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Statistically significant chuckles: who is using humour at scientific conferences?

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We've all been there: 11.47, swamped by a long stretch of dense scientific talks at a conference. Six slides into a hyper-technical presentation, the speaker suddenly cracks a joke. The room erupts. Shoulders relax. Minds re-engage. Humour is a powerful but underused tool in scientific communication, often sidelined by academic norms that view levity as unprofessional. Social biases can further shape who feels safe joking without risking credibility. At 14 biology-related conferences, we collected data on humour use across 531 talks. Jokes clustered at the beginnings and ends of talks, with an extra bump in successful jokes midway through. Most jokes (66%) earned only polite chuckles. Humour success was unrelated to the type of joke or form of delivery; however, male speakers told about 0.35 more jokes per talk, and both male and native speakers had a 10% higher probability of eliciting laughter. This suggests how social dynamics influence who feels comfortable using humour and whose jokes resonate with the audience. Until academia reckons with these biases, humour will remain a privilege. Still, for those brave enough or granted the social licence, a well-placed zinger can turn a forgettable talk into one people actually remember—and perhaps even enjoy.

1. Introduction

At some point in every scientific conference—usually right before lunch—a strange transformation occurs: the audience turns into zombies. As caffeine levels plummet and eyes begin to glaze over, not even the most beautifully formatted graph is able to penetrate the collective fatigue. Then, a brave speaker cracks a joke and, suddenly, the room snaps back to life. Laughter re-engages attention and enhances learning by making content more memorable [1]. Humour also increases the approachability and likability of the speaker, fostering connection [2]. A survey of 1637 students across 25 science courses found that nearly 99% appreciated instructor humour, noting boosts in attention, relatability and sense of belonging [3]. Similarly, an analysis of 2000 TED Talks revealed that popular presenters used humour three times more often than their less popular counterparts [4]. So, one might

wonder—why do so many scientific talks have the energy of a sedated sloth? Where are the jokes, the puns, the playful delivery? Or, as Ewers [5] bluntly put it: why are most scientific talks so *boring*?

Scientists are neither actors nor stand-up comedians, and they typically develop their presentation skills through trial and error, with mixed results. Humour, in particular, is often avoided due to academic norms that frame levity as detracting from rigorous, objective scientific discourse [6–8]. As a result, speakers who use humour may be seen as violating professional conventions and risking their credibility. Crucially, who feels permitted to take this risk may be shaped by structural privileges such as gender norms, career stage and perceived authority [9–11]. For example, women, students and early-career researchers may avoid humour for fear of being perceived as less serious, while non-native speakers may lack the linguistic confidence to attempt jokes in English. These dynamics reflect broader academic norms that discourage emotional expression and levity, especially among those already navigating systemic barriers [9,11,12]. Understanding these social asymmetries is essential for interpreting not just how humour is used, but also who gets to use it and how audiences respond.

To combat the tedium of long conference sessions [5], we collected quantitative data on the use of humour in scientific presentations. While the benefits of humour have been explored in teaching and science communication contexts [3,4,13,14], to our knowledge, this is the first attempt to examine how professionals—primarily scientists—use humour when speaking to other experts. We asked the following questions. (i) How is humour used in scientific talks? (ii) What types of jokes are used the most and when are they deployed? (iii) Are there biases in humour usage related to gender norms, career stage or English proficiency, and does this affect whether the audience laughs? Beyond exploring these general patterns, we set two working hypotheses. First, we predict that joke timing follows a strategic pattern, with jokes clustering at the beginning and end of talks, where they are most effective in capturing attention and leaving a positive impression. If joking in professional contexts is indeed perceived as risky, we also predict use of humour to be most common among experienced speakers, native English speakers and men, whose privilege affords them greater freedom to deviate from professional norms.

