Supplement to "Treatment of opioid use disorder in Ukraine during the first year of the Russia-Ukraine war: Lessons learned from the crisis"

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1. **Governmental statistics on the number of MOUD patients and dropout rates in governmental clinics.**

Table S1 provides information on MOUD patient census in governmental clinics as of January 1 of each year between 2010 – 2023 along with the respective percentage increase of the number of patients each year.

Table S1. Annual dynamics of the number of MOUD patients in governmental clinics.

Year	MOUD patient census as of the end of the year	Proportion change during the year
2009	5,078	
2010	6,025	19%
2011	6,632	10%
2012	7,339	11%
2013	8,614	17%
2014*	8,407	-2%
2015	8,512	1%
2016	9,214	8%
2017	10,189	11%
2018	11,385	12%
2019	12,411	9%
2020**	14,868	20%
2021	17,043	15%
2022	19,919	17%

* Annexation of Crimea and occupation of parts of Donetsk and Luhansk regions by Russia
** COVID-19 pandemic: relaxation of regulations regarding take-home dosing

Table S2 shows data on monthly MOUD all-cause dropout rates in governmental clinics and dropout rates for reasons other than transfer to a different site or relocation. Approximate dropout rates are calculated as follows:

$$d_t = \frac{k_t}{N_{t-1}} * 100\%$$

where d_t is a dropout rate in month t, k_t is the number of patients who dropped out during month t, and N_{t-1} is the number of patients (census) as of the end of the month $t-1$.

Table S2. Monthly MOUD patient dropout rates in governmental clinics.

Month t	Patient census at the end of month t-1	Total number of patients who dropped out during month t	All-cause dropout rate in month t	Number of patients who dropped out during month t for reasons other than transfer or relocation	"Non-movement" dropout rate in month t
Jan, 2021	14,868	332	2.2%	207	1.4%
Feb, 2021	15,097	514	3.4%	187	1.2%
Mar, 2021	15,270	361	2.4%	211	1.4%
Apr, 2021	15,482	254	1.6%	187	1.2%
May, 2021	15,686	320	2.0%	199	1.3%
Jun, 2021	15,833	360	2.3%	220	1.4%
Jul, 2021	16,011	380	2.4%	240	1.5%
Aug, 2021	16,190	390	2.4%	222	1.4%
Sept, 2021	16,303	383	2.3%	248	1.5%
Oct, 2021	16,478	387	2.3%	223	1.4%
Nov, 2021	16,617	334	2.0%	256	1.5%
Dec, 2021	16,843	286	1.7%	201	1.2%
Jan, 2022	17,043	375	2.2%	257	1.5%
Feb, 2022	17,210	321	1.9%	214	1.2%
Mar, 2022	16,374	882	5.4%	253	1.5%
Apr, 2022	17,510	640	3.7%	331	1.9%
May, 2022	17,844	818	4.6%	343	1.9%
Jun, 2022	18,506	632	3.4%	174	0.9%
Jul, 2022	19,206	697	3.6%	534	2.8%
Aug, 2022	19,342	505	2.6%	361	1.9%
Sept, 2022	18,997	590	3.1%	331	1.7%
Oct, 2022	19,419	442	2.3%	326	1.7%
Nov, 2022	19,536	494	2.5%	320	1.6%
Dec, 2022	19,698	626	3.2%	399	2.0%
Jan, 2023	19,919	447	2.2%	337	1.7%

2. MOUD patients in private clinics.

Private clinics licensed to provide MOUD are not required to submit reporting to the Public Health Center of the Ministry of Health of Ukraine (PHC). For this reason, reporting is inconsistent and does not follow any specific methodology. For example, it is unknown whether private clinics maintain any patient registries that would allow them counting individual patients as opposed to visits or prescriptions given out. Criteria for someone to be counted as a new or current patient or as a dropout are also unclear.

Tables S3 and S4 provide summary data that were reported by private clinics to the PHC between February 1, 2022 – February 1, 2023. Given the registration and reporting systems limitations, data provided below should be interpreted with caution.

Table S3. Monthly dynamics of the number of private clinics reporting data to the PHC and the number of MOUD patients in these clinics (patient census as of the first day of each month).

