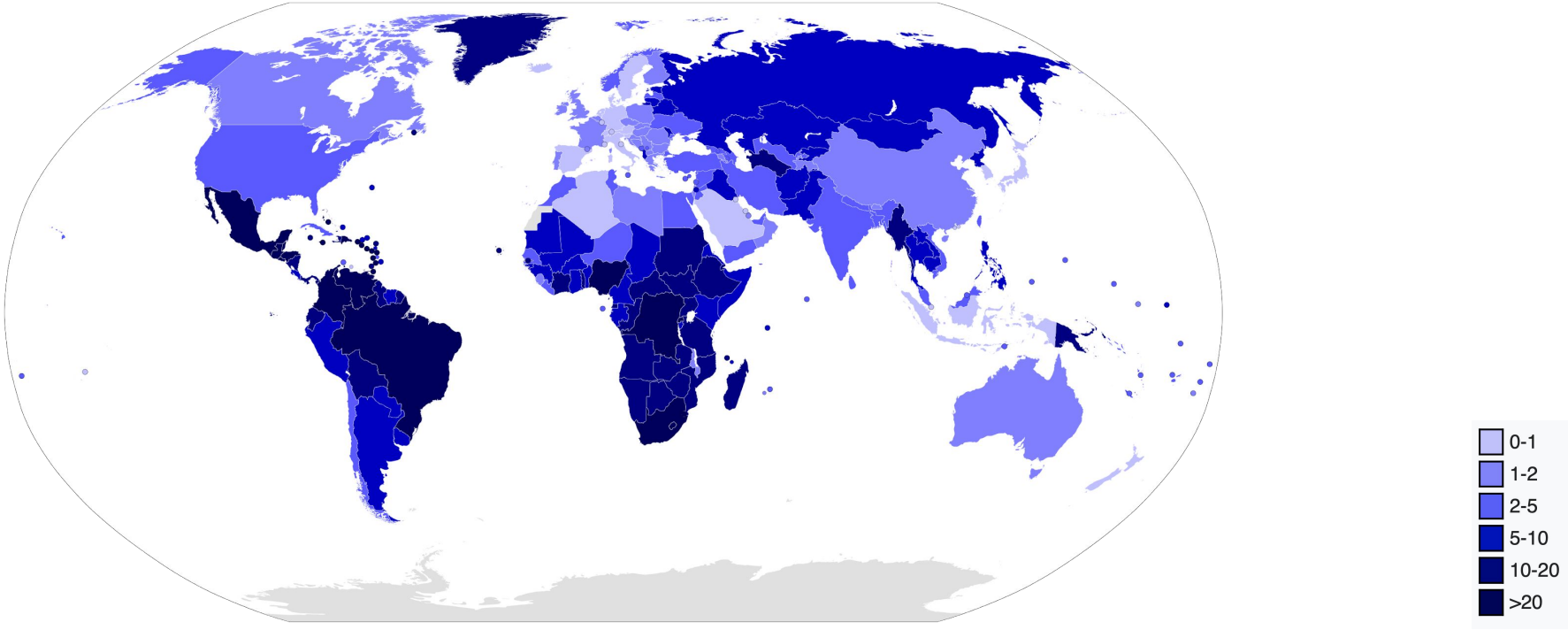
Número de homicidios en México

¿cómo medirlos?

Tasa de homicidios a nivel mundial



Fuentes de datos

SESNSP

SSPC

“Otros datos”