2. Methods

(a) Data collection

Between 2022 and 2024, we collected quantitative data on scientific talks across 14 biology-related conferences. All study authors participated in data collection. Data collection was opportunistic—specifically, we sampled conferences we were already planning to attend. We targeted exclusively international conferences, with English as the presenting language. All were general conferences in ecology, evolution and conservation, with only two focusing on a specific biome or taxon. Within the timeframe of the study, we did not sample the same conference twice in different years. Seated as regular audience members, we recorded every instance in which a speaker attempted humour. For the purposes of this study, we defined a 'joke' as a verbal, physical or visual element clearly introduced by the speaker to eliciting laughter, as indicated by timing, intonation, explicit framing (e.g. pauses, punchlines) or visual cues. We did not attempt to infer speakers' internal intentions; instead, we based coding on observable features of delivery and audience response. For each joke, we logged:

(i) Timing of the joke: elapsed time into the presentation
(ii) Joke type:
  — Topic: jokes about shared scientific experiences (e.g. fieldwork mishaps, data struggles, academia), aiming to elicit 'I've been there!' reactions.
  — Situation (empathy/struggle): jokes about the immediate context (e.g. technical difficulties with the pointer or the presentation, early morning or pre-lunchtime slots, presenter's nerves).
  — Inside jokes: references to conference-specific details (e.g. organizers, location, niche terminology) or high-status scientists.
  — Pop culture: references to films, music, politics or broader cultural contexts.
  — Other: unclassifiable jokes (noted descriptively).
(iii) Delivery type (although often multiple are used, we scored the main medium of delivery):
  — Oral: spoken only.
  — Visual: slide-based (images, cartoons, videos).
  — Physical: physical gestures, actions or impressions.
(iv) Effectiveness:
  — Low: polite chuckles—an ineffective joke eliciting none to minimal response, typically just a few individuals laughing quietly.
  — Medium: genuine laughter—around half the audience laughs audibly, indicating moderate success.
  — High: whole-room, hearty laughter—a strong, often surprise-driven response, with most or all attendees laughing enthusiastically.

We also recorded basic demographic information for each speaker, including:

(i) Sex: classified as male or female based on self-presentation and observable characteristics (e.g. name, pronouns, visual cues) due to a lack of self-reported data [15]. We acknowledge this as a limitation, as perceived sex may not reflect individuals' actual gender identities.

(ii) Native speaker status: yes/no. We assessed this based on observable characteristics, primarily fluency, and, when in doubt, verified using online sources such as CVs.

(iii) Career stage: determined based on conference listings and, when unclear, verified using online sources such as CVs or publication histories:
   - Student: PhD candidate or below.
   - Early career: <10 years of experience in science.
   - Late career: >10 years of experience in science.

Note that a single scorer from the author team collected data for each conference session, preventing a formal assessment of inter-rater agreement. However, during the planning phase of the study, the lead authors discussed and clarified operational definitions and illustrative examples for all coded variables. To mitigate potential concerns about consistency in coding, we deliberately maintained relatively coarse levels for measurement scales—for example, using only three categories for Effectiveness—thereby reducing sensitivity to fine-grained interpretative differences. Before publication, we anonymized all data, including scorer, speaker identity and conference/session information.

(b) Data analysis

We carried out all analyses in R v. 4.4.1 [16]. We used package 'ggplot2' v. 3.5.1 for visualizations [17], 'glmmTMB' v. 1.1.7 [18] for fitting regression models and 'performance' v. 0.12.4 [19] and 'DHARMa' v. 0.4.6 [20] for model validation.

First, we visually explored the temporal distribution of jokes using kernel density plots, broken down by laughter intensity, sex, career stage and native speaker status. For this, we standardized the timing of each joke relative to the total length of its corresponding presentation, allowing for comparisons across talks of varying durations.

Next, we used regression analyses [21] to test our hypotheses. In a first model, we examined the predictors of the number of jokes within a presentation. We used a generalized linear mixed-effects model to assess the relationship between the number of jokes and the speaker's sex, native speaker status, career stage, as well as the length of each talk (included as a controlling factor). We specified a Poisson distribution, suitable for count data, and a logarithmic link function, to ensure positive fitted values. To account for the non-independence of observations, we included a nested random intercept structure (conference/session). Conferences are unique social contexts where speaker behaviour may align, and we anticipated that each other's use of humour may influence presenters within a given conference. Additionally, audience responsiveness may vary across sessions—due, for example, to differences in time of day (e.g. early morning versus right after lunch), audience composition (e.g. undergraduates versus senior researchers) or room dynamics (e.g. crowded versus sparsely attended sessions, or acoustics that amplify or dampen laughter)—all of which could influence the likelihood of joke-telling. The sample size for this model was 531.

