Healthy Athletes 2018 Prevalence Report

Based on 2017 Data

Special Olympics
Healthy Athletes®

Contents

Introduction

Special Olympics (SO) provides year-round sports training and athletic competition to more than 5 million people with intellectual disabilities (ID) in 174 countries. Through sports, SO gives people with ID continuing opportunities to develop physical fitness, demonstrate courage, experience joy and participate in a sharing of gifts, skills and friendship with their families, other Special Olympics athletes, and the community. In addition to sports, SO has several health programs, including Healthy Athletes, Healthy Communities, Fitness programs, and Family Health Forums.

Global Health Strategy

The 2016-2020 Special Olympics International (SOI) Health Strategy focuses on reducing health disparities individuals with ID face. In creating opportunities for inclusive health for all people with ID, inclusion becomes normalized in mainstream health policies, programming, services, training programs, and funding streams. **SOI has set a goal to improve access to health for 11 million persons with ID by 2020 (the *11 by 20 Campaign*).**

The campaign is rooted in the Constitution of the World Health Organization (WHO), the UN Convention on the Rights of Persons with Disability (UNCRPD) and other universal and regional human rights instruments, SO Strategic Plan 2016-2020, and in the universal principle of "full participation of persons with ID."

National health systems must include people with ID to be most effective in promoting inclusion and protecting fundamental human rights. Special Olympics is committed to unlocking access to healthcare and services to 11 million people with ID by strengthening these existing health systems with a human rights-based approach. This improved access to comprehensive quality health services and prevention programs will contribute to SO's mission of improving athlete physical fitness and general health and wellbeing.

Data are critical in measuring progress toward this goal. SOI has been collecting data on the health of its athletes for over twenty years. These data clearly document significant disparities that arise, at least in part, from systemic barriers to accessing equitable health. Without these data, people with intellectual disabilities (ID) are invisible: they are not documented in mainstream data sets and censuses and they are consequently forgotten when governments and health systems write policies. Using these data, including the unique qualitative experiences of SO Programs, SOI is working toward addressing these disparities, identifying gaps in care, and connecting athletes to follow-up care. The data presented in this report help quantify the magnitude of the health disparities people with ID experience.

Healthy Athletes

Special Olympics created its Healthy Athletes (HA) program in 1997 to identify and address the health disparities that people with ID face. The program provides SO athletes with free health screenings, education, and referrals for follow-up care in a fun, welcoming environment that removes the barriers people with ID often encounter during a visit to a healthcare professional. In addition to the individual benefits HA provides, each event trains healthcare professionals and teaches them how to treat people with ID in their own practices.

Currently, the HA program includes eight disciplines of health screenings:

- Fit Feet (a podiatric screening);
- FUNfitness (a physical therapy screening);
- Health Promotion (a screening focused on health education with clinical exams in bone density, blood pressure, and BMI);
- Healthy Hearing (an ear and hearing screening);
- MedFest (a sports physical);
- Special Olympics-Lions Clubs International Opening Eyes (a vision and eye health assessment);
- Special Smiles (an oral health screening);
- Strong Minds (an interactive learning activity focused on developing coping and stress management skills)

Each discipline was created by clinical experts and is based on scientifically validated protocols. The data are collected on a standardized form that is specific for each discipline. These forms can be found in the health section of Special Olympics' resources page located here.

Since 1997, HA has conducted 2.3 million health screenings, and data collected at a majority of these screenings have been aggregated into the world's largest database on the health of people with ID. Special Olympics Programs[1] use HA data in a variety of ways. For example, Programs can present this data to potential partners for fundraising purposes, demonstrate the value of contributions of existing donors and partners, attract new donors and partners, and engage in evidence-based discussions with other stakeholders, such as policymakers and local governments. External researchers have also used HA data for publications in peer-reviewed research journals to expand the knowledge related to the health status of people with ID. See full Special Olympics Health Research bibliography here.

Description of Data and Health Indicators

The data covers results from over **900,000** screenings in the Healthy Athletes Software (HAS) System, with varying numbers of screenings between disciplines. Results presented in this report reflect data from SO athletes only. Data from Unified Partners (individuals without ID who participate in Unified Sports with SO athletes) or Young Athletes (SO participants under age 8) are excluded. The results presented in this report include responses for each health indicator unless otherwise noted. Separate protocols are currently being developed for Young Athletes and will be presented in future reports.

In public health, a health indicator refers to a variable that describes the health of a population, monitors its health status, and can identify the determinants of health within that population. When health indicators are compared across populations, disparities can be observed. The health indicators selected within each HA discipline have been identified by clinical experts as measures that can reveal specific health conditions common in individuals with ID. The data from each measure can help identify Program-specific focus areas and can also be compared across Programs, regions, and globally.

[1] Special Olympics Programs (SO Programs) are independent 501(c)3 organizations that are accredited to carry the Special Olympics name. Generally these Programs operate at the state level in the US (e.g., SO Florida) and at the national level outside the US (e.g. SO Malawi).

At a higher level, these indicators can reveal disparities when compared to the health status of the general population, or even within the broader ID population. While SO Programs can tailor interventions to meet the needs of the athletes, which are revealed through HA data, community- and systems-level changes must also occur for improvements to be made in the global health status of all individuals with ID. If an athlete is found to need care beyond what is delivered during the Healthy Athletes screening, they may receive a referral for follow-up care services. Preliminary analyses using data from Health Promotion suggest that approximately **62%** of screenings result in a need for at least one referral for follow-up care.

In order for an athlete to receive needed care, there must be a trained healthcare provider in that athlete's local community who will see the athlete. SO cannot train every healthcare provider, so in order to make this greater systems-level change and to ensure all individuals with ID have a clinician who can treat them, there must also be policy changes that expand or introduce training on how to communicate with and treat people with ID in all institutions that teach the delivery of healthcare services.

Data Source and Methodology

The data used for this analysis was collected using HAS. The analysis presented in this report is based on data from events that took place in 2017 and were entered into HAS as of 1 July 2018. Data included cover six of the eight HA disciplines.

Using SAS v9.4, univariate analyses were first performed to describe the characteristics of the study population by region, gender, and age group. Chi-square testing was used to determine if prevalence rates varied significantly by these demographic characteristics. Logistic regression models were then fit to describe the magnitude of these differences. Within each discipline, health indicators are highlighted and the odds of different groups having a particular health indicator are presented.

Data Limitations

The data presented in this report is limited to data entered into HAS for events that took place in 2017. Data entered as of 1 July 2018 has been included in analyses. Only data entered into HAS may be analyzed. For various reasons, not all completed screening forms are entered into the system, so each discipline section in this report presents the proportion of screenings entered into HAS out of all screenings that took place.

HA does not collect data on diagnostic cause of intellectual disability (i.e., Down syndrome, Fragile X, etc.). HA data also does not include demographic information beyond gender, age, and region. Missing data is another limitation of this dataset, which is in part due to data integrity issues, since screening forms have changed over time for each discipline. Other times, information is simply not entered into HAS. This can be for a variety of reasons, including data entry issues or athletes not completing a screening. Almost all HA screenings are performed by volunteers who may not be familiar with the way the data from the screenings are being used, which can lead to inconsistent data entry, especially in text fields.

Many of the Healthy Athletes variables are subjective in nature because some responses are reported by athletes, caregivers, or coaches, or they require a clinical, subjective decision. In the absence of highly

clinical and objective data, the indicators spotlighted in this report are believed to be the strongest indicators of athlete health status.

Lastly, there are not unique identifiers for this data set. While a combination of some variables can facilitate linkage, athlete information is not always entered into the system consistently or accurately which makes linkage challenging. Please see the next section on *Addressing Data Limitations* for more details about the unique identifier.

Addressing Data Limitations

Special Olympics is addressing these data limitations in a variety of ways, including working with a data vendor and technology partner, VecnaCares, to develop a data entry, management, and storage system for all Healthy Athletes data. This system is currently live in the SO North America (SONA) Region, and has been adopted by 100% of US Programs and will soon be rolled out to the remaining Regions. The system assigns unique identifiers (unique IDs) to each individual athlete based on several demographic criteria. This unique ID allows for linking athletes across disciplines and will eventually help in linking HA data to other Special Olympics data, such as athlete medical history and sports performance data. The unique ID will allow for longitudinal analysis of the data by athlete, Program, and sport.

While SOI is still in the process of fully transitioning to this system, HA data currently exist in two physically separate locations: the old HA screenings database (2003-present) and the new (2016-present). Due to competing priorities in the development of the VecnaCares HAS system in the most recent years, its quality assurance procedures, and its rollout, the migration of the older data has not yet occurred. The unanticipated complexity of the migration process, including the deduplication, indicator matching and merging of old data to the new data warehouse schema, has further delayed this process. Once this migration and matching process occurs, one seamless data warehouse of HA data with person-specific, longitudinal records will be accessible. Until this happens, however, the analyses that can be performed are limited to the data housed in each separate location and at this time may not be merged. As such, the data represented in this report reflect all HA events that occurred in 2017 and were entered into the old system. There are approximately 6,000 unique records in the new system for events that occurred in 2017 for which a majority of the results are not presented in this report. However, some analyses using data from the 2017 World Games in Austria, readily available in the new system, are presented separately in the *World Games: Data Highlights* section of this report.

Part of this new system includes electronic data capture, whereby SO Programs can collect data using electronic tablets instead of paper forms. This change has improved data quality by limiting inputs to biologically plausible values and eliminating the step of transferring information from paper to computer. It also decreases the amount of missing data by prompting or requiring volunteers to enter data into important or required fields. As a majority of SO Programs are not yet using the new system with this validation, SOI has developed data entry guidelines and standards to help train any volunteers who may be entering data.

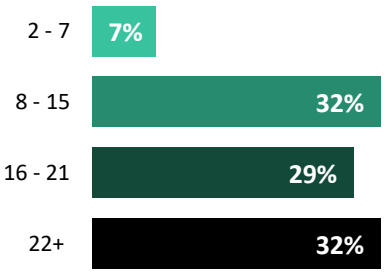
Of note, HA data is representative of people with ID who are Special Olympics athletes. It is not known whether this data is representative of all people with ID. It is possible that SO athletes may be healthier than non-SO athletes so these data are nevertheless alarming and important. We recognize this limitation

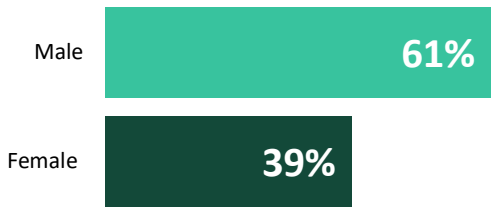
and are interested in evaluation projects that will help determine whether this data set is or is not representative of the broader population with ID. Regardless of how representative the data is, it is often the only data that exists in many countries around the world. Therefore, it is critical we maximize the impact of this data despite these limitations.

2017: SO Reach and Health Results at a Glance

To place the results presented in this report into perspective, it is critical to consider the global reach of Special Olympics. As of 2017, there are **5,169,489** Special Olympics athletes in **174 countries**. A regional breakdown of participating Special Olympics athletes is presented below.

Of the nearly 5.2 million athletes, 61% are male and age varies as follows, with a majority of athletes 8 years and older:





Every day, Special Olympics reaches thousands of individuals with and without ID. Highlights from our health work in 2017 include:

- **195,471** screenings
- **33,130** volunteers trained
- **12,203** athletes with a place to go for follow-up care
- **51,239** people with ID provided wellness opportunities

The full 2017 Special Olympics Reach Report summary can be found here.

Overall, results from **100,357 (51%)** of the nearly 200,000 screenings that occurred in 2017 in **83 countries** were entered into HAS and available for analysis. Looking at the global results by discipline, there is a relatively high prevalence of all health indicators. For example, **52%** of athletes have gait abnormalities, **23%** have never had an eye exam, and **38%** have untreated tooth decay.

This means that on a team of 10 athletes:

- **4** have untreated tooth decay and **1-2** are in need of urgent dental care
- **2** have never had an eye exam and **4** need a new prescription for glasses
- **2** would fail a hearing test
- **2-3** have low bone density even though they may look healthy
- **6** have problems with flexibility and **5** will have problems with strength, placing them at risk for injury
- **6** are overweight or obese and at risk for chronic health conditions

It is also important to consider the potential comorbidities athletes may have. Rarely will athletes have untreated tooth decay and no other health problems; they may also be overweight, have low bone density, and have problems with flexibility. Keeping the Global Health Strategy in mind, it is critical to think about changing systems and the framework for how care is received to create a pathway to improve health outcomes at the individual level.

Discipline Descriptions and Results

On the pages that follow, summaries of Healthy Athletes screening results are presented from six health disciplines, including detailed analyses on various health risk indicators. In 2017, a limited amount of data was entered into HAS from the Middle East/North Africa (MENA) Region. Data from this region is therefore not included in the analyses in this report.

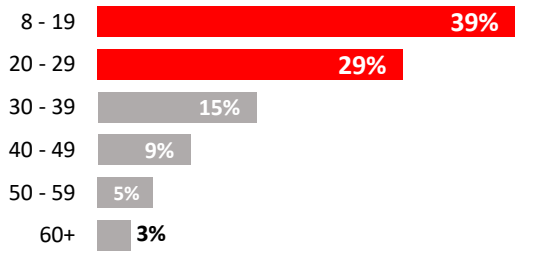
Special Olympics Fit Feet

Many Special Olympics athletes suffer from foot and ankle pain or deformities that impede their performance. Additionally, athletes are not always fitted with the best shoes and socks for their particular sport. In cooperation with the American Academy of Podiatric Sports Medicine and the Federation of International Podiatrists, SO developed the Fit Feet discipline to evaluate foot and ankle deformities. Athletes receive foot and ankle screenings, are checked for proper shoes and socks, and receive education in proper footwear and care of the feet and toes.

