



PUBLIC HEALTH CENTER  
OF THE MOH OF UKRAINE

# **Monkeypox vaccine acceptance among male users of smartphone-based online dating apps in Ukraine (based on data from ECDC survey on MPX vaccine acceptance in Europe)**

Kyiv, 2023

## Disclaimer

In original paper<sup>1</sup> authors used Bayesian nested random intercept logistic regression model and 90% credible intervals (“Bayesian statistics”) to investigate monkeypox vaccination acceptance.

In this analysis of Ukrainian sample both approaches were applied: “more common” frequency statistics approach (binomial and multiple logistic regressions with 95% confidence intervals) and Bayesian statistics (as of respect for original paper and for comparison purposes).

1. <https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2022.27.42.2200757>

# **Monkeypox acceptance survey overview**

## ECDC survey on MPX vaccine acceptance in Europe

- Survey objective: Assess the acceptance of monkeypox vaccination among MSM through smartphone-based online dating apps
- Platform: Grindr and Hornet MSM dating apps
- Timeline: 30 July – 12 August 2022
- Scale: 41 country, 32 902 participants



# Ukrainian survey results

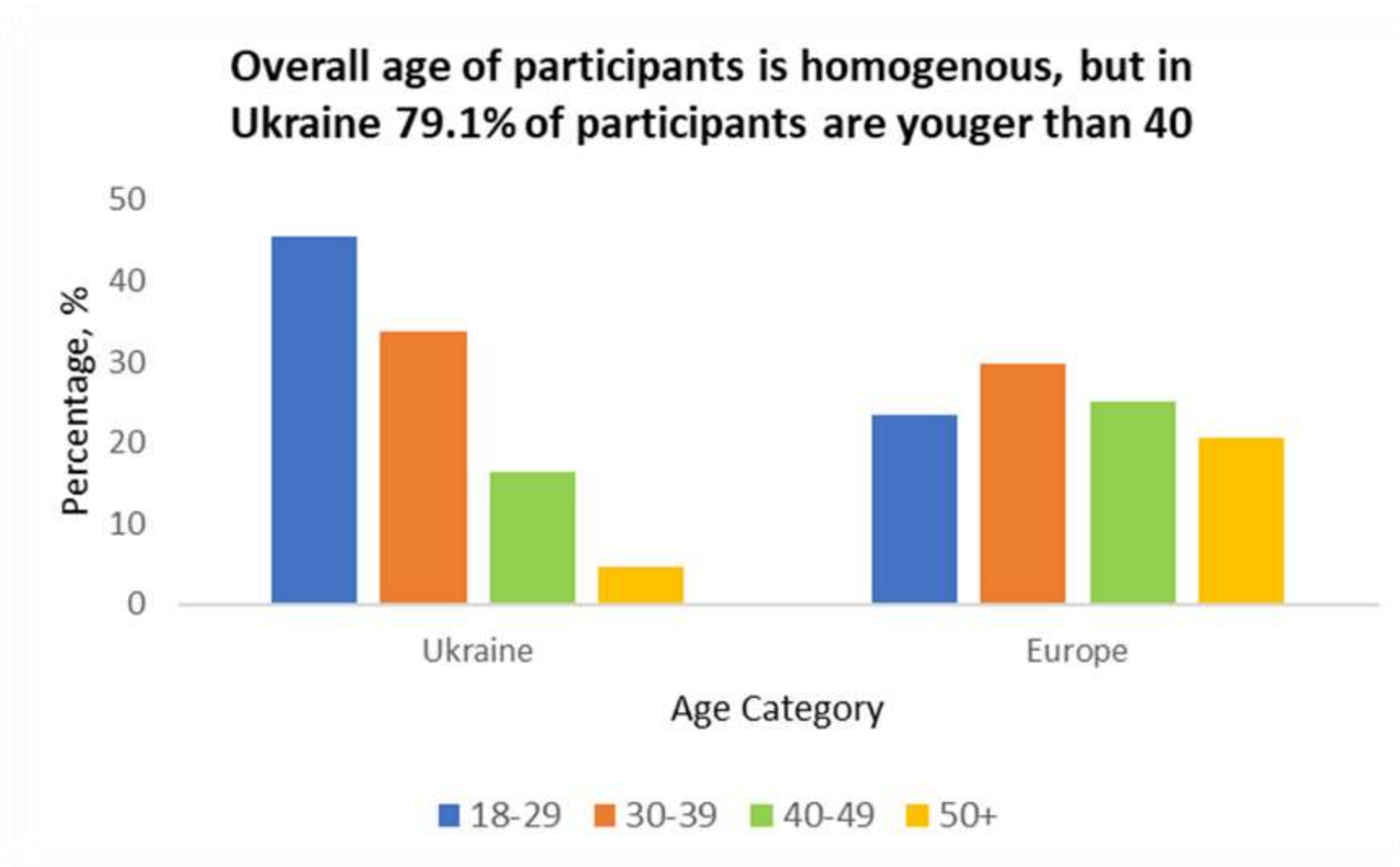


## Participants age: in Ukraine and from an overall sample

**Table 1. Age characteristics of participants in Ukraine and in the overall sample**

Characteristic	Ukraine, n	Ukraine, %	Overall Sample, n	Overall Sample, %
Median age in years (IQR)	31 (24-37)		38 (30-47)	
Age category:				
<i>18-29</i>	206	45.4	7724	23.5
<i>30-39</i>	153	33.7	9802	29.8
<i>40-49</i>	74	16.3	8549	25
<i>50+</i>	21	4.6	6827	20.7
<b>Total</b>	<b>454</b>	<b>100</b>	<b>32902</b>	<b>100</b>

**Figure 1. Age categories comparison in Ukraine and in overall sample**



**Table 2. Answers on question about vaccination acceptance in Ukraine (n = 454)**

<b>Characteristic</b>	<b>N = 454</b>
12. If the vaccine for monkeypox is offered to you, will you get vaccinated?	
1. I will get vaccinated	149 (33%)
2. Probably yes	143 (31%)
