

What is the impact of childbirth on performance in elite to world-class track and field female athletes?

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Abstract

Background

Whether the world's most competitive female athletes can return to pre-pregnancy performance after childbirth remains unexplored across most track and field disciplines. This observational study examined performance trajectories before and after childbirth, the influence of maternal age on performance post-birth, and the time to return to competition in elite and world class athletes.

Methods

Elite and world class track and field athletes with a documented childbirth and return to competition were included. Season's best results up to five years before and after childbirth were normalised to personal bests. Beta mixed-effects regression was used to assess whether performance varied between seasons. Logistic regression was used to determine the association of maternal age and probability of post-birth personal best.

Results

Eighty athletes contributed to 120 performance entries (age at childbirth 29 years (SD 4.3; range 17–37); 42.5% world class, 57.5% elite) across sprints, middle distance, hurdles, jumps, throws and combined events. Median maternity break was 11.5 months (Q1-Q3: 8.4–15.3 months) which varied across disciplines. Performances in middle distance, hurdles, jumps, and combined events showed no significant differences between seasons around childbirth. Sprint and throwing performances were significantly lower 1 year after childbirth compared to 1 and 2 ($p \leq 0.023$) years prior to childbirth, then significantly increased from year 1 to 3 years post-birth ($p \leq 0.033$). Overall, 36% of our sample achieved a personal best after childbirth, and advancing maternal age significantly lowered the odds of achieving this (odds ratio = 0.70, 95%CI = 0.58 to 0.81).

Conclusions

Childbirth does not preclude elite track and field performance. For most disciplines, performance was not significantly different after birth. Sprint and throwing disciplines demonstrated a transient performance dip, which recovered by 3 years post-birth. Athletes returned to competition ~ 11.5 months, with substantial individual variability. Peak performance post-birth remains achievable, although the probability decreased with maternal age.

1. Introduction

Over the past several decades, societal norms have shaped female athletes' decisions around motherhood, often portraying elite sport and parenthood as incompatible paths [1]. High profile athlete comebacks after childbirth have disrupted these outdated perceptions [2], showing that performance goals remain attainable [3, 4]. Female representation among Olympic athletes has risen from 23% in 1984, to 50% in 2024 [5], and a growing number of these athletes are sustaining successful careers well into their thirties, a period which overlaps with peak fertility [6]. With this, the probability of athletes combining their athletic career with motherhood is expected to increase [7], yet the implications on athletic performance remains underexplored.

Aerobic capacity has been shown to return to, and in some cases surpass, pre-pregnancy levels in aerobic-based elite athletes [3, 4]. During pregnancy, many athletes often continue their training, frequently maintaining volumes that exceed the general population physical activity guidelines [3]. While not established as ergogenic, pregnancy promotes physiological adaptations such as increases in blood volume and cardiac output [8], which may facilitate an accelerated return to pre-pregnancy aerobic performance [4, 7]. Despite these promising findings, most track and field events predominantly rely on anaerobic pathways and high-power outputs [9], and the impact of motherhood on performance in these disciplines is unknown. Given there is a growing population of elite athletes planning to conceive and ultimately return to competition [10], there is a clear need for evidence to evaluate and support this transition.

While some sporting organisations have introduced policies to guide elite athletes through preconception, pregnancy and postpartum return to competition [11], consistent support remains insufficient [12]. World Athletics have no formal policy guiding postpartum return to sport [13], leaving athletes reliant on variable levels of support by national federations. Consequently, decisions around incorporating motherhood in an athletic career are made under considerable uncertainty around career progression and financial stability. Time away from competition may affect competitive outcomes including selection for major competitions, which could threaten financial stability through performance dependent contracts [12]. Greater visibility of performance data in these athletes is critical to fill this evidence gap and could guide organisations which are yet to develop policy. Further understanding these trajectories in the perinatal period can assist coaches, clinicians, and sponsors to better support athlete-centred plans and continue to reframe motherhood as a phase that can be successfully integrated into an athletic career. Hence, the aims of this study are to 1) quantify performance trajectories following childbirth, 2) describe how long elite and world class track and field athletes take to return to competition, and 3) determine if age at childbirth changes the probability of an athlete achieving peak performance after childbirth. We hypothesised childbirth would not meaningfully alter long-term performance trajectories, and the probability of achieving peak performance following childbirth may be higher at a younger maternal age.

2. Methods

2.1 Ethics statement

As this non-interventional study relied entirely on publicly available data, a formal ethics exception was granted from the Australian Catholic University Human Research Ethics Committee (2025-4622X).

2.2 Participants

To be included in this study, participants were required to have a profile with the World Athletics database (<https://worldathletics.org/athletes-home>) and fell within either the world class (i.e., within the top 20 ranking in their respective sport), or elite (i.e., within the top 300) categories according to established performance classification criteria [14]. Athletes were eligible if they appeared in the top 300 for any given year between 2014–2024, had ≥ 1 pregnancy during their career, and recorded performances in the World Athletics database in the 1–5 years prior to and following childbirth [4]. The included disciplines were sprints (100m, 200m, 400m), middle distance (800m, 1500m), hurdles (100m, 400m), jumps (high jump, long jump, triple jump, pole vault), throws (shot put, discus, javelin), and combined events (heptathlon). For athletes who met the inclusion criteria for multiple events, all eligible performance entries were included in our analysis. A performance entry was defined as an athlete's result in a given event.

