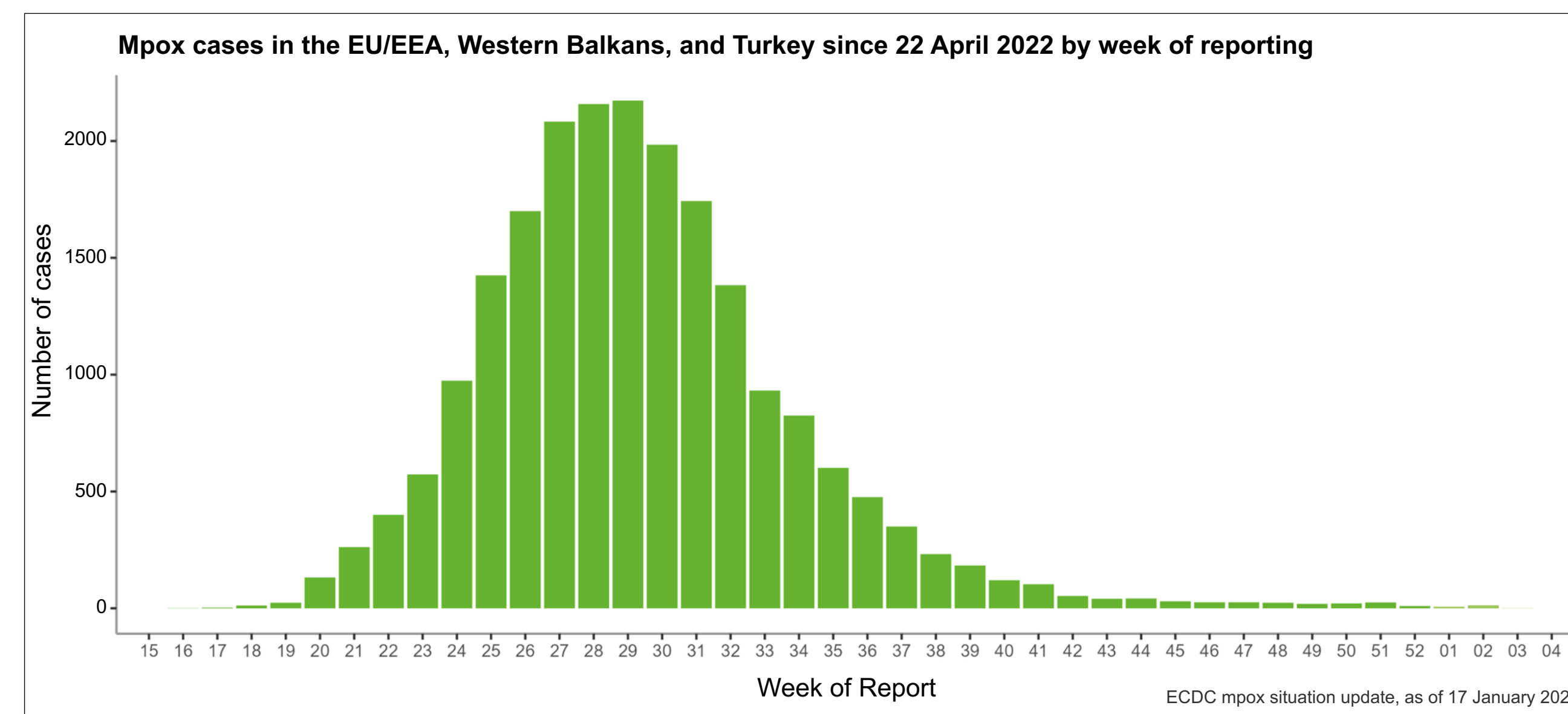


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## BACKGROUND

- Mpox (formerly known as monkeypox) is a zoonotic disease with endemic circulation in Africa that caused a sexually transmitted outbreak in non-endemic countries in 2022. As of 1 December, more than 80,000 cases have been identified across more than 100 countries.
- The Italian mpox outbreak involved essentially the Milan area (accounting for 410 out of the 954 confirmed Italian cases) starting from mid-June 2022.
- As observed in other European regions, new cases decreased significantly by October 2022, but no reasons for this epidemiologic trend have been established yet.



- Aim of the present study is to assess whether reduction in sexual activity and at-risk behaviors and/or vaccination might explain this epidemiologic trend in PrEP users attending a community-based service.

## METHODS

- Milano Checkpoint is a community-based service that provides assistance to the largest Italian cohort of PrEP users.
- At each visit clients fill self-administered questionnaires about their behavior in the previous 3 months.
- Subjects with a visit in July to November 2022 were selected: overall and condomless sexual intercourses, chemsex practices, and STIs incidence were compared to what registered in the previous visit.
- Descriptive statistics and non-parametric tests (Pearson's Chi-square, Mann-Whitney U, McNemar exact, and Wilcoxon signed-rank) were used to compare groups. Incidence rates of STIs and incidence rate ratio (IRR) were calculated. Logistic regression model was built to describe factors associated to change in sexual encounters.

