

# Europe's Refugee Crisis





**This story describes the refugee crisis affecting Europe  
and recommends how to respond**

**Define the Problem?**

*How should Europe Deal with the  
Migration Crisis?*

**Is the crisis over or evolving?**

**Where do migrants come from?**

**How do migrants get to Europe?**

**Where do migrants go in Europe?**

**Are there humanitarian costs?**

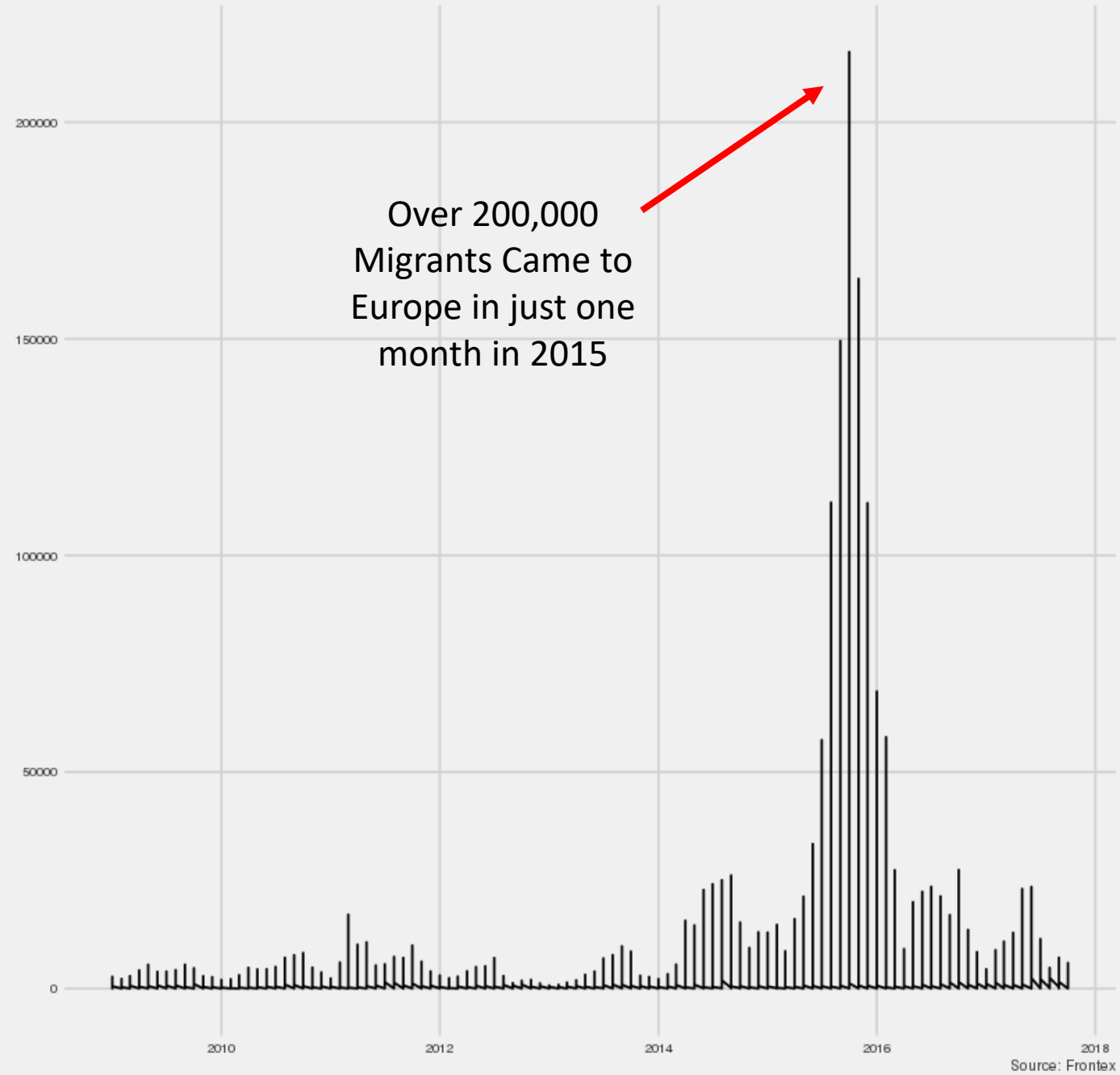




**Europe witnessed an explosion of migration starting in 2015**



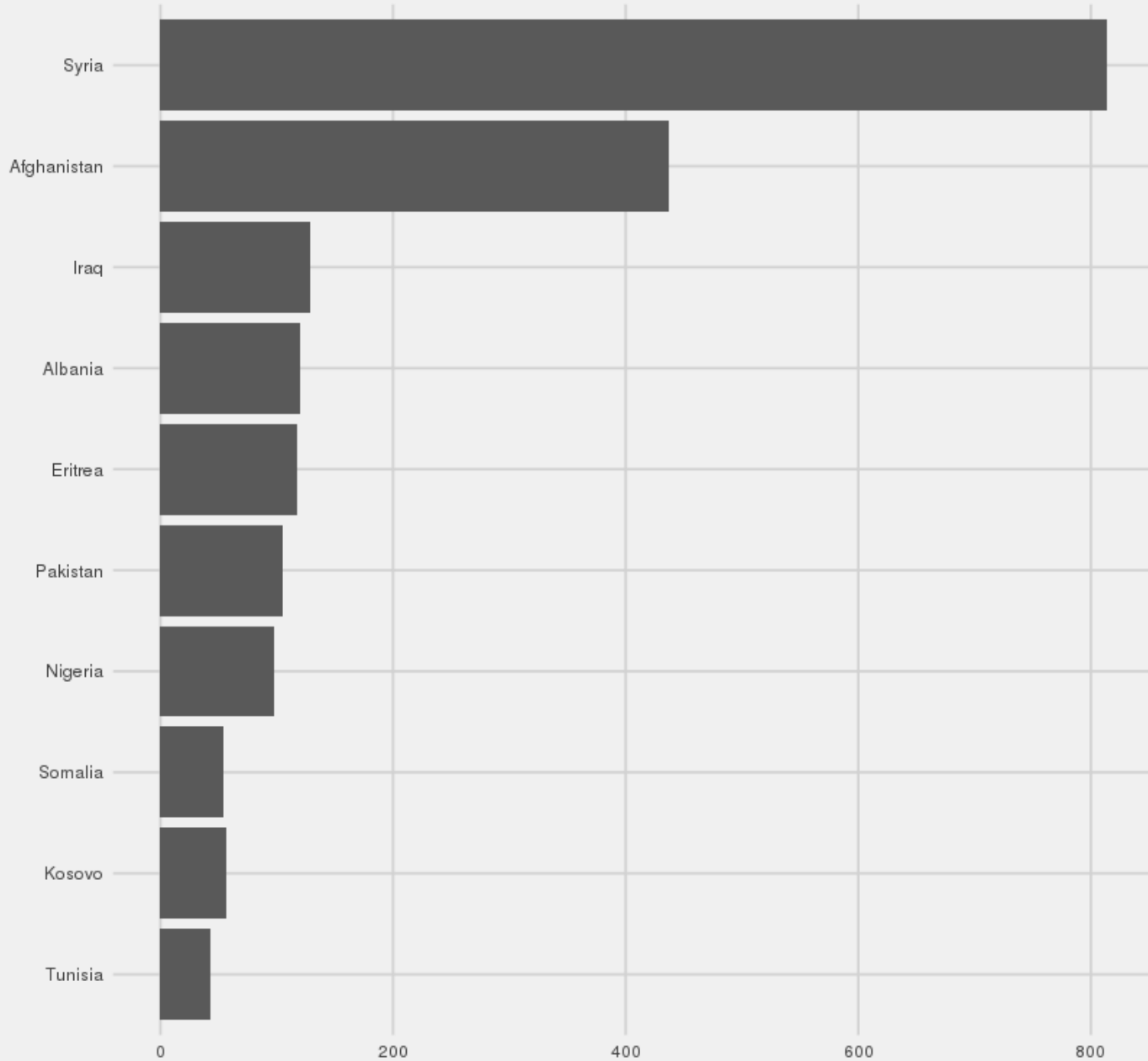
Migrants Traveling to Europe by Date





## Top 10 Migrants to Europe by Nationality

Shown in Thousands



Source: Frontex




**Since 2012, Syrians  
represent the largest share  
of migrants coming to  
Europe**



# Why are Syrians Coming to Europe?







The ongoing civil conflict in Syria has generated one of the world's worst migrant crises on record. UNHCR estimates more than 5 million Syrian refugees have been displaced to other countries and nearly 6.3 million Syrians have been internally displaced.