3. Not sure	87 (19%)
4. Probably not	41 (9.0%)
5. I won't get vaccinated	32 (7.0%)
6. Prefer not to answer	2 (0.4%)



## Vaccination acceptance in Ukraine

**Overall MPX vaccine acceptance<sup>1,2</sup> among participants in Ukraine is 64.32%, while in overall sample this indicator reached 82.0%.**

**Table 3. Vaccine acceptance in Ukraine, 95% CI/CrI**

<b>Method of calculation</b>	<b>95% CI/CrI<sup>1</sup>, Lower</b>	<b>95% CI/CrI<sup>1</sup>, Upper</b>
Frequency Statistics (CI, Wilson)	59.81	68.59
Bayesian Statistics (CrI)	59.87	68.66

<sup>1</sup>CI = Confidence Interval, CrI = Credible Interval

1. Those who answered “1. I will get vaccinated” or “2. Probably yes” on question “12. If the vaccine for monkeypox is offered to you, will you get vaccinated?” were considered those to accept vaccination
2. Those who answered “6. Prefer not to answer” were excluded from the calculation

**Table 4. Overall characteristics of participants' in Ukraine (n = 454)**

<b>Characteristic</b>	<b>Acceptance, N = 292</b>	<b>Hesitancy, N = 87</b>	<b>Refusal, N = 73</b>	<b>No answer, N = 2</b>
<b><i>Age category</i></b>				
18-29	136 (47%)	40 (46%)	29 (40%)	1 (50%)
30-39	96 (33%)	31 (36%)	26 (36%)	0 (0%)
40-49	47 (16%)	13 (15%)	13 (18%)	1 (50%)
50+	13 (4.5%)	3 (3.4%)	5 (6.8%)	0 (0%)
<b><i>HIV status</i></b>				
1. HIV-	224 (77%)	69 (79%)	58 (79%)	1 (50%)
2. HIV+ on cART	51 (17%)	12 (14%)	10 (14%)	0 (0%)
3. HIV+ not on cART	2 (0.7%)	0 (0%)	1 (1.4%)	0 (0%)
4. HIV status unknown	13 (4.5%)	5 (5.7%)	3 (4.1%)	1 (50%)
5. Prefer not to answer	2 (0.7%)	1 (1.1%)	1 (1.4%)	0 (0%)
<b><i>PrEP</i></b>				
1. PREP no	178 (61%)	60 (69%)	50 (68%)	1 (50%)
2. PREP yes	59 (20%)	15 (17%)	12 (16%)	1 (50%)
8. Missing	2 (0.7%)	0 (0%)	0 (0%)	0 (0%)
9. Unrequired	53 (18%)	12 (14%)	11 (15%)	0 (0%)
<b><i>STI diagnosis in last 12 months</i></b>				
1. STI no	261 (89%)	79 (91%)	67 (92%)	2 (100%)
2. STI yes	23 (7.9%)	7 (8.0%)	6 (8.2%)	0 (0%)
3. STI unknown	7 (2.4%)	0 (0%)	0 (0%)	0 (0%)
4. Prefer not to answer	1 (0.3%)	1 (1.1%)	0 (0%)	0 (0%)