SEGURIDAD
SECRETARÍA DE SEGURIDAD
Y PROTECCIÓN CIUDADANA
ESTADOS UNIDOS MEXICANOS


PGR
PROCURADURÍA GENERAL
DE LA REPÚBLICA
ESTADOS UNIDOS MEXICANOS


ESTADOS UNIDOS MEXICANOS
SEMAR
SECRETARÍA DE MARINA


SEDENA
SECRETARÍA DE LA
DEFENSA NACIONAL
ESTADOS UNIDOS MEXICANOS

Problemas

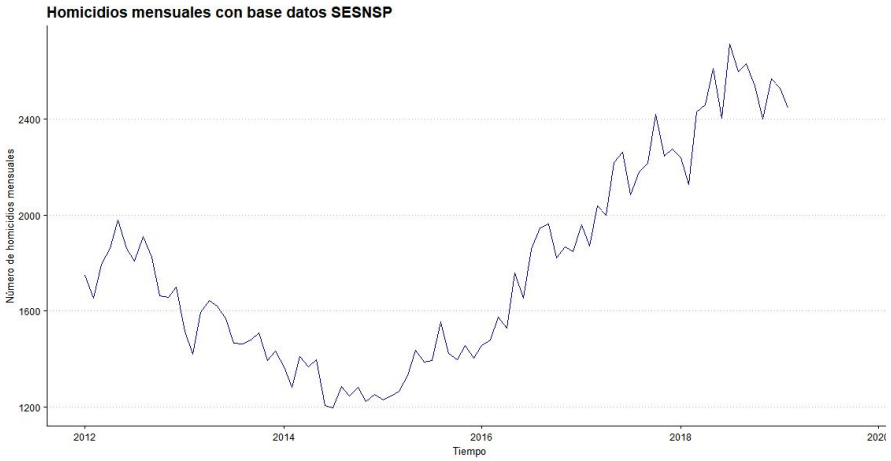
SESNSP

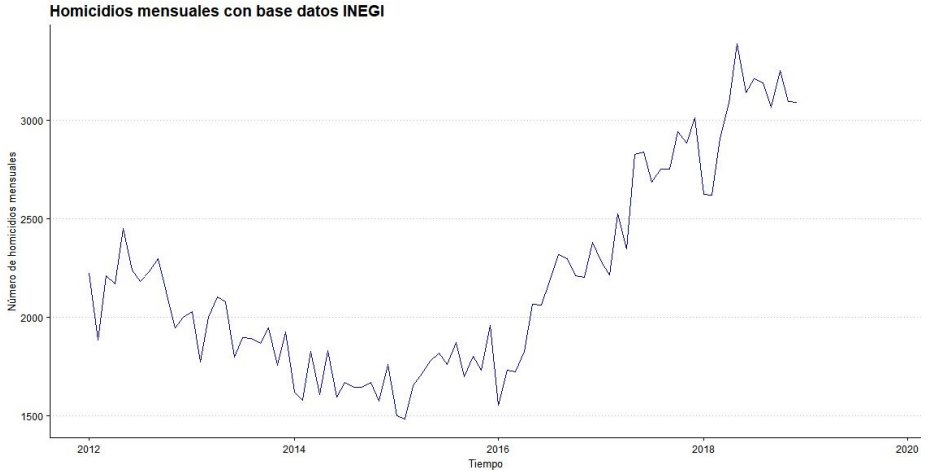
