2026 Health and Social Survey of the American Birkebeiner Database of Trail Users and Event Participants

While many large endurance events generate temporary participation, the American Birkebeiner has built something rarer: a year-round community where 95% of respondents meet national activity guidelines, 83% remain engaged in other endurance events, and the health benefits observed a decade ago are still evident today.

Physical Activity & Healthy Living

- **95% of Birkie survey respondents meet CDC aerobic activity guidelines**, compared with much lower levels typically seen in the general population, revealing a community deeply engaged in regular movement and exercise.
- **99.5% report participating in some leisure-time physical activity**, making physical inactivity almost nonexistent among respondents.
- **97% regularly participate in at least one non-ski endurance activity**, showing that the Birkie experience extends far beyond winter and supports year-round physical activity.
- **64% participated in all 4 related activities: skiing, running, cycling, and hiking**. This illustrates a remarkably broad culture of outdoor recreation and lifelong fitness.

The Birkie Creates Lasting Engagement

- **Research shows that many large mass participation events successfully attract active, affluent people but fail to sustain long-term behavior change. The Birkie demonstrates a different model.** Survey results show participants maintain active lifestyles across multiple sports and throughout the year, rather than training for a single event and disengaging afterward.
- **83% of respondents participate in additional endurance events beyond the Birkie**, suggesting the Foundation serves as an anchor for ongoing involvement in healthy activities rather than a one-time experience.
- **The data support the idea that the Birkie is not simply an event people attend. It is a community and lifestyle people remain engaged with over many years.**

Social Connection & Community Building

- **Only 23% initially identify social connection as a top reason for participating, yet participants report strong feelings of connection once involved, averaging 4.0 out of 5 when asked whether outdoor recreation helps them feel connected to others.**
- **Social connection grows with years of participation**, suggesting the Birkie becomes increasingly valuable as a source of friendship, belonging, and community over time.
- **The Birkie successfully combines two of the strongest predictors of long-term well-being: physical activity and meaningful social connection.**

Healthy Aging

- **Nearly half of respondents are between ages 55 and 74, yet they continue to report near-universal physical activity, low obesity rates, and excellent self-rated health.**
- **Despite an older respondent profile than a decade ago, 99% report good-to-excellent health and only 6.9% meet criteria for moderate obesity.**
- **The survey provides a compelling example of healthy aging in action, demonstrating how lifelong engagement in endurance sports can support health and function later in life.**

Evidence of Long-Term Impact

- **The Birkie health profile has now been replicated in two independent surveys conducted approximately ten years apart.** This is important because it demonstrates durability, not a one-time result.
- **Over a decade, inactivity remained extremely low (5.8% to 0.5%), smoking dropped from 3.4% to 0.5%, and participants continued to report exceptional levels of health and physical activity.**
- **The strongest finding may be that the positive health and activity patterns observed in 2014 were reproduced in a completely different group of respondents a decade later, under more rigorous comparison methods.**

Community Investment & Future Opportunity

- **The Birkie Trail and Foundation infrastructure support a community that remains active across all four seasons, creating benefits that extend well beyond race weekend.**
- **The biggest future opportunity is helping more inactive and underserved community members access the same benefits already being experienced by current participants.** The Foundation has demonstrated a successful model; the next step is broadening its reach.

Prepared for the American Birkebeiner Ski Foundation.

A consolidated analysis combining (I) an interpretation of the current Birkebeiner Health & Recreation Survey in the context of the peer-reviewed physical-activity and public-health literature, and (II) an interval comparison of the current survey wave against the Foundation's earlier, peer-reviewed survey wave conducted approximately a decade earlier.

Part I — The Current Survey in the Context of the Physical-Activity Literature

Executive framing

The central conclusion of this analysis is that the survey establishes a defensible, evidentiary foundation: the American Birkebeiner functions as a demonstrated platform on which participants realize the physical, mental, and social benefits that the medical literature attributes to regular physical activity, and it does so in a sustained, community-anchored form that comparable events frequently fail to achieve. This briefing sets out the basis for that conclusion, distinguishes what the data establish from what remains to be tested, and situates the finding within recognized international public-health strategy.

The apparent obviousness of the result, and why it is misleading

At first inspection, the survey's headline results may appear self-evident. Respondents are affluent and highly educated—94% hold a college degree or higher, and 75% report household income of $100,000 or more—and both income and educational attainment are independently associated with higher levels of physical activity and more favorable health outcomes. A reasonable skeptic might therefore conclude that the observed health profile is a foregone consequence of the participant demographic.

