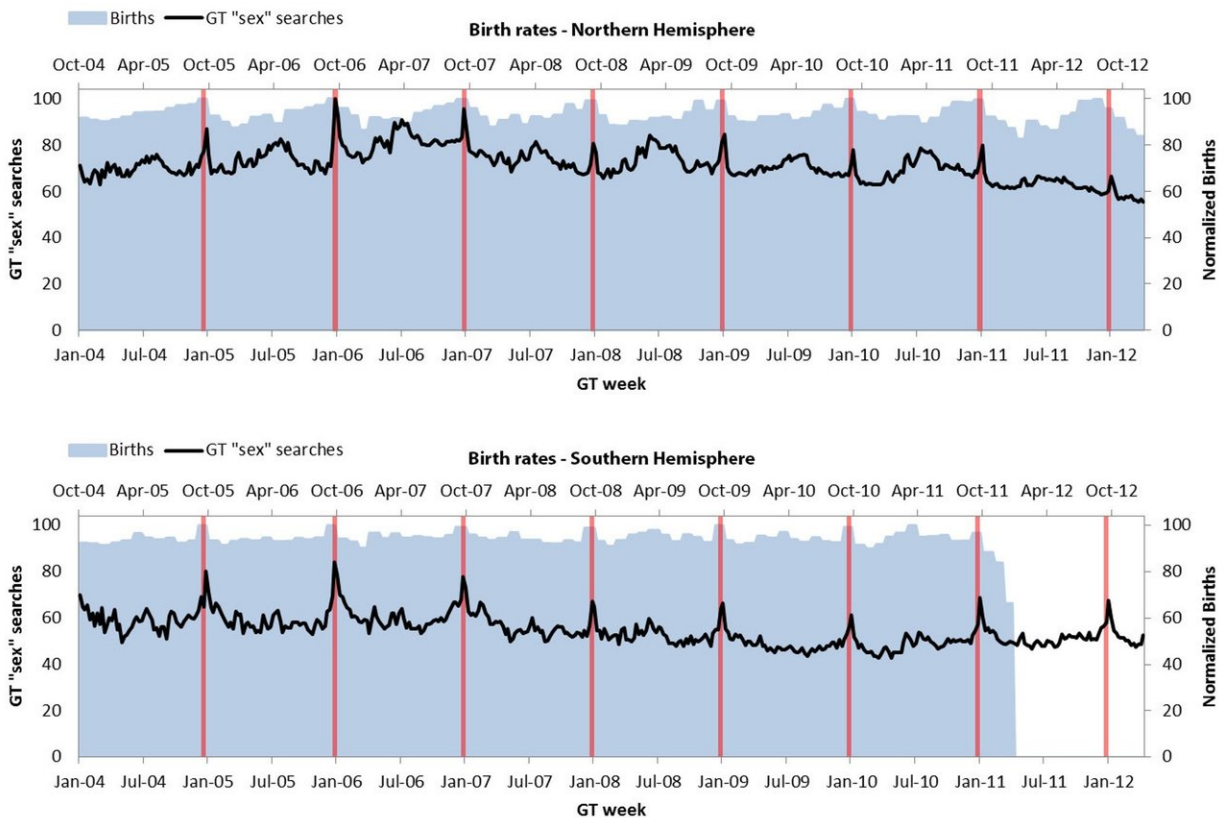


# Study finds online interest in sex rises at Christmas, with more births nine months later

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The study found a close correlation between peaks in sexual search terms on Google (black line) and spikes in birth rates (shaded upper line in blue), shifted by nine months, in the Northern Hemisphere (upper chart) and Southern Hemisphere (lower chart). The red line marks Christmas week. Credit: Image courtesy Ian Wood, Indiana University

It's often wryly observed that birth rates peak in September, with many studies citing seasonal changes in human biology to explain this post-holiday "baby boom." But new research from scientists at Indiana University and the Instituto Gulbenkian de Ciência in Portugal finds that spikes in pregnancies are actually rooted in society, not biology.

The evidence was discovered in the "collective unconscious" of web searches and Twitter posts that researchers now use to reveal our hidden desires and motivations.

"The rise of the web and social media provides the unprecedented power to analyze changes in people's collective mood and behavior on a massive scale," said [Luis M. Rocha](#), a professor in the IU School of Informatics, Computing and Engineering, who co-led the study. "This study is the first 'planetary-level' look at human reproduction as it relates to people's moods and interest in sex online."

