



FAMINE & FOOD CRISIS FORECASTING CENTER

HACKATHON I:YEMEN

Team Presentations, Day 3

Golden girls

Amy, Hayfa, Lilieth, Maya, Sultan, Yota

I. Situation analysis and context

Timeline Food Insecurity - Famine (year 2015-present)



2022-
present

Current Situation

- Child malnutrition is one of highest in world
- Humanitarian situation worsened due to Ukraine-Russia conflict
- July - August 22 - Widespread flooding across Yemen
- Intensified Fighting in Marib & Hajjah

2020-2021

Ongoing famine situation

- Death tolls increase as a result of acute food insecurity, lack of healthcare, locust swarms.
- Two-thirds of the population dependent on humanitarian aid
- Drastic increase in cost of food / collapse of Yemen's currency

2018-2019

Heading into world's worst famine in 100 years

- Worsening of the conflict
- Scale up of aid operations in the country (by March 2018, 22 ml citizens require humanitarian aid)

2015- 2017

Pre-cursors to Yemen catastrophe

- Cholera outbreak
- Food and Supply Blockade - ports closed

Pre-2015

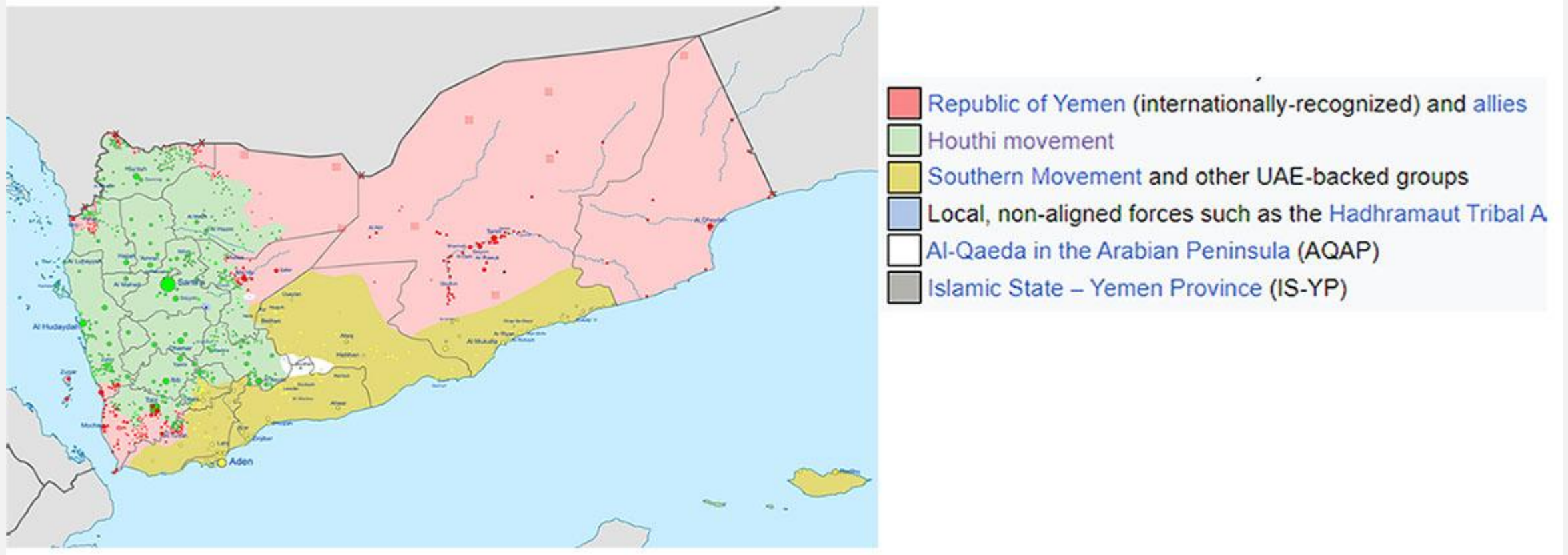
Historical context

- Long term political instability / Conflict (civil war since the 90's)
- Cultivation of khat (30% of economy in 2000)
- 90% of food is imported

Golden girls

I. Situation analysis and context

Yemeni Civil War detailed map (2014-present)

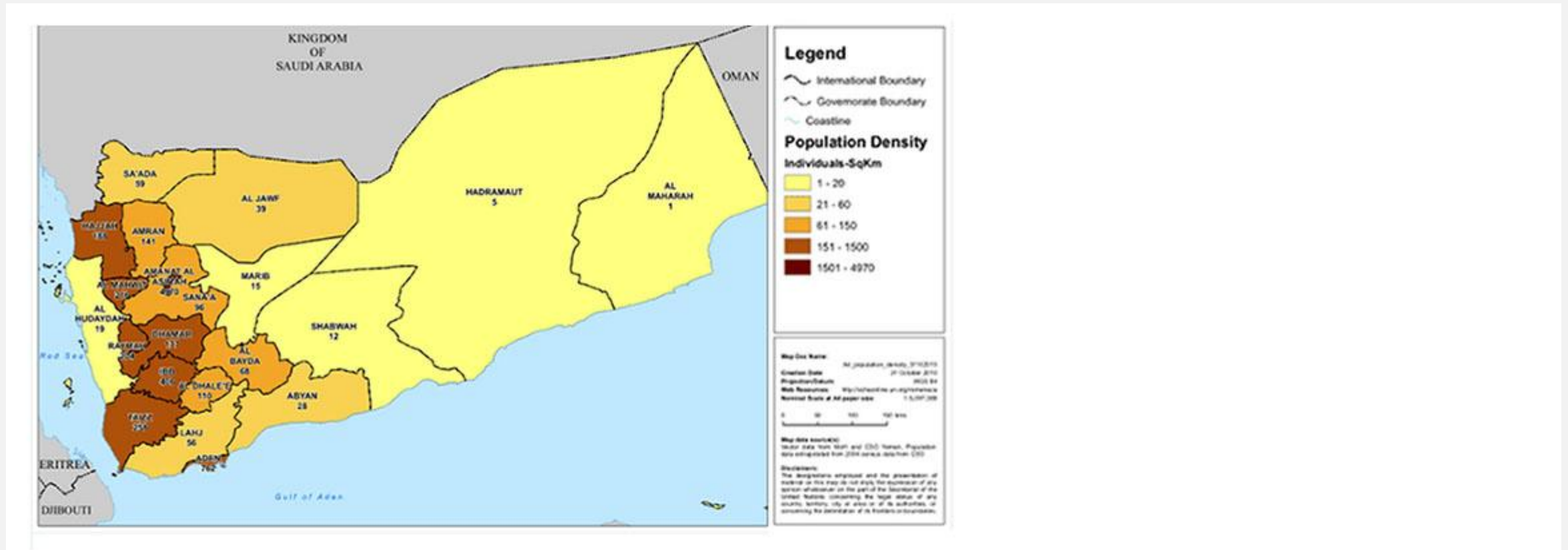


Map Source: WIKIPEDIA - image credit: Ali Zifan ([https://en.wikipedia.org/wiki/Yemeni_Civil_War_\(2014%E2%80%93present\)](https://en.wikipedia.org/wiki/Yemeni_Civil_War_(2014%E2%80%93present)))

