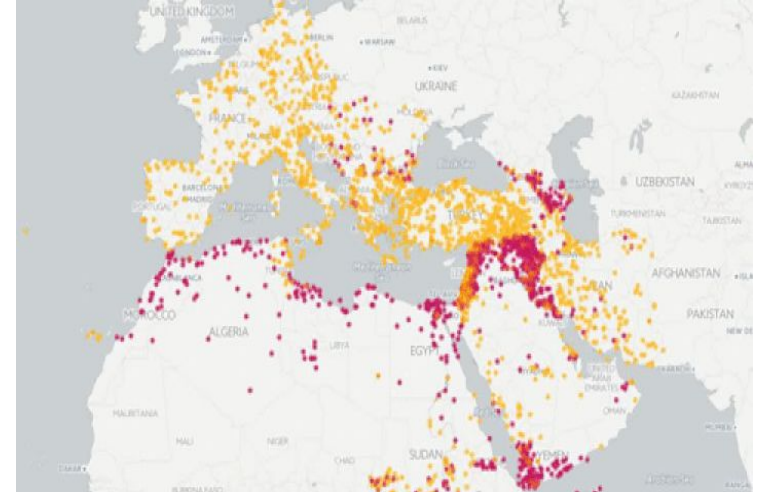


# Europe's Migrant/Refugee Deaths since 1993

Time-Series Analysis and Predictions

# Europe's Migration Crisis:

1. Humanitarian problems need impactful solutions
2. \$Billions spent with 'intended' and 'unintended' outcomes
3. National and EU Policy Outcomes require 'accurate' observations



- Death Records are Important!

# Where was the data?

## Dataset Used

- NGO collected death count since 1993
- Using The Guardian's Total Death Findings

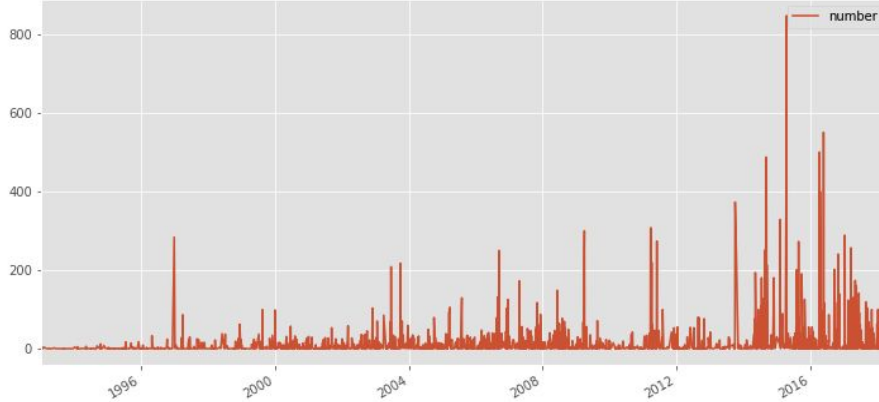
The two major death datasets are sourced from the News media.



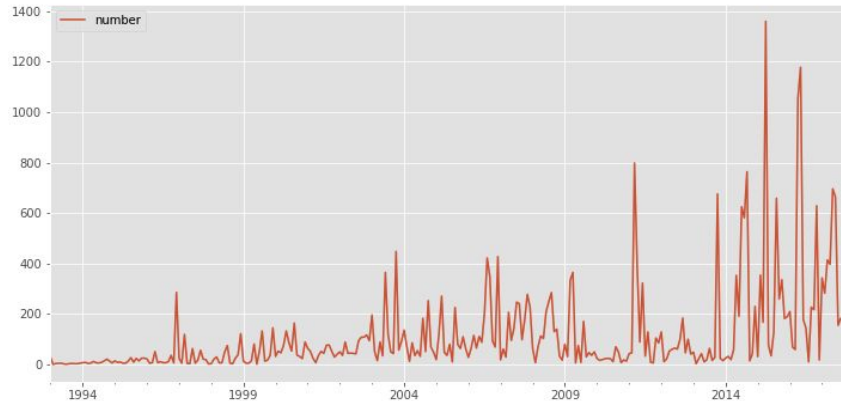
## Potential Problems with Dataset

1. Undercounting (Media)
2. Overcounting (Misidentification)

## Daily Deaths



## Monthly Deaths



- 34,361 deaths Total
- 80% drowned
- 2015 Large Boat Disaster
- Low 90s counts, borders were more lax

