

## ANALYSIS OF MORTALITY SURVEILLANCE DATA

# GUIDE ON THE DETERMINATION OF EXCESS MORTALITY

### Overview

Analysis of mortality surveillance data during the COVID-19 pandemic can take two general forms. First, a *descriptive report* can review surveillance data over an extended time frame (e.g. over the course of one year) to provide a comprehensive assessment of how COVID-19 may have affected mortality patterns in a country (or subnational jurisdiction). The descriptive report can reflect various levels of maturity (from basic to advanced) depending on the availability of reliable, accurate, and timely data.

*Monitoring reports* are a second type of data product supported by the analysis of mortality surveillance data. This type of product focuses on the most recently available mortality surveillance data (e.g. from the prior week) and evaluates the direction and magnitude of changes in those data.

### Purpose

This document presents job aids 1 – 5, which provide guidance on basic and intermediate determinations related to mortality surveillance analysis. A separate template is available to facilitate the routine analysis and interpretation of mortality surveillance data that are presented in monitoring reports.

LEVEL	ANALYTIC OBJECTIVE	DATA SOURCE(S) REQUIRED	JOB AID
Basic	Presence/absence of excess mortality in the total population	Total deaths [all causes] from a source large/representative enough to reflect the total population accurately; total deaths attributed specifically to COVID-19	Job Aid #1
	Differences in excess mortality by gender and/or by age	Total deaths [all causes] disaggregated by gender and/or by age	Job Aid #2
Intermediate	Differences in excess mortality by additional demographic groups	Total deaths [all causes] disaggregated by other demographic variables (e.g. age + gender; race)	Job Aid #2
	Differences in excess mortality by geographic location	Total deaths [all causes] disaggregated by subnational units (e.g. states or municipalities)	Job Aid #3
	Differences in excess mortality by location of death (e.g. facility vs. community)	Deaths reported/recorded at different types of locations (e.g. public hospitals; cemeteries)	Job Aid #4
	Differences in the pattern of excess mortality by cause of death	Deaths by specific causes (either in total or among deaths reported from facilities)	Job Aid #5
Advanced	Comparison of excess mortality [all causes] to COVID-19-specific mortality	Total deaths [all causes] and COVID-19 deaths, disaggregated by demographic groups and/or geographic location	
	Relationship of excess mortality to implementation of COVID-19 public health and social measures (PHSM)	Total deaths [all causes] and data on adoption of COVID-19 control measures (e.g. mobility patterns) by geographic location	
	Relationship of excess mortality to other health issues	Total deaths [all causes] and data on utilization of other health services (e.g. antenatal care visits; immunizations)	



**ANALYSIS OF MORTALITY SURVEILLANCE DATA**

**JOB AID #1: EXCESS MORTALITY - TOTAL**

The initial focus of a basic mortality analysis should determine the presence/absence of excess mortality in a total population.

Completing this analysis requires a data source for total deaths that is representative/large enough to reflect accurately the mortality trends in the population being surveilled.

