

STATE OF THE GAME

2022 - 2023 SEASON



An initiative of the
National Football Foundation

FUTURE FOR
FOOTBALL

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“The Future for Football is bright. It’s strong at every level. It’s more inclusive, better and provides more opportunities than ever.

Football is a constant in American’s lives. We come together on Fridays, Saturdays and Sundays to cheer, cry and commune. The game is vibrant, and the game is growing.”



Steve Hatchell

President and Chief Executive Officer
National Football Foundation & College
Hall of Fame, Inc.

Football is the most popular sport in the United States.

Football provides many benefits to those who play through association with a team or organization and as part of a community.

Football provides opportunities for band members, cheerleaders, coaches, the community, managers, media, parents, players, referees, trainers, videographers, and many more.

Over the years, many organizations (at all different levels) have worked to make the game better and will continue to do so.

Women's involvement in football has increased significantly.

Rules changes, guidance issued on coaching techniques, and tech advancements at all levels have helped make the game better.

1.04 million
high school players

774 colleges and
universities at all levels

5.62 million
college players all-time
(since 1869)

81 colleges and
universities added
programs since 2008

81,000+
college players

81% graduation
success rate of FBS
student-athletes
(68% general student body)

A dark, blue-tinted photograph of two basketball players in mid-air, competing for a rebound. The player on the right is reaching high with his right arm, mouth open in a shout. The player on the left is also reaching up, with his back to the camera. Both are wearing athletic jerseys and shorts. The background shows a basketball court with other players and spectators in the distance.

GOOD OF THE GAME

GOOD OF THE GAME

Insights

Youth Stats

- More than 1.04 million players (est.) in high school.¹
- 2 million youth players (est.).²

Collegiate Stats

- 892 colleges and universities playing football at all levels.³
 - 767 schools among all NCAA divisions, the NAIA and independents³
 - 125 junior college football programs³
- 15 collegiate sprint football teams (full-contact sport for players weighing 178 pounds or less that has the same rules as regular college football)³
- 68 colleges and universities added programs since 2010.³
- 93,770 (+) college football players at all levels.¹

Educational Opportunities Provided

- 80% graduation success rate of Football Bowl Subdivision student-athletes.⁴
 - Compared to 69% federal graduation rate of general student body.⁴
- According to the NCAA (not exclusively football):
 - \$3.5 billion awarded in athletic scholarships every year.⁵
 - More than 90% of student athletes surveyed 10 years after finishing their eligibility reported being satisfied with their overall experience.⁵
 - Former student-athletes are significantly more likely to be thriving in four out of five areas of well-being (purpose, social, financial, community and physical).
 - This is important because it demonstrates that college athletics builds the foundation for former student-athletes to excel in multiple areas of well-being.⁶

Increased Women's Involvement in the Game

The presence of women in football has steadily increased at every level of the game.

NFL

- During the 2020 season, eight female coaches were on staff across the League. This marks the first time there has ever been more than two women coaching at the same time in the NFL.⁷
- Super Bowl LV had a record-breaking three women on the field with Lori Locust and Maral Javadifar coaching for the Tampa Bay Buccaneers, while Sarah Thomas became the first female to officiate the championship game.⁸
- In May of 2021 alone, seven women were promoted to scouting positions in the NFL.⁹

Pro Women Leagues

- The Women's Football Alliance (WFA) has grown from 36 teams and 1,000 participants nationally in 2009 to 65 teams and more than 2,500 participants.¹⁰
 - 15 alumnae of the league have earned coaching and scouting positions in the NFL including Katie Sowers and Jennifer King, the first female to coach in a Super Bowl and the first female African American coach in the NFL, respectively.
- The Women's National Football Conference (WNFC) had their inaugural season in 2019 with 15 teams in 13 states. The 2021 season will feature 20 teams playing in a 10-week season.¹¹ The conference is currently in Phase 2 of its development and plans to expand to between 30 and 32 teams in the league throughout the US.¹²

College

- The participation of women at the college level has been steadily increasing.
- Sarah Fuller, Vanderbilt University: first to play in a Power 5 Conference in 2020.⁸
- Toni Harris, Central Methodist University (MO): first to accept a scholarship to a four-year college in 2019.¹³
- Heather Marini: first Division I position coach in 2020.¹⁴
- Callie Brownson: first full-time Division I coach in 2018.¹⁵
- 15 NAIA institutions have added women's flag football as a varsity sport.³

High School/Youth

- From the 2014-15 to the 2018-19 school years, the overall number of girls participating in “boys” tackle football has grown 53.4% (1,698 to 2,604). The number of NFHS high school programs with at least one girl on its “boys” tackle football team has grown 291.8% (510 to 1,998).¹⁶
- Six states currently sanction girls’ high school football: Alaska, Arizona, Florida, Georgia, Nevada and New York. Alabama has sanctioned the sport for the upcoming school year.¹⁷
- The Utah Girls Tackle Football league began in 2015 and is the first of its kind. In 2019, 446 girls played on 24 teams.¹⁸

Flag

- The National Junior College Athletic Association (NJCAA) announced in 2021 that women’s flag football would become an emerging sport.¹⁹ The National Association of Intercollegiate Athletics (NAIA) announced the same a month later.²⁰
- Five states currently list girls’ flag football as a high school club or emerging sport with six additional states that currently have girls’ flag football as a varsity sport.²¹
- From the 2014-15 to the 2018-19 school years, the number of girls’ flag football programs has grown 36%; overall participation numbers in girls’ flag football among NFHS members has grown 23.7%.¹⁶

Continued Popularity Growth

Viewership

- Of the top 100 most watched shows of 2020, 69 of those were NFL broadcasts. That includes every awards show, every sporting event, and even every debate from the last presidential election. No other professional sport made it into the top 100.²²
- For 80 years, Gallup has polled Americans on their favorite sport to watch. In the most recent poll (2018), football was on top with 37 percent. Football has been on top every time Gallup has conducted that poll for half a century.²³

Misc.

- Since EA Sports stopped making *NCAA Football*, fans have been vocal about the game's return to gaming consoles. In 2021, the game maker will be returning to the space with *EA Sports College Football*.²⁴

Football Found a Way in 2020

Football found away amidst many challenges and unknowns brought on by the pandemic.

- The NFL played the entire regular season, postseason and Super Bowl.²⁵
- All ten FBS conferences played in 2020 (sans three schools). More than 80% of the regular season games were played and a national champion was crowned.²⁶
- 111 of 127 FCS schools participated in fall and/or spring schedules that culminated in the crowning of a national champion.²⁷
- High schools in 47 states and D.C. played in 2020-2021.^{29,30}

A group of young people, mostly teenagers, are posed in a parking lot. In the background, a building with a sign that reads "DAVID KUYKENDALL S" is visible. The group consists of several individuals, some standing and some sitting. One person in the foreground is wearing a t-shirt with a car graphic. Another person is wearing a t-shirt with "JUST DO IT" repeated. A person in the back row is making a hand gesture. The overall tone is casual and youthful.

PARTICIPATION

PARTICIPATION

Insights

Insights in this section reference the following exhibits:

Exhibit 1: National Federation of High School Associations: Total Participation in High School Football¹

	2014-15	2015-16	2016-17	2017-18	2018-19
Boys 6-Man	4,403	4,438	4,546	5,102	5,275
Boys 8-Man	19,423	19,195	19,514	19,554	20,954
Boys 9-Man	5,112	5,310	5,278	4,971	4,992
Boys 11-Man	1,083,617	1,080,693	1,057,382	1,036,842	1,006,013
Boys Tackle Total	1,112,555	1,109,636	1,086,720	1,066,469	1,037,234
Boys Flag	838	1,226	1,210	1,144	945
Boys Total	1,113,393	1,110,862	1,087,930	1,067,613	1,038,179
Girls Tackle	1,698	2,120	2,143	2,401	2,604
Girls Flag	9,059	10,867	11,254	11,007	11,209
Girls Total	10,757	12,987	13,397	13,408	13,813

Exhibit 2: National Federation of High School Associations: High School Football Programs¹

	2014-15	2015-16	2016-17	2017-18	2018-19
Boys 6 Man	247	250	259	317	373
Boys 8 Man	832	834	841	847	946
Boys 9 Man	251	265	258	243	244
Boys 11 Man	14,154	14,047	14,099	14,079	14,247
Boys Tackle Total	15,484	15,396	15,457	15,486	15,810
Boys Flag	32	69	76	56	33
Boys Total	15,516	15,465	15,533	15,542	15,843
Girls Tackle	510	613	706	735	1,998
Girls Flag	278	359	420	350	378
Girls Total	788	972	1,126	1,085	2,376

