# Article information:

Brain charts for the human lifespan | Nature
<https://www.nature.com/articles/s41586-022-04554-y>

# Article summary:

1. Growth charts are currently available only for a small set of anthropometric variables, such as height, weight and head circumference, and only for the first decade of life.

2. There is an urgent need for normative brain charts to benchmark individual differences in brain structure over the entire lifespan.

3. Advances in neuroimaging data processing and statistical frameworks now enable the generation of brain charts that quantify age-related changes in multiple MRI-derived phenotypes across the entire life-course.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article “Brain Charts for the Human Lifespan” provides an overview of current research on brain development and aging, with a focus on the utility of standardized norms to benchmark individual trajectories of development. The authors present their own approach to generating brain charts using generalized additive models for location, scale and shape (GAMLSS), which leverages large datasets to optimize model selection empirically and account for site- or study-specific ‘batch effects’ on MRI phenotypes in terms of multiple random effect parameters.

The article is generally well written and provides a comprehensive overview of current research on brain development and aging. The authors provide detailed information about their methodology, including details on acquisition, processing, demographics, image quality control, pre-processing and statistical analysis. They also provide extensive supplementary information regarding model stability and robustness; phenotypic validation against non-imaging metrics; inter-study harmonization; assessment of cohort effects; extended global and regional cortical morphometric phenotypes; regional variability of cortical volume trajectories; developmental milestones; etc., which further strengthens the trustworthiness and reliability of their findings.

However, there are some potential biases that should be noted when considering this article. First, it is important to note that the authors rely heavily on existing datasets from previous studies when generating their brain charts – thus any potential biases or errors in those studies may be reflected in their results as well. Additionally, while they do discuss possible risks associated with their approach (e.g., variation in scanner platforms/sequences), they do not explore these issues in depth or provide any evidence to support their claims regarding potential risks associated with their methodology. Finally, it should also be noted that while the authors do discuss both male and female subjects when presenting their results, they do not explore any potential gender differences or implications when discussing their findings – thus any conclusions drawn from this article should be considered with caution until further research has been

# Topics for further research:

* Gender differences in brain development
* Impact of scanner platforms/sequences on brain imaging
* Inter-study harmonization of brain imaging data
* Global and regional cortical morphometric phenotypes
* Regional variability of cortical volume trajectories
* Developmental milestones in brain development

# Report location:

<https://www.fullpicture.app/item/0fb67ff89aa8f88c2c107c72b9daad7f>