trends in InBody Measurement

When do people typically measure their body composition? The most common time is in January, as we often set new goals for our New Year's resolutions, which often includes weight management. As we naturally accumulate more body fat as we age, diet tends to take precedence in our New Year's resolutions.

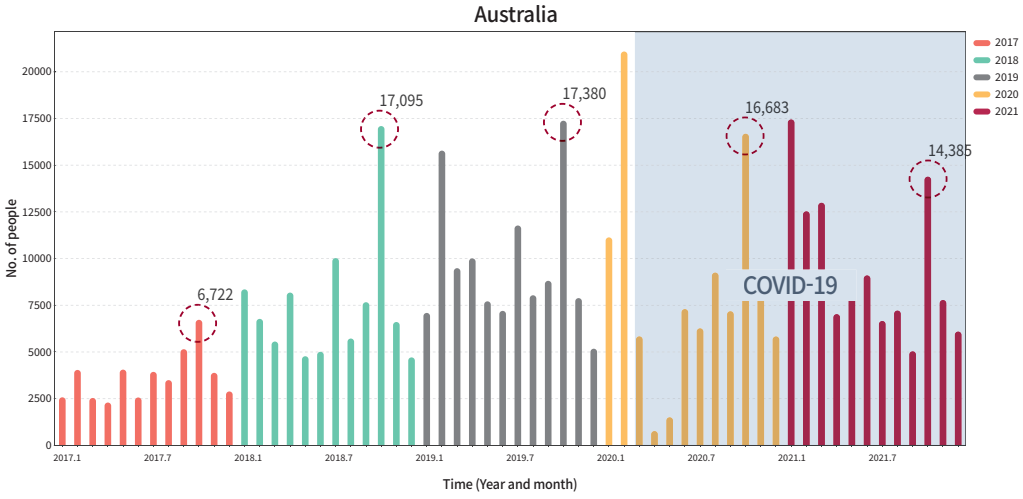
You can track the progress of New Year's resolutions by examining the InBody measurement data. The graph below indicates that the number of InBody measurements generally declines during the winter season, when the weather turns colder. However, once January arrives, the number of InBody test rises sharply. This trend is common not only in Korea but also in many other countries. Health is a primary focus for many people when setting their New Year's resolutions, with seven out of ten Koreans selecting health as their goal for 2022.

Looking at the graph below, in September in Australia, the number of InBody tests increased by 2 to 2.5 times compared to the average number of measurements in the same year. What happened in Australia, unlike other countries? Besides New Year's resolutions, what other factors had an impact?

Number of InBody measurements per month



Data source: InBody cloud server (Korea)
Target: Korean adult males and females between the ages of 20 and 80
Period: January 2017 - December 2021
COVID-19 outbreak in March 2020



Data source: InBody cloud server (Asia)
Target: Australian adult males and females between the ages of 20 and 80
Period: January 2017 - December 2021
COVID-19 outbreak in March 2020

Health Care Season by Country Examined by InBody Measurement Period

In Australia, the number of InBody measurement data increases in October when the warm season begins. In order to determine the differences in the number of InBody tests according to seasonal changes, we additionally looked at India, which has a different seasonal pattern from Korea.

InBody measurement data is typically collected in bulk during a specific season every year, varying by country. Before embarking on health care routines, such as dieting, people often measure their body composition and assess their physical condition with InBody. The fact that InBody data is collected during a specific season each year for each country suggests that people in the same country tend to start taking care of their health around the same season.

First, from January 2017 to December 2021, we looked at the number of monthly InBody measurement data of Korean women, and three was the highest number of InBody measurement data in January of each year from 2017 to 2020. January is the month to make plans for and resolutions on how to spend the year for the new year. In fact, as a result of a survey of Koreans' personal goals for the new year in 2022 by Hankook Research, “health maintenance and recovery” ranked first and “diet and weight loss” ranked second. As a result of a survey by Statista, a German market research institute, the New Year's resolutions of Americans in 2022 also showed that “maintaining health ranked first.”

Of course, there were some changes due to the impact of COVID-19. Looking at the number of InBody measurement data from Korean women, since January 2021 was a time when the COVID-19 was in full swing, the number of InBody measurement data decreased by 96% compared to January 2019 and by more than 97% compared to January 2020. From April 2021, when the first vaccination of the COVID-19 vaccine began, the number of InBody measurement data soared due to expectations for back-to-normal, hitting the all-time high of the year in May, with a whopping 4690% increase compared to January of the same year.

In comparison to Korea, we selected India and Australia, whose seasonal patterns are easy to compare with Korea.

Next, we looked at the number of InBody measurement data of Indian women. In India, a somewhat unusual pattern emerged.

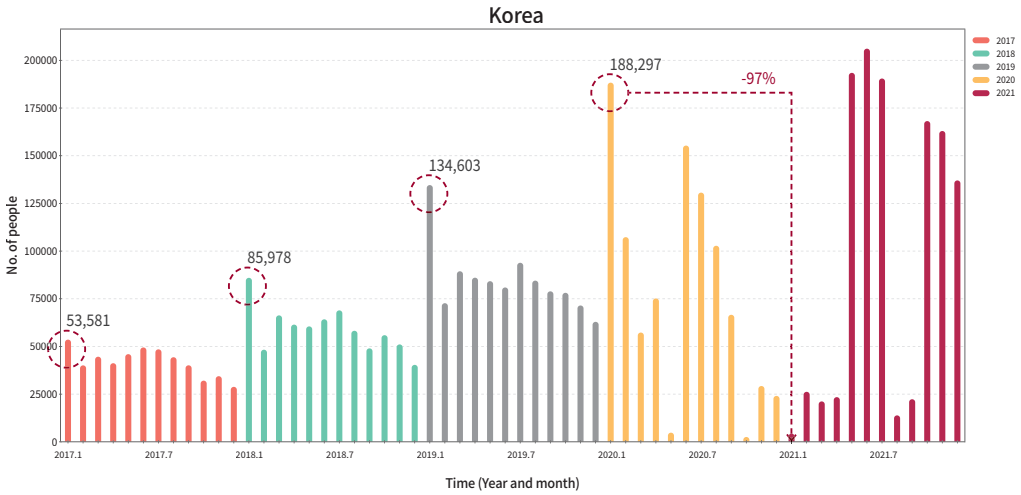
Looking at the data from 2017 to 2020, the InBody measurement data surged in February and October every year. The increase in the number of InBody measurement data in February seems to be due to the New Year's resolutions such as health care and diet, and October can be interpreted as the influence of the climate. Generally, India has three seasons. October to February is the relatively warm winter, April to June is the hot season, and June to September is the rainy season. During the hot season and rainy season, it is not easy to move the body for outdoor activities and exercise, so health care is a little neglected, but from October when activities become easier, more people start health care in earnest.

Another country, like India, where the number of InBody measurement data is increasing due to climate is Australia. In Australia, the number of InBody measurement data surges every year in October, not January. Looking at the data from 2017 to 2020, the InBody measurement data in October each year increased by an average of 2.3 times compared to January. Australia is a southern hemisphere country that shows the opposite seasonal trend to Korea, a northern hemisphere country. When it is winter in Korea, it is summer in Australia, and when it is summer in Korea, it is winter in Australia. October in Korea is the season when the temperature drops as autumn begins. On the other hand, in Australia, the warm summer begins in October, the temperature rises, so it is easy to manage health through active activities.

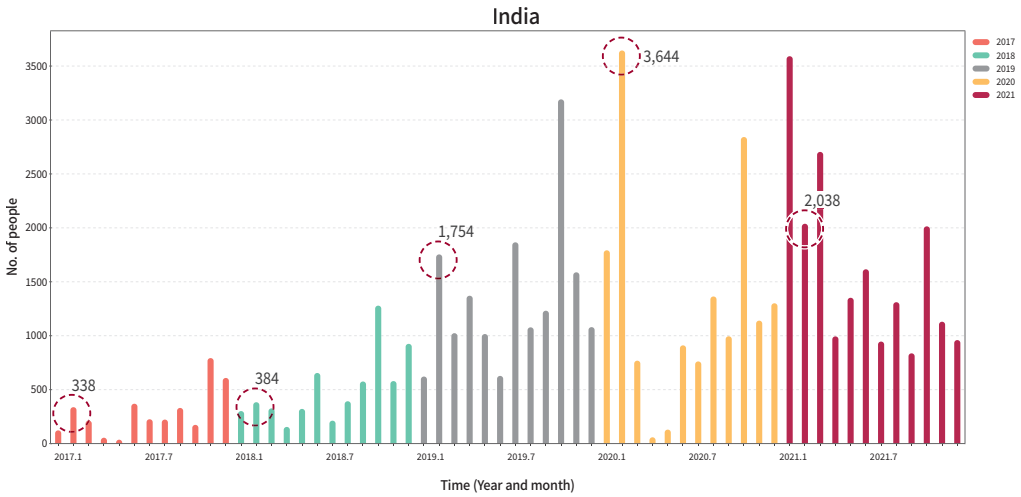
Through the monthly InBody measurement data, it was possible to determine when each country began to take health care seriously. We conducted an in-depth analysis based on several variables to identify the sources of the differences.

As a country in the southern hemisphere, Australia exhibits the exact opposite seasonal pattern to Korea.

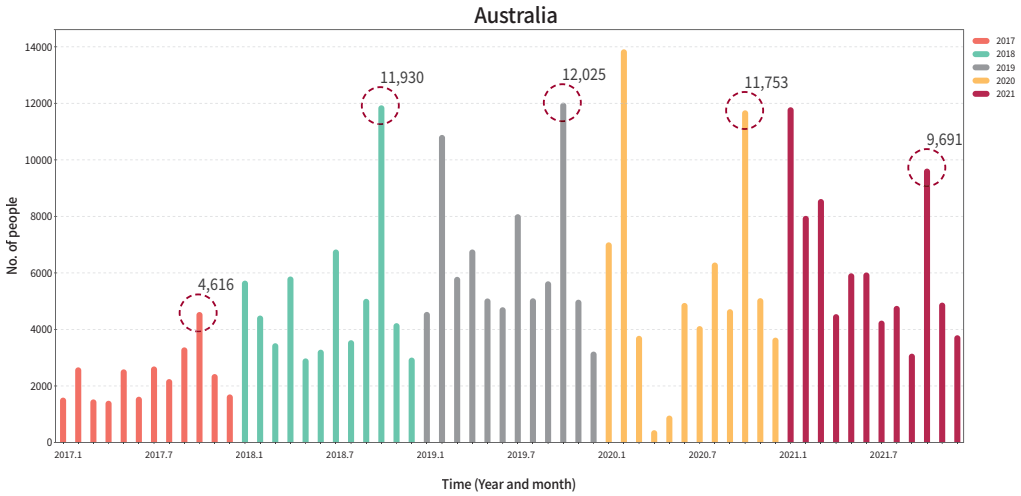
Number of InBody measurements per month of adult females



Data source: InBody cloud server (Korea)
Target: Korean adult females between the ages of 20 and 80
Period: January 2017 - December 2021
COVID-19 outbreak in March 2020



Data source: InBody cloud server (Asia)
Target: Indian adult females between the ages of 20 and 80
Period: January 2017 - December 2021
COVID-19 outbreak in March 2020



Data source: InBody cloud server (Asia)
Target: Australian adult females between the ages of 20 and 80
Period: January 2017 - December 2021
COVID-19 outbreak in March 2020

Trends in Changes in Body Fat Percentage of People by Country on a Yearly Basis

It is interesting to look at the trend of body fat change of people around the world who measured their body composition with InBody. There are distinct patterns in body composition changes that vary according to gender and age, with notable differences in body fat trends by country.