Exhibit 3: SFIA Data Trends

All participation figures are in 000s

Team Sports	Definition	2014	2015	2016	2017	2018	2019	1-year change	3-year AAG	5-year AAG
Football (Flag)										
Total participation	1+ times	5,508	5,829	6,173	6,551	6,572	6,783	3.2%	3.2%	4.3%
Casual	1-12 times	2,838	3,105	3,249	3,572	3,573	3,794	6.2%	5.4%	6.0%
CORE	13+ times	2,669	2,724	2,924	2,979	2,999	2,989	-0.3%	0.7%	2.3%
Core Age 6 to 17	13+ times	1,178	1,276	1,401	1,565	1,578	1,590	0.8%	4.4%	6.3%
Football (Touch)										
Total participation	1+ times	6,586	6,487	5,686	5,629	5,517	5,171	-6.3%	-3.1%	-4.6%
Casual	1-12 times	3,727	3,809	3,304	3,332	3,313	3,065	-7.5%	-2.4%	-3.6%
CORE	13+ times	2,859	2,678	2,383	2,297	2,204	2,105	-4.5%	-4.0%	-5.9%
Football (Tackle)										
Total participation	1+ times	5,978	6,222	5,481	5,224	5,157	5,107	-1.0%	-2.3%	-3.0%
Casual	1-25 times	2,588	2,842	2,242	2,145	2,258	2,413	6.8%	2.6%	-0.7%
CORE	26+ times	3,390	3,380	3,240	3,078	2,898	2,694	-7.1%	-6.0%	-4.5%
Core Age 6 to 17	26+ times	2,590	2,539	2,543	2,427	2,353	2,311	-1.8%	-3.1%	-2.2%

*SFIA data from the 2020 SFIA Topline Report.²

All data referenced from Exhibits above and in Exhibit A in Addendum unless otherwise noted.

Growth Areas

- While NFHS did not release participation data for 2019-20 season, the optimism surrounding a positive trend in football participation came to fruition. After annual declines of 23,311, 20,540 and 30,829 the past three years, boys participation in high school 11-player football in 2019 dropped by only 2,489 – from 1,006,013 to 1,003,524. Last year's decline is the smallest in 10 years.³
 - SFIA data trends on tackle football aligns with NFHS data in that the declines appear to be stemmed – dropping only 1% YoY vs. 3% average annual decline for the last five years. This is a stark contrast to the 11.9% drop in 2016 vs. 2015.³

Net Numbers Fall

- From the 2014-15 school year to 2018-19, there has been an overall 6.75% decline in participation in all forms of boys' football among NFHS-member schools. (Boys' tackle is down 6.77%.)
 - By net numbers, the decline of 75,321 tackle football participants overall is comprised of: 77,604 net loss in 11-man players, 120 net loss in 9-man players, 1,531 net gain in 8-man players, and 872 net gains in 6-man players.

From the 2014-15 to the 2018-19 school years:

- There are 1,103 more schools participating in boys' football and 1,954 more schools participating in girls' football
- 93 net 11-man tackle programs, 114 net 8-man tackle programs and 126 net 6-man football were gained, while seven programs in 9-man football were lost. (Net +326 programs.)
- Boys' flag football saw a 12.8% jump in participation over the same time frame, from 838 to 945 participants. And SFIA data indicates flag has been on the rise every year since 2014 (up 23.1% through 2019).

- Boys' 6-Man football has grown every season, in programs and total participation.
- Also, over the past five seasons, boys' 8-Man football has seen growth in programs and participation.
- Together, 6-Man and 8-Man football has seen a net growth of 240 programs and 2,403 participants from 2014-15 to 2018-19.
- The overall number of girls participating in "boys'" tackle football has grown 53.4% (1,698 to 2,604).
- The number of NFHS high school programs with at least one girl on its "boys'" tackle football team has grown 291.8% (510 to 1,998).
- The number of girls' flag football programs has grown 36%; overall participation numbers in girls' flag football among NFHS members has grown 23.7%.

Related to Other Sports

- According to NFHS data for the 2008-2009 – 2018-2019 time frame, baseball participation is up 2.02% basketball is down .803%, golf is down 8.8% and soccer is up 19.6%.^A
- When reviewing the data as a percentage of all sports played, at its peak in 2008-2009 (in terms of raw participation numbers), football made up 25.8% of the total participation in all sports. Last year (2018-2019), it made up 22.9%. During that same time frame:^A
 - Basketball: 12.3% to 11.9%
 - Track & Field (outdoor): 12.6% to 13.4%
 - Baseball: 10.7% to 10.6%
 - Cross Country: 5.2% to 5.9%
 - Golf: 3.6% to 3.16%
 - Tennis: 3.6% to 3.5%
 - Wrestling: 6.0% to 5.5%
 - Soccer: 8.7% to 10.1%
 - Swim & Dive: 2.9% to 3%
 - Others: 8.6% to 10%
- When looking at weighted percentages, Soccer and Others are the only sports that had more than a 1% increase of total participation from the 2008-2009 school year. Basketball, baseball, golf, tennis and wrestling all went down (from a weighted percentage standpoint).

Historic summary breakdown by sports since 1977-1978 (full list found in Addendum Exhibit A).

	Football	Basket	T&F	Base	XC	Golf	Tennis	Wrest	Soccer	S&D	OTHER
1977-78	25.9	17.5	16.2	9.9	4.7	3.1	3.9	7.7	3.2	2.4	5.3
1987-88	27.7	15.3	13.1	12.1	4.5	3.4	3.9	7.5	6.1	2.5	4.0
1997-98	26.5	14.5	12.5	12.0	4.7	4.2	3.7	6.1	8.2	2.3	5.4
2008-09	25.8	12.3	12.6	10.7	5.2	3.6	3.6	6.0	8.7	2.9	8.6
2018-19	22.9	11.9	13.3	10.6	5.9	3.2	3.5	5.5	10.1	3.0	10.0

Percentage of participation by sports pulled from National Federation of High School Associations.¹

A dark, blue-tinted photograph of a football helmet mounted on a mechanical testing rig. The helmet is positioned in the center-left of the frame, facing left. It is attached to a complex metal structure with various bolts, pipes, and a large circular component on the right. In the background, a wall with the word "dell" is partially visible, and a rack of other helmets can be seen on the right. The overall scene suggests a laboratory or testing facility for sports equipment.

INJURIES

INJURIES

Insights

Not the Most Dangerous Sport

Football Deaths

- Deaths from directly or indirectly from participation in the game of football are down.¹
- Deaths in all levels of football by decades:¹
 - 1931-1965: 914
 - 1966-1969: 146
 - 1970s: 633
 - 1980s: 144
 - 1990s: 124
 - 2000s: 170
 - 2010s: 153
 - 2020: 6
- Deaths steadily decreased in the 1980s and 1990s before increasing in the 2000s. That trend was reversed in the 2010s.

Injuries from Other Sports

- At the collegiate level, there are more catastrophic direct injuries in men's gymnastics (15.82 per 100,000 competitors) and women's skiing (10.96) than football (9.87).²
- As it relates to catastrophic indirect injuries in college, men's basketball (9.9 per 100,000), men's water polo (5.46), and men's skiing (4.53) all rank above football (3.95).²
- At the high school level there are more catastrophic direct injuries in men's gymnastics (3.32 per 100,000), men's cheerleading (3.2), and women's cheerleading (2.64). All rank above football (2.62).
- As it relates to catastrophic indirect injuries in high school, men's rowing (1.71 per 100,00) and men's basketball (.86) both rank above football (.80).²

All above referenced data is from the National Center for Catastrophic Sport Injury Research Annual Survey of Football Injury Research¹ and Catastrophic Sports Injury Research².

- Injury risk associated with high school football is at its lowest in history.³
- According to a Tweet from the NCAA Research account, 42% of NCAA men experienced a major sports-related injury before entering college. Highest by sport: Ice Hockey (56%), Soccer (50%) and Wrestling (47%). Ranked next: Baseball, Football and Lacrosse – all at 44%.⁴
- Concussion rates are higher in girls' soccer than boys' football in high school. During the years after TBI law enactment (2010 to 2015), the concussion rate was higher in girls' soccer than boys' football. During the 2014-2015 school year, concussions were more common in girls' soccer than any other sport.⁵

- A study from the University of Colorado Boulder found no link between youth contact sports and future brain and mental health problems.⁶
- Concussions in the NFL are down 37.5% from the 2015 season and down 23.2% from last year (note: no Preseason games played in 2020).⁷
- A study of children's (age 5 to 14) sports and recreation by the Stanford Children's Orthopedic and Sports Medicine Center, which includes football, concluded that almost 50% of head injuries sustained in sports and recreation activities occur during bicycling, skateboarding or skating incidents.⁸

RULE CHANGES, GUIDANCE & COACHING ADVANCEMENTS

Over the years, rule changes have been implemented to make the sport better.