Golden girls

I. Situation analysis and context

Yemen Population Density (2009)

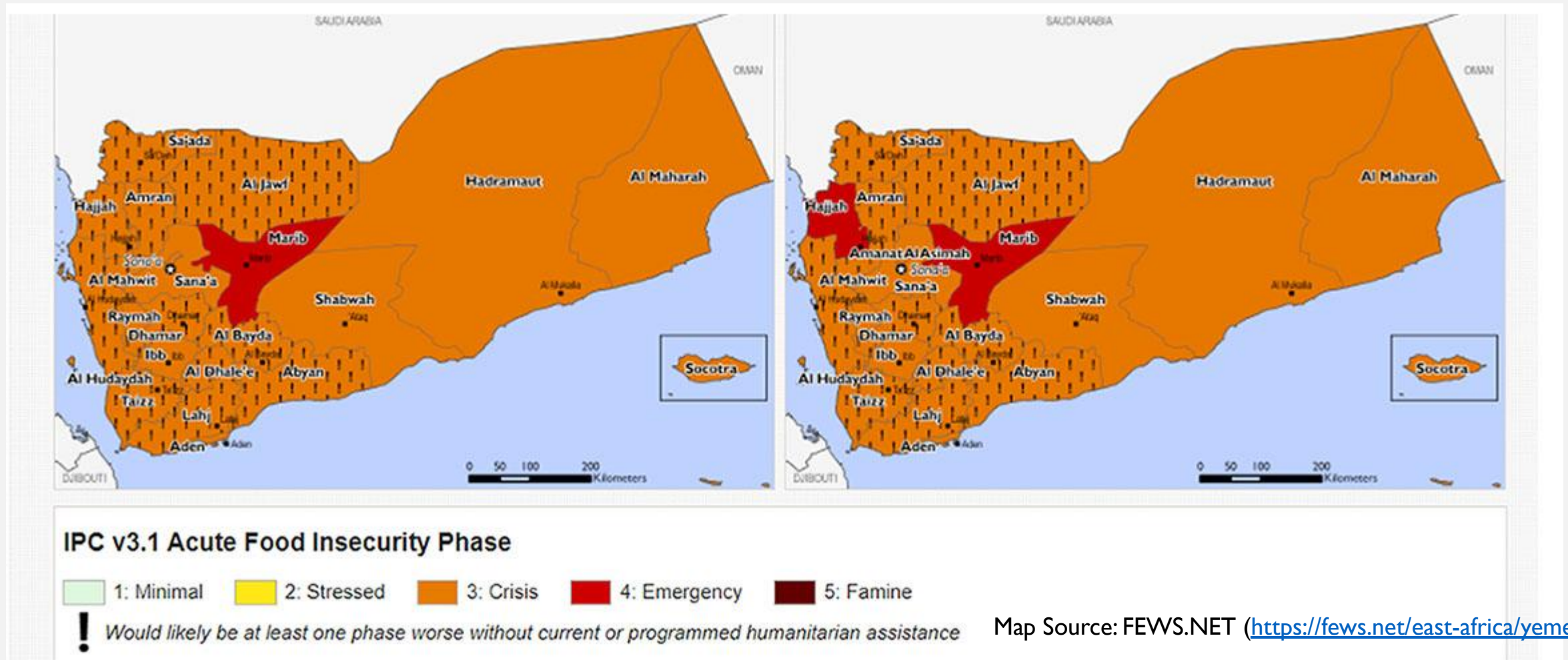


Map Source: OCHA - RELIEFWEB 2010 (<https://reliefweb.int/map/yemen/yemen-population-density-2009>)

Golden girls

I. Situation analysis and context

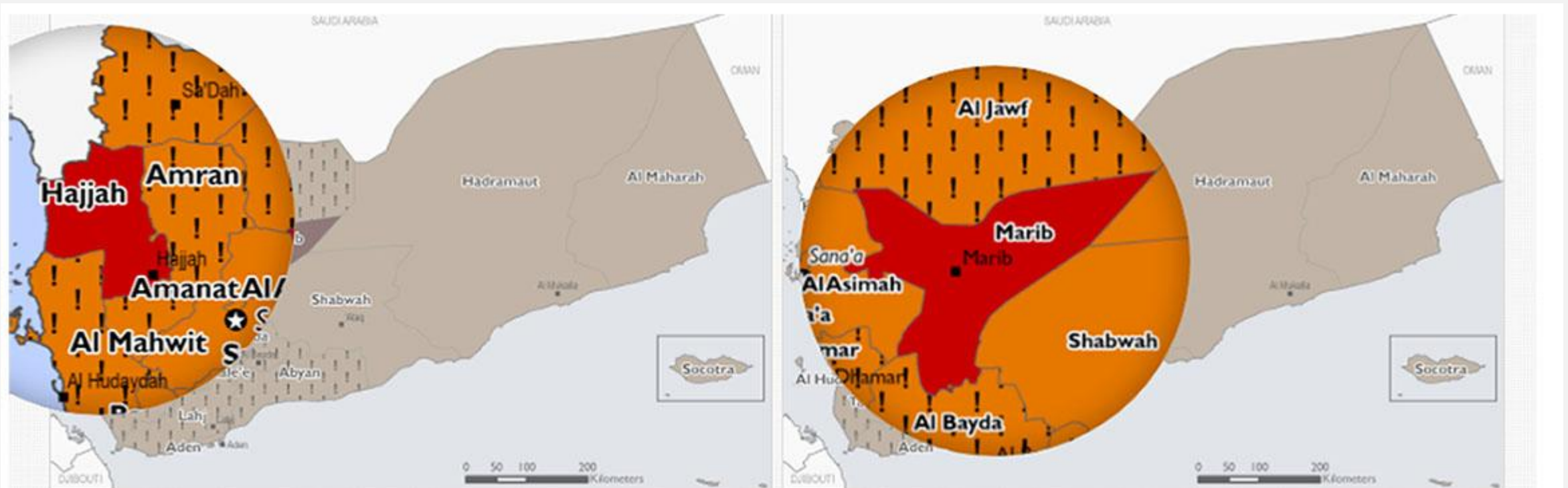
Acute Food Insecurity Phase (Dec.2022 - Jan. 2023)



Golden girls

I. Situation analysis and context

Acute Food Insecurity Phase (Dec.2022 - Jan. 2023)_detail (Hajjah & Marib districts)



IPC v3.1 Acute Food Insecurity Phase

1: Minimal 2: Stressed 3: Crisis 4: Emergency 5: Famine

! *Would likely be at least one phase worse without current or programmed humanitarian assistance* Map Source: FEWS.NET (<https://fews.net/east-africa/yemen>)

Map Source: FEWS.NET (<https://fews.net/east-africa/yemen>)

Research question

What are the factors that led to worsened food security situation in two governorates (Hajjah and Marib)?

