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Research article

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## War-related psychological sequelae among emergency department patients in the former Republic of Yugoslavia

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### Abstract

**Background:** Residents of the Republic of Serbia faced civil war and a NATO-led bombing campaign in 1999. We sought to assess the burden of mental health dysfunction among emergency department (ED) patients presenting for care three years post-war in Serbia.

**Methods:** This study was conducted during July and August 2002 at two sites: a university hospital ED in Belgrade, Serbia and an ED in a remote district hospital serving a Serbian enclave in Laplje Selo, Kosovo. Investigators collected data on a systematic sample of non-acute patients presenting to the ED. All respondents completed a structured questionnaire assessing demographics and symptoms of post-traumatic stress disorder (PTSD) (using the Harvard Trauma Questionnaire), and major depression (using the Center for Epidemiologic Studies Depression Scale).

**Results:** A total of 562 respondents participated (310 in Belgrade, 252 in Laplje Selo); the response rate was 83.8%, 43% were female, and mean age was 37.6 years (SD = 13.4). Overall, 73 (13.0%) participants had symptoms consistent with PTSD, and 272 (49.2%) had symptoms consistent with depression. Sixty-six respondents had both disorders (11.9%). In separate multivariable logistic regression models, predictors of PTSD were refugee status and residence in Laplje Selo, and predictors of depression were older age, current unemployment, and lower social support.

**Conclusions:** Three years post-war, symptoms of PTSD and major depression in Serbia remained a significant public health concern, particularly among refugees, those suffering subsequent economic instability, and persons living in rural, remote areas.

## Background

### Historical context

From June 1991, a series of civil wars dissolved the Socialist Federal Republic of Yugoslavia as Slovenia, Croatia, Bosnia-Herzegovina, and the Former Yugoslav Republic of Macedonia sought independence. Yugoslav President Slobodan Milošević ignited years of ethnic tensions between Kosovar Serbs and Kosovar Albanians, which led to the forced mass expulsion of thousands of ethnic Albanians from Kosovo. As a result, open conflict subsequently erupted in March 1999 in Kosovo – the southern province and historic center of the Republic of Serbia. After attempts at reaching a peace accord failed in Rambouillet, France, members of the states of the North American Treaty Organization (NATO) voted to intervene militarily to end the conflict. On 24 March 1999, NATO-led air strikes commenced against targets throughout Serbia and the capital city of Belgrade. After an 11-week air campaign, a tenuous peace accord was established and the province was placed under the administration of the UN Interim Administration Mission in Kosovo (UNMIK) [1].

Fearing retaliation from ethnic Albanians, thousands of Kosovar Serbs fled the province during in the months following the NATO campaign. While census data show that nearly 200,000 Serbs lived in Kosovo in 1991 (approximately 10% of the population), there are currently less than 100,000 Serbs in the province (approximately 6% of the population) [2-4]. Most of these Serbs who have remained in Kosovo reside in community enclaves protected by NATO-led peacekeeping forces. Today, despite the general improvement of conditions in the region, the Serb minority continues to lack freedom of movement and access to basic services, including access to health care.

Research has long-documented the significant burden of war on the mental health of civilians [5-13]. A population-based study [14] was conducted in Kosovo among the ethnic Albanian population two to four months after the end of armed hostilities. This study found that approximately 17.1% of the population had symptoms consistent with a diagnosis of post-traumatic stress disorder (PTSD) [14]. Two years after the Kosovo crisis, in an emergency department (ED) sample in Pristina, Kosovo, 14% of respondents had symptoms of PTSD and lower levels of overall mental health relating to the war [15]. A high prevalence of nonspecific psychiatric morbidity has been documented among Serbs who remained in Kosovo soon after the war [6]. One year after the NATO air attacks, the prevalence among Serbian students was persistently high [16]. Unfortunately, additional reports on the mental health status of Serbians following the cessation of active conflict have been sparse.

