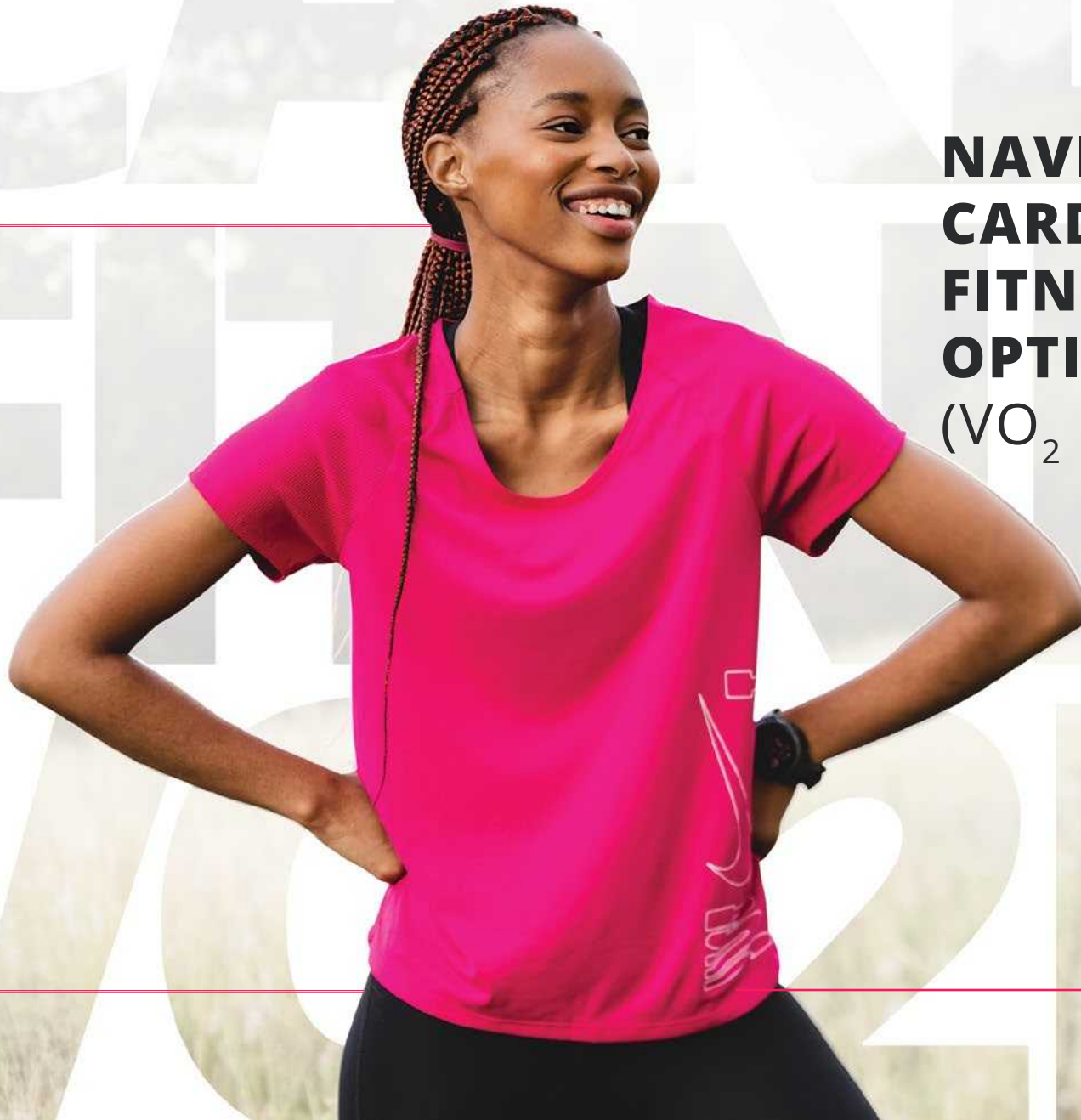



**NAVIGATING
CARDIORESPIRATORY
FITNESS FOR
OPTIMAL HEALTH
(VO₂ MAX)**





 NAVIGATING CARDIORESPIRATORY FITNESS FOR OPTIMAL HEALTH (VO₂ Max)

CARDIO FITNESS VO₂MAX

INDEX

What is cardio fitness? **12**
 How is VO₂ max measured? **13**

Poor cardio fitness increases our risk of developing serious medical conditions. **16**
 High cardio fitness leads to reduced hospitalisation costs. **18**
 Relationship between cardio fitness and cardiometabolic claims. **19**
 Relationship between cardio fitness and mental health claims. **20**
 Relationship between cardio fitness and cardiometabolic risk factors. **21**

Every heartbeat matters, every step counts – Prof Jon Patricios **26**

Why we exist. **30**
 Introducing a new measure to the Vitality programme: Vitality Cardio Fitness Levels. **32**
 Vitality's physical activity strategy. **34**

What is the clinical significance of each Vitality Cardio Fitness Level? **39**
 Where did SA's fittest people live in 2023? **42**

Vitality's fittest members log more points-earning workouts on more days each month. **46**
 Vitality members on higher Vitality statuses tend to have better Vitality Cardio Fitness levels. **47**
 Women seem to be fitter than men. **50**
 Members with high cardio fitness engage in other healthy behaviours. **50**

Practical examples of how you can progress from low to fair to good Vitality Cardio Fitness Levels. **55**
 How different types of exercises impact cardio fitness. **56**
 The physiological process that occurs in the body when cardio fitness improves. **57**

Individuals **60**
 Clinicians and policymakers **61**



At Vitality, we use innovative behavioural, clinical, and actuarial science to deliver on our core purpose of helping people live healthier lives. We incentivise positive behaviour change, nudging our members to understand their health metrics, exercise, eat healthily, and stop smoking.

Cardiorespiratory fitness is a powerful indicator of one's potential for a long and healthy life, so I'm proud to share our groundbreaking research with you, as well as our strategy to get people to prioritise VO₂ max (the key measure for cardiorespiratory fitness) as a health metric worth improving on.

This publication is a world-first, providing groundbreaking insights on the factors influencing VO₂ max, as well as the resultant health outcomes. These findings are based on Discovery's unique data ecosystem that includes lifestyle information such as physical activity and sleep data, clinical data such as screening results, as well as health and life insurance claims data. This intellectual property has enabled us to not only link cardiorespiratory fitness to health outcomes, but also to specific lifestyle behaviours.

Among other findings, our research revealed that our fittest members tend to exercise more frequently, for longer, and at higher intensities. We also found that members with higher cardio fitness levels tend to have earlier bedtimes, earlier wake up times, and longer sleep durations.

Additionally, our findings show a direct link between Vitality Statuses and cardio fitness levels, indicating that members on a higher Vitality Status consistently show higher levels of cardio fitness.

Most importantly, these findings demonstrate the tangible benefits of prioritising cardiorespiratory fitness, with dramatically reduced risk of developing – and dying from – cardiovascular diseases, certain cancers, and diabetes, among other conditions.

We firmly believe that by rewarding our Vitality members for knowing, understanding and improving their VO₂ max, we are helping protect their healthspan and lifespan.

This is why we are fully integrating VO₂ max into the Vitality programme. The reason we're sharing this research more broadly is to raise everyone's awareness of VO₂ max as an important health risk metric in the same way that they might view, say, blood pressure or BMI. My vision is that these insights help inform the global effort to combat the growing epidemic of physical inactivity and its associated health risks.

Dinesh Govender

DINESH GOVENDER
CEO: DISCOVERY VITALITY

Where health and wellbeing are concerned, one vital aspect often stands out as key to one's overall health: cardiorespiratory fitness (measured through VO₂ max), or cardio fitness for short. It's not just a measurement for athletes or fitness enthusiasts, but a critical metric for everyone.

Cardio fitness refers to the ability of your heart and lungs to supply oxygen to your muscles during sustained physical activity. It's a simple concept with profound implications for your overall health.

Think of it as your body's internal gauge, indicating not only your current fitness level but also your risk for disease and mortality. Studies have shown that cardio fitness levels can predict our risk of death from cardiovascular diseases, much like other well-known risk factors such as smoking or high blood pressure. It's a sobering reminder that cardio fitness isn't something to take lightly.

I became interested in my cardio fitness levels when I took up cycling, where 'VO₂ max' was a term frequently discussed among cyclists chasing ambitious finish times during races. Though the association between VO₂ max and performance is still prevalent, there is an increasing awareness that its significance reaches far beyond athletic performance, extending to overall health and wellbeing.

It is limiting to think of cardio fitness only in terms of avoiding an early death or severe illness; it's also about embracing life to its fullest. Imagine being able to chase after your grandchildren without gasping for air in the first few seconds, going for a walk around your neighbourhood or tackling a hiking trail with confidence and ease. That's the transformative power of improved cardio fitness. Beyond adding years to your life, it's also about adding life to your years.

Yet, despite its importance, cardio fitness often remains a misunderstood or an underappreciated aspect of health. That's why we published this white paper. It isn't just a collection of data and statistics, it's a beacon of knowledge for the improvement of our overall health. With contributions from clinicians, researchers, and Vitality experts alike, the white paper offers a holistic perspective on cardio fitness, bridging the gap between science and everyday life.