2.3 Procedures

Maternity data (i.e., number of childbirths, childbirth date, maternal age at childbirth, maternity break) was primarily collected from World Athletics (<https://worldathletics.org>) and official national federation websites [4]. When sufficient information was unable to be located from these, athletes' personal websites and media interviews were utilised consistent with previous methodologies in this cohort [4]. To ensure robustness, athletes were only included if childbirth could be confirmed through ≥ 2 independent sources. Cases with ambiguous or single-source confirmation were excluded. For each eligible participant, their personal best and annual season's best performance from up to 5 years before and after their relative childbirth date was then extracted from the World Athletics database [4]. For athletes who experienced > 1 birth within the capture period, each birth was identified using the same publicly available sources. Once identified, to minimise the influence of multiple births on performance trajectories, performances only from the years after the first birth to second pregnancy were included in our analysis. Due to the small number of athletes with multiple pregnancies ($n = 3$), we were unable to robustly examine the effects of second and subsequent childbirths. Season's best was defined as the athletes' best recorded performance (i.e., fastest time, greatest distance/height, highest points) for a given year, and used to represent their maximal performance as listed in the World Athletics database [15]. This approach was chosen since a mean or median performance from a given season may have been influenced by preliminary races (i.e., heats, semi-finals) where athletes may intentionally limit their effort. If available, season's best data during the year of childbirth was excluded from analysis due to the confounding factors (i.e., altered training, competition exposure) influencing performance in this period. While it is possible that some athletes competed whilst pregnant in the year preceding childbirth, based on the distribution of childbirth dates within this cohort, any such influence is likely minimal. We defined maternity break as the days elapsed since the athlete's childbirth date (day, month, year) to the first date (day, month, year) of their competition listed in the World Athletics database. Durations were then

converted to months, assuming 30.4 days per month. When only the month and year of childbirth were available, we calculated the maternity break by using the median day of the given month. If we were unable to determine the exact day or month of childbirth, the athlete was excluded from the maternity break analysis. Maximal performance data for track (i.e., time), field (i.e., distance, height), and combined (i.e., points) disciplines and maternity data were extracted and tabulated into an Excel spreadsheet (Microsoft Excel; Washington, US).

2.4 Data analysis

To facilitate comparison of performance across different events, each athlete's season's best was normalised and expressed as a percentage (%) of their personal best. This normalisation provided a consistent internal standard, enabling meaningful comparisons of performance changes, irrespective of the event type. All statistical analyses were conducted using R statistical software (R Core Team, 2024). To compare performance between the seasons surrounding childbirth, a beta mixed effects model [16] using the maximum data set available, with season as a categorical fixed effect, participant ID modelled as random intercepts, and maternal age at childbirth was included as a covariate to adjust for its potential influence on performance outcomes (see Supplementary Material 1 for further details). Where a significant main effect for season was observed, post-hoc pairwise odds ratios (OR) and 95% CIs were computed, where the OR represents the ratio of the odds of the normalised performance proportion between seasons. [17]. Assumptions were tested via visual review of Q-Q plots and residual plots.

Logistic regression was used to model the relationship between age at childbirth and the probability of achieving peak performance (personal best) after childbirth. For athletes competing in multiple events, we selected their best event by using their highest result score, which standardises performances across disciplines into a comparable points-based metric based on a given result (e.g., time, distance, height, points) produced from the World Athletics Scoring Tables of Athletics [18], for their personal best. Logistic regression results were exponentiated and reported as the OR and 95%CI for ease of interpretation. Statistical significance was set as $p < 0.05$ for all statistical analyses. A formal power analysis was not performed, as this retrospective study included all eligible athletes identified from available data [19].

3. Results

3.1 Participant characteristics

In total, 80 participants contributed to 120 performance entries and 814 athlete-seasons across the observation window. Performance entries in included discipline categories were 30 in sprints (100m $n = 9$, 200m $n = 12$, 400m $n = 9$), 24 in middle distance (800m $n = 12$, 1500m $n = 12$), 12 in hurdles (100m $n = 8$, 400m $n = 4$), 32 in jumps (high jump $n = 13$, long jump $n = 11$, triple jump $n = 7$, pole vault $n = 1$), 16 in throws (discus $n = 3$, javelin $n = 8$, shot put $n = 5$), and 6 in combined events (heptathlon $n = 6$). Included participants had a mean age of 29 years (SD 4.3; range 17–37) at the time of childbirth and 28 years (SD 4.0; range 19–37) at the time of personal best. Their performance entries were categorised as world

class (n = 51, 43%) or elite (n = 69, 58%). Participant characteristics and included discipline are presented in Table 1.

Table 1
Summary of participant characteristics and included disciplines

Performance entry classification	n (%)
World class	51 (43%)
Elite	69 (58%)
Age	Mean (SD; range)
At personal best	28 (4.0; 19–37)
At childbirth	29 (4.3;17–37)
Discipline	n (%)
Total	120 (100%)
Sprint	30 (25%)
100m	9 (8%)
200m	12 (10%)
400m	9 (8%)
Middle distance	24 (20%)
800m	12 (10%)
1500m	12 (10%)
Hurdles	12 (10%)
100m	8 (7%)
400m	4 (3%)
Jumps	32 (27%)
High jump	13 (11%)
Long jump	11 (9%)
Triple jump	7 (6%)
Pole vault	1 (1%)
Throws	16 (13%)
Discus	3 (3%)
Javelin	8 (7%)
n represents the number of performance entries rather than number of participants, since some participants achieved elite or word class status for multiple events.	