**After 7 years the Syrian conflict  
rages on with no end in sight**



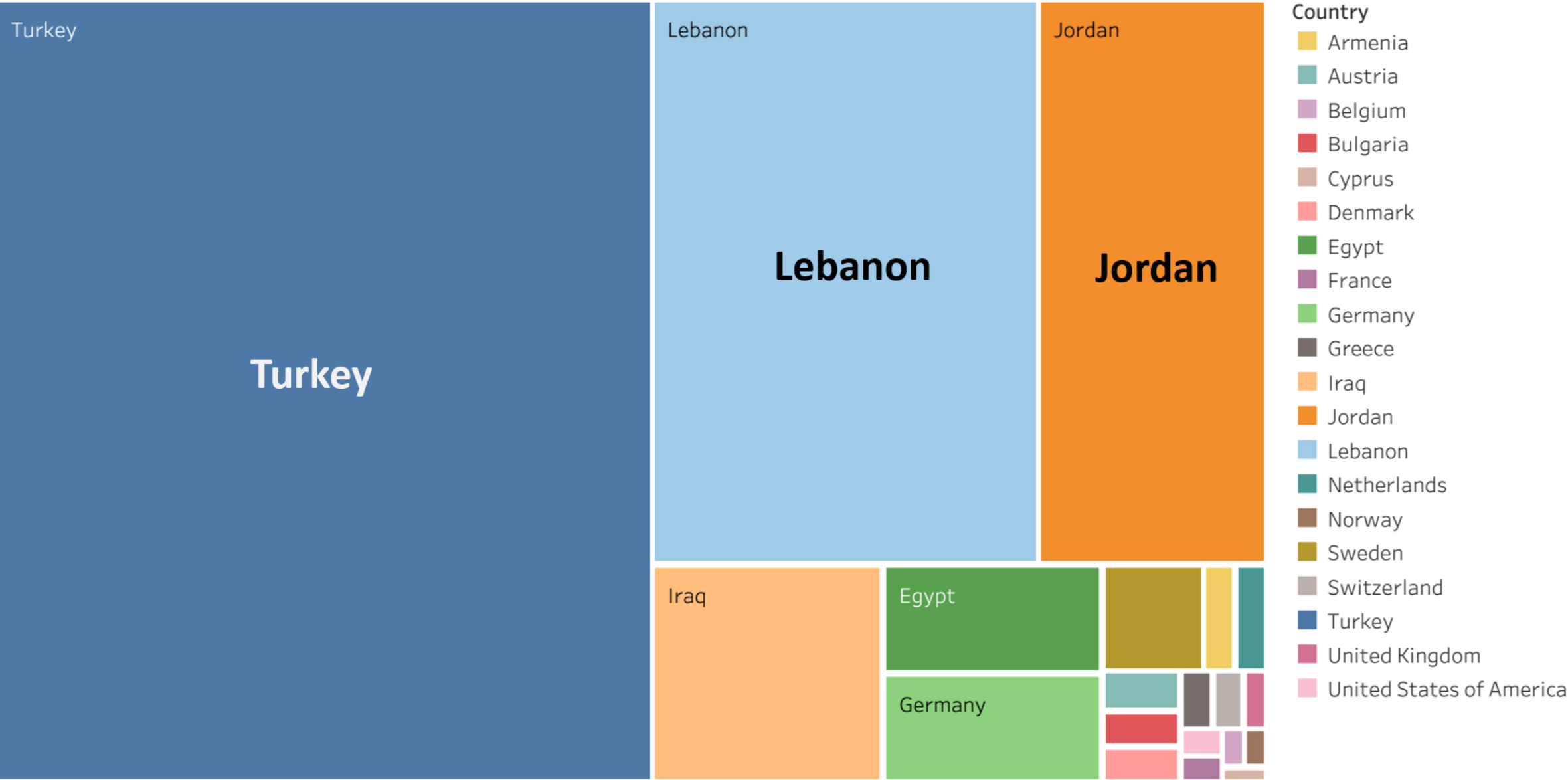


# **Are All Syrian Refugees Coming to Europe?**





# Turkey, Lebanon, and Jordan host the largest number of Syrian refugees



Source: UNHCR

Country. Color shows details about Country. Size shows Number of Records and Refugees. The marks are labeled by Country.



