

for publication elsewhere. The manuscript is submitted with the knowledge and on behalf of the listed co-authors.

#### Data availability statement

All data are available (by contacting the Corresponding Author).

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## Trend of sexually transmitted infections during the Covid-19 age. What was the impact of the pandemic and the social distancing measures?

#### Editor

Covid-19 pandemic has led to social distancing guidelines and resource allocation with subsequent impairment of sexual health

services. The impact of such measures and the recommendations regarding changes of sexual behaviour is a matter of debate.<sup>1–3</sup> Published reports have shown conflicting results. Balestri *et al.*<sup>4</sup> suggested that the incidence of STI in 2020 was comparable to 2019. Bonato *et al.*<sup>5</sup> reported no differences in the syphilis cases with previous years, while Cusini *et al.*<sup>6</sup> reported a reduction in non-acute cases of STI and Latini *et al.*<sup>7</sup> showed a reduction in STI diagnoses.

For this reason, we have analysed the trends of seven sexually transmitted microorganisms in 5809 patients (4911 females and 898 males) from June 2014 to December 2020. Cervical swabs (4495), vaginal swabs (270), seminal fluids (584), gland swabs (39), urethral swabs (476), endometrial fluids (1565), oral swabs (26) and anal swabs (79) were analysed. In case of multiple different samples collected from the same patient in the same date, the results were pooled as a single one. In case of repetition of the testing procedure in other dates, the results were removed by a 2-year filter.

DNA was extracted by MagNa Pure Compact System (Roche Diagnostics GmbH, Mannheim, Germany). DNA amplification was performed by Anyplex™ II, STI-7 Detection Kit (Seegene, Inc. Seoul, Korea). The study was approved by the Ethical Committee of Policlinico of Bari.

The analysis of the yearly positivity rates was performed by either Poisson or Quasipoisson regression model. The *P*-values of the models were corrected by Benjamini and Hochberg's procedure. Plots were created by the package ggplot2 implemented in R and the calculations of all statistical tests were performed by the open-source environment R 4.0.3.<sup>8</sup> *P*-values < 0.05 were considered statistically significant.

The number of patients remained stable until 2018 and then decreased from 2019 (884) to 2020 (616). The percentage of female (84.86% in 2020 vs. 83.77% in 2014–2019) and male (16.23% in 2020 vs. 15.14% in 2014–2019) patients remained stable in 2020 when compared to the previous years (Chi-Squared *P*-value = 0.511). A slight increase of the median age of the patients (36.00 [Interquartile Range, IQR: 31.00–42.00] in 2020 vs. 35.00 [IQR: 30.00–41.00] in 2014–2019) has been also observed (Wilcoxon test *P*-value = 0.010). The prevalence rates for each microorganism were not statistically different in the year 2020 and the years 2014–2019 (Table 1). Some statistically significant differences between females and males have been also detected, but the effect size is likely negligible because of the small values of the Cramer's *V*. UP accounted for the most prevalent microorganism both in females and males followed by UU and MH.