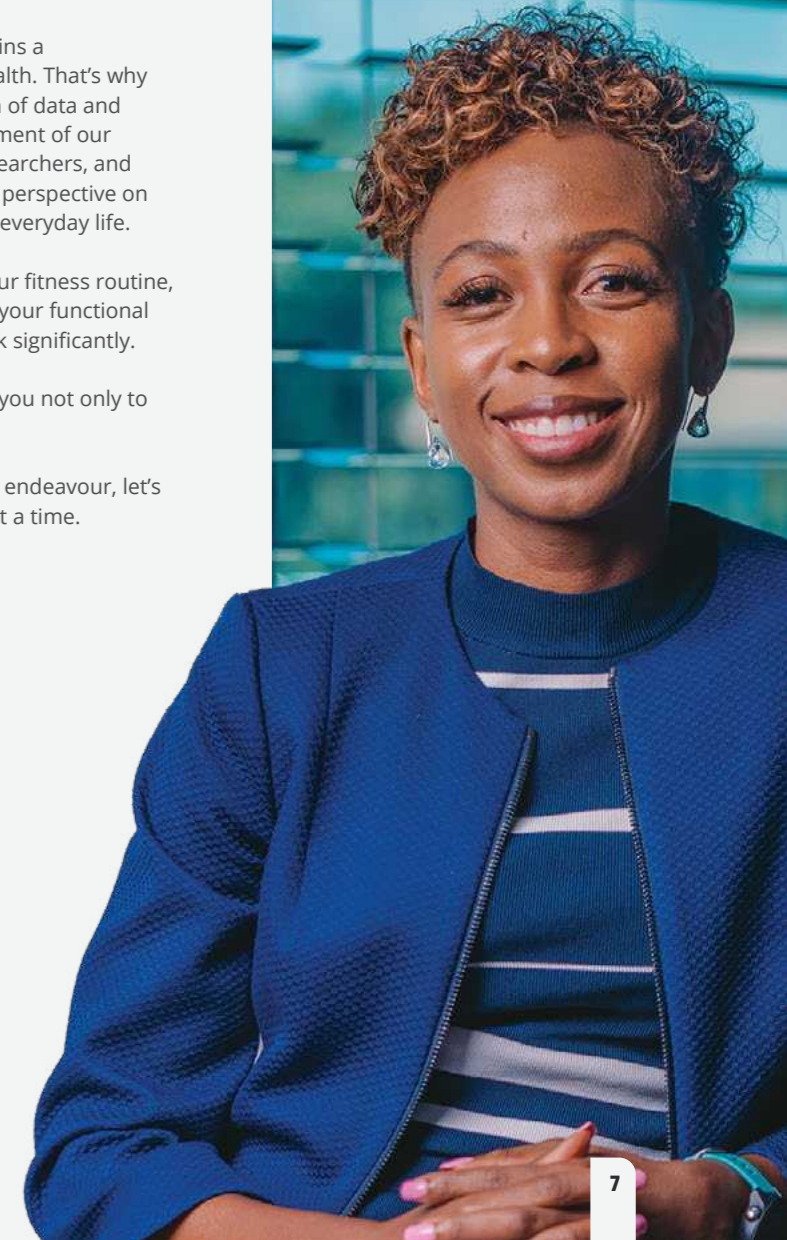
By making intentional and progressive changes to your fitness routine, you can improve your cardio fitness, thus enhancing your functional capacity, and reducing your disease and mortality risk significantly.

As you dive into the pages of this white paper, I urge you not only to read but to absorb, to reflect, and to act.

With heartfelt gratitude to all who contributed to this endeavour, let's start on this journey toward better health, one step at a time.

Mosima Mabunda

DR MOSIMA MABUNDA
HEAD OF WELLNESS: DISCOVERY VITALITY



FOREWORD





WE ARE NOT AS FIT AS WE SHOULD BE

Physical activity levels are not where they should be worldwide.



Globally, **1 in 3 adults (about 1.8 billion adults)** do not meet the global recommended levels of physical activity.

34%  **29%** 

Around **34% of women and 29% of men** are not meeting the global guidelines for physical activity.

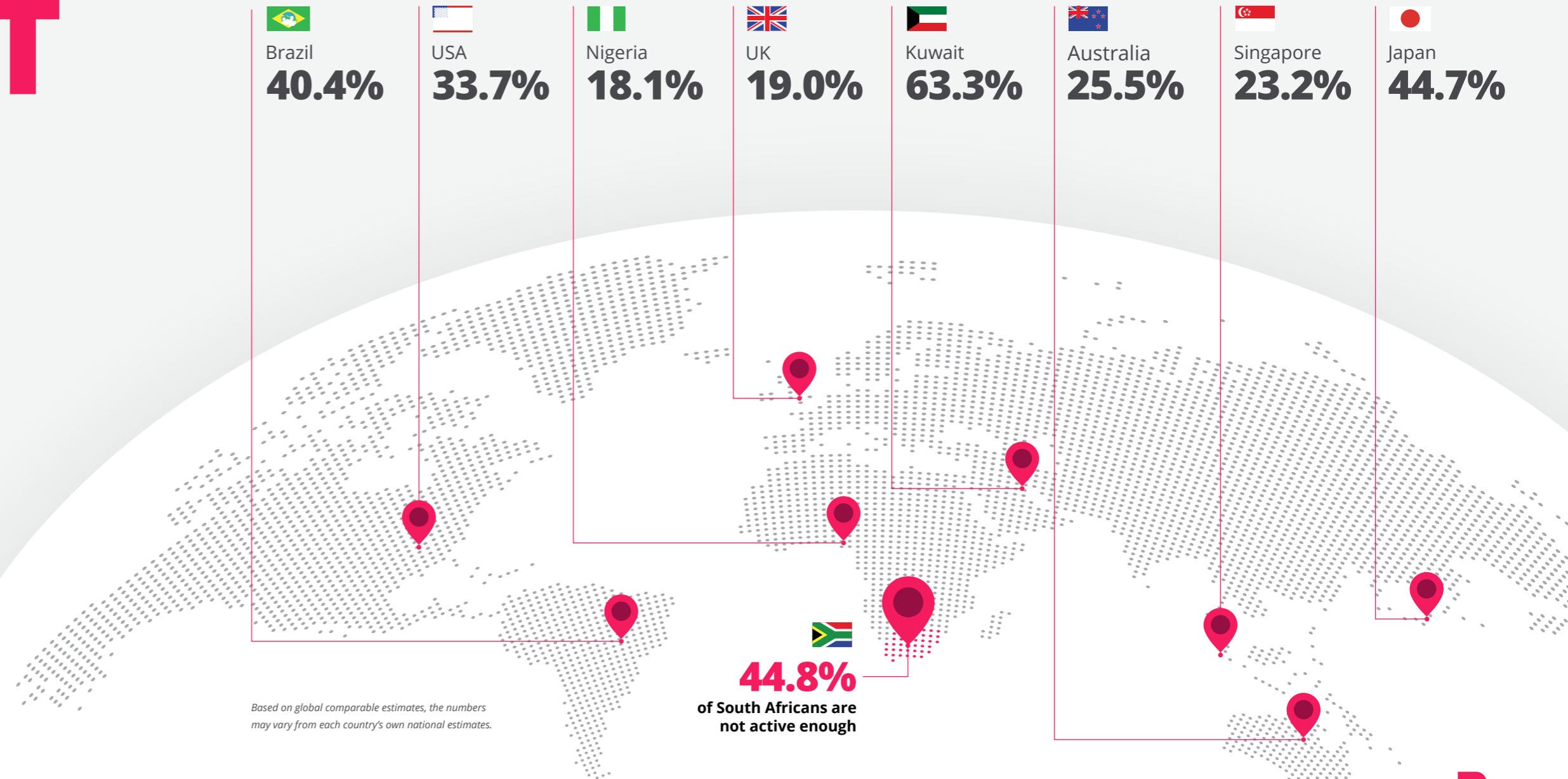
Physical inactivity is influenced by a combination of factors, including environmental, medical, and individual factors. Environmental factors such as lack of accessible recreational facilities or safe outdoor spaces can discourage physical activity. Additionally, medical conditions like chronic pain or obesity can also contribute to low levels of physical activity.

The unfortunate consequence of physical inactivity is low cardiorespiratory fitness, which can lead to a number of adverse outcomes such as increased risk of cardiovascular diseases, obesity, diabetes, and decreased overall health and longevity.

The global recommended levels of physical activity include at least 150 minutes of moderate-intensity (around 70 – 79% of heart rate max), or 75 minutes vigorous-intensity (80% + of heart rate max) physical activity per week.

Global physical inactivity prevalence

Prevalence of insufficient physical activity levels across the world



Based on global comparable estimates, the numbers may vary from each country's own national estimates.

44.8%
of South Africans are not active enough

UNDERSTANDING CARDIO FITNESS

What is cardio fitness? 12
How is VO₂ max measured? 13



20

UNDERSTANDING CARDIO FITNESS

WHAT IS CARDIO FITNESS?

Cardiorespiratory fitness (CRF), also known as cardio fitness, refers to how well your respiratory and circulatory systems supply your body with enough oxygen to keep exercising.

It is measured through a metric known as VO_2 max, a measure of the maximum amount of oxygen that your body can use when you're exercising. As your VO_2 max increases, so does your aerobic endurance.

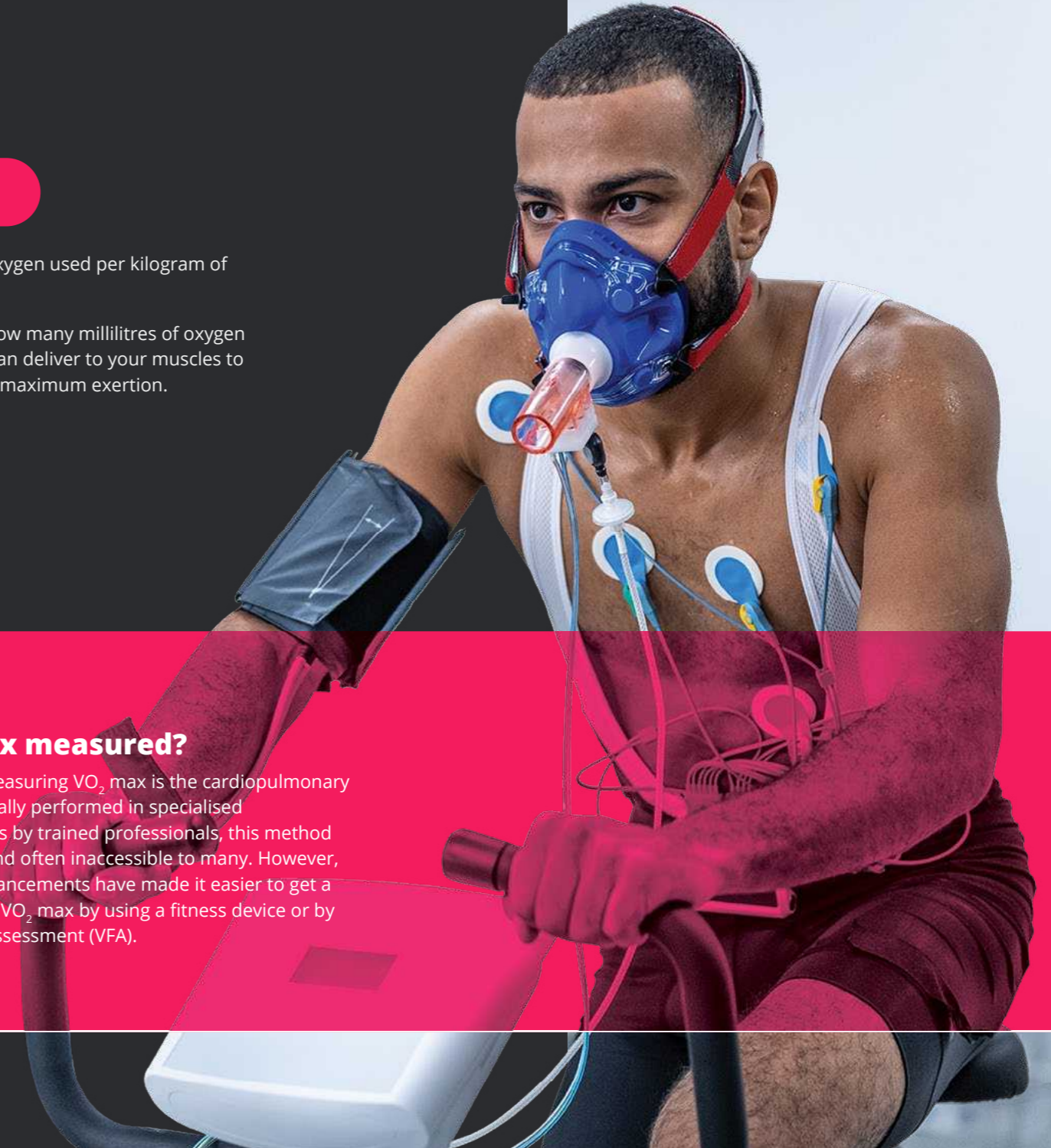
BREAKING IT DOWN:

- VO_2 max is measured in millilitres of oxygen used per kilogram of body weight per minute (ml/kg/min).
- V stands for 'volume' which refers to how many millilitres of oxygen (O_2) per kg of body weight your body can deliver to your muscles to generate energy when you exercise at maximum exertion.



How is VO_2 max measured?

The gold standard for measuring VO_2 max is the cardiopulmonary exercise test (CPX). Typically performed in specialised performance laboratories by trained professionals, this method is complex, expensive, and often inaccessible to many. However, recent technological advancements have made it easier to get a reliable estimate of your VO_2 max by using a fitness device or by doing a Vitality Fitness Assessment (VFA).



CARDIO FITNESS IS STRONGLY LINKED TO OUR OVERALL HEALTH STATUS

- Poor cardio fitness increases our risk of developing serious medical conditions **16**
- High cardio fitness leads to reduced hospitalisation costs **18**
- Relationship between cardio fitness and cardiometabolic claims **19**
- Relationship between cardio fitness and mental health claims **20**
- Relationship between cardio fitness and cardiometabolic risk factors **21**



30

CARDIO FITNESS IS STRONGLY LINKED TO OUR OVERALL HEALTH STATUS

There is an incredible amount of scientific evidence demonstrating the strong correlation between **cardio fitness and our overall health**. In the long-term, cardio fitness not only influences how long one will live (lifespan) but also how many of those years will be in good health (healthspan).

Research clearly links “low” cardio fitness to an increased risk of developing - and even dying from - cardiovascular diseases, certain cancers, and diabetes, among other conditions. Cardio fitness is regarded as an important health risk factor, comparable in significance to smoking, high blood pressure, high cholesterol, and type 2 diabetes.


There is a dose-response relationship between improvements in your cardio fitness and associated improvements in health and mortality risk, with the greatest improvements seen in individuals that increase their cardio fitness from lower to higher values.

Every 3.5ml/kg/min improvement in VO₂ max is associated with:

 **21-30%** decreased risk of premature cardiovascular disease (CVD) and all-cause mortality.

18% reduction in heart failure risk.

8-14% survival benefit post myocardial infarction in men.

 **13%** risk reduction of developing diabetes when adjusted for BMI.



POOR CARDIO FITNESS INCREASES THE RISK OF DEVELOPING SERIOUS MEDICAL CONDITIONS



Dementia, Alzheimer's disease, and psychological stress:

- Several studies have established a link between higher cardio fitness levels and a reduced risk of developing both dementia and Alzheimer's disease.
- High cardio fitness is associated with a 36% lower risk of developing dementia compared to low cardio fitness.
- Higher levels of cardio fitness are associated with lower measures of anxiety and symptoms of depression.



Cardiovascular disease:

- Men with higher cardio fitness show a 68% lower risk of stroke-related death compared to those with lower cardio fitness.



Cancer:

- Higher levels of cardio fitness are associated with a reduced risk of developing certain cancers, including lung, breast, and gastrointestinal cancers.
- Moderate to high levels of cardio fitness are associated with a 20% and 45% lower risk of all-cause cancer mortality, respectively.



Pre-diabetes, type 2 diabetes & metabolic syndrome:

- Numerous studies have shown that higher levels of cardio fitness are associated with a lower risk of developing pre-diabetes, metabolic syndrome, and type 2 diabetes.
- Higher cardio fitness is associated with higher insulin sensitivity, independent of the effect of physical activity, reducing the risk of developing cardiometabolic diseases such as type 2 diabetes.

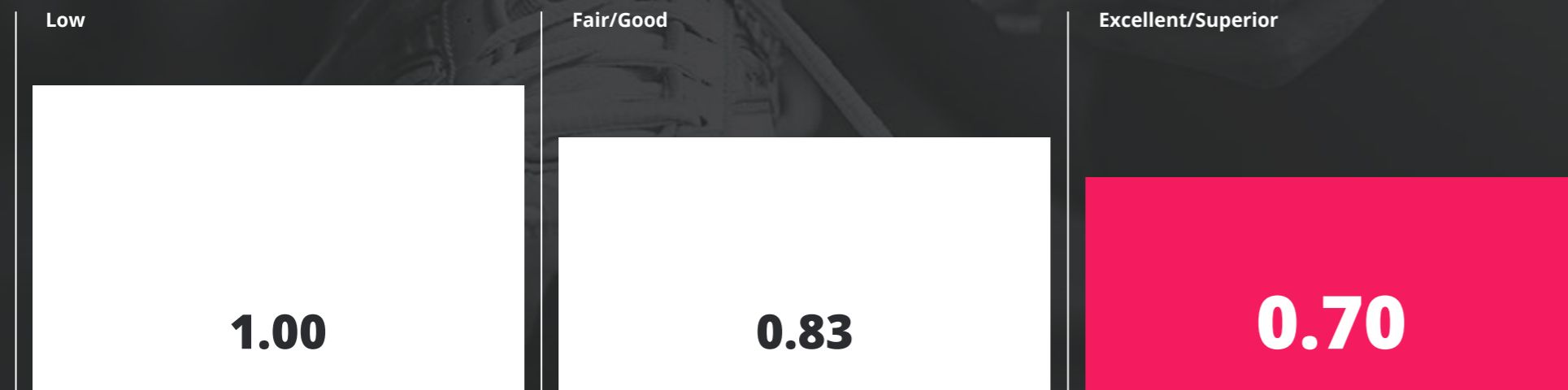
High cardio fitness is associated with reduced hospitalisation costs

Cardio fitness plays a key role in determining health outcomes, significantly influencing the costs associated with hospitalisation.

Our analysis of Discovery Health Medical Scheme claims data from Vitality members reveals a striking association: higher cardio fitness levels correlate with a reduced claims experience. **Members with “superior” or “excellent” cardio fitness levels showed a significantly lower risk-adjusted in-hospital claims experience, averaging a reduction of 30% compared to individuals with “low” cardio fitness levels.**

**17%
reduction**

Additionally, even members with “fair” to “good” cardio fitness levels experienced a notable **17% reduction in their risk-adjusted in-hospital claims experience compared to those with a “low” cardio fitness level.**



Risk-adjusted in-hospital claims relative to members with low recorded cardio fitness levels

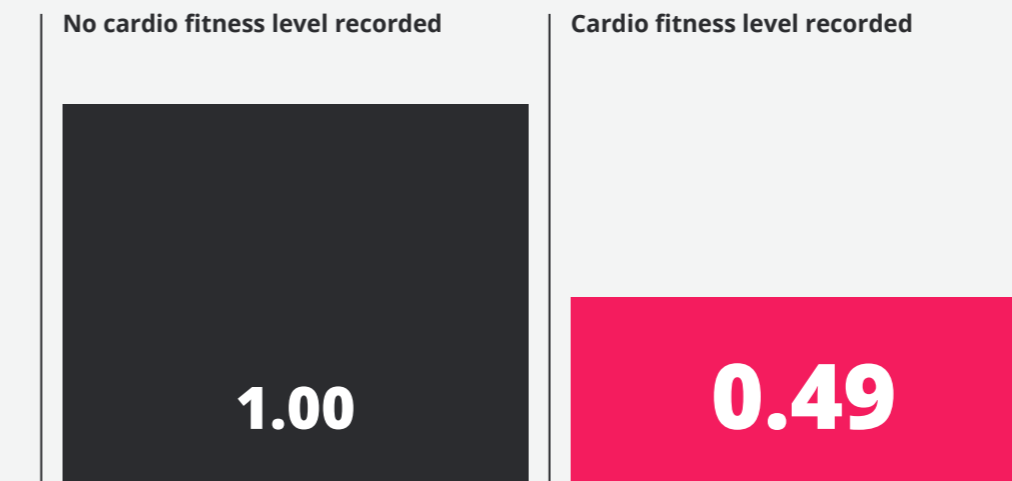
Based on Discovery Health Medical Scheme in-hospital claims for calendar year 2023, excluding pregnancy, dentistry, and trauma claims. Risk-adjusted for age, sex, and the Discovery Health Medical Scheme plan type.

Association between cardio fitness and the cardiometabolic claims experience

Regardless of one’s initial cardio fitness level, a significant decrease in risk-adjusted in-hospital claims related to cardiometabolic conditions (lifestyle-related conditions) is observed among members with a recorded cardio fitness level.

**51%
reduction**

These members show a **51% reduction in risk-adjusted in-hospital claims for cardiometabolic conditions compared to members with no cardio fitness level recorded.** This emphasises the wider health benefits linked to regular engagement in physical activity.