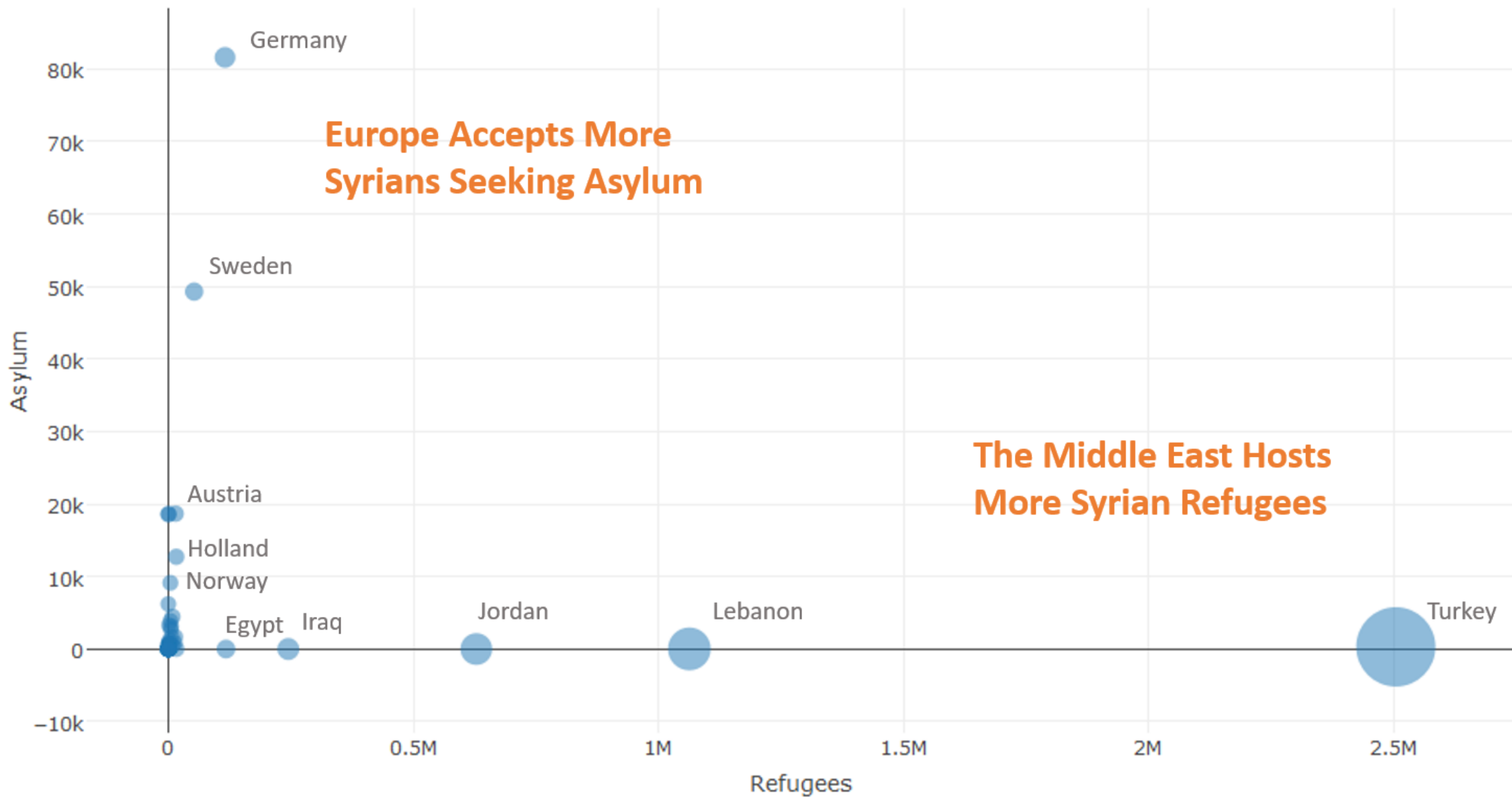


**Yet, Almost 1 million Syrian Refugees have Traveled to Europe Seeking Stability, Peace, and Asylum**





# Syrian Refugee Countries vs. Syrian Asylum Countries in 2015



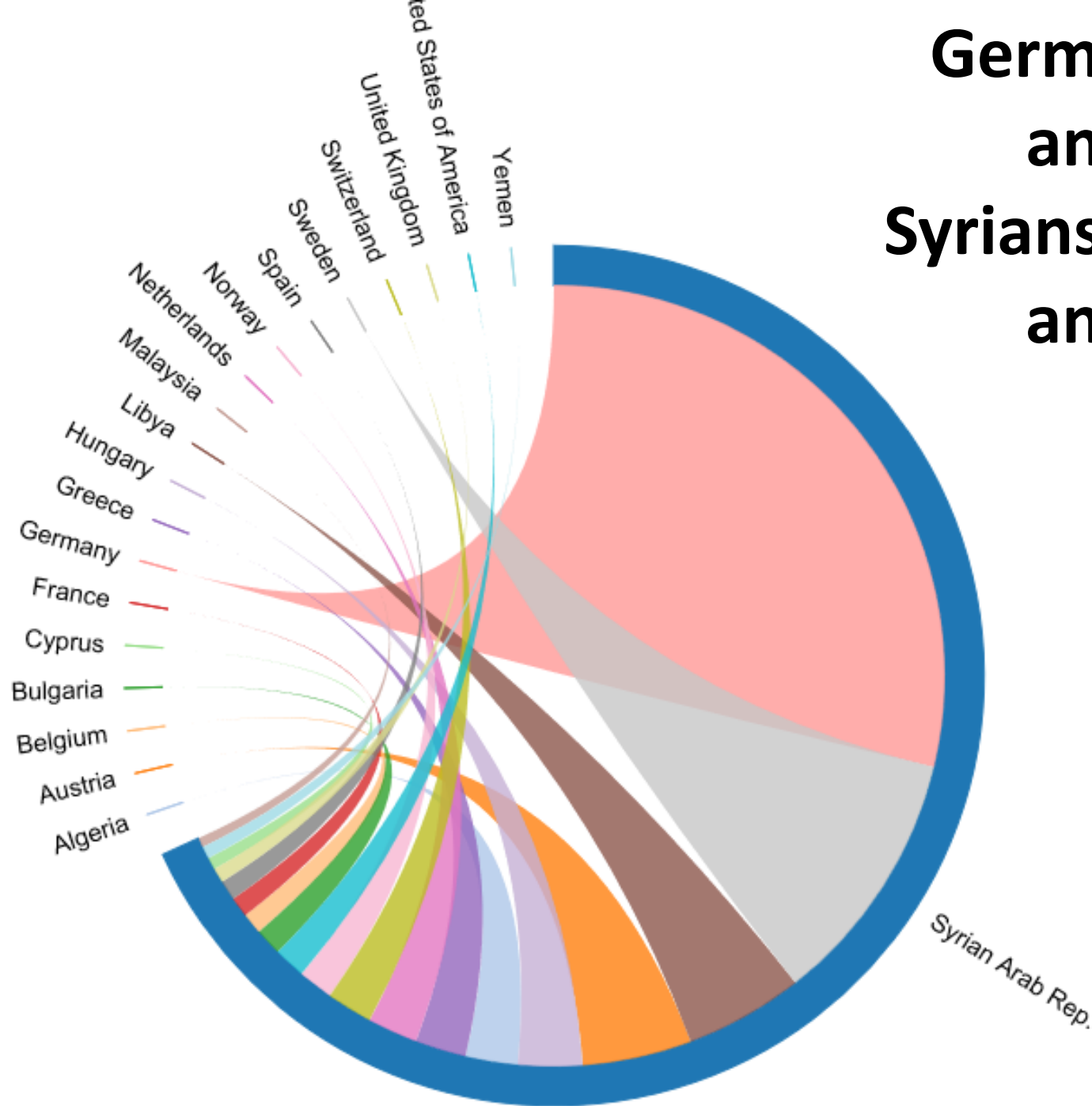
Source: UNHCR



# **Which European Countries are Most Affected?**

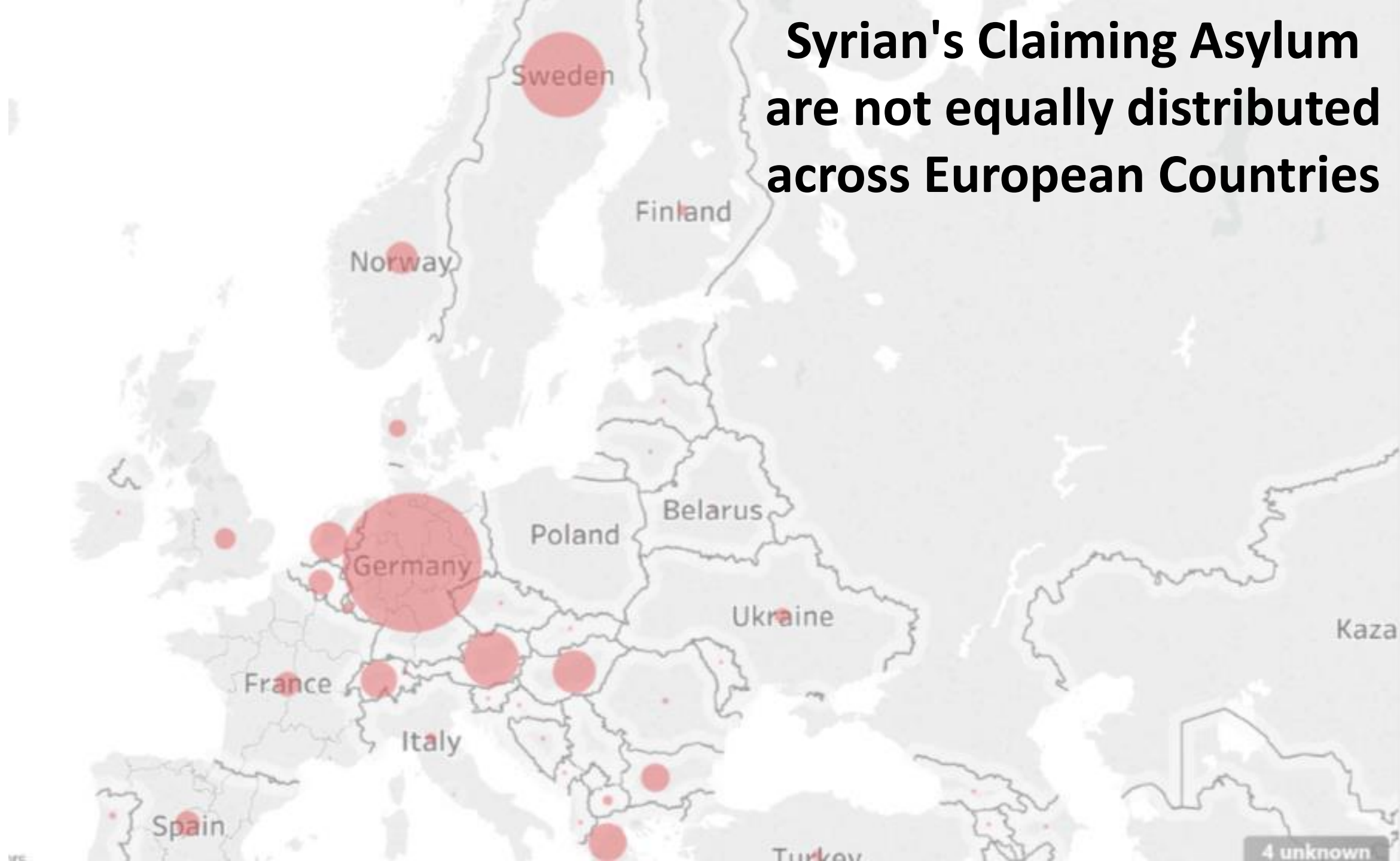


**Germany, Sweden, Austria,  
and Hungary have more  
Syrians Seeking Asylum than  
anywhere in the Europe**





