Impact of COVID – 19 Restrictions on Air Quality Levels on Samsun, Turkey

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Contents

Introduction

- First positive case of SARS-CoV-2 (hereinafter COVID - 19) detected in Turkey on the 11th of March 2020. After the confirmation of the first case, some measures like stay at home order, airway transportation were implied by the Turkish government. However, the number of cases reached 4500 on 10th of April. Than, more strict measures were applied for 30 crowded cities including Samsun. These measures are lockdown on weekends, cancellation of intercity travels, etc.

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Samsun

Station	PM_{10}	CO	NO_x	NO_2
Tekkekoy	2019 - 2020	2019 - 2020	2019 - 2020	2019 - 2020

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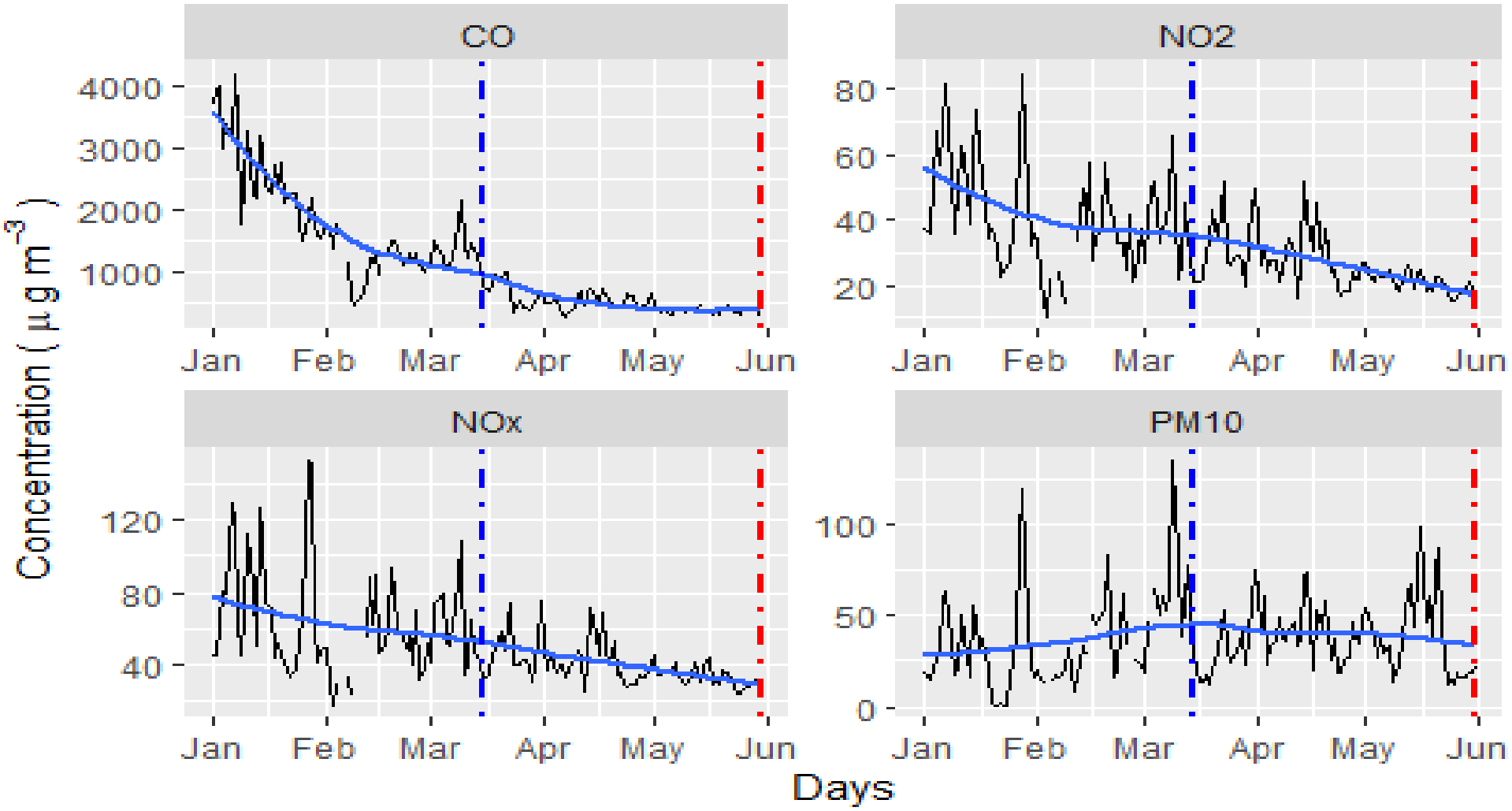
Comparison of Lockdown and Pre-Lockdown Period