Unlike the average body fat percentage discussed in the previous chapter that were analyzed from the results of the InBody data measured in 12 countries, the trend of changes in body fat by period was different for each country, although similar pattern of graphs was shown every year when body fat was analyzed on a yearly basis.

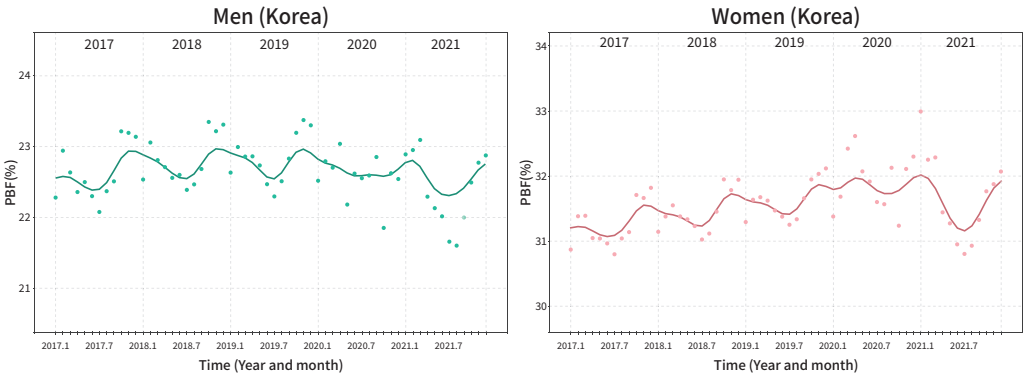
Let's take a look at Korean data. In Korea, body fat decreases from the beginning of the year to the middle of the year, and increases toward the end of the year. Based on one year, the graph, which looks like a bowl with a slight indentation in the middle, is repeated every year.

We found that the yearly body fat graphs in various countries such as the U.S., India, Germany, the U.K., and Australia also repeat the same pattern every year with different shapes for each country. So, why do body fat patterns vary from country to country, and why do cycles repeat on an annual basis?

Changes in body fat percentage by month

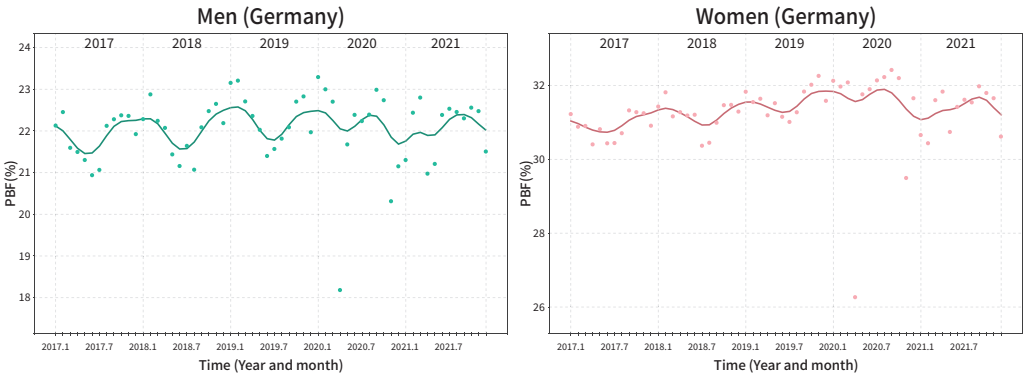
L) Data source: InBody cloud server (Korea)
Target: Korean adult males between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Average change in PBF by month

R) Data source: InBody cloud server (Korea)
Target: Korean adult females between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Average change in PBF by month



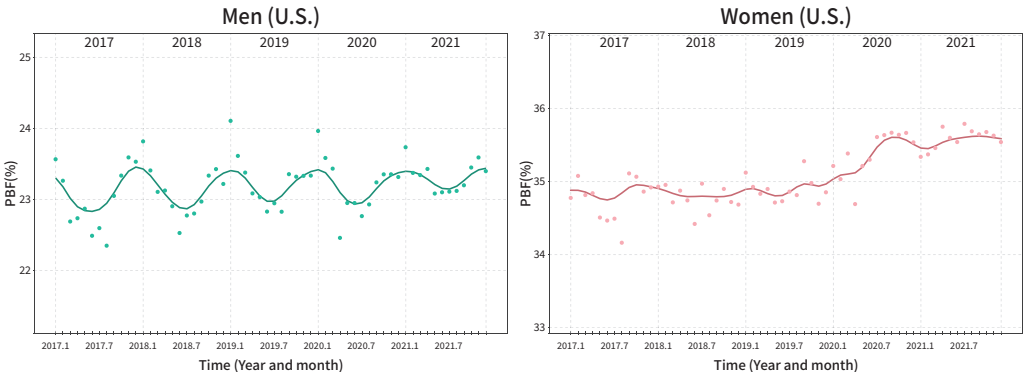
L) Data source: InBody cloud server (Europe)
Target: German adult males between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Average change in PBF by month

R) Data source: InBody cloud server (Europe)
Target: German adult females between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Average change in PBF by month



L) Data source: InBody cloud server (U.S.)
Target: American adult males between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Average change in PBF by month

R) Data source: InBody cloud server (U.S.)
Target: American adult females between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Average change in PBF by month



Seasonal Weight Fluctuations :

Gaining in Winter and Losing in Summer
Temperature-Related Trends in Body Fat Percentage : A Comparison between the Northern and Southern Hemispheres

"I gained weight in winter." This is a statement we often hear people make. But why do people say that they gain weight and lose weight with the change of seasons? To answer this question, from 2017 to 2021, we looked at the changes in average body fat percentage by month for people whose body composition was measured with InBody.

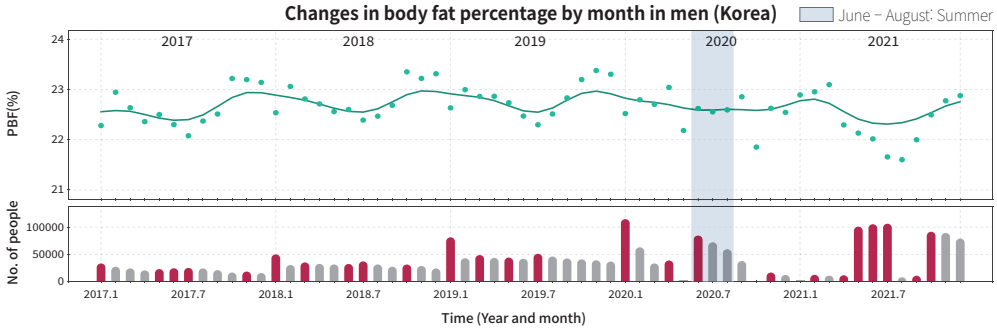
When we analyzed changes in average body fat percentage by month in Korean men, we found that the same pattern occurred on a yearly basis. Body fat percentage decreased from December to June, reached its lowest point in midsummer (June-July), increased from July to November, and peaked in November. This pattern shows that body fat percentage tends to decrease in the summer and increase in the winter.

The reason why body fat percentage changes in the same pattern by season, as you may have guessed, is largely due to the influence of activity metabolism. In fact, the basal metabolic rate is higher in winter than in summer, making it a better season for reducing body fat through exercise. However, during winter, the amount of exercise naturally decreases due to the cold weather, and fatigue increases due to the decrease in sunlight. As a result, if people do not move their bodies as much, calorie consumption decreases as well.

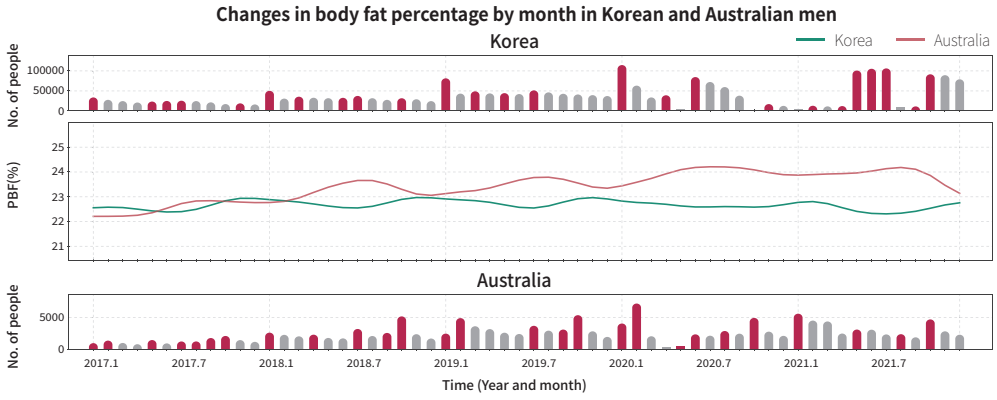
On the contrary, during summer, outdoor activities increase and there is more sunlight, resulting in fewer days where people feel lethargic. As a result, the amount of activity and calorie consumption increase, and body fat percentage decreases.

This result was derived only from data on Korean men, so further data was needed to reinforce the fact that body fat percentage is lower in summer and higher in winter. Therefore, we examined the changes in average body fat percentage by month in Australia, a country in the southern hemisphere with opposite seasons to those in Korea. Interestingly, over the same period, body fat percentages in Australia exhibited a completely opposite pattern to those in Korea. In June, for example, body fat percentage decreased in the northern hemisphere during the summer, while it increased in the southern hemisphere during the winter.

However, we noticed a peculiarity in the data. In January, when there is no significant difference in temperature from December, body fat percentage begins to gradually decrease. From February to November, body fat percentage shows a decreasing trend despite being in the middle of winter. This trend appears to be influenced by the social climate in which the number of people who start exercising by registering at facilities such as fitness centers for the New Year Rapidly increases. In fact, every January, compared to the previous December, the body composition data accumulated by InBody surges, indicating an increase in the number of people measuring their body composition with InBody to achieve their New Year's exercise goals.