**Table 4 Continued. Overall characteristics of participants' in Ukraine (n = 454)**

<b>Characteristic</b>	<b>Acceptance, N = 292</b>	<b>Hesitancy, N = 87</b>	<b>Refusal, N = 73</b>	<b>No answer, N = 2</b>
<b><i>Engaged in chemsex in last 3 months</i></b>				
1. Chemsex no	276 (95%)	87 (100%)	67 (92%)	2 (100%)
2. Chemsex yes	14 (4.8%)	0 (0%)	6 (8.2%)	0 (0%)
3. Prefer not to answer	2 (0.7%)	0 (0%)	0 (0%)	0 (0%)
<b><i>General perception of protection provided by vaccines</i></b>				
1. Strongly disagree	3 (1.0%)	0 (0%)	12 (16%)	1 (50%)
2. Slightly disagree	7 (2.4%)	4 (4.6%)	8 (11%)	0 (0%)
3. Neither disagree nor agree	8 (2.7%)	17 (20%)	17 (23%)	1 (50%)
4. Slightly agree	78 (27%)	31 (36%)	22 (30%)	0 (0%)
5. Strongly agree	194 (66%)	34 (39%)	10 (14%)	0 (0%)
6. I don' know	2 (0.7%)	1 (1.1%)	4 (5.5%)	0 (0%)
<b><i>Perception of MPX severity</i></b>				
1. Not severe	6 (2.1%)	5 (5.7%)	17 (23%)	0 (0%)
2. Slightly severe	22 (7.5%)	10 (11%)	7 (9.6%)	0 (0%)
3. Moderately severe	90 (31%)	27 (31%)	22 (30%)	0 (0%)
4. Severe	91 (31%)	15 (17%)	7 (9.6%)	0 (0%)
5. Very severe	31 (11%)	6 (6.9%)	6 (8.2%)	0 (0%)
6. I don' know	52 (18%)	24 (28%)	14 (19%)	2 (100%)

**Table 4 Continued. Overall characteristics of participants' in Ukraine (n = 454)**

<b>Characteristic</b>	<b>Acceptance, N = 292</b>	<b>Hesitancy, N = 87</b>	<b>Refusal, N = 73</b>	<b>No answer, N = 2</b>
<b><i>Know someone diagnosed with MPX<sup>1</sup></i></b>				
1. No	271 (93%)	82 (94%)	68 (93%)	2 (100%)
4. Yes, only someone I know	3 (1.0%)	2 (2.3%)	0 (0%)	0 (0%)
5. I don' know	18 (6.2%)	2 (2.3%)	5 (6.8%)	0 (0%)
6. Prefer not to answer	0 (0%)	1 (1.1%)	0 (0%)	0 (0%)
<b><i>Perception of personal risk of MPX infection</i></b>				
1. Not worried	45 (15%)	17 (20%)	36 (49%)	1 (50%)
2. Slightly worried	68 (23%)	27 (31%)	17 (23%)	0 (0%)
3. Moderately worried	67 (23%)	24 (28%)	11 (15%)	0 (0%)
4. Worried	72 (25%)	6 (6.9%)	4 (5.5%)	0 (0%)
5. Very worried	33 (11%)	3 (3.4%)	2 (2.7%)	0 (0%)
6. I don' know	6 (2.1%)	10 (11%)	3 (4.1%)	1 (50%)
8. Missing	1 (0.3%)	0 (0%)	0 (0%)	0 (0%)
<b><i>Worries about being treated differently</i></b>				
1. No	126 (43%)	47 (54%)	42 (58%)	0 (0%)
2. Yes	76 (26%)	17 (20%)	14 (19%)	0 (0%)
3. I don' know	89 (30%)	22 (25%)	17 (23%)	0 (0%)
4. Prefer not to answer	1 (0.3%)	1 (1.1%)	0 (0%)	2 (100%)

