Circaseptan (Weekly) Rhythms in Smoking Cessation
Considerations

Smokers’ rhythms in contemplating quitting or making quit attempts are poorly understood. Tobacco control has focused on annual events (eg, New Year’s Day), but circaseptan (weekly) time cycles may likewise exist. For example, many illnesses such as strokes are more common on Mondays.1 Do cessation behaviors also have weekly rhythms?

Methods | Traditional survey-based assessments are inadequate to capture weekly cessation rhythms. However, examining how individuals search online takes surveying them to the next level by revealing both the searcher’s thoughts, through the types of queries undertaken, and their actions toward behavior change, through engaging in the search behavior itself.2 Global Google cessation query trends in English, French, Mandarin/Cantonese, Portuguese, Russian, and Spanish were monitored from January 2008 through 2012 (google.com/trends). In English, all queries including “quit” and “smoking” (eg, “quit smoking help”) were combined into a single trend. This was repeated for “arrêter de fumer,” “戒烟,” “parar de fumar,” “бросить курить,” and “dejar de fumar.” Because raw volumes are misleading (all searches may not be about quitting), we divided the number of queries each day by the global monthly volume for “quitsmoking” and its next 100 related terms from Google Adwords (adwords.google.com) to our results. For this sample of Google queries in English, there were 153 800 more searches on Monday than the Tuesday through Sunday mean, totaling 8 000 000 each year.

Discussion | Just as illness has a weekly clock, so do cessation behaviors. The discovery of weekly rhythms in quitting contrasts with previous scientific understanding and can be harnessed to improve cessation advocacy.

Individual quitting behaviors have been described as “chaotic.”4 A bird’s-eye view of the population, however, suggests anything but chaos. Quitting behaviors are not spontaneous events but are instead an aggregate phenomenon partially governed by a weekly clock. To fully appreciate the microdecision to quit, we must begin exploring macrodynamics, such as interconnectedness,5 in lieu of individual psychology.

Given that most cessation contemplations do not result in successful quits, public health advocates can use these findings to facilitate quitting by providing resources (staffing smoking cessation lines) when more smokers are engaged in the quit process through day-of-the-week targeting. Hypothetically, 145% more susceptible English-speaking smokers may need resources on Monday than on Saturday.

Finally, developing research agendas and advocacy priorities around weekly rhythms in cessation is justified by our findings. Weekly clocks likely impact other behaviors, and ours are just initial steps toward a more substantial (and novel) research program to discover these patterns.

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The main panels in each graph show segments of the weekly trend lines (light blue curves) for searches in the indicated languages from 2008 to 2012 layered over one another, with the mean for each day of the week, as estimated from the wavelet-reconstructed time series, indicated by an open diamond; reference lines (dashed lines) for the Monday means were added to aid interpretation. In the bottom portion of each panel is illustrated the Google search volume for Monday (open diamonds) relative to the combined Tuesday through Thursday means; horizontal error bars represent the 95% CIs. Smoking cessation volume on each graph is represented as a relative search volume (ie, a normalized daily ratio of cessation queries to all queries).
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