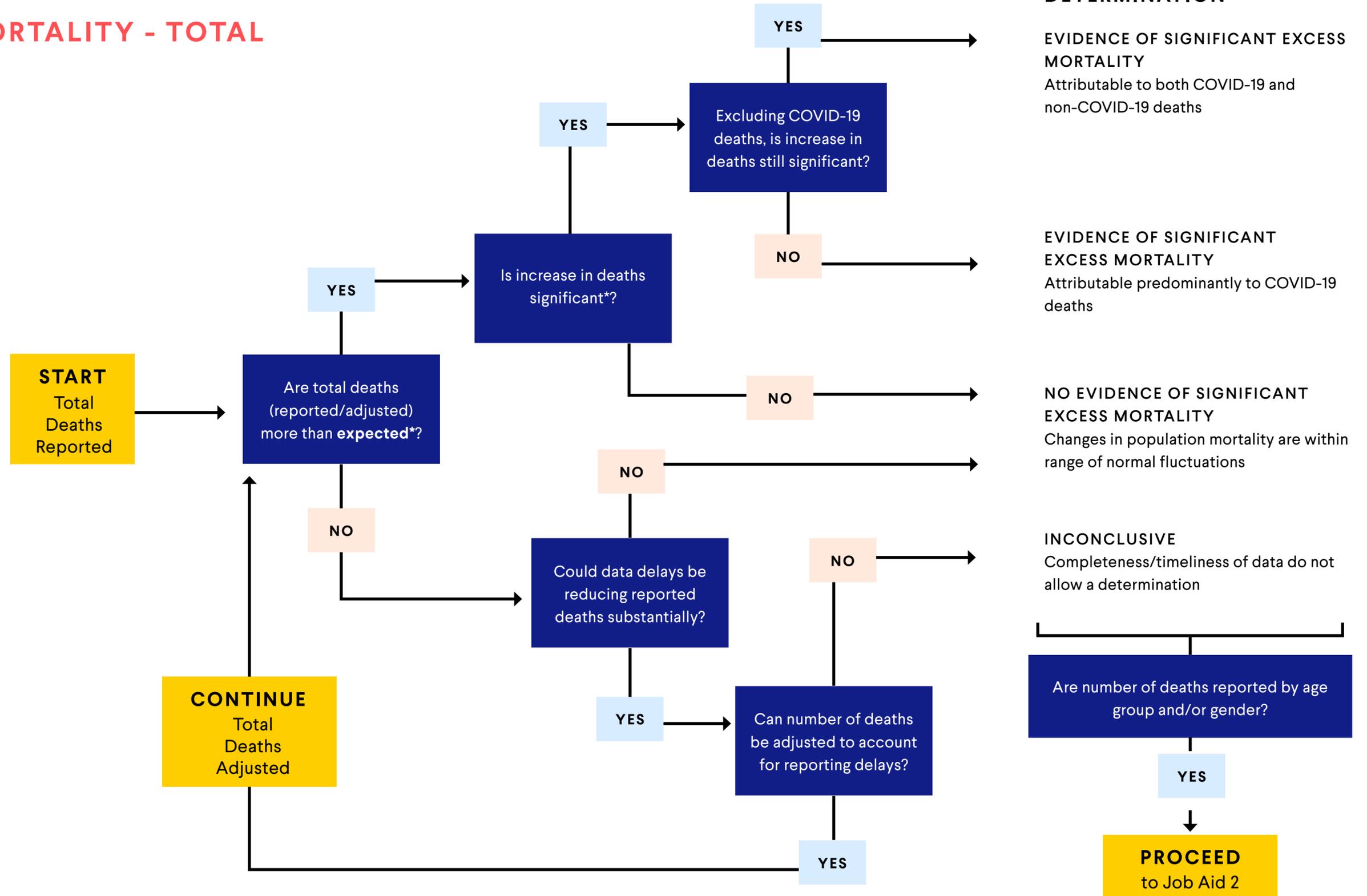
**\*Explanatory Notes**

Potential benchmarks for “expected” deaths:

- deaths last year
- average deaths for last x years
- forecasted deaths for this year.

Potential benchmarks for “significance”:

- statistical confidence interval
- pre-set standard for absolute/percent change



**DETERMINATION**

**EVIDENCE OF SIGNIFICANT EXCESS MORTALITY**

Attributable to both COVID-19 and non-COVID-19 deaths

**EVIDENCE OF SIGNIFICANT EXCESS MORTALITY**

Attributable predominantly to COVID-19 deaths

**NO EVIDENCE OF SIGNIFICANT EXCESS MORTALITY**

Changes in population mortality are within range of normal fluctuations

**INCONCLUSIVE**

Completeness/timeliness of data do not allow a determination

**ANALYSIS OF MORTALITY SURVEILLANCE DATA**

**JOB AID #2: EXCESS MORTALITY - BY SUBGROUP**

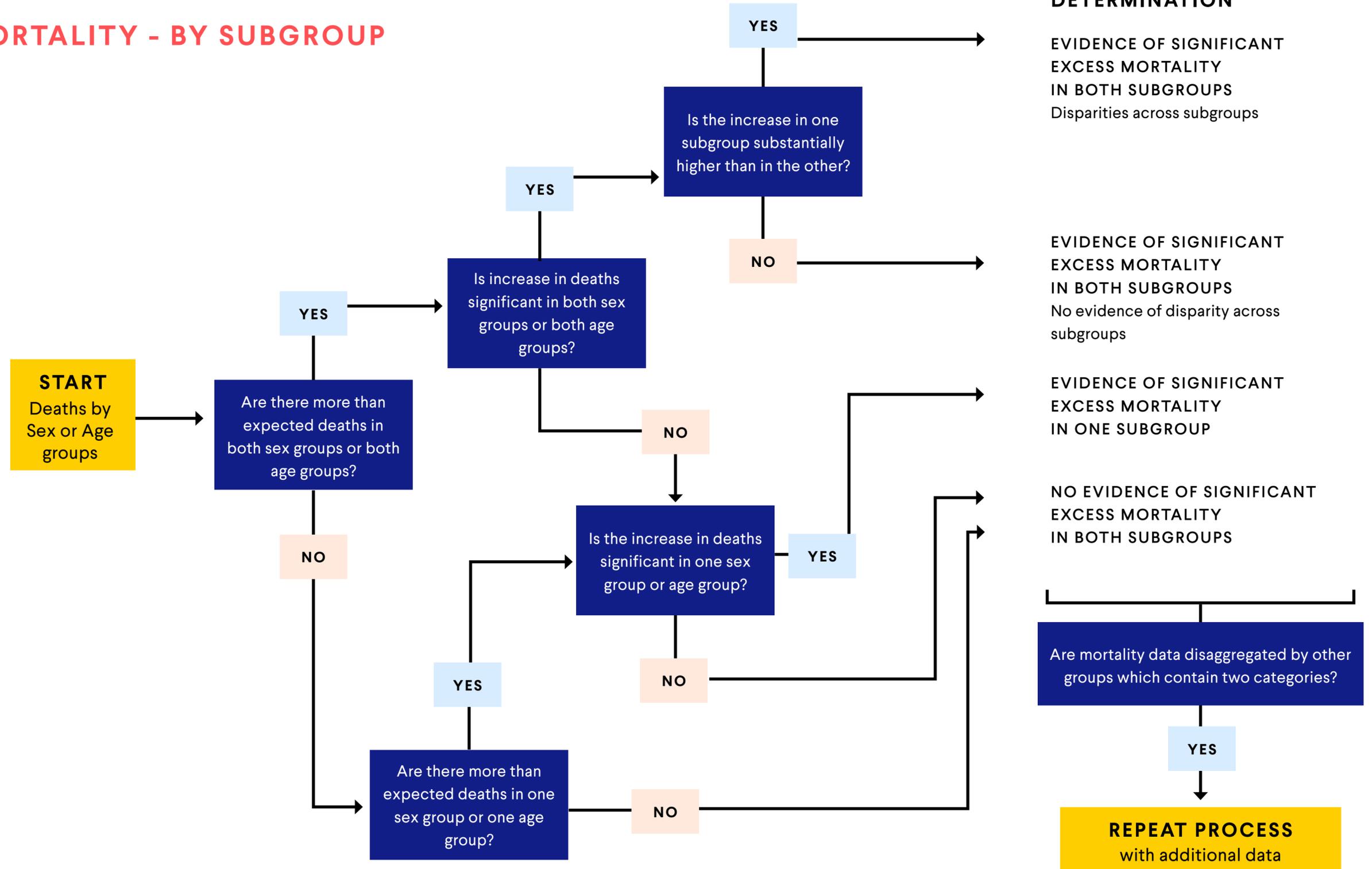
After assessing excess mortality in the total population (Job Aid #1), a basic mortality analysis should review differences in the pattern of excess mortality by sex and age groupings within the total population.

Completing this analysis requires data on deaths for the total population (reported or adjusted) disaggregated by sex and/or by age group.

**Explanatory Notes**

This job aid is based on situation where valid data are available for both sex (e.g. Female vs. Male) and only two age (e.g. 0-59 vs. 60+) groupings.

The sequence of analytic questions would be similar in instances where a comparison is sought for other groups which contain two categories within the total population.



