

Traffic Safety Facts

Research Note

Forecasts of Crash Fatalities During Summer Holiday Periods in 2004

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Generally, the fatality rates are higher during holiday periods than during non-holiday periods [1, 2]. Analysis and forecasting of the fatality rates during holiday periods are useful for providing warnings that may reduce fatalities. In preceding work, two time series techniques, Holt-Winters (HW) Algorithm and Autoregressive Moving Average Model (ARMA), had been employed to analyze and forecast the fatality counts during holiday periods [2]. For three summer holiday periods in 2003, two forecasts were made based on 1982-2002 historical data. In Table 1, these forecasts are compared with the FARS (Fatality Analysis Reporting System) 2003 Early Assessment File (EAF)[†], to examine the accuracy of the forecasts.

Table 1
Fatalities in Three Summer Holiday Periods in 2003

Holiday Period	FARS 2003 EAF*	Forecasts	
		HW	ARMA
Memorial Day	497	508	504
4 th of July	552	537	564
Labor Day	541	526	545
Total	1590	1571	1613

Note: * Early Assessment Files (EAF) of FARS.

In this report, we provide our estimates of fatality counts for three summer holiday periods in 2004. Two similar time series techniques [2] are used to do the analyses and forecasts based on 1982-2002 historical data and 2003 EAF files data. That is, the forecasts are based on an in-

ferred study of past general data behavior over time (time series). The fatality counts for 1998-2003 are shown in Table 2, along with the HW and ARMA forecasts for 2004.

Table 2
Three Summer Holiday Periods' Fatality Counts for 1998-2003 and Fatality Forecasts for 2004

Year	Memorial Day	4 th of July (days)	Labor Day
98	393	479 (3)	464
99	500	509 (3)	485
00	466	717 (4)	529
01	515	207 (1)	481
02	491	683 (4)	541
03*	497	552 (3)	541
04	HW: 511 ARMA: 506 95% C.L. (417, 595)	HW: 547 ARMA: 564 95% C.L. (419, 709)	HW: 546 ARMA: 545 95% C.L. (468, 622)

Notes: * 2003 Early Assessment Files of FARS.

Three Summer Holiday Periods in 2004

Memorial: 6:00 pm Fri. 05/28/04 to 5:59 am Tue. 06/01/04

4th of July: 6:00 pm Fri. 07/02/04 to 5:59 am Tue. 07/06/04

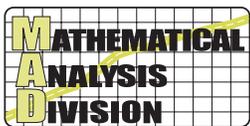
Labor Day: 6:00 pm Fri. 09/03/04 to 5:59 am Tue. 09/07/04

† Subject to change when the final files of FARS 2003 are available.

[1] U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, <<Traffic Safety Facts 2002>>.

[2] Cejun Liu and Chou-Lin Chen, *Time Series Analysis and Forecast of Crash Fatalities during Six Holiday Periods*, U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis, NHTSA Research Note DOT-HS- 809-718.

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