Reporting date	Number of private clinics that submitted reporting	MOUD patient census (number of patients) in these clinics
February 1, 2022	19	3,121
March 1, 2022	0	NA
April 1, 2022	0	NA
May 1, 2022	0	NA
June 1, 2022	13	5,818
July 1, 2022	15	5,182
August 1,2022	0	NA
September 1, 2022	17	5,016
October 1, 2022	16	5,363
November 1 ,2022	17	5,532
December 1, 2022	22	7,513
January 1, 2023	26	8,604
February 1, 2023	27	8,960

Table S4. Monthly dynamics of the number of MOUD patients (census) among 8 clinics consistently reporting data to the PHC (excluding March, April, and May 2022 reporting).

Reporting date	MOUD patient census (number of patients) in 8 clinics reporting consistently
February 1, 2022	1,384
March 1, 2022	NA
April 1, 2022	NA
May 1, 2022	NA
June 1, 2022	2,873
July 1, 2022	2,857
August 1,2022	2,857
September 1, 2022	3,181
October 1, 2022	3,167
November 1 ,2022	3,308
December 1, 2022	3,349
January 1, 2023	3,281
February 1, 2023	3,272

3. MOUD patient survey methodology

Design: Cross-sectional survey.

Target population: Patients of governmental MOUD clinics.

Duration of data collection: June-July 2022.

Sample size: N=700, stratified by site proportionally to the total number of patients.

Sampling procedures: Random sampling was done by recruiting all patients visiting the clinics on randomly chosen days (patients come to the clinic once every ten days on average). Patients were enrolled in the survey after eligibility screening and signing of informed consent. Recruitment was continued until the target sample size was achieved.

Eligibility criteria: 1) MOUD patient at one of the participating clinics regardless of the duration of treatment; 2) over 18 years old; 3) was not internally displaced since the beginning of the war; 4) able to provide informed consent.

Interview type: Self-administered (with staff assistance if needed) computer-assisted interview (REDCap).

Questionnaire: Survey questionnaire included sections related to demographics, substance use history and risk behaviors, sexual risk behaviors, substance use and MOUD experiences before and after the war started, alcohol use disorder, depression, and anxiety screenings, and withdrawal symptoms.

IRB approval: IRB at the Ukrainian Institute on Public Health Policy approved the study.

Geography: Table S5.

Table S5. MOUD patient survey sample size by region.

Region	Sample size (N)
Rivne	30
Ivano-Frankivsk	45
Lviv	55
Poltava	116
Vinnytsia	49
Kryvyi Rih	161
Mykolaiv	136
Odesa	108
TOTAL	**700**

4. MOUD provider survey methodology

Design: Cross-sectional survey.

Target population: MOUD providers in governmental clinics, including physicians and site managers.

Duration of data collection: July-August 2022.

Sample size: N=143; no target sample size was specified, all providers for whom contact information was available were invited, and efforts were made to enroll as many participants as possible.

Recruitment procedures: Survey link was distributed via email and text messaging to all physicians included in the PHC mailing list (N=210), and via online chat platform (exclusive for MOUD physicians, N~150). Survey link dissemination was repeated weekly until survey termination on August 31, 2022.

Eligibility criteria: Medical doctors involved in MOUD provision (physicians or administrators) in Ukraine in 2022. Those who stopped working due to site closure or migration during the war were also eligible to participate in the survey.

Interview type: Self-administered online survey (Google forms).

Questionnaire: Survey questionnaire included questions related to the site characteristics, changes after the war started, main challenges and needs, as well as a set of knowledge, attitude and practice questions collected by the PHC for the purposes of the national MOUD program evaluation.

IRB approval: IRB at the Ukrainian Institute on Public Health Policy approved the study.

Geography: Table S6.

Specialization: Table S7.

Table S6. MOUD provider survey sample size by region.