We compared sexual behaviors of 435 PrEP users before and during mpox outbreak. The majority did not change the number of sexual acts during the outbreak: the overall number of sexual contacts arose from 11 (IQR 5-25) to 12 (IQR 5-26) in the epidemic months ( $p=0.070$ ). Condomless intercourses and use of chemsex did not change ( $p=0.459$  and  $p=0.766$ , respectively).

## RESULTS (1)

- The analysis selected 435 individuals.
- Smallpox vaccine was available from the second half of August and only a minority (26.2%) completed the full course.
- A reduction in the number of intercourses was observed in 174 (40.0%) PrEP users, but the majority did not change the number of sexual acts during the mpox outbreak.
- Chemsex use did not change as well ( $p=0.766$ ).

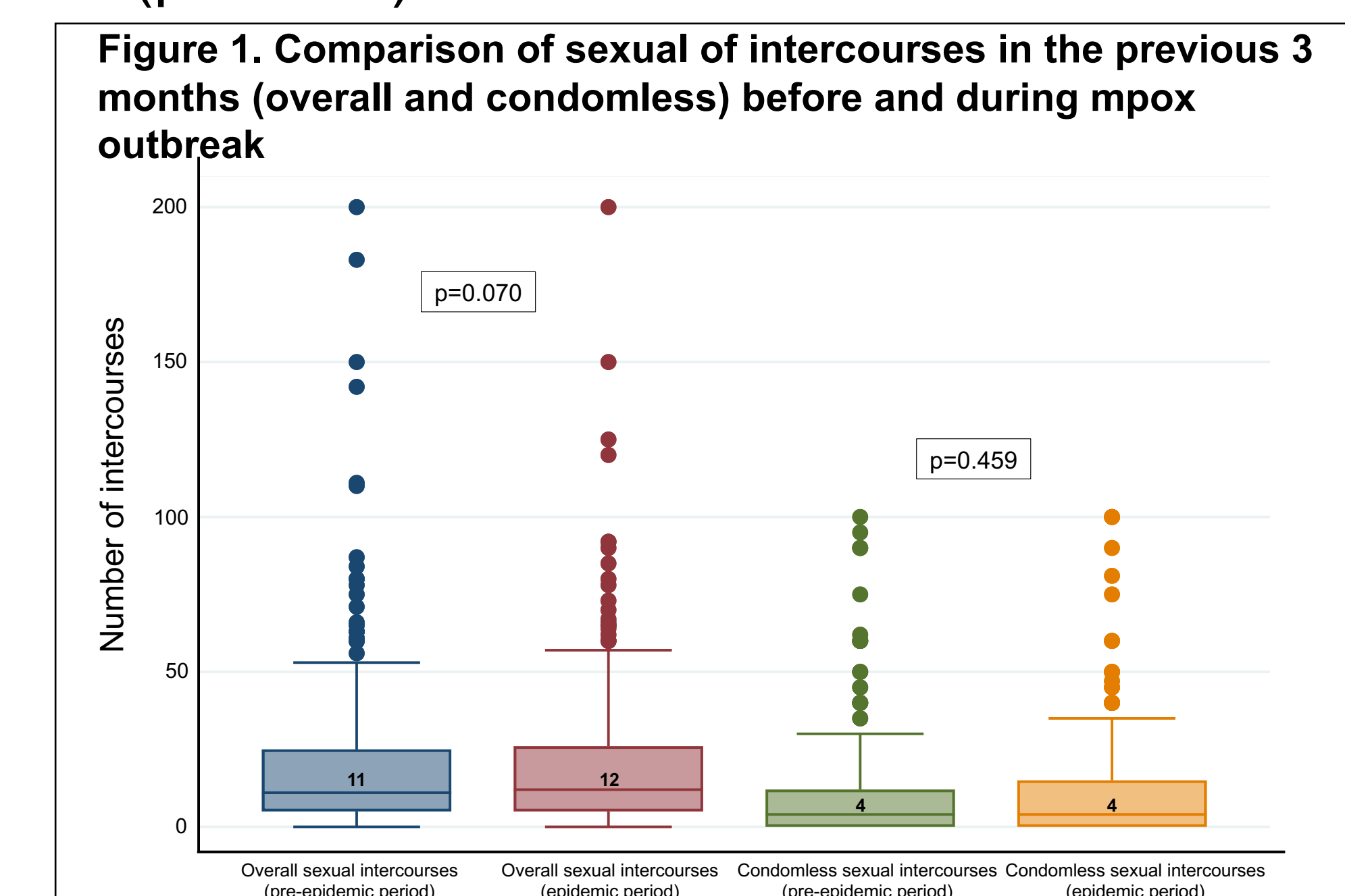


Table 1. Demographic, clinical, and behavioral features of study population.