Data source: InBody cloud server (Korea)
Target: Korean adult males between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Average change in PBF by month



Data source: InBody cloud server (Korea, Asia)
Target: Adult males between the ages of 20 and 80 (Korea and Australia)
Period: January 2017 - December 2021
Main index: Average change in PBF by month

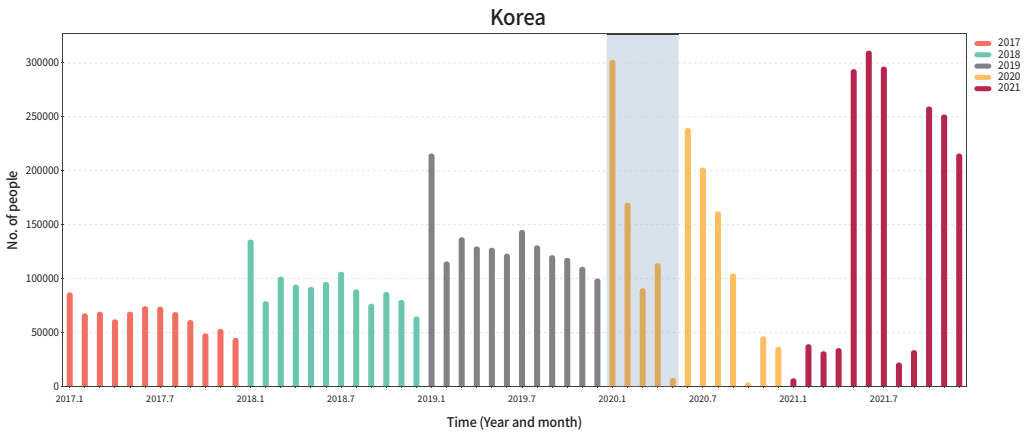
Global InBody Measurement Trends Following the COVID-19 Pandemic

Due to the outbreak of COVID-19 in 2020, the number of InBody tests worldwide decreased by approximately 79% in April compared to January. This phenomenon appeared as outdoor activities decreased drastically following the outbreak of COVID-19. The time taken for the number of InBody tests to recover varies from country to country, but it typically took about 3 to 4 months.

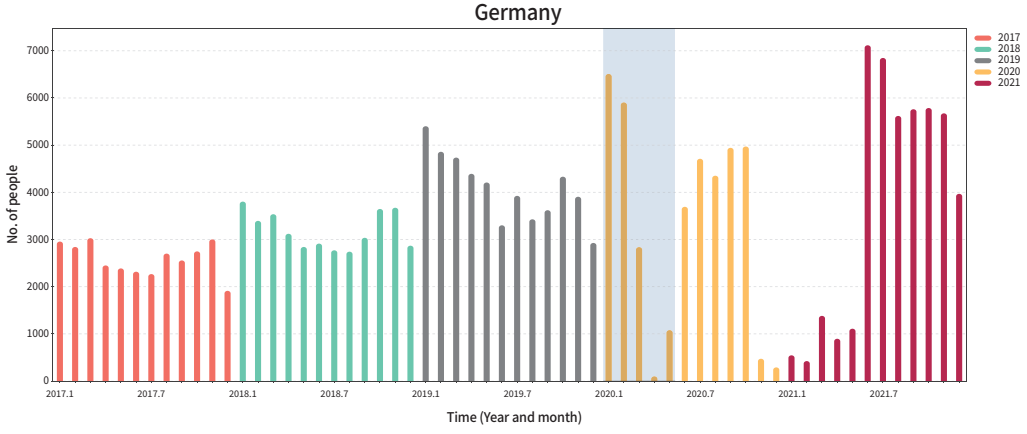
However, since the implementation of measures such as social distancing, shutdowns, and restrictions on the number of people indoors, people's behavior patterns have been affected. In the case of Korea, the number of InBody tests rapidly decreased as the second stage of social distancing was implemented from mid-august 2020, and this trend continued. As social distancing measures were eased, the number of tests increased significantly. While national policies had caused a sharp decrease in the number of tests, people continued to engage in outdoor and indoor sports activities to stay healthy, and the number of InBody Tests eventually recovered to pre-COVID-19 levels. In the following sections, we will examine the short and long term effects of COVID-19 on people's body composition.

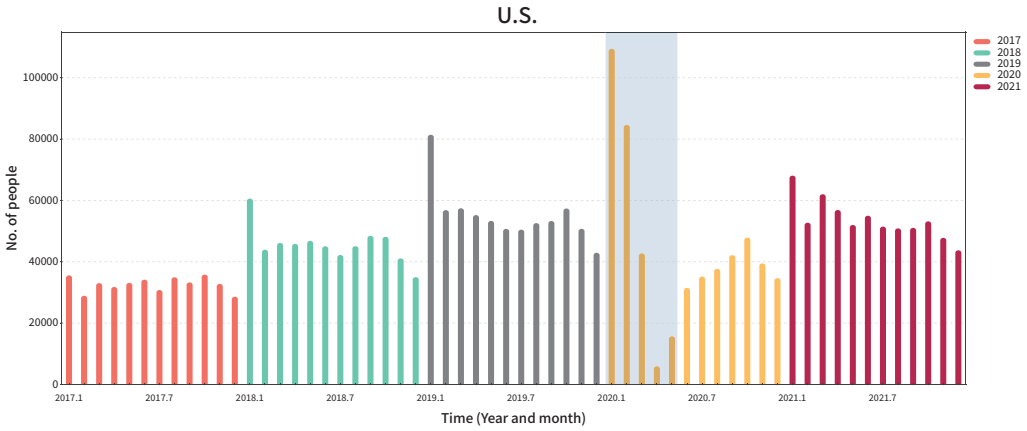
Number of InBody measurements per month

Data source: InBody cloud server (Korea)
Target: Korean adult males and females between the ages of 20 and 80
Period: January 2017 - December 2021

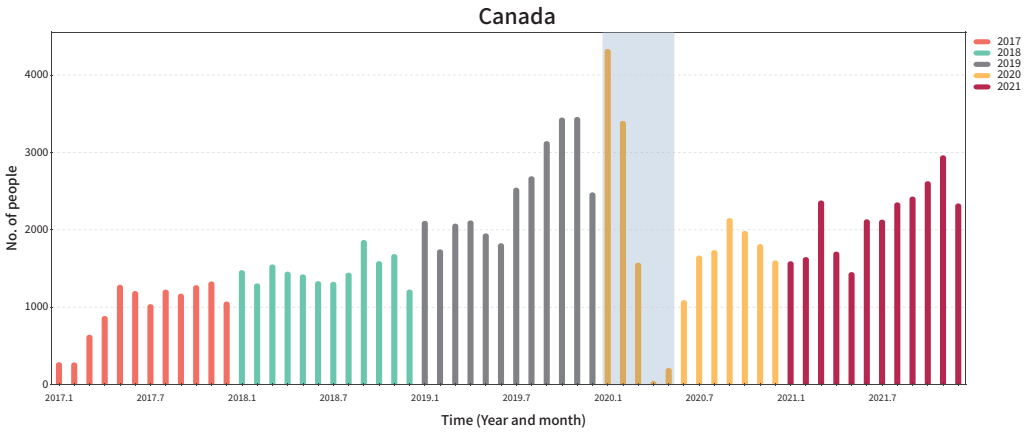


Data source: InBody cloud server (Europe)
Target: German adult males and females between the ages of 20 and 80
Period: January 2017 - December 2021

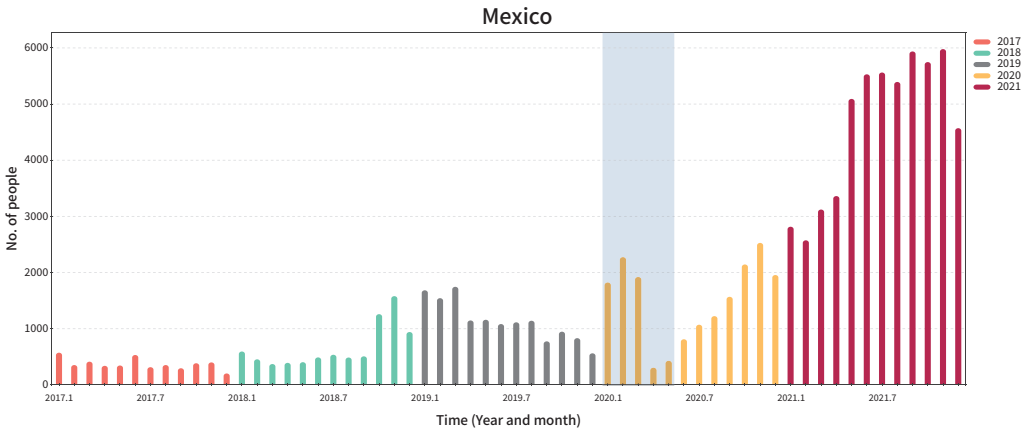




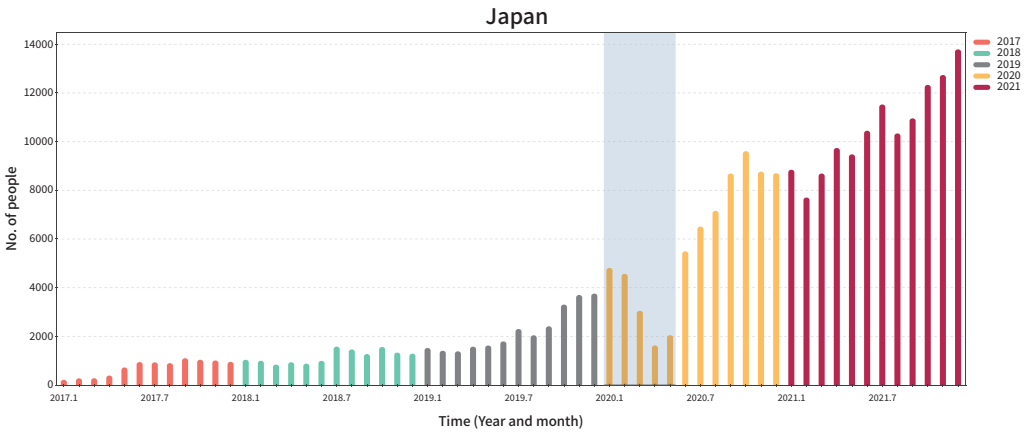
Data source: InBody cloud server (United States)
Target: American adult males and females between the ages of 20 and 80
Period: January 2017 - December 2021



Data source: InBody cloud server (Canada)
Target: Canadian adult males and females between the ages of 20 and 80
Period: January 2017 - December 2021



Data source: InBody cloud server (Latin)
Target: Mexican adult males and females between the ages of 20 and 80
Period: January 2017 - December 2021