In a second model, we explored the predictors of joke effectiveness. Because the effectiveness variable was highly imbalanced (low: 67%, medium: 24%, high: 9% observations), we grouped the 'medium' and 'high' levels to define a binary outcome variable: whether a joke landed (1) or not (0). We used a generalized linear mixed-effects model with a Bernoulli distribution to model binarized joke success as a function of joke type, delivery method and all demographic variables from the first model. The random effects structure included conference and session, with an additional random intercept term Talk ID to account for pseudoreplication due to instances of multiple jokes per speaker. We specified a complementary log–log (clog–log) link function, as it is better suited for unbalanced binary outcomes with a high proportion of zeros [22]. The sample size for this model was 870.

Model validation for the Poisson model revealed significant over-dispersion (dispersion ratio = 2.30, Pearson's $\chi^2 = 1200.57$, $p < 0.001$), so we switched to a negative binomial distribution. Despite the high number of zeros in the dataset (i.e. speakers not delivering any jokes), there was no sign of significant zero-inflation (observed zeros: 223; predicted zeros: 224; $p = 0.976$; electronic supplementary material, figure S1). Diagnostic plots based on residuals revealed satisfactory model fit for both models (electronic supplementary material, figures S2 and S3). In an exploratory phase, for both models, we also tested interactions (sex × native speaker status; career stage × sex; career stage × native speaker status: career stage × delivery type), but none were statistically significant.

3. Results and discussion

We collected data from 531 individual talks across 14 conferences, totalling 870 unique jokes. Joke distribution was highly skewed, with most speakers telling no jokes ($n = 223$; 41.9%) or only a few (median = 1). Only a handful of speakers attempted multiple jokes (figure 1A), confirming that the absence of humour in scientific talks is indeed the norm. The most common jokes seemed largely improvised, revolving around situational hiccups ($n = 367$; 42.2%)—e.g. technical issues with the pointer, slide malfunctions or the speaker's own nervousness. By openly acknowledging something that is happening in the room, this type of joke works to forge connections with the audience through empathy. Furthermore, a large proportion of jokes connected audiences to the subject matter ($n = 161$; 18.5%), including the experience of being a scientist, fieldwork anecdotes, commentary on academic life or jokes specific to a research topic. By contrast, speakers only sporadically made popular culture jokes unrelated to academia ($n = 52$; 5.9%) or inside jokes referring to specific group norms of the immediate academic community and conference ($n = 30$; 3.4%). About one-third of jokes ($n = 260$; 29.8%) were hard to classify and were grouped as 'other'. Most

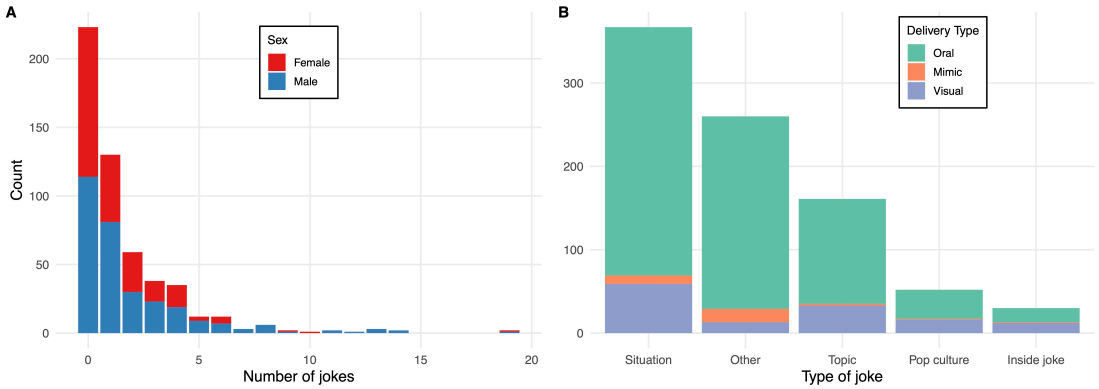

Figure 1. Frequency and types of jokes used during scientific talks. (A) Histogram of jokes per talk: most speakers make none or very few, though a few tell many. (B) Joke categories: situation (technical issues, nervousness), topic (scientific life), inside joke (community references), pop culture (outside references) and other (uncategorized). Delivery modes: oral (spoken), visual (slides/props) and physical (gestures/imitation). Most jokes are oral, followed by visual; physical humour is rare.