Outcome (Dependent variable)

Emergency (IPC Phase 4) in Hajjah and Marib (governorates)

(Independent) Variables that could have led to the outcome

Climatic datasets - Rainfall (compared to averages)

Nutrition indicators - SAM, MAM

Intervention indicators (VITA, MNP, FEFO, etc.)

Population information: IDPs, # flood-affected, density

Food prices

Geographic location - distance from coast (access to seaports)

Conflict zones/intensity

to better understand..

floods

level of child malnutrition

assistance provided (or not)

number of vulnerable population

Food Security (accessibility)

Food security (availability)

Conflict level

The final product of this exercise

A dashboard that displays visualization (graphs or/and maps) of the different indicators, change over time, and trends. The purpose of this tool is to assist aid practitioners to assess & monitor / evaluate current interventions and to forecast potential need for future assistance or assistance scale-up.

Research Question:

- What is the relationship between a rise in pressure factors, changes in food insecurity, delivery of aid, and resulting changes in food insecurity?
- The question was borne to out of curiosity between price spikes and delivery shortfalls.

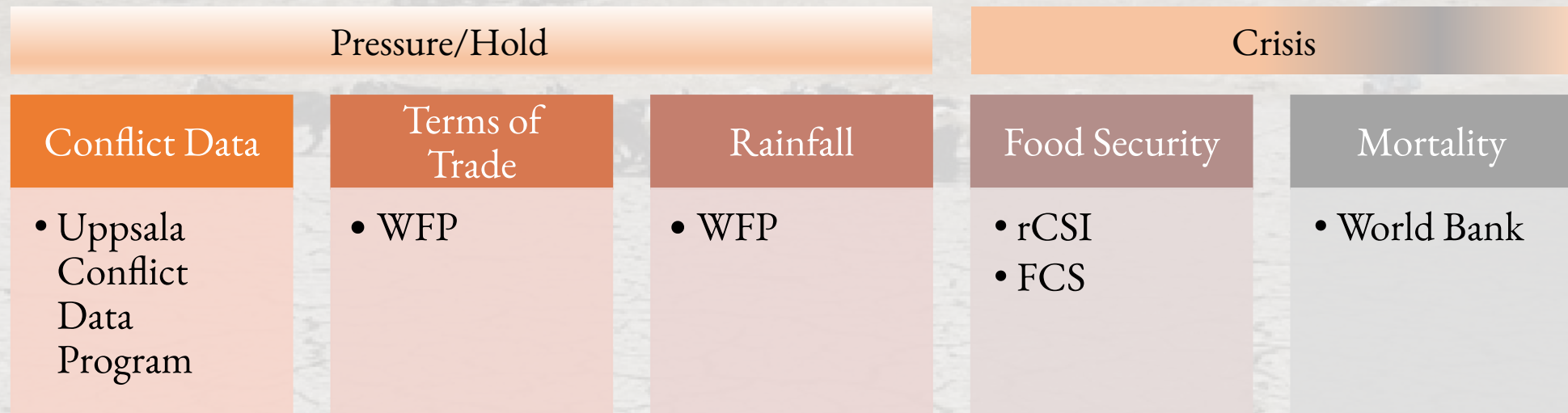
Indicators

- Nutritional Support
- Conflict
- Commodity Prices (Terms of Trade)
- Rainfall
- Food Security



Historic buildings and garden in the Old City of Sanaa.