ÚLTIMA ACTUALIZACIÓN:
HOY

INEGI

ÚLTIMA ACTUALIZACIÓN:
DICIEMBRE 2018

Diferentes unidades, misma tendencia





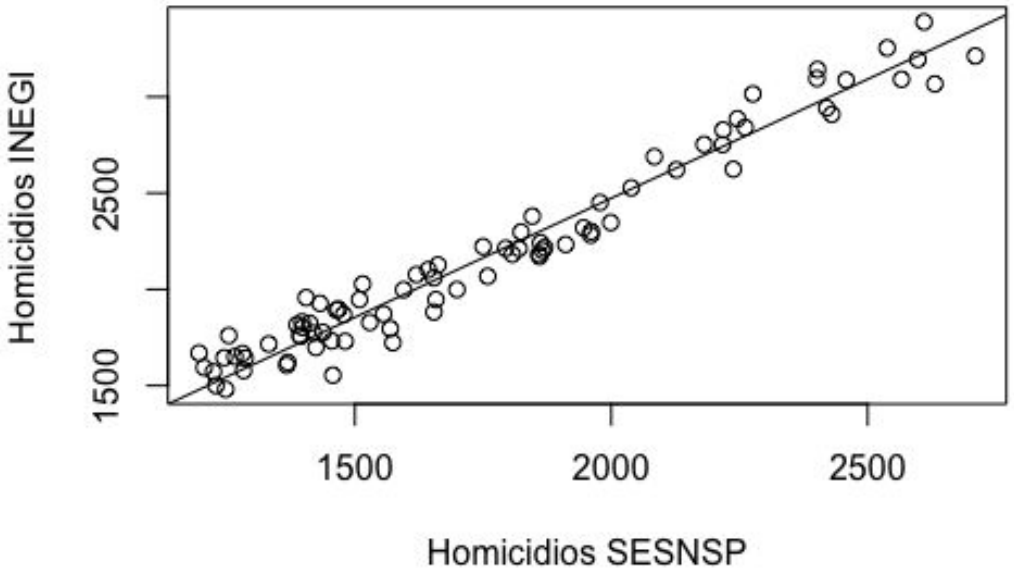
Metodología

1- Regresión Lineal

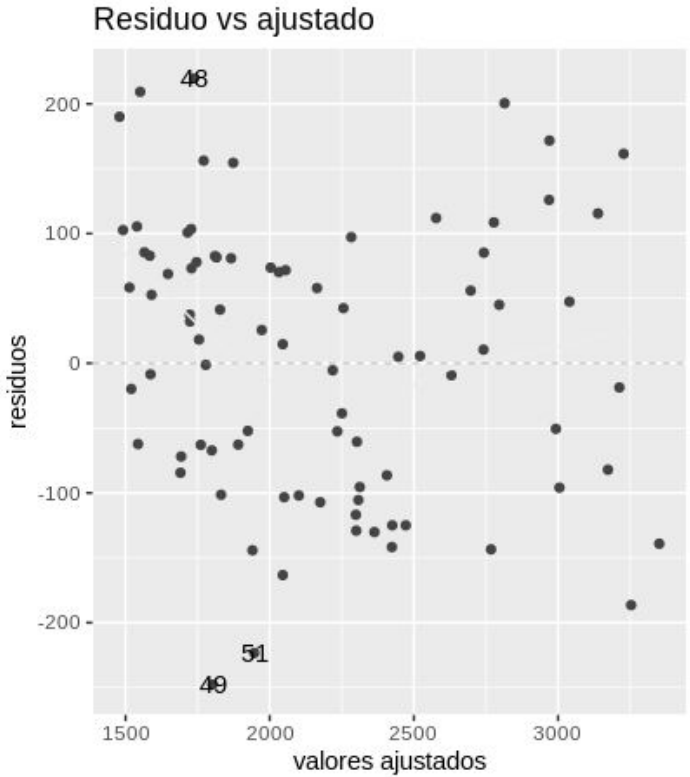
2- Obtener una sola serie

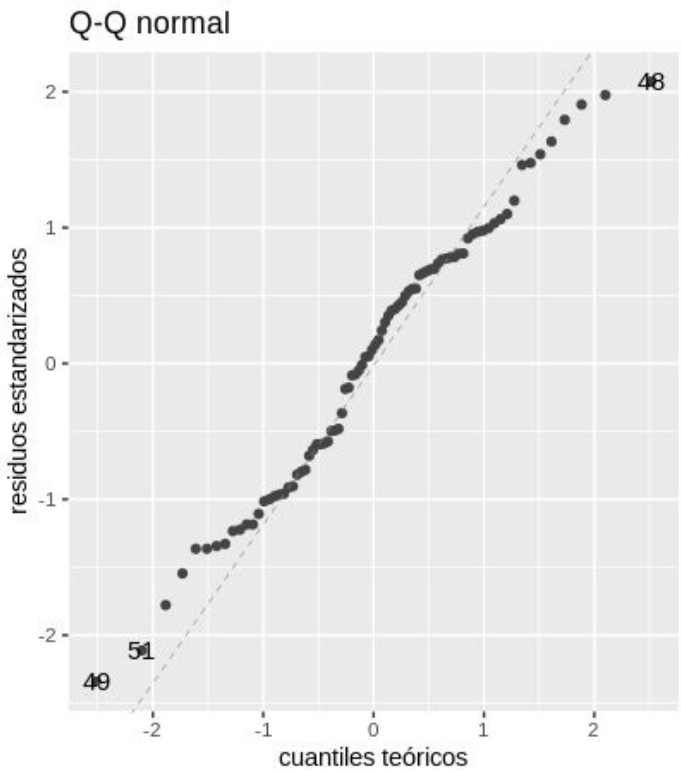
3- Trabajar con dicha serie

Regresión Lineal