### Clinical relevance

The long-term psychological effects of war are underappreciated in clinical settings [17-21]. Physical symptoms, frequently co-occurring with psychological symptoms, may obscure psychological impairment in a medical healthcare setting [22-24]. For example, in one study, 42% of patients presenting to an ED setting with somatic complaints had an occult psychiatric disorder [23]. Physicians frequently miss opportunities to make diagnoses of a primary mental health nature in their clinical practices [23]. The evaluation of frequent, somatic complaints can result in a costly burden of care, especially in an ED setting [22-24]. The direction of public health interventions can be steered by describing the extent of psychosocial issues in post-conflict settings, and demonstrating how these issues correlate with somatic presentations to EDs. This may be particularly important during conflict or in post-conflict situations [25].

### Study objective

We were interested in assessing the mental health status among Serbs in the post-conflict setting. We hypothesized that a substantial prevalence of subjects would have war-related psychological sequelae even three years after the end of overt hostilities. We further hypothesized that any long-term sequelae of war would be more profound among those residing in a remote, minority enclave within the Albanian-dominated areas of Kosovo, in contrast with those living in Belgrade. Furthermore, we were interested in conducting the project in an ED setting, to identify the burden of mental health dysfunction among persons presenting with 'routine' complaints to an ED in the aftermath of war.

## Methods

### Study design

This project was designed as a cross-sectional, self-administered questionnaire study, enrolling patients presenting for care between 15 July and 30 August 2002.

### Setting

The study was conducted in two locations: an ED at a tertiary care university hospital in Belgrade, Serbia, and an ED at a remote district hospital serving a Serbian enclave in Laplje Selo, Kosovo. The annual patient census for the ED in Belgrade is approximately 130,000 visits; 18% of patients are admitted for further care. For Laplje Selo, the annual volume is approximately 7,500, with 10% admitted. The hospital in Belgrade is the flagship of the teaching hospitals in Serbia, with training programs in medicine, surgery, pediatrics and many of the subspecialties. In Laplje Selo, there are no trainees working in the hospital and only fully trained medical personnel attend to patients. Hospital staff members are accompanied from often remote areas of Serbia into the Laplje Selo enclave

under armed police escort, and work on a rotational basis for a set number of days per month. This reduces the risk of being caught, during transit, in ongoing clashes between members of the Albanian majority and Serbian minority in Kosovo.

### **Selection of participants**

After receiving several hours of training in survey-based research techniques and human subject protection by the investigators, research staff approached stable patients waiting to be seen in one of the participating EDs. From Monday to Saturday, between 9 am and 5 pm, patients were enrolled into the study if they were over the age of 18, presented with a stable, non life-threatening complaint, and could give informed consent to participate. Patients were excluded if they presented with an unstable or life-threatening condition, or if they were unable to give informed consent freely, due to inebriation, unconsciousness, extreme emotional or physical distress, etc, as designated by medical facility staff. Patients were selected through a systematic sampling of patients presenting for care at each of the two participating sites. In Belgrade, every fifth non-acute patient presenting for care at the ED was approached to participate in the study. Due to a smaller daily patient volume, every second non-acute patient was asked to participate in Laplje Selo. In the case of visual impairment or illiteracy, the research staff were instructed to read the survey questions aloud, and mark down the participants' answers.

### **Method of measurement**

The structured, self-administered survey contained questions regarding the patient's demographics (age, sex, occupation, municipality of origin, etc), medical and surgical history, history of alcohol use, and history of cigarette smoking. The Harvard Trauma Questionnaire (HTQ) and the Center for Epidemiologic Studies Depression (CES-D) Scale were used to assess the prevalence of persons with symptoms of PTSD and major depression, respectively. Both the HTQ and CES-D have been used extensively in a variety of international settings [5,9,14,15,21,25-35]. The questionnaires were translated from English into Serbian, and then translated back from Serbian into English by a physician fluent in both languages. This questionnaire was then pilot tested among various physicians in Belgrade.

### **Outcome measures**

The HTQ was scored based on a two-part instrument: the first part assesses the exposure to various traumatic events, and the second part seeks to assess specific symptoms of PTSD. Symptoms in the HTQ are based on symptoms from the fourth revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) [36]. We used the algorithm created by the Harvard Refugee Trauma Group

to assess whether participants had symptoms consistent with a diagnosis of PTSD [37]. Briefly, respondents are asked to indicate their direct exposure to a list of traumatic experiences associated with the 1999 NATO campaign in Serbia (Criteria A). Respondents are then asked if they've experienced any symptoms of post-traumatic stress from a second list of options. Each of these questions is answered on a four-point Likert scale (that is, 'not at all', 'a little', 'quite a bit', or 'extremely'). A response of 'quite a bit' or 'extremely' is considered a positive endorsement of that symptom. To be classified as a case, a respondent would have to have at least one traumatic exposure on the list of traumatic events (Criteria A); at least one positive answer on the Likert scale with regards to symptoms experienced (Criteria B); at least three of the seven avoidance/numbing symptoms (Criteria C); and at least two of five symptoms of arousal/hypervigilance (Criteria D).

