

## OPINION

## Exploring medical terminology inexpediencies: Tripledemic vs. triple epidemic

IOANNIS N. MAMMAS<sup>1-3</sup>, SIMON B. DRYSDALE<sup>4,5</sup>, MARIA THEODORIDOU<sup>2</sup> and DEMETRIOS A. SPANDIDOS<sup>1</sup>

<sup>1</sup>Department of Clinical Virology, School of Medicine, University of Crete, 71003 Heraklion; <sup>2</sup>First Department of Paediatrics, School of Medicine, University of Athens, 11527 Athens; <sup>3</sup>Paediatric Clinic, Aliveri, 34500 Island of Euboea, Greece; <sup>4</sup>Centre for Neonatal and Paediatric Infection, St. George's, University of London, London SW17 0RE; <sup>5</sup>Department of Paediatrics, St. George's University Hospitals NHS Foundation Trust, London SW17 0QT, UK

Received May 9, 2023; Accepted May 15, 2023

DOI: 10.3892/etm.2023.12033

*epidemics, the third book (ἐπιδημιῶν τὸ τρίτον)*

Hippocrates (1)

**Abstract.** Accurate and consistent medical terminology has a fundamental value in medicine. It enables medical students to understand the meaning of each term, medical physicians to communicate with each other, and it also enables science to adopt a logical language of high-level understanding and scientific regularity. Medical terminology inexpediencies caused by the adoption of etymologically illogical or linguistically false terms lead to misunderstanding and confusion among clinicians. The medical terms epidemic and pandemic are as old as Hippocrates and Sophocles, respectively. The present article evaluates the new medical terms tripledemic and triple epidemic, which were introduced during the recent COVID-19 pandemic.

The medical term 'epidemic' is as old as Hippocrates. Born on the island of Kos in the Aegean Sea, Hippocrates, the father of medicine, used the Greek word 'ἐπιδημία (epidemia)', coming from the Greek prefix 'ἐπι- (epi-)' meaning upon and the Greek word 'δῆμος (demos)' meaning the public; this word was included at the title of seven of his books on epidemics (1,2). Similarly, the word 'pandemic' is as old as *Antigone*, the ancient Greek tragedy of the 441 BC, written by Sophocles in the ancient city-state of Athens (3). The Greek word 'πάνδημος (pandemos)' coming from the Greek prefix 'παν- (pan-)' meaning all and the Greek word 'δῆμος (demos)'

meaning the public was used by Sophocles to describe something that belongs to the public, to all the people. Both Greek words, 'ἐπιδημία (epidemia)' and 'πανδημία (pandemia)' remained unaltered throughout history and are still in use in the Greek language.

The medical term 'triple epidemic' describes an epidemic, which is caused by the co-existence of three different agents. To date, it has been used in the PubMed database to describe the triple epidemic of obesity, diabetes and hypertension (4), the triple overlap of intimate partner violence, human immunodeficiency virus (HIV) infection and mental health issues in Africa (5), the severe Dengue epidemic in Brazil complicated by the introduction of the Zika and Chikungunya viruses since 2014 (6,7) and the triple epidemic of silicosis, tuberculosis and HIV infection in South Africa and Zimbabwe (8,9). Recently, this term was used by the medical journalist, Janice Hopkins Tanne, in her article published in *BMJ* on November 7, 2022 to describe the expected triple epidemic of influenza, respiratory syncytial virus (RSV) in young children and COVID-19 in the US (10). The equivalent Greek term for 'triple epidemic' is 'τριπλή επιδημία (triple epidemia)'. Similarly, compared to the English term, this is an accurate, well descriptive, two-word term describing an epidemic, which is caused by three different causes.

On October 23, 2022, an article written by the medical journalist, Apoorva Mandavilli for *The New York Times* (11), used in its title the word 'triple epidemic' describing the expected increase of cases infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), influenza viruses and respiratory syncytial virus (RSV) during the forthcoming 2022-2023 winter period in the USA. The aforementioned article hosted the expert views by Professor Alpna Waghmare (Fred Hutchinson Cancer Center, Seattle Children's Hospital, Seattle, WA, USA), Professor Andrew Read (Penn State University, State College, PA, USA), Dr Diego Hijano (St. Jude Children's Research Hospital, Memphis, TN, USA) and Professor Aubree Gordon (University of Michigan, Ann

---

*Correspondence to:* Professor Demetrios A. Spandidos, Department of Clinical Virology, School of Medicine, University of Crete, Voutes, 71003 Heraklion, Greece  
E-mail: spandidos@spandidos.gr