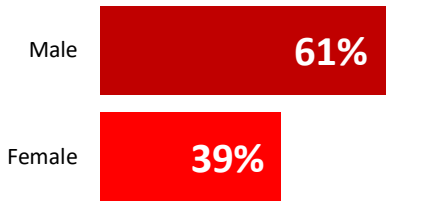
Goals

- Increase access to foot care for Special Olympics athletes, as well as all people with intellectual disabilities.
- Raise foot care specialists' awareness of foot concerns of people with special needs, including difficulties involved in accessing treatment.
- When possible, provide a list of regional foot care specialists who care for people with special needs to all athletes who participate in the Special Olympics Fit Feet program.
- Develop a body of knowledge about proper foot care of children and adults with special needs.
- Ensure appropriate footwear with regards to the sport in which an athlete is participating as well as fit and comfort.
- Train healthcare professionals, students, and others about the needs and care management of people with intellectual disabilities.

Most athletes were **under 30 years old.**



Most athletes were **male.**



Most Fit Feet screenings in 2017 occurred in the **North America** Region.

In 2017, over 20,000 Fit Feet screenings were conducted with athletes from 31 countries at 150 events. Results from 12,522 (more than 50%) of these screenings were entered into HAS and show that:

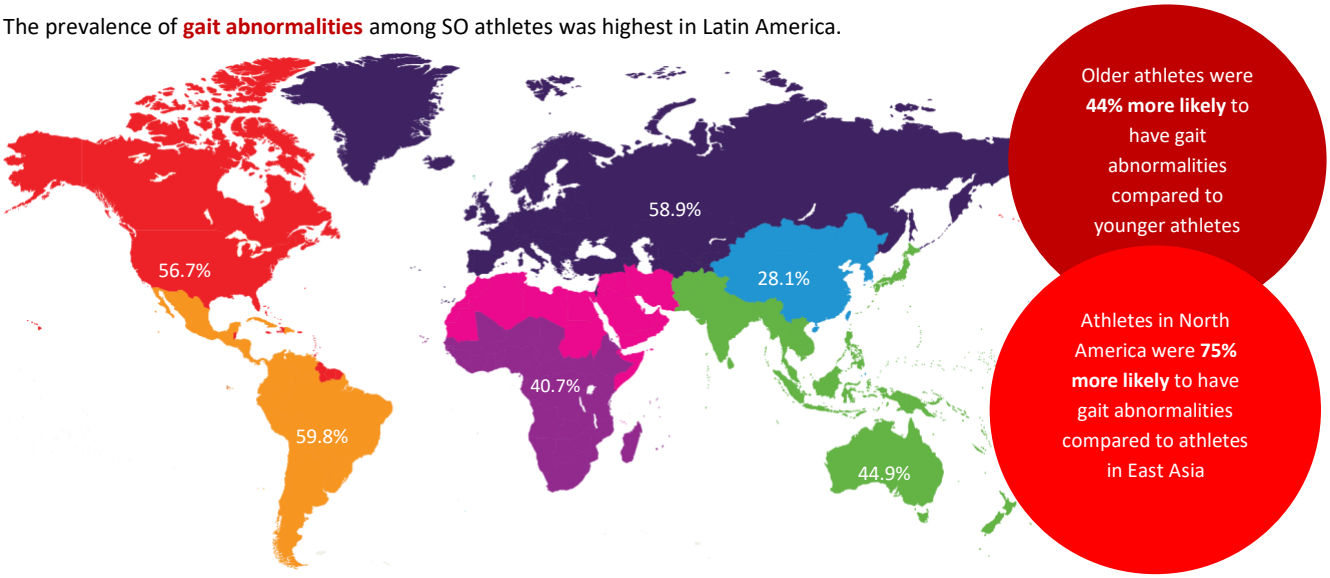
- **52%** have gait abnormalities
- **22%** have bone deformation
- **57%** have skin or nail conditions

Indicator Spotlight: Gait Abnormalities

During the Fit Feet screening, clinical volunteers analyze an athlete's gait and perform a series of observational tests on both feet to evaluate the athlete for any abnormalities associated with gait. Gait is both a cognitive and a motor activity, and abnormalities (beyond what may be expected with cognitive challenges) can result from muscle tightness and postural problems. When uncorrected, gait abnormalities can place athletes at a higher risk for falls and injuries, which could lead to loss of independence and a diminished quality of life.

A gait abnormality can include excessive pronation, early heel, forefoot abduction, excessive supination, or forefoot adduction. While this portion of the Fit Feet screening is somewhat limited by the subjectivity of a volunteer's interpretation of what qualifies as an abnormality, these observations can have substantial implications. An early heel, or toe-walking, for example, can place significant stress on the Achilles and calf muscles, cause pain, and limit athlete mobility.

The prevalence of **gait abnormalities** among SO athletes was highest in Latin America.



Results from events that took place in 2017 indicate that globally, 52% of SO athletes have at least one gait abnormality, a 6% increase in prevalence from the previous year. The prevalence of athletes with this indicator also varies significantly by gender, region, and age.

Based on data from 2017 events, the odds of having a gait abnormality increased with age. After controlling for region and gender, athletes 60 and older were about 44% more likely to have gait abnormalities compared to athletes aged 8-19. There were also significant regional differences. Athletes in North America were 75% more likely to have gait abnormalities compared to athletes in East Asia.

Gait abnormalities may also become exacerbated if an athlete is wearing an improperly fitted shoe. Based on a recent study using Healthy Athletes data, approximately 41.4% of Healthy Athletes screenings indicated that an athlete was wearing the wrong-sized shoe. A majority of those who were discovered to be improperly fitted (28.6%) were wearing at least one size too big, and a smaller portion (12.8%) were found to be wearing shoes that were too small.[2]

[2] Jenkins, DW, Foot-to-shoe-mismatch and rates of referral in Special Olympics athletes, *Journal of the American Podiatric Medical Association,* 102 (3), 2012, 187-97.

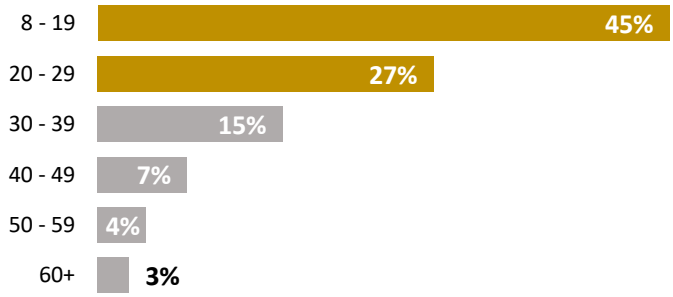
Special Olympics FUNfitness

FUNfitness provides fitness screenings and education services. FUNfitness, developed in collaboration with the American Physical Therapy Association, provides an assessment of: flexibility of hamstring, calf, shoulder rotator and hip flexor muscles; strength of the abdominal, lower and upper extremity muscles; static and dynamic balance; and aerobic fitness. These assessments are used as the basis for one-on-one education and on-site consultation to athletes and coaches on how to improve performance. Physical therapists, physical therapy assistants, and students also discuss the components of a good fitness program for risk prevention, and make recommendations for optimal function in sports training and competition so that the athletes train and compete safely.

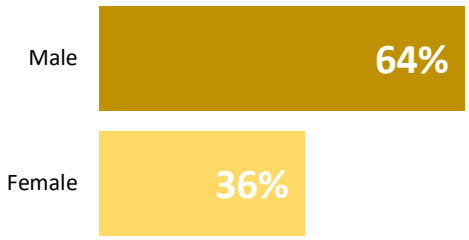
Goals

- Improve athletes' ability to train and compete in Special Olympics and improve the overall fitness of people with intellectual disabilities.
- Train healthcare professionals, students and others about the needs and care management of people with intellectual disabilities.
- Collect, analyze and disseminate data on the health and fitness status and needs of people with intellectual disabilities.
- Advocate for improved health and wellness policies and programs for people with intellectual disabilities.

Most athletes were **under 30 years old.**



Most athletes were **male.**



A majority of FUNfitness screenings took place in the **North America** Region in 2017.

In 2017, 21,296 FUNfitness screenings were conducted with athletes from 46 countries at 190 events. Results from 12,292 (57.7%) screenings were entered into HAS and show that:

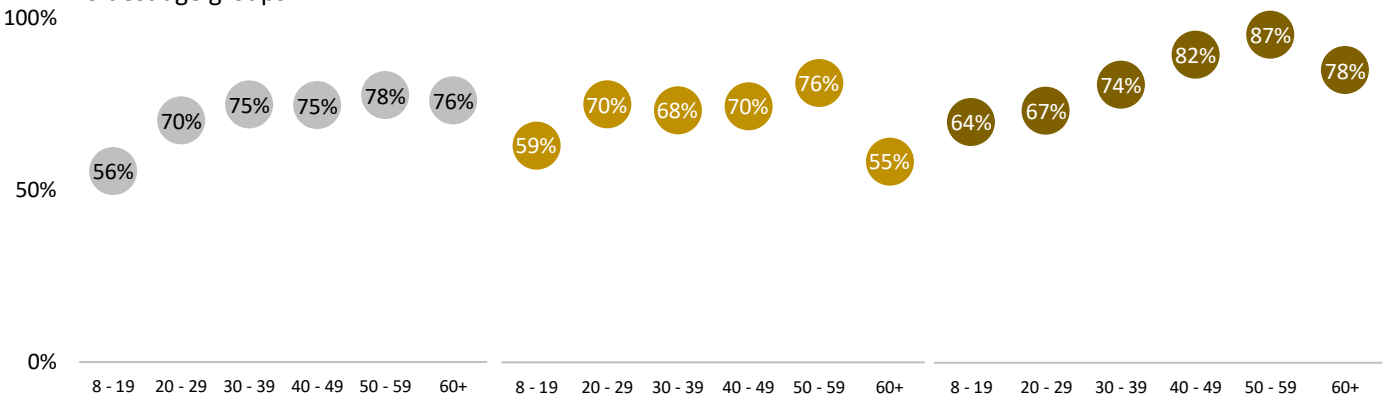
- **65%** have flexibility issues
- **65%** have strength issues
- **69%** have balance issues
- **13%** have a history of falls

Indicator Spotlight: Fitness Profile

FUNfitness is the physical therapy component of Healthy Athletes and evaluates the fitness needs of athletes. FUNfitness assesses flexibility of hamstring, calf, shoulder rotator and hip flexor muscles; functional strength of the abdominal, upper and lower extremity muscles; balance and aerobic condition. Physical therapists, related professionals and students offer expert guidance and exercise recommendations to reduce injury risk, and improve function in sports and life.

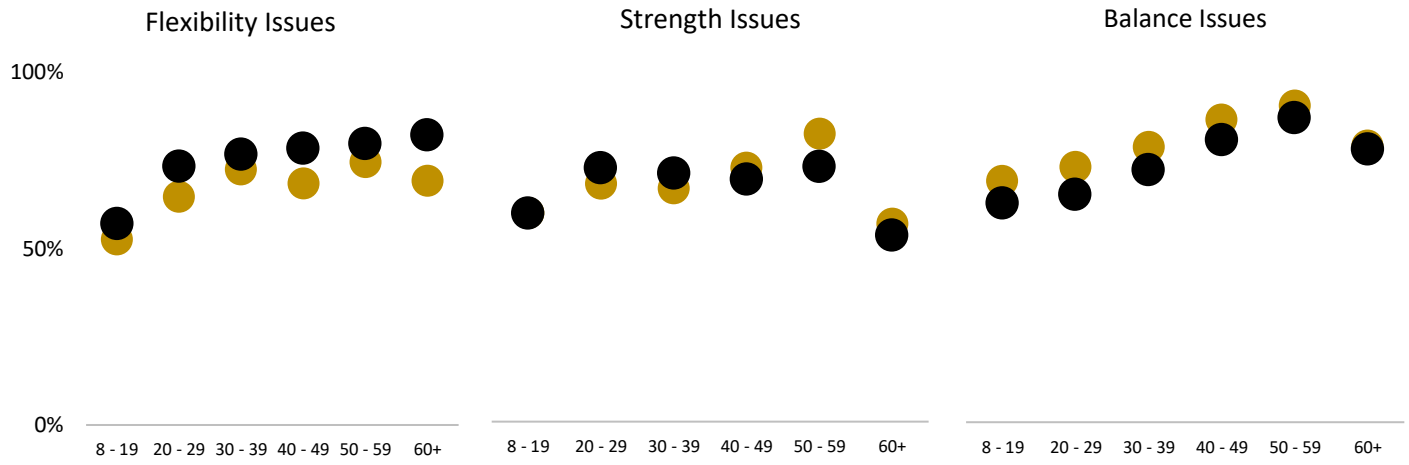
While it is important to understand these measures of flexibility, strength, balance, and aerobic condition separately, it is also critical to evaluate them together in order to develop a fitness profile of the SO athlete. Understanding this fitness profile and looking at indicators by gender, age and region can help direct fitness program planning and training for athletes with ID.

Athletes demonstrated increasing issues with **flexibility**, **strength**, and **balance** from the youngest to the oldest age groups.



