

# HARBINGERS of VIOLENCE Predicting Armed Conflict

Can a correlation be established between a set of given factors and the occurrence of armed conflict? Students at Lehman College, City University of New York, examined this question during the Fall semester of 2006. Geographic Information Science technology and geospatial statistics were employed for use in analysis as well as to provide a visual means of illustrating the process and results.

Conditions existing during two separate decades, 1975-1984 and 1995-2004, were studied in order to determine the potential association with non-internationalized internal conflicts occurring in the subsequent decade. Variables were chosen based on a review of the literature regarding the conditions believed to be of significance to the occurrence of armed conflict.

Conflicts were defined according to a dataset for armed conflict which was developed through a joint project between the Uppsala University Conflict Data Program (UCDP) and the International Peace Research Institute (IPRI) in Oslo. Illustrated results reflect findings using non-internationalized internal violence (Type 3).

Major and minor conflicts were differentiated as follows: Major conflicts entail over 1,000 battle-related deaths, and minor conflicts indicate between 25-999 such deaths.

Three decades of armed conflict were examined: 1975-1984, 1985-1994, 1995-2004, in order to predict potential Type 3 conflict for 2005-2014.



Exploratory spatial data analysis was performed on the following variables in order to quantify their predictive power: polity and government; political rights; civil liberties; voter turnout; government spending (infrastructure, education, transportation, etc.); Gross National Income; military spending; health and infant mortality; disasters (famine, drought, earthquake, human-induced, etc.); linguistic, racial, ethnic, and religious fractionalization; poverty and wealth; fertility rate; population density; population displacement; crime rates; trade (imports and exports, external debt); labor force (employment and unemployment, strikes and walkouts, etc.).



Several statistical techniques were employed to analyze the data, including geographically weighted regression, spatially lagged regression, and conditional logistic regression. The prediction of future Type 3 conflicts was carried out by applying the formulas suggested by the conditional logistic regressions to the data from 1995 to 2004. This, in theory, would model the locations of likely conflicts occurring between 2005 and 2014.

Country Name	Predicted Type 3 Conflict 2005-2014
Afghanistan	major
Algeria	minor
Bosnia And Herzegovina	minor
Burkina Faso	minor
Cambodia	minor
Chad	major
Colombia	minor
Democratic Republic Of Congo	major
India	major
Indonesia	minor
Iran	minor
Iraq	major
Liberia	major
Myanmar	minor
Niger	minor
Rwanda	minor
Sudan	major
Tanzania	minor
Turkey	minor
United Kingdom	minor



Results of analysis revealed that the single largest indicator of armed conflict for a given decade is the occurrence of armed conflict in the preceding decade.

Two other factors were also shown to have a significant bearing on the occurrence of Type 3 conflict: the literacy rate of a country, and the mean political duration of the country's governing body.

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Data sources: Environmental Systems Research Institute (ESRI); United Nations; CIA; World Bank; International Monetary Fund (IMF); UCDP; IPRI; Emergency Disasters Database (EM-DAT - World Health Organization); U.S. Census; Correlates of War Project; International Labour Organization (ILO); World Almanac.