



SAVE STANDARD TIME

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2020 March 4

Maryland Senate Education, Health, & Environmental Affairs Committee
The Honorable Paul G Pinsky, Chair
Miller Senate Office Building, 2 West Wing
11 Bladen Street
Annapolis MD 21401-1991

Re: SB 517 (Permanent Daylight Saving Time) – Oppose (Amend to Permanent Standard Time)

Dear Senator Pinsky and Members of the Committee,

Thank you for your work in the best interests of Maryland's citizens. I write with the concerns of circadian-health researchers and advocates for children's well-being, to request you oppose a bill that awaits your committee's hearing. SB 517 has good intentions, but until it is amended from permanent Daylight Saving Time (pDST) to permanent Standard Time (pST), it is poised to harm rather than benefit the public good.

Clock choice is not arbitrary. While SB 517's plan to retry pDST would remove the acute harms caused each March by changing clocks from Standard Time (ST) to Daylight Saving Time (DST), it would increase the chronic harms caused every day by continually observing the clock that disrupts civil time from human circadian rhythms—the clock known as DST.

Many lawmakers, with all due respect, are unfortunately confusing evidence against DST as being merely against clock changes.

ST is objectively defined as an approximation of solar time, to which human biology is intrinsically tied through our internal circadian rhythms. DST disrupts civil clocks from these rhythms. Its artificially delayed sunsets and sunrises make it harder for us to sleep and harder for us to wake. It decreases exposure to morning sunlight, when mental and physical health need it most. Its continual observation leads to chronic sleep deprivation, which manifests as increased disease, accidents, and deaths, and as decreased scholastics, productivity, and even wages. Claims that DST increases exercise have been debunked as anecdotal and culturally dependent. Observation of DST also increases energy waste, which costs millions of dollars each year. And pDST threatens to reverse the necessary and popular benefits of starting school later.

pDST was first introduced to America during World War II; it was unpopular and quickly reverted. It was retried in 1974, when it was again reverted—though sadly after the loss of at least eight children's lives to sleep-deprived motorists. Similar trials have proved disastrous in the UK (1968–1971) and Russia (2011–2014). Why repeat bad history?

Current scientific polling (AP-NORC, October) shows most Americans prefer pST when given all three choices of pST, pDST, and biannual clock changes. History shows even when pDST is greeted with optimism (79% approval in the US in 1973), it quickly reverses once experienced (42% approval in the US in 1974).

DST has long been promoted by merchants of gasoline, golf, and candy, since DST may temporarily benefit these special interests. But momentary profits for a few shouldn't come at the unending cost of the general population's health, safety, and prosperity. It is unjust to force needlessly harmful conditions on the entire citizenry.

This is a public-health issue; it must be decided by data:

If someone says, "I like Daylight Saving's longer evenings," it's the same as saying, "I like smoking." Both are correct on a hedonic level. Both do not take into account evidence that both are bad for us. Over time, they become very expensive experiments by society.
—Dr Till Roenneberg, Professor of Chronobiology, Ludwig Maximilian University

Permanent Daylight Saving undermines any benefits of shifting school start time later. A required wake time of 7am during Daylight Saving leads to the same degree of [circadian] misalignment as a required wake time of 6am during Standard Time.
—Anne Skeldon PhD, Professor of Biology, University of Surrey

Permanent Standard Time is the only fair and viable option.
—Gene Block PhD MS BA, Chancellor, University of California, Los Angeles

pST is the quickest way to end clock changes, since it is the only way approved by Congress (it's what Arizona and Hawaii do). History and polling show it's the most popular and sustainable way forward. Scientific consensus worldwide—and studies of millions of citizens over several years in countless locations—all show it to be the healthiest, safest, most economical, and most environmental way.

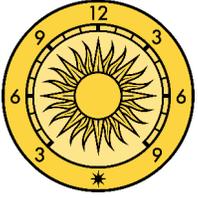
Please oppose SB 517. Please urge its sponsors to amend to a restoration of pST. Please consider drafting new legislation for pST if need be.

Most respectfully yours,



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Save Standard Time is a nonprofit, nonpartisan, single-issue, volunteer-run effort, presenting concerns of scientists and advocates, seeking to preserve and extend the observation of Standard Time.



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Endorsements of Permanent Standard Time as the Better Year-Round Clock

The following parties reject permanent Daylight Saving Time and endorse permanent Standard Time as the better year-round clock. These are not implied to be endorsements of the Save Standard Time entity.