The CESD was developed in the 1970s by researchers at the National Institute of Mental Health (NIMH) [25]. In this study, it was used as a screening tool to determine the prevalence of study subjects who have symptoms consistent with major depression. These questions are also configured using a four-point Likert scale format. We graded the CES-D according to the established NIMH methodology, considering persons who scored 16 or more positive endorsements on an additive scale as screening positive for depression [25,26]. It is a widely-used screening measures of depression used in cross-cultural mental health research [27-35].

### **Data analysis**

To assure overall data quality, standard protocols were followed to ensure consistency in the entering and coding of data. Routine comparisons were made between the hard copy data forms and the keyed data to reduce input errors. Periodic edits were performed on the computer database to safeguard against out-of-range entries. The investigators used the SAS System, version 8 (SAS Institute Inc., Cary, NC, USA), to carry out statistical analysis. In the bivariate analyses, we identified a set of factors *a priori* that we thought were probable predictors of the two mental health outcomes: age, sex, education and employment status as well as the number of traumatic events experienced. Significant individual bivariate correlates of poor mental health function ( $p \leq 0.10$ ) were included in a multivariate logistic regression model for analyses. Overall, we sought to identify the association between various factors, PTSD (as determined by the HTQ), and symptoms of major depression (as determined by the CESD), while controlling for relevant socio-demographic variables.

### **Results**

A total of 671 eligible patients presenting for care during the study period were approached to participate in the

**Table 1: Demographic characteristics among a sample of emergency department patients in Belgrade, Serbia, and Laplje Selo, Kosovo, three years after the 1999 NATO bombing campaign (N = 562)**

Characteristic	N	%
Age		
18–34	209	38.49
35–54	198	36.46
55+	136	25.05
Female gender	237	42.47
Serbian ethnicity	518	94.01
Married	338	60.68
Living with spouse or partner	350	63.41
Place of birth		
Serbia	248	44.29
Kosovo	254	45.36
Elsewhere	58	10.36
Number of times moved in past five years		
0	352	66.42
1	86	16.23
2+	92	17.36
Refugee status during NATO bombing		
Was not a refugee	449	82.84
Refugee for ≤ 30 days	44	8.12
Refugee > 30 days	49	9.04
Lived in same house as before NATO bombing	444	80.29
Education		
High School education or more	355	63.51
< High School education	204	36.49
Total combined household income last year		
>500 German Deutsche Marks (DEM)	166	30.40
250–500 DEM	157	28.75
<250 DEM	223	40.84
Employed before NATO bombing	368	65.95
Currently employed	246	44.01
Social support		
High	387	69.60
Moderate	135	25.36
Low	28	5.04
Site of data collection		
Belgrade	310	55.16
Laplje Selo	252	44.84

study. Of these, 567 agreed to participate and 562 (83.8%) completed the questionnaire (310 in Belgrade, 252 in Laplje Selo). The mean age of the sample population was 37.6 years (SD = 13.4). The participants were predominantly male (57%), of Serbian ethnicity (N = 518, 94%); 242 (43%) participants were female. Two hundred forty-eight (44.3%) respondents were born in Serbia; 254 (45.4%) were born in Kosovo, and 58 (10.4%) were born elsewhere. see Table 1 for detailed demographics.