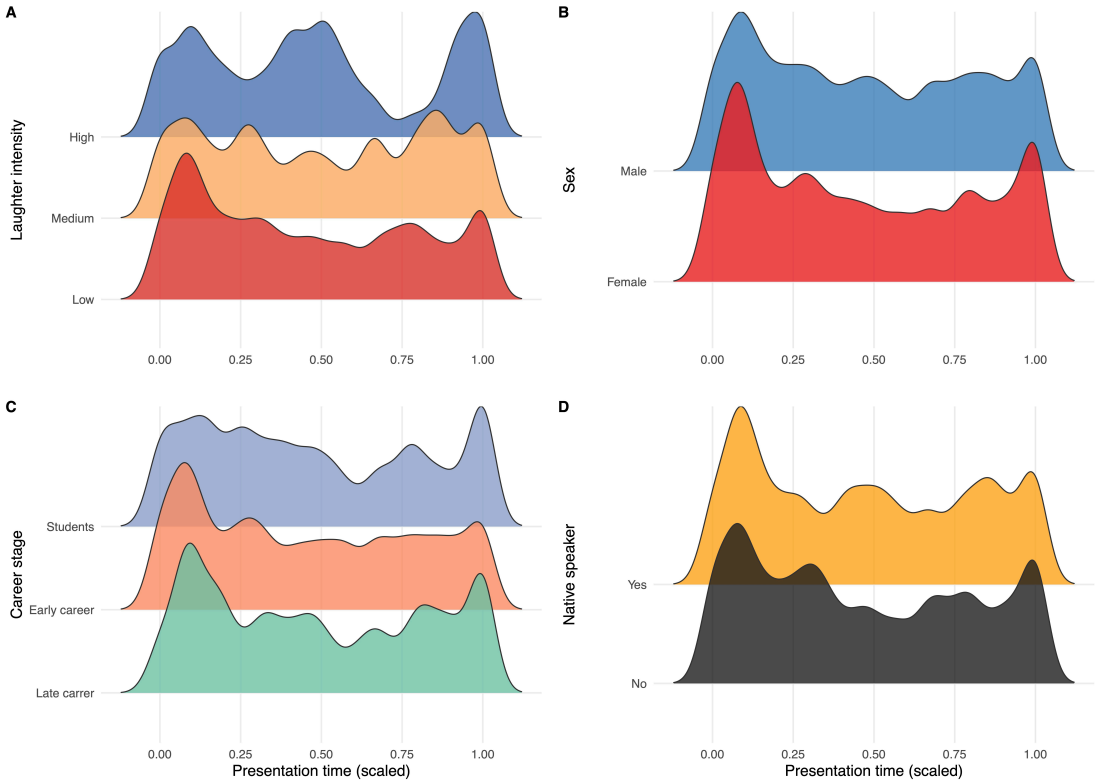

Figure 2. Timing of jokes throughout scientific talks. Density plots show when jokes occur, with presentation time scaled from 0 (start) to 1 (end). (A) Most jokes occur at the beginning and end; successful jokes (eliciting medium/high laughter) also appear midway. Patterns hold across (B) sex (female, male), (C) career stage (students, early career, late career)—though students tend to make fewer jokes at the beginning—and (D) English proficiency (native versus non-native).

humour was delivered orally (n = 707; 81%), with a smaller portion relying on visuals (n = 133; 15.2%). Physical comedy, based on impressions or gestures, was rare (n = 30; 3%; figure 1B).

In comedy, timing is everything. Jokes clustered mostly at the beginning and, to a lesser extent, at the end of presentations (figure 2). This bimodal pattern suggests distinct psychological dynamics: opening jokes may serve as icebreakers and establish speaker likability, while closing jokes may reflect both speaker relaxation and a deliberate effort to end on a positive note. At the same time, professional norms may implicitly restrict most use of humour to the beginning or end of talks—perceived as 'safe zones' that do not compromise scientific seriousness. Indeed, during informal chats with some of the speakers at coffee breaks, early career scientists reported being explicitly advised by their mentors to avoid jokes during the core content of their presentations. This reinforces the idea that humour is perceived as acceptable when it does not interfere with 'serious science'. Interestingly, this general temporal pattern is consistent across sexes (figure 2B), career stages (figure 2C) and native-tongue status (figure 2D), with one notable exception: students showed reduced joke frequency at the beginning of their talks compared with experienced researchers, instead peaking at the conclusion—suggesting that initial nervousness gives way to increased comfort as their presentations progress.