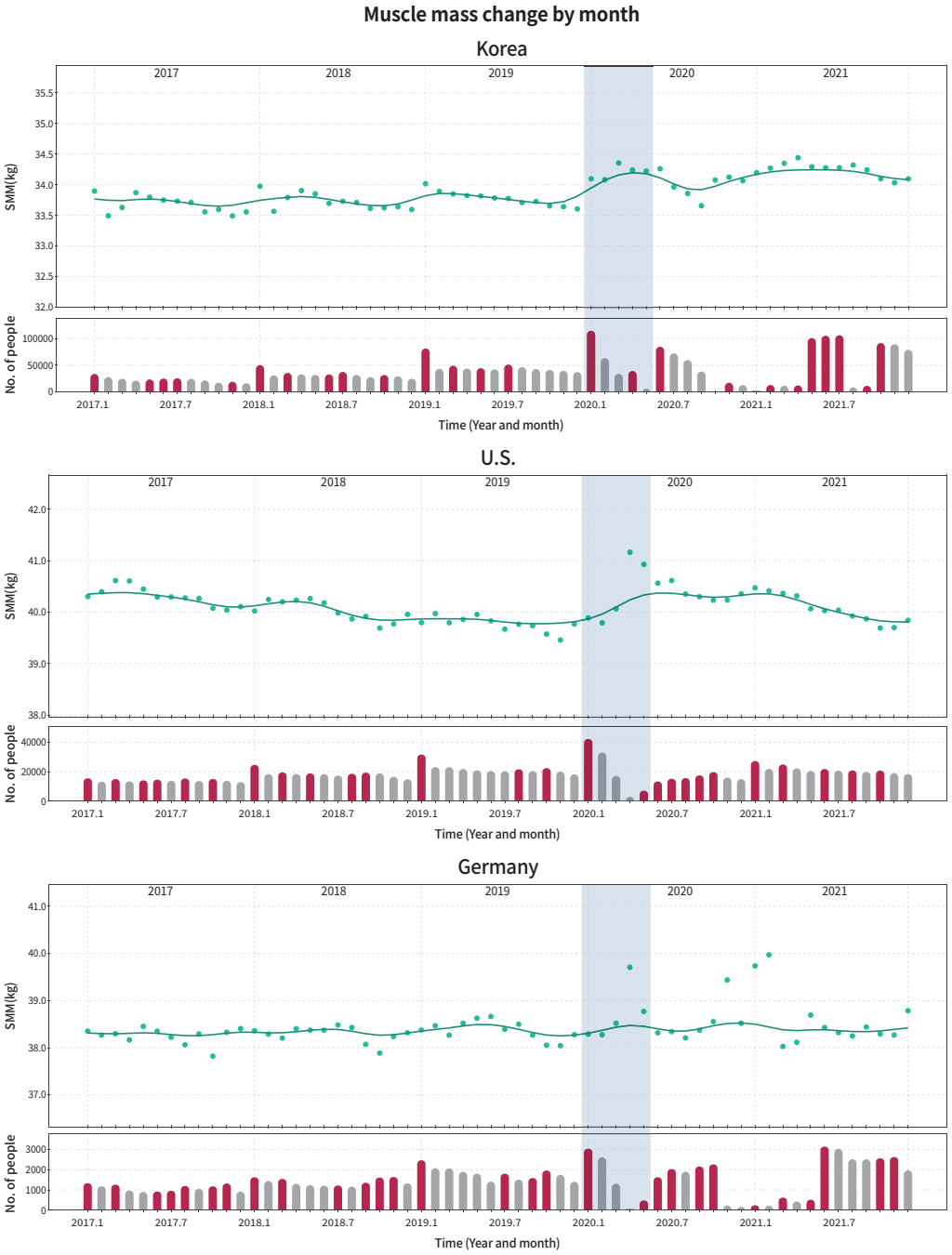
Data source: InBody cloud server (Asia)
Target: Japanese adult males and females between the ages of 20 and 80
Period: January 2017 - December 2021

Global Variations in Muscle Mass Changes During COVID-19 Pandemic

Korea, Germany, and the United States were selected as representative countries in Asia, Europe, and the Americas. We also added a graph for Canada, which

Despite experiencing the same COVID-19 pandemic, the InBody measurement results revealed diverse reactions among countries. As a consequence of the pandemic, the number of InBody measurements decreased, and we examined the demographics of individuals who underwent the test during this time.

If we look at most countries, including Korea, U.S., and Germany, we can infer that people with above-average muscle mass usually visited sports facilities and underwent InBody tests, as the number of InBody tests significantly reduced due to COVID-19. There were times when the muscle mass was measured much higher than the average value, indicating that the body composition measurement was conducted for the sake of their health despite the restrictions due to the national policies.

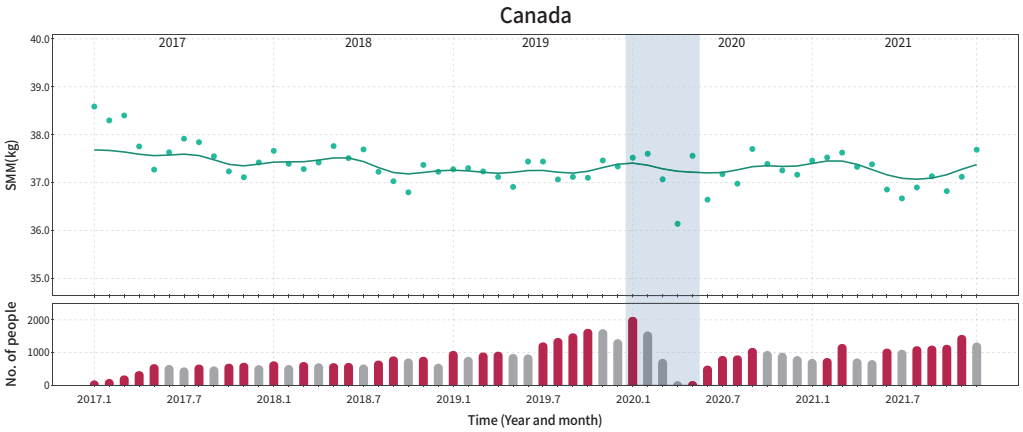


Data source: InBody cloud server (Korea)
Target: Korean adult males and females between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Monthly average change in SMM

Data source: InBody cloud server (United States)
Target: American adult males and females between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Monthly average change in SMM

Data source: InBody cloud server (Europe)
Target: German adult males and females between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Monthly average change in SMM

In April 2020, Canada differed from other countries as many people with less muscle mass than the average for the same month over the past five years conducted InBody measurements. This indicates that each country has a different pattern of visiting indoor sports facilities when outdoor activities become difficult due to COVID-19.



Data source: InBody cloud server (Canada)
Target: Canadian adult males and females between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Monthly average change in SMM

Unlike body fat, changes in muscle mass are not affected in a short period of time, so it is difficult to identify that muscle mass has increased or decreased due to COVID-19. However, as COVID-19 is prolonged, checking the change in muscle mass/fat before and after COVID-19 outbreak will be of significant help for health care in the future. What were the changes in muscle mass and fat mass before and after the COVID-19 outbreak in each country?

Impact of Prolonged COVID-19 on Muscle Mass and Body Fat Mass: A Country-Wide Analysis by Gender

After the COVID-19 outbreak, there was a significant decrease in the number of InBody measurements and changes in body fat mass and muscle mass were observed. As people began to regain their daily lives, the number of visitors to indoor sports facilities started to increase gradually. Similarly, the number of InBody measurements also began to recover, and body fat mass and muscle mass returned to pre-COVID-19 levels in most countries. However, four out of the twelve countries showed unique changes in body composition following the pandemic.

Among men, the U.K. showed an increase in body fat mass while maintaining muscle mass, while men in Korea and the Netherlands showed an ideal body composition with an increase in muscle mass and maintenance of body fat mass. Men in other countries returned to their pre-COVID-19 body composition.

In the case of women, only the U.S. showed an increase in body fat mass while maintaining muscle mass. In other countries, body composition was similar to that before COVID-19. These findings reflect the global efforts of people to prioritize their health through exercise and diet, even amidst the uncertainty of the pandemic.

Body Fat Mass (BFM)
:Body fat mass means fat mass.

Fat Free Mass (FFM)
:Lean mass means muscle mass.

Male BFM/FFM

	Korea	U.S.	China	Japan	Canada	U.K.	Germany	Netherlands
BFM	●	●	●	●	●	▲	●	●
FFM	▲	●	●	●	●	●	●	▲

▲: Increase ●: Maintain

Female BFM/FFM

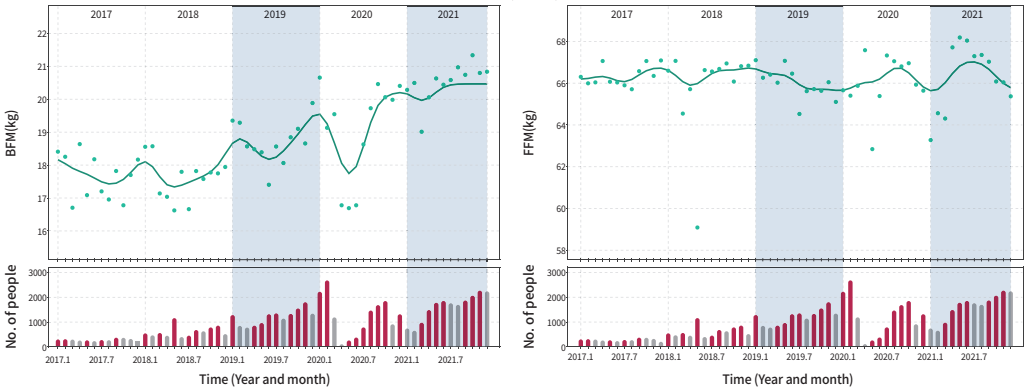
The data was divided based on COVID-19 in March 2020.

	Korea	U.S.	China	Japan	Canada	U.K.	Germany	Netherlands
BFM	●	▲	●	●	●	▲	●	▲
FFM	●	●	●	●	●	●	●	▲

▲: Increase ●: Maintain

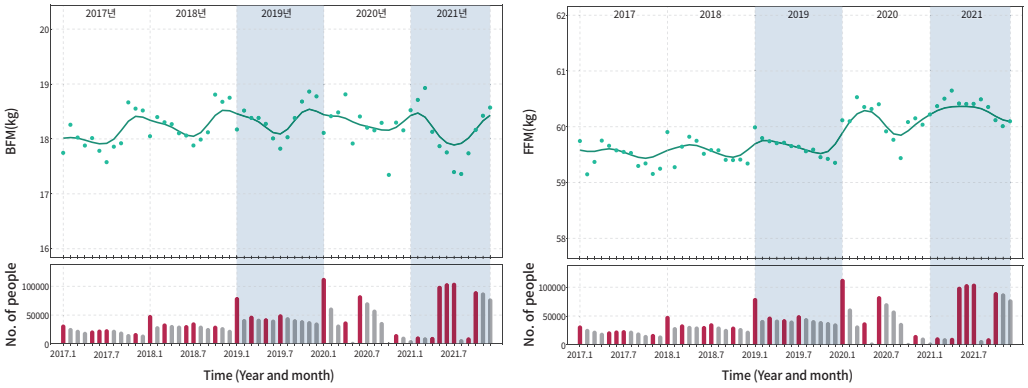
Changes in BFM (body fat mass) and FFM (fat free mass) by month

Men (U.K.)