Organizations

Society for Research on Biological Rhythms
Canadian Society for Chronobiology
European Sleep Research Society
Chronobiology Lab Groningen
Sleep Medicine Association
Society for Sleep Research & Medicine
National Education Association
National PTA
Association of Canadian Ergonomists
Time Reform Catalonia
Association Against Double Summer Time
Rabbinical Council of California
Agudath Israel of California
Adath Israel San Francisco

Society for Light Treatment & Biological Rhythms
European Biological Rhythms Society
Australasian Chronobiology Society
Dutch Society for Sleep–Wake Research
Dutch Francophone Chronobiology Society
French Northwest Noggin Neuroscience
National School Boards Association
American Federation of Teachers
German Society for Time Policy
Saratov for a Healthy Time
Rabbinical Council of America
Agudath Israel of America
Agudath Israel of Florida

Individuals (non-comprehensive list)

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Travis Longcore PhD, Institute of the Environment & Sustainability, University of California, Los Angeles
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SCIENCE & TECHNOLOGY

WashU Expert: This year, let's make standard time permanent

By [Talia Ogliore](#) • October 24, 2019

Erik Herzog, professor of biology in Arts & Sciences at Washington University in St. Louis, is among the experts in biological rhythms who believe that the United States should abolish daylight saving time. (Photo: Shutterstock)

Never again.

After we turn back the clocks one hour on the morning of Nov. 3, Washington University in St. Louis chronobiologist [Erik Herzog](#) wants us to just keep it that way.

“Just lock it in,” Herzog said. “Forever.”

Herzog is a professor of biology in Arts & Sciences and president of the [Society for Research on Biological Rhythms \(SRBR\)](#), a scientific organization dedicated to the study of biological clocks and sleep. He is often asked his opinion about time changes.



Herzog

The SRBR recently released a formal position paper, titled “[Why Should We Abolish Daylight Saving Time?](#)” The researchers have been carefully following the initiatives of the European Commission and California Proposition 7 to abandon the annual clock-time changes in spring and autumn.

There is a consensus among experts that the advantages of permanent standard time outweigh those of switching back and forth to daylight saving time annually — or of switching to daylight saving time permanently.

In the SRBR position paper, the researchers recommend:

- If we want to improve human health, we should not fight against our body clock.
- We should return to standard time — which is when the “sun clock” time most closely matches the “social clock” time — throughout the year.
- This solution would fix both the acute and the chronic problems of daylight saving time.

The science behind this choice is clear, the researchers said. Living creatures have a body clock that creates daily rhythms. For humans, this body clock organizes our biology, such as when we eat and sleep, when we

can run fastest and when our brain works at its best. **The body clock must be made to match our 24-hour environment.**

Throughout the year, standard time will be healthier than daylight saving time in terms of sleep, cardiac function, weight, cancer risk and alcohol and tobacco consumption, to name a few examples.

To help the public and politicians understand the benefits of permanent standard time, SRBR has put together [a helpful list of resources](#) on this topic.

“We must recognize the important role of sunlight in shaping our daily behavior and the important role of our body clock in maintaining our health and well-being,” Herzog said.

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

USC experts confirm biological challenges of the time change; if anything, they say we should be on standard time all year.



BY Joanna Clay

MARCH 19, 2019

If you were yawning more than usual thanks to last week's switch to daylight saving time, you weren't alone.

It takes some people a full week to recover from feeling more sluggish than usual after rolling back the clock for daylight saving time. Experts call the phenomenon "social jet lag."

Much like the jet lag we experience after flying across time zones, losing an hour upsets our circadian rhythm. That not only throws off our sleep schedule but actually has impacts on the cellular level, since many biological functions are timed to that clock.

"It really messes people up," said Steve Kay, the director of the USC Michelson Center for Convergent Bioscience who is considered one of the preeminent experts in circadian rhythm.

"It affects human performance. The data has been clear in terms of traffic accidents and there's also data that it's not great in terms of cardiovascular health: Heart attacks go up."

In California, daylight saving time could become year-round after voters in November approved Proposition 7. The ballot measure allows the state legislature to make daylight saving time permanent, provided federal law is changed to allow the move.

Research shows there are all kinds of health concerns when it comes to circadian disruption. When experienced long term, as is the case with night shift workers, an individual's likelihood to develop obesity, Type 2 diabetes or cancer increases, according to USC experts.