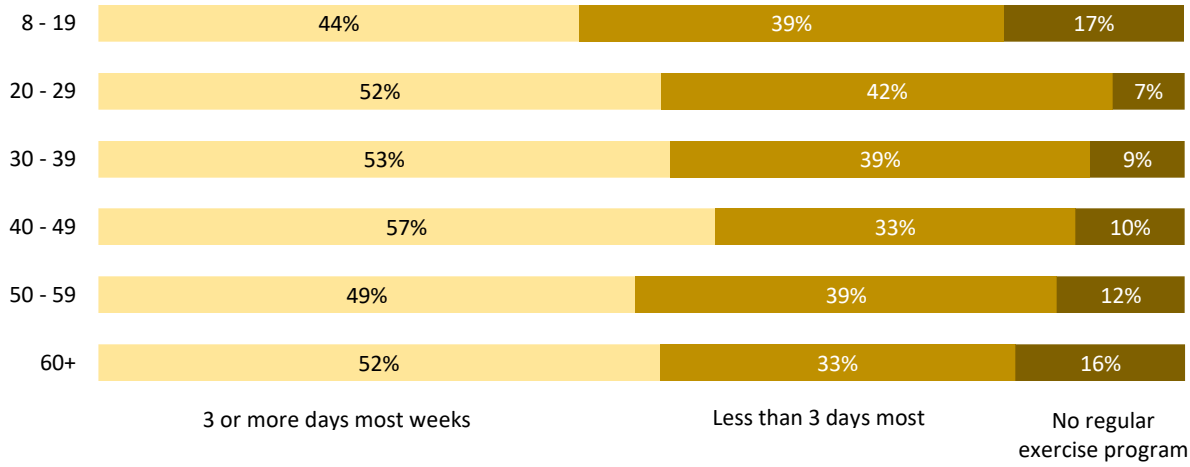
From the age range of 8-19 years, athletes demonstrated problems with flexibility (56%), strength (59%) and balance (64%). These percentages increased by approximately 20% until age 60. Interestingly, flexibility, strength, and balance issues decreased slightly after age 60.

Across all age groups, **males** demonstrated more flexibility and strength issues compared to **females** while **females** demonstrated a higher prevalence of balance issues compared to **males**.



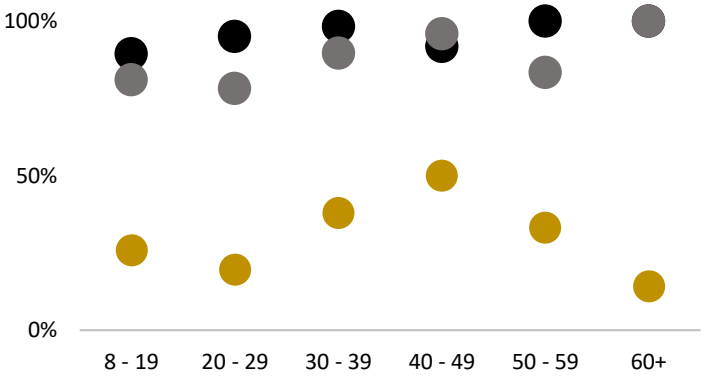
Those in the youngest and oldest age groups exercised the least number of days, while those between 20-60 years exercised more regularly (50-57% > three days). Overall, males and females demonstrated a similar prevalence of strength issues (65%) while flexibility issues were more prevalent among males and balance issues were more prevalent among females. Athletes who had balance issues were 81% more likely to report a history of falls compared to athletes who did not have balance issues.

Athletes between 20 and 60 years old exercised the most while the prevalence of not having a regular exercise program increased with age.

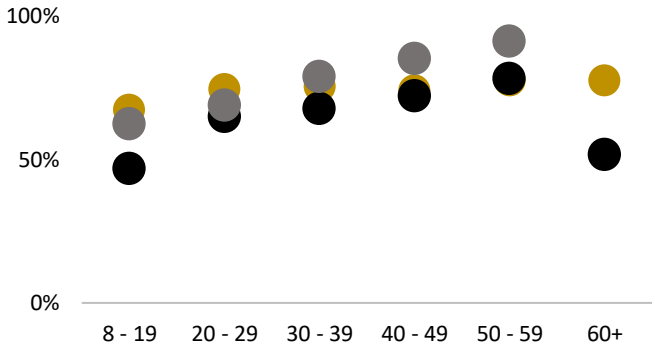


Global differences were also noted. In Africa, athletes had the highest prevalence of strength (91%) and balance (82%) issues, and demonstrated highest rate for no regular exercise (37%) compared to all other SO Regions. Notably, after controlling for age and gender, athletes in Africa were 2.4 times more likely to have balance issues compared to athletes in North America.

In Africa, **strength** and **balance** issues were highly prevalent among athletes while there was a lower prevalence of **flexibility** issues.



In North America, **strength** and **balance** issues among athletes increased with age while the prevalence of **flexibility** issues remained similar across age groups.



Athletes with ID have lifelong problems with flexibility, strength and balance. Differences in the prevalence of these issues were observed by gender, age, and global environment.

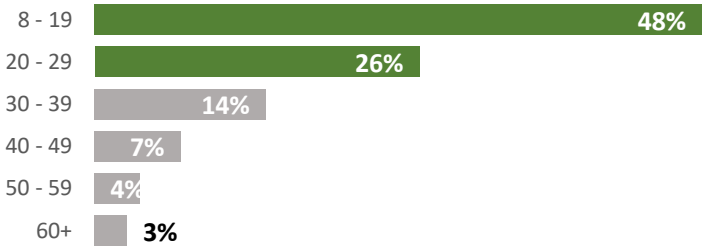
Special Olympics Health Promotion

Health Promotion focuses on health behavior and health education. The rationale for Special Olympics to promote overall health is the awareness that people with intellectual disabilities frequently have medical conditions such as heart disease, obesity, and diabetes, and that they tend to develop these conditions at earlier stages of life. At Health Promotion, physicians, nurses, nutritionists and health educators provide clinical screenings in bone density, blood pressure, and BMI and provide education in areas such as nutrition, sun safety, and tobacco cessation, targeting the athletes' needs. Health Promotion is designed to convey and reinforce key concepts on healthy living, healthy lifestyle choices, and locally-specific health issues.

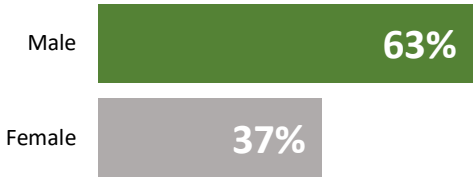
Goals

- Encourage and enhance healthy behaviors, and reduce risky behaviors, related to chronic disease prevention, as well as locally-specific health issues; improve self-efficacy and self-advocacy of people with intellectual disabilities around health and wellness.
- Provide training and educational opportunities through screening events for allied health providers to learn how to provide quality care and wellness programming to individual with intellectual disabilities.
- Develop a body of knowledge about the overall health and wellness of children and adults with intellectual disabilities.

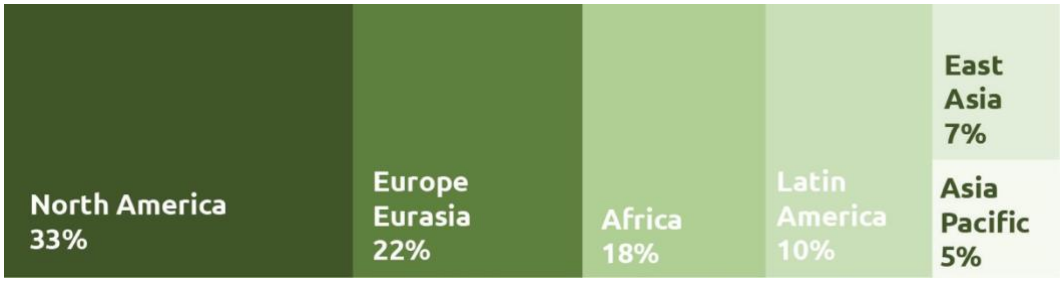
Most athletes were **under 30 years old.**



Most athletes were **male.**



A majority of Health Promotion screenings took place in the **North America** Region in 2017.



In 2017, 30,146 Health Promotion screenings were conducted with athletes from 50 countries at 257 events. Results from 17,582 (64.0%) screenings were entered into HAS and show that:

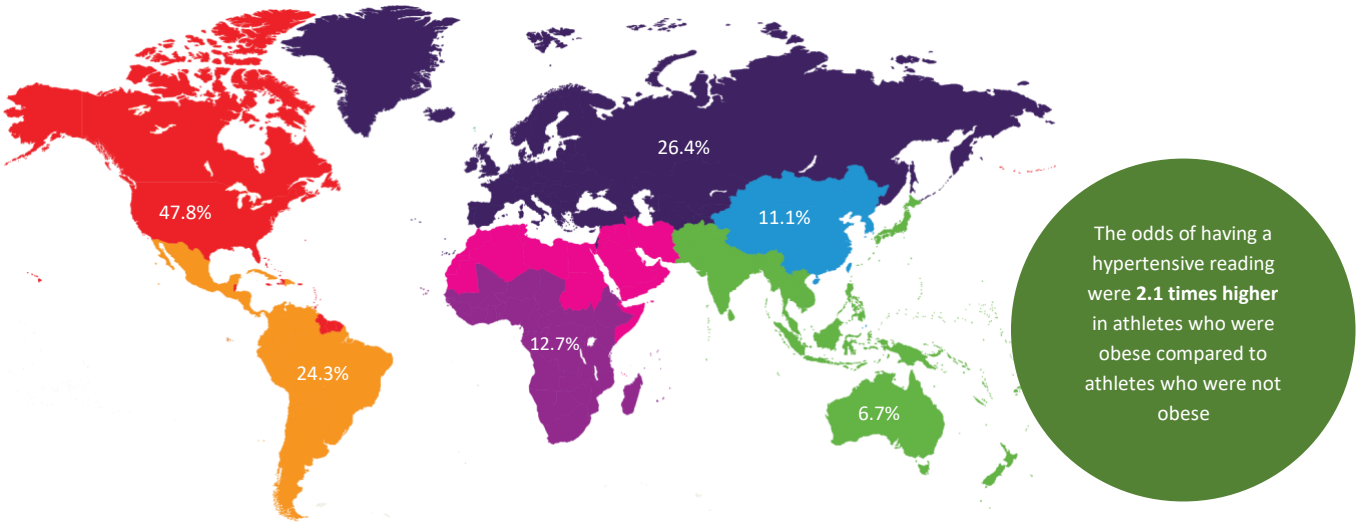
- **27.1%** of adult athletes have low bone density
- **29.7%** of youth athletes are overweight or obese
- **62.1%** of adult athletes are overweight or obese
- **56.4%** had a pre-hypertensive or hypertensive reading at time of screening
- **6.8%** use tobacco products
- **36.5%** report exposure to second hand smoke

Indicator Spotlight: Obesity, High Blood Pressure, and Heart Disease

During the Health Promotion screening, athletes' height and weight are collected and BMI is calculated. The weight categories for adults are based on World Health Organization (WHO) guidelines[3] and for athletes under 20, the WHO youth guidelines[4] for percentile are followed. Blood pressure readings are also recorded during the screening, and the latest guidelines for hypertension categories published by the American College of Cardiology[5] were used for analyses.

A well-established body of evidence suggests that cardiovascular disease (CVD) is one of the most significant factors that contributes to mortality. It remains the leading cause of death globally and claimed 17.9 million lives, or 31% of all deaths, in 2016.[6] Other studies suggest that this proportion remains high among people with ID, accounting for 22% in one study.[7] Critical behavioral risk factors for heart disease include tobacco use, poor diet, obesity, physical inactivity, and high blood pressure. While individuals may not be able to control external factors such as poverty, stress, and genetics to minimize their risk for disease, the primary contributing risk factors for CVD are behavioral in nature. Through education and the promotion of healthy habits, individuals can reduce their risk for CVD. As risk for disease also increases with age, it is essential that steps are taken to decrease the risk as early as possible.

The prevalence of **obesity** among adult athletes was highest in the North America Region.