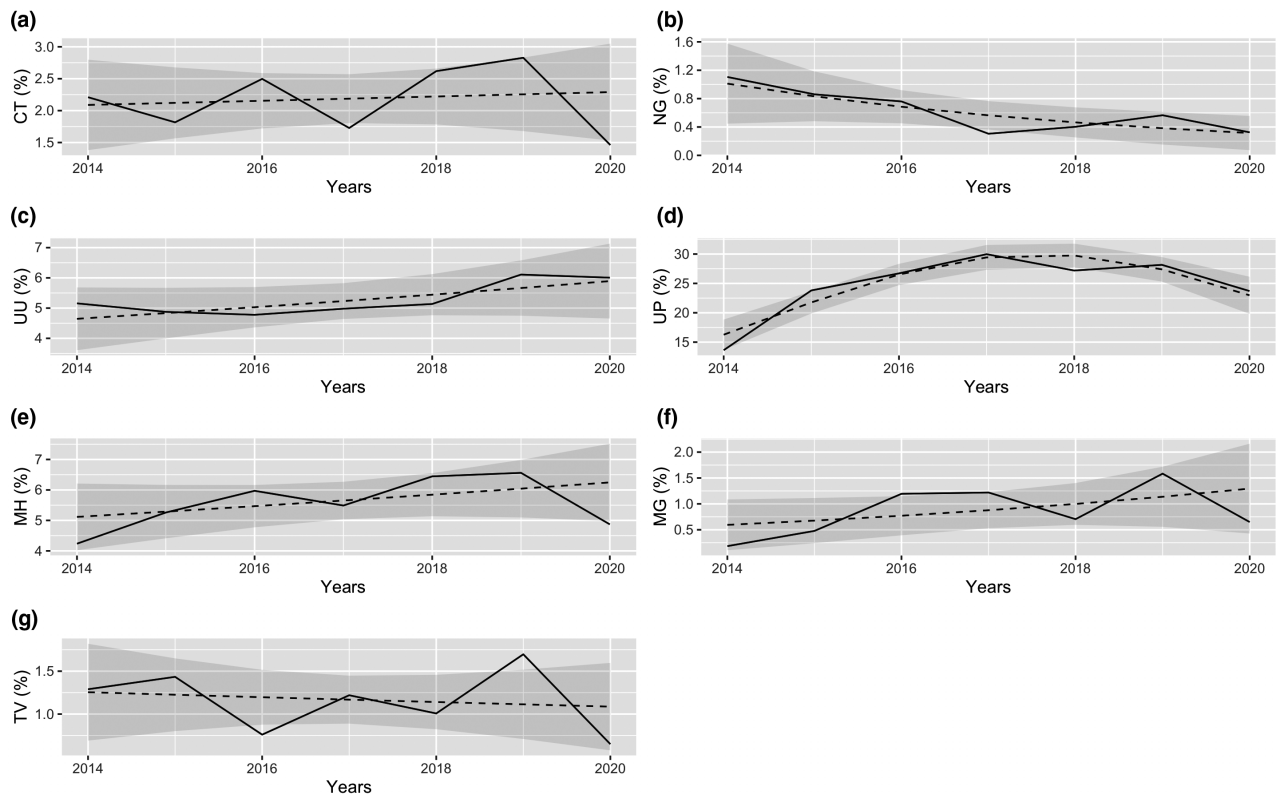
The results of the models to evaluate the yearly trends for each microorganism are reported in Fig. 1. After Benjamini and Hochberg's correction, the only *P*-values of the UP model were statistically significant. In particular, the UP positivity rates varied in a quite complex way increasing from 2014 to a maximum value in 2017 followed by a decreasing trend.

**Table 1** Evaluation of the prevalence for each microorganism by year (2014–2019 vs. 2020) and by sex

Micro-organism	Year		P-value	F vs. M		P-value-Cramer's V
	2014–2019	2020		F %	M %	
	Patients (%)	Patients (%)				
CT	122 (2.27%)	9 (1.46%)	0.243	1.77	4.49	<0.001–0.07
NG	34 (0.63%)	2 (0.32%)	0.578	0.14	3.18	<0.001–0.14
UU	277 (5.16%)	37 (6.03%)	0.413	5.50	3.83	0.046–0.03
UP	1383 (25.75%)	146 (23.78%)	0.312	28.55	8.87	<0.001–0.16
MH	309 (5.75%)	30 (4.89%)	0.430	6.33	1.97	<0.001–0.07
MG	50 (0.93%)	4 (0.65%)	0.653	0.69	2.08	<0.001–0.05
TV	66 (1.23%)	4 (0.65%)	0.317	1.20	0.99	0.738–0.01

P-values have been calculated by Chi-Squared test or by Fisher's exact test as appropriate. Effect size was evaluated by Cramer's V.

