

## **CONTRASTING HEALTH EFFECTS OF MORNING AND EVENING DAYLIGHT: Evidence from Russia's 11 time zones**

Daylight in the morning is associated with a better self-evaluated health in the short run. But in the long run, daylight in the evening leads to a lower body mass index through a healthier lifestyle: more exercise and more time spent outside.

These are the central findings of research by **Pavel Jelnov**, to be presented at the annual congress of the European Economic Association in Manchester in August 2019. His study uses 40 years of time zone reforms merged with 25 years of individual longitudinal data to explore the effect of time zones on health in European and Asian Russia.

This is an exceptionally big study in terms of the size of the country and the period of time analysed. At the heart of it is a question about time zone, which is effectively a choice between longer daylight in the morning and longer daylight in the evening – what is healthier?

'Let there be light', are God's first words in the Bible. Yet since industrialisation, humans want not only exposure to daylight but also coordination with each other: this is what the time zones do.

In some cases, this coordination comes at the expense of naturalness. In particular, the time zone generates a trade-off between daylight in the morning and daylight in the evening. This trade-off leads to debates and reforms.

For example, recently, the EU decided to stop the daylight saving time transitions and let each member country choose in which time zone it wants to permanently stay. Time zones are also manipulated for political reasons, with the biggest example being China, where the revolutionary government reduced the number of time zones from five to one in order to exhibit the unification of the country under the rule of the Communist party.

Russia has 11 time zones, and the frequent reforms that move the borders between them generate a unique natural experiment where different time zones are applied in the same place. In particular, the author compares two regions, which are more frequently than others exposed to reforms: the Volga river region in Europe and Western Siberia in Asia.

The results show that daylight between 7am and 8am, the hours when most people commute to work or school, has a positive effect on self-evaluated health, whereas daylight around 6pm has a positive effect on physical activity, non-exercise-related walking, and is associated with a lower body mass index. These results suggest that daylight in the morning enhances subjective health, but daylight in the evening leads to a healthier lifestyle.

In more detail, the author finds that what matters for self-evaluated health is morning daylight over the past year. With regard to the evening daylight, there is gradual combination of the effects.

In particular, evening daylight on the same day matters for non-exercise-related walking, whereas evening daylight over the past year matters for exercise. The effect of

evening daylight on body mass index and obesity is observed after a longer period of time. These results suggest that the healthier lifestyle when the sun shines around 6pm gradually translates into a lower body mass index.

The plausible explanation for the research's findings is the naturalness of the individual's schedule and the direct positive effect of exposure to morning daylight (which is richer than evening light in the healthy blue light) when the sunrise is early, whereas a late sunset triggers individuals to spend more time outside and be more active physically.

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'When Should the Sun Shine? The Effect of Time Institutions on Health'

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