Risk-adjusted in-hospital claims related to cardiometabolic diseases relative to members with no recorded cardio fitness level

Based on Discovery Health Medical Scheme claims for calendar year 2023. Risk-adjusted for age, sex, and the Discovery Health Medical Scheme plan type. Cardiometabolic conditions include diabetes (type 1 and 2), ischaemic heart disease, essential and secondary hypertension, and hypercholesterolemia.



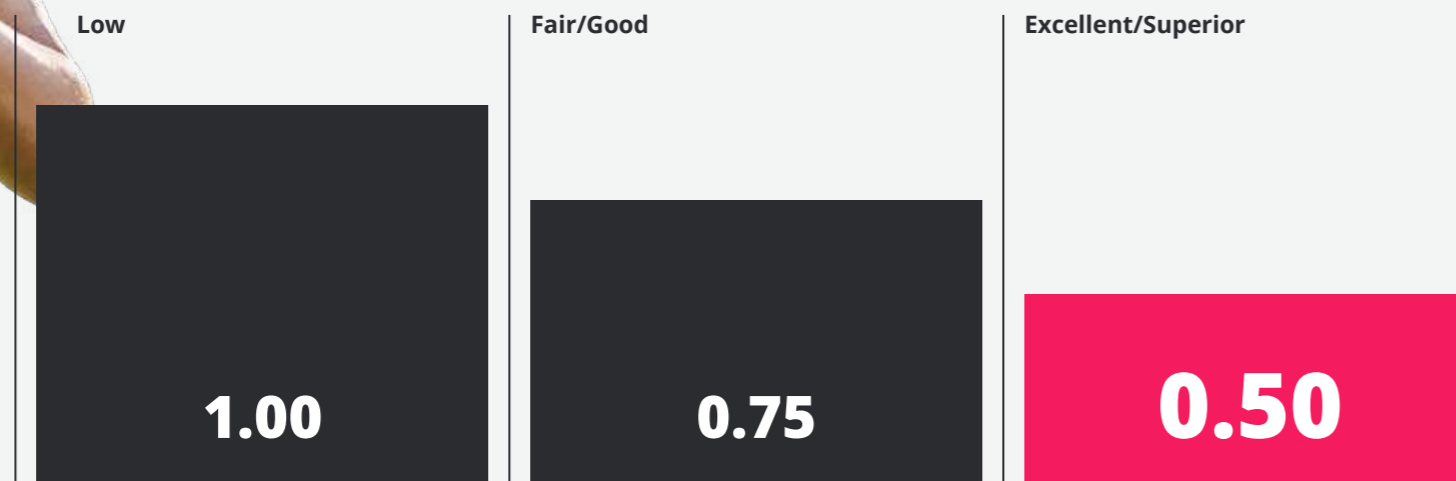


Association between cardio fitness and mental health claims

The benefits of improving cardio fitness levels also extend to mental health outcomes. A higher cardio fitness level is linked to a notable reduction in risk-adjusted in-hospital claims for depression.

50%
risk reduction

The most substantial improvements, with a 50% reduction in risk-adjusted in-hospital claims for depression, are observed among individuals with a “superior” or “excellent” Vitality Cardio Fitness Level compared to individuals with a “low” Vitality Cardio Fitness Level.



Risk-adjusted in-hospital claims relative to members with low recorded cardio fitness levels

Based on Discovery Health Medical Scheme claims for calendar year 2023. Risk-adjusted for age, sex, and the Discovery Health Medical Scheme plan type.

Refer to page 40 for a detailed breakdown of the Vitality Cardio Fitness Levels.

Poor cardio fitness is associated with an increased risk of cardiometabolic disease risk factors

Screening for cardiometabolic diseases includes measuring the risk factors associated with them, such as high blood pressure, high blood glucose, high cholesterol, being overweight, obesity, and smoking. Vitality incentivises members to undergo screening for these cardiometabolic risks through an assessment known as the Vitality Health Check.

Among Vitality members who complete a Vitality Health Check, those with **higher cardio fitness levels have a lower prevalence of high-risk Vitality Health Check metrics** compared to those with lower cardio fitness levels.

Weight status

Among Vitality members who complete a Vitality Health Check, those with a “good” cardio fitness level have a 69% lower prevalence of a high-risk weight status and members with a “superior” cardio fitness level have a 95% lower prevalence of a high-risk weight status compared to members at a “low” cardio fitness level.

High-risk weight status is defined as a body mass index (BMI) of ≥ 30 kg/m² and a waist circumference measurement of ≥ 94 cm for men and ≥ 80 cm for women.



Refer to page 40 for a detailed breakdown of the Vitality Cardio Fitness Levels.

Blood glucose

Among Vitality members who complete a Vitality Health Check, those with a **“good” cardio fitness level have a 63% lower prevalence of a high-risk glucose reading and those with a “superior” cardio fitness level have an 84 % lower prevalence of a high-risk glucose readings** compared to members with a “low” cardio fitness level.

Blood glucose: High-risk blood glucose is defined as ≥ 11 mmol/L or an HbA1c result of $\geq 7\%$.



Blood pressure

Among Vitality members who complete a Vitality Health Check, those with a **“good” cardio fitness level have a 44% lower prevalence of a high -risk blood pressure reading and those with “superior” cardio fitness level have a 70 % lower prevalence of a high-risk blood pressure readings** compared to members with a “low” cardio fitness level.

High-risk blood pressure is defined as $\geq 160/100$ mmHg.



Smoking

Among Vitality members who complete a Vitality Health Check, those with a **“good” cardio fitness level have a 20% lower prevalence of reporting smoking and members with a “superior” cardio fitness level have a 52% lower prevalence of reporting smoking** compared to members with a “low” cardio fitness level. Smoking reduces the lungs’ capacity to carry oxygen due to the damage that it causes.

Self-reported smoking status

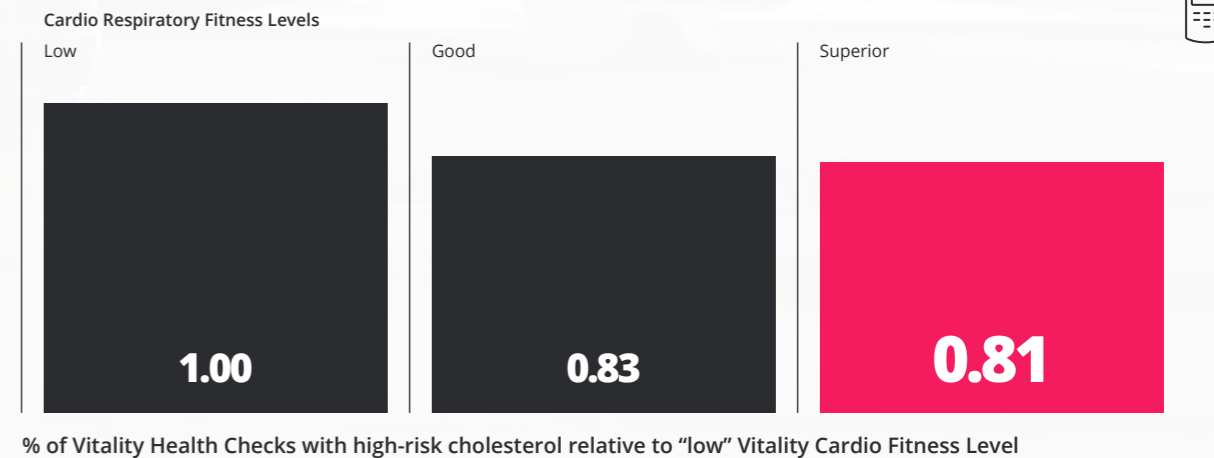


Blood cholesterol

Among Vitality members who complete a Vitality Health Check, those with a **“good” cardio fitness level have a 17% lower prevalence of high-risk cholesterol and members with a “superior” cardio fitness level have a 19% lower prevalence of high-risk cholesterol** compared to members with a “low” cardio fitness level.

Exercise has been shown to be effective in reducing Triglyceride (TG) and increasing HDL levels. Additionally, lifestyle factors such as healthy eating and weight loss, as well as genetics, can influence the extent to which exercise reduces cholesterol levels.

High-risk blood cholesterol is defined as a total cholesterol of ≥ 7.5 mmol/L. Based on Vitality Health Checks done in 2023.



EXPERTS AGREE: CARDIO FITNESS IS AN IMPORTANT HEALTH RISK METRIC

Every heartbeat matters, every step counts – Prof Jon Patricios 26



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EXPERTS AGREE:

CARDIO FITNESS IS AN IMPORTANT HEALTH RISK METRIC

Every heartbeat matters, every step counts.

Globally, cardiovascular disease (CVD) kills more people than TB, HIV and malaria combined.

In South Africa, heart disease and strokes are the biggest killers after HIV. Every hour, 5 people suffer heart attacks, and 10 South Africans have strokes. Death from cancer has increased by 29% over the last decade.

In a country with stretched health resources and large disparities in access to care, there is an accessible and affordable solution: optimal cardiorespiratory fitness. The prescription of aerobic-based exercise provides some of the most effective disease intervention strategies and should be our core lifestyle intervention.

Disease prevention with the right dose of the most potent “drug”.



The “Disease”

People who are more physically active tend to live longer and those that adopt exercise as a deliberate intervention lead better quality lives. This applies especially to non-communicable diseases of lifestyle such as cardiovascular disease, type 2 diabetes, and cancers, but equally to mental health, including depression and Alzheimer’s disease. All of these have a lower incidence among physically active individuals. Recently, especially during the COVID-19 pandemic, being physically fit has been shown to protect against viral illnesses and improve the efficacy of vaccines.



The “Drug”

Physical activity is the most powerful and accessible tool for confronting disease prevention. Cardiorespiratory fitness (CRF) refers to the ability of our heart, lungs, and muscles to support an active and healthy lifestyle, and habitual physical activity is the primary way of improving CRF. CRF is often reported as maximal oxygen uptake (VO₂ max) and most accurately measured in a laboratory setting, but increasingly, field tests are used to provide suitable estimates of VO₂ max.



The “Dose”

The World Health Organisation provides practical guidelines for exercise to improve health outcomes: 150-300 minutes per week of moderate-intensity activity or 75-150 minutes of intense activity. Moderate exercise includes brisk walking or social cycling, while intense exercise might include running, high-repetition weight training, and intervals.