Comparison of Lockdown and Pre-Lockdown Period

Mean Concentrations

Pollutant	Before Lockdown (µg/m^3)	Lockdown (µg/m^3)	Change (%)
CO	1807	496	-73
NO_2	41	26	-37
NO_x	62	40	-35
PM_{10}	37	38	+3

Exceedance Numbers

Pollutant	Before Lockdown	Lockdown	Change (%)
NO_2	0	0	-
PM_{10}	19	16	-16

Comparison of the sub-periods in lockdown period

Pollutant	Full Lockdown days (µg/m³)	Remaining Days (µg/m³)	Change (%)
CO	497	491	-1
NO_2	28	21	-25
NO_x	41	33	-20
PM_{10}	40	31	-18

Comparison of the lockdown concentrations with the same period of 2019

Pollutant	2019 (µg/m^3)	2020 (µg/m^3)	Change (%)
CO	474	496	+4
NO_2	26	26	0
NO_x	39	40	+2.5
PM_{10}	48	38	-21

Relationship between mobility and air pollution

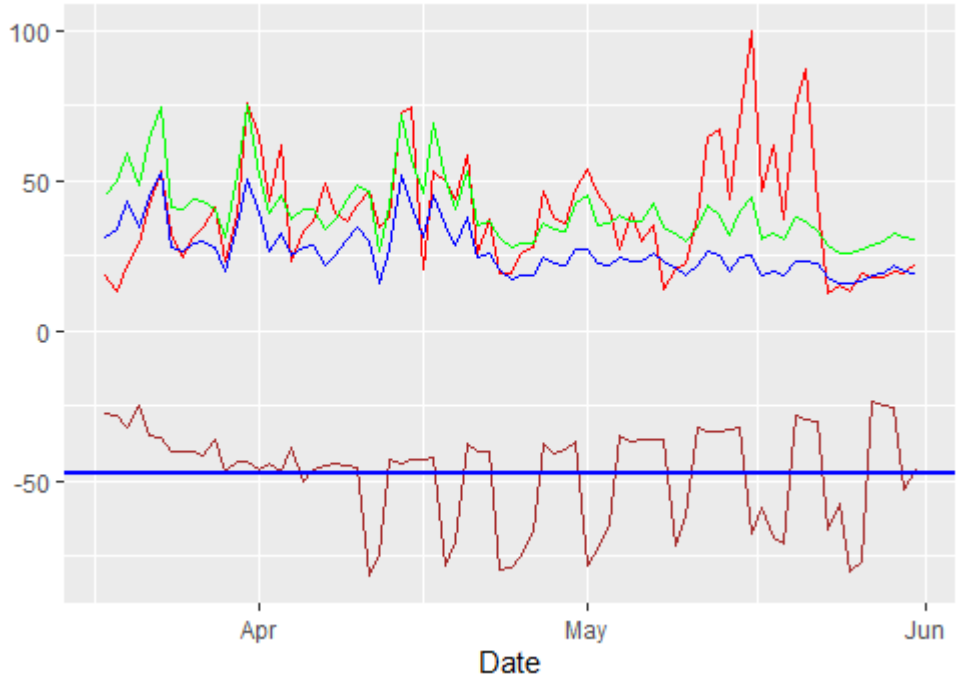


Table 6 Pearson's correlation coefficients between work mobility and pollutant concentrations

	CO	NO_x	NO_2	PM_{10}
Correlation Coefficient	0.15	0.27	0.30*	0.08

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Conclusion

- The mean concentration of CO, NO_2 and NO_x declined 72, 37 and 35 percent while the mean concentration of PM_{10} increased 3 percent during lockdown according to the before lock down period. PM_{10} concentrations exceeded the WHO limits 19 times before lock down and 16 times during lockdown although mean concentrations of PM_{10} increased during lockdown according to the pre-lockdown period.

Conclusion

- The mean concentration of all the pollutants decreased during full lockdown measures compared the remaining lockdown days in different levels. CO concentration decreased just 1% during full lockdown measures with respect to the remaining days of lockdown. NO_2, NO_x and PM_{10} decreased 25, 20 and 18%, respectively.

Conclusion

- NO_2 concentrations didn't change during lockdown with respect to 2019. CO and NO_x increased 4 and 2.5 percent, respectively whilst PM_{10} decreased 21 percent.

- The correlation between mobility change and pollutant concentrations were calculated and tested via Pearson's test. Only the correlation coefficient between mobility and NO_2 is statistically significant at 99% confidence level with the value of 0.30.

- Thank you!