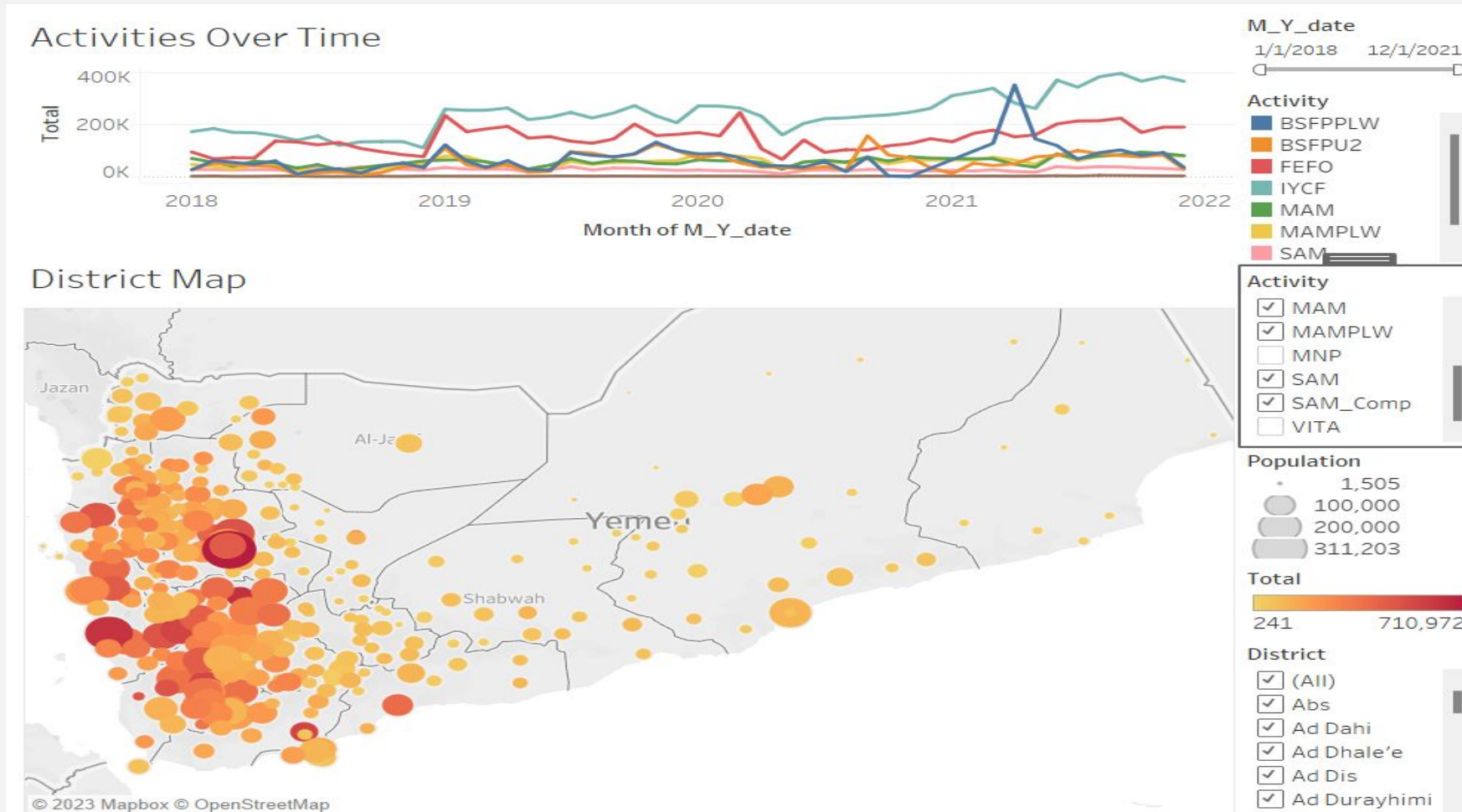
Source: baytalfann.com



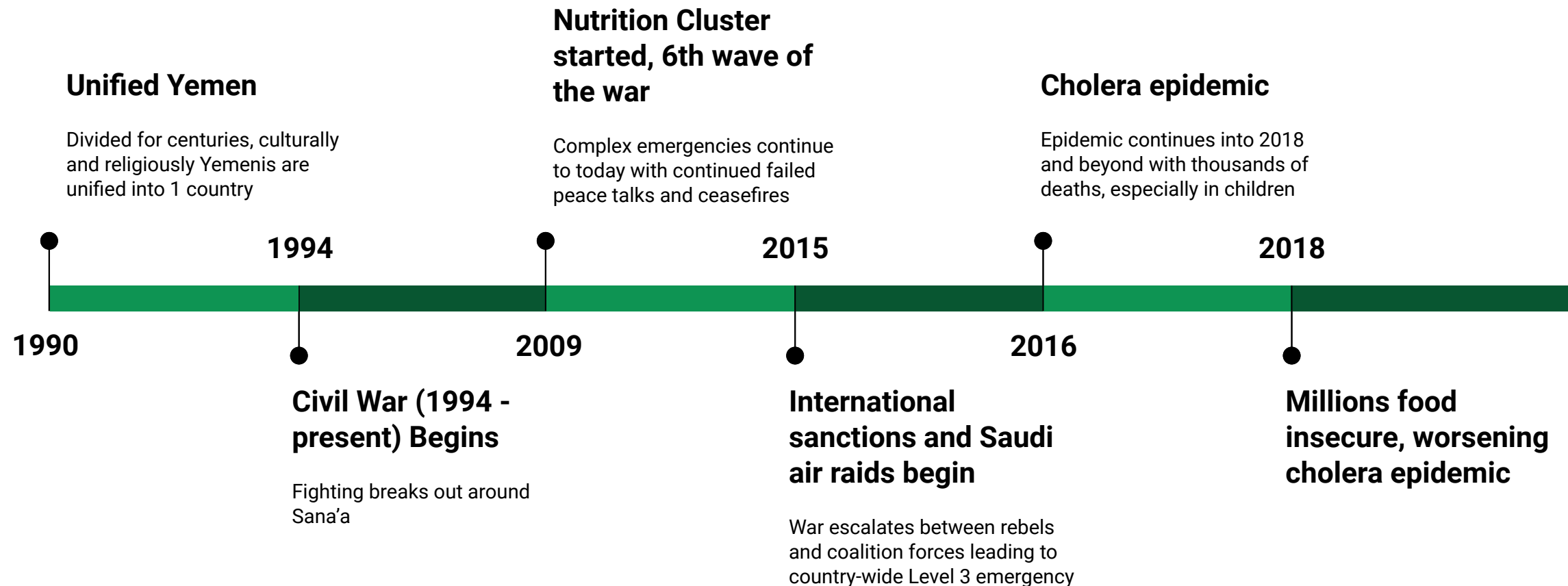
Database Schema

- **Nutrition:** year, month, governorate, district (p-code), activities, count
- **Conflict:** year, month, governorate, event, fatalities
- **Terms of Trade:** market price, year, month, commodity price, wages and terms of trade
- **Market:** market, governorate, district, distance
- **Rainfall:** year, month, governorate, total precipitation
- **Food Security:** year, month, governorate, metric (rCSI, FCS), score

Tableau Dashboard

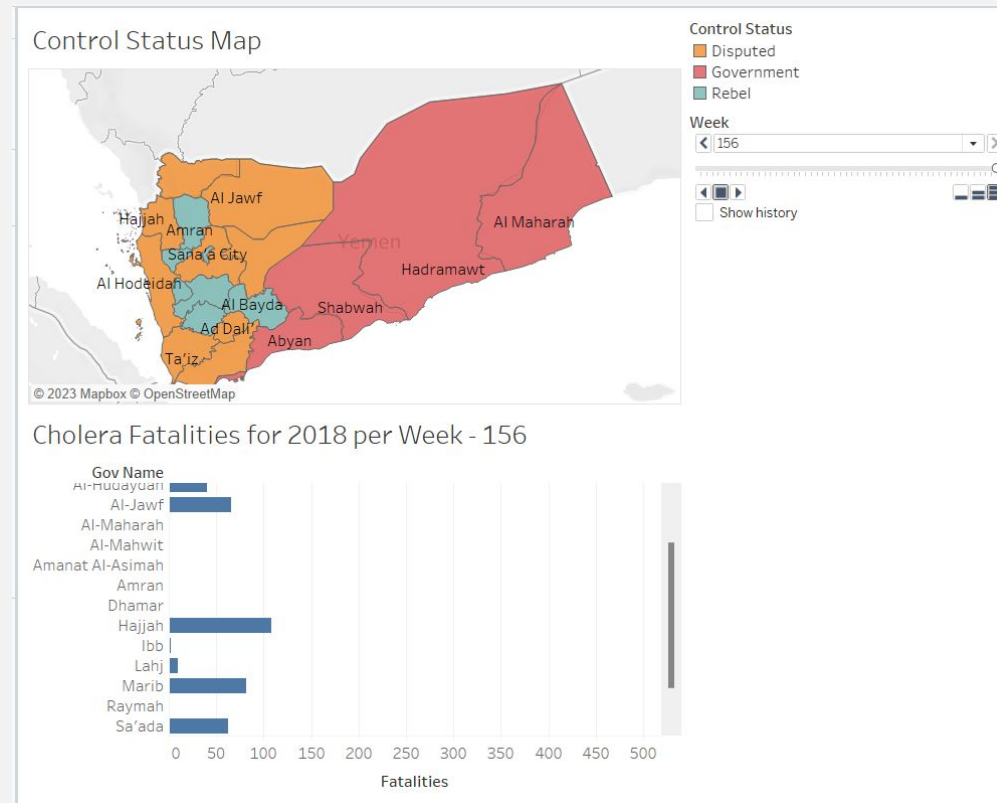


TEAM Rice



Our Visualization

How do cholera cases affect the total percent receiving nutrition intervention in rebel, disputed, and coalition-controlled governorates in Yemen in 2018?



Next Steps

- Expand years included in dashboard
- Improve UI interactivity for better understanding
- Involve other secondary data like rainfall and FCSs
 - Investigate correlations b/w cholera, rainfall, and other factors affecting food insecurity/fatalities
- Fix temporal scale between maps (weeks vs. months)
- Add slider for time with indicators

Team 3: Framing the Research

Initial research question:

How “contagious” is a famine?

Criteria:

- Market prices (terms of trade: ratio of wages of non-qualified labor to market price of wheat flour)
- FCR

In other words: Does change in ToT affect FCS or vice versa over time?
How long is the **lag**?