OSHA includes daylight saving time side effects in its trainings, since workplace accidents increase by about 6 percent.

Some proponents of the proposition brought up the health concerns, such as upticks in traffic accidents and heart attacks, but USC experts say they're missing the mark. Permanent daylight saving time wouldn't solve this issue; instead, it would prolong it — adding more days of social jet lag to the year.

Less light in the a.m. with year-round daylight saving time

There's a long-held understanding that **experiencing light when you first get up is good for you**, said USC Assistant Professor **Travis Longcore**, who researches **night lighting**. If we could shift our work and school schedules to accommodate the time change we would be fine, he said, but we don't. That "summer schedule," during which most of us wake up before the sun, could have real health implications if done long term.

A **study on 150,000 nurses** found that, over the course of five years, those who worked the night shift had a 30 percent higher chance of developing Type 2 diabetes. If they had other unhealthy habits on top of that, such as smoking, the diabetes risk increased threefold. There's also research that shows night shift workers are more likely to engage in unhealthy behavior, such as having a poor diet or exercise habits.

Longcore noted a study on four million Americans, comparing how far east they lived in their time zone with cancer rates. People who lived west within their time zones saw impacts: **each 20 minutes of later sunrise increased certain cancers by 4 to 12 percent**. In California, farther-west San Francisco would be hit harder than L.A., where the sun rises earlier, he said.

Year-round daylight saving time and cellular function

A **recent study** by Kay and his team showed that **circadian disruption changed the way cells function to the point of increasing disease risk, including cancer**.

It's also a change that could **disproportionately impact teenagers**, whose clocks are biologically shifted to wake up later. When they sleep in late on the weekends, it's not just lethargy — it's biology, Kay said. That's the reason some schools are shifting their start times. A study showed students got 34 minutes more sleep, on average, when school started later.

"As we age, our biological clocks shift earlier," Kay said.

If anything, both Kay and Longcore agree, California should consider **switching permanently to standard time, like Hawaii and Arizona**. The Society for Research of Biological Rhythms **penned a letter** to the author of Proposition 7 in support of that. Although it would mean earlier nights, it would **address the health implications associated by starting your day in darkness**.

"Our highly evolved circadian lifestyle is making us ill," Kay wrote in a recent paper. "Humans are not evolved for night shifts, nighttime lights and intercontinental travel. Modern life challenges to our circadian system present a long-term threat to our health."



British Columbia

Year-round daylight time will cause 'permanent jet lag,' sleep experts warn in letter to government

Change would particularly affect children, say signatories, who want permanent standard time

CBC News · Posted: Oct 31, 2019 10:59 AM PT | Last Updated: an hour ago

A group of sleep experts have sent a letter to the provincial government asking it to stand down on paving the way for permanent daylight time in the province.

On Thursday, the B.C. government is introducing legislation that gives the province the power to usher in the change sometime in the future.

The letter, signed by six experts in sleep and biological rhythms, advises the government against the decision, saying it could have adverse long-term implications for public health and safety.

The letter says if daylight time is kept year round, the sun will rise later in the winter, leading to decreased exposure to morning sunlight, which humans need to wake their internal biological clock.

It notes that when exposure to morning sunlight is reduced, it makes it harder to wake up in the morning and more difficult to fall asleep at night.

The letter says sleep deprivation can lead to mental and physical health problems and increase risk of vehicle and workplace accidents. In December, the sun will not rise until around 9 a.m. in southern B.C. — and later further north — if daylight time becomes the norm.

"It will be permanent jet lag," said Myriam Juda, a researcher at Simon Fraser University's Circadian Rhythms and Sleep Lab, on CBC's [The Early Edition](#).



Sleep experts warn reduced light exposure in the morning will disrupt circadian rhythms, making people sleep deprived and putting them at greater risk of vehicle accidents and certain health problems. (Shutterstock)

Juda said it might seem appealing to have more light exposure in the evening, as will happen with permanent daylight time, but said it will cause increased fatigue and decreased morning productivity.

Children will be particularly affected, Juda said, explaining that they would be woken up earlier when their melatonin levels are high and sleep should not be interrupted.

Juda said inadequate sleep can affect children's developing brains and mental health. There will also be safety risks for them commuting to school in the dark for at least one-third of the school year.

Juda and the letter's other signatories say they would prefer permanent standard time, which their research says is the best option for public health and safety.