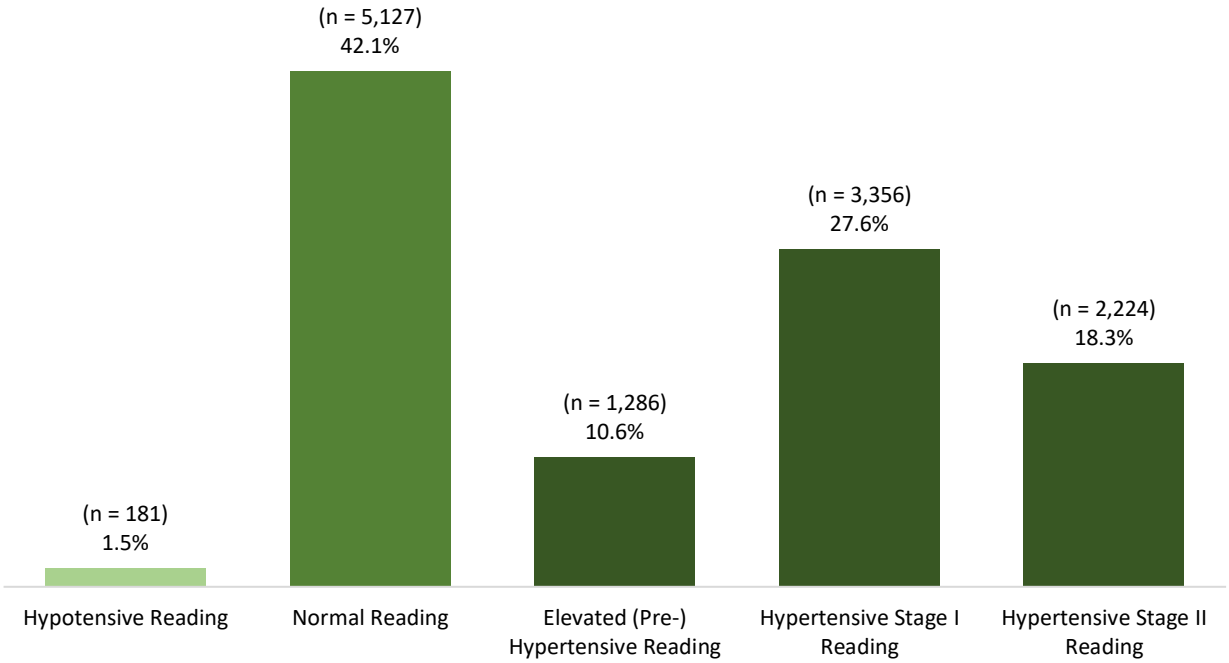


[3] World Health Organization, *Obesity and Overweight*, 16 February 2018, available at: https://www.who.int/en/news-room/fact-sheets/detail/obesity-and-overweight.
[4] World Health Organization, *Growth Reference 5-19 Years*, available at: https://www.who.int/growthref/who2007_bmi_for_age/en/.
[5] Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines, the 2017 Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults. November 2017. http://hyper.ahajournals.org/content/guidelines2017.
[6] World Health Organization, Cardiovascular diseases (CVDs), Fact Sheet, May 2017, available at http://www.who.int/mediacentre/factsheets/fs317/en/.
[7] Heslop, et al., Confidential Inquiry into premature deaths of people with learning disabilities (CIPOLD), Final Report, 2013, available at: http://www.bris.ac.uk/media- library/sites/cipold/migrated/documents/fullfinalreport.pdf.

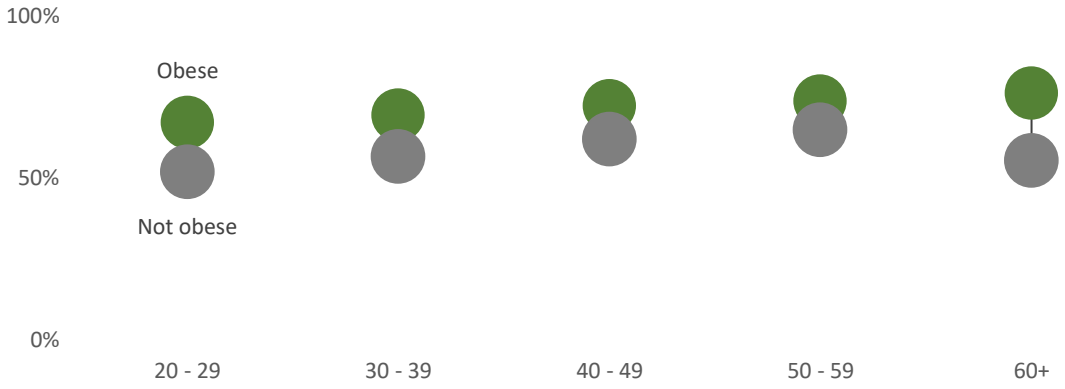
Given these behavioral factors and the objective data collected in Health Promotion, the potential association between obesity and high blood pressure was explored, recognizing that these indicators individually are well documented risk factors for heart disease.

Prevalence rates of hypertensive readings and obesity both varied significantly by age, gender, and region. Notably, North America had both the highest obesity rate and hypertensive rate compared to the other regions. After controlling for gender, age, and region, the odds of having a hypertensive reading were 2.1 times higher among athletes who were obese compared to athletes who were not obese. Poor quality of care and limited access to health promotion could affect these higher odds of hypertension.

56.4% of athletes had a **pre-hypertensive** or **hypertensive reading**.



Athletes 20 and older who were **obese** were more likely to have hypertensive readings than athletes who were **not obese**.



Hypertensive readings were also more prevalent among athletes 20 and older who were obese compared to athletes who were not obese.

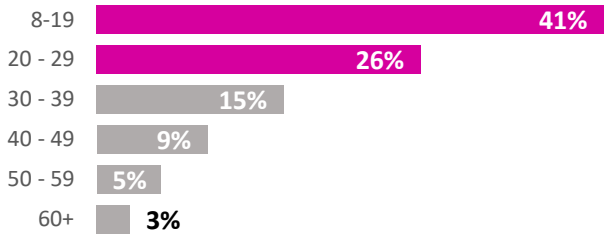
Special Olympics Healthy Hearing

Healthy Hearing is designed to assess and report the prevalence of hearing loss among Special Olympics athletes as a means of focusing attention on the hearing needs of people with intellectual disabilities. Additionally, Healthy Hearing identifies athletes with hearing loss and ear health problems through hearing testing; notifies/counsels them about needed follow-up care; and whenever possible, provides follow-up care on site at Special Olympics events. Healthy Hearing also informs athletes, coaches and caregivers about the prevention of hearing loss by providing informative brochures to them at events.

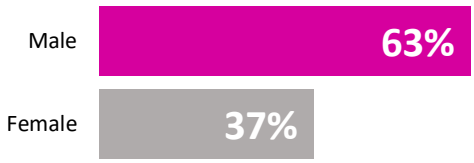
Goals

- Increase access to ear and hearing care for Special Olympics athletes, as well as all people with intellectual disabilities.
- Raise hearing health professionals' awareness of the ear and hearing concerns of people with special needs, including difficulties involved in accessing care.
- When possible, provide a list of regional hearing health professionals who care for people with special needs to all athletes who participate in Healthy Hearing.
- Develop a body of knowledge about the ear canal hygiene of children and adults with intellectual disabilities.
- Train healthcare professionals, students and others about the needs and care management of people with intellectual disabilities.

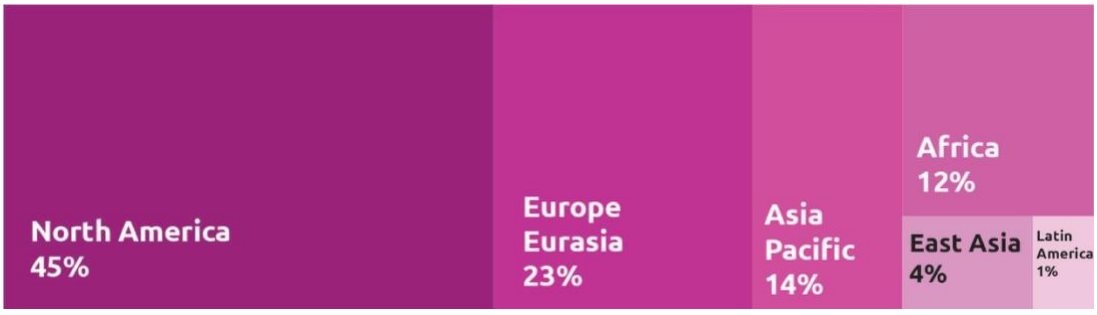
Most athletes were **under 30 years old.**



Most athletes were **male.**



A majority of Healthy Hearing screenings took place in the **North America** region in 2017.



In 2017, 22,366 Healthy Hearing screenings were conducted with athletes from 35 countries at 158 events. Results from 10,603 (47.4%) screenings were entered into HAS and show that:

- **7.1%** have permanent hearing loss
- **23.0%** failed the pure tone hearing test
- **28.8%** have possible middle ear problems
- **40.6%** have blocked or partially blocked ear canals

Indicator Spotlight: Subjective Hearing State and Measured Hearing Screening Results

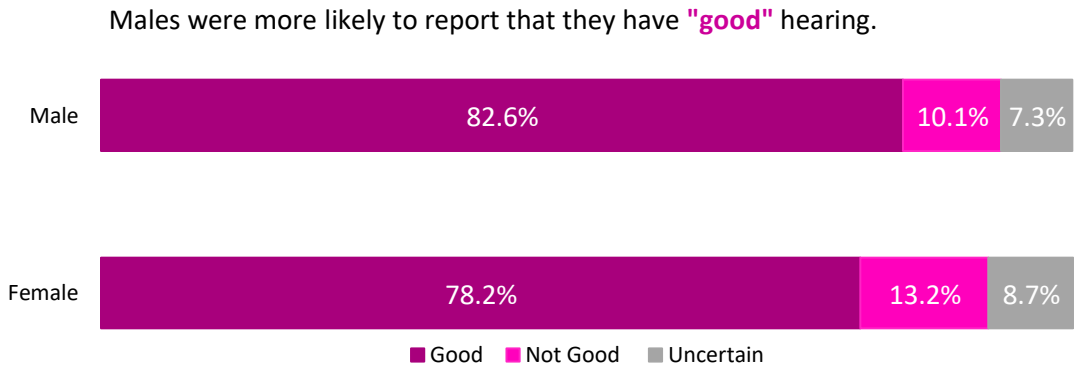
During the Healthy Hearing screening, athletes are asked some preliminary questions about the state of their hearing, including questions about pain in the ear and use of hearing aids. The athlete needs to qualify their general hearing state as "good," "not good," or "not sure." The athlete's subjective answer compared to the actual hearing screening results provides information on an athlete's awareness about their own hearing health.

Within this 2017 sample, a majority (81%) of athletes rated their hearing as "good." About 11% rated their hearing as "not good," and 8% were uncertain how to rate their hearing state. Among those who self-rated their hearing as "good," 40% had blocked or partially blocked ear canals, 6% had permanent hearing loss, 25% had possible middle ear problems, and 19% failed the pure tone hearing test.

Subjective Hearing Status	Blocked or Partially Blocked Ear Canals	Permanent Hearing Loss	Possible Middle Ear Problems	Failed Pure Tone Hearing Test
Good	40%	6%	25%	19%
Not Good	43%	16%	37%	47%
Uncertain	47%	12%	27%	39%

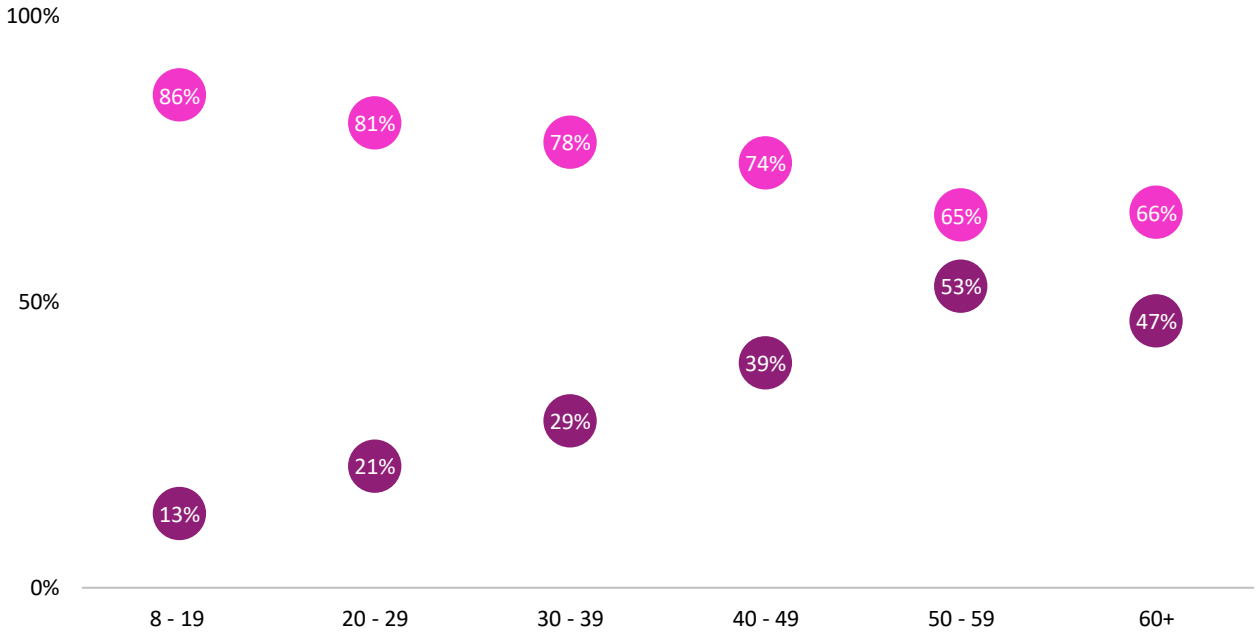
Similarly, among those athletes who rated their hearing as "not good," 43% had blocked or partially blocked ear canals, 16% had permanent hearing loss, 37% had possible middle ear problems, and 47% failed the pure tone hearing test. Based on these observations, athletes who rated their hearing as good were less likely to have hearing issues compared to athletes who rated their hearing as not good.

After controlling for age, gender, and region, athletes who rated their hearing as good were about 30% less likely to have permanent hearing loss, 20% less likely to have blocked or partially blocked ear canals, 30% less likely to have possible middle ear problems, and 70% less likely to fail the pure tone hearing test compared to athletes who did not rate their hearing as good.