- In 2019, Pop Warner became the first national football program at any level to eliminate the three-point stance in future efforts to make the sport safer for young players (for its three youngest divisions). Additionally, Pop Warner's 2016 rule banning kickoffs in its three youngest age groups was introduced at its Pop Warner division in the 2019 season.¹ Instead of kicking the ball off following a score or to start a half, it will be placed at the 35-yard line.
- Since 1985, the NFL has changed or implemented more than 75 rules pertaining player health and safety.² Whereas in college football since 2000, an estimated 34 rules changes or new rules have been implemented regarding players' health and safety.^{3,4}

Almost every state high school athletic association has proactively, or by state legislated law, put limits on full contact during football practice and limited exposure to heat exertion. Studies done since these limits have been put in place for just before show a reduced number of injuries, concussions and heat-related illnesses.

- All 50 states and the District of Columbia passed legislation between 2009 - 2015 targeting brain injuries and concussions in youth sports.¹⁵
- High school athletics associations in 46 of 50 states began the 2016 football season with limits on full contact practices in high school football. Examples:
 - California-2014: passed a law limiting middle and high school to two full contact practices per week, each no more than 90 minutes long during the 30-day period before and during the regular season. It also banned all off-season practice contact entirely.¹⁶
 - Wisconsin and Michigan-2014: prohibited contact, at some level, during football's preseason and regular season.^{17,18}
 - Florida-2016: limits contact during regular and postseasons to no more than three days per week, 30 minutes per day and 80 minutes per week. Also bans contact on more than two consecutive days.¹⁹
 - Pennsylvania-2016: limits contact in practice to 60 minutes per week.²⁰
 - New Jersey-2019: limits full contact drills in practice to 15 minutes per week, down from 90.²¹
 - Michigan-2019: no more than six hours of full-pads collision contact per week during the preseason, no more than 30 minutes of collision contact during the regular season.²²
 - Florida-2019: an independent foundation is educating athletes, trainers and coaches on how to protect from abdominal injuries.²³
- The NFL has asked teams to stop the Oklahoma drill, pitting blocker vs. defender in a battle-type atmosphere surrounded by teammates.²⁴
- The NCAA Division I Council made changes to football preseason practice to protect the health and safety of student-athletes while providing the opportunity to prepare them for the football season.²⁵ The changes include:
 - Prohibiting athletic activities, such as drills that encourage or create straight-line contact, as specified in policies and procedures established and maintained by the Division I Football Oversight Committee and the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports. This prohibition applies year-round, not just during the preseason.
 - Reducing the maximum number of contact practices from 21 to 18 and restricting full-pads days to nine (9).
 - Increasing the acclimatization period from five (5) to seven (7) days.
 - Additional limits on full-contact practices, including no more than two consecutive days of full-contact practices, a total of no more than 75 minutes of full contact within any practice session and no more than two scrimmages in the preseason.
- Maryland passed the Jordan McNair Safe and Fair Play Act, which gives student-athletes certain health-related protections, including the right to speak up for themselves when they are exhausted or overheated and remove themselves from competition until they are ready to return.²⁶
- Studies show positive signs:
 - Published results from the University of Wisconsin-Madison in 2015 reported that concussion rates during the 2014 high school football season decreased concussions by 57% (compared to previous two seasons) after practice contact limits were put in place by the state association.²⁷


- A 2016 study showed that a 2014 rule change in Michigan limiting full-contact high school football practices to no more than two days per week reduced head-impact exposure for all players by an average of 42%, with the largest reduction occurring among linemen.²⁸
 - 2019: University of North Carolina-Chapel Hill research showed “strong evidence” that rates of heat-related illnesses such as heat strokes were cut in half in states that mandated guidelines to reduce exertion-related heat illnesses.²⁹
- The NCAA-U.S. Department of Defense Concussion Assessment, Research and Education Consortium is the largest concussion and repetitive head impact study in history. The project, funded by the NCAA and DOD, launched in 2014 and now includes participants on 30 campuses across the country.³⁰
 - The initial phase of the study focused on the acute effects of concussion by evaluating concussed study participants with a sequence of tests in the immediate hours, days and weeks after the injury, and comparing the results with baseline tests administered at the start of the study.³⁰
 - The second phase of the study, initiated in the winter of 2018, includes comprehensive testing of the participants when they leave college and up to four years after their collegiate sports or service academy career has ended. This new phase will enable researchers to study the intermediate and cumulative effects of concussion and repetitive head impact exposure. Importantly, researchers hope — for the first time — to differentiate between the effects of concussion and repetitive head impact from sports participation with no history of either concussion or repetitive head impact exposure.³⁰
 - While numerous studies have come out regarding the research over the last few years, some key findings include:
 - Concussions in collegiate football are managed more conservatively than 15 years ago.³¹
 - The average time between injury and return to play in the original NCAA Concussion Study was 6.7 days (1999-2001). In the CARE study, that figure increased to 16.1 days (2014-2017).³¹
 - The rate of same season repeat concussion in the CARE study was 41% lower than in the earlier NCAA Concussion Study. Further, among those who suffered a repeat concussion, the average interval between injuries in CARE was 50.8 days longer.³¹
 - Preliminary evidence suggests that age of first exposure to contact sports is not associated with neurocognitive impairment in college athletes.³²
 - Female and male collegiate athletes take approximately the same amount of time to recover from a concussion, with subtle differences in recovery time depending on the type of sports being played and the division level.³³ The findings suggest that equity in access to sports medical care among college athletes may contribute to these similar outcomes.
- College athletic training staff are starting to report to medical staff instead of athletic staff and coaches, as the NCAA has recommended as a best practice.³⁴
- At the collegiate level, all training and conditioning sessions should be administered by personnel with demonstrated competency in the safe and effective development and implementation of training and conditioning activities, and with the necessary training to respond to emergency situations arising from those activities.³⁵

Numerous entities have issued guidance and guidelines.

- National Football Foundation Issues Coach Guidelines.³⁶
 - In August of 2016, the National Football Foundation distributed a set of guidelines, created with feedback from the Texas High School Coaches Association (THSCA) and the American Football Coaches Association (AFCA), to help more than 150,000 high school coaches inform parents about efforts to make their programs safer.
 - The guidelines were sent to and utilized by state high school athletic associations, the AFCA membership base of 11,000, the NFF's 120 nationwide chapters and high school coaches across the country.
- USA Football Releases Guidelines for Practice in 2015.³⁷
 - Gradually increase activity in the heat: time with equipment, duration and intensity.
 - Progressive contact.
 - Full contact practice limits:
 - Preseason: 30 minutes per practice, 120 minutes max per week.
 - Regular season: limit "Thud" drills to three practices per week.
 - 90 minutes max full contact per week.
- 28 states require coaches to be trained in youth sports concussion recognition and awareness.³⁸
 - Hawaii, Oregon, California, Montana, North Dakota, South Dakota, Minnesota, Wyoming, Colorado, New Mexico, Texas, Louisiana, Arkansas, Alabama, Tennessee, Kentucky, West Virginia, Ohio, Michigan, Pennsylvania, New York, New Jersey, Delaware, Connecticut, Rhode Island, Massachusetts, Vermont, Maine.
 - The state of Ohio requires training of coaches and referees.
- Data from the NCAA-DOD CARE Consortium is used to shape rules changes designed to facilitate ongoing objectives in college sports.³⁹
 - The NCAA Sport Science Institute and leading scientific and sports medicine organizations have developed recommendations for athletics departments and coaches to use as they plan their year-round football practice sessions.⁴⁰
 - The 2017 recommendations serve as an update from 2014 guidance and include additional recommendations for preseason, in-season, postseason and spring practice.

- In 2014, NFHS issued recommendations and guidelines for minimizing head impact exposure and concussion risk in football.⁴¹
 - Full contact should be limited during the regular season, as well as during activity outside of the traditional fall football season.
 - Member state associations should consider a variety of options for limiting contact in practices. The task force strongly recommended full contact be limited to no more than 2-3 practices per week.
 - Preseason practices may require more full contact time than practices occurring later in the regular season to allow for teaching fundamentals with sufficient repetition.
 - During preseason twice-daily practices, only one session per day should include full contact.
 - Each member state association should review its current policies regarding total quarters or games played during a one-week time frame.
 - Member state associations with jurisdiction over football outside of the traditional fall football season should review their current policies to assess if those policies stand in alignment with the fundamentals discussed within the report and, if needed, modify the policies accordingly.
 - Each member state association should reach out to its respective state coaches' association on designing and implementing a coach education program that appropriately integrates youth, middle school and high school football programs in every community.
 - An Emergency Action Plan (EAP) with clearly defined written and practiced protocols should be developed and in place at every high school.
- In 2018, the NFL launched "Way to Play," an initiative committed to promoting proper playing technique across all levels of football.⁴²
 - Current players and NFL Legends from key positions demonstrate proper technique.
 - NFL coaches explain fundamental concepts, share best practices and advice on how to coach each position on the field.
 - The Playbook, created with the Legends Youth Advisory Committee, is a tool for youth coaches that outlines the curriculum, language to use and fundamentals of the game.
- In February 2020, the Center for Disease Control (CDC) revised its HEADS UP to Youth Sports to improve the culture of concussion by taking a free online training and using what is learned to inform how coaches and parents talk about, prevent and respond to concussions. The HEADS UP to Youth Sports: Online Training is available to coaches, parents, sports officials, athletic trainers and other individuals interested in learning about concussion safety.⁴³
- Pop Warner Rules and Heads-Up Football Training has resulted in an injury rate that has 87% fewer injuries compared to non-Heads-Up and non-Pop Warner programs, according to Datalys Institute's research data.^{44,45}