**DETERMINATION**

EVIDENCE OF SIGNIFICANT EXCESS MORTALITY IN BOTH SUBGROUPS  
Disparities across subgroups

EVIDENCE OF SIGNIFICANT EXCESS MORTALITY IN BOTH SUBGROUPS  
No evidence of disparity across subgroups

EVIDENCE OF SIGNIFICANT EXCESS MORTALITY IN ONE SUBGROUP

NO EVIDENCE OF SIGNIFICANT EXCESS MORTALITY IN BOTH SUBGROUPS

Are mortality data disaggregated by other groups which contain two categories?

YES

**REPEAT PROCESS**  
with additional data

**ANALYSIS OF MORTALITY SURVEILLANCE DATA**

**JOB AID #3: EXCESS MORTALITY - GEOGRAPHIC LOCATION**

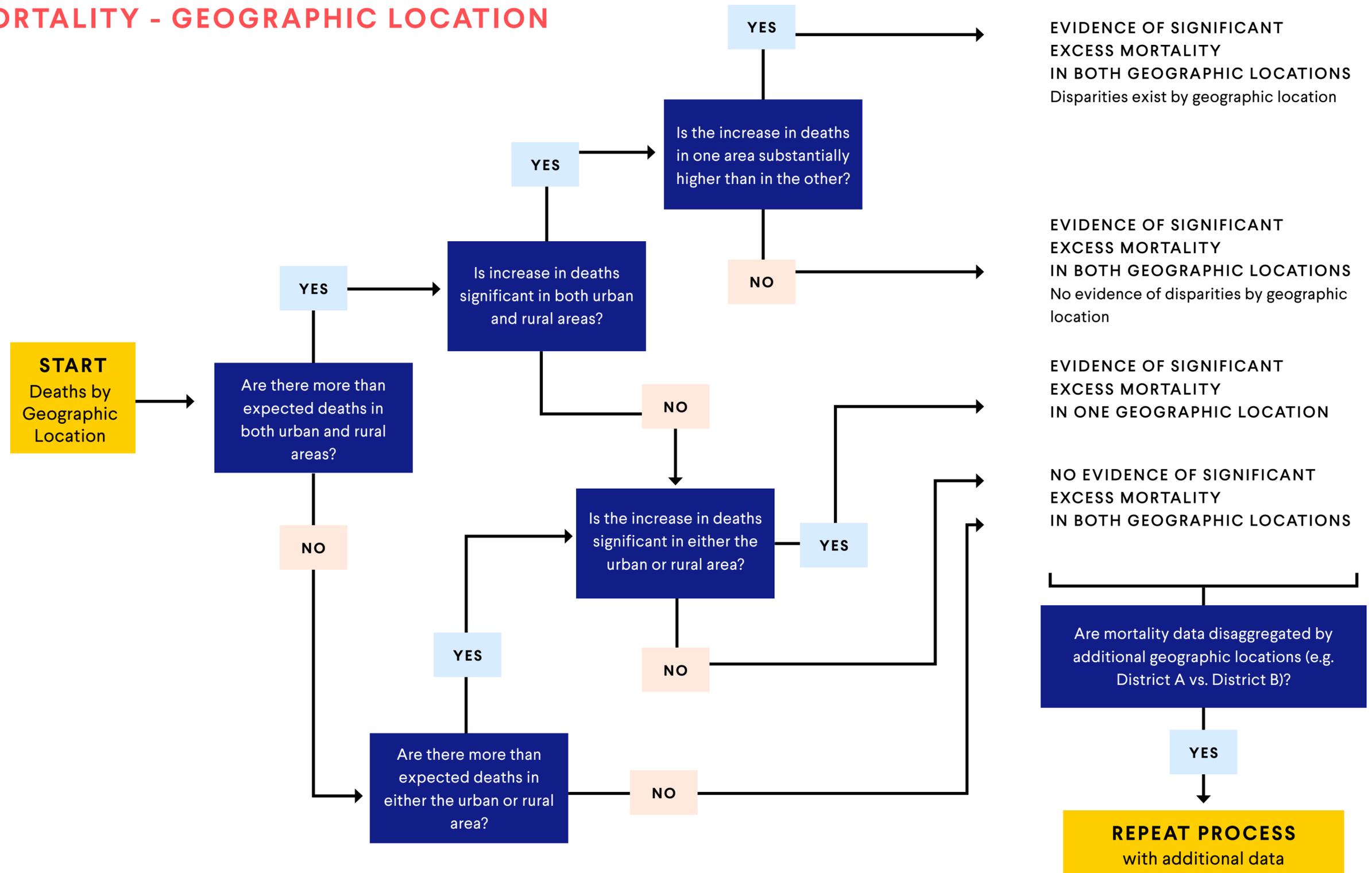
After assessing excess mortality in the total population (Job Aid #1), an intermediate analysis should review differences in the pattern of excess mortality by geographic location within the total population.