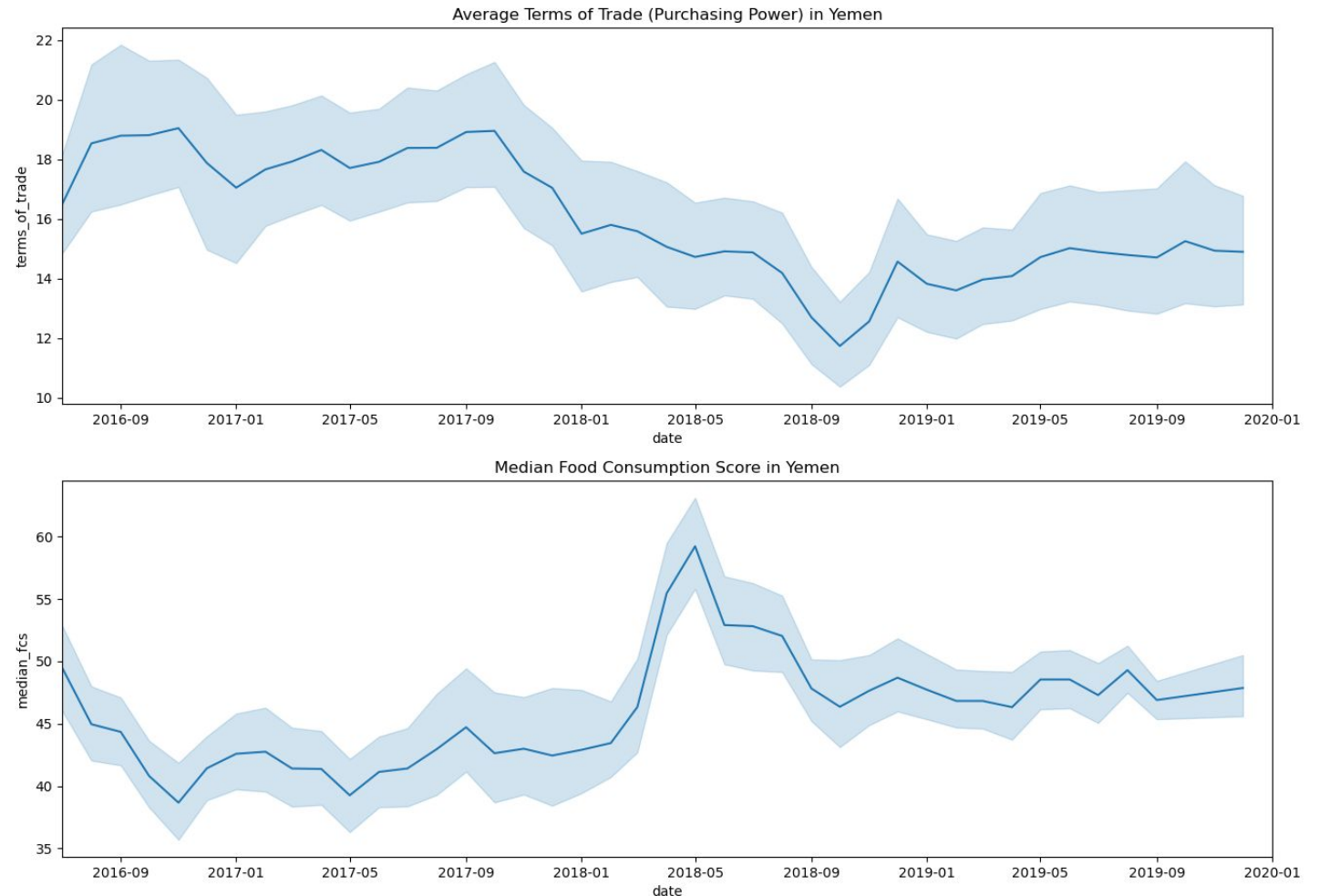
Team 3: FCR and TOT Over Time

X-axis: Time measured in monthly intervals from Sept 2016 to end of Sept 2019

Y-axis: FCS (top) or ToT (bottom) indicators

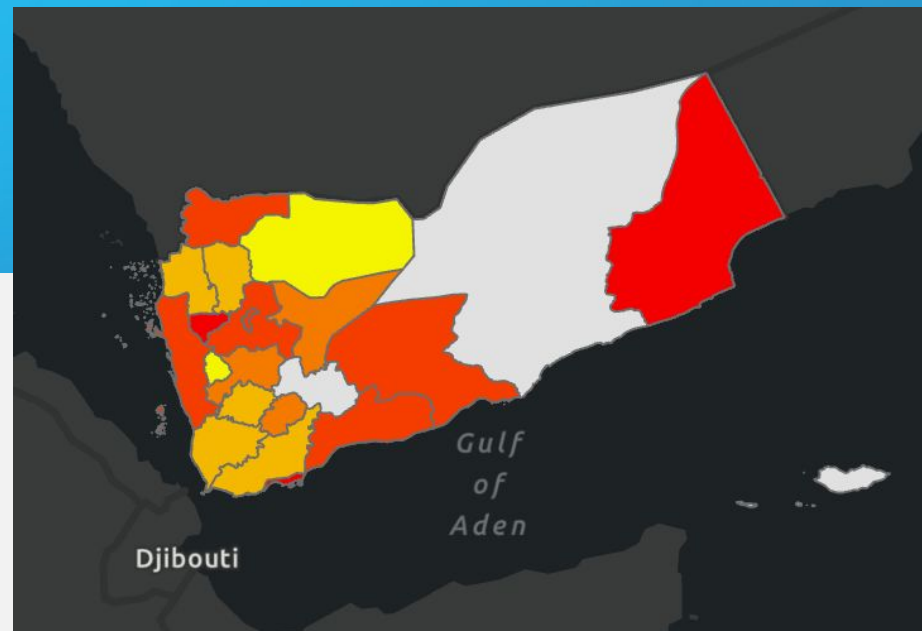
Notes—

1. Inversions vs. similar movements
2. Averages across the country (not a specific governorate)

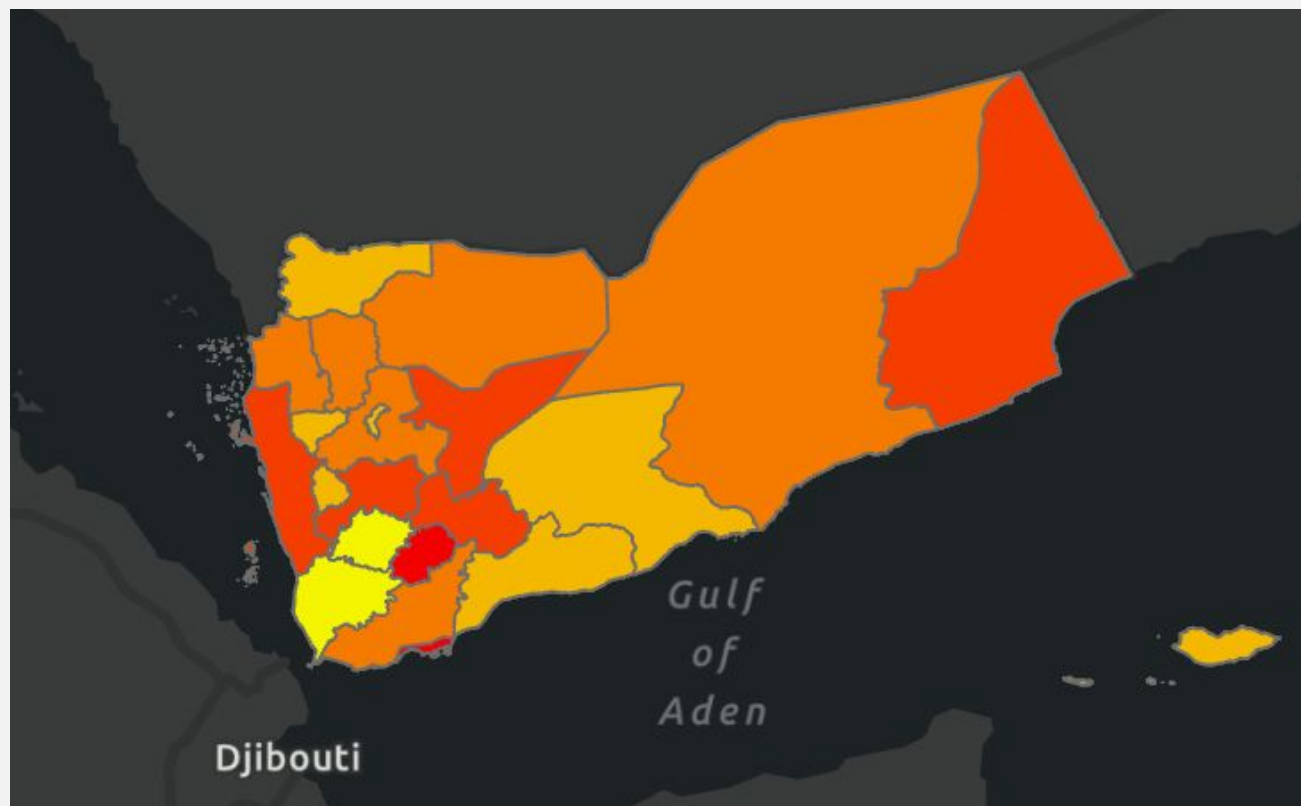