CT, *Chlamydia trachomatis*; MG, *Mycoplasma genitalium*; MH, *Mycoplasma hominis*; NG, *Neisseria gonorrhoeae*; TV, *Trichomonas vaginalis*; UP, *Ureaplasma parvum*; UU, *Ureaplasma urealyticum*.



**Figure 1** Yearly positivity rates (continuous lines) and evaluation of the temporal trend (dashed lines) with 95% confidence bands (grey shadows). P-values have been corrected by Benjamini and Hochberg's procedure and they were statistically significant in the UP model. (a) CT, *Chlamydia trachomatis*; (b) NG, *Neisseria gonorrhoeae*; (c) UU, *Ureaplasma urealyticum*; (d) UP, *Ureaplasma parvum*; (e) MH, *Mycoplasma hominis*; (f) MG, *Mycoplasma genitalium*; (g) TV, *Trichomonas vaginalis*.

Overall, the results suggest that the lockdown measures hindered access to the health care system, whereas they likely had a limited impact on sexual behaviours. In fact, the prevalence

rates have remained stable in 2020, without any reduction in sexually transmitted pathogens. Therefore, the risk of undiagnosed STIs has increased. Because of the decreased access to

the sexual health services, more intensive efforts will be needed in the future to reorganize the territorial network of the sexual health services to avoid the spread of STIs in the general population.

#### Conflicts of interest


None to declare.

#### Funding sources

None.

#### Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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## LETTERS TO THE EDITOR

### EczemaPartner – adapting a questionnaire to assess the impact of atopic dermatitis on partners of patients

Dear Editor,

Atopic dermatitis has an important impact on patients' quality of life, well-being and sleepiness. In addition, atopic dermatitis in children affects parents and caregivers.<sup>1</sup> In adults, the impact of the disease on the partner is poorly known. The FamilyPso questionnaire was developed to measure the partner's burden of psoriasis patients; however, it has not been adapted to other dermatological conditions.<sup>2</sup>

The objective of this work was to adapt and validate the FamilyPso for partners of patients with atopic dermatitis. We, therefore, renamed it EczemaPartner.

In the first step, we adapted the FamilyPso questionnaire by substituting the term 'Psoriasis' with 'Eczema'.

Adult patients with physician-confirmed atopic dermatitis completed an online questionnaire containing demographic information, the Dermatology Life Quality Index (DLQI), a stress VAS, the Well-being 12 (WBQ12) and a self-assessment of severity with the Patient-Oriented Eczema Measure (POEM).<sup>3–5</sup> Severity scores were then divided in three severity categories: mild, moderate and severe. The patient's partners fulfilled the EczemaPartner's questionnaire, as well as a stress VAS and the WBQ12. The online questionnaire was distributed by the French Eczema Patients Association (Fig.1).

We used confirmatory factor analysis to check if the structure that was originally found for psoriasis was valid for eczema using three criteria: Comparative Fit Index (CFI) above 0.9, Tucker-Lewis Index (TLI) above 0.9 and Root Mean Square Error of Approximation (RMSEA) under 0.08. We then used Cronbach's alpha to check for internal consistency aiming above 0.8. We checked for external validity using Spearman's correlation with each of the questionnaires' answers. Finally, we checked the score difference between different levels of severity. The EczemaPartner score is expressed as a percentage of its maximum. The higher the score, the higher the burden is on the partner.

We recruited 2411 patients, of which 1474 were in a relationship including 1266 spouses who completed the EczemaPartner. Mean patient age was 41.6 years (SD = 12.3) and 57.1% ( $n = 723$ ) were women, 44.2% ( $n = 560$ ) of them were mild, 44.3% ( $n = 561$ ) were moderate and 11.5% ( $n = 145$ ) were severe.

CFI score was 0.94, TLI score was 0.926 and RMSEA was 0.087 confirming a correct fit. Cronbach alpha was 0.96 IC 95% (0.96, 0.96) confirming an excellent internal consistency.