Performance entry classification	n (%)
Shot put	5 (4%)
Combined	6 (5%)
Heptathlon	6 (5%)
n represents the number of performance entries rather than number of participants, since some participants achieved elite or world class status for multiple events.	

3.2 Maternity break

Of the 120 performance entries, we excluded 23 entries from the maternity break analysis as we were unable to determine the month of childbirth. Of the 97 remaining entries, the day of childbirth was estimated as a median for 16 entries. The median maternity break was 11.5 months (Q1-Q3: 8.4–15.3 months). Across each event group, the median maternity break for throws was 7.2 months (Q1–Q3: 5.0–8.4), jumps 10.0 months (Q1–Q3: 8.4–12.4), hurdles 12.2 months (Q1–Q3: 10.3–15.0), sprints 11.9 months (Q1–Q3: 7.9–19.8), middle distance 14.1 months (Q1–Q3: 11.5–16.4), and combined events 12.7 months (Q1–Q3: 12.0–28.4) (Fig. 1).

3.3 Performance

Overall, 36% (43/120) of the athlete's performance entries achieved a personal best following childbirth. Across disciplines, the proportion achieving personal best after childbirth were 50% (6/12) in hurdles, 47% (15/32) in jumps, 38% (6/16) in throws, 29% (7/24) in middle distance, 27% (8/30) in sprints, 14% (1/6) in combined events (Fig. 2).

Performance results around childbirth are summarised in Fig. 3 (for full statistical results, see Supplementary Material 2, Tables S1-S3). For sprints, there was a significant main effect for season ($\chi^2(9) = 25.7$, $p = 0.002$). Post-hoc comparisons showed that performance 1 (OR = 2.04, 95%CI = 1.11 to 3.77, $p = 0.009$) and 2 (OR = 1.99, 95%CI = 1.10 to 3.61, $p = 0.009$) years prior to childbirth were significantly greater than the year immediately after childbirth. Performance immediately after childbirth was significantly lower than 3 years after birth (OR = 0.51, 95%CI = 0.27 to 0.97, $p = 0.033$). All other comparisons for sprints were not statistically significant. For throws, there was a significant main effect for season ($\chi^2(9) = 37.0$, $p < 0.001$). Post-hoc comparisons showed that performance 1 (OR = 2.69, 95%CI = 1.20 to 6.01, $p = 0.004$) and 2 (OR = 2.28, 95%CI = 1.06 to 4.89, $p = 0.023$) years prior to childbirth were significantly greater than the year immediately after childbirth. Performance immediately after childbirth was significantly lower than 3 (OR = 0.37, 95%CI = 0.15 to 0.89, $p = 0.013$), 4 (OR = 0.27, 95%CI = 0.10 to 0.79, $p = 0.004$) and 5 (OR = 0.26, 95%CI = 0.08 to 0.84, $p = 0.010$) years post birth. No significant main effects for season were observed for middle distance, ($\chi^2(9) = 10.6$, $p = 0.301$), hurdles ($\chi^2(9) = 4.7$, $p = 0.858$), jumps ($\chi^2(9) = 13.1$, $p = 0.158$), or combined events ($\chi^2(9) = 13.0$, $p = 0.163$).

3.4 Age

Logistic regression showed that increasing age at childbirth was significantly associated with lower odds of achieving a personal best after childbirth (odds ratio = 0.70, 95%CI = 0.58 to 0.81, $p < 0.001$, Fig. 4, see Supplementary Table S4 for full statistical results).

4. Discussion

Our findings indicate that elite track and field performance remains achievable following childbirth. Across all disciplines, over a third (36%) of observations achieved a personal best after childbirth. Athletes who gave birth at a younger age were more likely to achieve a post-childbirth personal best, highlighting maternal age as a key contextual factor associated with performance outcomes. When describing performance trajectories across seasons, no significant pre- to post-childbirth differences were observed in middle distance, hurdles, jumps, or combined events. In contrast, sprint and throwing events demonstrated a reduction in performance during the first year postpartum compared to performance in the 1–2 years prior to childbirth. Importantly, this was followed by progressive improvements in performance across subsequent seasons, such that performance was no longer significantly different from pre-birth levels by 3 years after childbirth. Athletes typically returned to their first competition ~ 11.5 months postpartum, although substantial individual variability was evident. Through providing a descriptive insight of those who have returned, our findings provide evidence that peak elite performance remains attainable for many athletes. Combined, these challenge assumptions that maternity inevitability constraints athletic success after childbirth and provide evidence to support decision making around integrating motherhood within an athletic career.

Performance in our included disciplines are sensitive to frequent exposure to high impact tasks, such as high-speed running, plyometrics, and power-oriented resistance training [20]. It is plausible that pregnancy related disruptions and constraints related to postpartum recovery could temporarily limit exposure to these stresses, inducing a transient period of deconditioning. Also, disciplines involving high velocity rotating, such as throwing, place substantial demands on force generation and transfer through the trunk and pelvis [21]. Pregnancy and childbirth introduce musculoskeletal and biomechanical changes concentrated in these regions, and the severity of these changes could prolong the time required to rebuild pre-pregnancy capacity due to the disruption of force transmission across the kinetic chain [8]. While these mechanisms could account for the temporary decline in performance observed in sprinting and throwing, other disciplines, such as hurdles, show no significant performance changes, despite requiring comparable physical demands. Future research with larger samples is warranted to better understand discipline specific factors underpinning these findings.