Region	Sample size (N)
Cherkasy	18
Chernihiv	6
Chernivtsi	1
Dnipro	16
Donetsk	5
Ivano-Frankivsk	7
Kharkiv	3
Kherson	2
Khmelnytskyi	2
Kropyvnytskyi (Kirovohrad region)	9
Kyiv city	8
Luhansk	1
Lviv	7
Mykolaiv	12
Odesa	5
Poltava	11
Rivne	4
Sumy	5
Ternopil	1
Vinnytsia	11
Volyn	2
Zakarpattia	1
Zaporizzhia	3
Zhytomyr	3
TOTAL	**143**

Table S7. MOUD provider survey sample size by specialization.

Specialization	Sample size (N)
Narcologist (addiction specialist) or psychiatrist	113
Infectious disease specialist or phthisiatrist	8
Primary care doctor	11
Other specialty	11
TOTAL	**143**

5. Regional distribution of patient and provider survey responses

Table S8. Main changes in MOUD site operations post-war, based on the provider survey (N=143)

Region	Site closed	Site is working, number of patients increased	Site is working, number of patients decreased	No major changes	Other	TOTAL
Cherkasy		9		9		18
Chernihiv		5		1		6
Dnipro		11		5		16
Donetsk	1		3		1	5
Ivano-Frankivsk		6		1		7
Kharkiv	1		2			3
Kropyvnytskyi		7	1	1		9
Kyiv City		7		1		8
Lviv		5		2		7
Mykolaiv		2	2	7	1	12
Odesa		3		2		5
Poltava		10	1			11
Rivne		4				4
Sumy		2		3		5
Vinnytsia		8		3		11
Zaporizzhia		3				3
Zhytomyr		3				3
Sites with N<3	1	6	1	2	0	10
TOTAL (N=143)	3	91	10	37	2	143

Table S9. Providers reporting that they transferred most patients to take-home dosing (N=143)

Region	Yes	No	TOTAL
Cherkasy	10	8	18
Chernihiv	3	3	6
Dnipro	8	8	16
Donetsk	5	0	5
Ivano-Frankivsk	5	2	7
Kharkiv	2	1	3
Kropyvnytskyi	7	2	9
Kyiv City	6	2	8
Lviv	4	3	7
Mykolaiv	8	4	12
Odesa	3	2	5
Poltava	10	1	11
Rivne	2	2	4

Sumy	3	2	5
Vinnytsia	10	1	11
Zaporizzhia	3	0	3
Zhytomyr	2	1	3
Sites with N<3	6	4	10
TOTAL	97	46	143

Table S10. Proportion of the patient survey respondents who reported receiving take-home MOUD medications for 1-10 days and for 11-30 days among patients who receive take-home or prescription dosing (N=663)

Region	% receiving MOUD for 1-10 days	% receiving MOUD for 11-30 days
Rivne (N=29)	100.0%	0.0%
Ivano-Frankivsk (N=42)	100.0%	0.0%
Lviv (N=54)	100.0%	0.0%
Poltava (N=106)	6.6%	93.4%
Vinnytsia (N=44)	95.5%	4.5%
Kryvyi Rih (N=149)	3.4%	96.6%
Mykolaiv (N=133)	12.0%	88.0%
Odesa (N=106)	20.8%	79.2%
TOTAL (N=663)	32.7%	67.3%

Table S11. MOUD dosing at the time of the survey, dosing changes since the beginning of the war, satisfaction with current dosing, and self-administration of higher dosing based on the patient survey (N=700)

Region	% with low current MOUD dose[*]	Dose: No change	Dose: Increased	Dose: Decreased	Would like to increase the dose	Took higher dose than prescribed in the last 30 days
Rivne (N=30)	20.0%	90.0%	3.3%	6.7%	63.3%	30.0%
Ivano-Frankivsk (N=45)	26.7%	88.9%	4.4%	6.7%	48.9%	31.1%
Lviv (N=55)	25.5%	69.1%	16.4%	14.5%	41.8%	29.1%
Poltava (N=116)	16.4%	19.0%	1.7%	79.3%	61.2%	2.6%
Vinnytsia (N=49)	22.4%	77.6%	16.3%	6.1%	59.2%	22.4%
Kryvyi Rih (N=161)	8.1%	95.7%	1.9%	2.5%	6.8%	3.1%
Mykolaiv (N=136)	19.1%	97.8%	2.2%	0.0%	28.7%	33.1%
Odesa (N=108)	6.5%	65.7%	2.8%	31.5%	52.8%	48.1%
TOTAL (N=700)	15.4%	74.7%	4.4%	20.9%	38.7%	22.1%