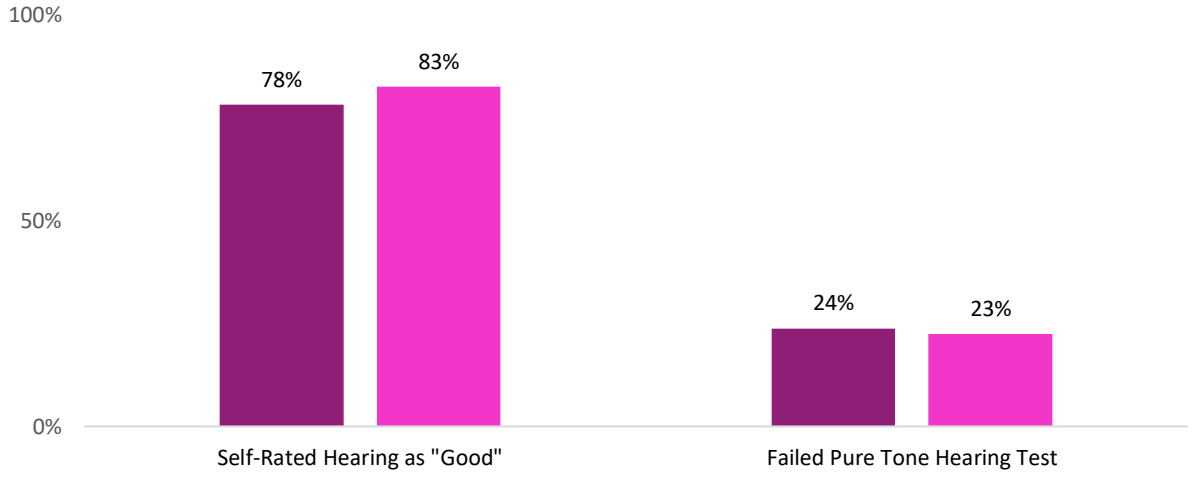
Differences in subjective hearing state were also noted across age, gender, and region. As expected, the likelihood of athletes reporting good hearing generally decreased with age, with athletes in the youngest age group (8-19) reporting the highest rate of good hearing (86%) and the 50-59 year old group reporting the lowest (65%).

The prevalence of athletes **who failed the pure tone hearing test** increased with age while the prevalence fo those who **reported their hearing as "good"** decreased.



Variation in subjective hearing state was also observed to be significant within gender. Males were about 25% more likely to report good hearing compared to females, and about as likely to fail the pure tone hearing test.

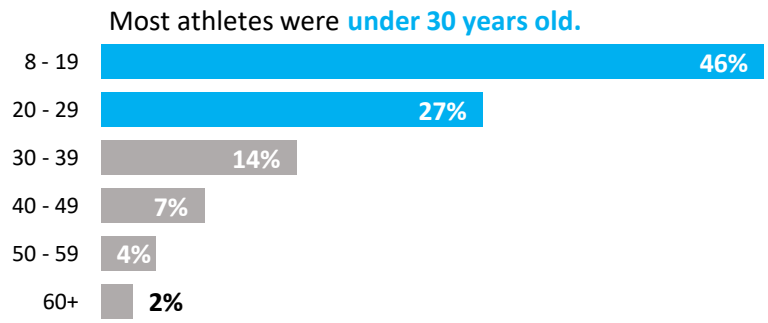
Males were more likely to self-rate their hearing state as "good" and almost as likely to fail the pure tone hearing test compared to **females**.

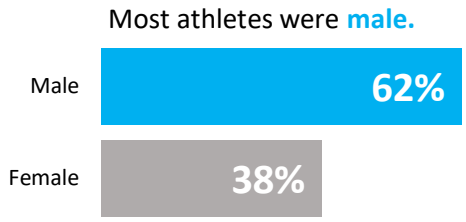


Through the global partnership of Special Olympics and Lions Clubs International Foundation, the Special Olympics Lions Clubs International Opening Eyes program, Special Olympics athletes receive extensive vision and eye health tests, refraction for those requiring further refractive evaluation in order to determine the need or provision of prescription eyeglasses and /or protective sports eyewear (either with a prescription or simply protective), and determination of whether there is a need referral for follow-up care. Sunglasses have also been provided for those athletes who go through the Opening Eyes program and do not need corrective lenses for distance viewing.

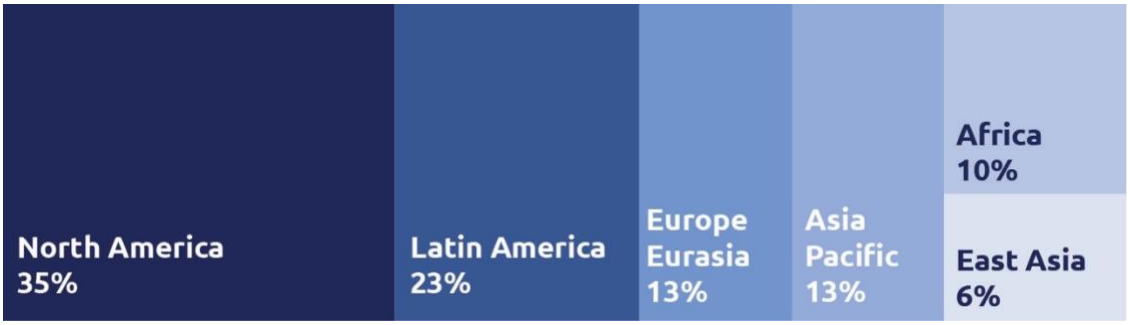
Goals

- Increase access to eye care for Special Olympics athletes, as well as all people with intellectual disabilities.
- Raise eye care professionals' awareness of vision and eye health concerns of people with special needs, including difficulties involved in accessing treatment.
- Train healthcare professionals, students and others about the needs and care management of people with intellectual disabilities.
- Develop a body of knowledge about vision and eye health of children and adults with special needs.





A majority of Opening Eyes assessments took place in the **North America** Region in 2017.



In 2017, 37,780 Opening Eyes assessments were conducted with athletes from 52 countries at 251 events. Results from 19,835 (52.5%) assessments were entered into HAS and show that:

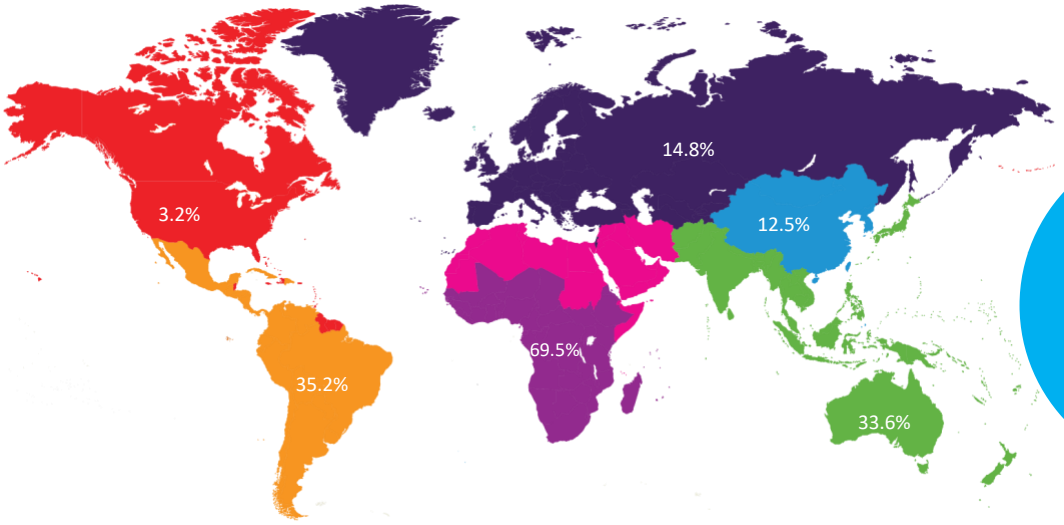
- **23.0%** never had an eye exam
- **18.1%** had an eye disease
- **26.3%** needed a new prescription

Indicator Spotlight: Exam History

During the Opening Eyes screening, athletes go through a series of tests to assess overall vision along with a brief history of vision care, and are provided prescription eyewear, sports goggles, or sunglasses if deemed necessary. For athletes, wearing the appropriate corrective lenses could mean the difference between seeing the ball on the soccer field and not seeing it. Making sure athletes can see clearly is critical not only as they compete in SO events, but as they function on a daily basis.

One question on the Opening Eyes form asks about the athlete's most recent eye exam. While this question may be subjective, 2017 data show a relatively high percentage of athletes in regions other than North America indicated that they have never had an exam and that the assessment they were about to receive would be their first one. Never before having an eye exam may be an indication that the athlete does not have access to adequate care in their home community.

The prevalence of **never having an eye exam** among SO athletes is highest in the Africa Region.



The odds of never having an eye exam in Africa were **45 times higher** than the odds of never having an eye exam in North America

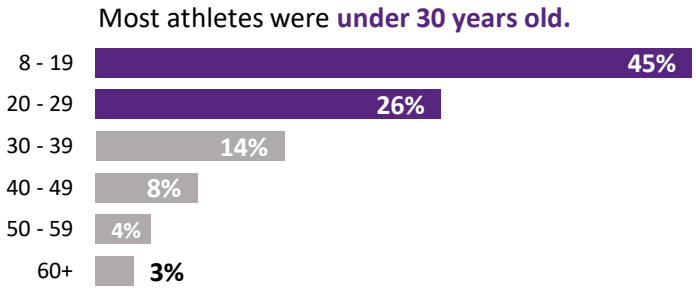
Nearly 10% of athletes reported that they had received an eye exam within the past year and also needed a new prescription for corrective lenses, indicating that the **quality of care** they did receive may not have adequate. Similarly, 8.7% of athletes who reported they do not wear corrective lenses received a prescription for them at the end of the assessment.

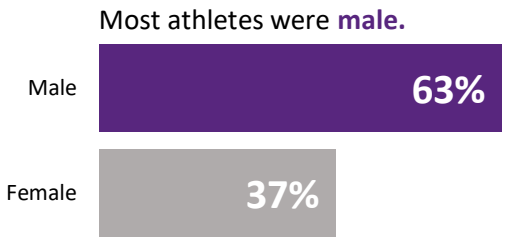
In 2017, globally, 23% of athletes indicated that they had never had an eye exam. The prevalence of this indicator varied significantly by gender, region, and age, but varied the most widely by region. After controlling for age and gender, athletes in all regions had significantly higher odds of never having an eye exam compared to athletes in North America. The odds of never having an exam in Africa, for example, were 45 times higher than the odds of never having an exam in North America.

In cooperation with the Division of Oral Health at the Centers for Disease Control and Prevention (CDC), Special Olympics developed the Special Smiles protocol to evaluate oral health. Special Smiles provides SO athletes with an oral health screening, education about the importance of good oral hygiene habits, instructions in correct tooth brushing and flossing methods, and refers athletes to potential sources of treatment and follow-up care.

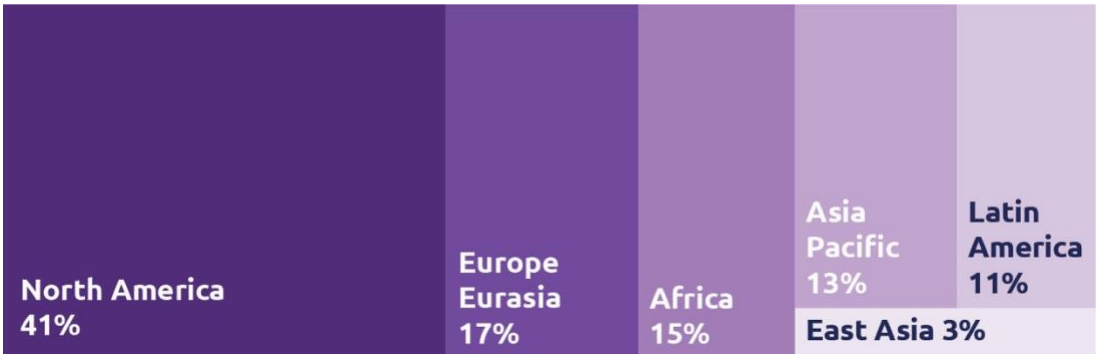
Goals

- Increase access to dental care for Special Olympics athletes, as well as all people with intellectual disabilities.
- Raise dental professionals' awareness of the oral health concerns of people with special needs, including difficulties involved in accessing care.
- Train healthcare professionals, students and others about the needs and care management of people with intellectual disabilities.
- Develop a body of knowledge about the oral healthcare needs of children and adults with intellectual disabilities.
- When possible, provide a list of regional dental professionals who care for people with special needs to all athletes who participate in Special Smiles.





A majority of Special Smiles screenings took place in the **North America** Region in 2017.



