Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Patient age must be incorporated into future paediatric injury severity scoring systems

In general, we agree with the Comment by William Sargent and colleagues, calling for development of paediatric-specific injury severity scoring systems.[1] Few injury scoring systems account for differences between paediatric and adult patients with trauma. However, one critical point the authors omitted is that the age of a paediatric patient with trauma is a key factor in not only the patterns of injury seen, but more importantly, how they physiologically compensate for that injury. Therefore, future paediatric-specific injury scoring systems must incorporate the child's age to accurately estimate injury severity.

Picture a mother and her 4-year-old child, struck by a motor vehicle as they cross a road. The mother might suffer a lower extremity injury and perhaps a head injury as she is struck due to the higher centre of mass in an adult. Conversely, the same mechanism of injury in a 4-year-old might yield pelvic or abdominal trauma because of a lower centre of gravity. The same blunt mechanism of injury results in very different injury patterns. Although an adolescent's physiological response to injury might resemble that of an adult's, the 4-year-old's compensatory physiological response differs significantly from that of an adult or adolescent.

The authors raise the concern that blast injuries are not readily assessed by traditional injury scoring systems. This mechanism of injury might reflect a substantial proportion of paediatric injuries in conflict zones, and once again, patient age might determine injury patterns.[1,2] Although there are common blast-induced injury patterns seen across ages (eg, pulmonary contusions), paediatric victims are more likely to also suffer head and burn injuries and to require operative intervention.[2] An injury metric incorporating mechanisms of injury such as blast injuries while also accounting for patient age could improve the triage and care of paediatric patients with trauma in conflict zones.

We propose that the ideal paediatric injury severity scoring system would incorporate anatomic and physiological data, mechanism of injury, and patient age. Our recently developed Trauma Composite Score incorporates these elements, as well as mechanism of injury and patient age.[3] Although the Trauma Composite Score outperforms Injury Severity Score and Shock Index Pediatric-Adjusted as an injury severity scoring system, the Trauma Composite Score has not been compared with other paediatric-specific injury scoring systems such as International Classification of Diseases (ICD) Critical Care Severity Score, the ICD General Anesthesia Severity Score, or the Pediatric Trauma Score.[4,5] It will be important to also compare these scoring systems in various settings, including conflict zones, to establish the most effective tools for triaging paediatric patients with trauma.

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Risk factors for COVID-19 mortality in hospitalised children and adolescents in Brazil

We read with great interest the work by Eduardo Oliveira and colleagues,[1] who used a multivariate survival analysis to estimate the risk factors for COVID-19 mortality among children and adolescents admitted to hospital in Brazil. The study has important implications to guide policy and improve care of individuals at increased risk of death. Here, we highlight some methodological concerns and limitations.

First, the clustering of different clinical disorders in a variable containing the sum of the number of comorbidities might be considered a poor index. For example, a comprehensive study of adult patients admitted to hospital with COVID-19 in Brazil[2] revealed that comorbidities such as obesity were significantly associated with poor prognosis, whereas asthma was reported to be inversely correlated with mortality risk. In this context, the differences in mortality might be confounded by the comorbidities in each age group. For example, obesity is more frequent in adolescents than in younger children,[3] and chromosomal abnormality or syndromes are more prevalent in infants than in older children.[4] Therefore, these findings indicate that comorbidities should have been treated separately in the multivariate analysis. In addition, the authors ignored the variable of other comorbidities, available in the Influenza Epidemiological

Surveillance Information System (SIVEP-GRIPE) dataset.

Second, the authors should have mentioned that the risk factors included in SIVEP-GRIPE were self-reported (provided by the patients themselves or their families). Therefore, the analysis could be biased by the patients' knowledge regarding their medical condition. Additionally, some variables could be incorrectly coded in the electronic records; for instance, we identified in the current SIVEP-GRIPE platform at least 14 puerperal individuals younger than 10 years, which was probably a data entry error (leading to outliers).

Finally, the author did not mention any effort to test the regression model assumptions (eg, non-linearity relationship and residual analysis). The inclusion of the variables in the final multivariate model was based on a univariate parameter, which could have suppressed other important variables that should be included in the model. There was also no internal validation or cross-validation. Therefore, we believe that our concerns should affect how the data presented by Oliveira and colleagues[1] should be interpreted.

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We read the Article by Eduardo Oliveira and colleagues[1] with great interest and believe the findings from this cohort study are important, given that they directly investigated the risk factors associated with COVID-19 in children and adolescents.

In their study, patients were roughly evenly distributed among the three age groups, and risk of death was increased in infants younger than age 2 years and in adolescents aged 12–19 years, relative to children aged 2–11 years. However, the authors did not provide a rationale for the age groupings. The lower age limit of adolescence is generally defined as 10 years,[2] including by the UN and WHO.[3] Additionally, a study of COVID-19 trends between March 1, 2020, and Dec 12, 2020, in young people aged 0–24 years in the USA found that more than 81% of patients were older than 10 years.[4] Therefore, we are interested to know how a different age stratification (<2 years, 2–9 years, and 10–19 years) would affect the study findings, and we believe that comparison between these age groups could provide further insight on the COVID-19 mortality risk in adolescents.

It is important to present the median and mean ages in the three age groups, given that this information will help readers understand how mortality risk is influenced by age within the broad age bands. Having data related to symptoms, comorbidities, admission to intensive care units, and death rate by age groups will also provide a basis for understanding the disparity in death risk among age groups.

The upper-age definition of adolescence has long posed a conundrum and varies across countries. Defining adolescence as age 10–24 years has been proposed to align more closely with adolescents' biological growth and social-role transitions,[2] and some studies on COVID-19 have included patients aged 0–24 years.[4] The study by Oliveira and colleagues[1] included patients younger than 20 years, and the inclusion of patients aged 21–24 years might provide a more comprehensive understanding of COVID-19 in adolescence.

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Authors' reply

We thank Jonas Carneiro Cruz and colleagues and Siyu Chen and Yong Shao for their interest in our study in *The Lancet Child & Adolescent Health*.[1] Here, we further discuss some findings and methodological aspects, specifically the question of the effect of age and comorbidities in the prognosis of paediatric COVID-19.

Cruz and colleagues raised concerns about grouping different clinical disorders in a single categorical variable. This issue is interesting from both clinical and methodological points of view. We tested various models that included the variable comorbidities, as dichotomous, categorical, or continuous, and also models including the main chronic pre-existing conditions as separate covariates. In this regard, we did not observe any superiority in clinical contribution among the different