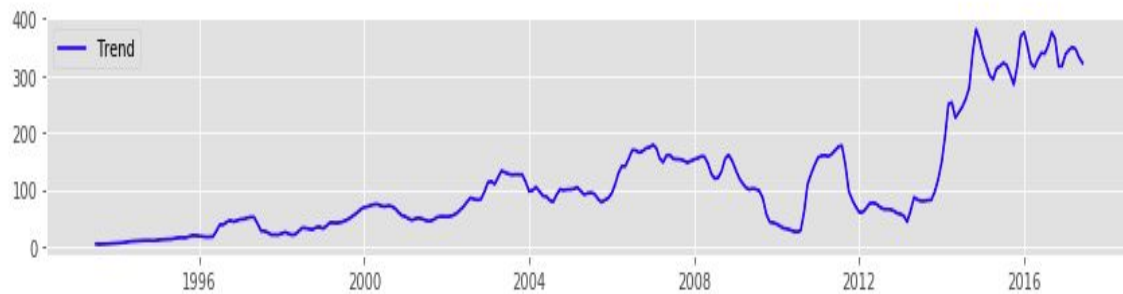
## Europe's various responses (**intended**)

Late 1990s	Late 2000s	2005	2009
Italy's Naval Blockade	Spain's S.I.V.E. System	New EU Border Agency: Frontex	Italy's Libya push

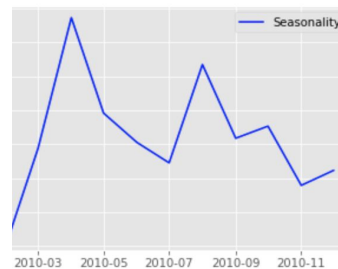
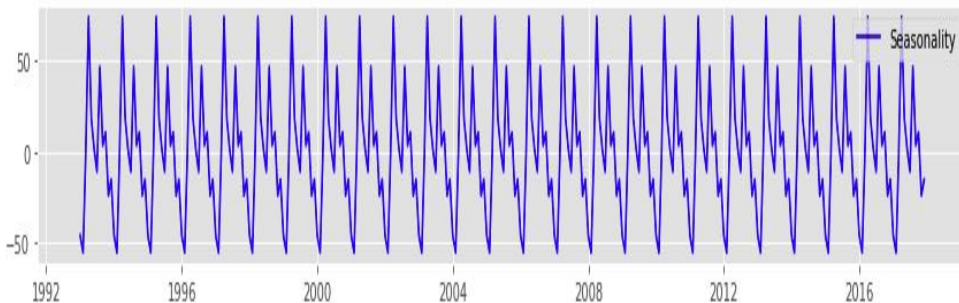
Increased enforcement, migrants resort to more dangerous routes to avoid detection, which lead to increased deaths (**unintended**).

# Trends in Deaths over time

**Goal:** “Essentially looking for patterns to understand the data in a way to make accurate predictions about the future.”



Long Term Trend:  
increase in Deaths



Just 2010

Seasonality: outside influences

# Time Series: Plan

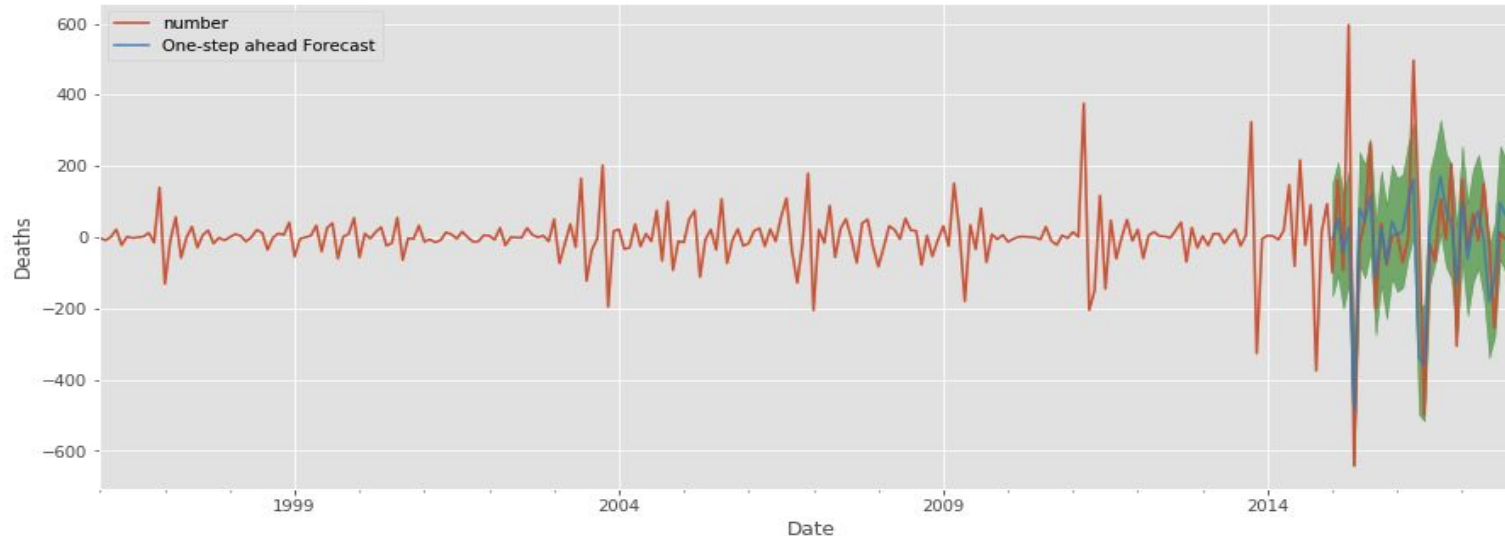
## **Steps Finding Best Model**

1. ACF/PACF
2. Best Model was transformed Subtracted Rolling Mean SARIMA model
3. GridSearch for Non-Seasonal (p,d,q), and Seasonal (P,D,Q) components.