Our findings demonstrate a younger maternal age was associated with a higher likelihood of achieving a post-birth personal best, which could represent an important contextual consideration for career planning. In track and field, performance generally follows a curvilinear trajectory, often peaking around 25–27 years [22], while female fertility is the highest in the early to mid-20s and declines with age [23]. These overlapping timelines contribute to the complexity of decision making around motherhood for athletes. Many athletes delay motherhood beyond these peaks due to concerns of returning to

performance after childbirth, potentially risking fertility challenges [24]. Others report the length of their career was influenced by the decision to have children, and the supposed incompatibility of these roles led to a premature retirement [25]. However, this observed association should be interpreted with caution, as they may partly reflect established age-related performance trajectories [22], independent of childbirth. Future studies with larger samples may be able to evaluate more complex age-performance relationships. Consequently, maternal age could be considered one of several contextual factors that may influence post-birth performance outcomes and not interpreted in isolation when evaluating postpartum athletic success.

At present, there remains no specific guidance to return track and field athletes to sport after childbirth, particularly facilitating the restoration of running drills, high-speed running, and advanced plyometrics. In the absence of these guidelines, excessive burden is placed on coaches and clinicians who often feel ill-equipped with the knowledge to support the vast considerations related to a postpartum return to sport [26]. Our observed performance trends contribute to the evidence base that returning to high levels of performance in athletics is a realistic goal for athletes wishing to return to performance post-partum, although the timelines for return are likely to be highly individualised. Further research is needed to develop sport specific guidelines and decision making tools that support track and field athletes and their high performance teams to navigate the rehabilitation, training and return to performance pathways.

4.1 When should athletes return to competition?

To our knowledge, our findings are among the first to describe maternity break patterns in elite and world class track and field athletes in these disciplines. Although most athletes took ~ 11.5 months to return to their first competition, returning within this time frame should not be considered as a prescriptive benchmark, as there was wide individual variability of ~ 3–30 months. A previous study in elite marathon runners displayed similar individualised recovery contexts, showing a range in maternity break from 9–94 months [4]. Returning to sport postpartum can be a non-linear process, and timeframes are governed by individual tissue recovery, obstetric factors, maternal demands (e.g., lactation, poor sleep) and availability of support (e.g., childcare, financial and governance policy) [12, 27, 28]. As such, rigid time-based approaches fail to account for meaningful individual variability in readiness [29]. Overly conservative timelines could minimise exposure to sport specific loading, where premature progressions can increase the risk of adverse outcomes [12, 30].

While athletes may attempt to plan pregnancy around competition schedules, timing of conception and birth remain fundamentally unpredictable. Fixed scheduling of major competitions (e.g., Olympics, World Championships) or qualifying events (e.g., Diamond Leagues, National Championships) may impose pressure on athletes to rush their return [31]. While a premature resumption may increase the risk of injury, particularly when the additional load of infant care constrains recovery capacity, periods away from sport can consequently threaten both income and contractual security with governing bodies or sponsors [12]. Allyson Felix's public testimony on her own experiences with maternity as a world class

athlete illustrated how limited contractual protections can amplify the pressure to return, even as one of the most decorated track athletes [4]. Collectively, these highlight the complexity of a postpartum return to sport, and the variability illustrated in our return trajectories could promote the need for individualised, athlete-centred approaches. To date, World Athletics has no formal maternity leave policies or supportive measures for female athletes looking to return to elite competition after childbirth [13]. At a policy level, approaches that provide greater security around competition eligibility may help alleviate concerns about financial or competitive pressures [12], which could aid future athletes to return safely and on their own timeline.

4.2 Clinical implications

This study can provide athletes, coaches, support staff, and policy makers with discipline-specific evidence that suggests returning to performance in elite track and field after childbirth is possible, and achieving peak performance could be a realistic target in some athletes. Advancing maternal age was associated with a lower probability of achieving a post-birth personal best and may represent an important contextual factor during athlete-centred career planning. However, this finding should be interpreted with caution given athletic performance naturally changes across the lifespan. The wide variability in return to competition timelines reinforces postpartum return to sport should not be guided by fixed time-based milestones alone. These findings add to the growing body of evidence which suggests motherhood and successful performance can coexist within elite sport.

4.3 Small margins, big outcomes

Quantifying performance in track and field athletes after childbirth remains an emerging area of research, and to our knowledge, we are the first to explore field-based and anaerobic dominant track disciplines. Existing literature exclusively involves elite middle to long distance runners, where no statistically significant decrease in performance from pre- to post-childbirth were found [3]. We recognise in elite sport; athletic careers often pivot on margins far smaller than typical group level effects. Differences in results too modest to yield a significant p-value could still be decisive in practice and move an athlete across performance or medal thresholds. For example, the Paris 2024 Olympic games featured the gold and silver medallists in the women's high jump both clearing 2.00m, and third to seventh place all clearing 1.95m, with countback deciding finishing order [32]. Thus, minor shifts could remain practically decisive and shape performance outcomes, which consequently impact future selection opportunities and financial support through sponsors and governing bodies.