Among respondents, 73 (13.0%) had symptoms consistent with PTSD. As Table 2 shows, the covariates found associated with PTSD in bivariate analyses were: living with a spouse or partner ( $p = 0.014$ ), marital status ( $p = 0.016$ ), lower household income ( $p < 0.001$ ), being born

in Kosovo ( $p < 0.001$ ), refugee status during war ( $p < 0.001$ ), greater number of times moved in past five years ( $p < 0.001$ ), living in same home as before the war ( $p < 0.001$ ), remote Laplje Selo (versus urban Belgrade) as the data collection setting ( $p < 0.001$ ), and social support ( $p < 0.001$ ). Overall, 272 (49.2%) had symptoms consistent with depression. Depression was associated with older age ( $p < 0.001$ ), current ( $p < 0.001$ ) and pre-war employment status ( $p < 0.001$ ), being born in Kosovo ( $p = 0.010$ ), refugee status during the war ( $p = 0.017$ ), lower household income ( $p < 0.001$ ), less education ( $p < 0.001$ ), living in the remote community of Laplje Selo ( $p = 0.005$ ), and lower social support ( $p < 0.001$ ). Overall, 66 respondents had symptoms of both PTSD and depression (11.9%). Due to the high degree of comorbidity between PTSD and

**Table 2: Bivariate analysis of sample characteristics and association with symptoms of PTSD and major depression among emergency department patients in Belgrade, Serbia, and Laplje Selo, Kosovo, three years post-war (N = 562)**

Characteristics	PTSD			Depression		
	N	%	p-value	N	%	p-value
Total	73	12.99		272	49.19	
Age						
18–34	29	13.88	0.119	84	41.18	<0.001
35–54	31	15.66		92	47.18	
55+	11	8.09		86	63.70	
Gender						
Male	40	12.46	0.612	145	45.89	0.072
Female	33	13.92		125	53.65	
Ethnicity						
Serbian	67	12.93	0.389	252	49.41	0.684
Not Serbian	6	18.18		17	53.13	
Marital status						
Not married	19	8.68	0.016	102	47.22	0.439
Married	53	15.68		168	50.60	
Living with spouse or partner						
No	16	7.92	0.014	93	46.73	0.504
Yes	53	15.14		171	49.71	
Place of birth						
Serbia	11	4.44	<0.001	103	42.21	0.010
Kosovo	55	21.65		139	55.82	
Elsewhere	6	10.34		28	48.28	
Number moves in past five years						
0	27	7.67	<0.001	159	45.69	0.123
1	9	10.47		41	48.81	
2+	24	26.09		52	57.78	
Refugee status during NATO bombing						
Was not a refugee	44	9.80	<0.001	205	46.28	0.017
Refugee for ≤ 30 days	5	11.36		24	55.81	
Refugee for > 30 days	18	36.73		32	66.67	
Live in same house as before NATO bombing						
Yes	47	10.59	<0.001	208	47.49	0.063
No	25	22.94		61	57.55	
Education						
High School education or more	39	10.99	0.078	151	43.14	<0.001
Less than a High School education	33	16.18		119	59.50	
Total combined household income last year						
>500 German Deutsche Marks (DEM)	14	8.43	<0.001	63	38.18	<0.001
250–500 DEM	14	8.92		70	44.87	
<250 DEM	44	19.73		133	60.45	
Employment before NATO bombing						
Yes	49	13.32	0.821	157	43.61	<0.001
No	24	12.63		114	60.32	
Currently employed						
Yes	25	10.16	0.072	84	34.71	<0.001
No	48	15.34		187	60.71	
Social support						
High	35	9.04	<0.001	160	41.99	<0.001
Moderate	28	19.86		89	63.12	
Low	9	32.14		19	73.08	
Site of data collection						
Belgrade	13	4.19	<0.001	134	43.79	0.005
Laplje Selo	60	23.81		138	55.87	

**Table 3: Multivariate regression analysis of factors predicting symptoms of PTSD among emergency department patients in Belgrade, Serbia, and Laplje Selo, Kosovo, three years post-war (N = 562)**