**Syrian's Claiming Asylum  
are not equally distributed  
across European Countries**

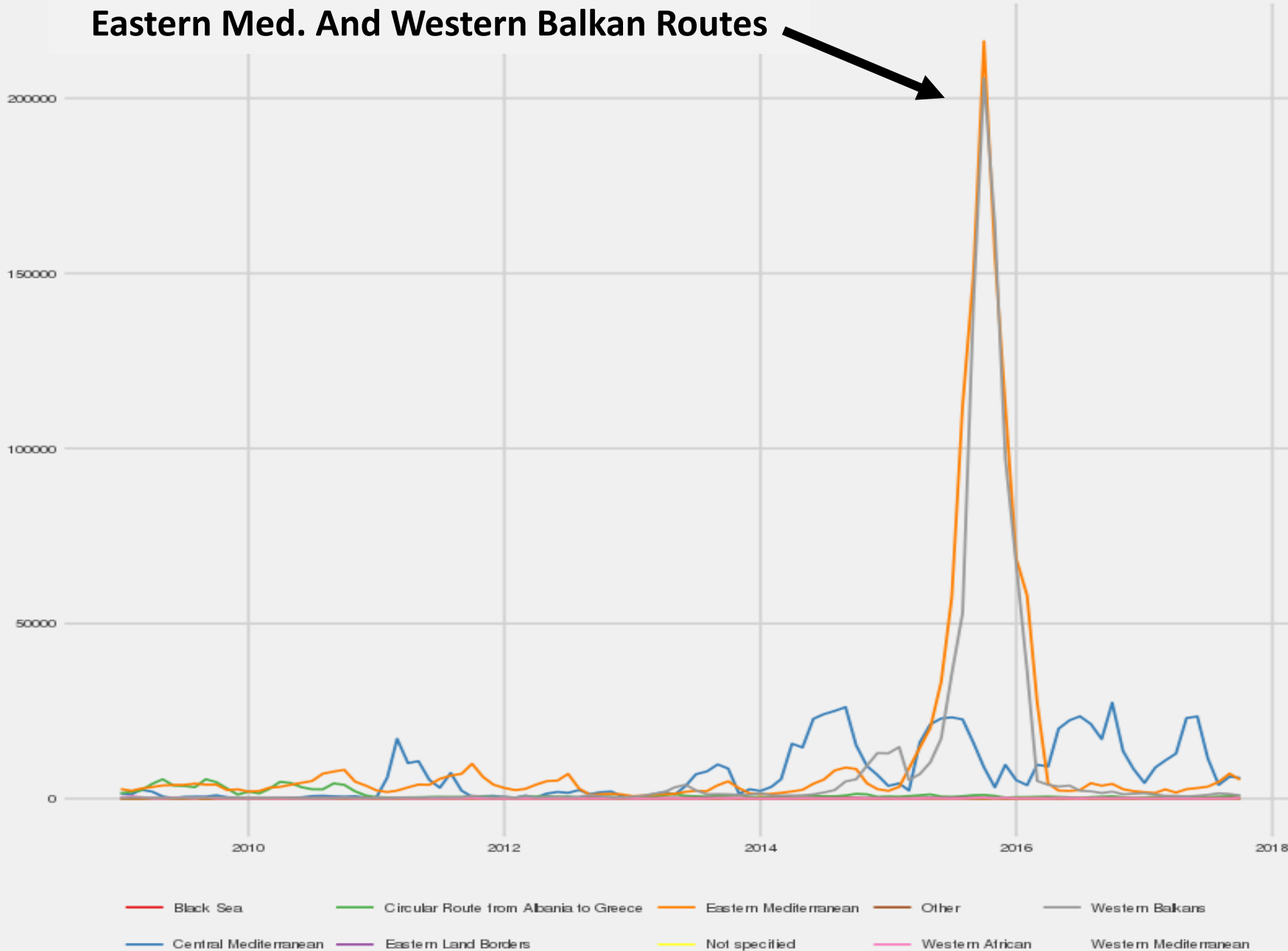


# How Do Syrian Migrants get to Europe?





## Eastern Med. And Western Balkan Routes



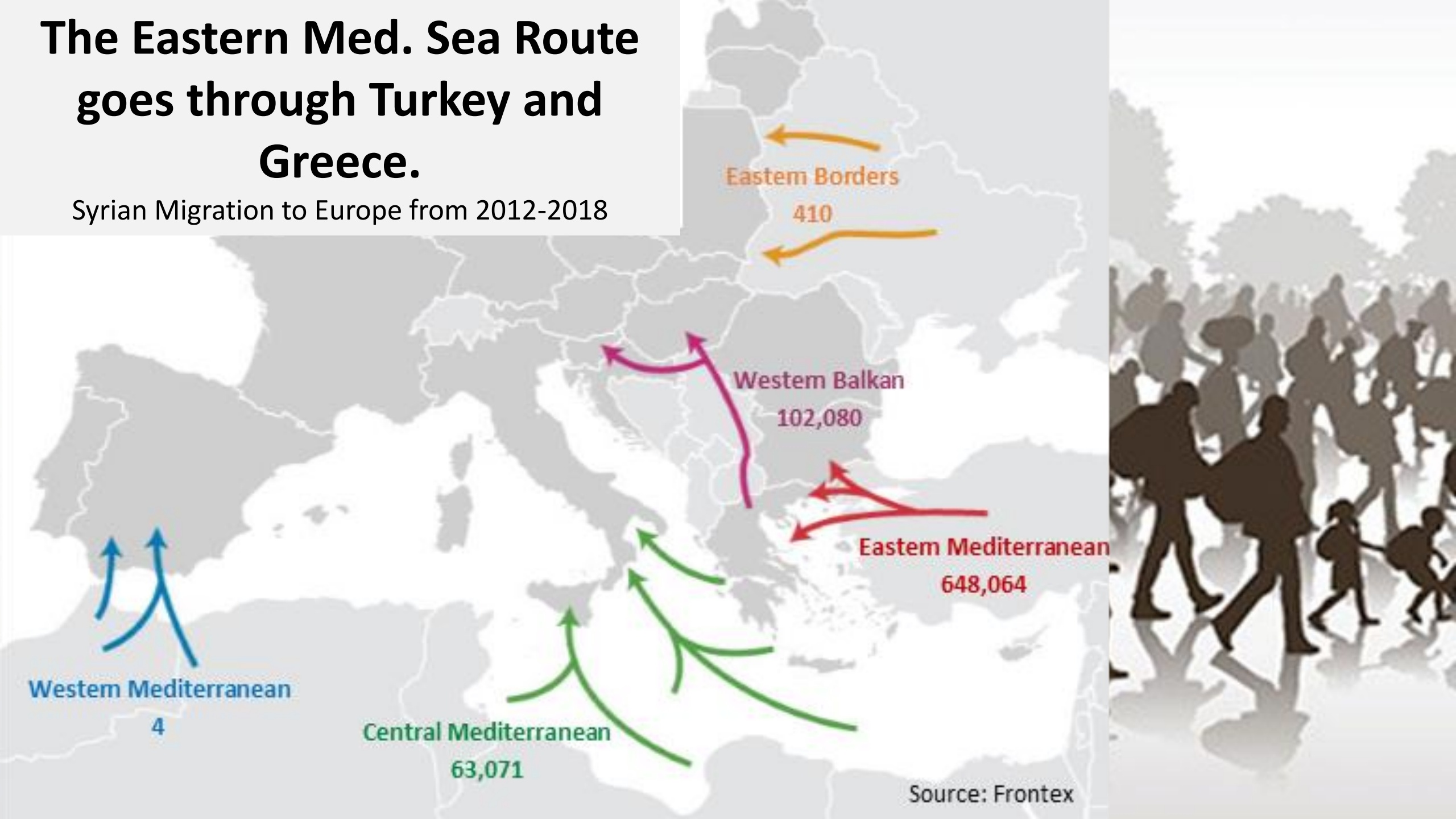
Source: Frontex

**In 2015, Migrants poured into Europe via the East. Med and Western Balkan Routes**



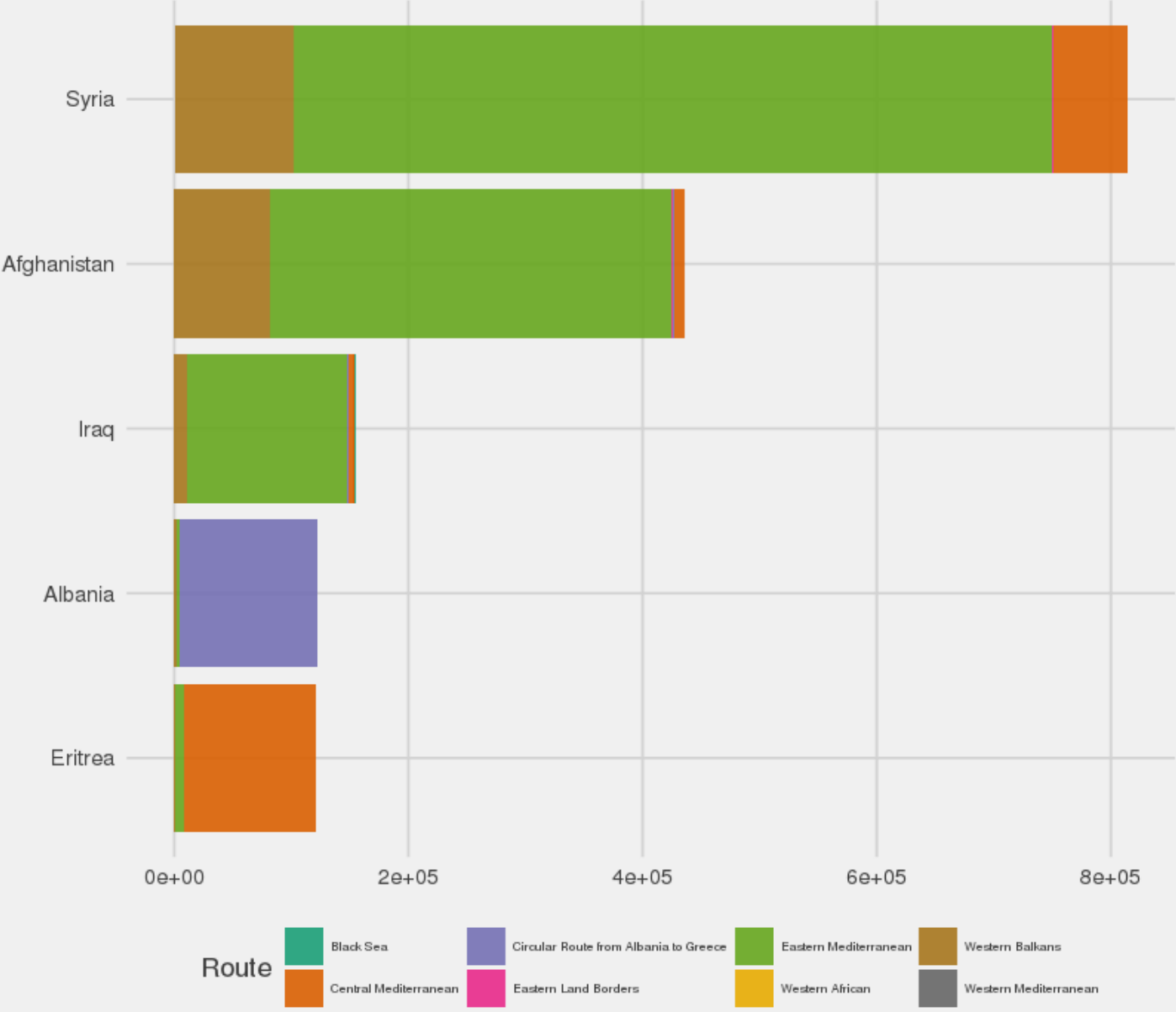
# The Eastern Med. Sea Route goes through Turkey and Greece.