4.4 Limitations

There are several limitations to our study. While a strength of our study is the high athletic calibre of included participants, sample size in some events were small, limiting statistical power for event specific analysis. As such, events were grouped into discipline categories. We acknowledge that individual events have distinct training and performance demands, though event specific analyses were insufficiently robust to support reliable interpretation. Similarly, performance trajectories of second and subsequent childbirths could not be examined due to limited sample size. Future studies with larger

samples are needed to explore event level differences and cumulative impact of multiple births. We acknowledge we may not have captured all athlete mothers in our sample, as those who did not publicly disclose their childbirth were unable to be included. As visibility is often linked to sponsorship and financial support, higher profile athletes with greater structural and economic support may be overrepresented, introducing a risk of selection bias and limiting the generalisability of our findings to those less supported. Finally, the smaller samples within some discipline groups were also reflected in wider confidence intervals for some estimates, which could indicate greater uncertainty in these findings.

We understand there are other considerations that could impact performance outcomes. Firstly, comparisons to personal best are one of the many markers of performance, and there may be alternative metrics which are valuable to the individual. For example, some athletes may value their honours (i.e., achieving a medal at major championships) as a greater marker of performance than achieving a personal best, however these are context dependent and influenced by field strength and championship cycles. Secondly, we were unable to account for injury prevalence or obstetric factors. Although research is scant, common injuries that may delay a return following childbirth are bone stress injuries, muscle strains, sprains, ruptures, and nerve-based injuries [3, 10, 31]. Likewise, delivery mode (i.e., vaginal birth vs caesarean section) and obstetric complications can affect recovery timelines and training resumption, which could account for the wide range observed in maternity break durations. Similarly, variations in national level support systems (e.g., maternity policies, financial assistance, childcare) could not be captured from public sources at the time of each athlete's career and might influence performance outcomes. Recent evidence indicates that fewer than half of international sporting organisations have established policies to support pregnant and postpartum athletes, with many policies limited in scope or still under development, and not consistently publicly available or identifiable even when organisations are directly contacted [33]. These factors could likely influence both time to return to competition and subsequent performance outcomes, and their absence may contribute to unexplained variability in our findings. A further consideration is the potential influence of advanced footwear technology (AFT) on observed performance trends. AFT has been shown to enhance performance, particularly in middle distance events through improvements in running economy [34, 35]. As such, athletes whose pre-pregnancy personal best predated widespread AFT adoption but returned to competition using AFT may demonstrate apparent performance improvements partly attributable to technological rather than physiological adaptation [15, 36]. However, similar postpartum performance trajectories were observed in sprint and throwing, where footwear influence is more limited, suggesting AFT is unlikely to fully explain the observed patterns. Nevertheless, AFT remains an important consideration when interpreting performance outcomes. Finally, we recognise the implications of the Covid-19 pandemic and deferring of the 2020 Tokyo Olympic Games could have influenced high-quality meet availability and travel opportunities in these athletes. Access to training facilities in these times due to lockdown and quarantine could limit an athlete's training capacity, inherently influencing performance within this period. Future work would benefit from longitudinal studies with these athletes to determine the extent of these factors on performance.

5. Conclusion

Our findings show that elite performance remains attainable after childbirth. Across most disciplines, performances after birth were not significantly different to those before. While sprinting and throwing disciplines showed a transient dip early postpartum, these recovered by 3 years after birth. Over a third of athletes achieved their personal best after childbirth, indicating peak performance can be achieved, and athletes who gave birth at a younger age were more likely to do so. Athletes typically returned to competition in ~ 11.5 months with wide individual variability, which should reinforce the need for athlete centred return trajectories, rather than reliance on fixed timelines.

Abbreviations

AFT Advanced footwear technology

CI Confidence interval

OR Odds ratio

Q1 First quartile

Q3 Third quartile

SD Standard deviation

X² Chi-squared

Declarations

Ethics approval and consent to participate: As this non-interventional study relied entirely on publicly available data, an exemption was approved by the ACU Human Research Ethics Committee (Approval number 2025-4622X).

Consent for publication: Not applicable

Availability for data and material: All data used in this study were derived from publicly available sources and cited within the text. De-identified data may be available from the corresponding author upon reasonable request.

Competing interests: The authors have no competing interests to declare.

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Authors' contributorship: LS: conceptualisation, methodology, formal analysis, data curation, writing – original draft, visualisation. JM: data curation, writing – review and editing. JD: conceptualisation, writing – review and editing, supervision. ATB: data curation, writing – review and editing, supervision. NL: data curation, writing – review and editing. KB: writing – review and editing, supervision. NM: conceptualisation, methodology, formal analysis, data curation, writing – review and editing, visualisation, supervision.