Characteristic	PTSD		
	OR	95% CI	p-value
Marital status			
Not married	1.000		0.737
Married	0.748	0.137–4.076	
Place of birth			
Serbia	1.000		0.193
Kosovo	0.285	0.051–1.575	
Elsewhere	1.424	0.379–5.347	
Number moves in past five years			
0	1.000		0.252
1	1.158	0.431–3.111	
2+	2.331	0.841–6.458	
Refugee status during NATO bombing			
Was not a refugee	1.000		0.006
Was a refugee for ≤ 30 days or less	0.391	0.075–2.038	
Was a refugee for > 30 days	3.888	1.483–10.193	
Live in same house as before NATO bombing			
Yes	1.000		0.686
No	0.821	0.315–2.139	
Education			
High School education or more	1.000		0.638
Less than a High School education	1.187	0.581–2.426	
Total combined household income last year			
>500 German Deutsche Marks (DEM)	1.000		0.538
250–500 DEM	1.290	0.448–3.717	
<250 DEM	1.764	0.622–5.004	
Currently employed			
Yes	1.000		0.430
No	0.734	0.341–1.580	
Social support			
High	1.000		0.117
Moderate	1.624	0.771–3.423	
Low	3.481	0.980–12.371	
Site of data collection			
Belgrade	1.000		0.002
Laplje Selo	13.598	2.723–67.899	

depression, the predictors were extremely similar to that of PTSD alone.

In a multivariable logistic regression model (Table 3), predictors of PTSD were being a refugee for longer than 30 days (odds ratio (OR) = 3.89, 95% confidence intervals (CI): 1.5, 10.2), and living in remote Laplje Selo (OR = 13.6, 95% CI: 2.7, 67.9). Multivariable predictors of depression (Table 4) were being 55 years or older (OR = 2.6, 95% CI: 1.4, 4.7), current unemployment (OR = 1.7, 95% CI 1.0, 2.7), and lower social support (OR = 3.3, 95% CI: 1.0, 11.1). The multivariate predictors of having both disorders were being a refugee for longer than 30 days (OR = 4.1, 95% CI: 1.6, 10.6), and living in remote Laplje Selo (OR = 6.5, 95% CI: 1.4, 29.9).

## Discussion

Three years after the NATO-led bombing campaign over Serbia and Kosovo, a high prevalence of war-related mental health problems exists among ED patients presenting for care. In our sample of 562 participants, 13.0% had symptoms of PTSD, while almost half the study sample (49.2%) had symptoms consistent with depression. Among study participants, becoming a refugee during the war and living in the remote community of Laplje Selo were predictive of PTSD. Older age, unemployment, and lower social support predicted depression.

A persistently high prevalence of PTSD following conflict situations, torture or forced migration has been frequently described [5,9,14-16,21,37-43]. For example, the preva-

**Table 4: Multivariate regression analysis of factors predicting symptoms of major depression among emergency department patients in Belgrade, Serbia, and Laplje Selo, Kosovo, three years post-war (N = 562)**

Characteristic	Depression		
	OR	95% CI	p-value
Age			
18–34	1.000		0.005
35–54	1.582	0.976–2.564	
55+	2.599	1.448–4.667	
Gender			
Male	1.000		0.323
Female	1.265	0.793–2.018	
Place of birth			
Serbia	1.000		0.470
Kosovo	1.450	0.530–3.970	
Elsewhere	0.743	0.358–1.539	
Refugee status during NATO bombing			
Was not a refugee	1.000		0.109
Was a refugee for ≤ 30 days	1.362	0.617–3.003	
Was a refugee for > 30 days	2.208	1.029–4.739	
Live in same house as before NATO bombing			
Yes	1.000		0.377
No	1.281	0.739–2.222	
Education			
High School education or more	1.000		0.142
Less than High School education	1.404	0.893–2.207	
Total combined household income last year			
>500 German Deutsche Marks (DEM)	1.000		0.808
250–500 DEM	0.997	0.584–1.703	
<250 DEM	1.165	0.666–2.036	
Employment before NATO bombing			
Yes	1.000		0.169
No	1.432	0.858–2.389	
Currently employed			
Yes	1.000		0.047
No	1.662	1.006–2.744	
Social support			
High	1.000		0.025
Moderate	1.678	1.040–2.707	
Low	3.334	1.000–11.117	
Site of data collection			
Belgrade	1.000		0.637
Laplje Selo	1.269	0.472–3.410	

lence of PTSD was 14% among ethnic Albanians presenting for care in the ED setting in Kosovo two years post conflict [15]. In Serbia, one year following the NATO air attack, 11% of subjects had symptoms suggestive of PTSD. Distress at the time of the bombing raids was predictive of PTSD symptoms one year later [16].