In 2017, 46,510 Special Smiles screenings were conducted with athletes from 59 countries at 353 events. Results from 27,523 (59.2%) screenings were entered into HAS and show that:

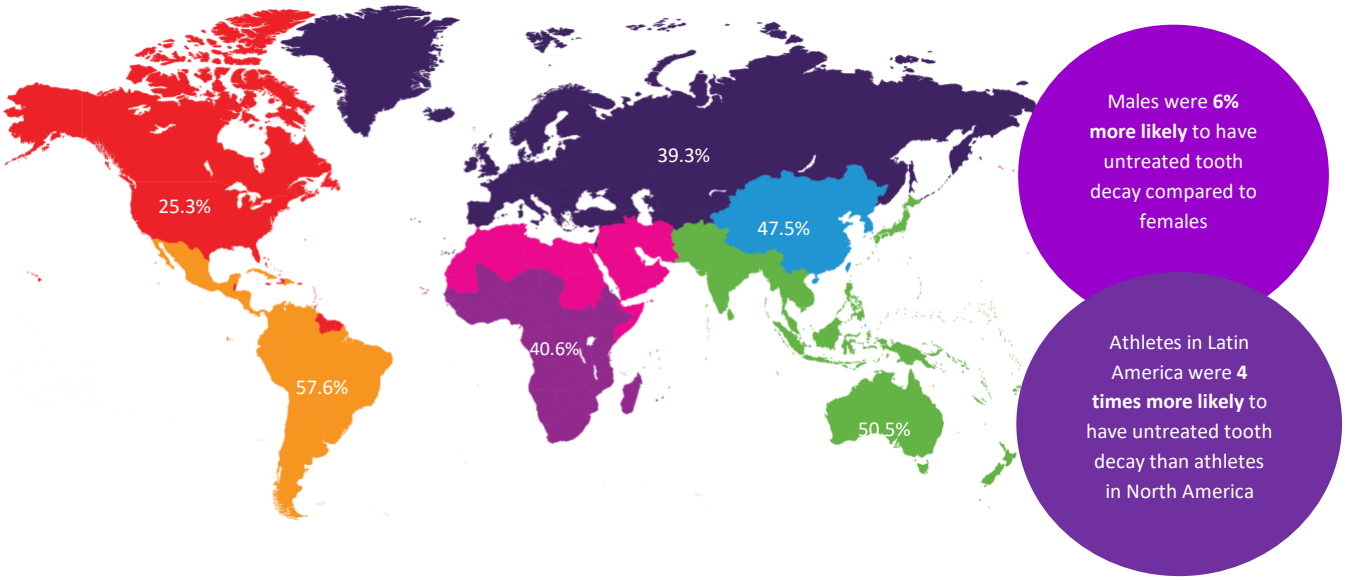
- **14.5%** have mouth pain
- **37.6%** have untreated tooth decay
- **27.7%** have missing teeth
- **44.5%** have gingival signs
- **15.2%** received an urgent dental referral

Indicator Spotlight: Untreated Tooth Decay

During the Special Smiles screening, clinicians assess whether or not athletes have untreated decay in at least one tooth. If left untreated, tooth decay can cause further health complications like swelling, pain, and infections, which can lead to eventual tooth loss. These complications can impact functioning in athletes and limit their ability to fully participate in not only sports, but in other aspects of everyday life as well.

In 2017, globally, nearly 40% of athletes had untreated tooth decay, which can indicate either a lack of access to care or a lack in the quality of care that is received. Notably, Latin America had the highest prevalence of athletes with untreated tooth decay.

The prevalence of **untreated tooth decay** among SO athletes was highest in Latin America.

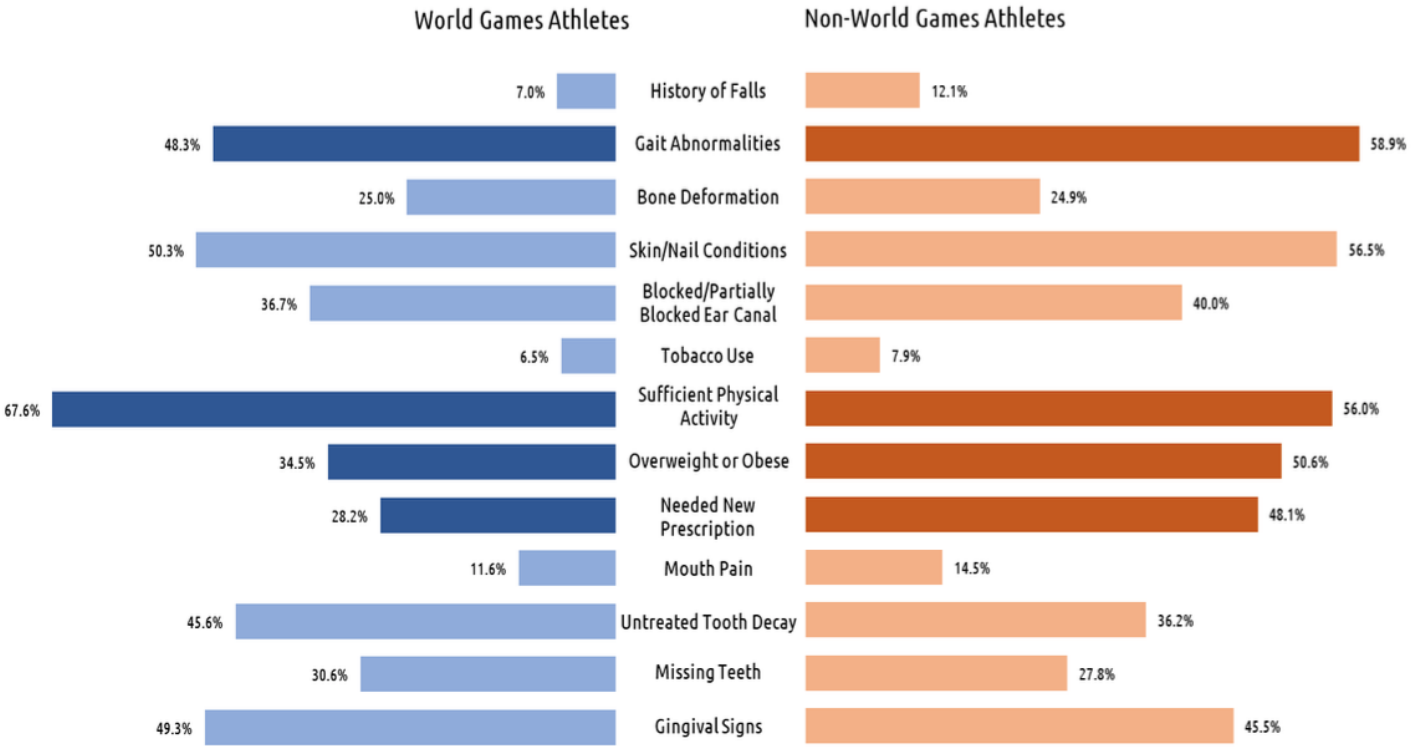


After controlling for gender and age, the odds of having untreated tooth decay in Latin America were **4** times higher than the odds of having untreated tooth decay in North America. Similarly, the odds of having untreated tooth decay in Africa, Asia Pacific, East Asia, and Europe/Eurasia were 2-3 times higher than the odds of having untreated decay in North America.

Prevalence of untreated tooth decay did not significantly vary by age group. Of note, however, males were 6% more likely to have untreated tooth decay compared to females after controlling for age and region.

World Games: Data Highlights

While it has been hypothesized that athletes who participate in World Games are healthier compared to athletes who do not participate in World Games, a comprehensive analysis supporting this claim has not been conducted until recently. **Preliminary analyses suggest that athletes who compete in World Games have a lower prevalence of several health risk indicators. See figure below for details.**



Notably, athletes competing in World Games have a lower prevalence of gait abnormalities (48.3%) compared to athletes not competing in World Games (58.9%). Additionally, World Games athletes were more likely to get sufficient physical activity compared to non-World Games athletes. World Games athletes were nearly twice as likely to exercise three times per week compared to their non-World Games competing peers. Athletes competing at the local level only were 2.3 times more likely to need a new prescription compared to athletes competing in World Games. Finally, non-World Games athletes were more than 75% more likely than World Games athletes to be overweight or obese.

General Population Comparison of Health Indicators

When comparing the prevalence rates of certain health risk indicators among Special Olympics athletes to those in the general population, disparities become evident. One of the largest discrepancies exists in obesity. In Special Olympics athletes, 32% of the adult population globally were obese compared to 13% of the general population. However, within the United States, a higher percentage of adult SO athletes were sufficiently active compared to the general population.

Health indicators for Special Olympics athletes and the general population (2008-2018)

Health Indicator	Special Olympics Athletes, Global (%)	Special Olympics Athletes, United States (%)	General Population, Global (%)	General Population, United States (%)
Untreated Tooth Decay	36.7	25.4	35.4[1]	27.0[2]
Missing Teeth[2]	28.1	29.4	-	52.0[3]
Obesity (BMI≥30) (Adults 20+)	32.2	46.2	13.0[4]	30.4[5]
Sufficient Aerobic activity (3 or more days per week)	53.2	65.9	-	49.7[6]
Insufficient Aerobic activity (1-2 days per week)	38.4	28.9	-	19.9[7]
Inactive - Aerobic activity (No days per week)	8.4	5.2	-	30.4[8]
Balance Problems	66.6	72.8	-	35.4[9]
Skin/Nail Conditions	50.2	43.1	-	27.0[10]

1. N.J. Kassebaum, , E. Bernabé, M. Dahiya, B. Bhandari, C.J.L. Murray, W. Marcenes, Global Burden of Untreated Caries, *Journal of Dental Research* Vol 94, Issue 5, pp. 650 – 658 First published date: March-04-2015 10.1177/0022034515573272.
2. Centers for Disease Control and Prevention, *Dental Caries and Tooth Loss in the United States, 2011-2012,* NCHS Data Brief, available from: https://www.cdc.gov/nchs/products/databriefs/db197.htm.
3. Centers for Disease Control and Prevention, *Dental Caries and Tooth Loss in the United States, 2011-2012,* NCHS Data Brief, available from: https://www.cdc.gov/nchs/products/databriefs/db197.htm.
4. World Health Organization, *Obesity and Overweight*, Fact Sheet, Updated June 2016, available from: http://www.who.int/mediacentre/factsheets/fs311/en/.
5. NCHS, National Health Interview Survey, 1997–2016, Sample Adult Core component https://www.cdc.gov/nchs/data/nhis/earlyrelease/earlyrelease201609_06.pdf.
6. NCHS, *Technical Notes for Summary Health Statistics Tables: National Health Interview Survey*, available from: http://www.cdc.gov/nchs/nhis/SHS/tables.htm.
7. NCHS, *Technical Notes for Summary Health Statistics Tables: National Health Interview Survey*, available from: http://www.cdc.gov/nchs/nhis/SHS/tables.htm.
8. NCHS, *Technical Notes for Summary Health Statistics Tables: National Health Interview Survey*, available from: http://www.cdc.gov/nchs/nhis/SHS/tables.htm.
9. Agrawal Y, Carey JP, Della Santina CC, Schubert MC, Minor LB. Disorders of Balance and Vestibular Function in US Adults: Data from the National Health and Nutrition Examination Survey, 2001-2004. Arch Intern Med.2009;169(10):938-944. doi:10.1001/archinternmed.2009.66.
10. Lim H, Collins S, Resneck J et al. The burden of skin disease in the United States. Journal of the American Academy of Dermatology. 2017;76(5):958-972.e2. doi:10.1016/j.jaad.2016.12.043, available from: http://www.sciencedirect.com.proxy-um.researchport.umd.edu/science/article/pii/S0190962217300166#bib1.

Conclusions and Implications

These results indicate that the prevalence rates of several health indicators were high among athletes who received Healthy Athletes screenings in 2017 regardless of age, gender, and region. The odds of these health indicators were also significantly elevated in certain groups. The health issues described in this report can be strong risk factors for chronic health conditions that affect both functional ability and quality of life. Understanding which groups have the highest risks for these issues helps SO improve interventions and target health programming to individuals with the greatest need.

Understanding the magnitude of these differences further allows SO to address systemic barriers to achieving equitable health for individuals with ID. While Healthy Athletes does not directly collect data on the quality of healthcare received outside of Healthy Athletes, there are several measures that are collected that could indicate a potential lack of quality or access to care. For example, the significantly higher odds of untreated tooth decay observed in several regions compared to the odds in North America could indicate that athletes either do not have access to a local dentist or that if they visit a dentist, the care they receive is not sufficient or appropriate. Identifying these upstream social determinants of health can be a powerful method to unlock these barriers at the systems level and facilitate change.

These results are an indication that the local care that is or is not received by athletes in their communities is not adequate. Programs can use these results to establish local partnerships or relationships with clinics to ensure athletes and the broader population of individuals with ID are receiving the care they deserve.

Contact Information

Special Olympics welcomes working with external partners, including students, to analyze Healthy Athletes data for research purposes. Data can be shared by filling out the data request and project proposal form. Special Olympics is open to collaboration on research projects and has the ability to provide some statistical support. Questions should be directed to healthdata@specialolympics.org or Molly Sadowsky (Senior Manager, Research and Evaluation) at msadowsky@specialolympics.org.

Appendices

The following appendices include comprehensive summary tables and figures for Healthy Athletes data collected at events through 2017.

Appendix I: Discipline Summary Tables

Table 1.1 Prevalence of Fit Feet Health Indicators by Age, 2017.												
	8 - 19		20 - 29		30 - 39		40 - 49		50 - 59		60+	
	%	n	%	n	%	n	%	n	%	n	%	n
Fit Feet Total	100.0%	4920	100.0%	3597	100.0%	1869	100.0%	1092	100.0%	651	100.0%	393
Gait Abnormalities	45.8%	2255	56.9%	2046	56.2%	1051	57.1%	624	54.8%	357	51.7%	203
Bone Deformation	18.1%	891	21.2%	762	26.0%	485	28.0%	306	33.5%	218	26.7%	105
Skin/Nail Conditions	50.7%	2364	57.4%	1941	60.7%	1058	64.8%	658	71.6%	444	62.4%	212

Table 1.2 Prevalence of Fit Feet Health Indicators by Region, 2017.												
	Africa		Asia Pacific		East Asia		Europe Eurasia		Latin America		North America	
	%	n	%	n	%	n	%	n	%	n	%	n
Fit Feet Total	100.0%	1199	100.0%	2252	100.0%	562	100.0%	1576	100.0%	748	100.0%	6185
Gait Abnormalities	40.7%	488	44.9%	1011	28.1%	158	58.9%	928	59.8%	447	56.7%	3504
Bone Deformation	16.7%	200	21.8%	490	12.1%	68	26.1%	411	22.2%	166	23.2%	1432
Skin/Nail Conditions	48.0%	564	74.4%	1653	36.6%	197	72.0%	1080	76.0%	547	47.0%	2636

*Not enough Fit Feet screenings that took place in the Middle East/North Africa (MENA) Region in 2017 were entered into HAS and are therefore not displayed in this table.

