Why Standard Time is better

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Mar 20 · 17 min read

We have to stop changing the clocks twice a year, but it's also important to pick the right schedule when we do it.

Thousands of scientists say that Standard Time is better, yet legislators are pushing for permanent DST, anyway. The scientists have shown that seeing light in the morning is essential to health, and without it we get more cancer, diabetes, and obesity.

We need to balance the needs of night owls and early birds to have a good outcome for everyone.

Changing the clocks

Around the world, voters have chosen to end the clock changes twice a year. California, Oregon, Florida, and the entire EU have begun doing away with the time change. Public health is one of the reasons: switching twice per year results in more accidents and heart attacks afterwards. But what if our health still depends on the clock throughout the entire year? Some schedules are better than others, and setting our clocks in a way that makes us sleep less year-round would be bad for our health.

The question is: which schedule should we choose? Legislators in several places around the world appear to favor permanent "daylight time", but this schedule is associated with more cancer, diabetes, and

obesity. There's a simple reason: **for most of us, waking up in the dark is tough on our internal clocks and our sleep.**

The consequences of this kind of sleep and light disruption are very serious. Shift work can raise the lifetime risk of cancer by 70%. Messing with the clock in smaller amounts matters too: **the best numbers say that making people wake up an hour earlier could give us 10–20% more cancer.** That's a huge disconnect between science and policy that's trying to improve public health.

Thousands of scientists have posted their statements online, so we've made a list of these statements all in one place, so you can read them. We're also trying to explain the evidence behind them, with the hope that this important research will become part of the public discussion.

Thousands of circadian scientists support standard time

The two largest groups of scientists researching circadian rhythms have issued statements with a strong preference for standard time.

Why Should We Abolish Daylight Saving Time?

" The authors take the position that, based on comparisons of large populations living in DST or ST or on western versus eastern edges of time zones, the advantages of permanent ST outweigh switching to DST annually or permanently."

Till Roenneberg, Anna Wirz-Justice, Debra J. Skene, Sonia Ancoli-Israel, Kenneth P. Wright, Derk-Jan Dijk, Phyllis Zee, Michael R. Gorman, Eva C. Winnebeck, Elizabeth B. Klerman

Read the SRBR statement (representing more than 1,000 scientists in the United States and worldwide)

"We emphasize that the scientific evidence presently available indicates that installing perennial Standard Time (ST, or 'wintertime') is the best and safest option for public health…ST will be healthier than DST in terms of sleep, cardiac function, weight, cancer risk, and alcohol and tobacco consumption"

SRBR Contacts: Céline Vetter, Public Outreach chair; Erik Herzog, President

Read the EBRS statement (the largest research society in Europe)

"[Standard Time] improves our sleep and will be healthier for our heart and our weight. The incidence of cancer will decrease in addition to alcohol and tobacco consumption. People will be psychologically healthier and performance at school and work will improve"

EBRS Contacts: Debra Skene, President; Martha Merrow, Vice-President

Time to change, but only to 'wintertime', Meijer and Foster

The main way in which biological time is set to the geographical time is by exposure to light—primarily in the morning. Without this 'light-kick' in the morning, our biological clock drifts and our bodies are no longer able to perform according to the demands of the time of day. This holds not only for teenagers, who are known to possess "slow clocks", but really for everyone.

Who wants to go to work in the dark? Californians need Permanent Standard Time

Humans require adequate morning light so that our internal biological rhythms synchronize properly to the local time. There's a wealth of data demonstrating that a lack of exposure to light leads to sleep and metabolic disorders, depression and cardiovascular disease, among other ailments.

— UCLA Chancellor Gene Block and Johanna Meijer

Is year-round daylight saving time a good idea? Maybe not

Permanent daylight saving time wouldn't solve this issue; instead, it would prolong it—adding more days of social jet lag to the year.

— Steve Kay and Travis Longcore (USC, interview by Joanna Clay)

Early to bed, Early to rise?

Let's imagine we took this too far and asked everyone to wake up super-early, at 3AM.

You'd probably wake up groggy and tired the next day. But maybe that's fine—why not go to bed at 7PM to feel better? Wouldn't we all get used to it? Lots of people think that their body's internal clock moves based on when they sleep, so they say, maybe you can get used to any schedule.

It doesn't actually work this way. Instead, your internal clock sets itself based on when you see bright light. People trying to sleep at 7PM couldn't fall asleep (their clock would be saying, *It's Daytime!)* because they wouldn't be tired yet. They also wouldn't find it very easy to wake up at 3AM in the dark—their clock would say they should still be asleep. *Nighttime!*

As you probably guessed, even if we kept this up for years, most people wouldn't get used to this schedule, because the timing of the light is all wrong. They wouldn't see enough light in their "morning" at 3AM, and they'd see too much of it right before bed. We know that the human body won't fall asleep at certain "internal" times of day due to work done by Steven Strogatz and colleagues at Harvard in the 1980s—there is a region just before bed when you can't fall asleep, and another one like this just after you wake up. We have to align our sleep with the light we see.