Syrian Migration to Europe from 2012-2018





Routes used by Countries with Largest Share of Migrants Coming to Europe



Syrian's largely use the Eastern Med. Sea Route

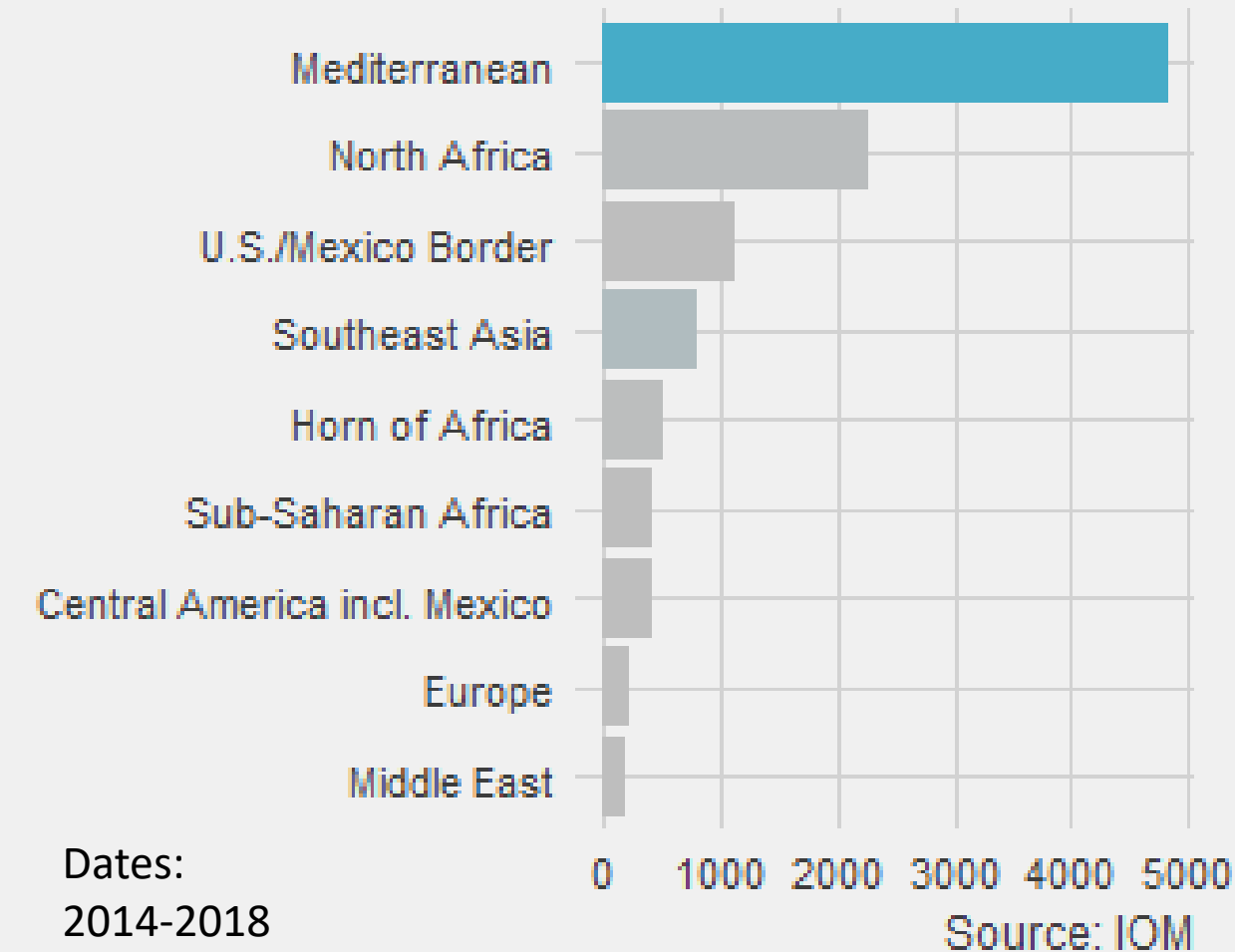


Source: Frontex

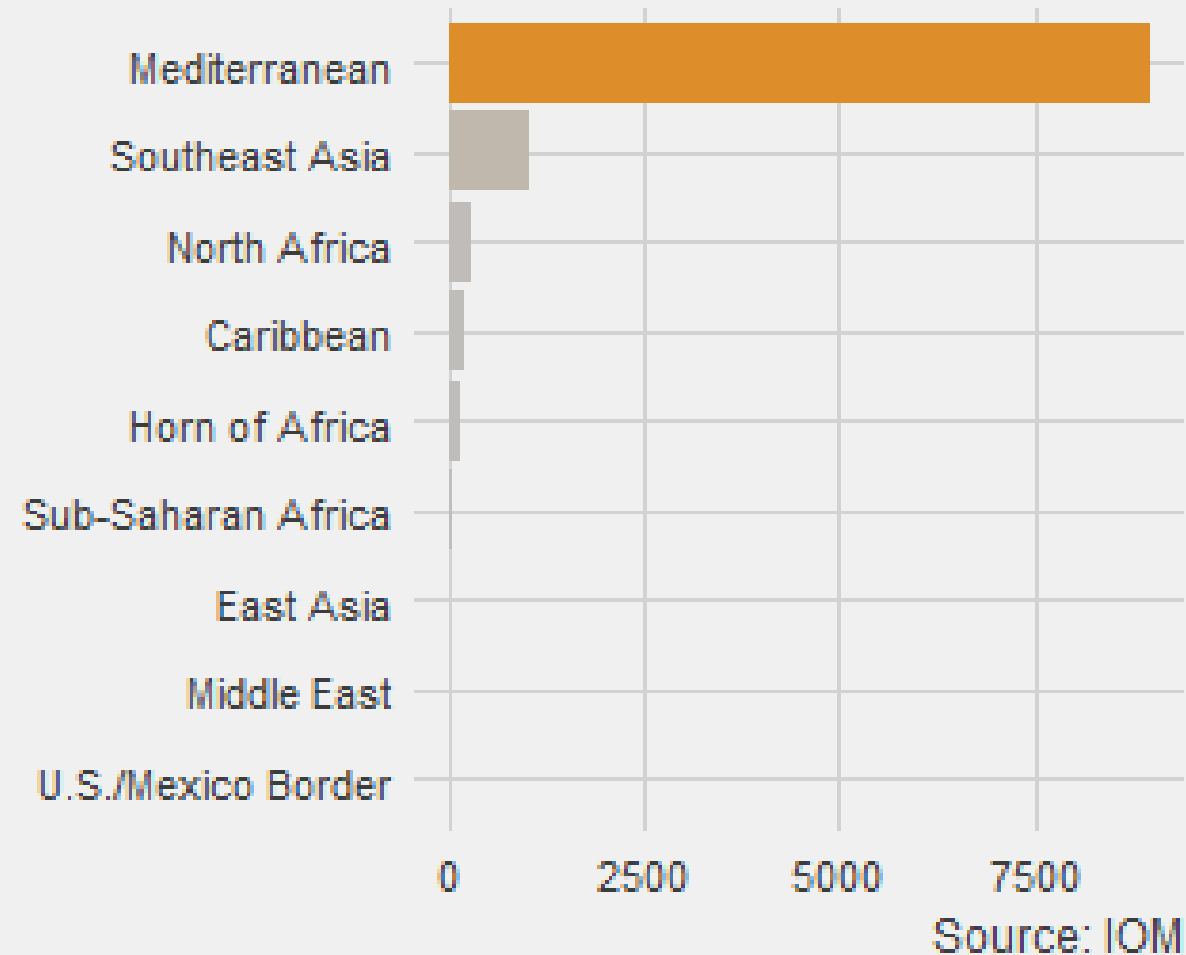
# Mediterranean Sea is the Most Dangerous Place for Migrants

*Nearly 15,000 migrants have gone missing or perished in the Mediterranean Sea since 2014*

**Migrant Deaths  
Recorded by Region**

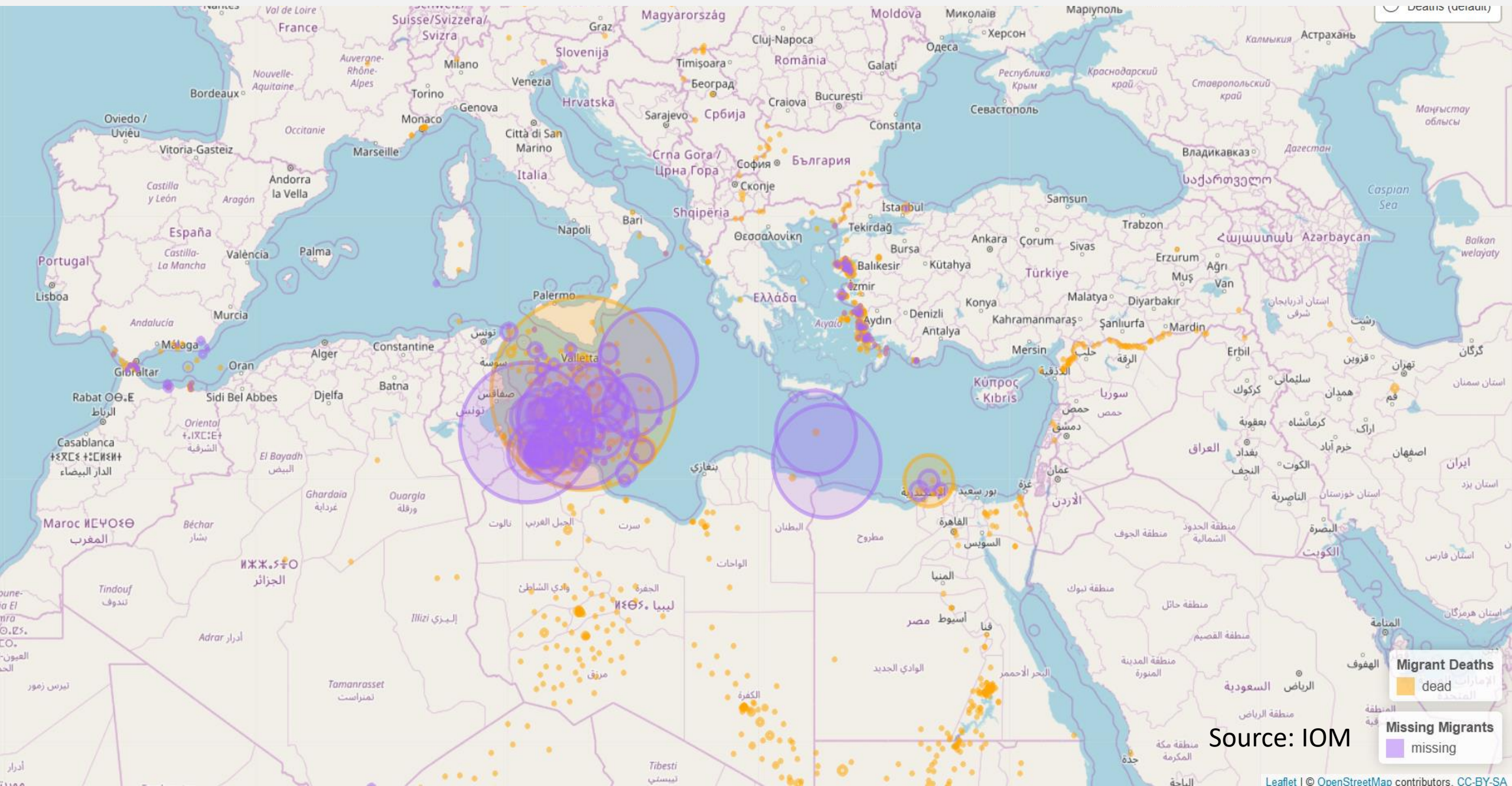


**Missing Persons  
Recorded by Region**





# Migrants Reported Missing and Dead 2014-2018





# Observations

- Europe may still be open to another migration crisis. The conflict in Syria is still ongoing and the Middle East could see another civil crisis causing migrants to come to Europe
- Most Syrian refugees remain in the Middle Eastern Countries surrounding Syria
- Refugees making it to Europe and claiming Asylum are NOT being distributed equally throughout Europe
- Most Refugees travel to Europe via the Mediterranean and Western Balkans
- There's essentially a humanitarian crisis in the Mediterranean Sea where migrants drown coming to Europe



## Additional Observation

**BBC**  
**NEWS**

## In 2016 the EU and Turkey Struck a Deal to Stop the Flow of Illegal Migrants coming to Europe

- **Returns:** All "irregular migrants" crossing from Turkey into Greece from 20 March will be sent back. Each arrival will be individually assessed by the Greek authorities.
- **One-for-one:** For each Syrian returned to Turkey, a Syrian migrant will be resettled in the EU. Priority will be given to those who have not tried to illegally enter the EU and the number is capped at 72,000.
- **Visa restrictions:** Turkish nationals should have access to the Schengen passport-free zone by June. This will not apply to non-Schengen countries like Britain.
- **Financial aid:** The EU is to speed up the allocation of €3bn (\$3.3 bn; £2.3 bn) in aid to Turkey to help migrants.