*1. No respondent in Ukraine answered that they had been diagnosed with monkeypox*

# **Factors associated with MPX vaccine acceptance in Ukraine**





**Table 5. MPX vaccine acceptance in Ukraine: Logistic Regression<sup>1</sup>**

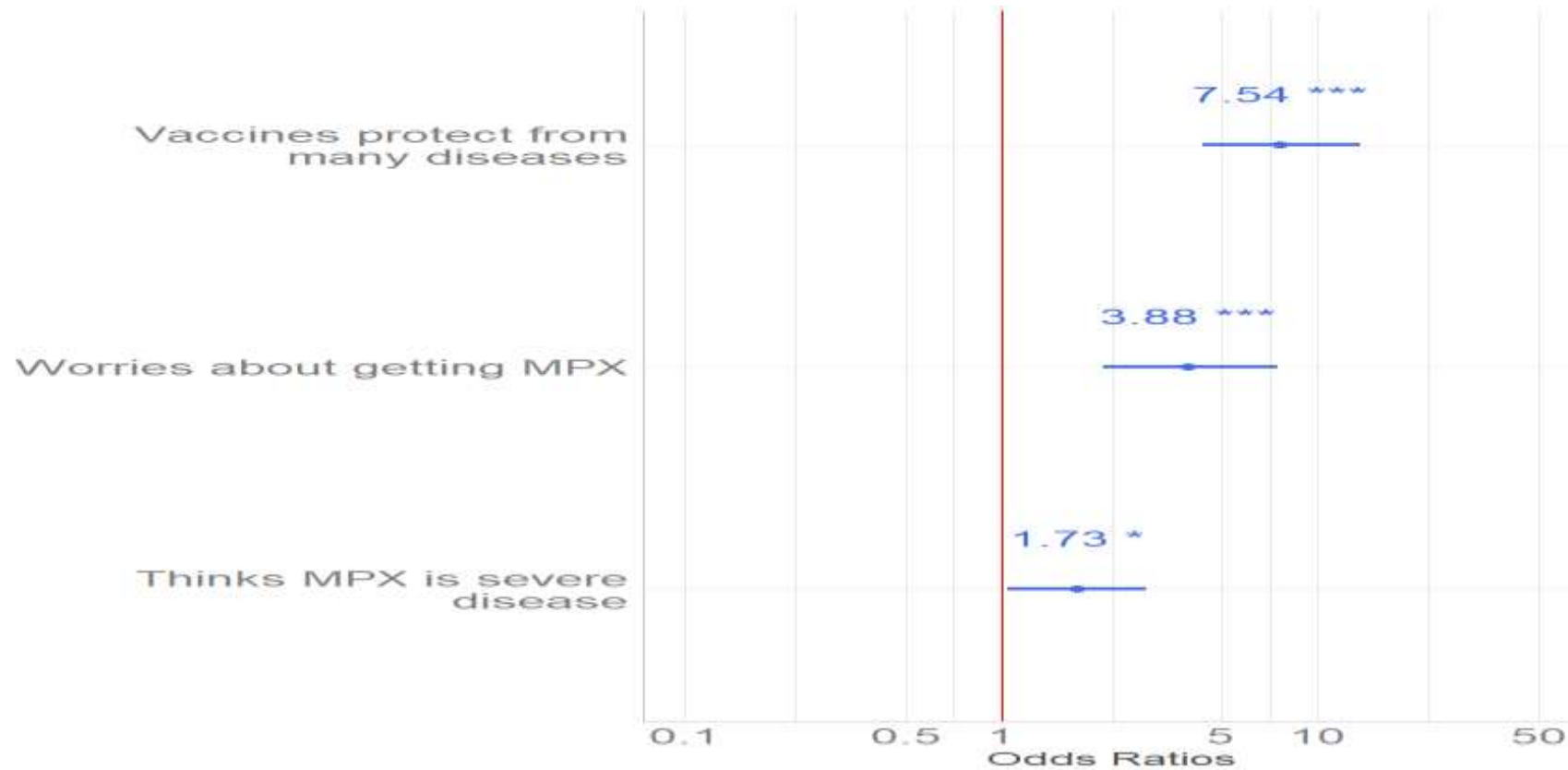
Characteristic	N	Univariate			Multivariate		
		OR <sup>1</sup>	95% CI <sup>1</sup>	p-value	aOR <sup>1</sup>	95% CI <sup>1</sup>	p-value
Age <30	452	1.15	0.78, 1.70	0.5			
HIV positive	427	1.31	0.77, 2.27	0.3			
Using PrEP	374	1.35	0.81, 2.28	0.3			
Had STI	443	0.99	0.49, 2.07	>0.9			
Engaged in chemsex	450	1.3	0.51, 3.74	0.6			
Worries about stigma	450	1.46	0.92, 2.36	0.12			
"Vaccine protect from many diseases" agrees	452	8.83	5.16, 15.7	<b>&lt;0.001</b>	7.54	4.32, 13.7	<b>&lt;0.001</b>
Thinks MPX is severe disease	452	2.66	1.72, 4.19	<b>&lt;0.001</b>	1.73	1.05, 2.89	<b>0.033</b>
Worries about getting MPX	451	5.46	3.13, 10.1	<b>&lt;0.001</b>	3.88	2.11, 7.53	<b>&lt;0.001</b>

