Time to change – but only to ‘wintertime’

Johanna Meijer, Leiden University, the Netherlands, Oxford University, UK
Russell Foster, Oxford University, UK

In August, the European Union voted to abolish the bi-annual change in clock time. Whether the continent will be in constant wintertime or summertime remains to be decided. In a public international consultation that took place, a majority of the 4.6 million respondents voted for constant “summer time”. Whilst the abolition of the spring and autumn clock change will relief millions of people from a bi-annual burden, constant “summertime” is not the sensible option.

Wintertime is a confusing term. Wintertime or geographical time is based on the actual time of sunrise and sunset. When our alarm clocks are set to the geographical time, the sun is at its highest point at noon and lowest at 24h midnight. It is strange, therefore that we should denote geophysical time ‘wintertime’. By contrast, when we set our alarm clocks to “summertime” in the spring, the sun is highest at around 1PM, and lowest at 1AM. As a result, sunrise and sunset are one hour later than the real time of sunset/sunrise on that date. The apparently attractive up side of this shift is that the evenings are sunny and bright and we seem to experience “longer days”. But in fact, we fool ourselves: daylength remains unchanged. The earth follows its path around the sun, indifferent for how we turn the hands of our clock. While the length of the day seems longer, it is not.

A longer and brighter evening is inevitably at the expense of a later rise of the sun in the morning. What is the consequence? In summer, the later onset of sunrise, due to summertime, is hardly noticeable simply because we are still asleep during dawn. However, in winter, when days are short, the consequence of an imposed constant “summertime” would be that the sun rises noticeably later. In midwinter the sun arises around 8.00h with current wintertime. With constant summertime this will be at 9.00h. Thus, at the time when children travel to school and when the rush hour is at its height, we will be plunged into darkness or at best semi-darkness, more or less from the beginning of October to the beginning of March. Also, people working in outdoor settings, such as construction workers, will suffer from ongoing darkness.
Apart from this, we now appreciate that the lack of morning light has a major impact upon the adjustment of our internal biological clock. This clock is present in the entire plant and animal kingdom, to fine-tune physiology and behavior to the daily light/dark cycle. In humans, even before we wake, this internal clock acts to increase blood pressure, metabolism, apatite and our cognitive abilities in anticipation of increased levels of activity.

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.

Thus, introducing constant summertime is not as positive as one may think at a first sight. For at least 4 months in winter we will lack the correcting input of morning light resulting in a continuous jetlag; a classical miss match between our internal bodily system and the geographical day. The result will be that the alarm clock will force us out of bed and then we will commute to work or go to school in a poorly adjusted state, which promotes fatigue and lowers performance. No doubt, this will increase the incidence of traffic accidents in the morning. Teenagers are especially vulnerable to this disruption, as their clocks are slow. On non-school days teenagers tend to sleep-in and fail to experience morning light, so they miss the corrective influence of light. This will worsen with continuous summertime. Apart from these immediate consequences, scientific research has revealed that ongoing distortion of our biological clocks leads to a wide variety of diseases, including metabolic abnormalities, cardiovascular disease and, most of all, an increased vulnerability to depression.

With the introduction of artificial light about 100 years ago, we have gradually adopted a life style that is remote from natural rhythms in our environment. We humans feel that we can do what we like, when we like and can act independently of our biology or time of day. On the other hand, it has become clear from fairly recent research is that a properly timed biological clock is essential for good overall mental and physical health. Why would we act to risk sleep disorders, fatigue depression and good health, just to obtain a longer evening, by adopting “summertime” rather than “wintertime”? It is time we started to live in harmony with the natural world and not think that we can succeed by fighting against it.