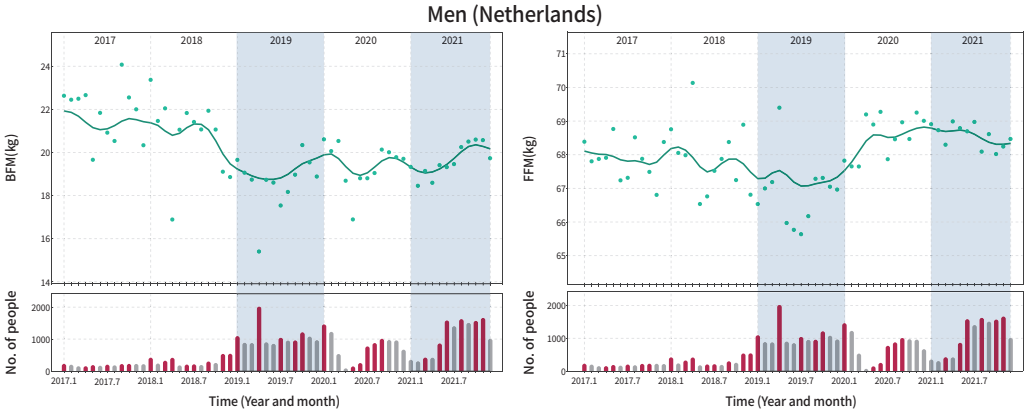
Data source: InBody cloud server (Europe)
Target: English adult males between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Monthly average change of BFM and FFM
BFM increased / FFM maintained

Men (Korea)



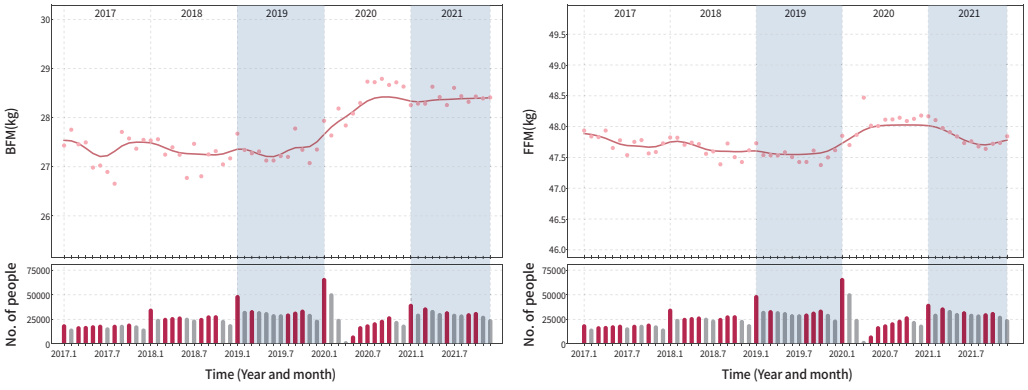
Data source: InBody cloud server (Korea)
Target: Korean adult males between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Monthly average change of BFM and FFM
BFM maintained / FFM increased

Men (Netherlands)



Data source: InBody cloud server (Europe)
Target: Dutch adult males between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Monthly average change of BFM and FFM
BFM maintained / FFM increased

Women (U.S.)



Data source: InBody cloud server (United States)
Target: American adult females between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Monthly average change of BFM and FFM
BFM increased / FFM increased

Comparing Age-Related Muscle Loss in Asian and Western Male Populations

Men losing muscle in their 30s and men losing muscle in their 40s

As men approach their late 30s, they experience aging due to decreased testosterone level and reduced muscle mass. Looking at InBody big data, Korean men show a decline in muscle mass from their mid-30s, and American men show a decline in muscle mass from their mid-40s.

Men undergo rapid aging from their mid-30s onward, which is mainly characterized by the loss of muscle mass. This age-related decline in muscle is largely attributed to a decrease in testosterone, the male hormone that plays a crucial role in maintaining muscle mass and regulating fat metabolism. Testosterone levels begin to increase during puberty and reach their peak in the 20s, but start to decline gradually from the ages of 35 to 44 in men.

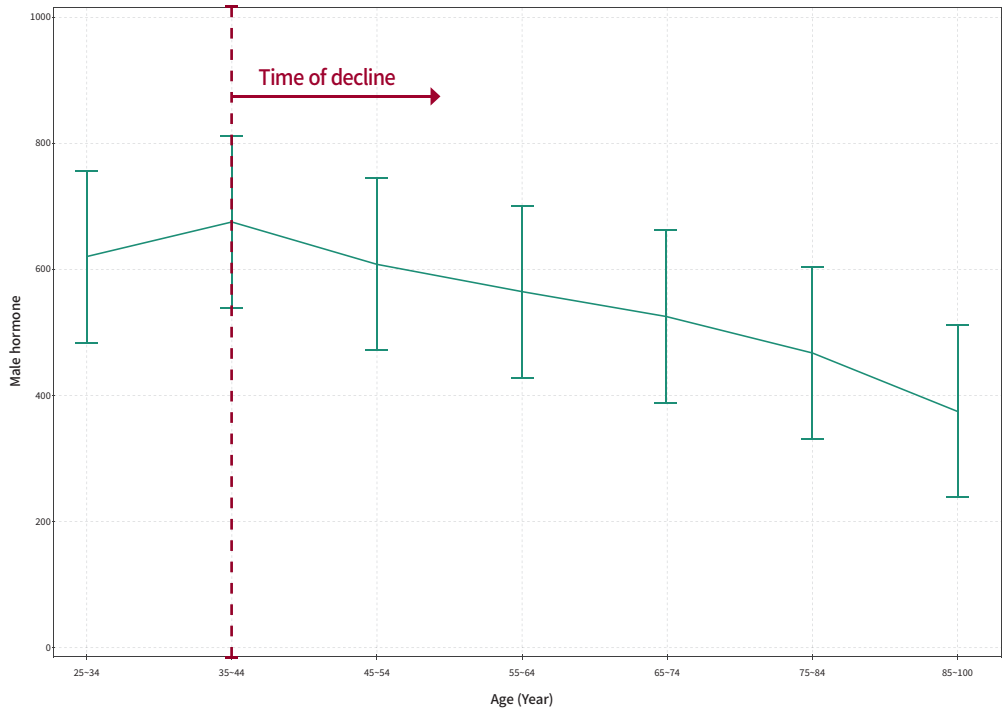
The aging process in men in their 30s is influenced not only by hormones but also by their lifestyle choices. Men around the world often start drinking and smoking in their 20s and 30s. According to the World Health Organization (WHO), the average smoking rate for adult males in high-income countries was 27.4% in 2020, much higher than the 7.0% for adult females. The same trends can be observed in alcohol consumption rates. For example, in Korea,[1)] the high-risk drinking rate among adult males was 21.6% in 2020, compared to just 6.3% for females. It is well-known that drinking and smoking can accelerate the aging process. In 2017, a Danish research team published the “Copenhagen Heart Study” in the “Journal of Epidemiology and Community Health,” which revealed that alcohol drinkers and smokers showed remarkable aging in various indicators such as earlobe wrinkles, corneal ring, xanthomas, and hair loss.

1) Based on the average amount of drinking per time, 7 or more drinks for men and 5 or more drinks for women, and 2 or more drinks per week

Even if we look at the abdominal obesity rate by age based on adult waist circumference, men in their 20s and 30s have the highest increase in abdominal obesity. This can be attributed to decreased muscle mass caused by declining testosterone levels, as well as changes in lifestyle due to drinking and smoking, which accelerate aging in men worldwide.

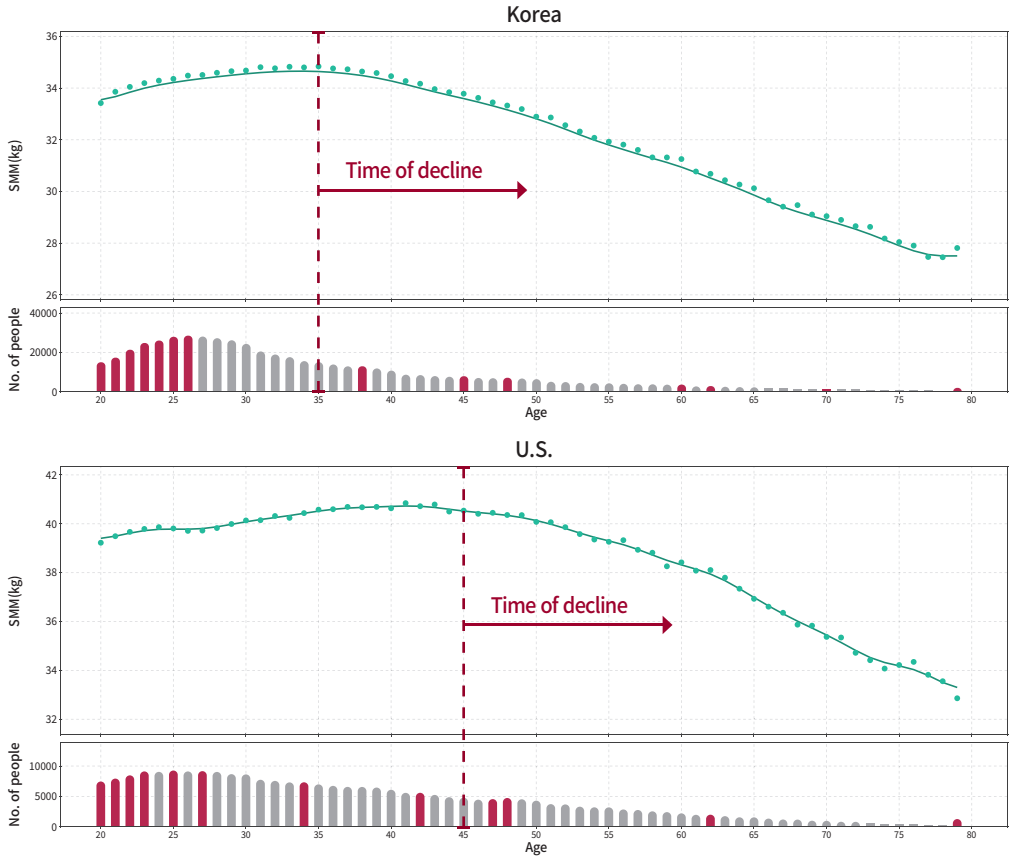
If so, are there national or racial differences in the timing of the aging in men? We decided to investigate the timing of muscle mass loss between Asian and Western men by examining changes in skeletal muscle mass by age group in Korean and American men, for whom we have the most body composition data among Asian and Western countries. It can be observed that the skeletal muscle mass of Korean men starts to decline in their mid-30s, while that of American men begins to decline in their mid-40s. Thus, it can be seen that Asian men tend to lose muscle mass approximately 10 years earlier than Western men.

Male hormonal changes with age



Kaufman, M. J.& Vermeulen A.(2005), The Decline of Androgen Levels in Elderly Men and Its Clinical and Therapeutic Implications, Endocrine Reviews 26: 833–876

Changes in muscle mass in men with age



Data source: InBody cloud server (Korea)
Target: Korean adult males between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Changes in SMM with age

Data source: InBody cloud server (United States)
Target: American adult males between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Changes in SMM with age

There are known differences in muscle fibers and hormone levels among people of different races that can affect athletic performance. For example, research suggests that Asian men tend to have fewer androgen receptors than Western men. Asian men also may have more slow-twitch muscles that are associated with endurance, and Western men may have more fast-twitch muscles that provide quick bursts of power. Additionally, factors such as childhood participation in outdoor activities can also impact athletic abilities.

Differences in Body Fat Percentage Change between Asian and Western Women

Asian women experience a rapid increase in body fat percentage later than Western women. Asian women usually have a rapid increase in body fat percentage between their 40s and 60s, and Western women between their 20s and 30s.

When a Western woman and an Asian woman of the same age stand side by side, we often get the impression that the Asian woman looks younger. But why is this the case? While there may be various factors at play, we believe that the timing of body fat accumulation may be one possible explanation. Excessive body fat percentage can lead to various health issues, including diabetes and premature aging. Therefore, we examined changes in body fat percentage in representative countries to understand any differences between Asian and Western women.

