

# Finding reference values for children's heart rate variability

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Measurement of heart rate variability (HRV) is a useful method when assessing the role of the nervous system for heart function. Standard reference values for heart rate variability in adults have existed for a long time already, but similar values have not been available for children until now. Children's HRV reference values have not been determined earlier, because heart rate variability from rest electrocardiogram (ECG) recordings has not been studied in sufficiently large population samples before. The presently published study defined reference values for a large number of HRV parameters in a sample of children living in Kuopio, eastern Finland. The results were published recently in *Clinical Physiology and Functional Imaging*.

Measurement of [children's](#) HRV may be useful when studying symptoms and diseases associated with physical or mental stress, or their risk factors.

The study constituted part of the Physical Activity and Nutrition in Children Study (PANIC), which is currently ongoing at the UEF Institute of Biomedicine. The PANIC Study provides new and scientifically valuable evidence on children's [physical activity](#), nutrition, physical condition, body composition, metabolism, cardiovascular function, learning, oral health, sleep, pain and other factors affecting the quality of life. The recently published study examined 465 children (226 girls and 239 boys) living in Kuopio, eastern Finland. The children were 6-8 years old at the time of the first measurements in 2007-2009. The extensive set of measurements included a 5-minute rest ECG recording

taken before a bicycle ergometer stress test. The HRV data was analysed separately in girls and boys in order to identify possible gender differences.

The main finding of the study was that there are no gender differences in the HRV parameters and that the child's age, maturity, height, weight or [body mass index](#) was not linked to the parameters, either. The results indicate that when studying HRV, a 5-minute ECG recording is not necessarily needed, as a 1-minute ECG recording may be sufficient.

The currently published reference values for parameters describing children's HRV are applicable to girls and boys alike, irrespective of the child's age, maturity, body height and weight, or body mass index. Although the researchers recommend a 5-minute ECG recording, it seems that a 1-minute ECG recording provides sufficiently reliable information about [heart rate variability](#). The findings provide valuable information for researchers interested in children's blood-vascular system and for physicians working with children.

In the future, researchers working in the PANIC Study will investigate whether [heart rate](#) variables are linked to metabolic disorders, blood-vascular disorders and unhealthy lifestyles in children.

**More information:** Website of the Physical Activity and Nutrition in Children (PANIC) Study: [www.uef.fi/en/biolaaketiede/la...ikunta-jaravitsemus](http://www.uef.fi/en/biolaaketiede/la...ikunta-jaravitsemus)

Provided by University of Eastern Finland

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