Table 1.3 Prevalence of Fit Feet Health Indicators by Gender, 2017.				
	Female		Male	
	%	n	%	n
Fit Feet Total	100.0%	4765	100.0%	7520
Gait Abnormalities	51.1%	2436	52.9%	3976
Bone Deformation	22.9%	1091	21.0%	1581
Skin/Nail Conditions	53.3%	2385	59.5%	4216

Table 2.1 Prevalence of FUNfitness Health Indicators by Age, 2017.												
	8 - 19		20 - 29		30 - 39		40 - 49		50 - 59		60+	
	%	n	%	n	%	n	%	n	%	n	%	n
FUNfitness Total	100.0%	5569	100.0%	3273	100.0%	1803	100.0%	871	100.0%	468	100.0%	308
3 or More Days of Exercise Most Weeks	44.3%	1940	51.9%	1413	52.7%	793	56.8%	406	49.5%	185	51.7%	123
Less Than 3 Days of Exercise Most Weeks	39.1%	1711	41.5%	1132	38.7%	582	33.2%	237	38.8%	145	32.8%	78
Flexibility Problems Identified	55.6%	3094	70.2%	2296	75.0%	1353	74.7%	651	77.6%	363	76.0%	234
Strength Problems Identified	58.9%	3281	70.0%	2290	68.4%	1233	69.6%	606	75.9%	355	54.6%	168
Balance Problems Identified	64.1%	3570	67.1%	2196	74.1%	1336	82.0%	714	87.4%	409	77.9%	240
History of Falls	14.4%	556	10.3%	269	11.1%	163	14.6%	104	10.8%	43	13.7%	39

Table 2.2 Prevalence of FUNfitness Health Indicators by Region, 2017.												
	Africa		Asia Pacific		East Asia		Europe Eurasia		Latin America		North America	
	%	n	%	n	%	n	%	n	%	n	%	n
FUNfitness Total	100.0%	770	100.0%	1119	100.0%	681	100.0%	3132	100.0%	1753	100.0%	4812
3 or More Days of Exercise Most Weeks	29.0%	170	42.9%	264	49.9%	238	39.9%	1157	30.1%	419	66.2%	2611
Less Than 3 Days of Exercise Most Weeks	34.3%	201	37.5%	231	31.7%	151	43.8%	1270	63.9%	889	28.5%	1123
Flexibility Problems Identified	26.5%	204	47.9%	536	52.9%	360	73.7%	2307	60.0%	1052	73.4%	3532
Strength Problems Identified	91.3%	703	71.8%	803	57.7%	393	55.8%	1747	72.6%	1272	62.2%	2991
Balance Problems Identified	82.0%	631	79.1%	885	74.5%	507	55.1%	1727	67.4%	1182	73.3%	3526
History of Falls	2.8%	15	9.7%	40	16.7%	51	14.4%	420	14.1%	163	12.1%	485

*Not enough FUNfitness screenings that took place in the Middle East/North Africa (MENA) Region in 2017 were entered into HAS and are therefore not displayed in this table.

Table 2.3 Prevalence of FUNfitness Health Indicators by Gender, 2017.				
	Female		Male	
	%	n	%	n
FUNfitness Total	100.0%	4359	100.0%	7756
3 or More Days of Exercise Most Weeks	45.2%	1587	50.6%	3174
Less Than 3 Days of Exercise Most Weeks	42.1%	1475	37.7%	2365
Flexibility Problems Identified	61.4%	2677	66.8%	5180
Strength Problems Identified	64.3%	2802	65.0%	5041
Balance Problems Identified	73.0%	3184	66.1%	5129
History of Falls	15.0%	503	11.3%	657

Table 3.1 Weight Status by Age, Youth (8 - 19), 2017.												
	8 - 9		10 - 11		12 - 13		14 - 15		16 - 17		18 - 19	
	%	n	%	n	%	n	%	n	%	n	%	n
Underweight	12.4%	83	15.2%	146	13.3%	168	12.3%	204	12.2%	238	13.3%	172
Normal Weight	54.3%	362	56.7%	545	56.2%	710	59.7%	991	58.7%	1143	55.6%	719
Overweight	13.8%	92	12.2%	117	12.6%	159	11.3%	187	12.6%	246	12.1%	156
Obese	19.5%	130	15.9%	153	18.0%	227	16.7%	277	16.5%	322	19.0%	246

Table 3.2 Weight Status by Age, Adults (20+), 2017.										
	20 - 29		30 - 39		40 - 49		50 - 59		60+	
	%	n	%	n	%	n	%	n	%	n
Underweight	7.5%	294	2.9%	61	2.7%	29	1.4%	8	4.9%	21
Normal Weight	39.4%	1536	29.3%	624	23.6%	256	22.6%	131	28.9%	123
Overweight	24.1%	941	28.3%	603	30.1%	326	34.8%	202	33.6%	143
Obese	29.0%	1131	39.5%	841	43.7%	474	41.3%	240	32.6%	139

Table 3.3 Prevalence of Health Promotion Health Risk Indicators by Age, 2017.												
	8 - 19		20 - 29		30 - 39		40 - 49		50 - 59		60 +	
	%	n	%	n	%	n	%	n	%	n	%	n
Health Promotion Total	100.0%	8420	100.0%	4503	100.0%	2376	100.0%	1198	100.0%	631	100.0%	454
Low Bone Density*	.	.	24.9%	190	24.1%	116	31.3%	86	31.3%	51	45.7%	32
Use Tobacco Products	4.7%	345	7.4%	274	9.6%	177	12.5%	114	14.3%	67	7.8%	13
Exposure to Second Hand Smoke	35.3%	2488	37.8%	1331	37.7%	660	38.1%	326	37.8%	166	36.6%	56
Pre-Hypertensive or Hypertensive Reading**	49.9%	2400	62.2%	2186	62.3%	758	33.2%	345	31.2%	172	37.1%	122

*Bone mineral density is only measured in adult athletes (20+)

**Hypertension only evaluated in athletes ages 13 and up.

Table 3.4 Prevalence of Health Promotion Health Risk Indicators by Region, 2017.												
	Africa		Asia Pacific		East Asia		Europe Eurasia		Latin America		North America	
	%	n	%	n	%	n	%	n	%	n	%	n
Health Promotion Total	100.0%	3169	100.0%	855	100.0%	1187	100.0%	3808	100.0%	2753	100.0%	5783
Low Bone Density (adults only)	.	.	.	.	.	.	32.3%	116	12.5%	3	26.2%	356
Obese (youth)	5.7%	119	3.9%	23	17.2%	162	11.8%	190	33.2%	447	34.6%	407
Overweight (youth)	6.6%	138	6.3%	37	16.0%	151	15.0%	241	14.0%	189	16.8%	198
Underweight (youth)	23.4%	493	30.6%	181	9.9%	93	7.2%	116	5.3%	71	4.8%	56
Obese (adult)	12.7%	74	6.7%	16	11.1%	24	26.4%	563	24.3%	230	47.8%	1916
Overweight (adult)	14.8%	86	17.9%	43	26.9%	58	29.9%	637	28.8%	272	27.9%	1118
Underweight (adult)	20.1%	117	24.2%	58	10.2%	22	3.4%	72	5.3%	50	2.4%	94
Use Tobacco Products	7.1%	211	2.4%	14	3.3%	38	12.8%	442	1.6%	38	6.3%	247
Exposure to Second Hand Smoke	32.5%	933	21.4%	118	44.2%	502	51.4%	1691	26.2%	599	0.0%	1176
Pre-Hypertensive or Hypertensive Reading**	53.1%	751	51.2%	334	42.8%	255	41.6%	1311	49.8%	749	41.1%	1995

*Not enough Health Promotion screenings that took place in the Middle East/North Africa (MENA) Region in 2017 were entered into HAS and are therefore not displayed in this table.

Table 3.5 Prevalence of Health Promotion Health Indicators by Gender, 2017.				
	Female		Male	
	%	n	%	n
Health Promotion Total	100.0%	6553	100.0%	10964
Low Bone Density (adults only)	24.4%	189	29.3%	286
Obese (youth)	17.3%	470	17.4%	885
Overweight (youth)	14.7%	399	11.0%	558
Underweight (youth)	8.6%	234	15.3%	777
Obese (adult)	43.3%	1391	29.1%	1427
Overweight (adult)	25.9%	832	28.2%	1379
Underweight (adult)	4.3%	138	5.6%	275
Use Tobacco Products	4.7%	249	8.1%	741
Exposure to Second Hand Smoke	35.9%	1815	36.9%	3194
Pre-Hypertensive or Hypertensive Reading*	49.5%	2277	60.6%	4576

*Hypertension only evaluated in athletes ages 13 and up.

Table 4.1 Prevalence of Healthy Hearing Health Indicators by Age, 2017.												
	8 - 19		20 - 29		30 - 39		40 - 49		50 - 59		60+	
	%	n	%	n	%	n	%	n	%	n	%	n
Healthy Hearing Total	100.0%	4387	100.0%	2802	100.0%	1617	100.0%	957	100.0%	551	100.0%	289
Permanent Hearing Loss	3.2%	140	5.9%	166	10.5%	170	12.4%	119	19.4%	107	18.0%	52
Blocked or Partially Blocked Ear Canal	38.5%	1689	40.3%	1130	42.0%	679	44.5%	426	44.5%	245	46.7%	135
Failed PureTone Hearing Test	13.0%	570	21.3%	597	29.3%	473	39.4%	377	52.8%	291	46.7%	135
Possible Middle Ear Problems	34.4%	439	28.6%	340	25.9%	209	24.7%	145	22.2%	82	29.0%	56

Table 4.2 Prevalence of Healthy Hearing Health Indicators by Region, 2017.												
	Africa		Asia Pacific		East Asia		Europe Eurasia		Latin America		North America	
	%	n	%	n	%	n	%	n	%	n	%	n
Healthy Hearing Total	100.0%	1306	100.0%	1481	100.0%	388	100.0%	2463	100.0%	158	100.0%	4792
Permanent Hearing Loss	2.2%	29	8.0%	119	4.9%	19	6.7%	166	.	.	8.8%	421
Blocked or Partially Blocked Ear Canal	33.8%	441	39.8%	589	39.7%	154	39.6%	976	34.2%	54	43.5%	2083
Failed PureTone Hearing Test	9.8%	128	25.1%	371	14.7%	57	19.8%	488	0.6%	1	29.0%	1388
Possible Middle Ear Problems	45.7%	129	30.1%	170	32.1%	43	24.5%	234	100.0%	1	27.9%	694

*Not enough Healthy Hearing screenings that took place in the Middle East/North Africa (MENA) Region in 2017 were entered into HAS and are therefore not displayed in this table.

Table 4.3 Prevalence of Healthy Hearing Health Indicators by Gender, 2017.				
	Female		Male	
	%	n	%	n
Healthy Hearing Total	100.0%	3809	100.0%	6599
Permanent Hearing Loss	7.3%	279	7.0%	460
Blocked or Partially Blocked Ear Canal	39.7%	1513	40.9%	2697
Failed PureTone Hearing Test	23.8%	907	22.5%	1482
Possible Middle Ear Problems	29.2%	461	28.4%	779

Table 5.1 Prevalence of Opening Eyes Health Indicators by Age, 2017.												
	8 - 19		20 - 29		30 - 39		40 - 49		50 - 59		60+	
	%	n	%	n	%	n	%	n	%	n	%	n
Opening Eyes Total	100.0%	9197	100.0%	5293	100.0%	2709	100.0%	1432	100.0%	761	100.0%	443
Never Had an Eye Exam	37.7%	2525	13.7%	565	9.9%	207	8.0%	88	4.8%	28	8.8%	29
Eye Disease	11.2%	1031	17.2%	908	21.3%	578	35.7%	511	45.7%	348	47.4%	210
Needed New Prescription	18.3%	1683	29.4%	1555	31.5%	854	42.1%	603	45.2%	344	38.4%	170

Table 5.2 Prevalence of Opening Eyes Health Indicators by Region, 2017.												
	Africa		Asia Pacific		East Asia		Europe Eurasia		Latin America		North America	
	%	n	%	n	%	n	%	n	%	n	%	n
Opening Eyes Total	100.0%	2060	100.0%	2503	100.0%	1270	100.0%	2511	100.0%	4507	100.0%	6961
Never Had an Eye Exam	69.5%	899	33.6%	624	12.5%	120	14.8%	279	35.2%	1352	3.2%	165
Eye Disease	22.7%	468	24.5%	612	10.9%	138	20.4%	513	6.7%	301	22.3%	1554

*Not enough Opening Eyes assessments that took place in the Middle East/North Africa (MENA) Region in 2017 were entered into HAS and are therefore not displayed in this table.