There is growing recognition that the amount of physical activity accumulated during the day contributes to CRF, with intermittent bursts of vigorous activity such as climbing stairs and cycling uphill being beneficial. Research into CRF benefits is consistent: improved CRF reduces disease risk, some activity is better than none, and vigorous levels of physical activity offer the greatest benefit.



The “Device”

The increased accessibility of technology in the form of smartphones and fitness-tracking watches has changed the way we are able to measure physical activity and prescribe exercise. Data collection is more accurate, research is better supported, and guidelines are better informed. We no longer have to prescribe “batches” of exercise but can measure activity as a continuum, with every step taken and every heartbeat recorded contributing to measuring a healthier life.

IT'S SIMPLE: STEP UP!

The evidence for the benefits of improving cardio fitness levels is overwhelming across a spectrum of South Africa’s most impactful diseases. The ability to measure physical activity over continuous periods allows for insightful monitoring of beneficial exercise interventions, acknowledging that every heartbeat matters and every step counts!



PROF JON PATRICIOS
Professor of Sports and Exercise Medicine

Wits Sport and Health (WiSH), Faculty of Health Sciences, University of the Witwatersrand, Johannesburg

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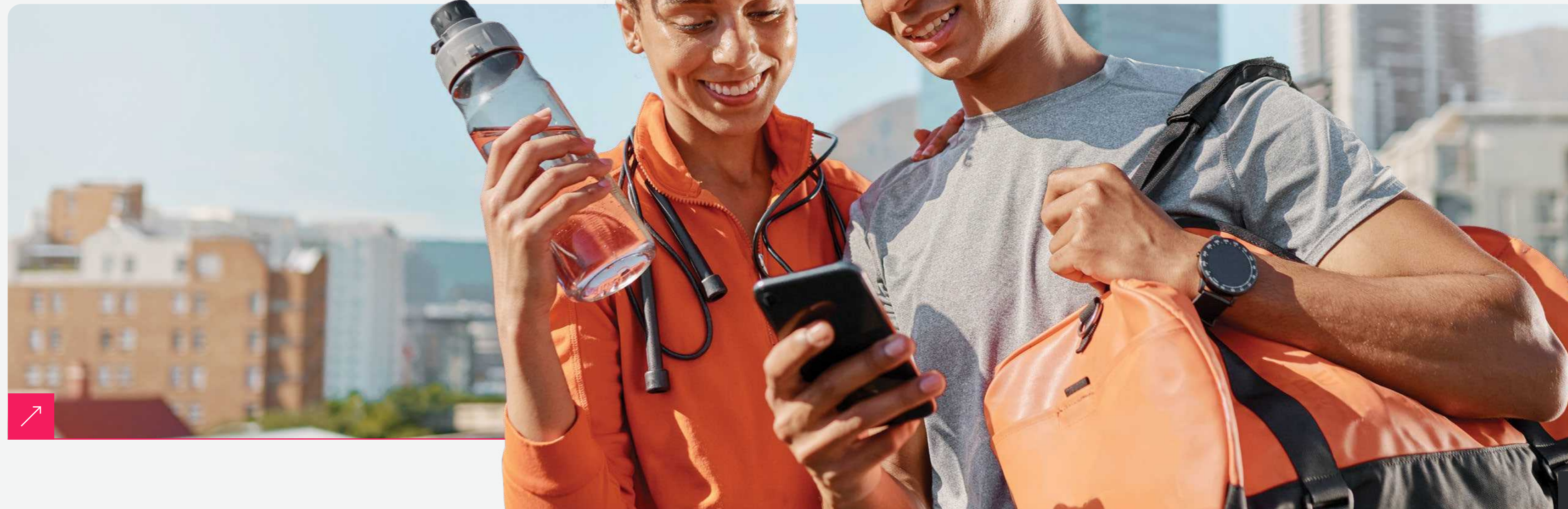
SECTION 5

VITALITY INCENTIVISES MEMBERS TO KNOW AND IMPROVE THEIR CARDIO FITNESS

Why we exist 30

Introducing a new measure to the Vitality programme: Vitality Cardio Fitness Levels 32

Vitality's physical activity strategy 34



VITALITY INCENTIVISES MEMBERS TO KNOW AND IMPROVE THEIR CARDIO FITNESS

Supporting members to improve their fitness aligns well with **Vitality's core purpose**

WHY WE EXIST

Vitality's core purpose is to make people healthier and enhance and protect their lives.

The engine that enables our core purpose is the Vitality Shared-Value Insurance model, which creates a virtuous cycle that benefits clients, the insurer (the business), and society.

Member Incentives



MEMBERS
Improved fitness and health outcomes

Healthy behaviour



SOCIETY
Healthier and productive people and communities



Insurer Savings

INSURER
Lower claims





INTRODUCING A NEW MEASURE
TO THE VITALITY PROGRAMME:

VITALITY CARDIO FITNESS LEVELS

Your Vitality Cardio Fitness Level is a
strong indicator of your overall physical health
and a predictor of your long-term health.

AVERAGE VO₂ MAX READING FOR EACH VITALITY CARDIO
FITNESS LEVEL, CATEGORISED BY AGE AND SEX

♂ MEN ♀ WOMEN

VITALITY CARDIO FITNESS LEVEL	Percentiles	AGE						
		20-29	30-39	40-49	50-59	60-69	70+	
Superior	95th +	♂	>=55.4	>=54	>=52.5	>=48.9	>=45.7	>=42.1
		♀	>=49.6	>=47.4	>=45.3	>=41.1	>=37.8	>=36.7
Excellent	80th - 94th	♂	>=51.1	>=48.3	>=46.4	>=43.4	>=39.5	>=36.7
		♀	>=43.9	>=42.4	>=39.7	>=36.7	>=33	>=30.9
Good	60th - 79th	♂	>=45.4	>=44	>=42.4	>=39.2	>=35.5	>=32.3
		♀	>=39.5	>=37.8	>=36.3	>=33	>=30	>=28.1
Fair	40th - 59th	♂	>=41.7	>=40.5	>=38.5	>=35.6	>=32.3	>=29.4
		♀	>=36.1	>=34.4	>=33	>=30.1	>=27.5	>=25.9
Low	0 - 39th	♂	>=0	>=0	>=0	>=0	>=0	>=0
		♀	>=0	>=0	>=0	>=0	>=0	>=0

VITALITY'S PHYSICAL ACTIVITY STRATEGY

Vitality is a behaviour change platform that champions physical activity and helps members understand their fitness levels. We provide the tools needed to improve fitness and offer rewards as members take steps toward a healthier lifestyle.

KNOW YOUR FITNESS LEVEL

Vitality members can determine their fitness level through their VO₂ max readings, which can be measured using either their wearable fitness devices or by completing a Vitality Fitness Assessment.



SUPERIOR
EXCELLENT
GOOD
FAIR
LOW

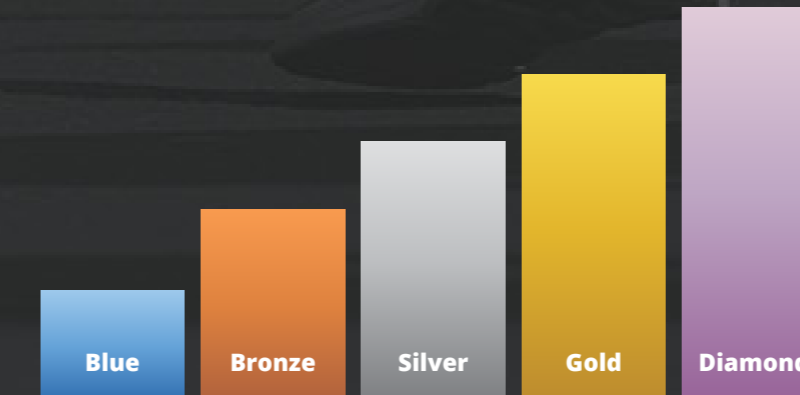
IMPROVE YOUR FITNESS

Vitality offers members many ways to get fit. Join a health club, link a fitness device to track physical activity, take part in race events or join Team Vitality. Plus, through Vitality Fitness, a first-of-its-kind fitness platform, members get access to hundreds of facilities nationwide, making it easier and even more affordable to get active.



EARN VITALITY POINTS AND INCREASE YOUR VITALITY STATUS

Vitality members can earn up to 10,000 Vitality points towards their 30,000 physical activity points just for knowing and improving their Vitality Cardio Fitness Level, which contributes to their overall Vitality status.



GET REWARDED

Members are rewarded for consistent exercise. Through Vitality Active Rewards they enjoy weekly rewards for reaching exercise goals, as well as the ability to purchase discounted sports gear, equipment and fitness devices. They also enjoy reduced gym fees, can fully fund an Apple Watch, and get discounts on travel and movie tickets.



UNDERSTANDING YOUR VO₂ MAX READING

What is the clinical significance of each Vitality Cardio Fitness Level? [39](#)
Where did SA's fittest people live in 2023? [42](#)



60

UNDERSTANDING YOUR VITALITY CARDIO FITNESS LEVEL



What is the clinical significance of each Vitality Cardio Fitness Level?

VO₂ max is a valuable benchmark for measuring your aerobic fitness levels as it directly indicates how well your body uses oxygen to perform daily tasks. There is no one good VO₂ max for a person, but everyone should strive to improve their cardio fitness (VO₂ max) to a good or higher level. A higher VO₂ max reduces your health risks and improves your athletic performance.

VO₂ max readings are categorised into five Vitality Cardio Fitness Levels:

- Low
- Fair
- Good
- Excellent
- Superior

See breakdown of each level on next page >

Once VO₂ max is estimated from a fitness device or through a Vitality Fitness Assessment, the VO₂ max reading will be classified based on age- and sex-specific reference norms to determine your Vitality Cardio Fitness Level.

What each Vitality Cardio Fitness Level means

Low

Everyone has to start somewhere. Your engine might not be that powerful yet, but you can increase the capacity of your heart and lungs to supply oxygen to your muscles by starting a slow and steady exercise routine.

While individuals with low Vitality Cardio Fitness Levels face the highest risk of disease and early death, positive changes are within reach. Improving from a “low” to “fair” Vitality Cardio Fitness Level is associated with a significant decrease in the risk of developing adverse cardiovascular conditions, leading to overall health improvement, and notably reducing the risk of disease and early mortality.