Despite numerous associations with PTSD in bivariate analysis, only two factors, refugee status during the war and living in a remote isolated setting, remained important after controlling for other factors in this study. The importance of refugee status in determining mental

health after conflict is consistent with the findings of others. For example, even after 20 years following civil conflict in Guatemala, 11.8% of participants had symptoms of PTSD [40]. In that study, symptoms of PTSD were predicted by refugee status, human rights violations, and sum of traumatic events [40]. Not surprisingly, living in the remote, isolated village of Laplje Selo was also predictive of PTSD. In a study evaluating the effects of social isolation, Mollica *et al.* [42] reported that among Bosnian refugees, PTSD was associated with isolation from family at a three-year follow up.



In our study, we found that nearly half of participants reported symptoms consistent with major depression. The high prevalence of depression in this sample is comparable with the findings by investigators in other post-conflict setting. Among a clinical sample of Bosnian refugees who had resettled in Chicago, Illinois, the prevalence of major depression was 66% [41]. In a study of Bosnian refugees, 43% of participants who met DSM-IV criteria on original testing for major depression (alone or co-morbid with PTSD) still met criteria at three-year follow-up [42].

Older age, unemployment, and lower social support were predictive of major depression among respondents in this dataset. Our findings are in accord with what has been reported elsewhere [43-47]. For instance, in a study of ethnic Albanians following the war in Kosovo, individuals aged 65 years and older had higher odds of psychiatric morbidity [14]. Among former Somali refugees resettled in the United Kingdom, suicidality and drug use were associated with unemployment prior to their migration [48]. In a study that evaluated coping strategies among Serbian medical students, greater social support activities seemed to protect against psychological morbidity in the year following the NATO air campaign [49].

Among participants in our study with symptoms of PTSD, many had symptoms of major depression as well. A number of other investigators have found PTSD comorbid with depression in the post-war setting [9,50-52]. PTSD commonly co-occurs with other psychiatric disorders, particularly with major depression. These co-existing entities are often difficult to distinguish, which leads to difficulties in diagnosis, and may be harder to manage than PTSD or depression alone [53].

#### Limitations

There were a number of limitations to this study. It was designed as a cross-sectional study, where both exposure status and outcomes are determined simultaneously. Therefore, the issue of causality (that is, war-trauma had directly caused poor results on post-war mental health screening) cannot be readily established [54-56]. However, cross-sectional studies allow for rapid, cost-efficient gathering of information that generates hypotheses for further investigation. Furthermore, the findings from a cross-sectional study can help to focus attention on issues of public health importance, which can assist public health planning [54-56]. It is possible that participants drawn from a clinical setting may exaggerate the true prevalence of PTSD and depression compared to a non-clinical sample [54-56]. This study was carried out among a Serbian patient population presenting to hospitals in a post-war setting, thus generalizations beyond this setting need to incorporate additional information.

One of the major challenges to conducting post-war mental health research beyond Western Europe and North America is the paucity of established benchmark data in a given area. Although these instruments have been used extensively, normative data have yet to be determined in this setting. Therefore, it is important to emphasize that the clinical implication of screening 'positive' for depression or PTSD using the instruments in this study has yet to be fully established in Serbia.

#### Conclusions

In this study, a considerable number of ED patients in two Serbian communities were found to have significant psychopathology even after three years post-war. This study highlights the burden that war-related mental health dysfunction might have on patients who present for care in the post-war context. Additional effort is needed to optimize appropriate screening for at-risk individuals. The ultimate goal of such a program for ED-based mental health screening would be to identify persons at-risk for mental health sequelae of war (that is, PTSD and/or depression), and refer them to outpatient mental health treatment. Public health officials, clinicians, and others with an interest in humanitarian work should bear in mind that a considerable number of patients who present for care in an ED setting may still harbor the mental health consequences of war, even after three years following the end of conflict.

#### Competing Interests

None declared.

#### Authors' contribution

WGF and SG formulated the research design. BDN, WGF, SG, and SS were responsible for creation of survey materials. BDN primarily translated all survey materials. BDN, SS, KD, and MVR pilot tested the surveys. BDN, KD, SS, GSG, and MM were responsible for recruitment of patients. AN and JA were responsible for data analysis. BDN, WGF, SG, and DV were responsible for creating the initial manuscript. All authors were involved in the editing and final approval of the manuscript. WGF takes overall responsibility for the manuscript.

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