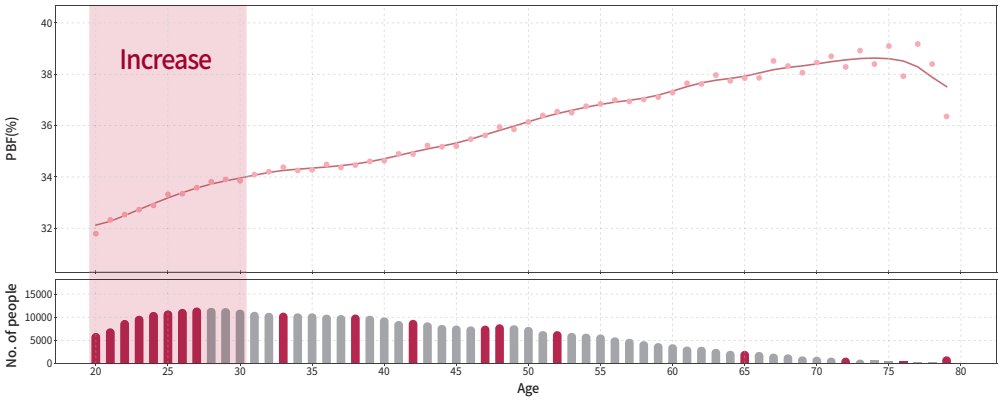
We examined body fat percentages by age in 12 countries and found that while body fat percentage generally increases with age, the timing of the most significant increase varies by country. In general, we observed that Asian women experience a more rapid increase in body fat percentage later in life than Western women.

As for Western countries, let's take a look at the U.S. and Germany, which rank at the top for the number of women's body composition data. The steepest increase in body fat percentage for American Women occurs between the ages of 20 and 30. Similarly, German women also show the steepest increase in body fat percentage between the ages of 20 and 30, although not as much as American women. Both countries show a significant increase in body fat percentage between the ages of 20 and 40.

This time, we will take a closer look at Korea and India, two countries with a high number of female body composition data in Asia. Korean women show a rapid decrease in body fat percentage from their 20s to late 20s. From their 30s to late 40s, the increase and decrease in body fat percentage fluctuate in small widths, but the margin of increase sharply rises in their 50s and 60s. Indian women experience a continuous increase in body fat percentage from their 20s to 70s. However, from their 40s to 60s, the margin of increase in body fat percentage significantly increases compared to before. Although there are some differences between Korea and India in the age group where body fat percentage increases rapidly, both countries show a slower increase in body fat percentage compared to Western women such as those in the U.S. and Germany.

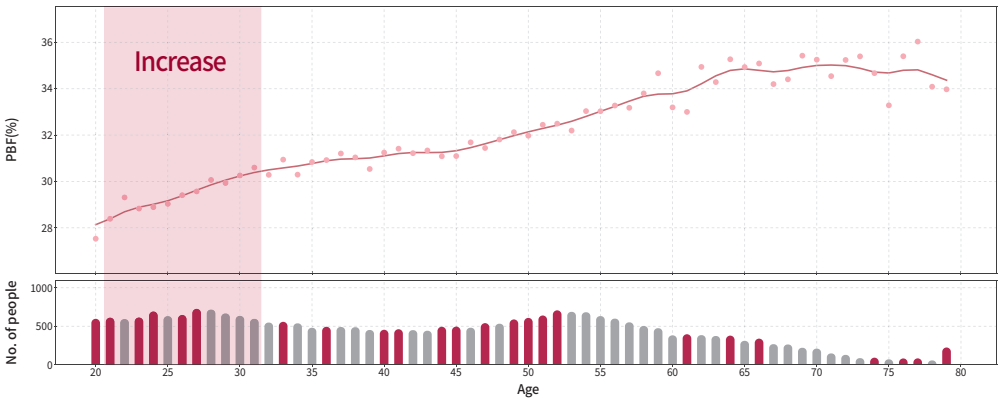
Changes in body fat percentage in women with age

U.S.



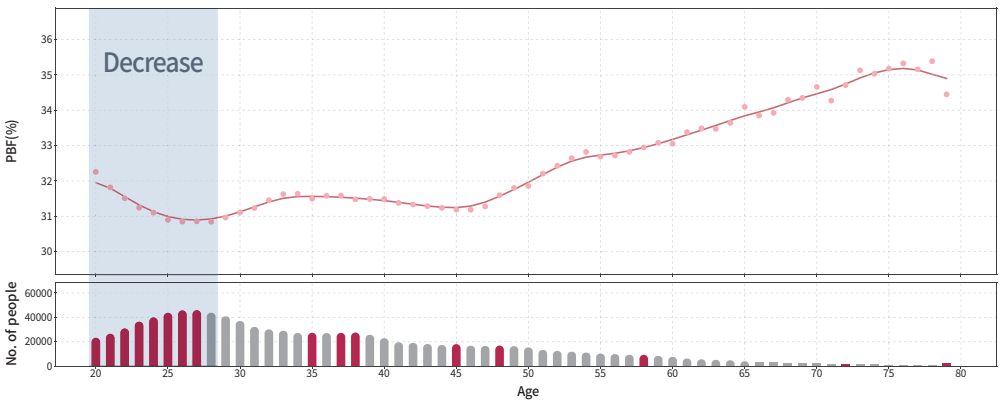
Data source: InBody cloud server (United States)
Target: American adult females between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Change in PBF with age

Germany



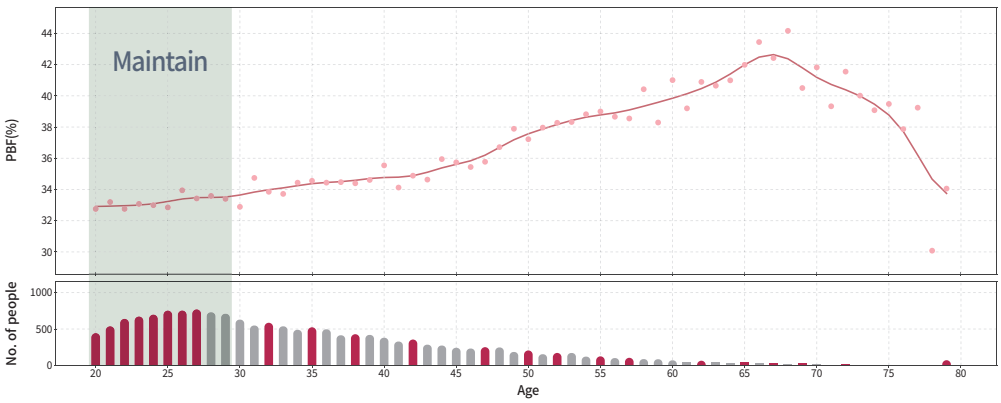
Data source: InBody cloud server (Europe)
Target: German adult females between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Change in PBF with age

Korea



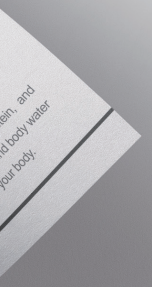
Data source: InBody cloud server (Korea)
Target: Korean adult females between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Change in PBF with age

India



Data source: InBody cloud server (Asia)
Target: Indian adult females between the ages of 20 and 80
Period: January 2017 - December 2021
Main index: Change in PBF with age


InBody Body Water [InBody970] [Yscope]
InBody
www.inbody.com
ID
Jane Doe
Height
156.9cm
Age
51
Gender
Female
Test Date / Time
2021.03.31. 15:44
Body Water Composition
Under
Normal
Over
TBW
Total Body Water
(L)
27.4
ICW
Intracellular Water
(L)
16.5
ECW
Extracellular Water
(L)
10.9
ECW Ratio Analysis
ECW Ratio
0.398
Segmental Body Water Analysis
Right Arm
(L)
1.55
Left Arm
(L)
1.49
Trunk
(L)
13.8
Right Leg
(L)
4.12
Left Leg
(L)
4.05
Segmental ECW Ratio Analysis
Over
Slightly Over
Normal
0.378
0.378
0.398
0.403
Right Arm
Left Arm
Trunk
Right Leg
Body Water Composition History
Weight
(kg)
65.3
63.9
62.4
61.8
62.3
60.9
TBW
Total Body Water
(L)
28.3
28.0
28.0
27.9
27.9
27.6
ICW
Intracellular Water
(L)
17.0
16.9
16.9
16.8
16.8
16.7
ECW
Extracellular Water
(L)
11.3
11.1
11.1
11.0
11.1
10.9
ECW Ratio
0.399
0.398
0.396
0.396
0.397
0.396
Recent
Total
20.07.21 15:11
20.08.27 14:58
20.09.20 15:02
20.11.23 15:23
20.12.21 15:00
21.02.19 14:52
Body Composition Analysis
Protein
7.1 kg
(7.0~8.6)
Minerals
2.64 kg
(2.44~2.98)
Body Fat Mass
22.0 kg
(10.3~16.5)
Fat Free Mass
37.1 kg
(35.8~43.8)
Bone Mineral Content
2.18 kg
(2.01~2.45)
Muscle-Fat Analysis
Weight
59.1 kg
(43.9~59.5)
Skeletal Muscle Mass
19.5 kg
(19.5~23.9)
InBody
[InBody970]
ID
Jane Doe
Height
156.9cm
Age
51
Body Composition Analysis
Total Body Water (L)
27.4
Protein
(kg)
Minerals
Body Fat Mass
SMM
Skeletal Muscle Mass
(kg)
Body Fat Mass
(kg)
Obesity Analysis
Under
Normal
Over
BMI
Body Mass Index
(kg/m²)
24.0
PBF
Percent Body Fat
(%)
37.2
Segmental Lean Analysis
Based on ideal weight
Based on current weight
Under
Normal
Over
ECW Ratio
Right Arm
(kg)
2.00
(%)
101.2
0.378
Left Arm
(kg)
1.91
(%)
97.1
0.378
Trunk
(kg)
17.7
(%)
99.0
0.398
Right Leg
(kg)
5.24
(%)
84.2
0.403
Left Leg
(kg)
5.15
(%)
82.7
0.404
ECW Ratio Analysis
Under
Normal
Over
ECW Ratio
0.398
Body Composition History
Weight
(kg)
65.3
63.9
62.4
61.8
62.3
60.9
60.5
59.1
SMM
Skeletal Muscle Mass
(kg)
20.1
20.0
19.7
19.7
19.8
19.7
19.8
19.5
PBF
Percent Body Fat
(%)
41.3
40.7
39.2
39.0
39.4
38.6
37.7
37.2
ECW Ratio
0.399
0.398
0.396
0.396
0.397
0.396
0.398
0.398
Recent
Total
20.07.21 15:11
20.08.27 14:58
20.09.20 15:02
20.11.23 15:23
20.12.21 15:00
21.02.19 14:52
21.03.20 15:12
21.03.31 15:44
InBody
Research Parameter
Intracellular Water
Extracellular Water
10.9 L
Basal Metabolic Rate
1171 kcal (1255~1452)
Waist-Hip Ratio
0.94
(0.75~0.85)
Body Cell Mass
23.6 kg
(23.4~28.6)
SMI
5.8 kg/m²
Whole Body Phase Angle
φ(°) 50kHz
4.0°
Segmental Body Phase Angle
RA LA TR RL LL
φ(°) 5kHz 1.7 4.7 1.7 1.6 4.5
50kHz 4.1 5.7 4.0 3.8 4.3
250kHz 3.8 5.6 2.9 2.9 2.9
Impedance
1
5
50
250
500
1000
2000
3000
kHz
Z(Ω)
RA LA TR RL LL TR
[000/000/000]
Copyright©1996~ by InBody Co., Ltd. All rights reserved. BR-English-C7-B-140206
InBody test



03
OUTRO

The availability of body composition analyzers has significantly altered the way people worldwide view health indicators. Prior to their widespread use, weight and BMI (Body Mass Index) were the primary measures used to assess health.