	Overall (N=435)	Decreased sexual activity (N=174)	No change in sexual behavior (N=261)	p	
Age, years, median (IQR)	39 (33-46)	39 (34-46)	39 (32-47)	0.588	
Gender identity, n (%)	Males	423 (97.3)	168 (96.5)	255 (97.7)	0.034
	Females	8 (1.8)	2 (1.2)	6 (2.3)	
	TGW	4 (0.9)	4 (2.3)	--	
Length of PrEP, months, median (IQR)	14.7 (6.7-22.3)	16.1 (8.2-24.1)	13.9 (6.2-20.8)	0.021	
Level of education, n (%)	University degree	295 (68.0)	134 (77.0)	161 (61.9)	0.004
	Secondary School	120 (27.6)	34 (19.5)	86 (33.1)	
	Lower level	19 (4.4)	6 (3.5)	13 (5.0)	
Employed, n (%)	381 (87.8)	153 (87.9)	228 (87.7)	0.941	
Any STI in the previous 3 months, n (%)	38 (8.7)	15 (8.6)	23 (8.8)	0.545	
Number of sexual intercourses in the previous 3 months, median (IQR)	11 (5-25)	20 (10-33)	8 (3-16)	<0.001	
Number of condomless sexual intercourses in the previous 3 months, median (IQR)	4 (0-12)	5 (1-15)	3 (0-9)	0.003	
Number of condomless sexual intercourses in the previous 30 days, median (IQR)	2 (0-5)	3 (0-6)	1 (0-4)	0.008	
Use of any recreational drug in the previous 4 weeks, n (%)	169 (38.9)	70 (40.2)	99 (37.9)	0.630	
Chemsex, n (%)	Cocaine hydrochloride	42 (9.7)	12 (6.9)	30 (11.5)	0.112
	Cocaine freebase	16 (3.7)	5 (2.9)	11 (4.2)	0.467
	MDMA	27 (6.2)	10 (5.8)	17 (6.5)	0.746
	Crystal meth	14 (3.2)	1 (0.6)	13 (5.0)	0.011
	Mephedrone	29 (6.7)	9 (5.2)	20 (7.7)	0.308
	GHB/GBL	28 (6.4)	10 (5.8)	18 (6.9)	0.632
	THC	79 (18.2)	30 (17.2)	49 (18.8)	0.685
	Ketamine	21 (4.8)	5 (2.9)	16 (6.1)	0.121
	Popper	110 (25.3)	46 (26.4)	64 (24.5)	0.652
	MDPV	18 (4.1)	5 (2.9)	13 (5.0)	0.280
Vaccinated against smallpox, n (%)	One injection	45 (10.3)	21 (12.1)	24 (9.2)	0.856
	Two injections	93 (21.4)	34 (19.5)	59 (22.6)	

\* Data available only for 304 subjects.

## RESULTS (2)

- The incidence of STIs was 87.3 per 100 PYFU in the pre-epidemic versus 84.8 per 100 PYFU in the epidemic period (IRR 1.03, 95% CI 0.80-1.32,  $p=0.813$ ).
- Logistic regression analysis found that the only factor associated to reduction in sexual activity was a lower level of education (OR 0.69, 95% CI 0.54-0.86,  $p=0.001$ ). Sexual behavior was not affected by vaccination ( $p=0.593$ ) nor by a diagnosis of mpox ( $p=0.856$ ).

## CONCLUSIONS

- Multiple factors might have contributed to hinder the 2022 outbreak. The WHO declaration of Public Health Emergency of International Concern facilitated global awareness and education.
- The sudden decrease of new cases in non-endemic countries could be a consequence of low  $R_0$ , circulation mainly limited to the MSM community, and absence of asymptomatic carriers.
- Our data suggest that both reduction of risky sexual behavior and mpox vaccination do not explain the vanishing of epidemics.
- Saturation of high-risk groups or hesitancy to contact health facilities to avoid quarantining policies should be investigated.

## ADDITIONAL KEY INFORMATION

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- Additional Resources:** Milano Checkpoint received economic grants through Gilead Sciences' Global Monkeypox Outbreak Emergency Fund to conduct this research. Received support also by Relab Srl, Direction and Coordination for SD Biosensor Inc. in Italy.
- Acknowledgements:** the authors wish to thank all the volunteers who collaborate with Milano Checkpoint: Antonella Antonino, Aby Babu, Alessandra Bianchi, Enrico Caruso, Dominic De Cia, Vittorio Ferrara, Nicoletta Frattini, Antonella Foschi, Emilio Garavaglia, Giuseppe Lapadula, Monica Massa, Roberto Reossi, Federica Rossi, Alessandro Soria, Paolo Testoni, Pietro Vinti.