

July 14th, 2020

Dr. Tedros Adhanom Ghebreyesus

Director-General
World Health Organization
Avenue Appia 20
Geneva, 1211

Dear Dr. Adhanom Ghebreyesus,

This correspondence is from the global G6PDD-COVID-19 Taskforce to highlight our concerns regarding G6PD deficiency, that affects more than **500 million** individuals worldwide, and its relevance during the current COVID-19 pandemic [1, 7]. The taskforce is made up of a passionate group of individuals, G6PD deficiency organizations, G6PD deficiency forum moderators, medical practitioners and scientists from around the world who are keen to make a difference towards improving the way the current pandemic is managed globally.

A [petition](#) has also been published on this topic, signed by an increasing number of individuals (5,586 as of Jul 14th, 2020), from all over the world, to draw the attention of the World Health Organization to this vulnerable population during the COVID-19 pandemic.

G6PD deficiency is the most common human enzyme deficiency, more prominent in descendants of African, Middle Eastern, Asian and Mediterranean regions [1]. A study of 2.3 million active-duty service members tested for G6PD deficiency from 2004-2018 in United States, showed that 11.2% of male and 4.7% of female African American service members tested positive for this deficiency. On extrapolation from the 2019 US census, this figure accounts for approximately 3.5 million African American individuals [2]. Given the lack of effective screening, the vast majority of G6PD deficient individuals are *unaware* of their status.

The G6PD enzyme is crucial in the response of red blood cells to oxidative stress. Individuals with G6PD deficiency are generally asymptomatic. However, they are triggered into acute hemolytic anemia post exposure to certain foods such as fava beans, and more importantly certain drugs and chemicals that induce oxidative stress. Viral and bacterial infections can also trigger hemolytic crisis. The identification and discontinuation of the precipitating agent is crucial in the management of hemolysis in patients with G6PD deficiency [3].

Currently, treatment for COVID-19 includes drugs such as Chloroquine (CQ) and Hydroxychloroquine (HCQ), known triggers for millions of deficient individuals globally [4, 5].

Acute hemolytic effects with HCQ treatment for COVID-19 in G6PD deficient individuals have been reported in 4 different clinical case reports, while many may remain unreported due to the lack of awareness of patient G6PD status - on the part of both the patient and their primary health provider [6, 7, 8, 9]

India has prohibited the use of these drugs for individuals that are G6PD deficient [10, 11], however continues to administer the drugs for the rest of the population. Other countries such as Italy, France, and Belgium have published guidelines on avoiding the use of these drugs for G6PD deficient individuals and vigilant monitoring of patients for hemolysis [3, 12, 13].

The scientific community, across the globe is also calling this out as a concern, with an urgent need for prompt action for this population in relation to COVID-19 medical treatment [14, 15, 16, 17, 18].

It is therefore important to examine the impact to this population before widespread generalized use of CQ/HCQ and other potentially harmful drugs as COVID-19 treatments uniformly across all populations around the world.

In addition, G6PD deficient cells have been found to be more vulnerable to human alphacoronavirus 229E infection in vitro, which correlated with elevated oxidant production and increased viral load [19]. This may suggest a similar mechanism with the novel SARS-Cov-2 virus. Monitoring for G6PD deficiency throughout COVID-19 clinical trials and studies may therefore also reveal COVID-19 etiology, and is not limited only to effects of drug response [20, 21, 22, 23, 24, 25].

We propose a 10-point agenda that we urge you to consider, to manage this pandemic much more effectively for this large population. They fall under the general categories of *COVID-19 MANAGEMENT* (Treatment / Drug selection / Monitoring adverse effects), *TESTING* and *DISEASE ETIOLOGY* (The identification of G6PD status in all upcoming research studies and clinical trials / Determining the role of G6PD in the pathogenesis of COVID-19).