This objection merits consideration, but it is incomplete. The salient analytical point is that attracting an affluent, educated, and already-active population does not, in itself, guarantee that an event generates or sustains the health and social benefits documented here. The mass-participation sport literature addresses both dimensions of this problem directly. First, such events are frequently characterized as attracting individuals who are already active and drawn from more affluent areas; an affluent participant base is thus the sector norm rather than an indicator of success (Quirk et al., *BMC Public Health*, 2021). Second, and more consequentially, many mass-participation events are discrete, non-recurring occasions with limited capacity to leverage sustained behavior change (Quirk et al., *BMC Public Health*, 2021). A systematic review of 39 studies found that the physical activity accrued while training for a mass-participation event tends to decline in the months following the event, and concluded that the evidence on

how best to sustain post-event activity remains limited (McVinnie et al., *Health Promotion International*, 2023).

It is therefore entirely possible for an event to attract precisely this demographic and nonetheless produce a transient increase in activity followed by a return to baseline, yielding no durable movement behavior, no lasting community formation, and no meaningful contribution to population health. This counterfactual is the appropriate benchmark against which the Birkebeiner should be evaluated.

The empirical signal in the Birkebeiner data

Assessed against that benchmark, the distinguishing feature of the Birkebeiner is not that its respondents are healthy, but that participation is associated with a sustained, year-round active lifestyle rather than an isolated seasonal or single-event episode:

- 97% of respondents regularly (weekly or more) engage in at least one non-ski endurance activity, and 64% engage in all four of skiing, running, cycling, and hiking at least occasionally across the year.
- 83% also compete in non-Birkebeiner endurance events, indicating that the event operates as one anchor within a continuous training calendar rather than as a stand-alone objective.
- 95% meet the CDC aerobic activity guideline, and the accompanying health profile—low prevalence of obesity, chronic disease, and physical and mental distress—is consistent in both direction and magnitude with the predictions of the physical-activity literature.
- Social connection is not a primary motivation for participation (only 23% cite it among their top three reasons), yet respondents consistently report developing it once engaged (agreement that outdoor recreation helps them "feel connected to others" averages 4.0/5), and this sense of connection increases with duration of participation.

The sustained-activity and community-formation patterns are the signals that differentiate this event from the non-recurring model against which the literature cautions.

The mechanisms are established in the evidence base

The benefits reported by respondents are not incidental; they correspond to recognized mechanisms documented in the literature.

- **Accessible trails and green space.** A systematic review found that publicly accessible urban and natural green space is positively associated with objectively measured physical activity and mental health, while emphasizing that access alone is insufficient—maintenance, proximity, and programming are material determinants of benefit

(Gianfredi et al., *International Journal of Environmental Research and Public Health*, 2021). The Birkebeiner trail infrastructure constitutes precisely this category of health asset.

- **The social dimension as a health mechanism.** There is strong evidence that social support, and moderate evidence that a sense of belonging and social participation, mediate the relationship between physical activity and mental health (White et al., *International Journal of Behavioral Nutrition and Physical Activity*, 2024). Membership in sport or exercise groups predicts fewer depressive symptoms years later, operating in part through reduced loneliness, with clinical depression rates approximately twice as high among non-members as among members (Stevens et al., *Social Science & Medicine*, 2021). The connection respondents develop through the Birkebeiner therefore represents a substantive, rather than incidental, health mechanism.

Alignment with the WHO framework for mass-participation events

This positioning is consistent with formal international public-health strategy rather than being a proposition original to the Foundation. In its *Global Action Plan on Physical Activity 2018–2030*, the World Health Organization identified the need for physical-activity opportunities that make use of public spaces and engage whole communities, and specifically called for "regular mass-participation initiatives in public spaces, engaging whole communities, to provide free access to enjoyable and affordable, socially and culturally appropriate experiences of physical activity" (WHO Global Action Plan, as cited in Quirk et al., *BMC Public Health*, 2021). Mass-participation events have been recognized for their public-health potential in light of their population reach, growing popularity, and community context, and have been characterized as a potential referral pathway for engaging inactive individuals in regular physical activity (McVinnie et al., *Health Promotion International*, 2023). The Birkebeiner falls squarely within this internationally endorsed category of intervention.