Start walking at least 5,000 steps 3 times a week. Incorporating lower intensity exercises such as walking, swimming, and/or cycling can contribute to increased physical activity and fitness and lower your risk of developing chronic conditions.

Excellent

An “excellent” Vitality Cardio Fitness Level is a good predictor of your athletic performance, especially if you participate in endurance exercises like running or cycling. Use it as a benchmark to maintain and improve your athletic performance.

Fair

A fair cardio fitness level means your heart and lungs are working together fairly well when you exercise.

Over half of the reduction in all-cause mortality occurs when transitioning from “low” to “fair” Vitality Cardio Fitness Levels.

You don’t need to train like an elite athlete to reap the health benefits and reduce mortality risk. Even small improvements in cardio fitness (e.g., 3.5 – 7 ml/kg/min increase) are associated with considerably lower (10% to 30%) adverse cardiovascular event rates, so aiming to move up to the next level (“good”) will already give you added health protection.

Now that you’re exercising consistently, slightly dial up the intensity by aiming for 5,000 steps for 5 or more days a week, and/or incorporating moderate intensity exercises such as jogging or adding a 5km parkrun into your weekly routine. Small changes to your cardio fitness can add healthy years to your life and move you to the next step on your fitness journey.

Superior

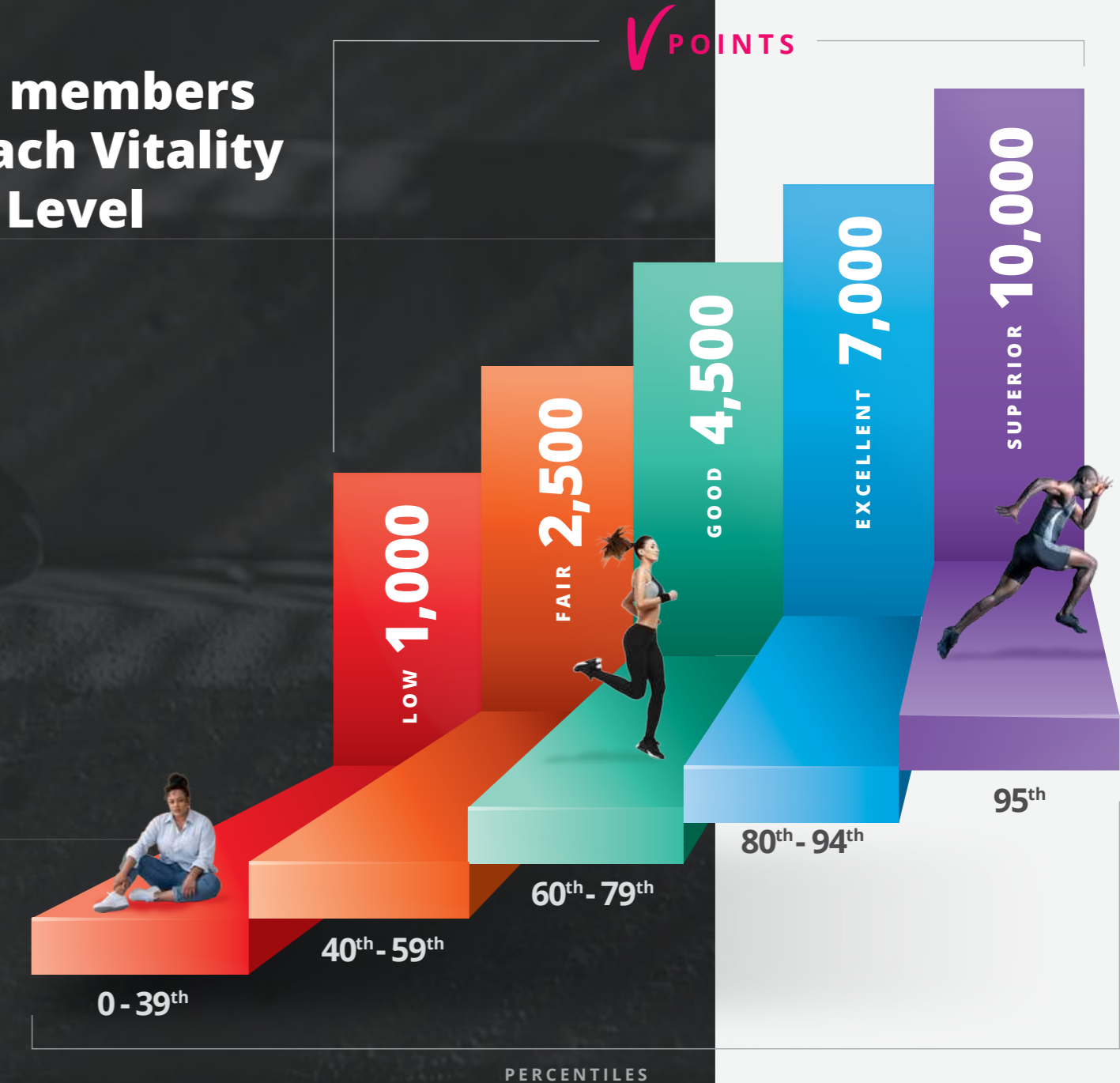
A Vitality Cardio Fitness Level at the “superior” level means you’re probably a professional, elite, or high-performance athlete who does high volumes of exercise for a longer duration and engages in higher intensity workouts on a regular basis.

Good

A “good” Vitality Cardio Fitness Level tells you that your heart and lungs are working very well together to supply oxygen to your muscles when you exercise. You have more endurance and you’ve added healthy years to your life.

For most people, reaching a “good” VO₂ max for their age and gender is a great milestone and will give them the health protection they need to live a long, healthy life. If you want to improve your fitness performance even more, you can fine-tune your training to include short workouts at a higher intensity (80% + of your max heart rate) or longer workouts at a moderate intensity (70 %+ of your max heart rate). Individuals who fall within this category include the majority of the general population who meet the physical activity guidelines of doing a minimum of 150+ minutes of moderate-to-vigorous intensity exercises a week.

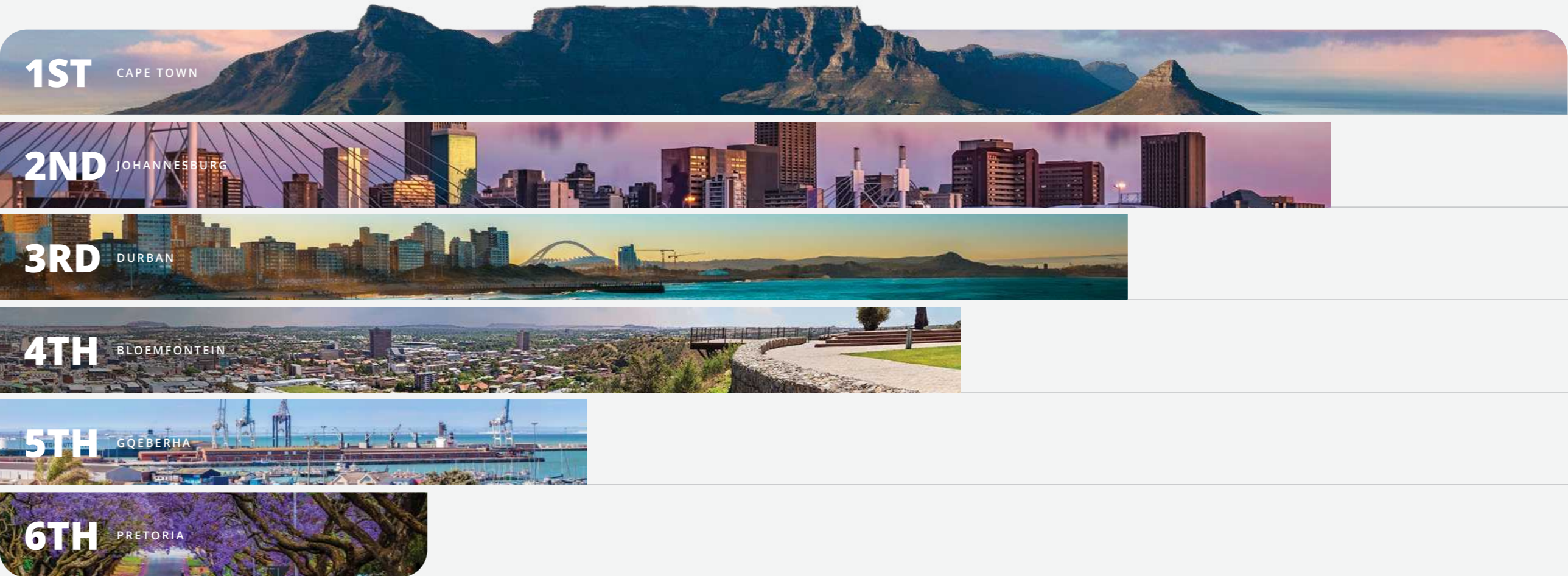
Vitality points members can earn for each Vitality Cardio Fitness Level



WHERE DID SOUTH AFRICA'S FITTEST PEOPLE LIVE IN 2023?

Using data from Vitality members' fitness devices and their Vitality Fitness Assessments, we compared Vitality Cardio Fitness Levels across six major cities in South Africa (from January to December 2023).

Vitality Cardio Fitness Level
ranking of South Africa's
major cities in 2023:



When ranking the cities, differences in age, sex, and device manufacturers were controlled for. The analysis was based on the number of Vitality members with cardio fitness data over the calendar year 2023, irrespective of their Vitality Cardio Fitness Level.

WHAT DO WE KNOW ABOUT VITALITY'S FITTEST MEMBERS?