- From 2010-2019, Pop Warner instituted other major safety-focused changes.⁴⁶
 - Teach kids how to better recognize if they or a teammate have suffered a concussion. Pop Warner provides access to CrashCourse, an interactive concussion education program developed by TeachAids, a nonprofit education initiative, and researchers at Stanford University.
 - Offers Rookie Tackle, a program to help kids transition from Flag Football to 11-player tackle. It is played on a smaller field with fewer players and meant to introduce the sport.
 - In 2016, Pop Warner announced contact is restricted to 25 percent of practice time.
 - In 2012, Pop Warner banned full speed head-on, blocking or tackling drills where players lined up more than 3 yards apart.
 - In 2010, Pop Warner implemented the first youth sports concussion policy. Under the policy, any participant removed from play due to a head injury may not return to Pop Warner activities until he or she is evaluated – and receives written clearance – by a licensed medical professional trained in the evaluation and management of concussions.
 - To ensure that Pop Warner stays on the forefront of health and safety issues and any medical developments that may affect our young athletes, Pop Warner formed an independent Medical Advisory Committee in 2010. Led by neurosurgeons, researchers, pediatricians and sports medicine professionals, the committee is focused on the prevention, proper identification and treatment of concussions; hydration awareness and proper nutrition guidelines; and general health and safety issues.
- The University Interscholastic League (UIL) and the Texas High School Coaches Association (THSCA) worked collaboratively to take the unprecedented step forward to make football a safer sport. In October 2017, the UIL Legislative Council passed a rule requiring every Texas high school and junior high school football coach to become certified in teaching tackling as a part of the official UIL Coaches Certification Program that began in the 2018-19 school year.⁴⁷

A stack of several footballs, likely Wilson brand, with the number '100' and 'NCAA' logos visible. The image is dark and has a blue tint, with the text 'TECHNOLOGY ADVANCEMENTS' overlaid in bright yellow.

TECHNOLOGY ADVANCEMENTS

TECHNOLOGY ADVANCEMENTS

Insights

Technology advancements through the years are making the game better.

The reliability and performance of helmets is an area of increasing study, and various tech businesses are creating new helmets to improve game safety.

- During the 2019 and 2020 seasons, 99 percent of NFL players wore high-performing helmets.¹ This is a jump from 41% in 2017.²
- The NFL helmet safety rankings ranked the VICIS ZERO2-R Matrix the number one performing helmet, followed by the VICIS ZERO2-R Trench and VICIS ZERO2-R. The rankings are based on the ability of the helmet to reduce head impact severity measures in lab testing.³
- The VICIS ZERO1 (number eight) is utilized by more than 1,200 high school programs and 150 professional and college teams.⁴
- Virginia Tech Helmet Ratings⁵
 - A total of 26 varsity football helmets have been rated using the STAR evaluation system. The impact tests evaluate a helmet's ability to reduce linear and rotational acceleration of the head resulting from a range of head impacts a football player might see on the field. Helmets with more stars provide a reduction in concussion risk for these impacts compared to helmets with less stars.⁶
 - A total of 29 youth football helmets have been rated using the STAR evaluation system. The impact tests evaluate a helmet's ability to reduce linear and rotational acceleration of the head resulting from a range of head impacts that youth football players might see on the field. The lab tests are based on data collected directly from 10- to 14-year-old youth football players that wore helmets equipped with sensors.⁷
 - A total of 22 flag football headgear have been evaluated using the STAR evaluation system. The impact tests evaluate a headgear's ability to reduce linear and rotational acceleration of the head resulting from impacts a flag football player might see on the field. Headgear with more stars provide a reduction in concussion risk compared to headgear with less stars.⁸ Group ratings are differentiated by pre-determined thresholds.
- One neurologist believes a new helmet concept will save high school football.⁹
 - Modified testing showed the BrainGuard helmet reduced rotational force by 25-50% compared to the top helmets on the market.
- Scientists and the U.S. Army Research Laboratory have developed elastic microlattice pads that can withstand both single hits and a series of impacts better than existing state-of-the-art foams used in football helmets. Their research suggests that the material may pave the way for helmets that better protect football players and other athletes from brain injuries caused by repeated head hits.¹⁰
- The National Operating Committee on Standards for Athletic Equipment (NOCSAE), an independent and nonprofit standards development body, works to enhance athletic safety through scientific research and the creation of performance standards for athletic equipment, including football helmets and face guards. NOCSAE standards are constantly being updated to reflect the latest science, technology and medicine.¹¹ A list of NOCSAE certified equipment is available online.

- New tracking technology has improved the benefits of “smart” mouthguards.^{12,13,14}
 - Data from mouthguards can track the force of impact on a player and assist in evaluating the risk of a concussion after a hit.
 - Force Impact Technologies (FITGuard), Akervall Technologies (SISU Sense) and Catapult are three companies that have created mouthguards that use sensors placed in a mouthguard to measure accurate acceleration readings upon impact.
- Organizations are testing and/or being rewarded for advancing the game through technology.
 - The NFL awarded over \$1.3 million in HeadHealthTECH Challenge grant funding in June 2020 to support teams of innovators in the creation of their helmet prototypes.¹⁵
 - In July 2021, all helmet prototypes were officially submitted in the NFL Helmet Challenge, the multi-year innovation challenge aimed at stimulating the development of a new helmet that outperforms any model currently available to NFL players. An expert panel of judges has been assembled and is ready to award the \$1 million prize.¹⁶
 - The Pac-12 Grant Program offers research funding to support the advancement of Pac-12 student-athlete health and well-being and has made it a priority to research and develop best practices for general improvements in these areas. The Conference has committed approximately \$3,500,000 per year in research grants for projects at Pac-12 institutions designed to improve the health, general well-being and safety of student-athletes at all Conference member universities.¹⁷ Specific topics of interest to Pac-12 member institutions include:
 - Head Trauma
 - Prevention of Sudden Death (Cardia, Temperature Matters, Hydration)
 - Overuse Injuries / Injury Prevention
 - Emergency Care - Planning / Prevention of Emergent Medical Events
 - Student-Athlete Well Being (Sleep, Nutrition, Mental Health)
 - Data Driven Decisions (Use of Pac-12 Health Analytics Program - HAP) such as expansion of Presagia platform (e.g., software development) or sports injury epidemiology
- The NFL and Amazon Web Services (AWS) partnered to transform player health and safety using cloud computing, machine learning and artificial intelligence (AI). The partnership combines the NFL’s extensive set of game data with AWS technologies to provide a deeper understanding of the game than ever before. The NFL and AWS will work to develop new tools and generate deeper and better-informed insights into injuries, specifically the impact of a variety of factors such as game rules, equipment, and rehabilitation and recovery strategies.¹⁸

About the National Football Foundation

The National Football Foundation was founded in 1947 with leadership from Colonel Earl “Red” Blaik, General Douglas MacArthur, and Grantland Rice with a mission to mobilize the constructive forces of amateur football to strengthen America’s young people. All felt strongly that the sport built leaders like no other activity. The hallmarks taught through the game, courage, dedication, discipline, teamwork and tenacity, uniquely positioned football’s impact on the country.

The National Football Foundation is a multifaceted, 501(c)(3) nonprofit organization dedicated to promoting and representing everything right with the sport. Through the NFF’s programs and initiatives that encompass a broad spectrum of amateur football, the organization preserves the past, promotes the present, prepares for the future and protects the game and the opportunities it provides. These national programs and initiatives include, but are not limited to: Annual Awards Dinner, College Football Hall of Fame, Future For Football campaign, National Scholar-Athlete awards (including the William V. Campbell Trophy presented to college football’s top scholar-athlete), nationwide Chapter System, and research.