# EU-Turkey Agreement Implemented After March 2016



**The Agreement  
Seems to be  
Working**

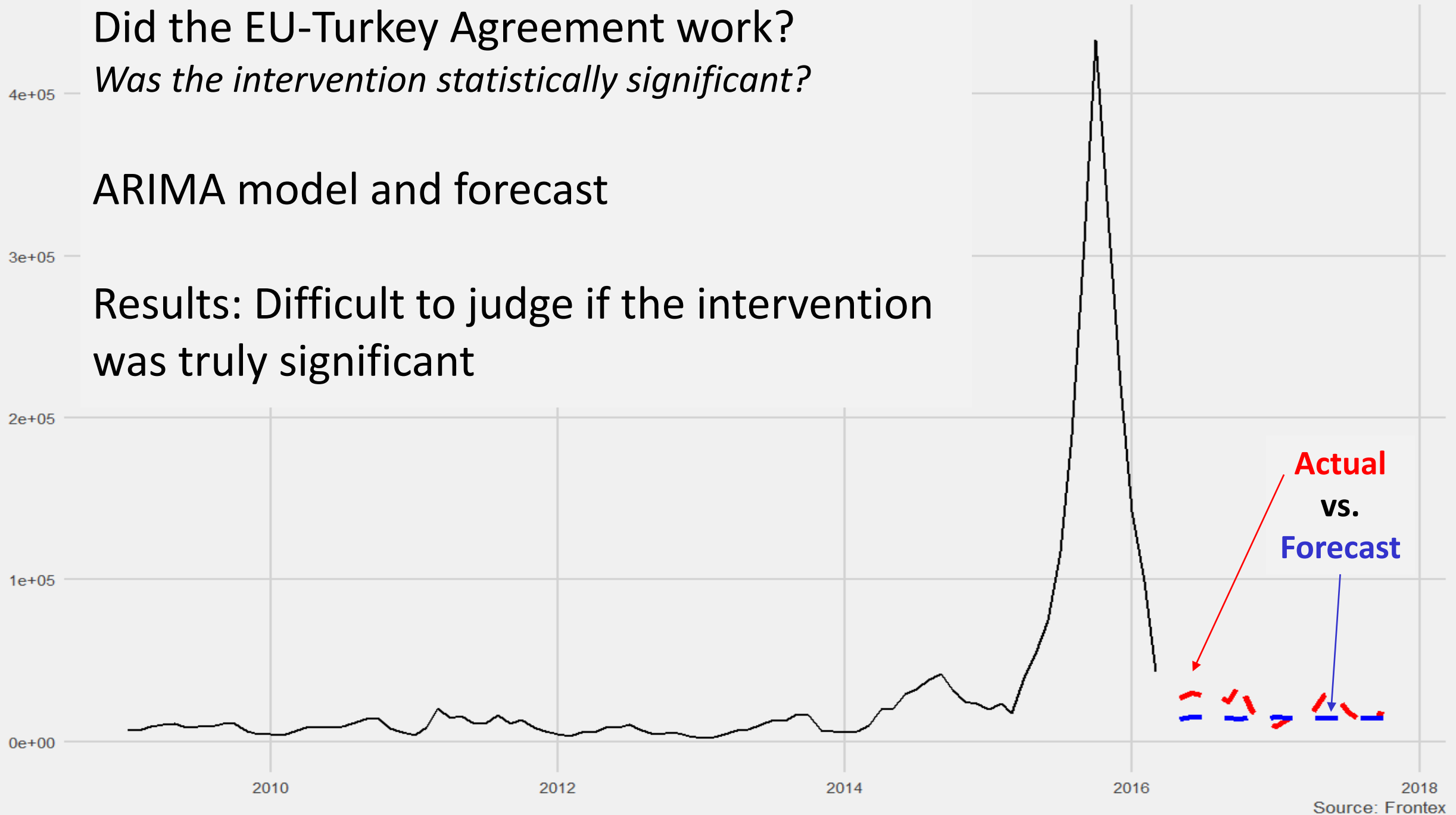




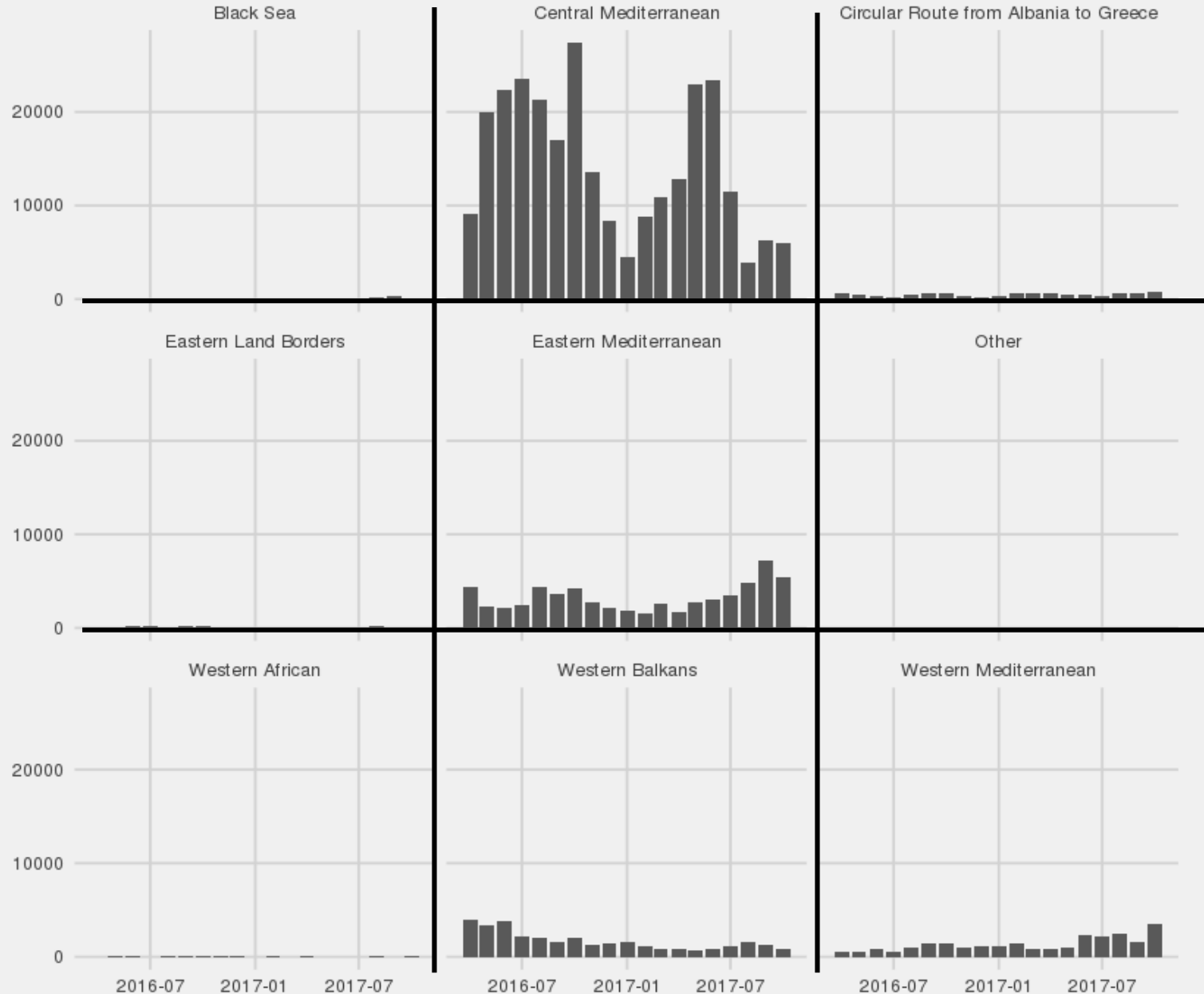
Did the EU-Turkey Agreement work?  
*Was the intervention statistically significant?*