**Key words:** tripledemic, triple epidemic, medical terminology, Hippocrates, paediatric virology

Arbor, MI, USA). Three days later, on October 25, 2022, another medical journalist, Kathleen Doheny, in the title of her article published at WebMD Health News (12) also used the word ‘tripledeemic’ in order to describe the expected pandemic due to the same three different pathogens, SARS-CoV-2, influenza viruses and RSV. Her article hosted the expert views by Professor Justin Lessler (University of North Carolina, Chapel Hill, NC, USA), Professor Timothy Brewer (University of California, Los Angeles, CA, USA), Professor Dean Blumberg (University of California Davis Health, Sacramento, CA, USA), Dr Elizabeth Murray (University of Rochester Medical Center, Rochester, NY, USA) and Dr Mandy De Vries (American Association for Respiratory Care, Irving, TX, USA). Notably, despite the word ‘tripledeemic’ being included in the title of both articles, it was not used in any of the recorded views of the aforementioned experts, which were included in these articles. During the following period, both articles were reproduced by mass media and on the internet, worldwide. In Greece, the article by Kathleen Doheny was summarized in Greek by Psaltopoulou *et al* (13) (University of Athens School of Medicine) and the term ‘tripledeemic’ was translated to ‘τριδημία (tridemia)’. During the following days, the word ‘τριδημία (tridemia)’ was used excessively in the Greek mass media and on the internet - including the valid and reliable Greek websites <https://www.ygeiamou.gr> and <https://www.in.gr>.

However, do these new words, the English word ‘tripledeemic’ and its Greek translation ‘τριδημία (tridemia)’, really have any meaning? The absence of the prefixes ‘epi-’, or ‘pan-’ from the one-word English word ‘tripledeemic’ markedly changes its potential dynamic to describe precisely the correct medical term ‘triple epidemic’. According to Professor Timothy Brewer, Professor of Medicine and Epidemics at the University of California (Los Angeles, CA, USA), ‘tripledeemic’ is a non-sense word (Brewer T: personal communication).

In the Greek language, the word ‘τριδημία (tridemia)’ is pronounced in the same manner as the existing Greek medical term ‘τριδυμία (tridyμία)’, which is used to describe ‘trigeminy’, a heart disorder characterized by the presence of ventricular ectopy (14). In this word, the prefix ‘τρι- (tri-)’ meaning three, triple, is used to describe the specific three heart-beats pattern of the occurring premature ventricular contractions. The second part of the word, ‘-δύμο (-dymo)’, originates from the Greek word ‘δύο (dyo)’, meaning two and is different from the Greek word ‘δήμος (demos)’, meaning the public. Given that these Greek words, ‘τριδημία (tridemia)’ and ‘τριδυμία (tridyμία)’, have the same pronunciation, the potential future adoption of the word ‘τριδημία (tridemia)’ by the medical terminology would definitely cause misunderstanding and confusion. Moreover, in the Greek language, the medical term ‘τριδυμο (tridyμο)’ is used for the ‘trigeminal nerve’, also known as the fifth cranial nerve. This term, which includes the same prefix ‘τρι- (tri-)’ meaning three, triple, is used to demonstrate the three major branches (ophthalmic, maxillary and mandibular) of this nerve. The same word, ‘τριδυμο (tridyμο)’, is used as a noun to describe a ‘triplet’ neonate, while the adjective ‘τριδυμος,-η,-ο (tridyμος,-i,-o)’ is used to describe a triplet pregnancy - ‘τριδυμη κύηση (tridyμι kyisi)’. According to Professor George Babiniotis, Professor

of Linguistics and former Rector at the University of Athens (Athens, Greece), the correct translation of ‘tripledeemic’ to the Greek language would be ‘τριπλοδημία (triplodemia)’ and not ‘τριδημία (tridemia)’ (Babiniotis G: personal communication). However, since the English word ‘tripledeemic’ is a non-sense word, then its Greek translations are also expected to be non-sense words; the words ‘τριπλοδημία (triplodemia)’ and ‘τριδημία (tridemia)’ are non-sense words.

Accurate and consistent medical terminology has a fundamental value in medicine. It enables medical students to understand the meaning of each term, medical physicians to communicate with each other and our science to adopt a logical language of high-level understanding and scientific regularity (15). Medical terminology inexpediciencies caused by the adoption of etymologically illogical or linguistically false terms lead to misunderstanding and confusion among clinicians. Unfortunately, the words ‘tripledeemic’ in English, ‘τριπλοδημία (triplodemia)’ and ‘τριδημία (tridemia)’ in Greek are non-sense words and should not replace the existing two-word medical terms ‘triple epidemic’ and ‘τριπλή επιδημία (triple epidemia)’, respectively.