People's awareness of body composition has increased, and body composition analyzers are becoming more accessible. The changes in our lifestyles require us to explore this field, which is now readily available.

InBody for Home vs. InBody for Professionals : The Differences between the Data Measured by Each Device and the User

In recent years, the world has undergone significant changes in daily life due to the unexpected COVID-19 pandemic. Many businesses have experienced setbacks in operations, including fitness centers. Due to the pandemic, the space available for exercise has decreased, and for those who have been unable to go outside, the time spent moving their bodies naturally has also decreased. Additionally, increased demand for delivery food has contributed to changes in our body composition.

At the same time, the trend for “at-home training” began to take off. Various popular online fitness trainers emerged on Youtube, and at-home workouts became one of the most popular categories on remote education platforms. As more people started exercising at home, the demand for reliable body scales increased. InBody’s at home body composition analyzer gained attention primarily because of its ability to provide precise readings of all body composition metrics, especially because of inconsistent measurements in other scales

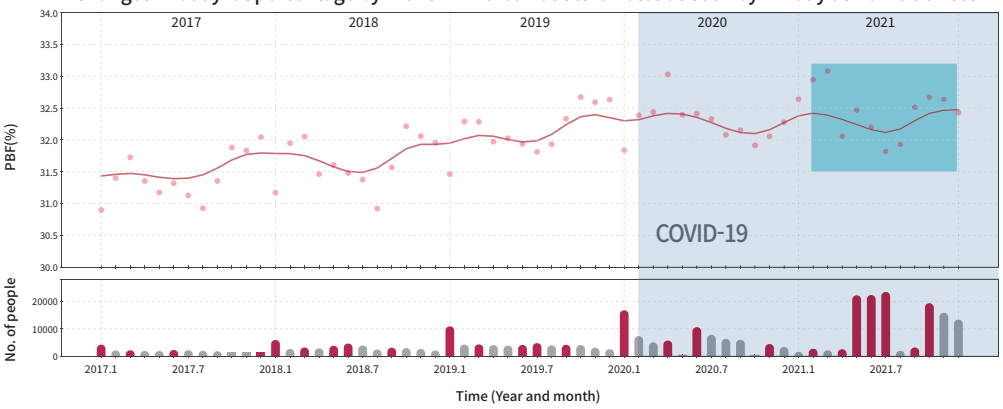
We want to investigate whether there are differences in body composition data collected by InBody devices for at-home use versus those used by professionals in settings like fitness centers. During our exploration of various conditions and aspects related to the impact of COVID-19, we came across an interesting finding.

First, let’s examine the body composition data of Korean women. Prior to the COVID-19 pandemic, women who used InBody at-home device, it exhibited lower body fat percentages than those who used InBody Professional device. However, following the pandemic, Korean women who used InBody Professional devices experienced a decrease in body fat percentage compared to pre-pandemic measurements.

Korean men showed a different graph compared to women. Both before and after COVID-19, men who had their body composition measured using InBody at-home device consistently had a higher body fat percentage than men who had their body composition measured using InBody Professional device at a fitness center.

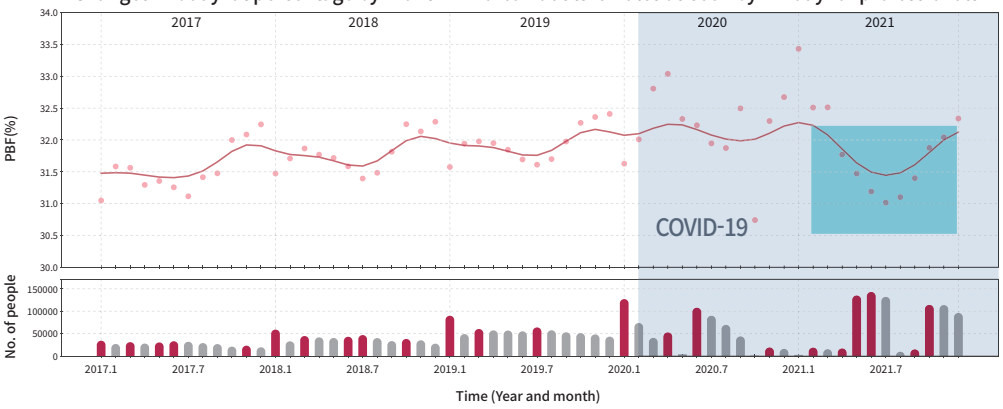
Before and after the outbreak of COVID-19, the differences in body composition measured by InBody at-home device and Professional device based on gender are interesting factors for predicting an individual’s lifestyle and exercise patterns.

Changes in body fat percentage by month in Korean adult females as seen by InBody at-home devices



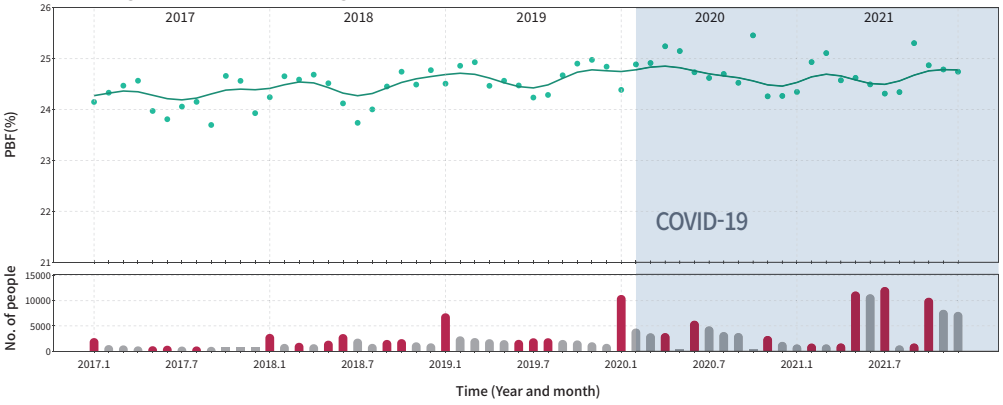
Data source: InBody cloud server (Korea)
Target: Korean adult females between the ages of 20 and 80
Period: January 2017 - December 2021
Equipment: In-Body for home (In-Body Dial)
Main index: Monthly average change in PBF

Changes in body fat percentage by month in Korean adult females as seen by InBody for professionals



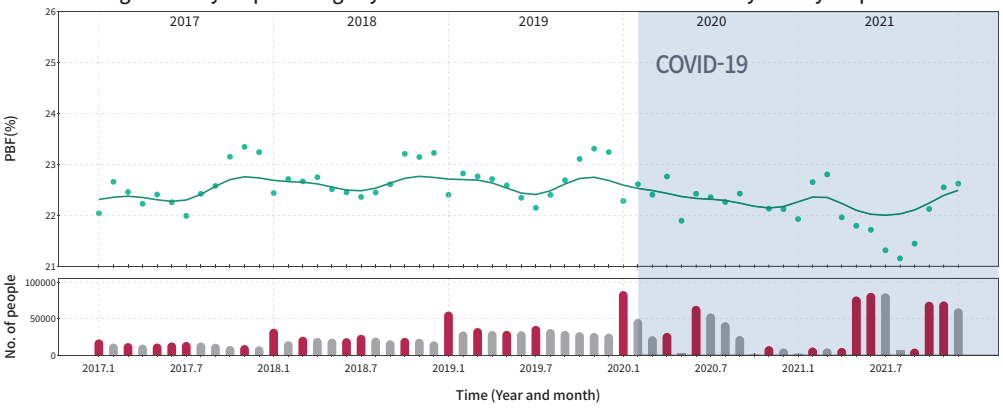
Data source: InBody cloud server (Korea)
Target: Korean adult females between the ages of 20 and 80
Period: January 2017 - December 2021
Equipment: InBody270 (73.81%), InBody570 (12.9%), InBody3705 (8.89%), and other equipment
InBody for professionals: InBody equipment installed in hospitals, public health centers, fitness centers, etc.
Main index: Monthly average change in PBF

Changes in body fat percentage by month in Korean adult females as seen by InBody at-home device

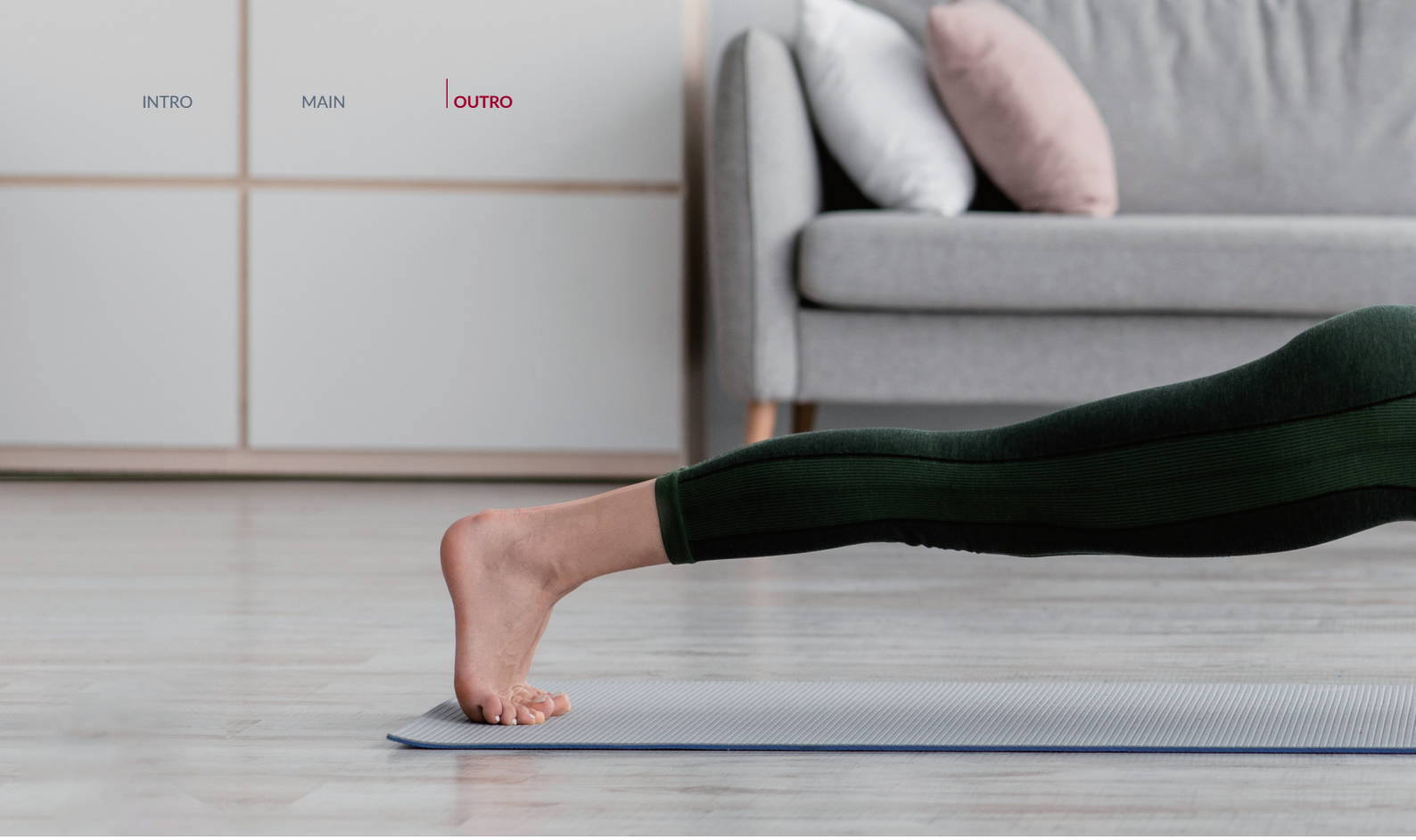


Data source: InBody cloud server (Korea)
Target: Korean adult males between the ages of 20 and 80
Period: January 2017 - December 2021
Equipment: InBody for home (In-Body Dial)
Main index: Monthly average change in PBF