Team 3: 10 month lag

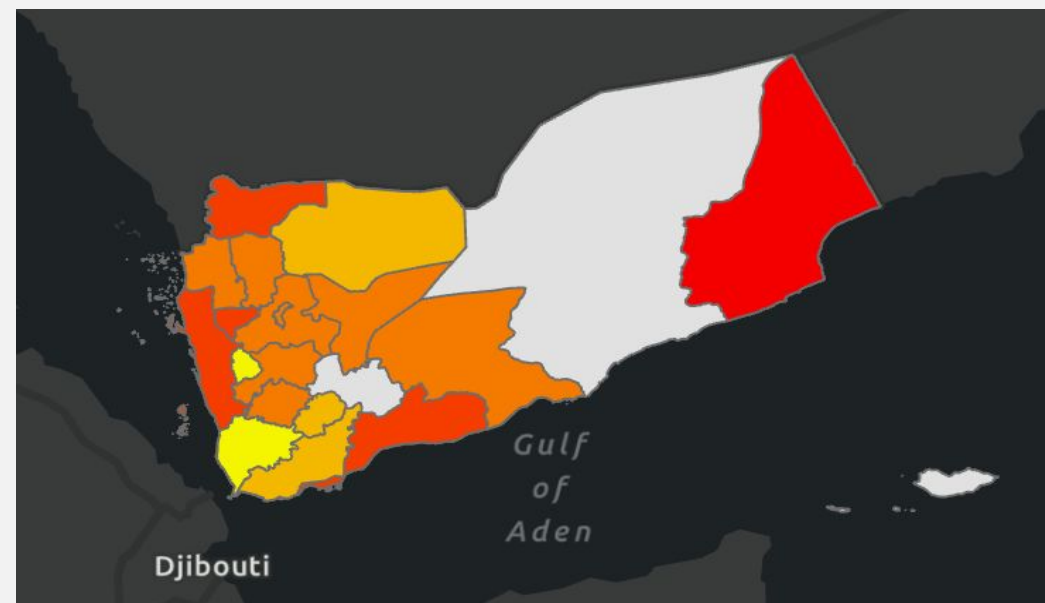
FCS June 2017



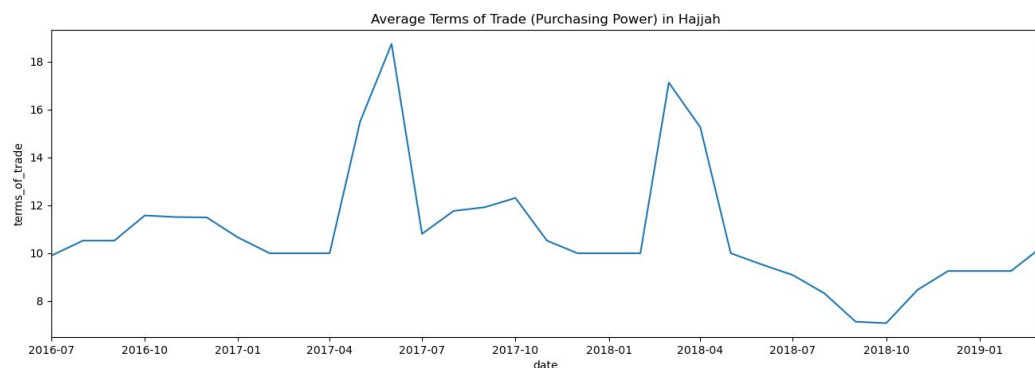
ToT June 2017



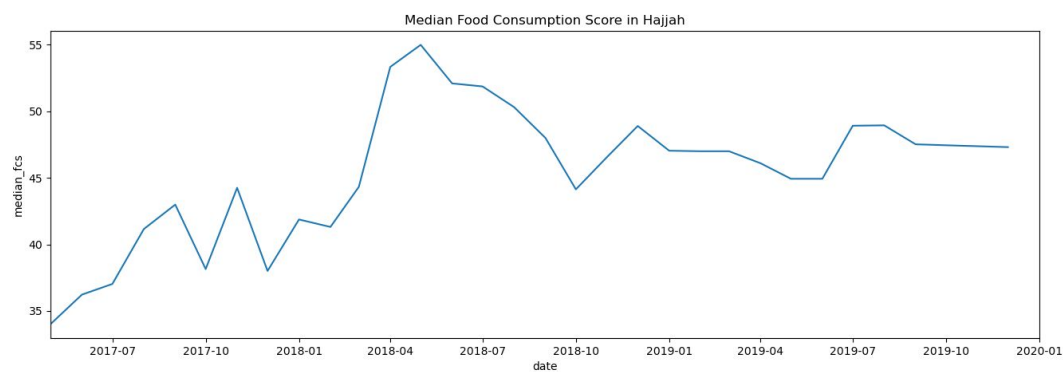
FCS Dec 2016



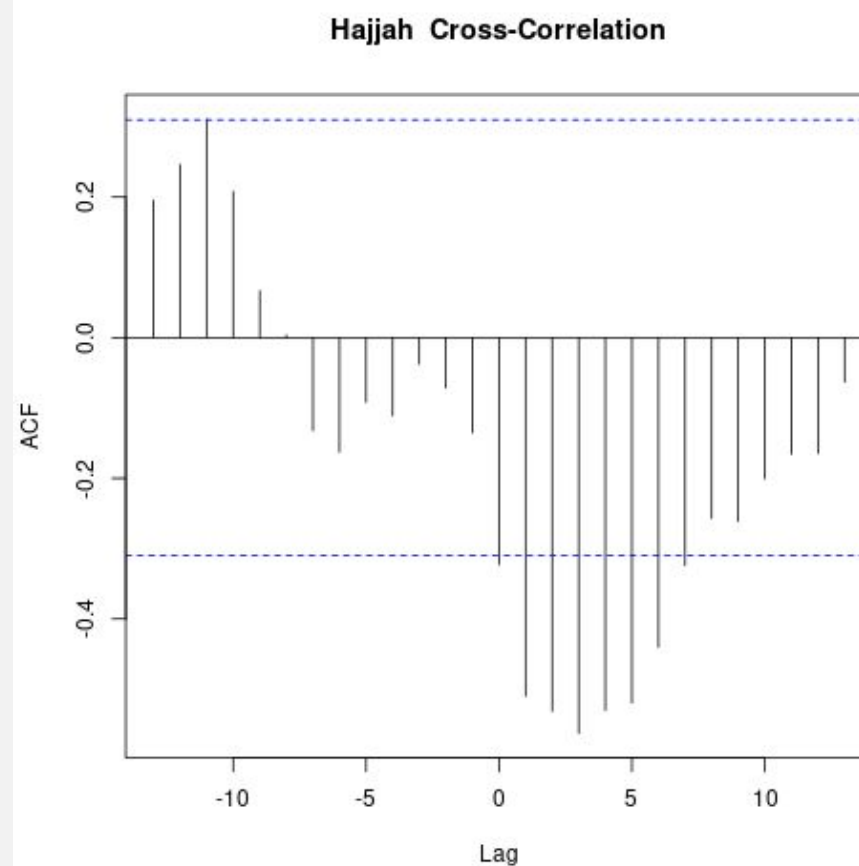
Team 3: Hajjah Governorate Example



Terms of Trade: July 2016 - March 2019



Food Consumption Score: May 2017 - Jan 2020 (10 month lag)