Jokes eliciting whole-room laughter were rare (9%), while the majority fell flat or landed mildly, earning mostly quiet chuckles (67%). These results support our hypotheses: when audiences do not 'expect' to laugh, laughter is more difficult to achieve [23]. Despite the anti-comedic professional norms that scientific audiences are bound by, we observed that unsuccessful jokes are not necessarily unappreciated. Most jokes at the beginning of talks elicited relatively low laughter intensity, while

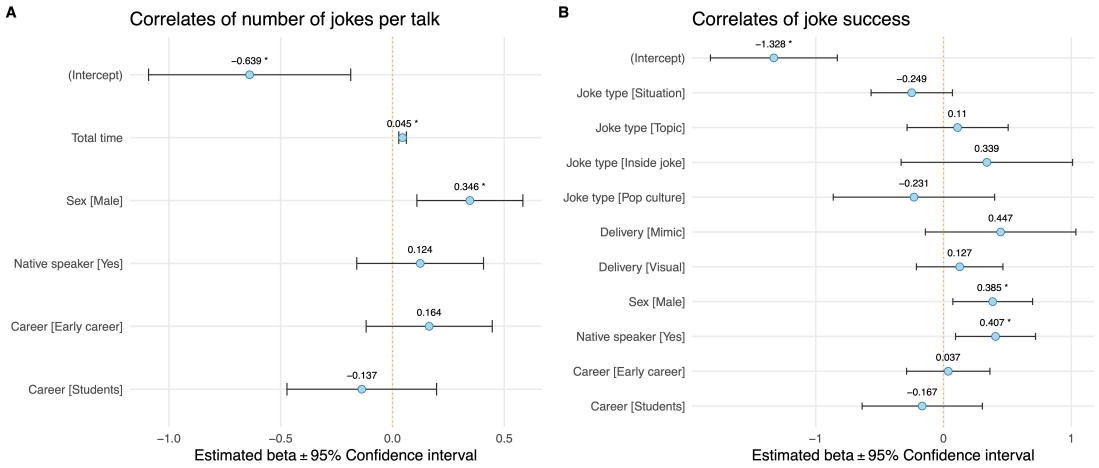

Figure 3. Predictors of joke frequency and success. Forest plots show standardized coefficients ($\beta \pm 95\%$ CI) from generalized linear mixed-effects models. (A) Predictors of joke number per talk: the number of jokes increases with talk length, and male speakers tend to tell more jokes. (B) Predictors of joke success (eliciting medium/high laughter): male speakers and native English speakers are significantly more likely to succeed. Categorical variables: sex (male versus female; baseline = female), career stage (students, early career, late career; baseline = late career), native language (yes versus no; baseline = no), joke type (situation, topic, inside joke, pop culture, other; baseline = other) and delivery (oral, visual, physical; baseline = oral). $*p < 0.05$.

the most successful jokes peaked not only at the beginning but also midway through and at the end of presentations (figure 2A). This pattern for successful jokes probably reflects strategic audience engagement: an effective opening joke 'warms up' the audience, breaking the ice and priming listeners to respond more enthusiastically to humour later on [24]. Midway through the presentation, experienced speakers may intentionally introduce another strong joke to recapture attention following extended technical content, helping to refresh focus. Finally, a well-placed closing joke serves as the cherry on top, leaving the audience with a positive lasting impression and reinforcing the speaker's connection with the listeners. This temporal distribution suggests that humour, when timed thoughtfully, can guide audience engagement throughout a presentation.

The first regression model examining the correlates of the number of jokes within a presentation predicted male speakers to tell approximately 0.35 more jokes per talk than female speakers. Furthermore, each additional minute of talk time was associated with roughly 0.05 more jokes. By contrast, career stage and native speaker status had no significant effect on the number of jokes told during a presentation (figure 3A). According to the second regression model examining the factors affecting the probability of making the audience laugh, male speakers had an estimated 9% higher probability of eliciting laughter, and native speakers had an estimated 10% higher probability. Joke type, delivery method and career stage showed no significant influence on joke success (figure 3B). The two models explained 32% and 21% of the variance, respectively, including variance accounted for by the random effects (conference, session and talk ID). Substantial unexplained variance remains, implying that additional unmeasured factors—including topic, speaker charisma and reputation, audience size and composition, spontaneity, time of day and room characteristics—probably contribute to both the use and effectiveness of humour in scientific talks. Given the opportunistic nature of the study, we did not systematically measure these contextual variables. While our nested random effects structure accounts for some of the non-independence of observations and potential inter-rater variability, it cannot fully substitute for these unmeasured covariates, and their absence may have influenced the observed effects.