* less of equal to 60 mg for methadone and less or equal to 8mg for buprenorphine

Table S12. Providers reporting MOUD dosing reduction due to risks related to medication supply (N=143)

Region	Yes	No	TOTAL
Cherkasy	8	10	18
Chernihiv	0	6	6
Dnipro	4	12	16
Donetsk	1	4	5
Ivano-Frankivsk	0	7	7
Kharkiv	2	1	3
Kropyvnytskyi	0	9	9
Kyiv City	6	2	8
Lviv	1	6	7
Mykolaiv	2	10	12
Odesa	2	3	5
Poltava	6	5	11
Rivne	0	4	4
Sumy	2	3	5
Vinnytsia	0	11	11
Zaporizzhia	0	3	3
Zhytomyr	0	3	3
Sites with N<3	1	9	10
TOTAL	35	108	143

Table S13. Regional distribution of the proportion of MOUD patients reporting illicit drug use in the 30 days before the survey and in the 30 days before the start of the war.

Region	Cannabis			Illicit opioids			Stimulants			Tranquilizers, antihistamines, and hypnotics		
	% who used in the 30 days before the survey	% who used in the 30 days before the war	p-value	% who used in the 30 days before the survey	% who used in the 30 days before the war	p-value	% who used in the 30 days before the survey	% who used in the 30 days before the war	p-value	% who used in the 30 days before the survey	% who used in the 30 days before the war	p-value
Rivne (N=30)	23.3%	23.3%	1.000	30.0%	30.0%	1.000	33.3%	30.0%	1.000	60.0%	63.3%	1.000
Ivano-Frankivsk (N=45)	26.7%	26.7%	1.000	31.1%	42.2%	0.267	24.4%	20.0%	0.617	51.1%	40.0%	0.074
Lviv (N=55)	23.6%	29.1%	0.450	34.5%	34.5%	1.000	16.4%	18.2%	1.000	36.4%	36.4%	1.000
Poltava (N=116)	13.8%	12.9%	1.000	6.0%	1.7%	0.131	1.7%	1.7%	1.000	10.3%	6.9%	0.289
Vinnytsia (N=49)	51.0%	44.9%	0.450	18.4%	14.3%	0.617	8.2%	14.3%	0.505	46.9%	44.9%	1.000
Kryvyi Rih (N=161)	15.5%	18.0%	0.343	9.3%	9.9%	1.000	11.8%	10.6%	0.617	7.5%	7.5%	1.000
Mykolaiv (N=136)	25.7%	28.7%	0.387	14.7%	12.5%	0.505	2.2%	2.2%	1.000	25.0%	24.3%	1.000
Odesa (N=108)	64.8%	71.3%	0.169	24.1%	50.0%	<0.001	9.3%	11.1%	0.752	81.5%	77.8%	0.480
TOTAL (N=700)	29.0%	31.0%	0.104	17.0%	20.4%	0.006	9.7%	9.9%	0.869	32.9%	30.9%	0.066

* p-value for McNemar's test

6. Regional changes in daily supervised dosing based on governmental reporting.

Figure S1 shows the dynamics of the proportion of patients receiving MOUD daily in a clinic under direct supervision of medical staff across Ukrainian regions based on routine governmental clinics reporting. Snapshots are provided as of February 1, April 1, August 1, 2022, and as of February 1, 2023.

February 1, 2022; Country average: 15.1%

April 1, 2022; Country average: 5.6%

August 1, 2022; Country average: 8.8%
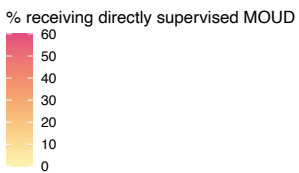
February 1, 2023; Country average: 9.4%

Figure S1. Proportion of patients in governmental clinics receiving daily directly supervised MOUD. Grey color represents occupied or annexed regions. In all plots, the red line shows the part of Ukraine that was occupied by Russian forces as of September 2, 2022. Outline of the occupied territory is approximate (source: Soar Earth https://soar.earth/maps/13152).