

# Epidemiology of seasonal influenza in the Middle East and North Africa, 2010-2016

## Circulating influenza A and B viruses and spatial spread of epidemics

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### Background

- We described the patterns of influenza A and B circulation and assessed the spatial spread of epidemics in countries of Middle East and North Africa.
- This region has a predominantly subtropical climate and a combined population of over 800 million inhabitants.

### Methods

- We used influenza surveillance data for 2010-2016 from the WHO-FluNet database.
- We analyzed the data by season (from July 1<sup>st</sup> to June 30<sup>th</sup> of next year), and seasons with 50 or more reported influenza cases were included.
- We determined the % of influenza cases that were caused by each virus type/subtype in each country and season, and calculated the median values for each country and the whole region.
- We determined the timing and amplitude of the primary and secondary epidemic peaks, overall and by virus type (A and B) using the EPIPOI software.
- We used linear regression models to test for spatial trends in the spread of epidemics.

### Results

- We included 70,532 influenza cases from seventeen countries in the region (Fig 1).
- Influenza A and B accounted for a median 76.5% and 23.5% of all cases in a season
- Influenza A and B were the dominant virus type in 87% and 13% of seasons, with no significant differences between countries.
- The % of A cases that were subtyped was 86%, while only 4% of influenza B cases were characterized.
- For most countries, influenza seasonality was similar to the Northern hemisphere, with a single large peak between Jan and Mar (Fig 2).
- Exceptions were Bahrain and Qatar, where the primary peak typically occurred earlier (Nov-Dec).
- The countries in the Arabian Peninsula and Jordan showed clear secondary peaks.
- The direction of the spread of influenza activity was east-to-west and south-to-north in two seasons, and west-to-east in one season.

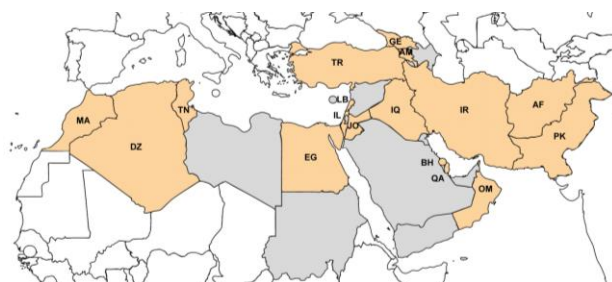


Figure 1. Countries included in the analysis (in red). AF: Afghanistan. AM: Armenia. BH: Bahrain. DZ: Algeria. EG: Egypt. GE: Georgia. IL: Israel. IQ: Iraq. IR: Iran. JO: Jordan. LB: Lebanon. MA: Morocco. OM: Oman. PK: Pakistan. QA: Qatar. TN: Tunisia. TR: Turkey.

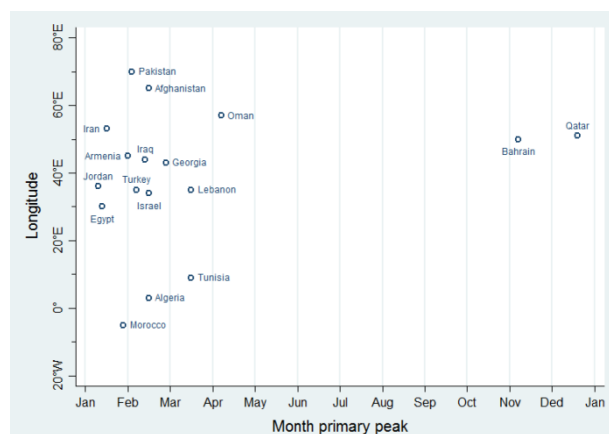


Figure 2. Timing of primary peak of influenza detection by country.

### Conclusions

- The epidemiology of influenza is generally uniform in countries of Middle East and North Africa.
- Influenza B caused nearly one fourth of all cases in a season on average, and was dominant in roughly one out of seven seasons.
- The recommendations for the timing of annual vaccination campaigns in this region should be aligned with those in the Northern Hemisphere.

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