NATIONAL FOOTBALL
FOUNDATION



ADDENDUM

GOOD OF THE GAME

1. Scholarship Stats. (n.d.). Retrieved from <http://www.scholarshipstats.com/football.html>
2. The football development model: USA Football. (n.d.). Retrieved July 28, 2021, from <https://fdm.usafootball.com/>
3. Football Remains Strong: 767 Colleges and Universities Offering Football. (2021, August 5). Retrieved from <https://footballfoundation.org/news/2021/8/5/football-remains-strong-765-colleges-and-universities-offering-football.aspx>
4. Hosick, M. (n.d.). DI college athletes reach 90% graduation rate. Retrieved July 28, 2021, from <https://www.ncaa.org/about/resources/media-center/news/di-college-athletes-reach-90-graduation-rate>
5. How We Support College Athletes. (2019, May 22). Retrieved from <http://www.ncaa.org/about/resources/media-center/ncaa-101/how-we-support-college-athletes>
6. Gallup Study: Interactive Dashboard. (n.d.). Retrieved July 28, 2021, from <https://www.ncaa.org/about/resources/gallup-study-interactive-dashboard>
7. Brassil, G., & Draper, K. (2021, February 03). These women were N.F.L. 'Firsts.' They're eager for company. Retrieved July 28, 2021, from <https://www.nytimes.com/2021/02/03/sports/football/nfl-women-coaches.html>
8. Porterfield, C. (2021, February 08). These three women are making super bowl history as the first female referee and coaches. Retrieved July 28, 2021, from <https://www.forbes.com/sites/carlieporterfield/2021/02/07/these-three-women-are-making-super-bowl-history-as-the-first-female-referee-and-coaches/?sh=e1090b478a>
9. Gannett Satellite Information Network. (2021, May 28). NFL: Eagles, Broncos Among Teams Elevating Women Scouting Roles. Retrieved September 15, 2021, from <https://www.usatoday.com/in-depth/sports/nfl/2021/05/28/nfl-eagles-broncos-among-teams-elevating-women-scouting-roles/7465552002/>
10. WFA expands partnership with Xenith. (2020, December 26). Retrieved July 28, 2021, from <https://wfaprofootball.com/wfa-expands-partnership-with-xenith/>
11. About: Women's National Football Conference. (n.d.). Retrieved July 28, 2021, from <https://www.wnfcfootball.com/about>
12. FAQ: Women's National Football Conference. (n.d.). Retrieved July 28, 2021, from <https://www.wnfcfootball.com/faq>
13. Florio, J., & Shapiro, O. (2019, August 29). Toni Harris made history by getting a football Scholarship. now she needs to Make tackles. Retrieved July 28, 2021, from <https://theundefeated.com/features/antoinette-harris-made-history-by-getting-a-football-scholarship-central-methodist-university/>
14. Brown's Marini becomes first female position coach in NCAA Division I football. (2020, March 16). Retrieved July 28, 2021, from <https://ivyleague.com/news/2020/3/16/football-browns-marini-becomes-first-female-position-coach-in-ncaa-division-i.aspx>
15. Meet Callie Brownson, Division I College football's first full-time FEMALE COACH. (2018, October 11). Retrieved July 28, 2021, from <https://www.cnn.com/2018/10/04/callie-brownson-is-d-i-college-footballs-1st-full-time-female-coach.html>

16. Participation Statistics. (n.d.). Retrieved July 28, 2021, from https://members.nfhs.org/participation_statistics
17. Wolter, D. (2021, July 17). I wanna play too: GIRLS flag football is a rising sport, but will it ever take hold in southwest Minnesota high schools? Retrieved July 28, 2021, from <https://www.dglobe.com/sports/7115385-I-wanna-play-too-Girls-flag-football-is-a-rising-sport-but-will-it-ever-take-hold-in-southwest-Minnesota-high-schools>
18. This football league was built for girls who love to hit. (2019, September 06). Retrieved July 28, 2021, from <https://deadspin.com/this-football-league-was-built-for-girls-who-love-to-hit-1835580300>
19. NFL. (2021, March 25). NFL announces Women's flag Football an emerging sport at NJCAA LEVEL. Retrieved July 28, 2021, from <https://www.nfl.com/news/nfl-announces-women-s-flag-football-an-emerging-sport-at-njcaa-level>
20. Wire, C. (2020, July 01). "The future is FEMALE": Women's flag football is newest college sport. Retrieved July 28, 2021, from <https://www.cnn.com/2020/07/01/sport/naia-flag-football-teams-up-with-nfl-for-success-spt-intl/index.html>
21. Bears to help launch girls flag football league. (2021, June 21). Retrieved July 28, 2021, from <https://www.chicagobears.com/news/bears-to-help-launch-girl-s-flag-football-league>
22. Garrett, T. (2021, February 12). NFL TV Ratings recap from the 2020-2021 NFL season. Retrieved July 28, 2021, from <https://www.profootballnetwork.com/nfl-tv-ratings-recap-from-2020-2021-nfl-season/>
23. Smith, M. (2018, January 10). Gallup poll shows football overwhelmingly Americans' favorite sport. Retrieved July 28, 2021, from <https://profootballtalk.nbcsports.com/2018/01/10/gallup-poll-shows-football-overwhelmingly-americans-favorite-sport/>
24. Rothstein, M. (2021, February 02). EA sports to do college football video game. Retrieved July 28, 2021, from https://www.espn.com/college-football/story/_/id/30821045/school-plan-ea-sports-do-college-football
25. Pells, E. (2021, February 07). The biggest win: In 2020, NFL found ways to play every game. Retrieved July 28, 2021, from <https://apnews.com/article/nfl-tampa-bay-buccaneers-super-bowl-football-coronavirus-pandemic-71defaceb1b8c4b12781bc8ae7277801>
26. Dellenger, P. (2021, January 11). The cost and gain of college football under covid-19. Retrieved July 28, 2021, from <https://www.si.com/college/2021/01/11/college-football-2020-season-covid-19-daily-cover>
27. National Football Foundation. (2021, July 14). Football by the Numbers: NFF Highlights Key Stats on the Game. Retrieved September 15, 2021, from <https://footballfoundation.org/news/2021/7/14/football-by-the-numbers-nff-highlights-key-stats-on-the-game.aspx>
28. NCAA.com. (2021, May 16). Sam Houston Wins 2020-21 FCS Championship over South Dakota State. Retrieved September 15, 2021, from <https://www.ncaa.com/live-updates/football/fcs/sam-houston-wins-2020-21-fcs-championship-over-south-dakota-state>
29. 2020-21 Football Seasons Modifications. (n.d.). Retrieved from <https://www.nfhs.org/media/4119492/2020-21-football-seasons-modifications.jpg>
30. With 2021 around the corner, all states expected to be playing high school sports. (n.d.). Retrieved July 28, 2021, from <https://www.nfhs.org/articles/with-2021-around-the-corner-all-states-expected-to-be-playing-high-school-sports/>

PARTICIPATION

1. Participation Statistics. (n.d.). Retrieved from https://members.nfhs.org/participation_statistics
2. Sports Fitness and Leisure Activities Topline Participation Report. (n.d.). Retrieved July 28, 2021, from https://www.sfia.org/reports/802_2020-Sports%2C-Fitness%2C-and-Leisure-Activities-Topline-Participation-Report
3. While total 2019-20 participation is unavailable, high school Football shows promising results. (n.d.). Retrieved July 28, 2021, from <https://www.nfhs.org/articles/while-total-2019-20-participation-is-unavailable-high-school-football-shows-promising-results/>