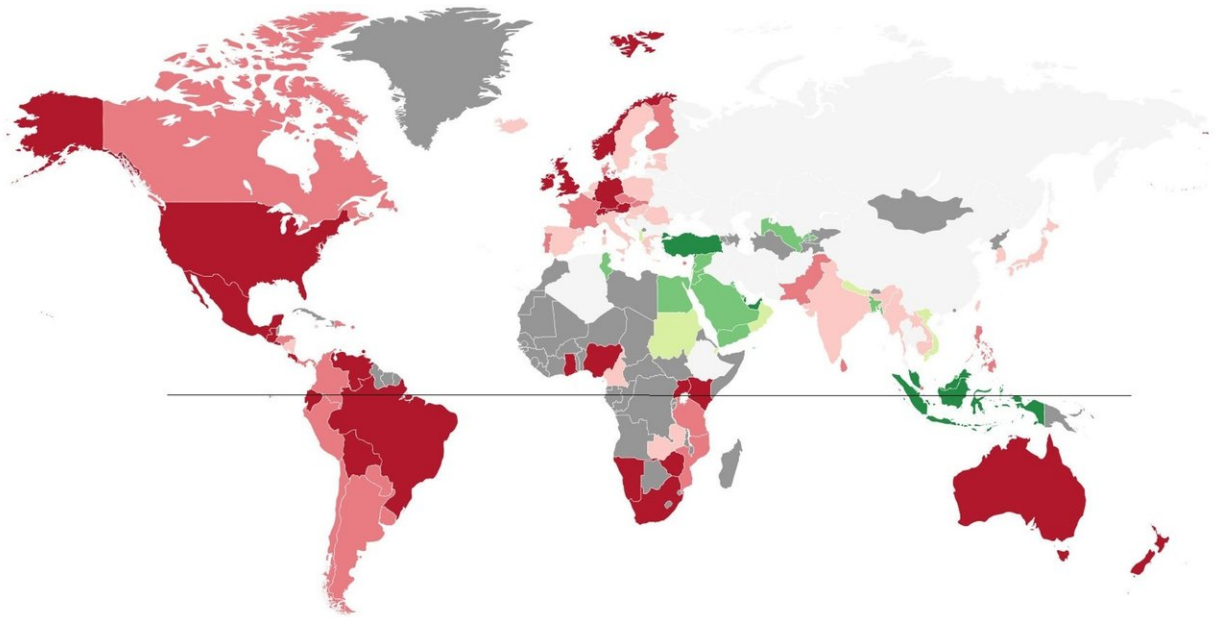
The study, which appears Dec. 21 in the journal *Scientific Reports*, draws upon data from nearly 130 countries that included sex-related Google search terms from 2004 to 2014 and 10 percent of public Twitter posts from late 2010 to early 2014.

The analysis revealed that interest in sex peaks significantly during major cultural or religious celebrations—based upon a greater use of the word "sex" or other sexual terms in [web searches](#). These peaks broadly corresponded to an increase in births nine months later in countries with available birth-rate data.

Moreover, the effect was observed in two different cultures, with the greatest spike occurring during major holiday celebrations: Christmas in Christian-majority countries and Eid-al-Fitr, the celebration that marks

the end of Ramadan, in Muslim-majority countries.

The use of data from the Northern and Southern hemispheres is notable since past analyses tended to focus on smaller geographic areas in the Western and Northern hemispheres. The case of Eid-al-Fitr is significant because the holiday does not occur on the same day each year, but the measured effect still shifts accordingly, following a clear cultural pattern.



Researchers were able to predict a country's religious majority based upon the correlation in their peak birth periods and higher interest in sex based upon web searches and social media. Countries with higher percentages of Christians appear in red. Countries with higher percentages of Muslims appear in green. Credit: Image courtesy Ian Wood, Indiana University

Because the seasons are reversed on opposite sides of the globe, and peak [birth rates](#) and online interest in sex did not change based on

geography, the researchers concluded the relationship between these effects is unrelated to biological shifts caused by changes in daylight, temperature or food availability.

"We didn't see a reversal in birth rate or online interest in sex trends between the Northern and Southern hemispheres—and it didn't seem to matter how far people lived from the equator," Rocha said. "Rather, the study found culture—measured through online mood—to be the primary driver behind cyclic sexual and reproductive behavior in human populations."

To understand the higher interest in sex during holidays, the researchers also conducted a sophisticated review of word choices in Twitter posts—known as a "sentiment analysis"—to reveal that, collectively, people appear to feel happier, safer and calmer during the holidays.

When these collective moods appear on other occasions throughout the year, the analysis also found a corresponding increase in online interest in sex. Interestingly, Thanksgiving and Easter did not generate the same mood and online interest in sex.

"We observe that Christmas and Eid-Al-Fitr are characterized by distinct collective moods that correlate with increased fertility," Rocha said.

"Perhaps people feel a greater motivation to grow their families during holidays when the emphasis is on love and gift-giving to children. The Christmas season is also associated with stories about the baby Jesus and holy family, which may put people in a loving, happy, 'family mood.'"

The study's results are notable for reasons beyond curiosity about the rise in babies born nine months after the holidays. For example, Rocha said the findings could help public health researchers pinpoint the best dates to launch public awareness campaigns encouraging safe sex in developing countries lacking in reliable birth-rate data.

"The strong correlation between birth rates and the holidays in countries where birth-rate data is available—regardless of hemisphere or the dominant religion—suggests these trends are also likely to hold true in developing nations," he added. "These types of analyses represent a powerful new data source for social science and public policy researchers."

**More information:** Ian B. Wood et al, Human Sexual Cycles are Driven by Culture and Match Collective Moods, *Scientific Reports* (2017). [DOI: 10.1038/s41598-017-18262-5](https://doi.org/10.1038/s41598-017-18262-5)

Provided by Indiana University

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