Where the sample sits on the dose-response curve

A further analytical observation concerns the position of this sample on the established dose-response relationship between physical activity and health. The relationship is not linear. The most rigorous synthesis to date—a dose-response meta-analysis of 15 prospective cohorts comprising more than 2.1 million person-years—describes an inverse curvilinear association between physical activity and incident depression, in which the steepest risk reduction occurs when moving from inactivity to modest activity, and additional volume beyond roughly the guideline level (equivalent to approximately 2.5 hours of brisk walking per week) confers only minor further benefit with rising uncertainty (Pearce et al., *JAMA Psychiatry*, 2022). The same curvilinear pattern, with the largest gains realized in the transition out of inactivity and a

plateau at higher volumes, is reaffirmed in the most recent public-health synthesis (Salvo et al., *Nature Medicine*, 2026) and in prospective cohort data showing risk of common mental disorders declining up to approximately ten hours of exercise per week before levelling off (Grasdalsmoen et al., *PLoS One*, 2026).

The analytically salient point is that the Birkebeiner respondents sit almost entirely on the flat, high-volume portion of this curve. With 95% meeting the aerobic guideline and a substantial share reporting weekly moderate-equivalent volumes far in excess of it, essentially the entire respondent sample has already captured the large, early gains that the curve attributes to leaving inactivity behind. This has two implications. First, it reinforces the reach argument made above: the marginal public-health value of the event lies not in adding further volume to an already highly active respondent group—who occupy the region of the curve where incremental returns are smallest—but in extending participation to inactive community members positioned on its steep initial segment, where the same behavioral step yields disproportionately large benefit. Second, it clarifies that the near-universal favorable health profile among respondents is consistent with, and predicted by, the plateau of the curve rather than evidence of benefit that scales indefinitely with training volume.

The survey's internal dose-response data are congruent with this interpretation and add a noteworthy nuance. Self-rated health is near-universal (97–100%) across every training-volume band from 3 to more than 15 hours per week, precisely the flatness the curve predicts once the guideline threshold is exceeded. Frequent mental distress, however, does not remain flat at the extreme: it is negligible through the 3-to-15-hour range (approximately 1.6–2.3%) but rises to 6.9% among the small subgroup training more than 15 hours per week in peak season (n = 102). This within-sample pattern should be read cautiously—it is descriptive, not causal, and rests on a small subgroup—but it aligns with an established body of evidence that the physical-activity–mental-health relationship is not monotonic at the upper extreme. Cross-sectional modeling has described U-shaped associations in which activity that is excessive in volume or duration is accompanied by less favorable mental-health measures (Shimura et al., *Frontiers in Psychology*, 2023), and the overtraining literature documents a graded, dose-dependent rise in negative mood states—and, in a minority who progress to overtraining syndrome, clinically significant mood disturbance—as training load rises without adequate recovery (Meeusen et al., ECSS/ACSM Joint Consensus Statement, *Medicine & Science in Sports & Exercise*, 2013). The observed uptick at the highest training band is therefore consistent with the shape the literature would anticipate: benefit plateaus across the broad middle of the distribution, and the highest-volume tail is the one region in which additional load may carry a mental-health cost rather than a gain.

For the Foundation, this reinforces rather than undermines the central message. The health value the event is positioned to deliver at the population level resides in moving inactive individuals onto the steep, high-yield portion of the curve, not in encouraging already-active respondents toward ever-higher volumes where returns flatten and, at the extreme, may reverse.

The foundational claim and its boundaries

The survey establishes a specific and defensible foundation: the Birkebeiner demonstrably functions as a platform on which respondents realize the physical, mental, and social benefits that the medical literature attributes to regular physical activity, and it does so in the sustained, community-anchored form that the WHO framework endorses and that many comparable events fail to achieve. This constitutes the necessary precondition for developing the event into a broader community health intervention.

Two claims must be held distinct. The data establish the platform's ceiling—the health and social profile of a fully engaged respondent. They do not yet establish its reach—its capacity to engage individuals who are presently inactive or socially disconnected. Because the respondent base is affluent, educated, and already highly active, the extension of the event's benefits to less-active and less-connected residents remains an objective to be designed and empirically tested, not a result already demonstrated.

Basis for subsequent work

For this reason, the finding is foundational rather than conclusive. The event has established that it can host and sustain the benefits of physical activity and social connection; the subsequent phase is to extend that demonstrated platform, deliberately and through an equity-informed design, to inactive and disconnected members of the surrounding community, and to measure that reach directly. The literature offers both a clear caution and a clear opportunity: mass-participation events do not automatically reach the populations with the most to gain (Quirk et al., *BMC Public Health*, 2021), yet they constitute a WHO-recognized vehicle for doing so when intentionally designed for inclusion. The Birkebeiner is well positioned to undertake that next step from a position of demonstrated strength.