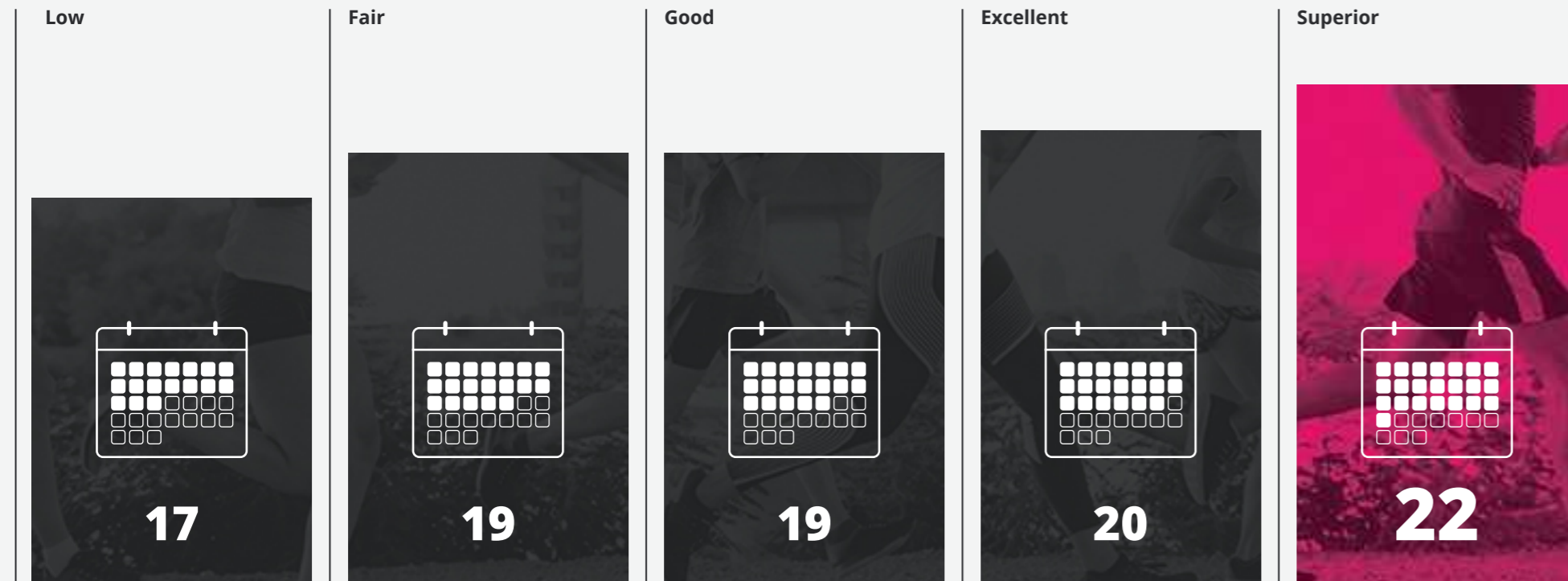
- Vitality's fittest members log more points-earning workouts on more days each month [46](#)
- Vitality members on higher Vitality statuses tend to have better Vitality Cardio Fitness Levels [47](#)
- Women seem to be fitter than men [50](#)
- Members with high Vitality Cardio Fitness Levels engage in other healthy behaviours [51](#)



70

WHAT DO WE KNOW ABOUT VITALITY'S FITTEST MEMBERS?

Vitality's fittest members log more points-earning workouts on more days each month compared to our least fit members. **In 2023, they exercised, on average, 5 more days per month.**

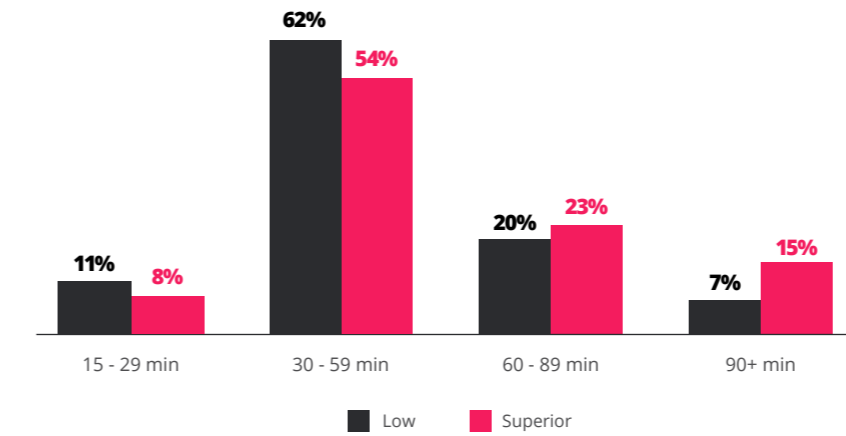


Average workout days per member per month by Vitality Cardio Fitness Level

The average number of days per month, per member logging points-qualifying workouts (maximum of one workout per member, per day).

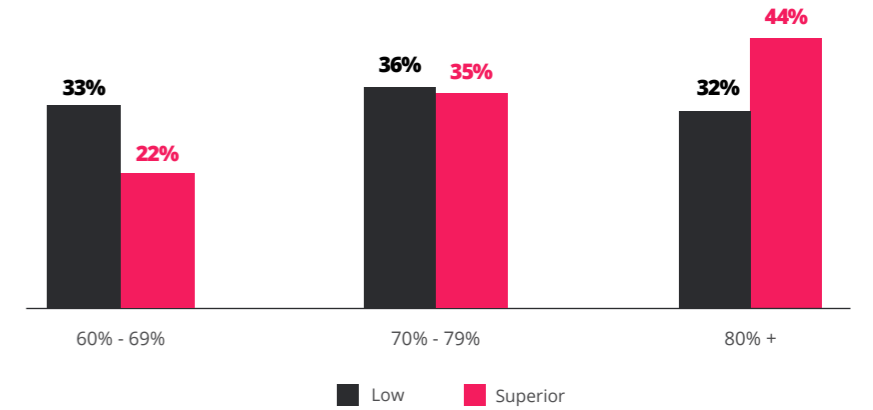
Their workouts are longer...

Distribution of workouts by duration



...and done at higher intensities.

Distribution of workouts by intensity



Vitality members on higher Vitality Statuses tend to have better Vitality Cardio Fitness Levels



Proportion of members with "high" Vitality Cardio Fitness Levels by Vitality Status relative to Blue Status



For individuals at low, fair, or good Vitality Cardio Fitness Levels, small increases in exercise deliver greater gains

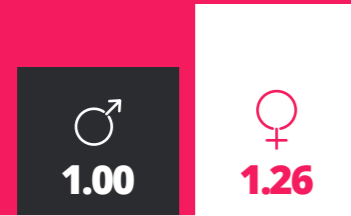


compared to those at a superior Vitality Cardio Fitness Level, who require more effort to improve further



Women seem to be fitter than men

Proportion of members with high cardio respiratory fitness level by sex relative to males



The proportion of Vitality females with a Vitality Cardio Fitness Level in the excellent or superior range is

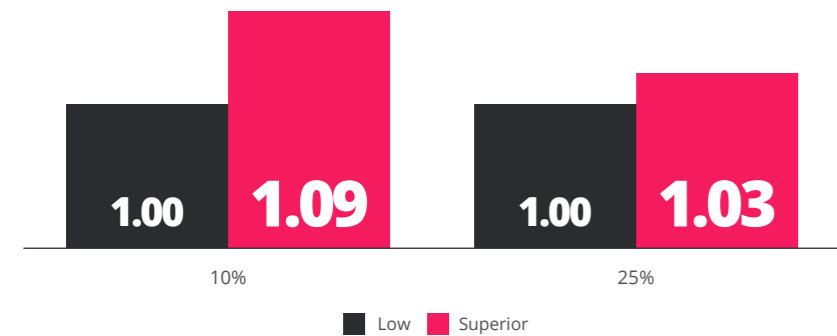
1.26x
higher than males

Members with a high cardio fitness level engage in other health behaviours

Total spend on HealthyFood

Healthy behaviours are positively correlated with one's cardio fitness level. Members at a "superior" Vitality Cardio Fitness Level spend more of their grocery spend on healthy food items, compared to those at a "low" Vitality Cardio Fitness Level. This is particularly evident for members receiving higher discounts on HealthyFood items.

HealthyFood Catalogue spend as a percentage of Total Food Spend by HealthyFood Discount, relative to "low" Vitality Cardio Fitness Level



Based on HealthyFood spend in CY2023. (As a Vitality member, you can get up to 25% back on HealthyFood items at your preferred HealthyFood partner. You also get up to 10% back at the other partner.)

Screening habits

Vitality Health Check completion increases with each cardio fitness level, with members on the "superior" Vitality Cardio Fitness Level having a 21% higher completion rate than those on the "low" Vitality Cardio Fitness Level.