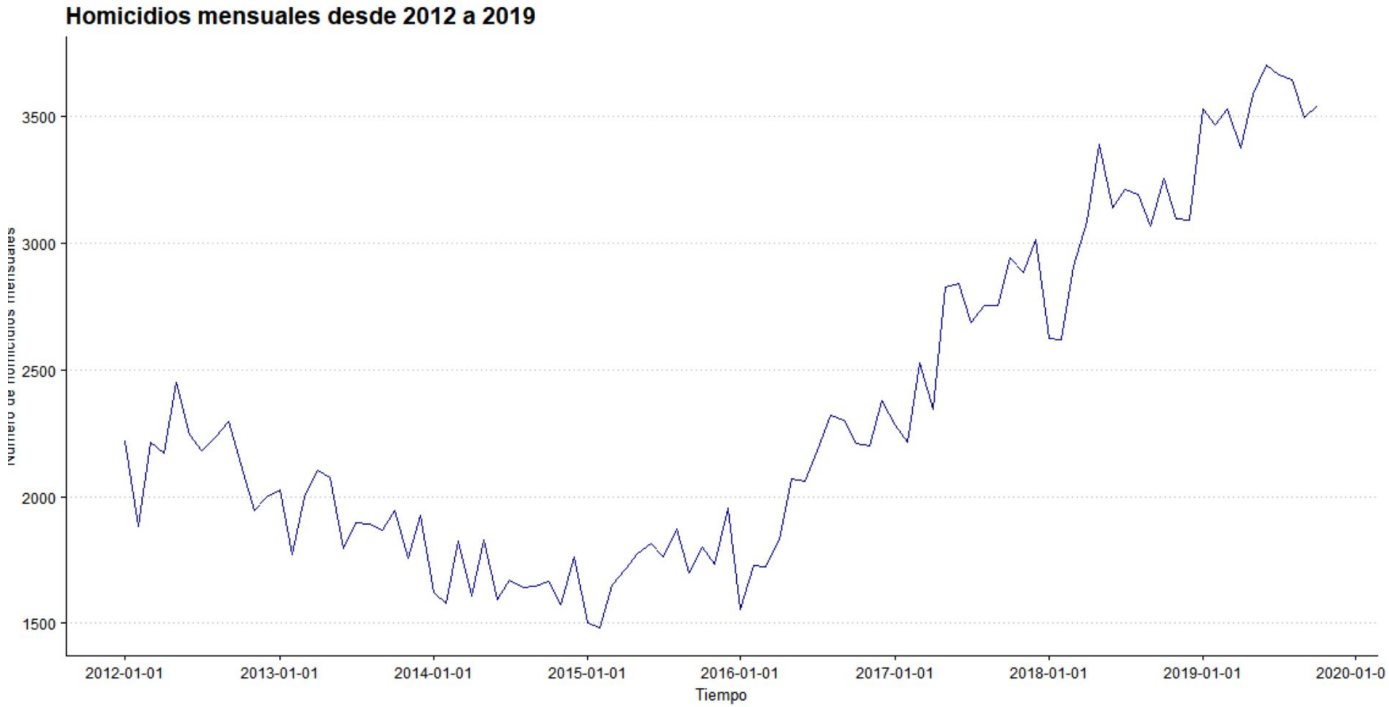


Análisis de Residuos

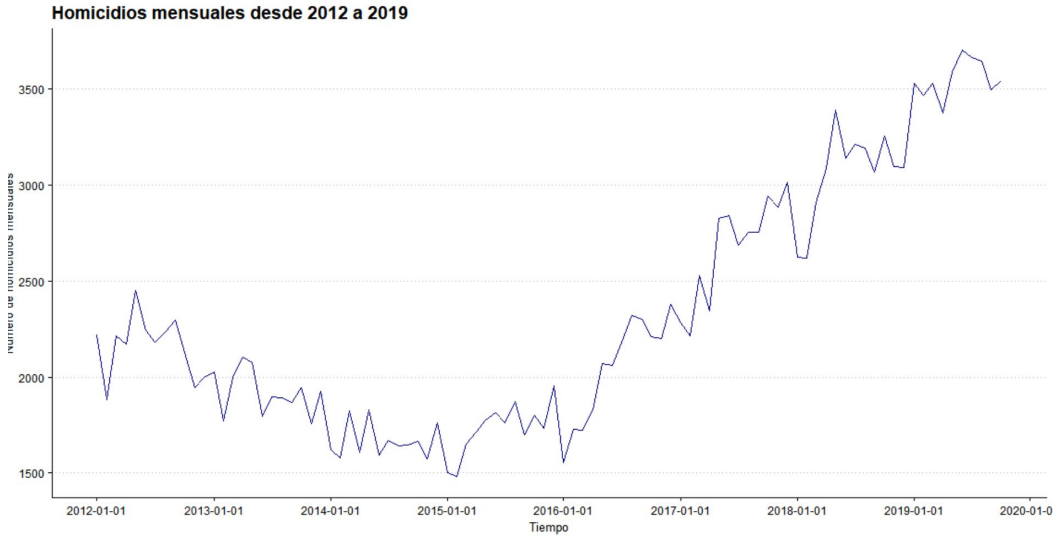




Serie con la que trabajaremos

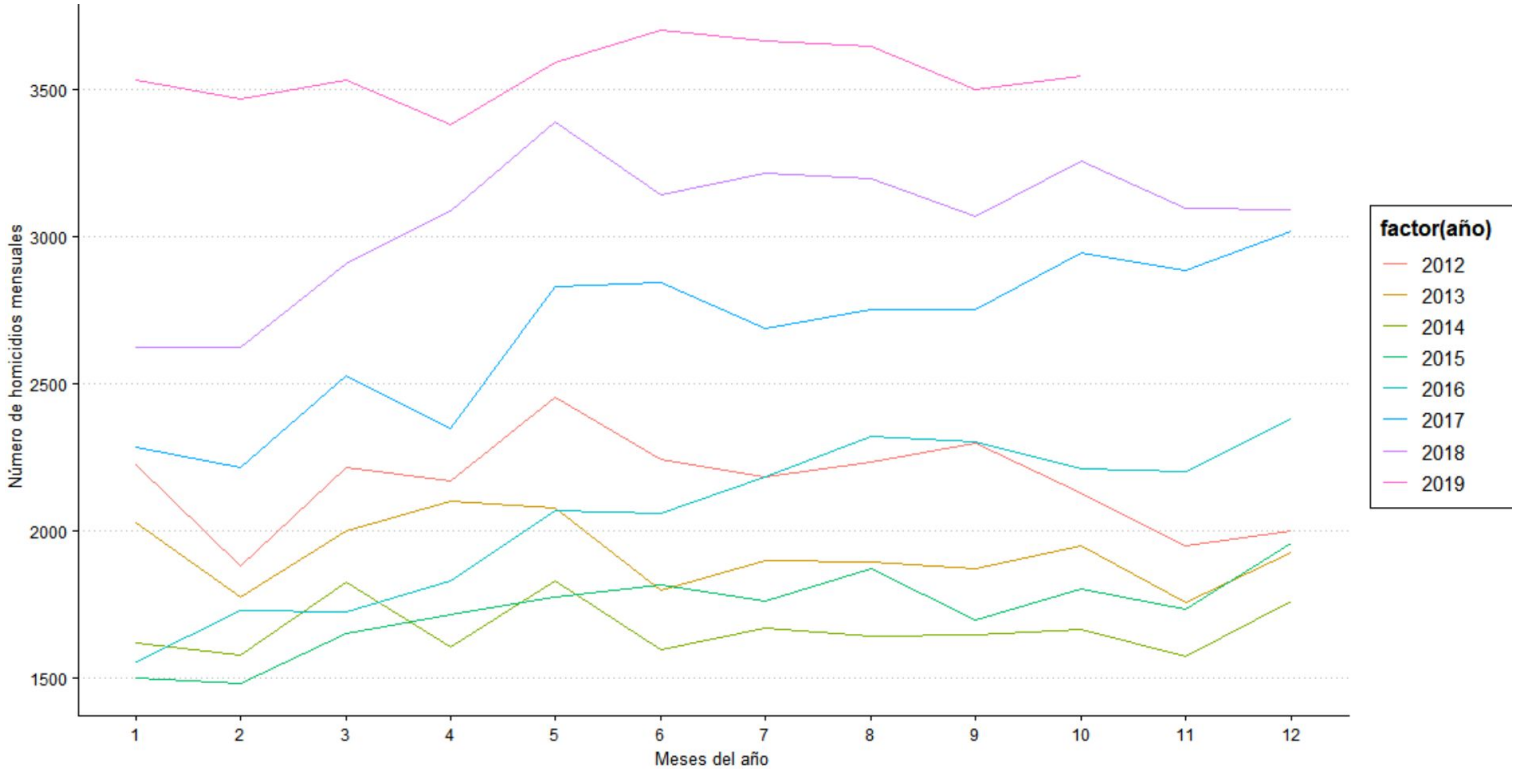


Análisis descriptivo

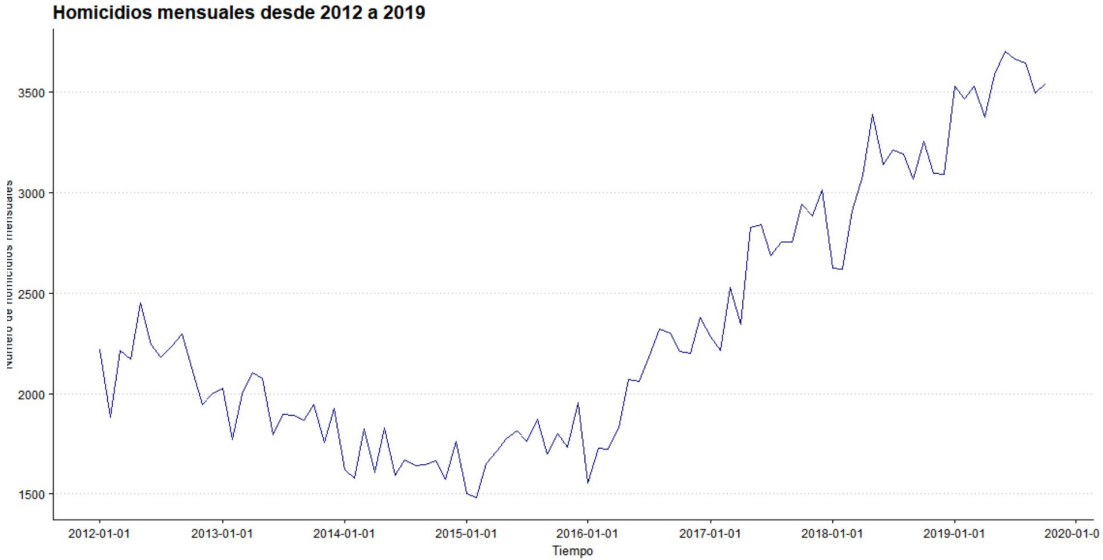


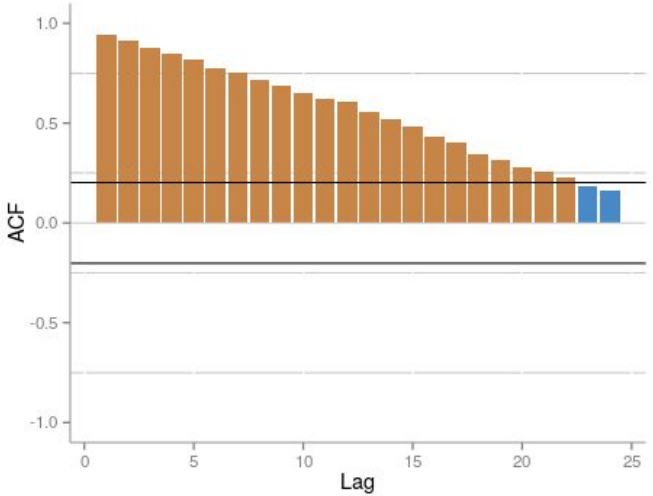
Periódo	Característica	Medida descriptiva
Ene. 2012 - Feb. 2014	Número de homicidios decreciente Mínimo local	Promedio tasas de variación:0.0083 Máximo: 2451 Mínimo: 1578
Feb. 2014 - Marzo 2016	Número de homicidios constante Variación constante alrededor del nivel	Promedio : 1698.3 Desviación estándar: 116.4
Marzo 2016 - Oct. 2019	Número de homicidios creciente Máximo local	Promedio de tasas de variación:0.0184 Mínimo:1723 Máximo: 3701