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Figures

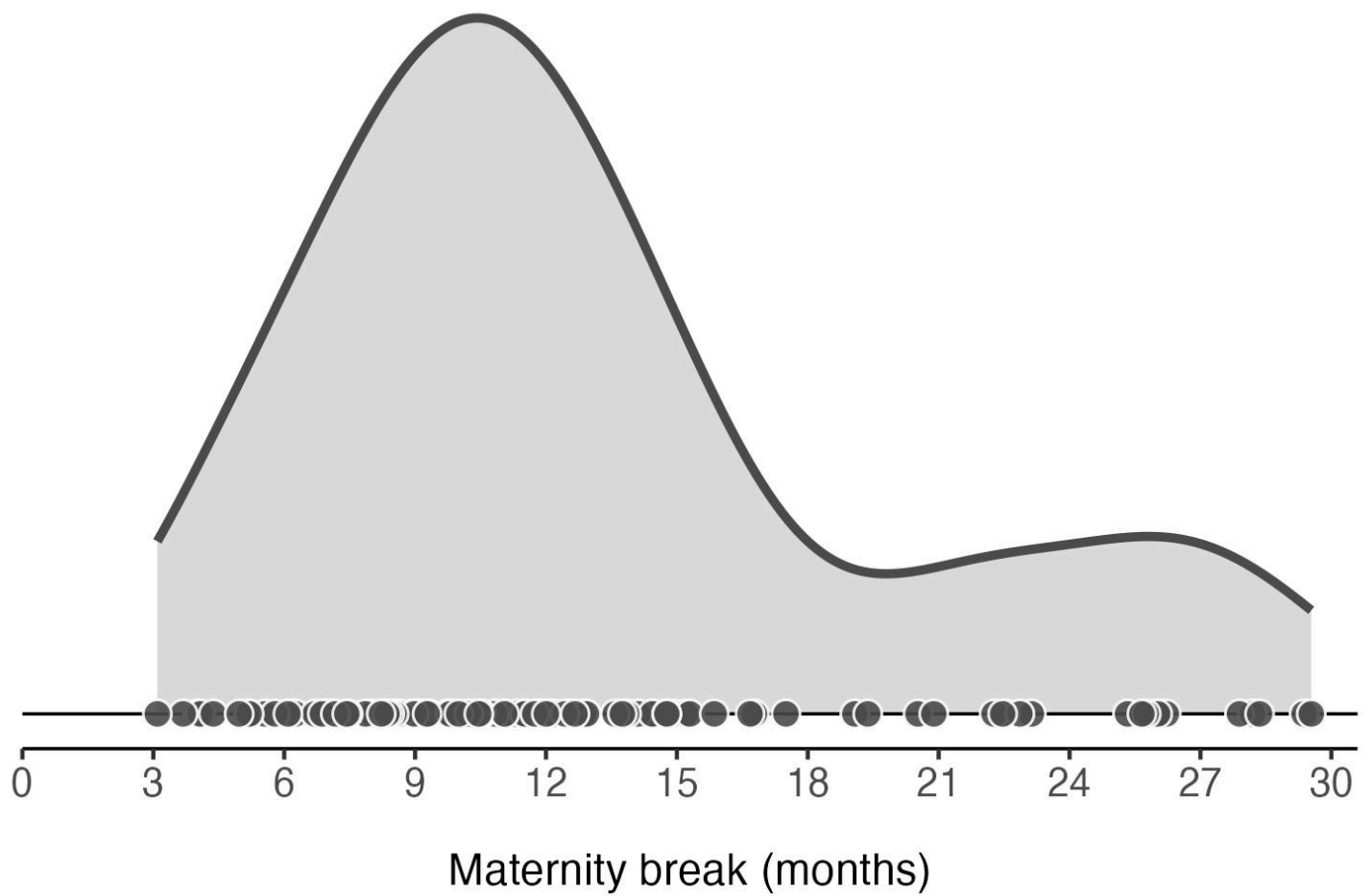


Figure 1

Distribution of maternity break duration in elite and world-class track and field athletes across discipline groups.

The density curve represents the distribution of time (months) between childbirth and first competition post-birth. Each dot along the x-axis corresponds to an individual athlete.