Sleep Review

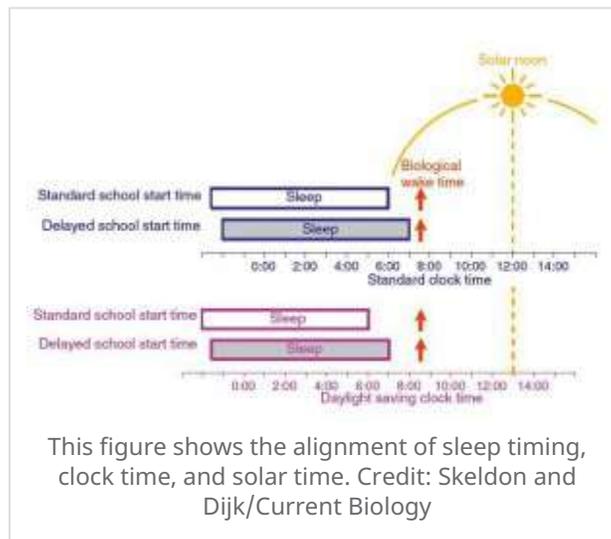
Permanent Daylight Savings May Cancel Out Changes to School Start Times

Posted by Sree Roy | Apr 22, 2019

Moving the clock forward and then back each spring and fall usually draws plenty of complaints and questions about why such a change is necessary. As a result, several states, including California, Washington, Florida, and North Carolina, are now considering doing away with the practice by making daylight savings time (DST) permanent.

But, researchers reporting in the journal *Current Biology* on April 22 say, **permanent DST would make it harder to wake up in the winter**, as it would remain dark an hour later into the morning. It would also **undermine efforts in many states to give teens more time to sleep** in by pushing school start times back.

“There has been a long-term, very active debate in the USA and other countries on the difficulties teenagers have in getting up for school,” says Anne Skeldon, professor of mathematics at the University of Surrey, UK, in a release. “Similar discussions on school start times and on permanent daylight saving/standard time are happening in Europe. It seemed important to us to point out that **moving to permanent daylight saving will undermine any benefits on sleep timing of shifting school start time later.**”



Two bills currently making their way through the Californian state legislature are a case in point. Senate Bill SB-328 Pupil Attendance: School Start Time would prohibit middle and high schools from starting earlier than 8:30 in the morning. Senate Bill AB-807 Daylight Saving Time would result in a switch to permanent DST.

Thinking through why permanent DST would negate changes in school start times is a bit tricky, Skeldon explains. That’s because it requires understanding how three different times are related to each other and how they shift over the course of the year: environmental time as determined by the sun, our internal biological time (linked to actual light exposure, including sunlight), and the time that we set on our clocks.

If the clocks weren’t turned back in the fall, as under permanent DST, it would mean that sunrise would come at an even later clock time than it already does during those shorter days

of the winter. As a result, Skeldon and co-author Derk-Jan Dijk, professor of sleep and physiology and director of the Surrey Sleep Research Centre, write, “a required wake time of 7 am during DST leads to the same degree of misalignment [between the socially required wake time and biological wake time] as a required wake time of 6 am during ST. With permanent DST, schools would need to delay start times by one hour during the winter months just to maintain the status quo!”

Of course, they continued, it’s possible that people living indoors under electrical lighting aren’t affected that much by shifts in sunrise. But, if that’s true, they point out, then it really doesn’t matter what time school starts in the first place.

“If we are not entrained to solar time, switching to DST will have no impact on adolescent sleep, but Bill SB-328 delaying school start times is pointless,” they write. On the other hand, “if we are completely or partially entrained to solar time, Bill AB-807 leading to permanent DST is bad for adolescent sleep (and the sleep of others) and negates the effect of later school start times.”

To sort it out, more research is needed to understand how light exposure affects the sleep and biological clocks of people living in different environments. “We know that spending most of our lives inside and having the lights on late into the evening has had profound effects on when we sleep, but we still have much to learn about exactly how much this matters,” Skeldon says.

The year Daylight Saving Time went too far

[Susan Steade](#) November 7, 2018 at 11:17 a.m.

The 7 a.m. darkness in the last days before springing forward put us in mind of a historical footnote: the year of unending Daylight Saving Time.

Or at least that was how it was supposed to be.

It was 1974, and the energy crisis was cutting into the American way of life, with odd-even gas rationing, a national speed limit and shortened Nascar races. The Emergency Daylight Saving Time Act signed by President Nixon dictated that clocks would spring forward one hour on Jan. 6 — and stay that way for almost 16 months, until April 27, 1975.