# Model Results: Predicting 2015-18

## Different Model Trials

	Real
Real	1.000000
OrigMonthlypred	0.014122
SRollMeanPred	0.965009
SQRTpred	-0.037280
Dynamic_SRollMeanPred	0.715320

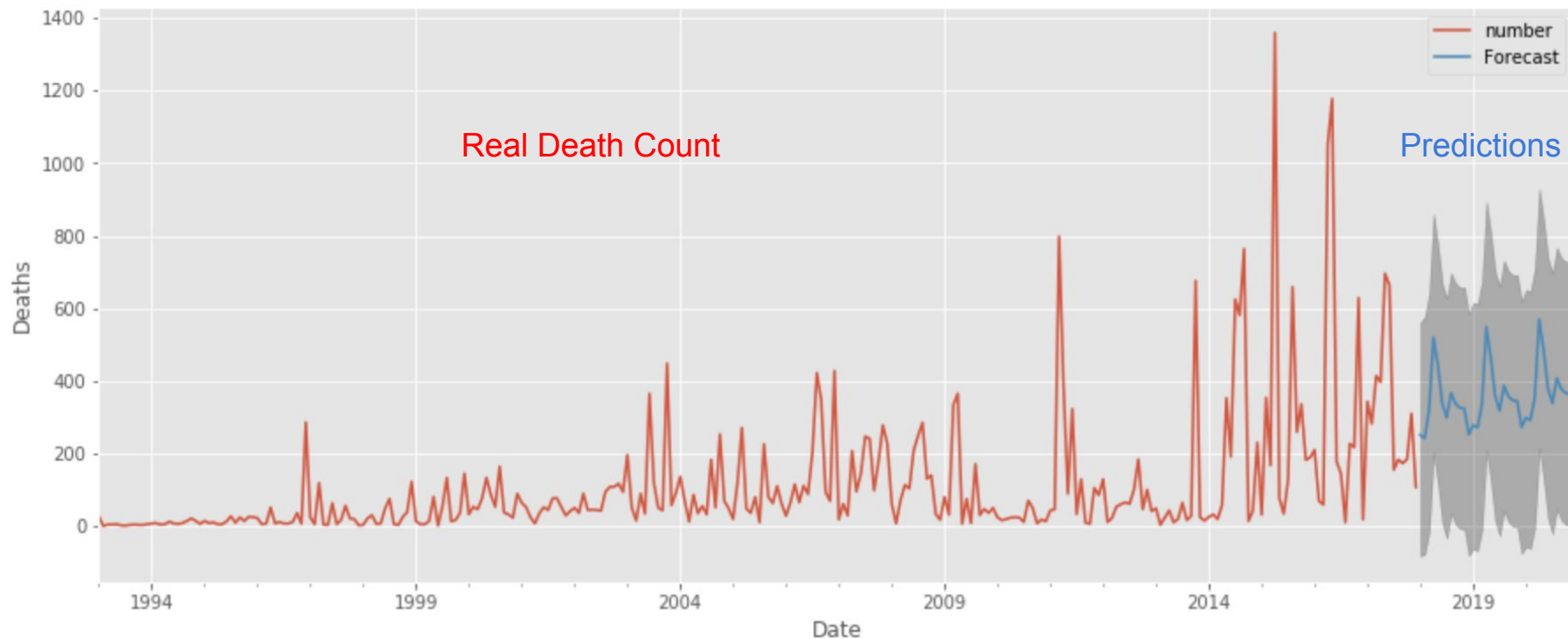


Real Death Count

Predictions

**Best**  
96% correlation  
between Real and  
Predicted deaths  
starting 2015

# Predicting 2018, 2019, 2020



Grey Shade = Prediction's Confidence Levels



# Importance of tracking and understanding Death Data

1. Responsibility to Investigate tragedies to find interventions
2. Humane

# Works Cited

[https://publications.iom.int/system/files/pdf/fataljourneys\\_countingtheuncounted.pdf](https://publications.iom.int/system/files/pdf/fataljourneys_countingtheuncounted.pdf)

<http://www.danielrossi.nl/refugee-map-europe/>

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<https://github.com/ondata/the-list>