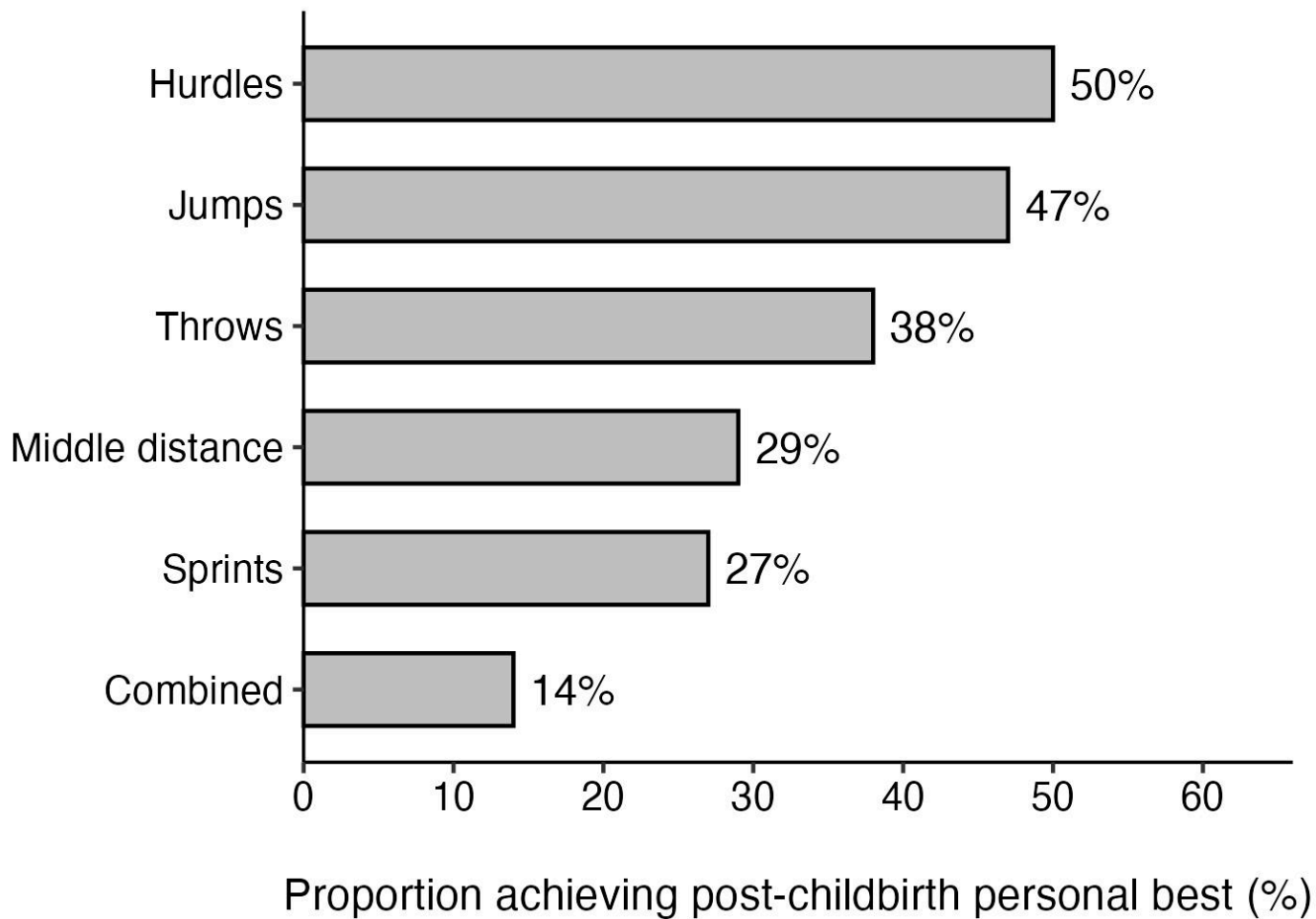


Figure 2

Proportion of elite and world-class track and field athletes achieving a personal best following childbirth across discipline groups.

Bars represent the percentage (%) of athletes in each discipline who recorded a personal best after childbirth.