Análisis por mes



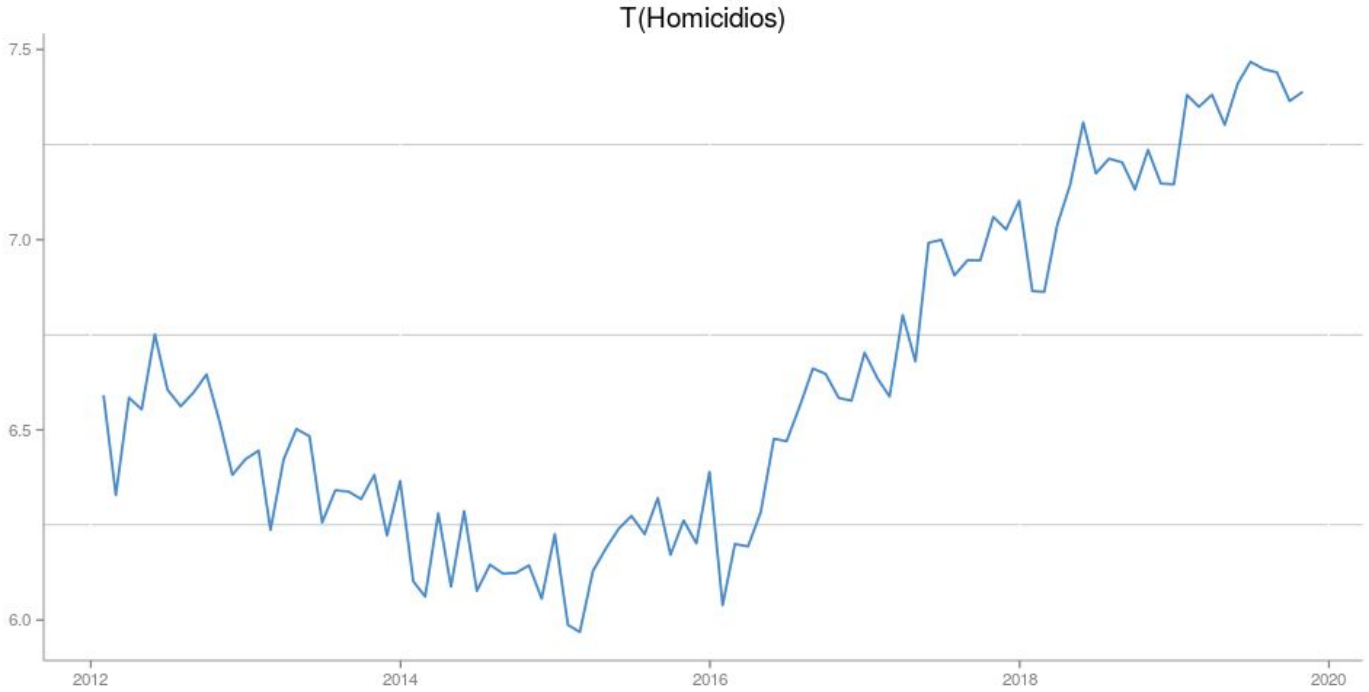
Análisis de series de tiempo



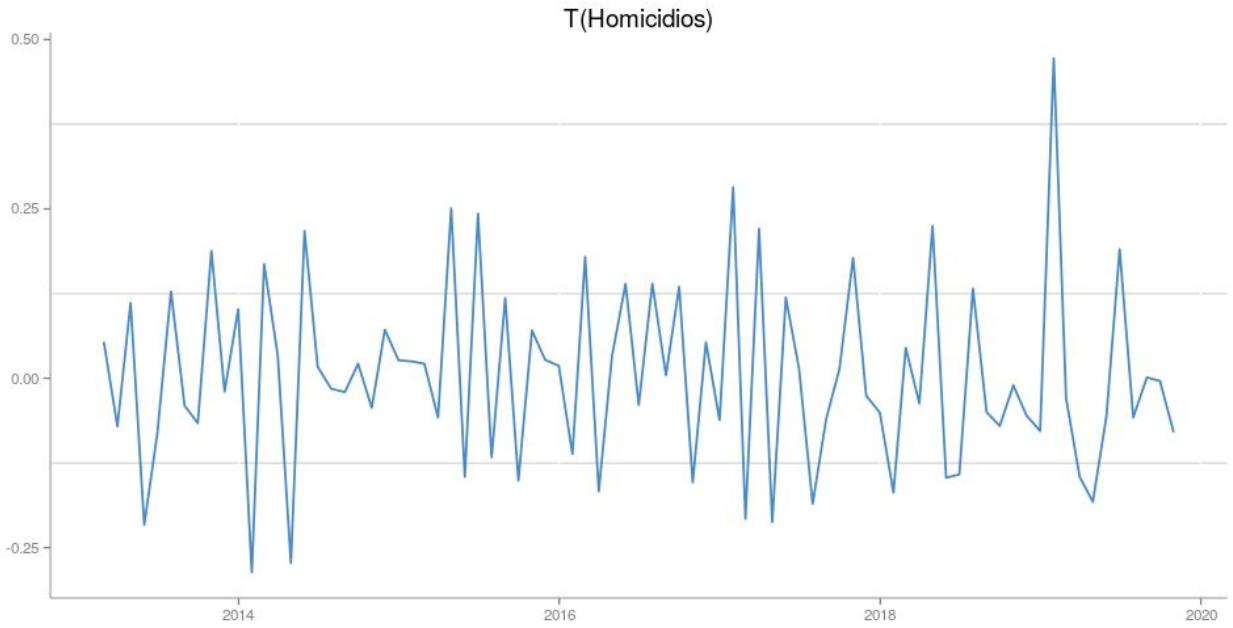


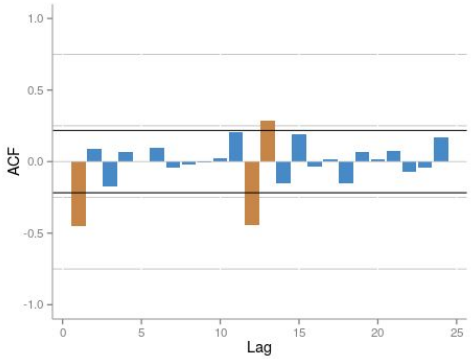
Aplicando Método Guerrero

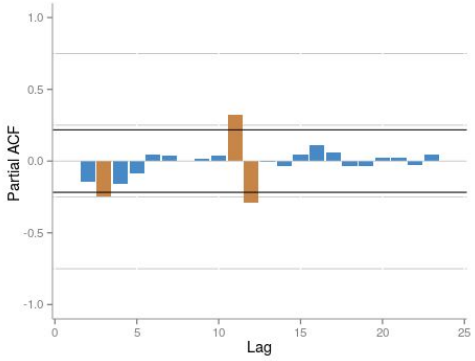
$\lambda = 0.2$



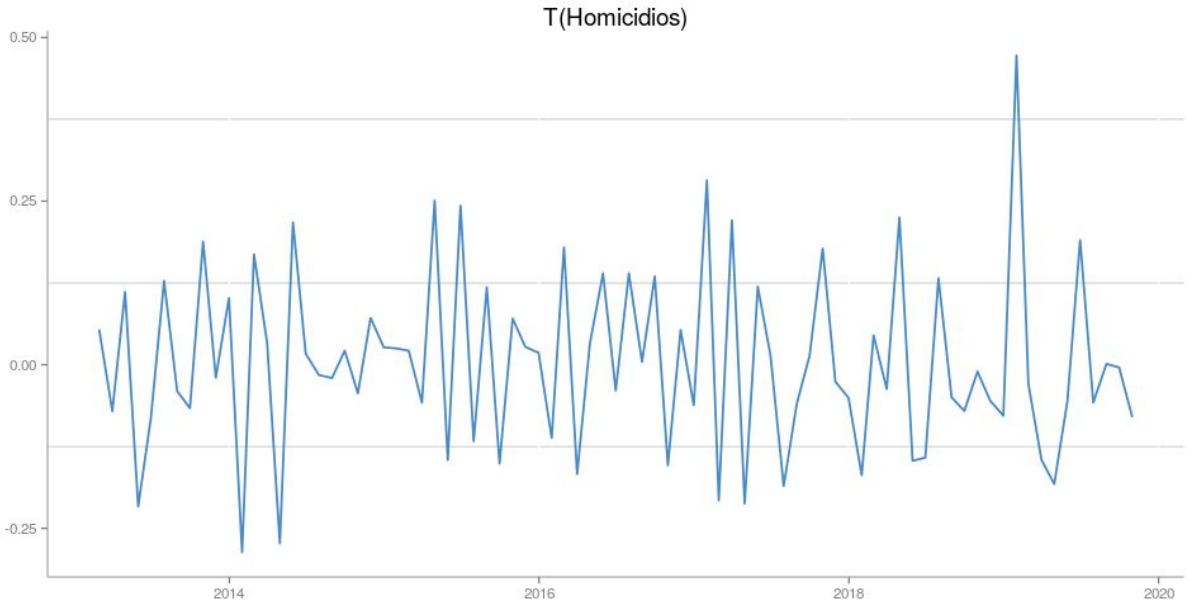
Aplicando una diferencia regular a la serie transformada

