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# Journal Pre-proof

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PII: S2352-5525(22)00031-7

DOI: <https://doi.org/doi:10.1016/j.jemep.2022.100782>

Reference: JEMEP 100782

To appear in: *Ethics, Medicine and Public Health*

Received Date: 11 March 2022

Please cite this article as: Evangelou K, Rozani S, Pafiti M, Syrigos N, Syphilis transmission: exacerbated due to the COVID-19 pandemic?, *Ethics, Medicine and Public Health* (2022), doi: <https://doi.org/10.1016/j.jemep.2022.100782>

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**Syphilis transmission: exacerbated due to the COVID-19 pandemic?**

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**Keywords:** Coronavirus; Pandemic; STDs; Syphilis;

**Acknowledgement:** Not applicable.

**Conflict of interest:** The authors declare no conflicts of interest with regard to this article.

Dear Editor,

We read a recently published article entitled “The Epidemic of Sexually Transmitted Diseases Under the Influence of Covid-19 in China” and were pleased by the reports of significant decline in STD cases during the Covid-19 pandemic in China. According to the Bureau for Disease Control and Prevention of China National Health Commission, actual syphilis case numbers were less than half of those predicted in February 2020 and were lower in mid-pandemic, compared to pre-pandemic thresholds [1]. While the article reviews similar declines in syphilis incidence worldwide, we hesitate to be complacent as supplementary data collected from PubMed indicate a contrary infection exacerbation in various locations around the world. On this basis, it is acknowledged that the introduction of novel and effective prevention measures is necessary for effective transmission restraint.

Syphilis is a disease that is primarily transmitted sexually; it is far more prevalent in individuals who engage in unprotected sexual intercourse and/or have multiple partners, HIV-positive and men having sex with men, though it can also be transmitted non-sexually (e.g., placental circulation) [2].

Although social restrictions enforced during the pandemic had allegedly limited sexual partner contacts (fewer entertainment venue and bar gatherings, public transportation confinement and mandatory stay-at-home policies) [1], and it would have been resultantly expected to observe a remarkable universal decline in STD incidence, data collected from various countries and summarized in (Table I) reveals that the current situation is in reality far divergent.

This notable increase in the number of patients with transmissible syphilis indicates that social contact restrictions and lifestyle changes imposed in response to the Covid-19 pandemic have not restrained disease transmission, probably due to the public’s in compliance with governmental protective measures implemented [9]. Internet accessibility and technological acclimatization, combined with an increase in domiciliary and leisure time, have impelled individuals to an online romantic partner pursuit, as smartphone dating applications seem to have been used unrelentingly during isolation periods [10]. Besides, the fear of contracting SARS-CoV-2 in addition to continuous restrictive lockdowns have inevitably downscaled the number of individuals seeking medical attention in a Covid-19-prioritised era, partially justifying possible incidence reductions [1].

To combat the rise in syphilis infections, effective preventive measures must be implemented. Governments should reinforce sexual partner tracing, early notification, and treatment systems, for patient reinfection prevention and exposed patient care provision. Adherence to official preventive guidelines and appropriate education are advised, including proper condom use especially among MSM, understanding the need for screening, recognising early manifestation signs (e.g., rashes, chancre), treating ulcers prior to laboratory confirmation and assessing individual epidemiological risk status. Organizing campaigns providing mental support to the public during isolation periods would be helpful, to avoid sexual activity flare-ups following restriction removal. Free pharmacological care for infected or possibly infected individuals is essential for early treatment and interruption of the bacterial transmission chain. Lastly but most importantly, STD monitoring and surveillance systems should reclaim their former priority; syphilis programmatic functions and case reporting have diminished as of Covid-19 being prioritized, so testing and medical attention towards infected individuals must be preserved at pre-pandemic levels.

Covid-19 pandemic afflicting STD surveillance is an indisputable fact. What has emerged, however, is a phenomenal increase in syphilis transmission among patients, mentally and socially stricken by unprecedented lifestyle changes. Medical communities owe to spread awareness about infection outbreaks in various parts around the world and all necessary measures be enforced to prevent further syphilis transmission, that has been deservedly described as a “modern epidemic” [10].