Completing this analysis requires data on deaths for the total population (reported or adjusted) disaggregated by geographic location.

**Explanatory Notes**

This job aid is based on situation where valid data are available for more than one geographic location (e.g. urban vs. rural) within the total population.

The sequence of analytic questions would be similar in instances where a comparison is sought for other geographic locations (e.g. District A vs. District B) within the total population.



**DETERMINATION**

EVIDENCE OF SIGNIFICANT EXCESS MORTALITY IN BOTH GEOGRAPHIC LOCATIONS  
Disparities exist by geographic location

EVIDENCE OF SIGNIFICANT EXCESS MORTALITY IN BOTH GEOGRAPHIC LOCATIONS  
No evidence of disparities by geographic location

EVIDENCE OF SIGNIFICANT EXCESS MORTALITY IN ONE GEOGRAPHIC LOCATION

NO EVIDENCE OF SIGNIFICANT EXCESS MORTALITY IN BOTH GEOGRAPHIC LOCATIONS

Are mortality data disaggregated by additional geographic locations (e.g. District A vs. District B)?

REPEAT PROCESS with additional data

**ANALYSIS OF MORTALITY SURVEILLANCE DATA**

**JOB AID #4: EXCESS MORTALITY - PLACE OF OCCURENCE**

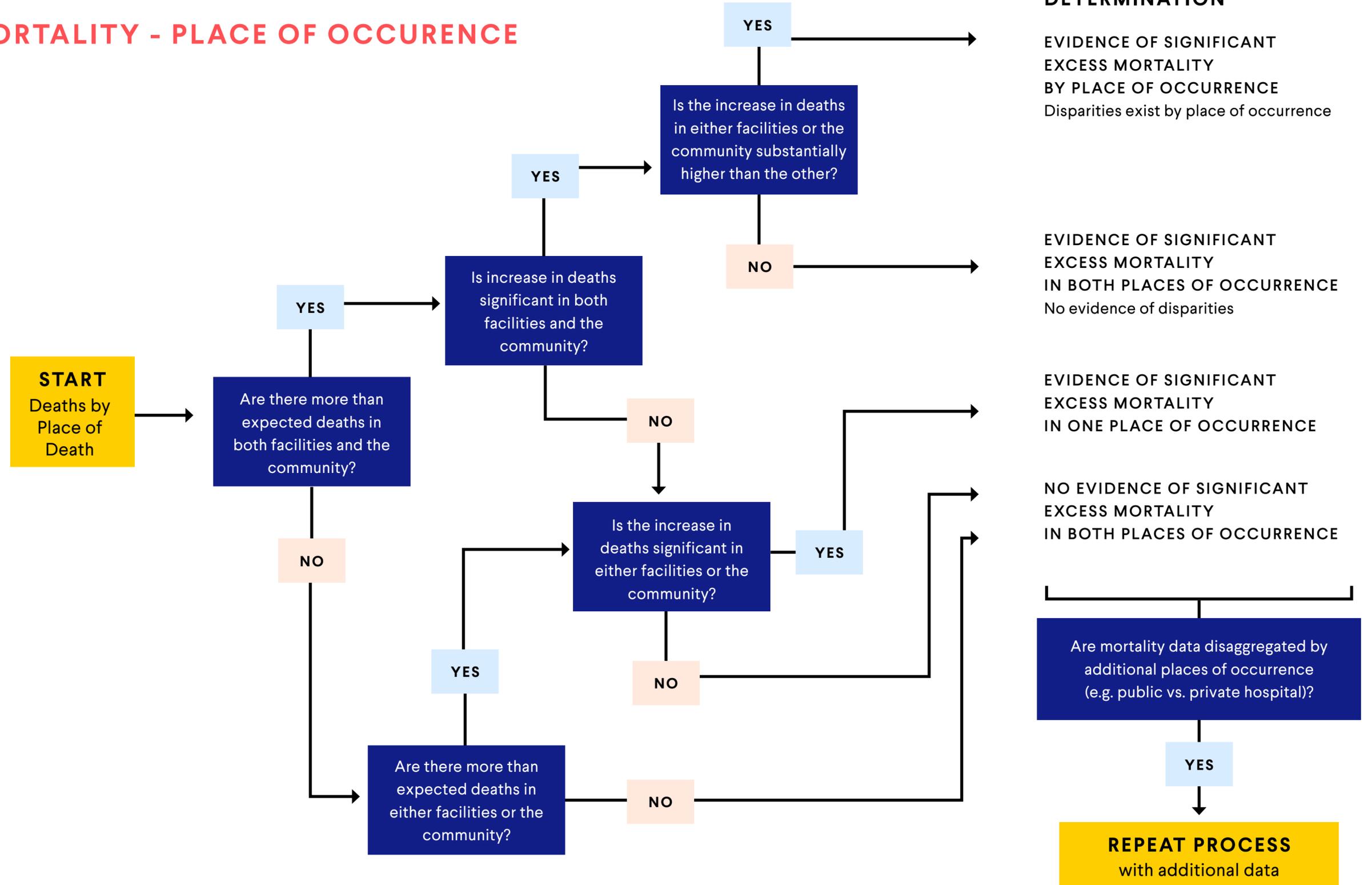
After assessing excess mortality in the total population (Job Aid #1), an intermediate analysis should review differences in the pattern of excess mortality by place of death within the total population.

