

INTRODUCTION

Everyday, people are exposed to chemicals and other pollutants from their environment, yet little is known about how these exposures impact children in utero and through their early years. The Children's Health and Environment Study (NYU CHES) seeks to determine if maternal and child exposures to environmental factors are associated with childhood health outcomes such as asthma, obesity, type 2 diabetes, autism spectrum disorder, and attention deficit hyperactivity disorder. The NYU CHES lab collects, processes, stores, and ships biological samples to various research groups nationwide in collaboration with the NIH Environmental Influences on Child Health Outcomes (NIH ECHO) study.

RESULTS

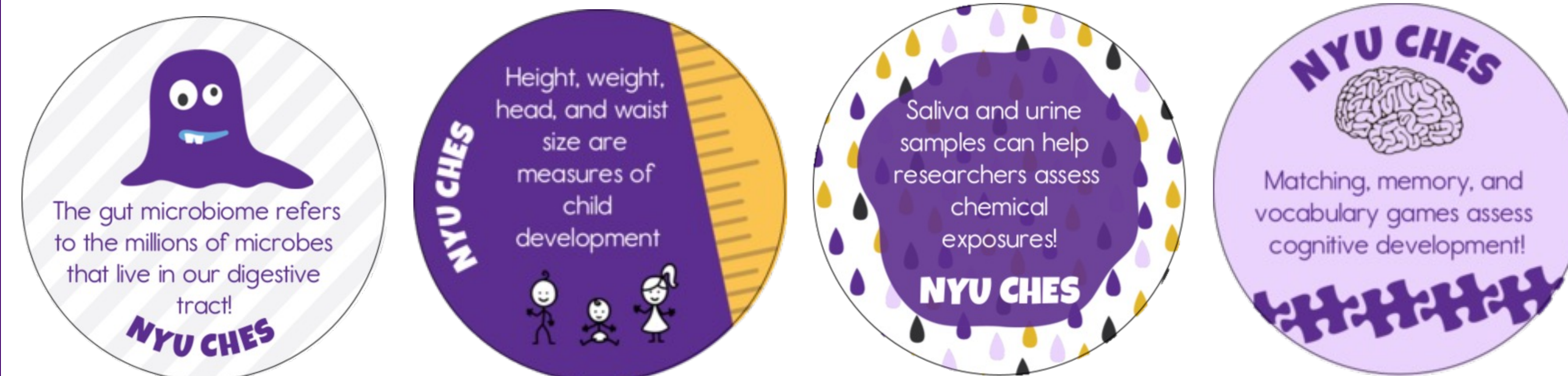
- The design of fun fact stickers to provide to NYU CHES participants at in person visits.



- Assisted in consenting expecting mothers into the first study arm.
- Assisted with measurements during in person visits at various clinic sites.
- Reorganization and inventory of on-site biological samples to be shipped to researchers nationwide.
- Assisted in processing placental tissues, umbilical cord, and other biological samples.
- Design of coloring sheet and bilingual "My Health" checklist for child participants.

MATERIALS & METHODS

Sample collection visits take place at three clinic sites across New York City— NYU Langone Tisch Hospital, NYU Langone Hospital Brooklyn, and NYC Health and Hospitals/Bellevue. Samples are collected from pregnant mothers at each trimester. Biospecimens collected include urine, blood, vaginal swab, and anal swab. At the time of delivery, the placenta and umbilical cord are retrieved, measured, weighed, and cored. Samples are stored in -80°C freezers until they are sent to the NIH or additional research labs for further study. If consented into subsequent stages of the study, the child will then be followed from birth to age 7. Samples collected at the 12-month visit include height, weight, head and waist circumference, blood pressure, body composition, saliva, urine, fecal matter, and a genital measurement. Saliva and urine provide evidence of chemical exposures while the genital measurement can provide details about hormonal balance in utero. In the 24-month visit the same samples are collected, except for the genital measurements, with the addition of hair and toenail specimens as well as sonograms of the child's heart and kidneys. At this visit, the mother's health literacy is assessed using a list of pre-set questions about a nutrition label. At the 3-5 year visit the additional tests include a DEXA scan, pulse wave velocity, and a NIH cognitive development iPad application test. At this stage, parents are also asked to bring in their child's tooth that has naturally fallen out, if possible. The 5-7-year stage of this study was recently funded and is still in development.



DISCUSSION

Biological Specimens:

- Saliva: used for genetic and chemical exposure testing
- Urine: measures of nutritional factors to assess chemical exposures, and proper development and bodily functions. For example, iodine levels are measured in urine to assess thyroid function.
- Fecal Matter: used for studying changes in the child's microbiome over time
- Body measurements: height, weight, and head/waist circumference provide insight on the child's development.
- Body composition: body fat and muscle are measured with a skinfold caliber as excess fat in childhood is a risk factor for future chronic disease.
- Blood pressure and pulse wave velocity: provide information about the child's heart health
- Genital measurements: one time measurement; measure of in utero hormonal balance
- Hair and toenail clippings: chemical exposure data
- Sonography (24M): reveals structure of internal organs such as the heart and kidneys
- DEXA Scan (3-5Y): measures whole body bone mass and soft tissue composition
- Teeth: used to measure in utero exposures to metals and environmental toxins
- Cognitive development testing: evaluation of the child's executive functioning and problem solving

REFERENCES



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