Students wait for a schoolbus at 7:35 a.m. in Astoria, Queens, during the daylight savings experiment. (Getty Images)

By fall, the dark mornings were apparently wearing on the American people. Proclaiming "it's for the children" — those scholars standing at bus stops in the predawn — lawmakers threw in the towel of gloom. Year-round DST

was scrapped, and on Oct. 27, clocks fell back.

But there's no way to stop the Earth from tilting, and — in 1974 as in all years — most of the morning daylight gain was gone within weeks.

The 1974 experiment was but one of the federal revisions of Daylight Saving Time in the past 50 years.

- 1966: To standardize practices across the United States (with a few exceptions), it was declared that DST would run from the last Sunday in April to the last Sunday in October.
- 1986: The start date was moved to the first Sunday in April.
- 2007: DST was extended on both ends, and it now runs from the second Sunday in March to the first Sunday in November.

Does daylight saving time save electricity?

Matthew Kotchen, Laura Grant 05 December 2008

Daylight saving time, designed for energy conservation purposes, is among the most widespread regulations on the planet. Surprisingly little evidence exists that it actually saves energy. This column, using a natural experiment, concludes that “saving” daylight has cost electricity.

Each year, 76 countries practice Daylight Saving Time (DST), referred to as Summer Time in the EU. By setting clocks forward one hour in the spring and turning them back one hour in the fall, DST effectively moves an hour of sunlight from morning to evening. The policy directly affects more than 1.6 billion people worldwide, making it among the most widespread regulations on the planet.

“Saving” daylight to save energy

Although commonly misunderstood to be an agricultural policy, DST has always been about energy conservation. History credits Benjamin Franklin with the original idea in a whimsical essay titled “An Economical Project” (1784). He mused that if people adjusted their schedules during summer months to wake earlier, an immense sum of tallow and wax could be saved in the evening by the “economy of using sunshine rather than candles.”

The idea was taken seriously when numerous countries implemented DST during World Wars I and II. But it was not until 1966 that DST became an annual policy in the US, and since that time, the start and end dates have changed several times. Most recently, the Energy Policy Act of 2005 extended DST beginning in 2007 to start three weeks earlier and last one week longer. Congressional debate about the extensions focused on the potential energy savings, with forecasts speculating that each additional day of DST would save the equivalent of 100,000 barrels of oil per day.

Existing evidence

Despite the historical and current practice of DST within the US and around the world, surprisingly little evidence exists that the overall policy actually saves energy. **An early and oft-cited study by the US Department of Transportation (1975) found that DST causes a 1% decrease in electricity consumption at the points of transition in the spring and fall. But a subsequent evaluation of the study concludes that the results are statistically insignificant** (Filliben 1976). Kellogg and Wolff (in press) find that extending DST in Sydney, Australia during the 2000 Olympic games had no effect on overall electricity consumption because the decrease in evening demand was offset by an increase in morning demand.

A related literature uses engineering simulations, and these results also call into question DST’s supposed energy savings. **Rock (1997) finds that DST increases electricity consumption on average over 224 different locations throughout the US.** Fong et al. (2007) investigate the effects of DST on household lighting in Japan and find a reduction in electricity consumption that varies by region. However, **Shimoda et al. (2007) conduct a similar exercise that accounts for air-conditioning as well and find that DST results in a 0.13% increase in residential electricity consumption.**

Indiana’s natural experiment

Recently, we were able to conduct a study that takes advantage of the unique history of DST in the state of Indiana (Kotchen and Grant 2008), where the policy was instituted statewide only in 2006. Before that year, only a relatively small set of counties were practicing DST. The change in statewide policy thus offered a natural experiment to measure the overall effect on residential electricity consumption. We could compare the amount of electricity used by households in the late-adopting counties during the two years before they switched to DST with the amounts they used during the year afterward – while using counties that always practiced DST as a control group. A notable feature of the research design is that it allows estimation, for the first time, of an overall DST effect and different effects throughout the year over the entire DST period, including the periods of transition.

Our main finding is that – contrary to the policy’s intent – DST increases residential electricity demand. Estimates of the overall increase are approximately 1%, but we find that the effect is not constant throughout the DST period. DST causes the greatest increase in electricity consumption in the late summer and early fall, when estimates range between 2% and 4%.