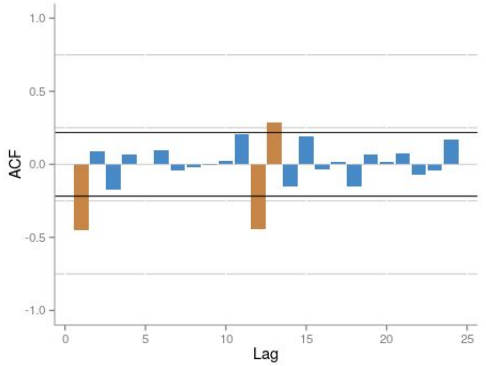


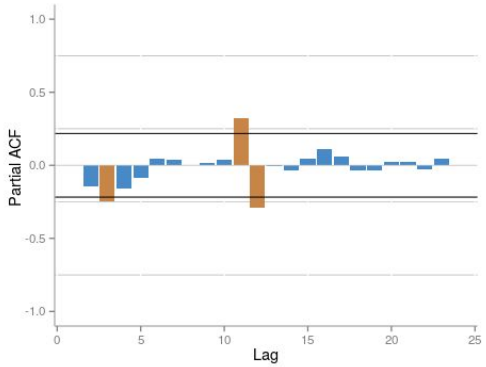




Aplicando una diferencia regular y una estacional

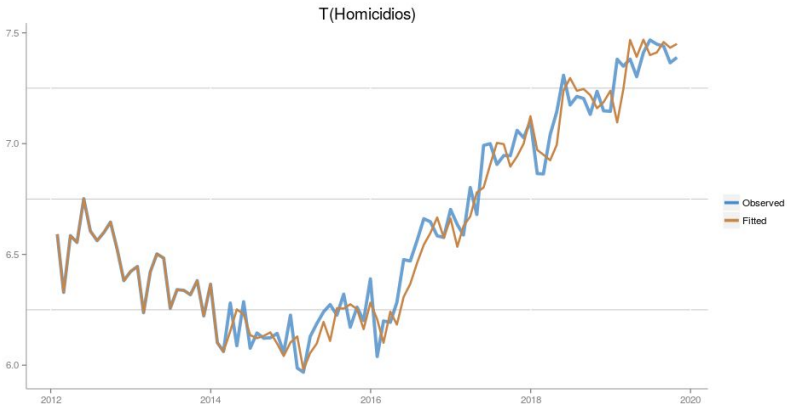






Modelo 1: ARIMA(1,1,0)(2,0,0)

$$(1-(\ -0.4131)B)(1-(0.2780)B^{12}-(0.3356)(B^{12})^2)\nabla T(Z_t)=a_t$$

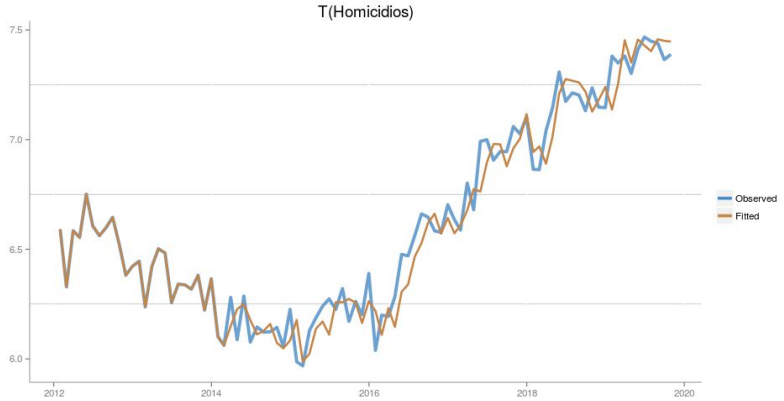


Num. Obs	Model ID	Estimated Parameter	95% Confidence Interval	Correlation between estimated parameters >0.5 or <-0.5	Mean of Residuals (t-ratio)	SD of Residuals	Q', d.f. (p-value)	rk(a) not 0	Large Residuals
94	ARIMA(1,1,0)(2,0,0) [12] RECOMENDADO	ar1=-0.387 sar1=0.212 sar2=0.351	(-0.544,-0.23) (0.047,0.376) (0.186,0.517)	r(sar2,sar1)=-0.54261	0.01828 (1.592)	0.094714	24.54,21 (0.268)	r18=-0.26	a85=3.01

Modelo 1.1: ARIMA(1,1,0)(2,0,0)

Sólo con el parámetro autorregresivo estacional de segundo orden

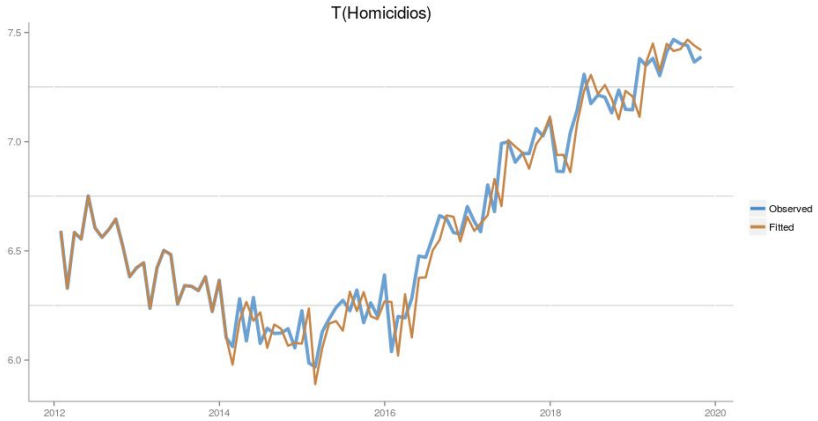
$$(1-(\ -0.3917)B)(1-(0.4666)(B^{12})^2)\nabla T(Z_t)=a_t$$



Num. Obs	Model ID	Estimated Parameter	95% Confidence Interval	Correlation between estimated parameters >0.5 or <-0.5	Mean of Residuals (t-ratio)	SD of Residuals	Q', d.f. (p-value)	rk(a) not 0	Large Residuals
94	ARIMA(1,1,0)(2,0,0)[12] SOLOSAR2	ar1=-0.392 sar2=0.467	(-0.548,-0.235) (0.324,0.609)	-	0.020826 (1.779)	0.096529	16.97,22 (0.765)	-	-

Modelo 2: ARIMA(0,1,0)(2,0,0)