Part II — Interval Analysis Across Two Survey Waves

Purpose

This section places the current Birkebeiner Health & Recreation Survey (benchmarked against 2021–2024 BRFSS microdata; n = 1,275) alongside the Foundation's earlier survey wave (fielded October–December 2014; n = 5,433), which was peer-reviewed and published in two papers

(Anderson et al., *BMJ Open*, 2016; Anderson et al., *BMC Research Notes*, 2017). The interval between the two waves is approximately a decade. The central question for leadership is whether the healthy-respondent signal documented in 2014 has proven durable, and what a second independent measurement adds to the public-health case for the event.

A critical caveat: these are two independent samples of respondents, not one tracked population

The two waves are best understood as two separate snapshots, each capturing only the individuals who chose to answer. Both waves invited a large pool—on the order of 30,000 individuals on each occasion—and each produced its own self-selected set of respondents. There is no linkage between the two respondent groups, and the people who answered in 2014 may be entirely different individuals from those who answered in 2021–2024. Several consequences follow, and they should be stated plainly to leadership:

- **The findings describe respondents, not the Birkebeiner population.** Every figure in this analysis characterizes those who elected to complete the survey. Neither wave is a census of Birkebeiner participants, and neither can be assumed to represent the full participant body, still less the surrounding community.
- **This is a comparison of two cross-sections, not a longitudinal cohort.** Because respondents were not tracked over time, the analysis cannot follow the same individuals as they age, and cannot establish that any single person's health changed. It can only compare the profile of one respondent group to the profile of another, a decade apart.
- **Self-selection operates independently in each wave.** Healthier, more engaged individuals are more likely to respond to a health-and-recreation survey. This response bias is present in both waves and is the dominant limitation of each; it means the respondent profile is likely more favorable than the participant population it is drawn from.

With those boundaries fixed, the appropriate reading of a stable profile across two independent respondent samples is that of reproducibility—not of a population being followed through time.

Headline conclusion

The healthy-respondent profile is not a one-time artifact. Two independently designed survey waves, conducted roughly ten years apart, on separate and unlinked respondent samples drawn from comparably large invitation pools, benchmarked against different external comparators, converge on the same finding: Birkebeiner survey respondents report markedly better health, far higher physical-activity levels, and far lower chronic-disease and smoking prevalence than demographically comparable regional or national populations. Reproducibility across two

independent respondent samples is itself the most important new piece of evidence, because a profile that reappears on a fresh set of respondents and an upgraded comparison method is substantially harder to dismiss as the artifact of one particular group of respondents than a single cross-section would be.

A note on comparability

The two waves are consistent in direction but not perfectly commensurable in method, and the memo is explicit about this:

- **Comparator engine changed, and improved.** The 2014 wave compared respondents to national NHANES and published BRFSS summary statistics, adjusting minimally. The current wave regresses against individual-level BRFSS microdata for Wisconsin and Minnesota, jointly adjusting for age, sex, education, and income. The current wave is therefore the more rigorous comparison; where it still shows a large gap, that gap has survived a tougher test.
- **Some metrics are defined differently.** The 2014 papers reported "free from depression/low mood" (93.1%); the current wave reports "frequent mental distress, ≥14 unhealthy days" (2.2%). These are related but not identical constructs and should not be differenced directly.
- **Response and sample size differ.** The 2014 wave drew 5,433 respondents (23% response from roughly 30,000 invited); the current wave, 1,275. Both respondent groups are self-selected and self-reported, the dominant limitation in both.

What has held constant across the interval

Metric	2014 respondents (Anderson et al.)	Current respondents	Read
Obesity (BMI ≥ 30)	3.2%	6.9%	Well below the matched population expectation in both waves

Metric	2014 respondents (Anderson et al.)	Current respondents	Read
Mean BMI	23.8	24.8	Normal range in both; modest upward difference between waves
Current smoking	3.4%	0.5%	Very low in both; lower in the current wave
No leisure-time physical activity	5.8%	0.5% (inverse: 99.5% any activity)	Near-universal activity among respondents in both waves
Self-rated health (favorable)	88.3% very good/excellent	99% good-or-better	Consistently far above population comparators
Male predominance	64.5%	69%	Stable skew across waves
College-educated or higher	86.2%	94%	Consistently high; higher in the current wave
Household income > $100k	54.2%	75%	Consistently affluent; more so in the current wave

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The qualitative profile of respondents—lean, active, low-smoking, high self-rated health, affluent, educated, male-skewed—is stable across both independent measurements.