Table 5.3 Prevalence of Opening Eyes Health Indicators by Gender, 2017.				
	Female		Male	
	%	n	%	n
Opening Eyes Total	100.0%	7444	100.0%	12165
Never Had an Eye Exam	24.1%	1347	22.8%	2092
Eye Disease	16.2%	1202	19.1%	2318
Needed New Prescription	28.0%	2086	24.8%	3016

Table 6.1 Prevalence of Special Smiles Health Indicators by Age, 2017.												
	8 - 19		20 - 29		30 - 39		40 - 49		50 - 59		60+	
	%	n	%	n	%	n	%	n	%	n	%	n
Special Smiles Total	100.0%	12375	100.0%	7165	100.0%	3919	100.0%	2117	100.0%	1150	100.0%	797
Mouth Pain	16.3%	1950	14.1%	978	12.8%	481	11.3%	229	10.9%	121	10.8%	82
Untreated Tooth Decay	40.7%	4832	35.8%	2415	34.3%	1265	34.6%	672	34.6%	352	31.2%	209
Missing Teeth	13.3%	1586	25.9%	1773	42.7%	1602	58.5%	1167	74.9%	783	52.2%	363
Gingival Signs	36.2%	4285	50.1%	3410	53.3%	1984	51.9%	1031	52.9%	549	49.8%	338
Urgent Dental Referral	16.4%	1926	14.1%	957	14.2%	530	14.5%	288	14.5%	150	11.9%	82

Table 6.2 Prevalence of Special Smiles Health Indicators by Region, 2017.												
	Africa		Asia Pacific		East Asia		Europe Eurasia		Latin America		North America	
	%	n	%	n	%	n	%	n	%	n	%	n
Special Smiles Total	100.0%	4000	100.0%	3533	100.0%	955	100.0%	4779	100.0%	2999	100.0%	11243
Mouth Pain	26.6%	1036	15.8%	539	11.1%	103	9.3%	436	16.5%	473	11.6%	1252
Untreated Tooth Decay	40.6%	1575	50.5%	1689	47.5%	442	39.3%	1778	57.6%	1607	25.3%	2646
Missing Teeth	16.5%	638	20.0%	677	31.5%	295	37.4%	1719	30.2%	855	29.1%	3088
Gingival Signs	31.2%	1191	47.1%	1564	26.8%	251	44.4%	2026	54.3%	1525	47.5%	5031
Urgent Dental Referral	24.1%	897	16.5%	552	5.9%	52	19.1%	877	24.3%	680	8.2%	872

*Not enough Special Smiles screenings that took place in the Middle East/North Africa (MENA) Region in 2017 were entered into HAS and are therefore not displayed in this table.

Table 6.3 Prevalence of Special Smiles Health Indicators by Gender, 2017.				
	Female		Male	
	%	n	%	n
Special Smiles Total	100.0%	10088	100.0%	17162
Mouth Pain	16.2%	1579	13.4%	2222
Untreated Tooth Decay	36.3%	3446	38.6%	6245
Missing Teeth	28.6%	2751	27.3%	4462
Gingival Signs	41.9%	3999	46.0%	7473
Urgent Dental Referral	14.3%	1362	15.8%	2552

Appendix II: Global/Regional Table, 2007-2018

	Global		Africa		Asia Pacific		East Asia		Europe Eurasia		Latin America		MENA		North America	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Special Smiles Total	**100.0**	**265,369**	**100.0**	**24,556**	**100.0**	**25,659**	**100.0**	**16,654**	**100.0**	**43,472**	**100.0**	**27,274**	**100.0**	**2,122**	**100.0**	**123,129**
Mouth Pain*	14.4	36,989	24.5	5,821	17.6	4,364	9.7	1,580	10.8	4,616	22.8	5,907	21.1	424	11.7	14,231
Untreated Tooth Decay*	36.6	91,761	38.9	9,161	45.8	11,140	38.8	6,269	44.3	18,209	61.8	15,856	62.8	1,262	25.3	29,735
Missing Teeth*	27.6	69,942	15.7	3,679	19.6	4,783	16.5	2,678	39.7	16,557	26.9	6,918	32.6	663	29.0	34,526
Gingival Signs*	45.3	113,700	33.1	7,678	42.8	10,301	37.9	6,127	49.3	20,408	50.6	12,785	57.7	1,125	46.4	55,120
Urgent Dental Referral*	14.0	35,036	21.2	4,746	17.4	4,172	4.9	759	19.7	8,145	23.6	6,023	19.9	395	9.1	10,739
Fit Feet Total	**100.0**	**119,023**	**100.0**	**5,440**	**100.0**	**13,576**	**100.0**	**8,378**	**100.0**	**26,168**	**100.0**	**9,349**	**100.0**	**1138**	**100.0**	**54,733**
Gait Abnormalities	58.1	59,231	51.1	2,575	44.0	5,039	48.5	3,628	58.2	13,422	54.1	4,641	54.1	503	65.0	29,314
Bone Deformation	25.8	25,425	18.6	873	17.4	1,913	14.9	1,117	28.0	6,510	30.8	2,632	23.8	226	28.6	12,100
Skin/Nail Conditions	54.4	58,115	52.7	2,632	51.1	5,341	47.4	3,687	66.6	16,239	62.8	5,606	54.1	563	48.8	23,324
Opening Eyes Total	**100.0**	**204,986**	**100.0**	**18,776**	**100.0**	**21,815**	**100.0**	**13,256**	**100.0**	**32,640**	**100.0**	**23,829**	**100.0**	**2,135**	**100.0**	**92,388**
Never Had an Eye Exam*	22.7	33,681	75.2	9,375	49.2	7,464	26.1	2,297	16.7	4,144	40.9	6,710	34.4	528	4.6	3,130
Eye Disease	16.1	32,632	18.2	3,408	15.8	3,438	12.4	1,647	16.4	5,339	12.7	3,032	13.0	278	16.8	15,477
Needed new Rx	35.2	72,122	15.0	2,822	22.6	4,937	20.9	2,753	33.6	10,973	29.9	7,136	21.3	454	46.5	43,000
Healthy Hearing Total	**100.0**	**119,985**	**100.0**	**8,829**	**100.0**	**11,186**	**100.0**	**7,439**	**100.0**	**28,105**	**100.0**	**3,616**	**100.0**	**1,965**	**100.0**	**58,661**
Permanent Hearing Loss	7.0	8,347	3.9	342	6.8	763	5.2	388	6.9	1,934	2.9	105	8.4	165	7.9	4,634
Blocked or Partially Blocked Ear Canal	39.9	47,922	37.5	3,309	36.4	4,067	40.5	3,010	39.6	11123	34.4	1243	43.3	851	41.3	24,251
Failed PureTone Hearing Test	24.6	29,482	20.3	1,788	24.2	2,706	16.9	1,255	22.8	6,414	14.4	520	24.6	483	27.7	16,269
Possible Middle Ear Problems*	17.1	20,538	11.5	1,015	17.4	1,951	12.1	899	19.0	5,326	12.5	453	27.0	530	17.6	10,313
Health Promotion Total	**100.0**	**159,585**	**100.0**	**17,978**	**100.0**	**9,656**	**100.0**	**12,120**	**100.0**	**31,423**	**100.0**	**27,326**	**100.0**	**2,184**	**100.0**	**58,574**
Low Bone Density (adults)*	25.8	5,949	10.4	13	28.5	440	26.5	219	26.1	1,082	14.6	69	18.4	89	20.1	4,014
Obese (child)*	16.9	11,582	7.8	917	9.2	494	13.3	1,107	12.8	1,503	17.8	2,850	19.0	183	31.6	4,500
Overweight (child)*	14.7	10,085	8.2	970	9.3	511	14.7	1,220	13.5	1,585	19.7	3,154	17.2	165	17.2	2,455
Underweight (child)*	10.4	7,147	21.7	2,557	23.3	1,275	10.5	868	6.9	806	4.7	749	5.5	53	5.7	816
Obese (adult)*	31.9	23,476	9.2	278	14.7	523	12.3	430	24.5	4,266	15.1	1,289	19.3	204	45.4	16,444
Overweight (adult)*	28.0	20,589	13.9	421	19.9	708	11.1	387	30.0	5,224	34.0	2,911	25.4	269	28.0	10,167
Underweight (adult)*	5.0	3,689	17.3	524	15.4	548	11.1	388	4.3	749	4.7	401	7.1	75	2.7	983
Use Tobacco Products*	7.7	10,471	6.0	949	6.6	537	5.8	599	16.2	4,657	2.8	688	5.3	96	6.4	2,926
Exposure to Second Hand Smoke*	37.9	46,661	30.7	4,582	31.6	2,225	49.5	4,736	53.8	13,811	26.6	6,235	37.3	667	28.4	18,538
Fun Fitness Total	**100.0**	**117,924**	**100.0**	**4,759**	**100.0**	**7,157**	**100.0**	**9,086**	**100.0**	**29,335**	**100.0**	**14,202**	**100.0**	**1,361**	**100.0**	**51,873**
Flexibility Problems Identified*	61.0	71,924	26.4	1,258	42.1	3,014	40.7	3,698	63.2	18,528	55.3	7,848	67.2	914	70.8	36,708
Strength Problems Identified*	55.4	65,355	80.5	3,832	54.4	3,892	52.3	4,752	42.7	12,537	78.5	11,154	50.4	686	54.8	28,440
Balance Problems Identified*	66.9	78,943	74.7	3,556	54.9	3,932	66.5	6,043	56.6	16,600	71.6	10,164	57.2	779	72.6	37,642
Exercise Frequency																
3 or More Days Most Weeks	53.3	53,517	33.9	1,206	41.8	2,367	58.9	4,271	42.3	11,439	40.5	5,165	58.2	445	66.1	28,539
Less Than 3 Days Most Weeks	38.3	38,441	41.2	1,465	31.6	1,788	31.9	2,316	49.6	13,417	52.2	6,645	35.8	274	29.0	12,505
No Regular Exercise Program	8.4	8,373	24.9	887	26.6	1,503	9.2	666	8.1	2,179	7.3	930	6.0	46	4.9	2,136

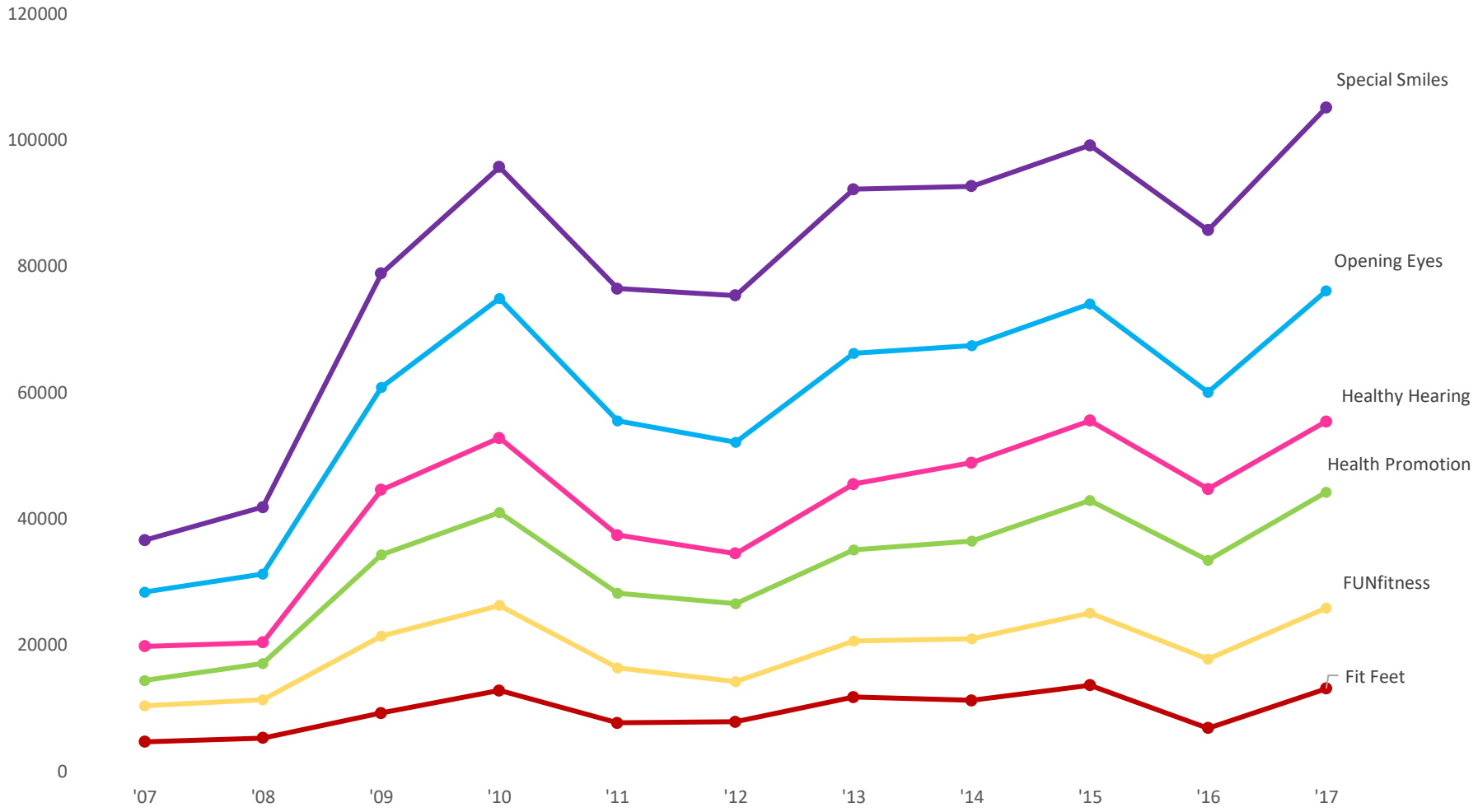
n = number with each health condition

*Percentages based on number of athletes who completed particular test or answered particular question

If you would like to use Healthy Athletes data or have questions about this report, please send an email to healthdata@specialolympics.org.

Appendix III: Healthy Athletes Screenings by Year, 2007-2017

There have been more **Special Smiles** screenings entered into HAS globally since 2007 than any other Healthy Athletes discipline.



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