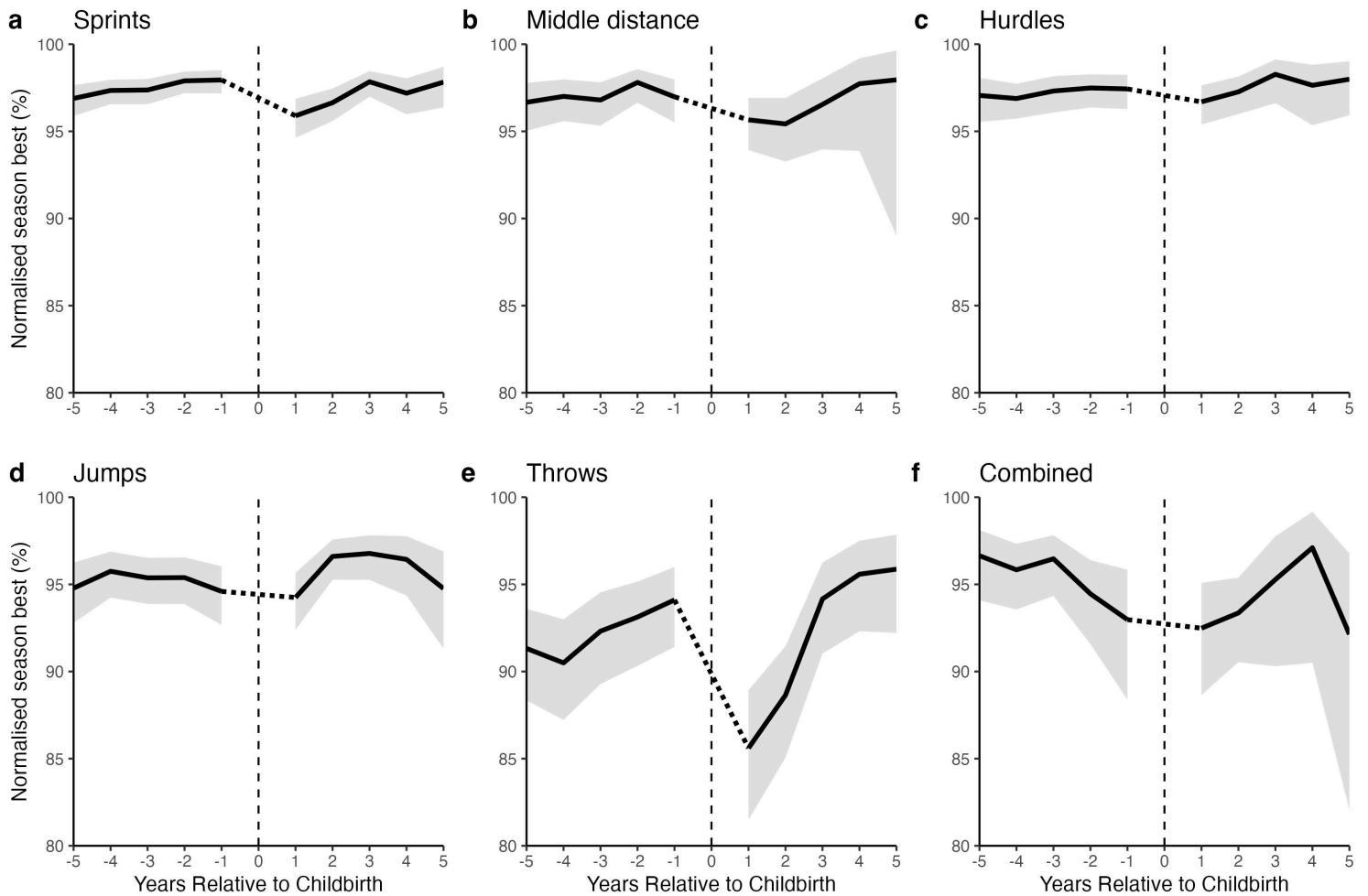


Figure 3

Normalised season best performance of elite and world-class track and field athletes before and after childbirth across discipline groups.

Solid line represents mean season best performance expressed as a percentage of each athlete's personal best, with shaded areas showing 95% confidence intervals. Note that a dashed line appears between years -1 and 1, since no data was obtained at year 0 (i.e., the year of childbirth).

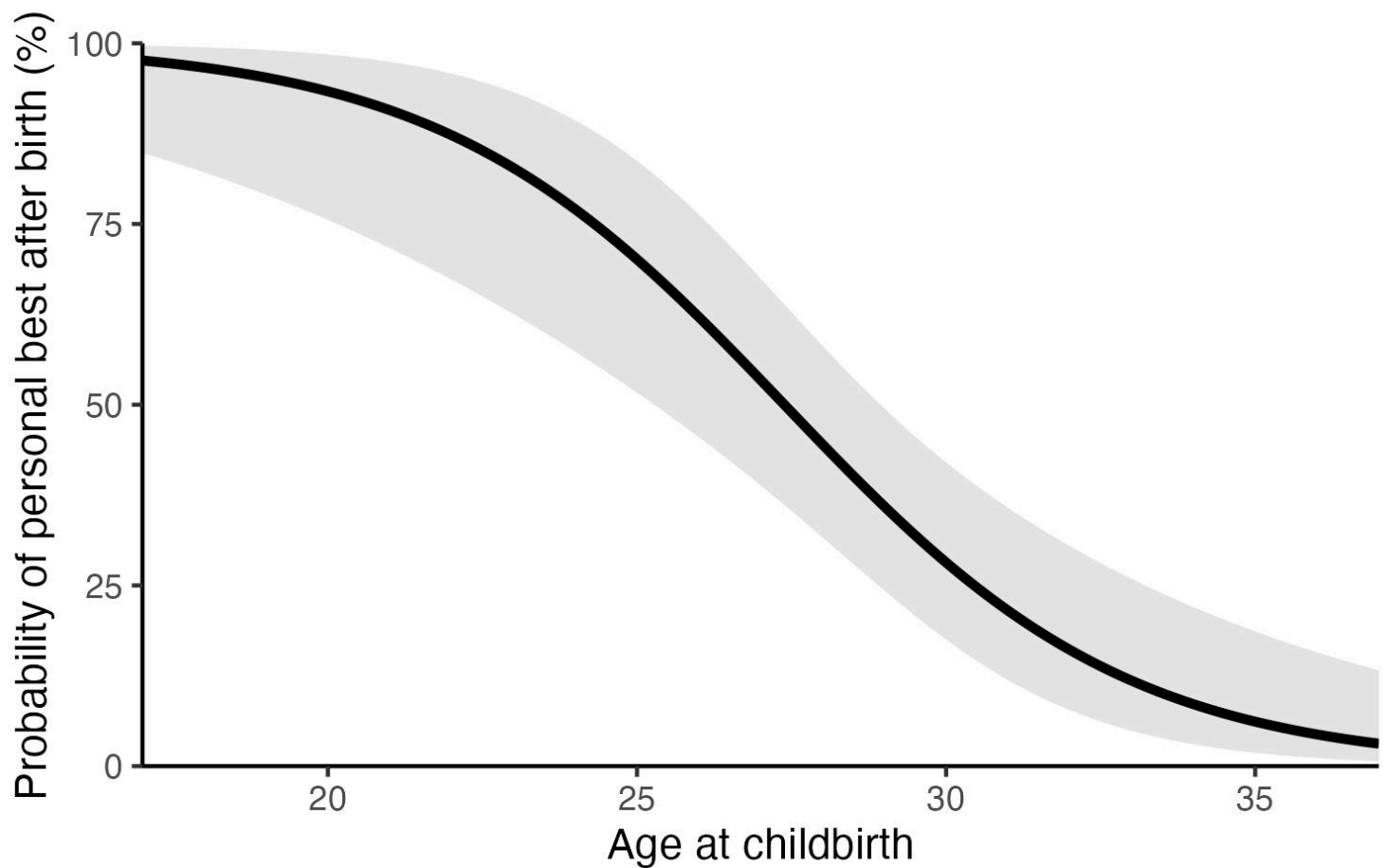


Figure 4

Probability of achieving a personal best after childbirth as a function of maternal age.

The solid line represents the modelled probability, and the shaded area shows the 95% confidence interval.

Supplementary Files

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- [CHAMPchecklist.pdf](#)
- [STROBEChecklist06.08.2026.doc](#)
- [Supplementarymaterial09.08.2026.docx](#)