What differs between the waves

- **The responding group is older and more affluent in the current wave.** Mean age was 47.9 in 2014; the current respondents are weighted toward the 55–74 bands (nearly half). College attainment (86% → 94%) and high income (54% → 75%) are both higher. Because the two respondent groups are not linked, this is best read as a shift in who responded rather than as proof that a fixed group has aged—though it is consistent with an established event whose committed core is maturing while the socioeconomic tilt of those willing to respond intensifies.
- **BMI and obesity are modestly higher among current respondents** (mean 23.8 → 24.8; obesity 3.2% → 6.9%), though both remain far below population expectations. Part of this likely reflects the older age profile of the current respondents, since body

composition tends to shift with age even in trained individuals; the masters-athlete literature nonetheless shows that sustained endurance training substantially attenuates—but does not fully abolish—age-related gains in fat mass and losses in aerobic capacity (Valenzuela et al., *Sports Medicine*, 2020; McKendry et al., *Journals of Gerontology Series A*, 2020; Veronese et al., *Ageing Research Reviews*, 2025).

- **Measurement rigor has increased**, as described above, which strengthens rather than weakens the current wave's conclusions.

What the interval adds to the public-health argument

1. **Reproducibility across independent respondents.** The single strongest new claim leadership can make is that the healthy-respondent signal has now replicated on a second, unlinked sample a decade later, under a stricter comparison. A profile that reappears under these conditions is durable evidence about who the event engages, rather than a one-off snapshot of a single group.

2. **A responding group that skews older yet remains on the favorable side of the aging curve.** The current wave captures a substantially older set of respondents that nonetheless reports low obesity, near-universal activity, and high self-rated health. This aligns with evidence that lifelong endurance activity preserves cardiometabolic and functional health into older age (Valenzuela et al., *Sports Medicine*, 2020; Veronese et al., *Ageing Research Reviews*, 2025). One clinically important caveat for messaging: high fitness does not eliminate cardiovascular risk in masters athletes, and traditional risk factors still warrant management in this population (Eijsvogels et al., ESC/ACC Clinical Consensus Statement, *European Heart Journal*, 2026). The event's contribution is best framed as risk reduction and healthy aging, not immunity.

3. **The social-connection theme is consistent across waves and matches the literature.** The 2014 wave documented that exercise-specific social support tracked with more weekly activity and lower depressed mood, and that most respondents were introduced to the sport by family or friends (Anderson et al., *BMJ Open*, 2016). The current wave shows the same pattern from the respondent's side: connection is rarely the reason people sign up (23% cite it as a top-3 motivator) yet is strongly experienced once they are engaged (mean 4.0/5), deepening with tenure. This is the bidirectional activity–social-support relationship that the older-adult literature describes, in which companionship and group settings both sustain activity and are sustained by it (Steinhoff, Ellwardt, and Reiner, *BMC Public Health*, 2026; Park et al., *American Journal of Health Promotion*, 2025).

4. **The foundational-versus-reach distinction is unchanged and now better evidenced.** Both waves candidly acknowledge the affluent, educated, self-selected respondent base and cannot establish causation. The 2017 paper explicitly flagged that disadvantaged populations may not share these outcomes and that access barriers may be "insurmountable" for some (Anderson et al., *BMC Research Notes*, 2017). That is the same boundary identified in the current analysis and the same rationale for an equity-informed next phase aimed at reaching inactive, underserved community members (Jerome et al., AHA Scientific Statement, *Circulation*, 2023). The interval strengthens the "proven platform" half of the argument without changing the "unproven reach" half.

Bottom-line framing for leadership

The two waves together let the Foundation move from "our respondents look healthy" to "the people who respond to our survey have looked healthy on two independent measurements a decade apart, under progressively stricter comparison, even as the responding group has skewed older." That is a materially stronger evidentiary position. It confirms the event as a durable platform associated with the well-documented benefits of an active lifestyle, while preserving two honest boundaries: the data describe respondents rather than the full participant population, and that respondent group remains affluent and self-selected. Those boundaries are precisely what motivate the proposed next phase of extending—and directly measuring—reach to less active and less connected members of the community.