And of course it doesn't make any difference if we move the clocks so that 3AM is called 7AM—you can't fool the body's clock. It's the *internal* clock that matters, and that clock mostly cares about when the sun is up.

There is a "best" time for each person to sleep relative to daytime, some of them early, others pretty late, and when we look across a population, there is a complicated way to pick the "best" time for everyone. We think it should be the schedule that, on average, lets everyone sleep a little better, have less cancer and lower weight, feel less irritable, and have fewer auto accidents. For most places (including California, Florida, and Europe), the science is clear. The right answer is closer to year-round "standard time" than it is to "daylight" time.

Does an hour matter?

Everyone would notice if they missed out on four hours of sleep like our exaggerated example, but a lot of people don't notice when they get just a little less sleep. Sleeping a half hour less actually does make a big difference for your health over time, but it's hard to tell when you're just a little off from your best schedule—you might start to feel burned out, hungry, or irritable. Over time, these small bits of sleep loss add up into large effects on our health. When scientists study sleep in larger populations, they can see these effects fast.

With "permanent DST" as proposed in California and in other places throughout Europe, we have to set our alarm clocks an hour earlier all year, so solar noon happens at 1 PM. And through the whole winter, we'd get up in the dark. This one-hour change has a big effect on our health, and a lot of it is due to how we feel in the wintertime.

Daylight vs. Morning Light

Daylight Time sounds good (since it makes some people think of "permanent summer" or even "more light"), but it's really not that good. Changing the clocks this way does not give us more light during the winter, and it comes at a steep cost, which is that our mornings are a lot worse. We have to set our alarm clocks earlier, waking up in hours of darkness and going to work earlier.

Your circadian clock sets its time by when the sun is up, and the morning is especially important. Without light in the morning (and there's a *lot* less light in the winter), your clock will get later and later, waiting for bright light to tell it that it's daytime. When your clock is set much later than the alarm clock, you have trouble falling asleep at night and trouble waking up in the morning. This makes us lose sleep, and this has serious effects on physical and mental health.

Extra light at night doesn't help—it only tells your clock: *Stay up later!*

We already tried DST all year long: 1974's Energy Crunch, and Russia's Traffic Accidents

In 1974, the United States decided to try permanent DST for two years, in order to save energy. At first, people were optimistic (79% were in favor of the move), but by February, after the first winter, support had

dropped to 42%. Remember, the winters are tough. The US in 1974 didn't make it the full two years: Congress rolled back the measure in a 383-to-16 vote.

In 2011, Russia tried changing to DST all over the country. Again, the measure was initially very popular, but within a year, traffic accidents had gone up and the measure was unpopular. They reversed the decision in 2014, and they now use standard time.

It's important to remember that initial enthusiasm for year-round DST does not mean that we've felt what it feels like to go through a winter without light in the morning.

Cancer Rates

In 2017, a group of cancer epidemiologists at NIH and Harvard looked at **four million** cancer diagnoses in 607 counties across the United States. They noticed that some people live on the eastern side of a timezone (where the sun rises a whole hour earlier), and others on the western side. They were able to see how cancer rates change by when the sun rises.

When the sun comes up later, cancer rates go up a *lot*.

In men, *twenty minutes* of later sunrise gives 9% more stomach cancer, 11% more liver cancer, 4% more prostate cancer, and 13% more leukemia.

In women, the same twenty minutes gives 3.7% more breast cancer, 16% more esophageal cancer, 4.5% more colorectal cancer, 4.6% more lung cancer, and 10% more uterine cancer.

Remember that we're wondering what happens when we shift our clocks earlier by a full hour? These statistics are for only twenty minutes. We don't have to try it to know what will happen—getting up earlier all year (for "daylight time") is not a good plan for keeping cancer rates low.

Social Jetlag and Obesity

One of the most influential groups working on the subject of how well people align with solar time is Till Roenneberg, Martha Merrow, and

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3OD@JHMF5O

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*O' MPSJEB ZPV DBOVTF

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&1* GVNWQEG

4USPHBU 4) ,SPCBVFS 3 & $[FJTMFS$ " $JSDBEJBO
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4USPHBUFUBM QEG

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IUUQT XXX TFNBOUDTDIPMBSPSH QBQFS*NQBDUPG
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8 JUNBOO . %JOJD + . FSSPX . 3PFOCFCFSH 5
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