

Climate change associated to an increase in congenital heart defects

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Abstract

Climate change causes a rise in global average temperatures and increases the number of extremely hot days every year in different regions of the world.

The National Aeronautics and Space Administration Agency (NASA) defines climate change as: “a broad range of global phenomena created by burning fossil fuels, which add heat-trapping gases to Earth’s atmosphere. These phenomena include the increased temperature trends described as global warming”.

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Editorial

The number of pregnant women exposed to these extreme high temperatures during early pregnancy is increasing and so are the possible teratogenic effects. Lyn et al. [1] reported the association between an increase in Congenital Heart Defects (CHD) and maternal heat exposure during the critical gestational period (3-8 weeks post conception) in multiple United States regions during the spring and summer seasons. Their findings also revealed an elevated risk of conotruncal malformations and ventricular septal defects during the spring in regions with larger temperature variations, and lower average temperatures [2-4].

Zhang et al. [2] designed a study to expand on these findings by projecting the US nationwide changes in maternal heat exposure during early pregnancy and changes in the CHD burden for the years 2015-2035. They utilized multiple heat exposure metrics used by NASA and the Godard Institute that were based on spatially and temporally high-resolution weather projections simulating changes in daily maximum temperatures by geographic region [5]. Then they calculated the anticipated maternal heat exposure per region for spring and summer. They paired these calculations with the

associated regional odds ratio for CHD [3] and assessed the change in the number of congenital heart defects.

This study from the School of Public Health of the University of Albany suggests that as many as 7000 additional cases of congenital heart defects will occur over an 11 year period in 8 representative states: California, Iowa, Georgia, Arkansas, Texas, Utah, New York and North Carolina.

Their findings also suggest that the greatest increase of newborns with CHD will occur in the Midwest followed by the Northeast and South with large increases of conotruncal malformations and ventricular septal defects in the South and atrial septal defect in the Northeast. As the planet keeps heating up, the health risks will grow. Each small shift in climate leads to a dramatic increase in the frequency of extreme heat waves. One study⁶ suggests that by midcentury, the number of days hotter than 35 degrees Celsius may be five to six times more than today with the consequential risk increase of congenital malformations [6,7].

These findings should be a wake up call for policy makers involved in the preparedness and resource allocation for climate change adaptation. They should also help us physicians to be better informed

and ready to act and advice of the possible catastrophic consequences of climate change.

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