### Acknowledgements

The present article is published in the context of the 8th Workshop of Paediatric Virology organized virtually on October 20, 2022, by the Institute of Paediatric Virology (IPV; <https://paediatricvirology.org>) based on the island of Euboea (Greece), under the auspices of the World Academy of Sciences (WAS) and the support of the Department of Clinical Virology of the University of Crete School of Medicine and the First Department of Paediatrics of the University of Athens School of Medicine. The authors would like to thank Professor Timothy Brewer, Professor of Medicine and Epidemics at the University of California (Los Angeles, CA, USA) and Professor George Babiniotis, Emeritus Professor of Hellenic Linguistics and former Rector of the University of Athens (Athens, Greece) for the personal communications and for their valuable comments.

### Funding

No funding was received.

### Availability of data and materials

Not applicable.

### Authors' contributions

All authors contributed equally to the conception and design of this manuscript, wrote the original draft, edited and critically revised the manuscript, read and approved the final manuscript. All authors have read and approved the final manuscript. Data authentication is not applicable.

### Ethics approval and consent to participate

Not applicable.

## Patient consent for publication

Not applicable.

## Competing interests

DAS is the Editor-in-Chief for the journal, but had no personal involvement in the reviewing process, or any influence in terms of adjudicating on the final decision, for this article. The authors declare that they have no competing interests.

## References

- Hippocrates: Epidemics I-III. In: Hippocrates, Apanta 13. Cactus Editions, Athens, 1993 (In Greek).
- Hippocrates: Epidemics IV-VII. In Hippocrates, Apanta 14. Cactus Editions, Athens, 1993 (In Greek).
- Sophocles: Antigone. In: Sophocles, Antigone. Cactus Editions, Athens, 1994 (In Greek).
- Commodore-Mensah Y, Himmelfarb CD, Agyemang C and Sumner AE: Cardiometabolic Health in African Immigrants to the United States: A Call to Re-examine Research on African-descent populations. *Ethn Dis* 25: 373-380, 2015.
- Mitchell J, Wight M, Heerden AV and RoCHAT TJ: Intimate partner violence, HIV, and mental health: a triple epidemic of global proportions. *Int Rev Psychiatry* 28: 452-463, 2016.
- Carvalho FD and Moreira LA: Why is *Aedes aegypti* Linnaeus so Successful as a Species? *Neotrop Entomol* 46: 243-255, 2017.
- Freitas LP, Cruz OG, Lowe R and Sá Carvalho M: Space-time dynamics of a triple epidemic: dengue, chikungunya and Zika clusters in the city of Rio de Janeiro. *Proc Biol Sci* 286: 20191867, 2019.
- Bloch K, Johnson LF, Nkosi M and Ehrlich R: Precarious transition: a mortality study of South African ex-miners. *BMC Public Health* 18: 862, 2018.
- Moyo D, Ncube R, Kavenga F, Chikwava L, Mapuranga T, Chiboyiwa N, Chimunhu C, Mudzingwa F, Muzvidziwa O, Ncube P, *et al*: The Triple Burden of Tuberculosis, Human Immunodeficiency Virus and Silicosis among Artisanal and Small-Scale Miners in Zimbabwe. *Int J Environ Res Public Health* 19: 13822, 2022.
- Tanne JH: US faces triple epidemic of flu, RSV, and covid. *BMJ* 379: o2681, 2022.
- Mandavilli AA: 'triple epidemic'? Flu, R.S.V. and covid may collide this winter, experts say. *New York Times*, 2022. [www.nytimes.com/2022/10/23/health/flu-covid-risk.html](http://www.nytimes.com/2022/10/23/health/flu-covid-risk.html). Assessed December 20, 2022.
- Doheny K: Is It Flu, RSV or COVID? Experts Fear the 'Triple Epidemic'. *WebMD Health News*, 2022. <https://www.webmd.com/cold-and-flu/news/20221025/is-it-flu-rsv-or-covid-experts-fear-the-triple-epidemic>. Assessed December 20, 2022.
- Psaltopoulou T, Syrigou RE, Ntanashw I, Malandrakis P and Demopoulos T: Is It Flu, RSV or COVID? Experts Fear the 'Triple Epidemic'. HUB University of Athens, 2022 (In Greek). <https://hub.uoa.gr/is-it-flu-rsv-or-covid-experts-fear-triple-epidemic/>. Assessed December 20, 2022.
- Mond HG, Haqqani HM: The Electrocardiographic Footprints of Ventricular Ectopy. *Heart Lung Circ* 29: 988-999, 2020.
- Mammas IN, Drysdale SB, Theodoridou M, Greenough A and Spandidos DA: Paediatric virology and medical terminology. *Exp Ther Med* 20: 301, 2020.



Copyright © 2023 Mammas et al. This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) License.