**References:**

- [1] Yan X, Wang X, Zhang X, Wang L, Zhang B, Jia Z. The epidemic of sexually transmitted diseases under the influence of Covid-19 in China. *Front Public Health* 2021; 9: 737817. Published 2021 Dec 16.
- [2] Tudor ME, Al Aboud AM, Gossman W. Syphilis. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; October 18, 2021.
- [3] Serwin AB, Kaczyńska J, Flisiak I. The impact of the Covid-19 pandemic on sexually transmitted infections services - experience from Białystok, Poland. *Przegl Epidemiol* 2021; 75: 151-8.
- [4] Braunstein SL, Slutsker JS, Lazar R, Shah D, Hennessy RR, Chen SX, et al. Epidemiology of reported HIV and other sexually transmitted infections during the Covid-19 Pandemic, New York City. *J Infect Dis* 2021; 224: 798-803.
- [5] Sacchelli L, Viviani F, Orioni G, Rucci P, Rosa S, Lanzoni A, et al. Sexually transmitted infections during the Covid-19 outbreak: comparison of patients referring to the service of sexually transmitted diseases during the sanitary emergency with those referring during the common practice. *J Eur Acad Dermatol Venereol* 2020; 34: e553-6.
- [6] Rodríguez I, Hernández Y. Sexually transmitted diseases during the Covid-19 pandemic: A focus on syphilis and gonorrhoea in Cuba. *Public Health Pract (Oxf)* 2021; 2: 100072.
- [7] Bížová B, Rob F, Třešňák Hercogová J. Increase of early syphilis cases during the Covid-19 pandemic in the Czech Republic [published online ahead of print, 2021 May 26]. *Sex Transm Infect* 2021;sextrans-2021-055098.
- [8] Latini A, Magri F, Donà MG, Giuliani M, Cristaudo A, Zaccarelli M. Is Covid-19 affecting the epidemiology of STIs? The experience of syphilis in Rome. *Sex Transm Infect* 2021; 97: 78.
- [9] Bonato F, Ferrel C, Satta R, Rongioletti F, Atzori L. Syphilis and the Covid-19 pandemic: Did the lockdown stop risky sexual behavior? *Clin Dermatol* 2021; 39: 710-3.
- [10] Ghanem KG, Ram S, Rice PA. The modern epidemic of syphilis. *N Engl J Med* 2020; 382: 845-54.

Table I: A summary of the main findings from different epidemiological studies conducted in six different places around the world. A common notable increase in syphilis cases either in absolute numbers or STD-total percentages is observed, validating the hypothesis that Covid-19 restriction measures have failed to effectively suppress syphilis transmission.

Place	Time periods compared	Main findings / observations
Dermatology and Venereology Department, University Outpatient Clinic Bialystok, Poland	A. January 2019 to February 2020	Increase in the proportion of syphilis cases among STDs (28% during A and 39.4% during B), frequency of early syphilis diagnosis (78,6% during A and 92,3% during B) and early asymptomatic syphilis (35,7% during A and 46,2% during B) [3]
	B. March 2020 to April 2021	
New York	A. July 2019	More positive syphilis cases reported via the ECLRS system to the Department of Health and Mental Hygiene (DOHMH) during A compared to those during B [4]
	B. July 2020	
Bologna	A. Before spring lockdown 2020	The percentage of syphilis cases among the total number of STD cases diagnosed had more than doubled (8.4% during A compared to 4.0% during B) [5]
	B. After spring lockdown 2020	
Cuba	A. June 2020	Syphilis incidence increased from 36.34 cases per 100,000 inhabitants per week during A to 39 cases per 100,000 inhabitants per week during B [6]
	B. September 2020	
Large Tertiary Care Centre, Prague	A. March 2016 to February 2020*	The total number of confirmed early syphilis cases in individuals during B has increased, after a slight initial decreased, compared to those during A [7]
	B. March 2020 to February 2021	
San Gallicano Dermatological Institute, Rome	A. January 2019 to April 2019	25 syphilis cases were reported during A compared to 68 during B; syphilis cases had doubled among HIV-positive and quadrupled among MSM individuals [8]
	B. January 2020 to April 2020	
*Monthly average during the corresponding 4-year period had been calculated.		