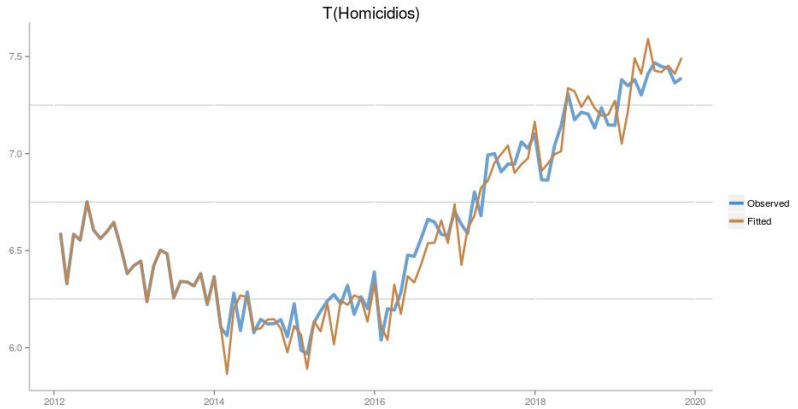
$$(1 - (0.4673)(B^{12})^2)\nabla T(Z_t) = a_t$$



Num. Obs	Model ID	Estimated Parameter	95% Confidence Interval	Correlation between estimated parameters >0.5 or <-0.5	Mean of Residuals (t-ratio)	SD of Residuals	Q', d.f. (p-value)	rk(a) not 0	Large Residuals
94	ARIMA(0,1,0)(2,0,0)[12] SOLOSAR2	sar2=0.467	(0.335,0.599)	-	0.015482 (1.214)	0.105971	38.5,23 (0.023)	r1=-0.42	-

Modelo 3: ARIMA(0,1,1)(1,1,0)

$$(1-(\ -0.5279)B^{12})\nabla\nabla_{12}T(Z_t) = (1-(\ -0.4192)B)a_t$$



Num. Obs	Model ID	Estimated Parameter	95% Confidence Interval	Correlation between estimated parameters >0.5 or <-0.5	Mean of Residuals (t-ratio)	SD of Residuals	Q', d.f. (p-value)	rk(a) not 0	Large Residuals
94	ARIMA(0,1,1) (1,1,0)[12]	ma1=-0.419 sar1=-0.528	(-0.588,-0.25) (-0.708,-0.348)	-	0.017732 (1.385)	0.106373	23.71,22 (0.363)	-	a85=3.11

Capacidad del Pronóstico (Modelo 1.1 vs 3)

In Sample

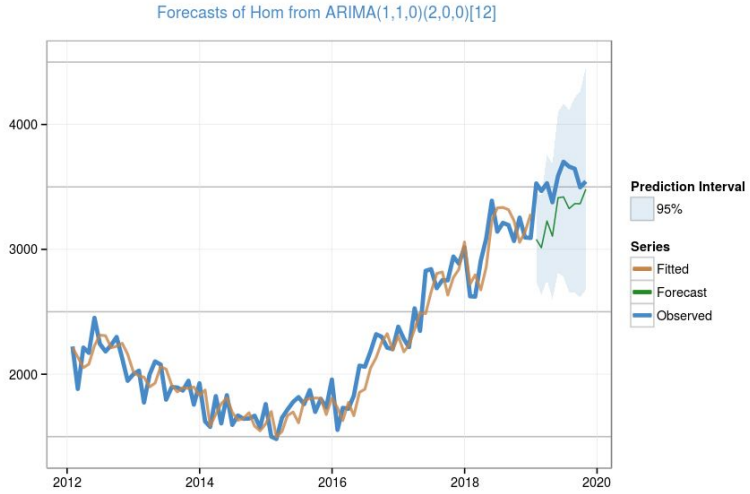
Type	ME	MPE(%)	MSE	MSPE(%)
Dynamic	300.93223	8.46812	101,411.43673	80.41051
Static	15.16268	0.41214	33,049.15409	26.61972

In Sample

Type	ME	MPE(%)	MSE	MSPE(%)
Dynamic	198.14284	5.62268	92,235.17797	74.82914
Static	-13.53633	-0.39432	71,534.13543	57.51886

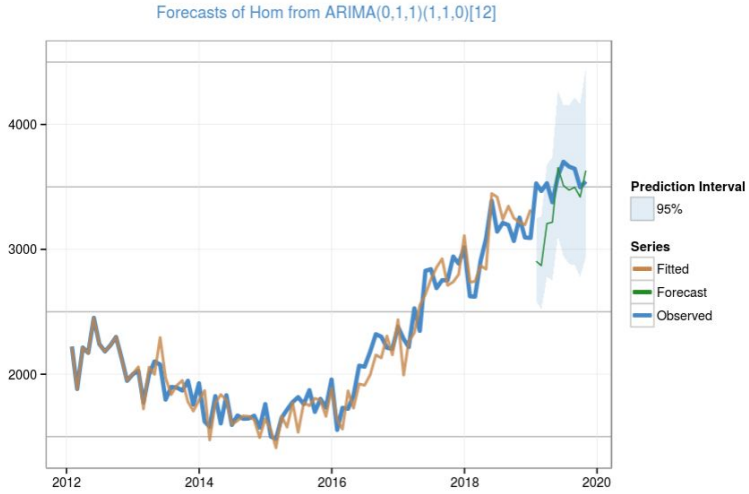
Capacidad del Pronóstico (Modelo 1.1 vs 3)

Out of Sample



Type	ME	MPE(%)	MSE	MSPE(%)
Dynamic	274.42094	7.73114	89,520.26889	71.34550
Static	13.64390	0.37168	35,497.52196	28.62075

Out of Sample



Type	ME	MPE(%)	MSE	MSPE(%)
Dynamic	215.81989	6.11474	98,766.14424	79.95560
Static	-10.43005	-0.30425	76,230.71004	61.38150

Conclusiones: Modelo 1.1