Completing this analysis requires data on deaths for the total population (reported or adjusted) disaggregated by deaths that occurred in facilities and in the community.

**Explanatory Notes**

This job aid is based on situation where valid data are available for more than one place of death (e.g. facility vs. community) within the total population.

The sequence of analytic questions would be similar in instances where a comparison is sought (e.g. Facility A vs. Facility B) within the total population.



**DETERMINATION**

EVIDENCE OF SIGNIFICANT EXCESS MORTALITY BY PLACE OF OCCURENCE  
Disparities exist by place of occurrence

EVIDENCE OF SIGNIFICANT EXCESS MORTALITY IN BOTH PLACES OF OCCURENCE  
No evidence of disparities

EVIDENCE OF SIGNIFICANT EXCESS MORTALITY IN ONE PLACE OF OCCURENCE

NO EVIDENCE OF SIGNIFICANT EXCESS MORTALITY IN BOTH PLACES OF OCCURENCE

Are mortality data disaggregated by additional places of occurrence (e.g. public vs. private hospital)?

**REPEAT PROCESS**  
with additional data

**ANALYSIS OF MORTALITY SURVEILLANCE DATA**

**JOB AID #5: EXCESS MORTALITY - CAUSE OF DEATH**

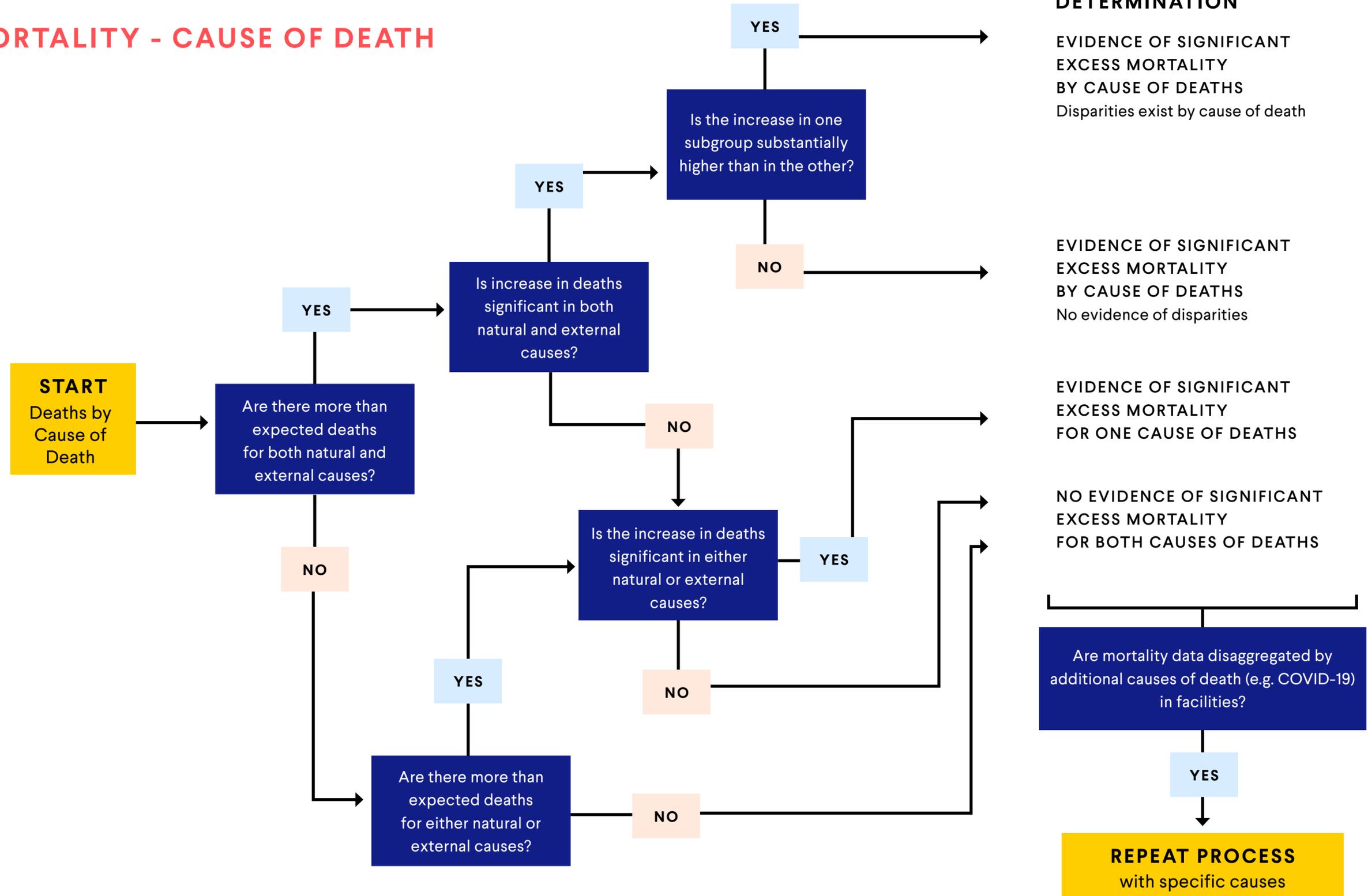
After assessing excess mortality in the total population (Job Aid #1), an intermediate analysis should review differences in the pattern of excess mortality by cause of death.

Completing this analysis requires data on all-cause mortality (reported or adjusted) disaggregated by cause of death.

**Explanatory Notes**

This job aid is based on situation where valid data are available for more than one cause of death grouping (e.g. natural vs. external causes).

The sequence of analytic questions would be similar in instances where specific cause of death data (e.g. pneumonia, COVID-19, injury) are available.



**DETERMINATION**  
EVIDENCE OF SIGNIFICANT EXCESS MORTALITY BY CAUSE OF DEATHS  
Disparities exist by cause of death

EVIDENCE OF SIGNIFICANT EXCESS MORTALITY BY CAUSE OF DEATHS  
No evidence of disparities

EVIDENCE OF SIGNIFICANT EXCESS MORTALITY FOR ONE CAUSE OF DEATHS

NO EVIDENCE OF SIGNIFICANT EXCESS MORTALITY FOR BOTH CAUSES OF DEATHS

Are mortality data disaggregated by additional causes of death (e.g. COVID-19) in facilities?

**REPEAT PROCESS**  
with specific causes