Changes in body fat percentage by month in Korean adult females as seen by InBody for professionals



Data source: InBody cloud server (Korea)
Target: Korean adult males between the ages of 20 and 80
Period: January 2017 - December 2021
Equipment: InBody270 (75.6%), InBody570 (12.72%), InBody3705 (7.03%), and other equipment
InBody for professionals: InBody equipment installed in hospitals, public health centers, fitness centers, etc.
Main index: Monthly average change in PBF



Changes in Health and Wellness Trends after COVID-19

After the outbreak of COVID-19, there has been a sharp increase in the number of people interested in health and wellness. While many industries have been negatively affected by the strengthening of social distancing measures, athleisure companies have been able to remain profitable.

The biggest change is the increase in the number of people doing “at-home training.” Various popular workout trainers have started to appear on Youtube, and community posts introducing the best at-home workout training courses. At the same time, demand has increased for household scales that can precisely measure weight and body composition. A body composition analyzer linked to an app continuously checks your body condition and helps plan for workouts. Various platforms offer healthy exercise methods and diet solutions according to changes in your body composition through an app linked to the body composition analyzer, which has also gained attention.

At the same time, people who prioritize cost-effectiveness for home appliances started to pay more attention to devices with superior technology that can be used at home for a long time even if they cost a little more.

After COVID-19, the number of people starting full-fledged exercise at home has increased significantly. Even those with no previous exercise experience have become interested in health and wellness and are finding exercise enjoyable. As social distancing was eased, more people were going to gyms and personal trainers managing members more actively to make up for the loss caused by COVID-19.

Health and wellness trends around the world are constantly evolving, but one thing is clear: caring about one’s health and taking care of oneself is becoming an essential element of daily life rather than just a temporary trend.

A Preview of the Health Care Trend in 2023, ECW Ratio(Extracellular Water / Total Body Water)

Measuring body fat and muscle mass and examining the condition of one's body through a body composition analyzer has already become an essential element in everyone's life. Beyond the era of focusing solely on fat and muscle for diet, the era of focusing on the importance of body water, which accounts for more than 70% of your body, has arrived.

Since water accounts for the largest portion of the body, monitoring the water balance in the body can reveal the progress of many diseases. Water in the human body is largely divided into intracellular water (ICW) and extracellular water (ECW). Healthy people maintain a constant body water ratio. Monitoring body water is very important for patients suffering from diseases, those with toxic substances and inflammation in the body, or those with poor nutritional status because the balance of body water ratio appears different from that of the general public. This is expressed as ECW/TBW (Extracellular Water/Total Body Water), and it is said to be ideal when the ratio is from 0.36 to 0.39.

In particular, monitoring body water in hemodialysis patients has a great impact on treatment as it can mean the difference between life and death. For hemodialysis patients, whether the fluid in the body is properly dialyzed, that is, whether or not it is drained, is an important factor in the treatment process. When measuring body water, the progress of treatment for patients with kidney disease is indicated by setting a dry weight (the weight when the body is not swollen, blood pressure is well maintained, and energy levels are at their peak) and confirming that the water is being properly dialyzed.

Body water measurement is also used to evaluate obesity and anti-aging. Fundamentally, muscles are made up of water, so people who are dehydrated are more likely to lack muscle, leading to obesity. The era of simply measuring the degree of obesity by body fat has passed, and now we can evaluate our body condition, obesity, and anti-aging more accurately through body water measurement.

For those who are experiencing health management through muscle mass and body fat percentage beyond body weight, if we were to choose a higher-level health care factor for those managing their health through muscle mass and body fat percentage beyond body weight, body water would certainly be the ideal choice.

Appendix

InBody Report
Body Composition Index of 12 Countries

Based on insights derived from InBody big data, we have examine the body composition by country. The 2023 InBody Report includes average body composition index for men and women in 12 countries, which are provided in the appendix.

Men			Country	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
40,540	21.51	8.79	Netherlands	55,366	32.28	7.12
89,855	22.3	8.8	Germany	113,661	31.49	7.02
10,456	24.93	8.21	Malaysia	15,828	33.73	6.26
36,528	26.42	8.55	Mexico	63,463	36.11	6.75
1,130,993	23.25	9.13	U.S.	1,644,899	35.11	7.19
59,649	21.82	8.73	U.K.	72,809	32.69	6.97
182,353	27.03	8.13	India	128,852	36.61	6.69
94,686	21.1	8.11	Japan	152,740	29.47	6.16
81,855	21.94	8.31	China	102,683	28.74	6.26
54,028	23.79	8.7	Canada	52,474	32.7	6.88
2,409,881	22.61	8.38	Korea	4,343,186	31.52	6.31
158,088	23.63	9.01	Australia	308,897	33.02	7.21

Men			Netherlands 	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
12,447	17.43	8.72	20s	14,585	29.49	6.98
8,759	21	8.82	30s	11,454	31.59	7.19
7,329	22.84	8.92	40s	11,768	32.68	7.27
6,922	24.52	8.89	50s	11,512	34.51	7.17
3,807	26.07	8.67	60s	4,674	35.2	7
1,276	27.29	8.33	70s	1,373	35.61	6.79

Men			Germany 	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
23,829	18.29	8.75	20s	26,720	29.05	6.9
18,979	21.48	8.86	30s	21,948	30.51	7.09
14,130	23.36	8.96	40s	20,786	31.47	7.2
16,704	24.32	8.91	50s	25,203	32.74	7.06
10,892	25.83	8.66	60s	13,867	34.4	6.89
5,321	26.7	8.32	70s	5,137	34.49	6.73

Men			Malaysia 	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
3,620	23.07	8.17	20s	4,954	32.55	6.12
3,785	25.5	8.3	30s	5,664	33.88	6.35
1,820	26.13	8.29	40s	3,290	34.34	6.37
799	26.7	8.09	50s	1,442	34.95	6.18
355	26.9	7.8	60s	397	36.31	6.07
77	27.65	7.22	70s	81	37.15	5.83

Men			Mexico	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
23,829	18.29	8.75	20s	26,720	29.05	6.9
18,979	21.48	8.86	30s	21,948	30.51	7.09
14,130	23.36	8.96	40s	20,786	31.47	7.2
16,704	24.32	8.91	50s	25,203	32.74	7.06
10,892	25.83	8.66	60s	13,867	34.4	6.89
5,321	26.7	8.32	70s	5,137	34.49	6.73

Men			U.S.	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
394,208	20.12	9.04	20s	444,677	33.3	7.13
305,675	23.4	9.23	30s	448,342	34.67	7.31
212,095	25.09	9.31	40s	359,763	35.5	7.31
132,332	26.17	9.17	50s	249,932	36.86	7.13
62,355	27.59	8.86	60s	108,405	38	6.88
24,328	28.77	8.41	70s	33,780	38.4	6.59

Men			U.K.	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
20,442	19.43	8.6	20s	21,632	30.54	6.82
20,244	21.65	8.77	30s	23,116	31.88	7.01
11,134	23.61	8.88	40s	14,554	33.79	7.13
5,498	25.49	8.84	50s	9,587	36.27	7.05
1,745	27.03	8.57	60s	3,006	36.68	6.78
586	27.05	8.24	70s	914	36.33	6.57

Men			India	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
85,879	25.19	8.04	20s	55,290	35.58	6.53
59,065	27.91	8.26	30s	40,577	36.56	6.83
24,211	29.24	8.25	40s	20,876	37.53	6.88
8,941	30.46	8.05	50s	8,673	39.6	6.72
3,079	32.34	7.7	60s	2,562	41.41	6.4
1,178	31.41	7.65	70s	874	38.17	6.57

Men			Japan	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
30,431	18.83	8.24	20s	44,170	28.72	6.07
26,016	21.26	8.19	30s	40,177	29.41	6.22
18,485	22.2	8.2	40s	32,696	29.7	6.32
10,455	22.68	8.11	50s	20,341	30.2	6.21
4,901	23.29	7.81	60s	7,873	30.18	6.06
4,398	25.05	7.23	70s	7,483	30.4	5.74

Men			China	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
42,959	20.67	8.31	20s	46,818	28.25	6.17
26,417	23.12	8.33	30s	38,294	28.8	6.3
8,121	23.61	8.32	40s	12,041	29.35	6.45
2,931	24.25	8.19	50s	4,024	31.09	6.41
885	24.39	8	60s	1,027	32.1	6.39
542	23.24	8.04	70s	479	30.26	6.28

Men			Canada	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
8,711	19.57	8.71	20s	11,551	30.94	6.9
9,475	22.83	8.79	30s	10,578	32.17	6.99
12,676	23.91	8.8	40s	12,278	32.7	7
12,927	25.05	8.75	50s	10,835	33.79	6.83
7,292	25.97	8.52	60s	5,476	34.46	6.64
2,947	27.88	8.18	70s	1,756	35.47	6.33

Men			Korea	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
1,087,001	21.17	8.36	20s	1,678,072	31.07	6.16
707,056	23.72	8.49	30s	1,249,369	31.42	6.34
325,325	23.83	8.45	40s	762,279	31.41	6.5
177,934	23.64	8.25	50s	446,029	32.6	6.45
82,208	24.02	7.99	60s	162,784	33.6	6.35
30,357	25.35	7.64	70s	44,653	34.77	6.14

Men			Australia	Women		
Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)		Number of data	Mean value of body fat percentage (%)	Mean value of skeletal muscle index (kg/㎡)
50,103	20.51	9	20s	113,493	31.42	7.17
53,258	23.27	9.06	30s	95,174	32.63	7.29
31,836	25.29	9.1	40s	59,856	33.65	7.29
14,893	27.67	8.95	50s	28,309	36.53	7.1
5,730	30.82	8.63	60s	9,325	39.34	6.87
2,268	32.89	8.23	70s	2,740	41.3	6.58

* The data used in this report were used solely for statistical purposes, to provide information, limited to the data for which personal information was agreed upon, and no information that can identify individuals is included in the data.

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InBody®

Date of publication : March 10, 2023

Publisher : InBody Co., Ltd.

Directing : Kyungwoo Lee and Bohye Choi

Editorial : Suyeon Yang

Design : Wuyong Choi and Subin Lee

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