Overall, these findings reveal some demographic patterns in the use and success of humour in scientific presentations, likely mirroring broader social dynamics in academia—where confidence, authority and the freedom to take risks (like joking) are not equally distributed. Disparities in the ability to joke seem to stem, at least partly, from gendered expectations and linguistic barriers that shape who feels comfortable being playful in professional spaces. For example, borrowing from role congruity theory [25], one could argue that women who use humour in traditionally male-dominated settings may violate gender norms and risk social penalties. Anecdotal evidence supports this: through informal follow-up chats during coffee breaks, many female scientists revealed that they experience heightened impostor syndrome when joking and perceive humour as a professional risk, fearing it could undermine their credibility in an environment where they already struggle with a sense of belonging. These findings may also reflect broader gendered patterns in risk-taking behaviour. Studies consistently show that men are, on average, more willing to take social and professional risks [26], which may include deviating from academic norms by using humour in formal settings. This way, humour may act as an amplifying mechanism—giving already-privileged speakers yet another tool to increase visibility, likability and memorability in professional spaces, potentially widening existing gaps in scientific communication.

Notably, an individual's career stage had no significant effect, suggesting that humour is not merely a matter of experience. The absence of strong effects of joke type or delivery method further supports the notion that the success of humour often depends more on who delivers it than on how it is delivered. Nonetheless, this variability—and the lack of any single, overwhelmingly effective joke type—encourages experimentation: humour does not need to be perfect to be powerful; it simply needs to feel natural, authentic and human [9]. In this context, it is also important to recognize the role of the speaker's intentional effort because audience expectations may further influence joke success [27]. Unlike audiences at stand-up comedy shows, scientific audiences are not expecting to laugh spontaneously; thus, speakers must actively work to prime their audiences for laughter through deliberate delivery and timing [28]. For example, one might choose a whimsical presentation

title to set the tone from the outset, or use strategic vocal intonations—such as changes in pitch or speech rate—to build anticipation for a joke and to distinguish intentional comedic comments from serious content [29]. This additional effort may interact with social dynamics to shape which jokes resonate and which fall flat.

Ultimately, each joke we recorded in this study was an attempt to connect the audience to the speaker through a shared experience, perspective or piece of information. This finding is supported by the encryption theory of humour [30], which proposes that humour is strategically used to signal common knowledge and attitudes, and that those who laugh indicate their inclusion in the shared community. When well-timed and used appropriately, humour in presentations becomes therefore a tool for connection and community building. Indeed, humour can help challenge imposter syndrome by allowing individuals to bring their authentic selves into professional spaces. While we recognize that the risks of attempting jokes are not distributed equally, we nonetheless recommend and encourage the use of humour in scientific presentations, provided it is delivered with care and appropriateness. Striking this balance is challenging, but when successful, humour can transform a talk from forgettable to unforgettable. After all, science may be serious—but scientists do not always have to be.

Ethics. This work did not require ethical approval from a human subject or animal welfare committee.

Data accessibility. Data and script to reproduce the analysis are available on Figshare [31].

Supplementary material is available online [32].

Declaration of AI use. The final article was reviewed for spelling and basic grammar using a large language model.

Authors' contributions. S.M.: conceptualization, data curation, formal analysis, investigation, methodology, validation, visualization, writing—original draft; D.F.: data curation, writing—review and editing; A.S.: data curation, writing—review and editing; K.N.O.: data curation, writing—review and editing; R.C.: data curation, writing—review and editing; M.B.M.: data curation, writing—review and editing; V.D.S.: data curation, writing—review and editing; V.S.: conceptualization, investigation, methodology, writing—original draft.

All authors gave final approval for publication and agreed to be held accountable for the work performed therein.

Conflict of interest declaration. We declare we have no competing interests.

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