

Author's declarative title: Sociodemographic variations in childhood diabetes incidence, mortality, and disability across countries.

Commentary on: Zhang K, Kan C, Han F, *et al.* Global, Regional, and National Epidemiology of Diabetes in Children From 1990 to 2019. *JAMA Pediatr.* 2023;177:837.

Commentary

Implications for practice and research

- Increasing awareness of childhood diabetes among healthcare professionals can aid disadvantaged areas.
- A diabetes classification system and studies on the impact of suboptimal and environmental temperatures on mortality in children are needed.

Context

Childhood diabetes carries a physiological and psychological burden for families. The continuous care demands and lasting consequences make it a significant public health issue. Zhang et al. [1] assessed the worldwide epidemiology of childhood diabetes. By analysing data from the global burden of disease (GBD) study [1], they investigated the changing patterns of childhood diabetes. They studied how diabetes varies worldwide, along with its risk factors, mortality, and disability impact.

The researchers analysed 1.45 million international cases of childhood diabetes over 30 years. They stratified the evaluated components based on age, sex, and each country's sociodemographic index (SDI).

Methods

Secondary retrospective data were collected by using the global health data exchange tool for children aged 0 to 14, which analysed incidence, mortality, and disability-adjusted life-years (DALYs) in 204 countries from 1990 to 2019, with their rates and uncertainty intervals. Data were grouped according to age groups (under 1, 1-4 years, 5 to 9 years and 10 to 14 years) to provide further sub analysis.

Countries were categorised into 5 SDI regions (low, medium, medium-high, and high) to explore the association between childhood diabetes burden and socioeconomic development.

Statistical analysis included linear regression of global risk factors contributing to mortality. Incidence, mortality, DALYs, and rates described children's diabetes burden. The GBD algorithm reported each rate per 100,000 population with an uncertainty interval of 95%. CI. Further analysis estimated annual percentage change (EAPC) to identify time-based deviations in burden.

Findings

Between 1990 and 2019, childhood diabetes diagnoses increased by 39.4% (95% UI, 30.99%-45.45%). Incidence increased from 9.31 (95% UI, 6.56-12.57) in 1990 to 11.61% (95% UI, 7.98-15.98) in 2019. Despite the significant increases, diabetes-related mortality and DALYs were reduced overall. Incidence rates vary across genders, age groups, and nations. In 2019, the childhood diabetes-associated mortality rate was the highest in the low SDI region (0.50; 95% UI, 0.39-0.64). Inversely, they were lowest in the high SDI region (0.05; 95% UI, 0.05-0.07).

Commentary

Children's diabetes diagnoses and associated financial and social costs have become a

global public health crisis over the last 30 years [1,2]. However, incidence varies [1–5], but lack of reporting from individual countries limits current knowledge [5].

Despite the rise in diabetes cases, there has been a decline in related mortality and DALYs, as noted in other reports [2]. An inverse proportional relationship exists between SDI and mortality figures and DALYs. Countries with lower SDI have higher incidence rates and mortality and DALYs rates than those of higher SDI countries. Access to quality healthcare services is a potential factor in low SDI countries.

The highest mortality rates are seen in children below one year old, especially in countries with lower SDI [6], which warrants further investigation. Zhang et al.[1] suggest a higher diabetes-associated mortality in males under five years. In the 5-14 year age group, females are at higher risk of DALYs and death than males. Mortality increased in the 10-14 year age group (2.16%). Childhood diabetes of types 1 and 2 is increasing worldwide, but no precise classification systems exist [5]. GBD database limitations, lack of registries, and undiagnosed cases limited the study [1].

The study highlights the need to prevent and manage diabetes early on. Understanding the worldwide impact requires assessing risk factors and gathering country-specific data. The report also shows that childhood diabetes mortality was linked to environmental, occupational, and high-temperature risks in 2019. It is crucial to understand how temperature affects healthcare quality and relates to accessibility for diagnosis and treatment.

References

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Competing interests

None