ARIMA model and forecast

Results: Difficult to judge if the intervention  
was truly significant



## Illegal Border Crossing to Europe by Route After EU-Turkey Agreement



Source: Frontex

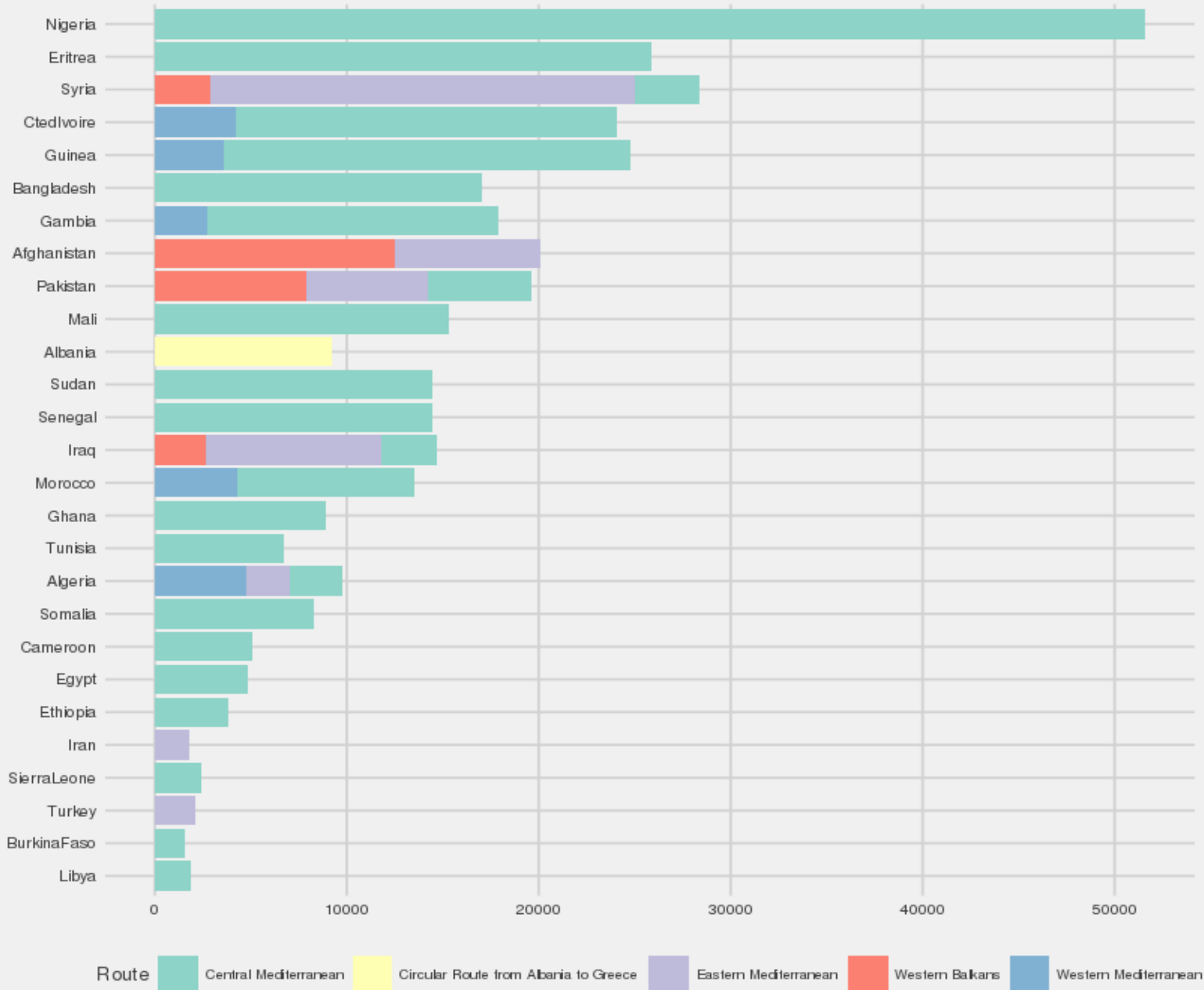
**Q:** What Happened After the EU-Turkey Agreement?

**A:** Migration via Turkey appears to have slowed

Most Migration to Europe is now happening via the Central Med. Route



**Number of Migrants Illegally Traveling to Europe by Origin and Route After EU-Turkey Agreement**



Source: Frontex

**Q:** Who's Coming to Europe After the EU-Turkey Agreement and how are they getting to Europe?

**A:** Central Med. Route. Africans and Syrians



# Observations Revised

- Europe may still be open to another migration crisis. The conflict in Syria is still ongoing and the Middle East could see another civil crisis causing migrants to come to Europe
- Most Syrian refugees remain in the Middle Eastern Countries surrounding Syria
- Refugees making it to Europe and claiming Asylum are NOT being distributed equally throughout Europe
- Most Refugees travel to Europe via the Mediterranean and Western Balkans
- There's essentially a humanitarian crisis in the Mediterranean Sea where migrants drown coming to Europe
- **Migrants continue to come to Europe via the Central Med. Route**





**Given the Situation What's Recommended?**



# Recommendations

## **1) Screen Asylum Applicants Before They Migrate to Europe**

- Review asylum claims while refugees are still close to home in the Middle East/Africa or in the “hotspots”

## **2) Enhance Humanitarian Aid to Refugee Locations Surrounding Syria to curb incentives migrants have to travel to Europe**

## **3) The third element is to insist that asylum-seekers stay put until their applications are processed, rather than jumping on a train to Germany.**

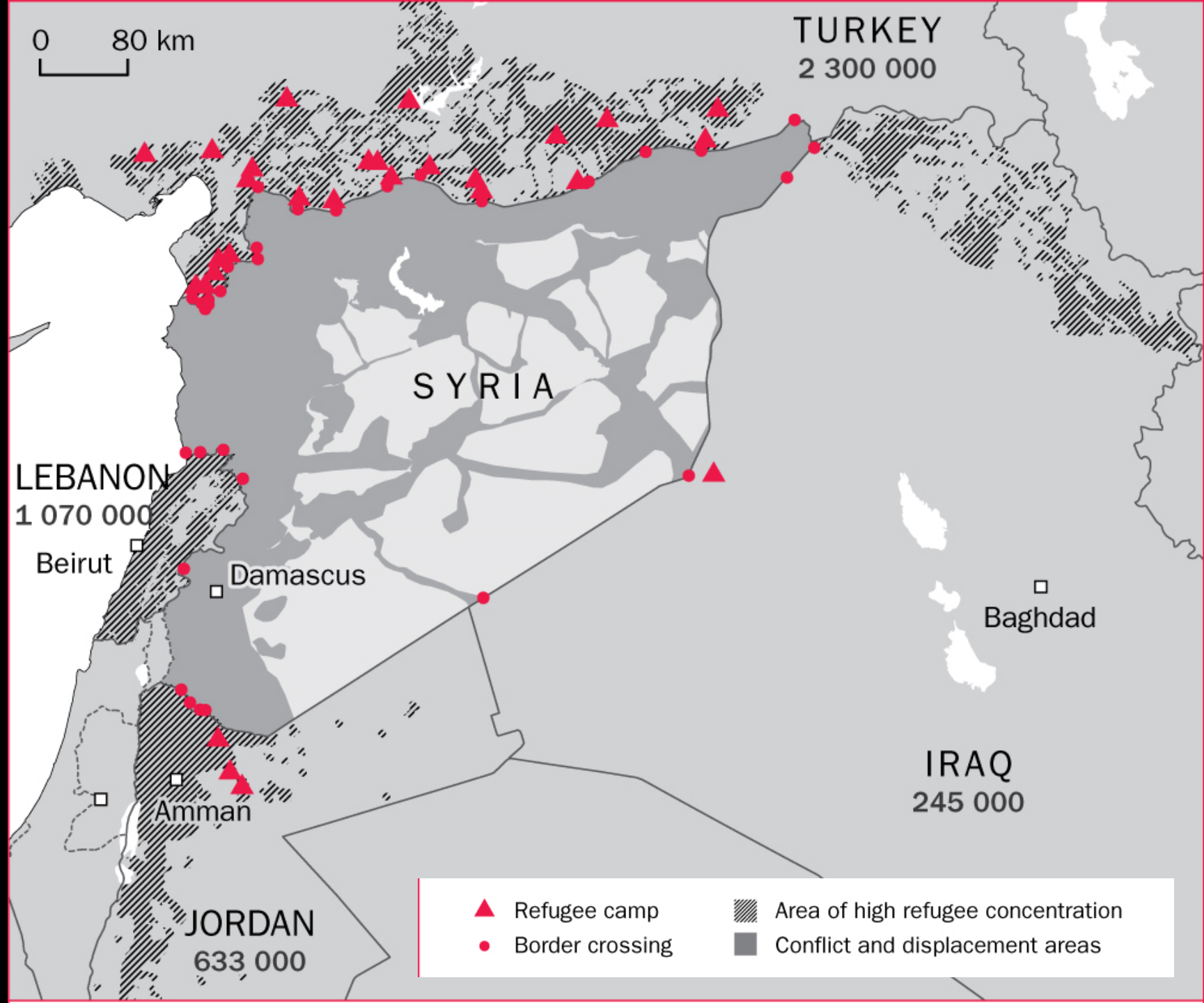
## **4) Europe should act together to equally distribute Asylum seekers throughout EU Countries**





# Refugee Camps

Focus  
Humanitarian  
Aid and  
Asylum  
Screening to  
Locations with  
Refugees



## Challenges

Only a limited number of official refugee camps are officially sanctioned by countries hosting Syrian refugees. In turn, it is not always clear where refugee/migrant settlements are located.