COVID-19 MANAGEMENT

- 1) A clear warning on the occurrence of acute hemolytic anemia on the usage of Hydroxychloroquine (HCQ) and Chloroquine (CQ) for G6PD deficient individuals.
- 2) Detailed clinical guidance on monitoring for acute hemolytic anemia, identified by peripheral blood smears demonstrating bite cells and Heinz bodies, for those administered HCQ and CQ.
- 3) A review of other clinical trial treatment options that could potentially cause increased oxidative stress and therefore more harm for G6PD deficient individuals.
- 4) A clear warning to the public of the impact of these drugs for G6PD deficient individuals, to avoid their consumption as a prophylactic.
- 5) Clinical guidance on monitoring for acute hemolytic anemia *irrespective* of drug treatments; given the potential to go into hemolysis due to increased oxidative stress based on viral infections for ethnic communities prone to and individuals known to have G6PD deficiency.
- 6) Adequate precautionary and medical guidance during the pandemic, for G6PD deficient populations and ethnic communities with a high prevalence of G6PD deficiency.

TESTING

- 7) Proactive testing of G6PD deficient status, prioritized for heterogeneous communities of mixed ethnicities with a high prevalence of G6PD deficiency, to ensure effective treatment options, in the event of COVID-19.
- 8) Adoption of DNA based screening as the gold standard for identifying known G6PD deficient variants. Other cheaper and easily available tests such as enzymatic and cytochemical assays are prone to errors. Monitoring enzyme levels while in crisis, can possibly lead to a false negative for G6PD deficiency.
- 9) Targeted *DNA based screening* of G6PD status among study participants, before clinical trials. This will lead to important insights into the disease pathology and treatment for these individuals.

As a global community, proactive testing for G6PD Deficiency is crucial for advancements in medicine and science, and may avoid significant downstream costs.

DISEASE ETIOLOGY

- 10) An investigation into the potential effects of G6PD deficiency in COVID-19, including the effect on red blood cells and other tissues which may help with understanding the disease more effectively. [26, 27]

We strongly believe that managing the needs of an estimated 500 million strong G6PD deficient population, may avoid unnecessary drug induced complications and/or lethality. It will allow for a much more effective management of the pandemic globally. We urge you to show prompt attention and action toward this vulnerable and overlooked group of individuals.

Yours Sincerely,

Signed by the Global G6PDD-COVID-19 Taskforce

(From A-Z: Name, Title, Affiliation, and Location)

1. *Dr. Carmela Iosco, PhD in Biochemistry, Favismo-G6PD Deficiency group moderator (Italy)*
2. *Dr. Daisy Lara, Doctorate in Nurse Practice (DNP), Nurse Practitioner , President National Association Hispanic Nurses Philadelphia Chapter (USA)*
3. *Frank Kujawa, Associate Professor, Chemistry Dept., University of Central Florida, (USA)*
4. *Dr. Hufereh Darbary, PhD in Molecular & Cellular biology, SUNY, Buffalo, NY; Postdoc from Columbia University, NY; G6PD deficient family members; Petition Co-creator (India)*
5. *Ibrahima Gueye, Ph.D. Medicine, Emergency Medicine and Disaster Specialist, Master 1 Bioinformatic and Biomathematic (Senegal)*

6. *Keely Harris, President / Founder of g6pd Deficiency Foundation, Inc. (501C-3) (g6pdDF.org) (USA)*
7. *Dr. Kola Akindele, Health Care Professional (Spinal Health Care Practitioner) (UK)*
8. *Niloofer Darbary, Director, Transformation Management (Fortune 500 company), Petition Creator (USA)*
9. *Terri Falbo, Non-Physician Member of Physicians for a National Health Program (USA)*
10. *Dr. Tivani Mashamba-Thompson, Medical Scientist (Molecular Biology), PhD (Public Health), Professor of Diagnostics Research at University of Limpopo (South Africa)*
11. *Roman Gurinovich, Founder sci.AI (Belarus)*
12. *Val Hartmann, Technical Translator B.A. (Literature), G6PDD and Ehlers Danlos syndrome advocate (France)*
13. *Virginia Burke, Activist, Volunteer, Jamaica W.I. (Jamaica)*
14. *Dr. Yuliya Buinitskaya, MD, Biomedical analyst at sci.AI (Belarus)*

Details of the Petition: [Need more awareness and research G6PD Deficiency and its role in the Corona Virus Pandemic](#)

Please see the attachment for the list of petition members and their comments.

Sources:

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