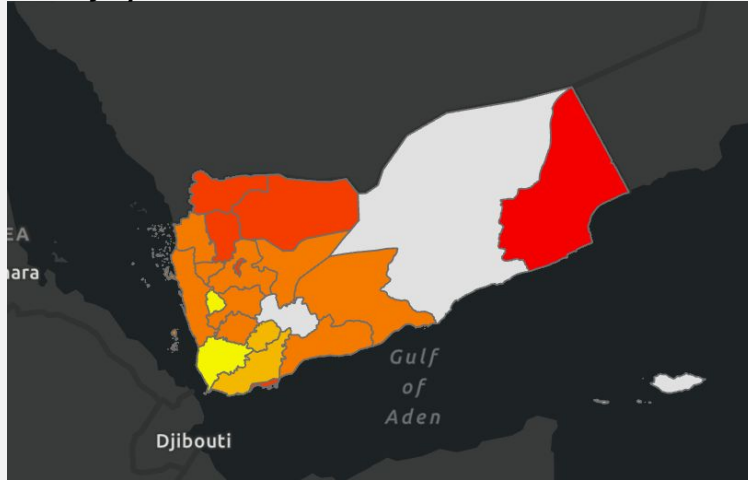


Team 3: Outstanding Questions

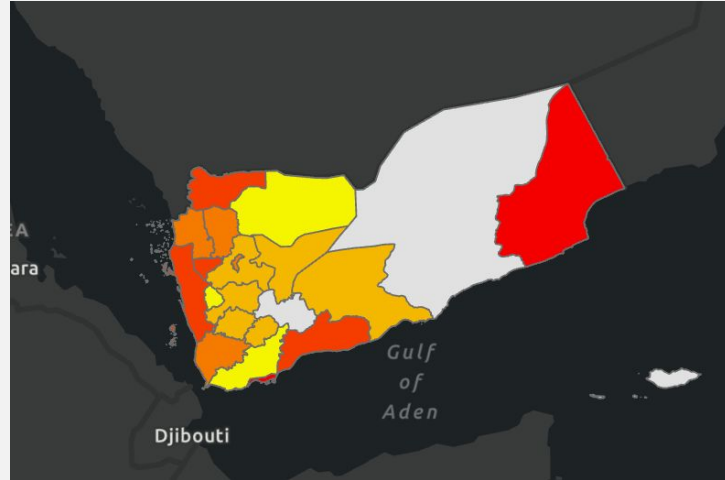
1. Does lag apply outside of the Hajjah governorate?
2. **What is the difference in lag per province & does it correlate with other factors?**
3. Does lag apply across the whole 3 year time period?
4. Is it s.s.?
5. Long run: parallels with infectious diseases, proximity analysis...