To understand what underlies this result, we simulate the effect of DST on components of household electricity demand with an engineering model. These simulations corroborate our empirical estimates and uncover changes in the quantity and



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timing of electricity demand due to the distinct components of lighting and indoor climate control. Consistent with Benjamin Franklin's original intuition, DST is found to save on electricity used for household lighting, but the savings is more than offset by increases in electricity use for heating and especially cooling.

A final component of our analysis is the calculation of costs associated with the estimated effect of DST. We find that the policy costs Indiana households an average of \$8.6 million per year in increased electricity bills. We also estimate social costs of increased pollution emissions due to the residential response to be between \$1.6 and \$5.3 million per year.

Where to from here?

Our analysis does not, of course, suggest that "saving" daylight will always cost electricity, but it, combined with much of the existing literature, casts doubt on the longstanding justification for the policy. The scepticism is particularly important at this point in time, as the US begins to evaluate its recent extensions to DST, as required by the Energy Policy Act of 2005. The US Department of Energy (2008) just released its report to Congress on the effects of extended DST. The main finding is that extending DST saves less than 0.5% of total electricity usage over the extension period.

But as attention begins to focus on the Department of Energy study, the US Congress should bear in mind that even if extending DST saves electricity, the overall policy need not. Making a potentially flawed policy better, does not make it a good policy. The Indiana study provides the first—and only—empirical evidence of DST's effect throughout the entire year, and the results suggest that DST costs, rather than saves, energy. Moreover, the effects are likely to be even worse in areas where demand for air-conditioning is greater.

Further research is currently underway to extrapolate the Indiana results to other regions of the US. But research is also needed to understand the impact of DST in other regions of the world. For instance, Pakistan and Morocco reinstated DST this year in response to energy needs, and other countries, including India and Japan, are now considering implementation of DST. With worldwide energy demand expanding rapidly, along with concerns about climate change, it is increasingly important to know whether DST should be considered part of the problem or part of the solution.

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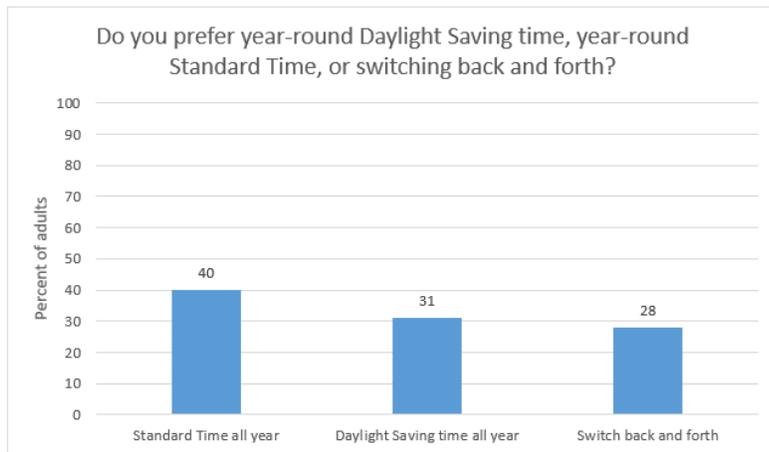
The Associated Press-NORC Center for Public Affairs Research

Daylight Saving Time vs Standard Time

An AP-NORC Poll conducted in October 2019 finds **71% want to end the practice of changing the clocks.**

Daylight saving time is observed from the second Sunday in March until the first Sunday in November. While states can opt into standard time permanently — which Hawaii and Arizona have done — the reverse is prohibited and requires congressional action. More than 30 states are considering legislation related to the practice of changing clocks twice a year, and Florida Sen. Marco Rubio introduced legislation making daylight saving time permanent nationwide.

Only 28% want to continue changing the clocks. Among the rest of Americans, **40% prefer year-round standard time** and **31% prefer year-round daylight saving time.**



Question: Would you prefer to use daylight saving time all year round, standard time all year round, or switch back and forth between them?

Source: AP-NORC poll conducted October 24-28, 2019, with 1,075 adults nationwide.

Older Americans are more likely than younger Americans to support staying in daylight saving time permanently. Thirty-eight percent of Americans age 45 and older support year-round daylight saving time, compared to 22% of Americans under 45.

The nationwide poll was conducted October 24-28, 2019, using the AmeriSpeak® Panel, the probability-based panel of NORC at the University of Chicago. Online and telephone interviews using landlines and cell phones were conducted with 1,075 adults. The margin of sampling error is plus or minus 4.1 percentage points.