# New study sheds light on 'lung sparing effect'

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A new study suggests that in cases of severe malnutrition, the body may prioritise lung development at the expense of other less vital growth.

The findings, published in the *European Respiratory Journal* today, found that children who are affected by severe acute malnutrition (SAM) in early childhood did not have significantly poorer lung function than unaffected children, but had shorter leg lengths than children not affected by malnutrition. The authors surmise that this could provide new evidence for the theory of 'lung sparing growth', whereby the body prioritises an important vital organ: the lungs.

Severe acute malnutrition is defined by a very low weight for height and affects more than 19 million children under 5 years of age worldwide. The authors sought to explore the long-term effects of early-life malnutrition on lung function.

Researchers carried out spirometry (lung function) and pulse oximetry (oxygen saturation of the blood) tests on 237 Malawian children who were malnutrition survivors, and compared their results with randomly selected children from the same community that were matched for sex and age, but who had never been treated for malnutrition.

Participant weight, chest depth and circumference, sitting height and leg length, HIV status, socioeconomic circumstances, sex, history of pneumonia, history of tuberculosis, exposure to cooking smoke and body composition (lean/fat mass) was also compared.

The results of lung function and oxygen saturation tests showed no significant difference between formerly malnourished children and children who had never been treated for malnutrition, suggesting that malnutrition in early childhood does not impact lung function later in childhood. However, further key findings indicated that:

- malnutrition survivors had shorter leg lengths; leg length was on average 1.9 cm shorter than children in their community of the same age
- malnutrition survivors were 73% more likely to be severely short for their age than children in their community of the same age

Lead author Dr Natasha Lelijveld, who completed research while studying at University College London and is now based at the London School of Hygiene & Tropical Medicine, said: "As far as we know, this is the first paper to hypothesise that severe acute malnutrition may result in lung sparing, in a similar fashion to studies that have found evidence of brain-sparing. The findings are very significant because, although it is great to see that lung function was apparently unaffected by malnutrition in these survivors, the process of preserving the lungs in infancy, at the expense of other growth, might mean that malnutrition survivors are at greater risk of other complications later in life."

The research team hopes that the findings will lead to more research in to severe acute malnutrition survivors, to enable such children to lead long and healthy lives. Dr Lelijveld continued: "We hope that adolescence, as a time of rapid growth and development, might be a second window to steer the health of these children back on track. This might be influenced by providing good nutrition to encourage limb growth, or through instilling healthy lifestyles to reduce the heighted risk of adult diseases; more research must be done in this area to determine what will be most effective."

The study identified girls and HIV positive children as the most at-risk of poor lung function among this particular group, and advised they should be especially considered in intervention packages that seek to improve lung function in survivors of severe acute malnutrition.

An accompanying editorial on lung-sparing growth, also featured in the *ERJ*, highlights the quality of the new research and discusses the hypothesis of lung-sparing theory in more detail.

**More information:** Long-term effects of severe acute malnutrition on lung function in Malawian children: a cohort study, DOI: 10.1183/13993003.01301-2016

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