Exhibit A: Percentage Share of Total HS Sports Played

BOYS	All Football	Basketball	Track & Field (out)	Baseball	Cross Country	Golf	Tennis	Wrestling	Soccer	Swim & Dive	OTHERS	
1969-70	902430.00	678559.00	623139.00	360157.00	144488.00	93841.00	83717.00	226681.00	49593.00	83286.00	212459.00	3458350.00
	26.09%	19.62%	18.02%	10.41%	4.18%	2.71%	2.42%	6.55%	1.43%	2.41%	6.14%	
1970-71	932691.00	645670.00	642639.00	400906.00	166281.00	120078.00	91279.00	265039.00	78510.00	91309.00	232515.00	3666917.00
	25.44%	17.61%	17.53%	10.93%	4.53%	3.27%	2.49%	7.23%	2.14%	2.49%	6.34%	
1971-72												3666917.00
1972-73												3770621.00
1973-74	1076904.00	688690.00	667974.00	409510.00	214840.00	135813.00	124208.00	319048.00	98482.00	114645.00	225011.00	4070125.00
	26.46%	16.92%	16.41%	10.06%	5.28%	3.34%	3.05%	7.84%	2.42%	2.82%	5.53%	
1974-75												
1975-76	1132172.00	722895.00	664413.00	425386.00	215029.00	189176.00	150401.00	355160.00	115811.00	128942.00	241030.00	4,109,021
	27.55%	17.59%	16.17%	10.35%	5.23%	4.60%	3.66%	8.64%	2.82%	3.14%	5.87%	
1976-77												
1977-78	1133350.00	764702.00	706892.00	432853.00	206587.00	135844.00	170653.00	338328.00	141070.00	106498.00	230665.00	4367442.00
	25.95%	17.51%	16.19%	9.91%	4.73%	3.11%	3.91%	7.75%	3.23%	2.44%	5.28%	
1978-79	1003729.00	619601.00	562567.00	415661.00	170126.00	117668.00	156376.00	281704.00	132073.00	95718.00	154289.00	3709512.00
	27.06%	16.70%	15.17%	11.21%	4.59%	3.17%	4.22%	7.59%	3.56%	2.58%	4.16%	
1979-80	957759.00	569228.00	524890.00	415860.00	163094.00	117273.00	131290.00	273226.00	133649.00	84204.00		3370573.00
	28.42%	16.89%	15.57%	12.34%	4.84%	3.48%	3.90%	8.11%	3.97%	2.50%	0.00%	
1980-81	958423.00	553702.00	507791.00	422310.00	172270.00	118390.00	130046.00	245029.00	149376.00	90941.00	154846.00	3503124.00
	27.36%	15.81%	14.50%	12.06%	4.92%	3.38%	3.71%	6.99%	4.26%	2.60%	4.42%	
1981-82	927666.00	538670.00	477650.00	415353.00	169891.00	110431.00	129478.00	256107.00	161167.00	79615.00	143053.00	3409081.00
	27.21%	15.80%	14.01%	12.18%	4.98%	3.24%	3.80%	7.51%	4.73%	2.34%	4.20%	
1982-83	923780.00	514791.00	475229.00	409970.00	165114.00	115187.00	126458.00	254581.00	162504.00	76657.00	131287.00	3355558.00
	27.53%	15.34%	14.16%	12.22%	4.92%	3.43%	3.77%	7.59%	4.84%	2.28%	3.91%	
1983-84	944473.00	497277.00	464956.00	398608.00	152521.00	103196.00	118539.00	248300.00	173423.00	82702.00	119604.00	3303599.00
	28.59%	15.05%	14.07%	12.07%	4.62%	3.12%	3.59%	7.52%	5.25%	2.50%	3.62%	
1984-85	1006675.00	493806.00	455277.00	391810.00	155550.00	107155.00	124467.00	244598.00	180281.00	78256.00	116409.00	3354284.00
	30.01%	14.72%	13.57%	11.68%	4.64%	3.19%	3.71%	7.29%	5.37%	2.33%	3.47%	
1985-86	953516.00	505130.00	446286.00	393905.00	154590.00	112602.00	128820.00	247653.00	196028.00	81516.00	124229.00	3344275.00
	28.51%	15.10%	13.34%	11.78%	4.62%	3.37%	3.85%	7.41%	5.86%	2.44%	3.71%	
1986-87	931176.00	515989.00	439441.00	406046.00	152418.00	113560.00	130957.00	251281.00	203984.00	85371.00	133859.00	3364082.00
	27.68%	15.34%	13.06%	12.07%	4.53%	3.38%	3.89%	7.47%	6.06%	2.54%	3.98%	
1987-88	949279.00	524606.00	431009.00	407630.00	157306.00	124486.00	136083.00	246771.00	208935.00	94199.00	145473.00	3425777.00
	27.71%	15.31%	12.58%	11.90%	4.59%	3.63%	3.97%	7.20%	6.10%	2.75%	4.25%	
1988-89	951669.00	513575.00	422251.00	412825.00	155192.00	124759.00	136158.00	242064.00	218973.00	84366.00	155012.00	3416844.00
	27.85%	15.03%	12.36%	12.08%	4.54%	3.65%	3.98%	7.08%	6.41%	2.47%	4.54%	
1989-90	947757.00	517271.00	405684.00	413581.00	155806.00	122998.00	136939.00	233856.00	220777.00	85112.00	158411.00	3398192.00
	27.89%	15.22%	11.94%	12.17%	4.58%	3.62%	4.03%	6.88%	6.50%	2.50%	4.66%	
1990-91	941423.00	515644.00	401350.00	419015.00	155375.00	125903.00	141250.00	230673.00	228380.00	82925.00	164417.00	3406355.00
	27.64%	15.14%	11.78%	12.30%	4.56%	3.70%	4.15%	6.77%	6.70%	2.43%	4.83%	
1991-92	912845.00	518127.00	417451.00	433684.00	154119.00	132847.00	145374.00	229908.00	236082.00	79998.00	169418.00	3429853.00
	26.61%	15.11%	12.17%	12.64%	4.49%	3.87%	4.24%	6.70%	6.88%	2.33%	4.94%	
1992-93	910407.00	521023.00	412638.00	430401.00	159536.00	129129.00	138177.00	222025.00	242095.00	78474.00	172484.00	3416389.00
	26.65%	15.25%	12.08%	12.60%	4.67%	3.78%	4.04%	6.50%	7.09%	2.30%	5.05%	
1993-94	928134.00	530068.00	419758.00	438846.00	162188.00	131207.00	135702.00	223433.00	255538.00	81328.00	166765.00	3472967.00
	26.72%	15.26%	12.09%	12.64%	4.67%	3.78%	3.91%	6.43%	7.36%	2.34%	4.80%	
1994-95	955247.00	540269.00	430807.00	440503.00	163829.00	133705.00	132735.00	216453.00	272810.00	80089.00	169912.00	3536359.00
	27.01%	15.28%	12.18%	12.46%	4.63%	3.78%	3.75%	6.12%	7.71%	2.26%	4.80%	
1995-96	981480.00	545596.00	454645.00	444476.00	168203.00	140011.00	136534.00	221162.00	283728.00	81000.00	177217.00	3634052.00
	27.01%	15.01%	12.51%	12.23%	4.63%	3.85%	3.76%	6.09%	7.81%	2.23%	4.88%	
1996-97	981790.00	544025.00	468061.00	444248.00	174599.00	150578.00	136451.00	227596.00	296587.00	93523.00	188767.00	3706225.00
	26.49%	14.68%	12.63%	11.99%	4.71%	4.06%	3.68%	6.14%	8.00%	2.52%	5.09%	
1997-98	996797.00	544463.00	471175.00	449897.00	178672.00	159501.00	137827.00	229176.00	309484.00	83781.00	202347.00	3763120.00
	26.49%	14.47%	12.52%	11.96%	4.75%	4.24%	3.66%	6.09%	8.22%	2.23%	5.38%	
1998-99	1007670.00	549499.00	477960.00	455305.00	181915.00	167781.00	142953.00	235973.00	321416.00	83411.00	208469.00	3832352.00
	26.29%	14.34%	12.47%	11.88%	4.75%	4.38%	3.73%	6.16%	8.39%	2.18%	5.44%	
1999-2000	1025762.00	541130.00	480791.00	451701.00	183139.00	165857.00	139507.00	239105.00	330044.00	86640.00	218073.00	3861749.00
	26.56%	14.01%	12.45%	11.70%	4.74%	4.29%	3.61%	6.19%	8.55%	2.24%	5.65%	
2000-01	1036141.00	539849.00	491822.00	450513.00	188420.00	161757.00	152731.00	244984.00	333109.00	88811.00	232967.00	3921069.00
	26.42%	13.77%	12.54%	11.49%	4.81%	4.13%	3.90%	6.25%	8.50%	2.26%	5.94%	
2001-02	1049478.00	540597.00	494022.00	451674.00	190993.00	163299.00	151999.00	244637.00	339481.00	90698.00	244490.00	3960517.00
	26.50%	13.65%	12.47%	11.40%	4.82%	4.12%	3.84%	6.18%	8.57%	2.29%	6.17%	
2002-03	1047885.00	540874.00	498027.00	453792.00	191833.00	162805.00	156831.00	239845.00	345156.00	94612.00	256758.00	3988738.00
	26.27%	13.56%	12.49%	11.38%	4.81%	4.08%	3.93%	6.01%	8.65%	2.37%	6.44%	
2003-04	1057660.00	544811.00	504801.00	457146.00	196428.00	163341.00	152938.00	238700.00	349785.00	96562.00	262577.00	4024749.00
	26.28%	13.54%	12.54%	11.36%	4.88%	4.06%	3.80%	5.93%	8.69%	2.40%	6.52%	
2004-05	1071163.00	545497.00	516703.00	459717.00	201719.00	161025.00	148530.00	243009.00	354587.00	103754.00	304615.00	4110319.00
	26.06%	13.27%	12.57%	11.18%	4.91%	3.92%	3.61%	5.91%	8.63%	2.52%	7.41%	
2005-06	1097584.00	546335.00	533985.00	470671.00	208303.00	161284.00	153006.00	251534.00	358935.00	107468.00	317444.00	4206549.00
	26.09%	12.99%	12.69%	11.19%	4.95%	3.83%	3.64%	5.98%	8.53%	2.55%	7.55%	
2006-07	1130480.00	556269.00	544180.00	477430.00	216085.00	159747.00	156944.00	257246.00	377999.00	106738.00	337985.00	4321103.00
	26.16%	12.87%	12.59%	11.05%	5.00%	3.70%	3.63%	5.95%	8.75%	2.47%	7.82%	
2007-08	1135612.00	552935.00	548821.00	478029.00	221109.00	159958.00	156285.00	259688.00	383561.00	111896.00	336302.00	4344196.00
	26.14%	12.73%	12.63%	11.00%	5.09%	3.68%	3.60%	5.98%	8.83%	2.58%	7.74%	
2008-09	1139446.00	545145.00	558007.00	473184.00	231452.00	157062.00	157165.00	267378.00	383824.00	130182.00	379817.00	4422662.00
	25.76%	12.33%	12.62%	10.70%	5.23%	3.55%	3.55%	6.05%	8.68%	2.94%	8.59%	
2009-10	1135393.00	540207.00	572123.00	472644.00	239608.00	157756.00	162755.00	272890.00	391839.00	131376.00	379149.00	4455740.00
	25.48%	12.12%	12.84%	10.61%	5.38%	3.54%	3.65%	6.12%	8.79%	2.95%	8.51%	
2010-11	1134712.00	545844.00	579302.00	471025.00	246948.00	156866.00	161367.00	273732.00	398351.00	133900.00	392359.00	4494406.00
	25.25%	12.14%	12.89%	10.48%	5.49%	3.49%	3.59%	6.09%	8.86%	2.98%	8.73%	
2011-12	1121995.00	535289.00	575628.00	474219.00	248494.00	152725.00	159800.00	272149.00	411757.00	133823.00	399108.00	4484987.00
	25.02%	11.94%	12.83%	10.57%	5.54%	3.41%	3.56%	6.07%	9.18%	2.98%	8.90%	
2012-13	1115705.00	538676.00	580672.00	474791.00	249200.00							