<sup>1</sup> OR = Odds Ratio, aOR = Adjusted Odds Ratio, CI = Confidence Interval

1. Several variables that are present in the original paper were excluded from the model because of small sample size in Ukrainian sample

## MPX vaccine acceptance in Ukraine: Logistic regression forest plot

Figure 2. Factors associated with MPX vaccination acceptance, multivariate logistic regression



**Table 6. MPX vaccine acceptance in Ukraine: Bayesian Logistic Regression**

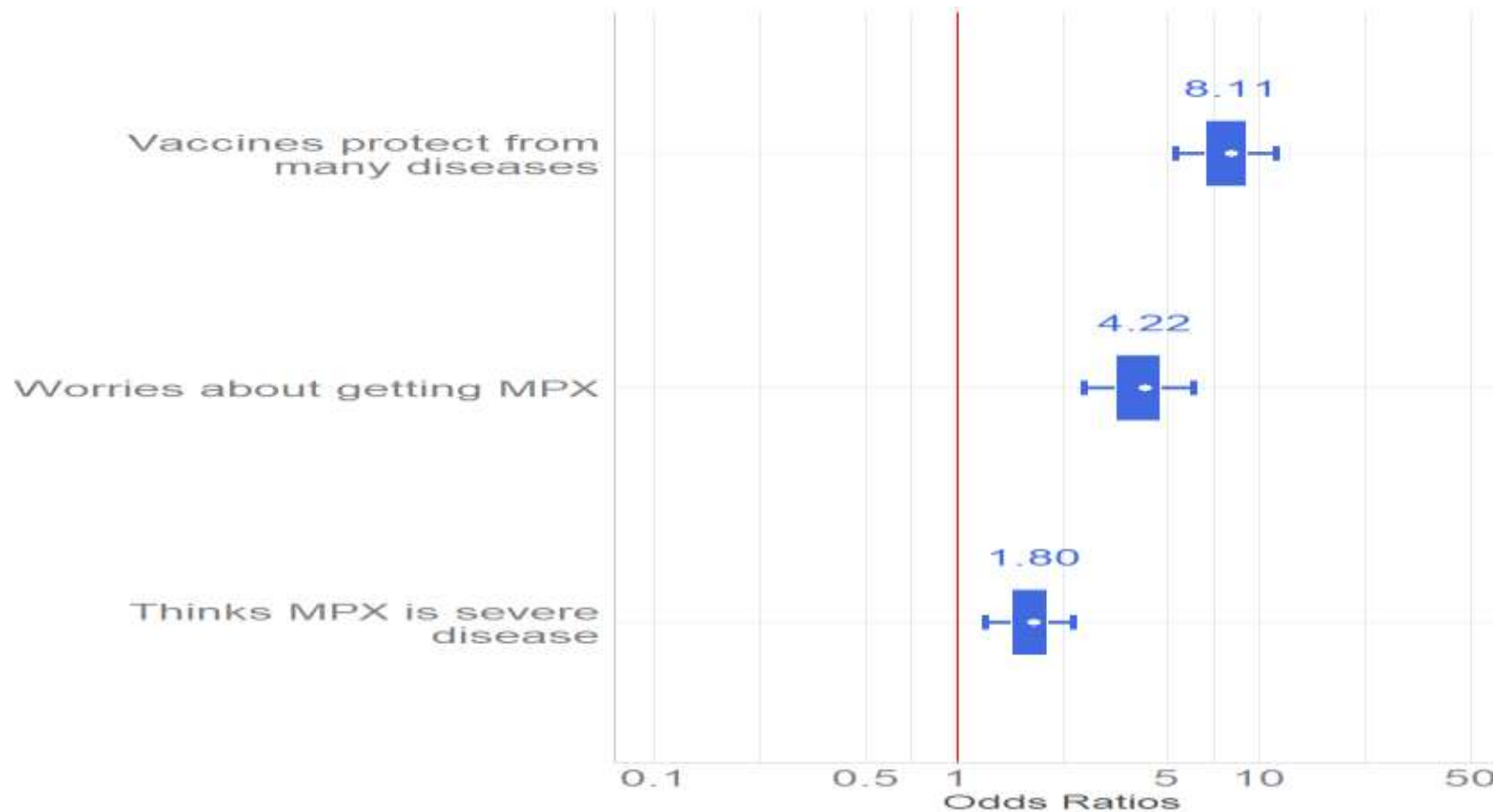
Characteristic	N	Univariate		Multivariate	
		OR <sup>1</sup>	95% CrI <sup>1</sup>	aOR <sup>1</sup>	95% CrI <sup>1</sup>
Age <30	452	1.16	0.78, 1.72		
HIV positive	427	1.31	0.79, 2.32		
Using PrEP	374	1.35	0.82, 2.29		
Had STI	443	1.00	0.5, 2.12		
Engaged in chemsex	450	1.34	0.51, 3.9		
Worries about stigma	450	1.45	0.93, 2.32		
"Vaccine protect from many diseases" agrees	452	9.03	<b>5.31, 15.49</b>	8.11	<b>4.77, 12.71</b>
Thinks MPX is severe disease	452	2.72	<b>1.75, 4.26</b>	1.80	<b>1.14, 2.69</b>
Worries about getting MPX	451	5.47	<b>3.16, 10.28</b>	4.22	<b>2.34, 6.91</b>

<sup>1</sup> OR = Odds Ratio, aOR = Adjusted Odds Ratio, CrI = Credible Interval



## MPX vaccine acceptance in Ukraine: Bayesian logit regression plot

Figure 3. Factors associated with MPX vaccination acceptance, Bayesian logistic regression



## Conclusions

1. Participants in Ukraine had lower level of vaccine acceptance than in the overall sample (64.32% vs 82.0% respectively). However, vaccine acceptance in Ukraine is still one of the highest in the Eastern Europe.



## Conclusions

**2. 45.4% of participants from Ukraine are younger than 30, and most participants (79.1%) are younger than 40 years old, whereas participants age in overall sample is homogenous.**



## Conclusions

**3. Statistically significant factors for vaccination acceptance are personal considerations about vaccination and MPX - confidence that vaccination protects from many diseases, concern about getting MPX and grading MPX as a severe disease. Age, HIV status, PrEP usage, history of STI, chemsex and concerns about stigmatization were not statistically significant.**



## Conclusions

**4. Results of analysis of Ukrainian participants shows that there is a need for general pro-vaccination activities in Ukraine to increase vaccination acceptance.**

# Thank you for your attention!

**In case of any questions please contact:**

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