% Vitality Premium adults completing a Vitality Health Check

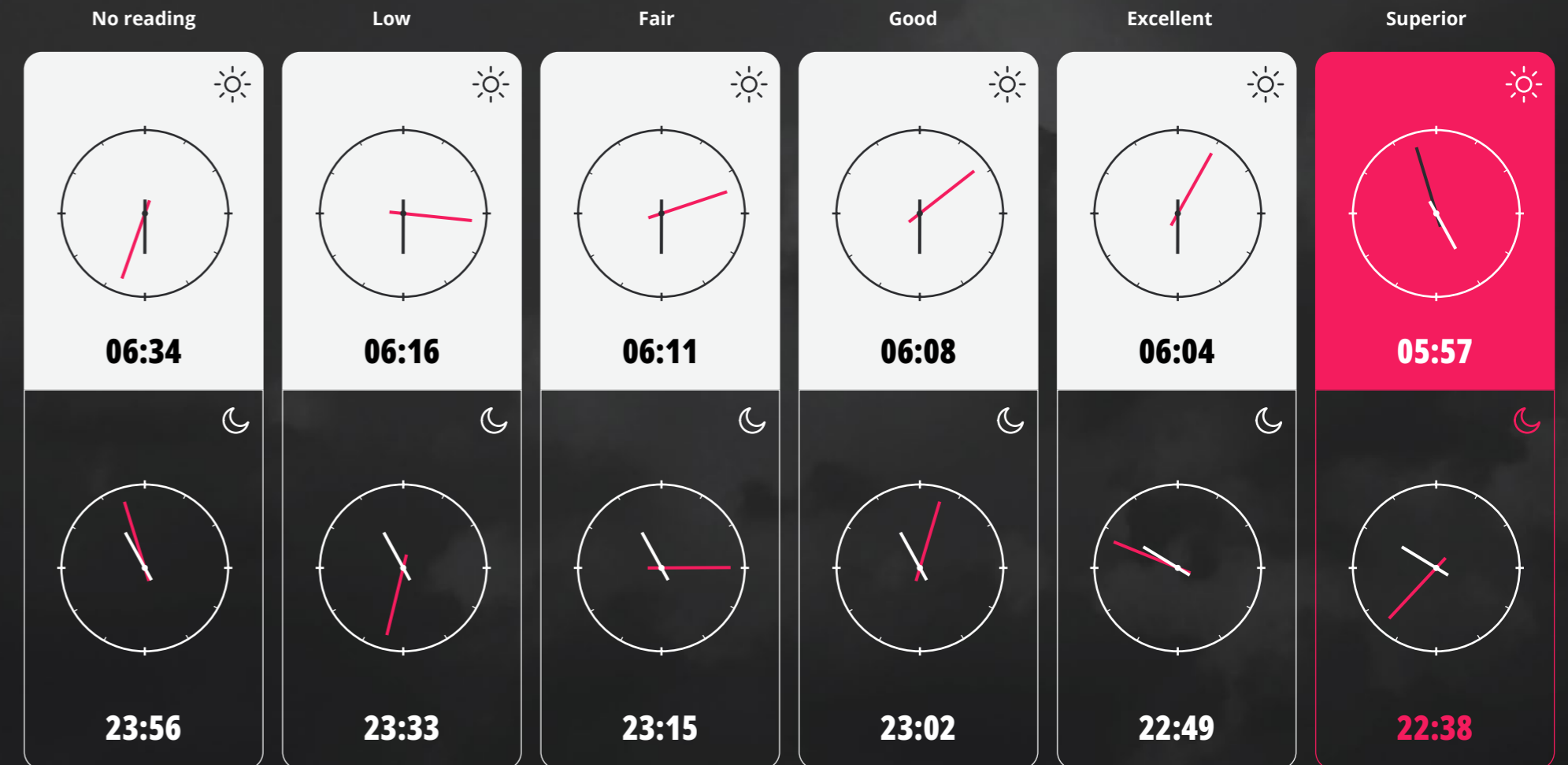


Based on Vitality Health Checks completed in calendar year 2023

Sleep trends by Vitality Cardio Fitness Level

The view below compares the average bedtime and wake-up time for members logging sleep data, by Vitality Cardio Fitness Level. The trend that emerges shows that members with higher Vitality Cardio Fitness Levels have earlier bedtimes, earlier wake-up times, and longer sleep durations.

Average bedtime and wake-up time by Vitality Cardio Fitness Level



UNFIT, FIT OR VERY FIT? HERE'S YOUR GUIDE TO IMPROVING YOUR CARDIO FITNESS

Practical examples of how you can progress from “low” to “fair” to “good” Vitality Cardio Fitness Levels [55](#)

How different types of exercises impact cardio fitness [56](#)

The physiological process that occurs in the body when cardio fitness improves [57](#)



UNFIT, FIT OR VERY FIT?

HERE'S YOUR GUIDE TO IMPROVING YOUR VITALITY CARDIO FITNESS LEVEL



EXPERT ADVICE:

How you can improve your Vitality Cardio Fitness Levels

Practical examples of how you can progress from “low” to “fair” to “good” Vitality Cardio Fitness Levels:



If at “low” and “fair” Vitality Cardio Fitness Levels:

Start with moderate intensity, continuous exercise. After 6 weeks, gradually incorporate short, harder intervals into your routine (for example, try 4 sets of 10 seconds at 85% intensity with 20 seconds of rest between each set).



If at a “good” Vitality Cardio Fitness Level:

Include high intensity interval training sessions 2 to 3 times per week. For instance, you can do intervals of 4 sets of 4 minutes at 90% intensity, resting for 2 minutes between each set.



Always start with a light intensity warm-up at least 10 minutes before an interval session and add a cooldown 10 minutes after the workout.



Include metabolic resistance training days into your schedule to further improve your overall cardio fitness. This can include a circuit of exercises (between 9 and 10) such as lunges, squats, push-ups, and other bodyweight exercises done in quick succession (for 20 seconds each), repeating the circuit 2-3 times.

How different types of exercises impact Vitality Cardio Fitness Levels

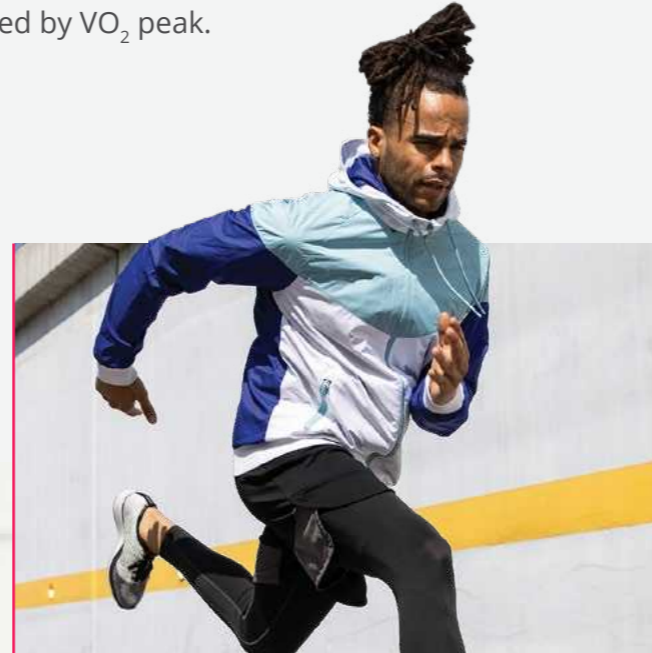
A range of exercises can impact cardio fitness, where Vitality Cardio Fitness Levels are measured by VO_2 peak.



Multi-joint activities like brisk walking, running, swimming, rowing, and arm cranking can improve VO_2 peak depending on the individual's physiology, training history, training intensity, and training volume.



Higher intensity aerobic training is more effective in improving VO_2 max.



A recent meta-analysis found that sprint interval training was significantly better at improving cardio fitness compared with Moderate Intensity Continuous Training (MICT), in overweight or obese persons.

The physiological process that occurs in the body when cardio fitness improves involves several mechanisms:



The heart muscle contracts more efficiently, pushing out blood more effectively to meet the demands of exercise for longer periods and at higher exercise intensities.



Submaximal heart rate decreases for the same given absolute intensity. This means that you can fuel exercise for longer and at a higher maximal intensity.



Increased blood flow to active muscles, achieved through an increase in capillarisation, capillary recruitment, and an improved capillary to muscle fibre ratio. This increases the area for exchange of nutrients to fuel activity.



An increase in total blood volume, which increases one's ability to fuel exercise for longer.



An increase in red blood cell volume, decrease in blood plasma viscosity, and increase in blood plasma volume improve oxygen delivery to working muscles.

The above mechanisms contribute to the decrease in blood pressure that occurs during training at submaximal exercise intensities, facilitating the ability to achieve higher maximal exercise intensities (increased systolic blood pressure and decreased diastolic blood pressure at maximal exercise).



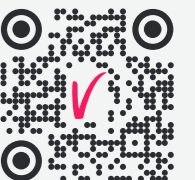
- Lung function improves due to increased ventilation and increased lung perfusion at maximal exertion, allowing for a higher level of maximal exercise.
- Increased oxygen extraction and active muscle blood flow allow for higher maximal oxygen consumption (VO_2 max).
- Increases in the size and number of mitochondria (energy-producing organs), myoglobin (oxygen carrying molecules in the muscle), and oxidative muscle enzymes increase the oxidative capacity in the muscle and allow for the attainment of higher maximal exercise levels.
- Increased dependence on fats and decreased dependence on glucose extend the duration of energy fuel sources, allowing for increased maximal exertion levels.



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For more information on Vitality Cardio Fitness Levels:



**RECOMMENDATIONS FOR INDIVIDUALS,
CLINICIANS AND POLICY MAKERS**

Individuals **60**
Clinicians and policymakers **61**



90

RECOMMENDATIONS

FOR INDIVIDUALS, CLINICIANS

AND POLICY MAKERS

Individuals

Improving Vitality Cardio Fitness Levels requires engagement in regular, consistent cardio exercises. As a result, it is important to build a habit of physical activity. The Vitality Habit Index, released in March 2024, shows that habit laddering is the most effective pattern to form and sustain good, strong habits that lead to tangible positive health outcomes. Building habits using habit laddering is powerful because it supports replacing an old habit with a new one, and creates the persistency needed to unlock the health benefits of good habits.

4 steps to build a habit and improve Vitality Cardio Fitness Levels :

- 1 Set a target:** Define your goal based on where you are in your fitness journey.
- 2 Start small:** Choose an activity that's easy and practical and focus on building frequency and consistency.
- 3 Celebrate the small wins:** Every completed exercise session brings you closer to forming a habit for even bigger wins such as completing your first race or improving your VO₂ max.
- 4 Gradually increase intensity:** Start with increasing either the duration of your exercise or the number of days you exercise per week. Once you are more accustomed to exercise, you can start adding higher intensity exercises to your weekly exercise plan. This builds a strong foundation, reduces injury risk, and makes exercise a lasting habit.

Clinicians


Clinicians play a vital role in guiding patients toward a healthier lifestyle. By assessing cardiorespiratory fitness, clinicians can gain unique insights into a patient's cardiovascular health. Exercise prescription, when tailored appropriately, empowers patients to improve cardiovascular health, manage chronic conditions, and enhance overall well-being. Therefore, it's important for clinicians to add cardio fitness as a metric to identify risk alongside other known risk factors like smoking, hypertension and so on.



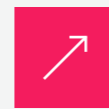
Regulators and policymakers

Encouraging physical activity within the population is crucial for promoting overall health and well-being. Effective policies can play a pivotal role in achieving this goal. These include:

- **Creating active societies:** Create positive social norms and attitudes and a paradigm shift in all of society by enhancing knowledge and understanding of, and appreciation for, the multiple benefits of regular physical activity, according to ability and at all ages.
- **Creating active environments:** Create supportive spaces and places that promote and safeguard the rights of all people, of all ages and abilities, to have equitable access to safe places and spaces in their cities and communities in which they can engage in regular physical activity.
- **Creating active people:** An increase in programmes and opportunities can help people of all ages and abilities to engage in regular physical activity as individuals, families, and communities.
- **Creating active systems:** Strengthen the systems necessary to implement effective and coordinated international, national, and subnational action to increase physical activity and reduce sedentary behaviour. These actions address governance, leadership, multisectoral partnerships, workforce capabilities, advocacy, information systems, and financing mechanisms across all relevant sectors.

 **By implementing enabling policies, we can create an environment where regular physical activity becomes the norm, leading to improved health outcomes for all.**

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