INJURIES

1. Annual Football 2020 Fatalities. (n.d.). Retrieved from <https://nccsir.unc.edu/wp-content/uploads/sites/5614/2021/03/Annual-Football-2020-Fatalities-FINAL.pdf>
2. Catastrophic Sports Injury Research. (n.d.). Retrieved from <https://nccsir.unc.edu/wp-content/uploads/sites/5614/2021/05/2019-Catastrophic-Report-AS-37th-AY2018-2019-FINAL2.pdf>
3. Injury Risk Lowest in History of High School Football. (2019, February 6). Retrieved from <http://www.nfhs.org/articles/injury-risk-lowest-in-history-of-high-school-football>
4. 42% of NCAA men experienced a major sports-related injury before entering college. (2019, May 23). Retrieved from <https://twitter.com/NCAAREsearch/status/1131701846425444352>
5. Female soccer players suffer the most concussions in high school sports. (2017, March 10). Retrieved from https://aaos-annualmeeting-presskit.org/2017/research-news/concussions_hsu/
6. Bohr, A., Boardman, J., & McQueen, M. (2019, September 26). Association of Adolescent sport participation with cognition and depressive symptoms in early adulthood. Retrieved July 28, 2021, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6764154/>
7. NFL. (2021, April 21). Injury data since 2015. Retrieved July 28, 2021, from <https://www.nfl.com/playerhealthandsafety/health-and-wellness/injury-data/injury-data>
8. Sports Injury Statistics. (n.d.). Retrieved from <https://www.stanfordchildrens.org/en/topic/default?id=sports-injury-statistics-90-P02787>

RULE CHANGES, GUIDANCE & COACHING ADVANCEMENTS

1. Pop Warner bans three-point stance and some kickoffs. (2019, February 28). Retrieved from https://apnews.com/7de4de4ecf2b4917a298a23324f818de?utm_source=Twitter&utm_campaign=SocialFlow&utm_medium=AP_Sports
 2. Health & safety rules changes. (n.d.). Retrieved July 28, 2021, from <https://operations.nfl.com/the-rules/rules-changes/health-safety-rules-changes/>
 3. NCAA Football Rules Committee Proposes Rules To Enhance Student-Athlete Safety And Encourage Consistent Pace Of Play. (n.d.). Retrieved July 28, 2021, from <https://football.refs.org/rules/NCAA2008pr.html>
 4. NCAA Football Rules Committee Strengthens Rules To Protect Student-Athletes And Confirms Sportsmanship Enforcement. (n.d.). Retrieved July 28, 2021, from <https://football.refs.org/rules/NCAA2009pr.html>
 5. Adelson, A. (2010, August 17). NCAA rules changes for 2010. Retrieved July 28, 2021, from https://www.espn.com/blog/ncfnation/post/_id/24738/ncaa-rule-changes-for-2010
 6. 2011 NCAA FOOTBALL RULES COMMITTEE ACTION REPORT. (n.d.). Retrieved from http://fs.ncaa.org/Docs/rules/football/2011/2011rulescommitteeactionreport_links.pdf
 7. Johnson, G. (n.d.). Playing Rules Oversight Panel approves rules changes in football, other sports. Retrieved July 28, 2021, from <https://www.ncaa.org/about/resources/media-center/news/playing-rules-oversight-panel-approves-rules-changes-football>
 8. Myerberg, P. (2013, March 07). NCAA approves rule automatically ejecting players for targeting. Retrieved July 28, 2021, from <https://www.usatoday.com/story/sports/ncaaf/2013/03/07/ncaa-football-approves-rule-ejecting-for-targeting/1970725/>
- Johnson, G. (n.d.). Football Rules Committee slightly adjusts targeting rule, defensive substitutions. Retrieved July 28, 2021, from <https://www.ncaa.org/about/resources/media-center/news/football-rules-committee-slightly-adjusts-targeting-rule-defensive>
9. NFF. (2015, August 25). Rule changes. Retrieved July 28, 2021, from <https://www.ncaa.com/news/football/article/2015-08-25/ncaa-football-need-know-rules-changes-2015-season>
 10. NFF. (2016, August 03). College football: Need-to-know rule changes for 2016 season. Retrieved July 28, 2021, from <https://www.ncaa.com/news/football/article/2016-08-03/college-football-need-know-rule-changes-2016-season>
 11. Kercheval Aug 23, B. (2017, August 23). College football rule changes 2017: Area for Horse-collar tackle penalties explained. Retrieved July 28, 2021, from <https://www.cbssports.com/college-football/news/college-football-rule-changes-2017-area-for-horse-collar-tackle-penalties-expanded/>
 12. New kickoff rule approved for 2018. (2018, April 13). Retrieved July 28, 2021, from <https://www.ncaa.com/news/football/article/2018-04-13/alteration-football-kickoff-rule-approved>

13. Important rule changes for the 2019 college football season. (2019, August 22). Retrieved July 28, 2021, from <https://insider.afca.com/important-rule-changes-for-the-2019-college-football-season/>
14. Rittenberg, A. (2021, April 22). College football rule changed to require 2-point conversions after TDs in 2ND Ot rather than 3rd. Retrieved July 28, 2021, from https://www.espn.com/college-football/story/_/id/31310857/rule-changed-require-2-point-conversions-touchdowns-2nd-ot-rather-3rd-ot
15. Traumatic Brain Injury Legislation. (2018, October 11). Retrieved from <http://www.ncsl.org/research/health/traumatic-brain-injury-legislation.aspx>
16. Siders, D. (2014, October 08). Jerry Brown signs bill limiting full contact football practice in California. Retrieved from <https://www.sacbee.com/news/politics-government/capitol-alert/article2604439.html>
17. WIAA Football Player on Player Contact. (2014). Retrieved from <https://www.wiaawi.org/Sports/Fall/Football/Rules-Regulations>
18. New Football Practice Policies Promote Safety as 14-15 Sports Year Begins. (2014, August 7). Retrieved from <https://www.mhsaa.com/News/Press-Releases/articleType/ArticleView/articleId/3093/New-Football-Practice-Policies-Promote-Safety-as-14-15-Sports-Year-Begins>
19. FHSAA Limits Live Contact for High School Football. (2016, June 7). Retrieved from <https://nfhs.org/articles/fhsaa-limits-live-contact-for-high-school-football/>
20. White, M. (2016, May 25). PIAA further limits contact in high school football practices. Retrieved from <https://www.post-gazette.com/sports/highschool/2016/05/26/PIAA-further-limits-contact-in-high-school-football-practices/stories/201605260113>
21. Waldstein, D. (2019, February 14). New Jersey Unveils New Limits on High School Football Practices. Retrieved from <https://www.nytimes.com/2019/02/13/sports/new-jersey-football-rules.html>
22. Purcell, J. (2019, May 10). New contact rules for high school football practice get mixed reactions. Retrieved from <https://www.mlive.com/highschoolsports/2019/05/new-contact-rules-for-high-school-football-practice-gets-mixed-reactions.html>
23. Tang, E. (2019, May 21). These parents are tackling a common football injury that took their son's life. Retrieved from <https://www.goodmorningamerica.com/news/story/parents-tackling-common-football-injury-sons-life-continue-63152724>
24. Seifert, K. (2019, May 22). NFL asks teams to stop Oklahoma drill, others. Retrieved from https://www.espn.com/nfl/story/_/id/26800703/nfl-asks-teams-stop-oklahoma-drill-others
25. Hosick, M. (n.d.). DI Council adjusts transfer waiver guidelines. Retrieved July 28, 2021, from <https://www.ncaa.org/about/resources/media-center/news/di-council-adjusts-transfer-waiver-guidelines>
26. Public Institutions of Higher Education – Student Athletes (Jordan McNair Safe and Fair Play Act). (n.d.). Retrieved July 28, 2021, from <https://mgaleg.maryland.gov/mgaweb/Legislation/Details/sb0439?ys=2021RS>
27. Wisconsin rule limiting full-contact practice in high school football cuts concussion rate by more than half. (n.d.). Retrieved July 28, 2021, from <https://www.med.wisc.edu/news-and-events/2019/july/rule-cuts-concussion-rates-in-half/>

