

A Major Research Gap Found when Scientists Reviewed Studies by Covering 1.17 Million Children

Researchers reviewed pregnancy and birth cohorts worldwide that collect information on early-life nutrition and [child neurodevelopment](#). The analyses screened 504 candidate cohorts and identified 104 large-scale cohorts representing over 1.17 million children across 41 countries.

The study findings revealed that while data spanning infant feeding and [maternal diet](#) during pregnancy are widely collected, the participating populations were unevenly distributed across regions and income groups. Approximately 99% of participants in the income-stratified analysis were from high- or upper-middle-income countries, showing the need for greater representation of lower-income populations and coordinated use of existing datasets.



Study

The present study aimed to address this dataset fragmentation and support future international [nutrition](#) research by identifying long-term child cohorts suitable for combined epidemiological analyses.

The study primarily used a structured PubMed search, restricted to English-language publications, supplemented by a birth cohort registry and other [public sources](#). The search identified 3,419 articles, yielding 434 candidate cohorts; supplementary methods identified another 70. Large language models (LLMs) suggested potential additions, which the researchers evaluated manually.

Cohort screening inclusion criteria comprised: 1. Enrollment of at least 1,000 birth parent-child pairs, 2. Documentation of nutrition across the first 1,000 days (maternal pregnancy or lactation diet, [infant breastfeeding](#), or complementary solid-food introduction), and 3. Longitudinal assessment of child neurodevelopment before 18 years of age. The minimum cohort size excluded 202 smaller cohorts and may have contributed to underrepresentation of studies in resource-limited settings.

The researchers systematically indexed and extracted cohorts by country [income](#) according to World Bank classifications and grouped them into United Nations Sustainable Development Goal

(UN-SDG) subregions. Two multinational cohorts were excluded from geographical and income comparisons because they spanned different categories.

Results

The study's screening process identified 104 distinct cohorts initiated between 1982 and 2022, which together comprised approximately 1.17 million enrolled [children](#) across six continents.

The income distributions showed substantial imbalances: High-income nations accounted for 57% of participants (76 cohorts), while [upper-middle-income countries](#) represented 42% (23 cohorts).

[Lower-middle-income](#) settings contributed approximately 1% of the combined population across three cohorts, with no low-income countries represented in the income-stratified analysis.

Regionally, population representation was highest in [Australia](#) and New Zealand (541 children per million residents) and Northern America and Europe (427 per million). Sub-Saharan Africa had just six children per million residents.

Nutritional tracking statistics revealed that infant breastfeeding was documented across 93.3% of cohorts (97/104), followed by early solid foods (88/104) and maternal diet during [pregnancy](#) (74/104).

Maternal dietary intake during lactation was recorded in only 25.0% of cohorts (26/104). The authors noted that neurodevelopmental assessments were most often available in early childhood (between ages one and five [90/104]), but were identified in only 30.8% (32/104) during adolescence. Some newer cohorts may not yet have reached adolescence or reported later follow-up assessments. The researchers also identified 29 cohorts recording maternal diet during pregnancy, breastfeeding, solid-food feeding, and [neurodevelopment](#) in both infancy and early childhood.

Across the cohort inventory, the researchers identified more than 200 tools for assessing neurodevelopment. The Strengths and Difficulties Questionnaire (SDQ; 34 cohorts), Ages and Stages Questionnaire (ASQ; 25 cohorts), Bayley Scales of Infant and Toddler Development (BSID; 23 cohorts), and [Child Behavior](#) Checklist (CBCL; 22 cohorts) were found to be the most commonly used instruments.

Biospecimens were collected in 88 cohorts, and 66 collected genetic or epigenetic profiles, whereas brain [magnetic resonance imaging](#) (MRI) was captured in only nine cohorts, often among subsets of participants.

Conclusion

The present investigation identifies international cohorts that could support future analyses of relationships between early nutrition and child neurodevelopment. Variation in dietary and neurodevelopmental measures, measurement timing, and language poses obstacles to combining data and comparing findings across populations. The inventory relied on published cohort information and did not establish how many children had matched nutrition and [neurodevelopmental measurements](#).

Progress will require standardized core data elements, secure pooled or federated analysis methods, and funding for longitudinal birth cohorts within underrepresented global communities to support research across a wider range of populations. Nutritional guidelines based on subsequent analyses would require replicated results and stronger [causal evidence](#).

Source:

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