Lebanon has no official refugee camps and hosts nearly 1.5 million refugees. This creates challenges when focusing resources to “hotspots”

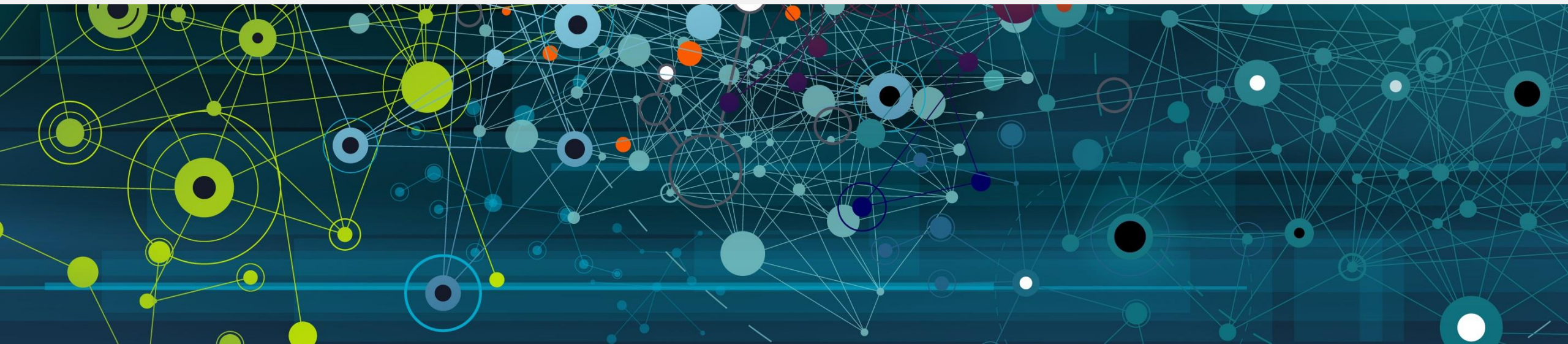
The multidimensional Syrian conflict quickly displaces people across borders





**How Can Machine Learning Help?**

**What are the possibilities?**





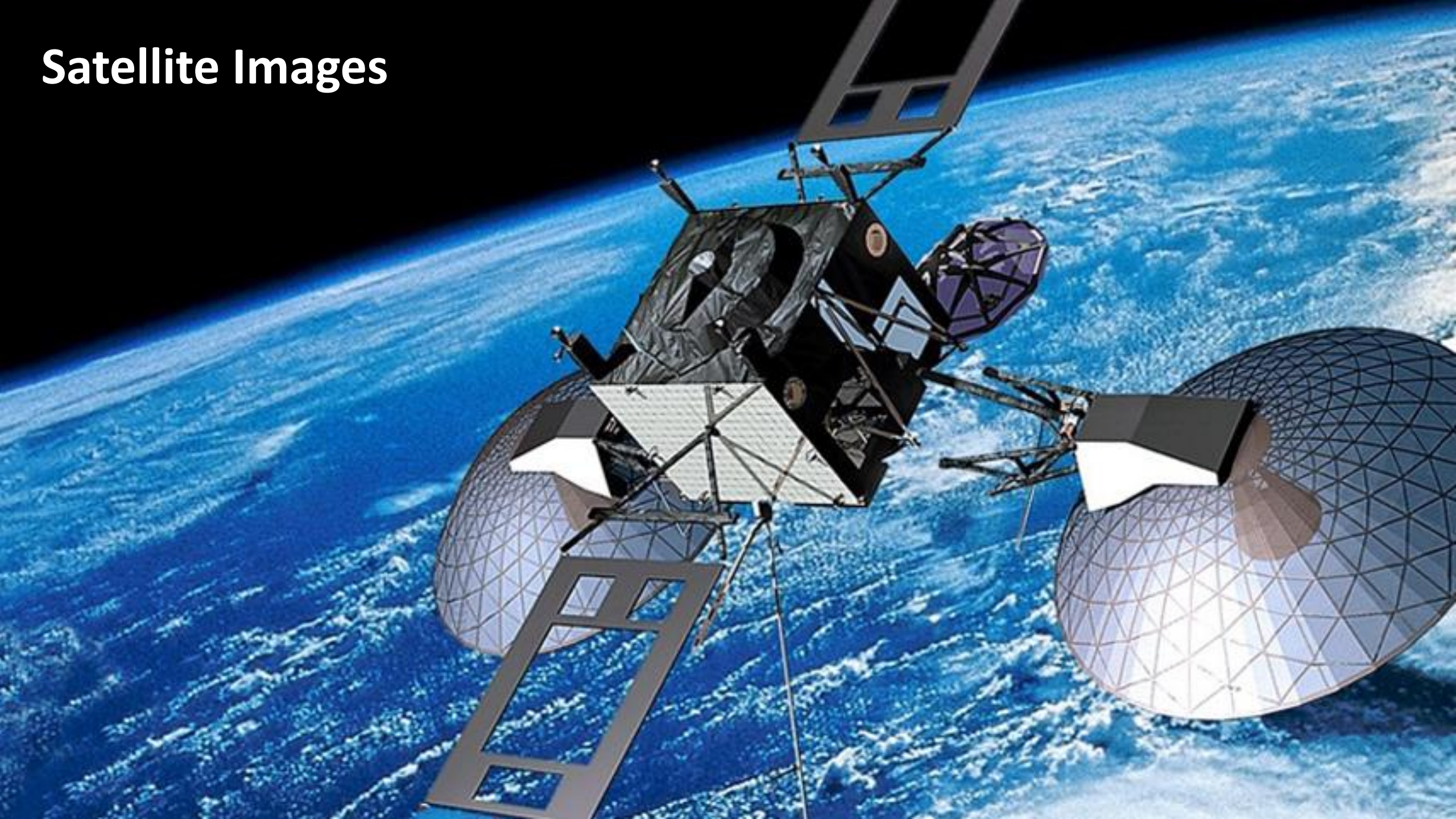
An aerial photograph of a vast refugee camp in a dry, open landscape. The camp is composed of numerous small, rectangular tents or huts, many of which are white, arranged in a grid-like pattern. The surrounding terrain is flat and arid, with some sparse vegetation visible in the distance. The sky is clear and blue.

## ML Possibilities

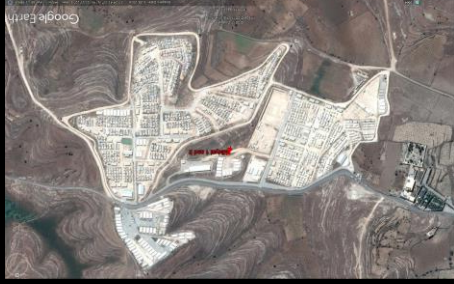
- Discovery of new refugee camps
- Monitoring of refugee camps for approximate size (changes)



# Satellite Images









# Key Features

- **Tent Dominated Areas**
- **Clear Borders**
- **White Areas**
- **Outside of Cities or Developed Areas**



# Discovery of Camps: Classification Problem

**Refugee Camp**



**Refugee Camp**



**Non Camp**





# Image Processing and Classification

Original Image



Create Image Chips



Camp



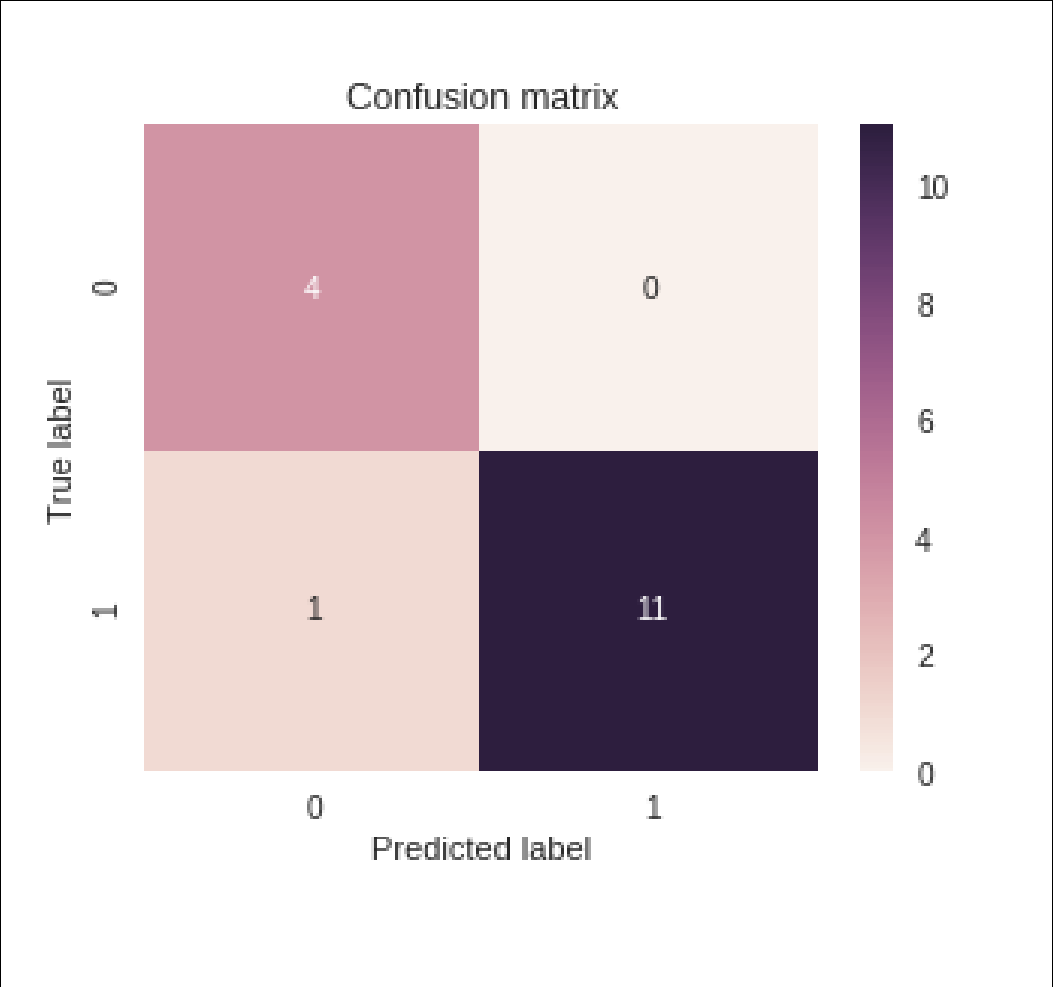
Noncamp





# Evaluation Results

	Precision	Recall	F1-score	Support
Refugee Camp	0.80	1.00	0.89	4
Noncamp	1.00	0.92	0.96	12
Avg/Total	0.95	0.94	0.94	16



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## **3) The third element is to insist that asylum-seekers stay put until their applications are processed, rather than jumping on a train to Germany.**

## **4) Europe should act together to equally distribute Asylum seekers throughout EU Countries**



**END**

**Special Acknowledgments:**

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