TEAM 3: Heat Maps with 3-Month Lags

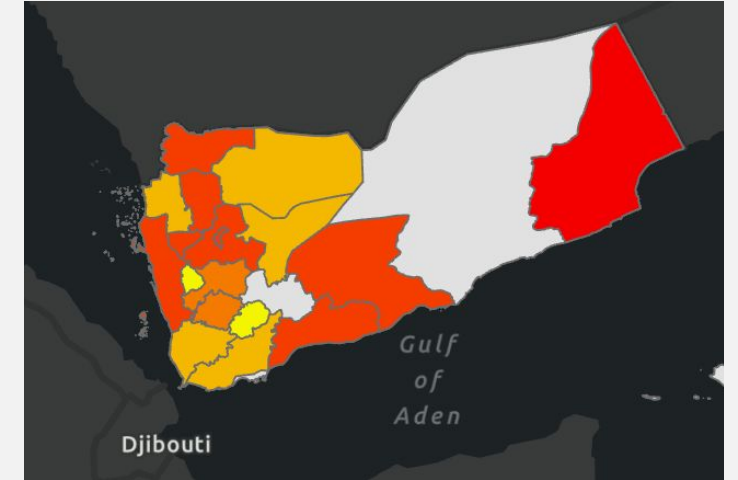
FCS July 2016



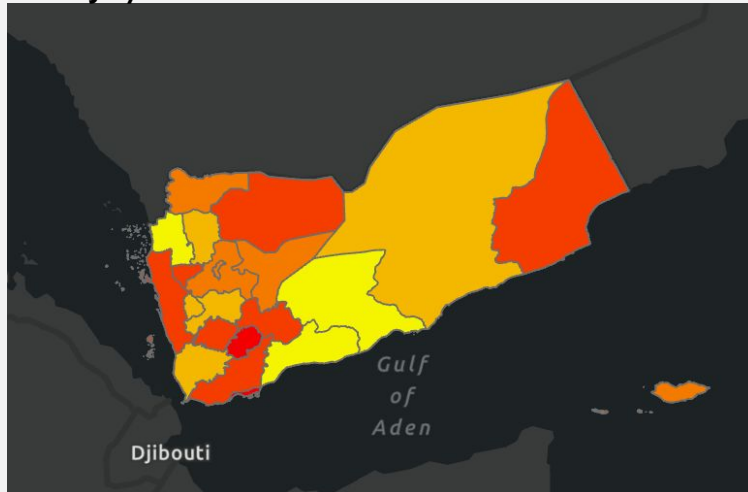
FCS October 2016



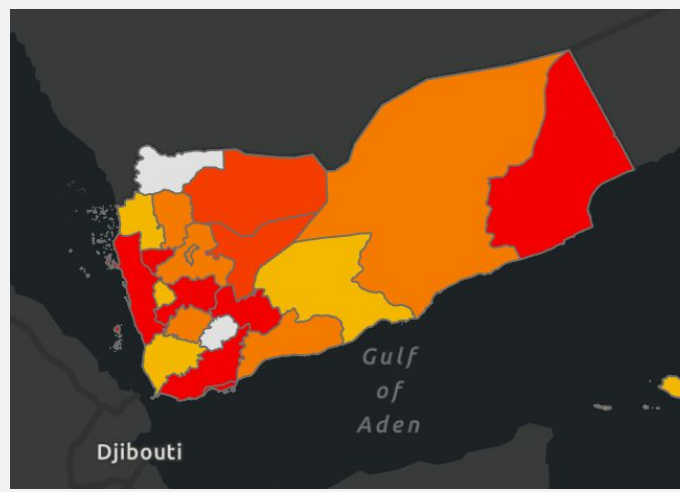
FCS December 2016



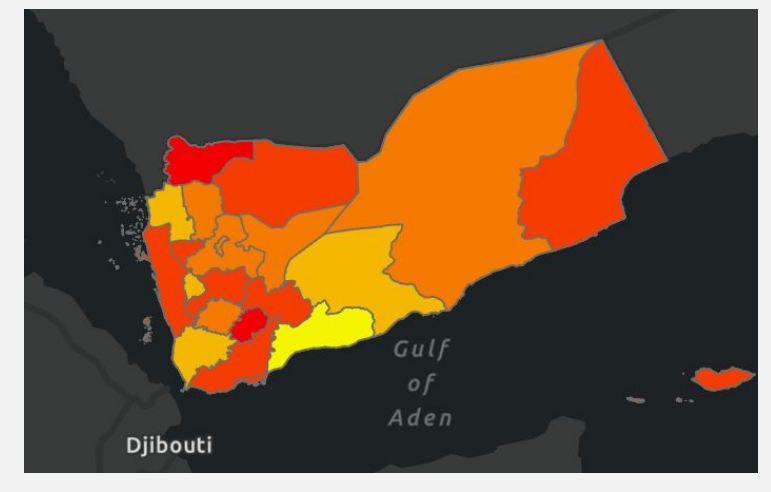
ToT July 2016



ToT October 2016

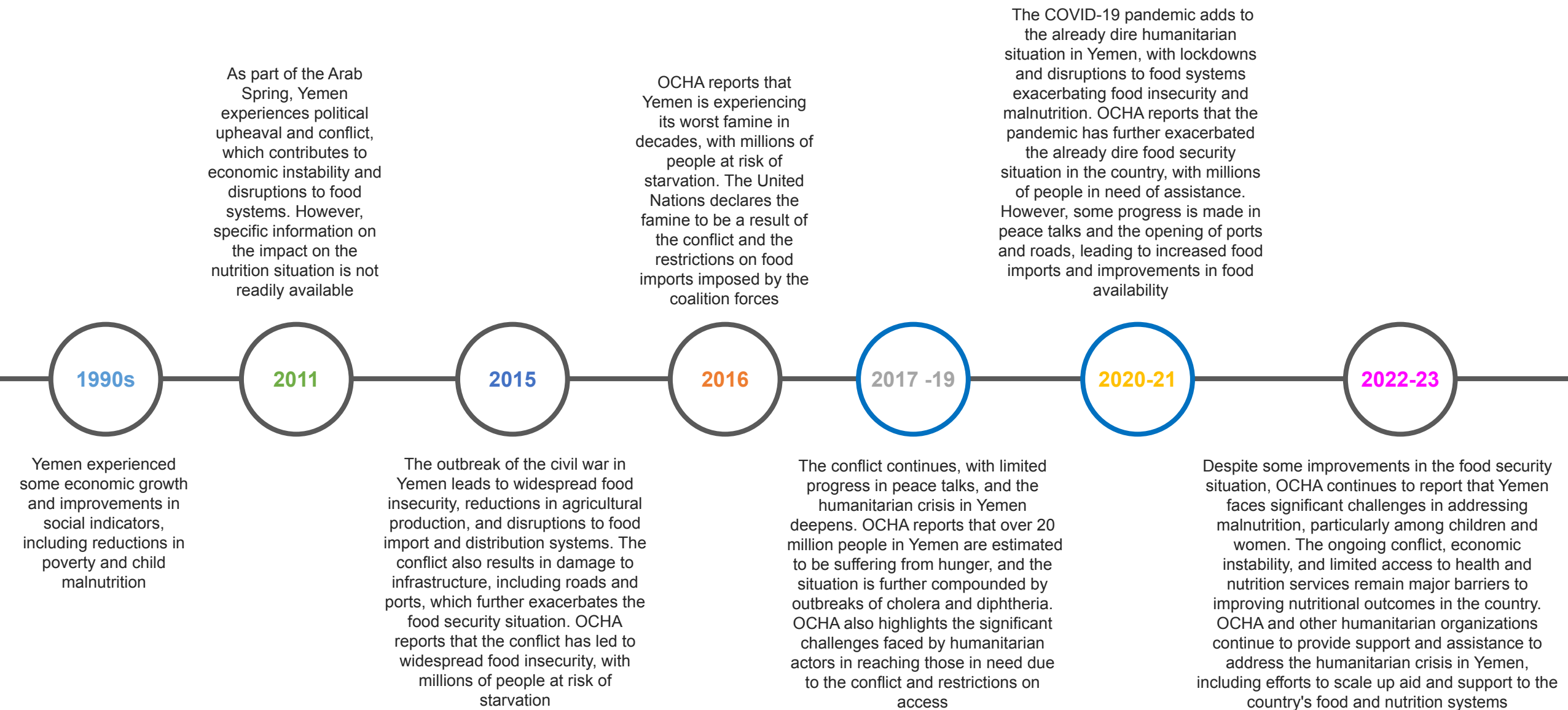


ToT December 2016





Events and situations – The Yemen story



We did it!

- Visual briefs
- Learning skills
 - Peter's NLP
- We will follow up with survey
 - Example feedback - One day intensive
- Certificates! Participating in 2 out of 3 events



FAMINE & FOOD CRISIS FORECASTING CENTER

HACKATHON #I:YEMEN

Team Presentations, Day 3