28. Broglio, S., Williams, R., O'Connor, K., & Goldstick, J. (2016, July). Football players' head-impact exposure after limiting of full-contact practices. Retrieved July 28, 2021, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5317186/>
29. Mandatory pre-season guidelines reduce heat illness among high school football players. (2019, April 10). Retrieved from <https://www.sciencedaily.com/releases/2019/04/190410105652.htm>
30. NCAA-DOD Care Consortium. (2018, November 16). Retrieved from <http://www.ncaa.org/sport-science-institute/topics/ncaa-dod-care-consortium>
31. Burnsed, B. (2019, May 15). CARE Consortium: Return to play and risk of repeat concussion in football. Retrieved from <http://www.ncaa.org/sport-science-institute/care-consortium-return-play-and-risk-repeat-concussion-football>
32. CARE Consortium: Estimated age at first exposure to contact sports and neurocognitive performance in service academy athletes. (n.d.). Retrieved July 28, 2021, from <https://www.ncaa.org/sport-science-institute/care-consortium-estimated-age-first-exposure-contact-sports-and-neurocognitive-performance-service>
33. Master, C., Katz, B., Arbogast, K., McCrea, M., McAllister, T., Pasquina, P., . . . Broglio, S. (2020, December 20). Differences in Sport-related CONCUSSION for female and male athletes in comparable COLLEGIATE Sports: A study from the NCAA-DoD Concussion Assessment, research and EDUCATION (care) Consortium. Retrieved July 28, 2021, from <https://bjsm.bmj.com/content/early/2020/12/20/bjsports-2020-103316.long>
34. Athletics Health Care Administration Best Practices. (2017, November 16). Retrieved from <https://www.ncaa.org/sport-science-institute/athletics-health-care-administration-best-practices-0>
35. Preventing Catastrophic Injury and Death in Collegiate Athletics. (2019, July). Retrieved from https://ncaaorg.s3.amazonaws.com/ssi/injury_prev/SSI_PreventingCatastrophicInjuryBooklet.pdf
36. NFF Distributes Coach Guidelines for Informing Parents on Football Safety. (2016, August 10). Retrieved from <https://footballfoundation.org/news/2016/8/9/55653.aspx?path=football>
37. Tools for Better Practices. (n.d.). Retrieved from <https://usafootball.com/resources-tools/coach/practice-guidelines/>
38. Traumatic Brain Injuries Among Youth Athletes. (2015, November 18). Retrieved from <http://www.ncsl.org/research/health/traumatic-brain-injuries-among-youth-athletes.aspx>
39. CARE-Based Policy Changes and Resources. (2018, May 29). Retrieved from <http://www.ncaa.org/sport-science-institute/topics/care-based-policy-changes-and-resources>
40. Year-Round Football Practice Contact Recommendations. (2017, July 11). Retrieved from <http://www.ncaa.org/sport-science-institute/year-round-football-practice-contact-recommendations>
41. Recommendations and Guidelines for Minimizing Head Impact Exposure and Concussion Risk in Football. (2014, October). Retrieved from https://www.nfhs.org/media/1014885/2014_nfhs_recommendations_and_guidelines_for_minimizing_head_impact_october_2014.pdf
42. NFL way to play. (n.d.). Retrieved July 28, 2021, from <https://operations.nfl.com/inside-football-ops/nfl-way-to-play/>
43. HEADS up to Youth Sports: Online training. (2020, February 27). Retrieved July 28, 2021, from <https://www.cdc.gov/headsup/youthsports/training/index.html>

44. Football Safety. (n.d.). Retrieved from <https://www.popwarner.com/football/footballsafety>
45. Kerr, Z. Y., Yeargin, S., Valovich McLeod, T. C., Nittoli, V. C., Mensch, J., Dodge, T., Dompier, T. P. (2015, July 15). Comprehensive Coach Education and Practice Contact Restriction Guidelines Result in Lower Injury Rates in Youth American Football. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4622331/>
46. Pop Warner Becomes First National Football Organization to Eliminate 3-Point Stance. (n.d.). Retrieved July 28, 2021, from <https://www.popwarner.com/Default.aspx?tabid=1403205&mid=1475016&newskeyid=HN1&newsid=279263&ctl=newsdetail>
47. Lawrence, L. (2018, March 20). Texas High School Football Mandates Tackling Certification for All High School Coaches - University Interscholastic League (UIL). Retrieved September 15, 2021, from <https://www.uil texas.org/press-releases/detail/texas-high-school-football-mandates-tackling-certification-for-all-high-sch>

TECHNOLOGY ADVANCEMENTS

1. NFL downgrades safety of 9 helmet models used by 18 percent of players. (2021, April 20). Retrieved July 28, 2021, from <https://theathletic.com/news/nfl-downgrades-safety-of-9-helmet-models-used-by-18-percent-of-players/kyPPIEZuQD0F>
2. Battista, J. (2019, January 24). NFL sees significant drop in concussions during 2018 season. Retrieved July 28, 2021, from <https://www.nfl.com/news/nfl-sees-significant-drop-in-concussions-during-2018-season-0ap3000001013041>
3. 2021 Helmet Laboratory Testing Performance Results. (n.d.). Retrieved from <https://static.www.nfl.com/image/upload/v1622046050/league/iy73jncpobiberqpg3fa.pdf>
4. TAFT SCHOOL CONVERTS ENTIRE FOOTBALL ROSTER TO TOP-RANKED VICIS ZERO1 HELMETS. (n.d.). Retrieved July 28, 2021, from <https://www.vicis.com/insider/taft-school-converts-entire-football-roster-to-top-ranked-vicis-zero1-helmets>
5. Virginia Tech Helmet Ratings. (n.d.). Retrieved July 28, 2021, from <https://helmet.beam.vt.edu/>
6. Varsity Football Helmet Ratings. (n.d.). Retrieved July 28, 2021, from <https://helmet.beam.vt.edu/varsity-football-helmet-ratings.html>
7. Youth Football Helmet Ratings. (n.d.). Retrieved July 28, 2021, from <https://helmet.beam.vt.edu/youth-football-helmet-ratings.html>
8. Flag Football Headgear Ratings. (n.d.). Retrieved July 28, 2021, from <https://helmet.beam.vt.edu/flag-football-headgear-ratings.html>
9. Doney, P. (2019, May 27). New Helmet Concept May Save the Game of Football. Retrieved from <https://www.nbcdfw.com/news/sports/Neurologist-Believes-New-Helmet-Concept-May-Save-High-School-Football-510184231.html>
10. Material for safer football helmets may reduce head injuries. (2019, November 27). Retrieved July 28, 2021, from <https://www.sciencedaily.com/releases/2019/11/191127121223.htm>
11. Certified products: Safety equipment institute. (n.d.). Retrieved July 28, 2021, from https://www.seinet.org/search.htm#sections=NOCSAE_collapse3,NOCSAE_Football_collapse31
12. FITGuard by Force Impact Technologies. (n.d.). Retrieved from <https://www.fitguard.me/>
13. SISU Sense | Smart Mouthguard with Impact Sensors. (n.d.). Retrieved from <https://www.sisuguard.com/sisusense/>
14. Lemire, J. (2019, May 30). Catapult, Prevent Biometrics Partner to Sync Safety, Performance Data. Retrieved from <https://www.sporttechie.com/catapult-prevent-biometrics-safety-performance-data/>
15. \$1.37 million awarded in HeadHealthTECH grant funding to NFL Helmet Challenge applicants. (n.d.). Retrieved July 28, 2021, from <https://www.nfl.com/playerhealthandsafety/equipment-and-innovation/innovation-challenges/1-37-million-headhealthtech-grant-funding-nfl-helmet-challenge-applicants>
16. NFL. (2021, June 21). NFL helmet challenge judging panel set & ready for action. Retrieved July 28, 2021, from <https://www.nfl.com/playerhealthandsafety/equipment-and-innovation/innovation-challenges/nfl-helmet-challenge-judging-panel-set-ready-for-action>

17. Pac-12 Research Grants Program. (n.d.). Retrieved July 28, 2021, from <https://pac-12.com/pac-12-research-grants-program>
18. NFL. (2021, January 05). Using artificial intelligence to advance player health and safety. Retrieved July 28, 2021, from <https://www.nfl.com/playerhealthandsafety/equipment-and-innovation/aws-partnership/using-artificial-intelligence-to-advance-player-health-and-safety>