



AN ANALYSIS OF DEVELOPMENTAL AND LANGUAGE OUTCOMES IN CHILDREN WHO WERE EXPOSED TO CYTOMEGALOVIRUS IN-UTERO

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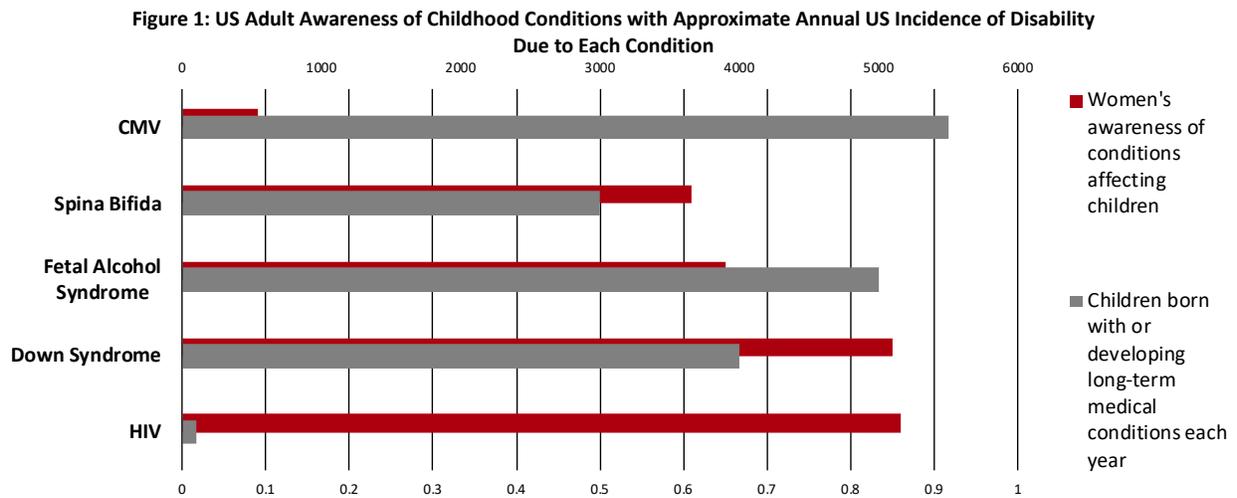
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Introduction: Cytomegalovirus (CMV) is a common virus with which the majority (50%-80%) of people have been infected by age 40 in the United States. Once infected, the virus stays in a person's body for life (CDC, 2018). Cytomegalovirus is among one of the most toxic viruses a fetus can encounter while in-utero, yet most people are unaware of the virus (see Figure 1) (Doutre et al., 2016). With limited research and data available on Congenital Cytomegalovirus (cCMV), this virus is now coming to the forefront of research in order to understand the lasting effects of this condition. In 2013, the State of Utah was the first state to enact a Cytomegalovirus Public Health Initiative to educate the general public about this disease. With a small \$30,000 annual budget, information on CMV was passed along to medical providers, parents, and pregnant mothers. A second provision was added that required all infants who failed their newborn hearing screening to be tested for Cytomegalovirus within 3 weeks of birth. This testing was done to distinguish congenital CMV (in-utero CMV) from the postnatal CMV that is not associated with hearing loss (Diener et al., 2016). Since this law was passed in Utah, more than five other states have enacted similar laws in order to provide early identification of cCMV and begin treatment of infants earlier to prevent additional advancement in hearing and neurological disorders (Diener et al., 2016). With an increased identification of infants born with cCMV, there is a need to identify whether there are lasting effects on children's development. The present study examined children's developmental outcomes among children exposed to cCMV in utero.

Method: For this research study, caregivers of children followed at the Primary Children's Medical Center in Salt Lake City, UT for cCMV and hearing loss were sent a link to an online survey consisting of language and development measures. The surveys included the Ages and Stages Questionnaire (ASQ-3), the Children's Communication Checklist (CCC-2), and the MacArthur Bates Communicative Development Inventory. Of the 84 eligible participants, 22 participants were contacted with 6 completing the surveys in their entirety (see Figure 2). Potential barriers for survey completion included a lack of time to complete surveys in a given time period and little knowledge of participation importance. Completed surveys were scored using specific measure protocol and analyzed for results.

Results: Preliminary data analysis showed an increase in developmental delay in the categories of gross motor, fine motor, and communication. In terms of personal social development, the children were more likely to be on target for development (see Figure 3).

Discussion: Although the results are preliminary in this study, there are concerning findings in terms of developmental delay regardless of hearing loss. At this time, more data collection is in progress with almost 30 participants in the completed and scored category. An in-depth chart review has been conducted to gain information about each child’s diagnosis, current medical status, and treatment plans. The scored surveys including measures and family history are going to be compared to cCMV negative, hearing loss children along with cCMV negative, no hearing loss in order to identify a correlation between hearing loss and cCMV. With this understanding of hearing loss and development outcomes, additional research can be conducted to understand early interventions and how they may play a positive effect in cCMV infants and children.



Eligible Participants	Participants Contacted	Surveys in Progress	No Response	No Interest	Completed and Scored
84	22	5	8	3	6

Figure 2: Participant Tracking

