**TITLE OF STUDY**

DATE, LOCATION

## Project Overview

## *Title*

## *Summary*

## Introduction

* Burden of disease globally, i.e. extent of the public health problem
* Burden of disease nationally, i.e. extent of problema at local level
  + All-cause mortality (or other outcome of interest to give context to health problem)
  + Infectious causes of pneumonia deaths (or other outcome of interest)
    - All ages
    - Under-five
* Global and national recommendations regarding the vaccine (or other intervention of interest for the study)
* Background on the introduction of the vaccine (or other intervention of interest for the study)
  + Date, Schedule, other details regarding the roll out or progarm launch

## *Purupose and justification for the study*

* Why conduct the study? What evidence gap does it address? What policy implication will the study results have?
* Expected results and audience of the study

## Objectives

## *General study objectives:*

Evaluate the impact of childhood immunization program for VACCINE on HEALTH OUTCOME in AGE GROUP in COUNTRY through the evaluation of secondary mortality data.

## *Specific objectives*

In particular, this study will:

* 1. Describe the burden of deaths (all-ages and target group)
  2. Describe the burden of deaths associated with the health outcome of interest (all-ages and target group)
  3. Characterize the coverage levels of the compete vaccination series (VACCINE) over the study period
  4. Other?

## Methods

## Study design

## Study setting (location, context, etc.)

Characterize the country or sub-national level área targeted for the study: Geographic location, population, other socioeconomic indiactors.

## Study period (time horizon)

Total study period (Year – Year). Three immunization periods will be considered, depending on the year of vaccine introduction and how fast vaccination coverage increased following vaccine introductions in each country:

1. Prior to the introduction of the vaccine (Year – Year), when there was no universal use of the vaccine
2. Transition period (Year – Year), when vaccine was introduced in the country and coverages were still low (usually 1 year after vaccine introduction, may vary up to 2 years); and
3. Post-vaccine introduction period (YEAR-YEAR), when PCVs was routinely offered to all infants in all states in the country.

## Health outcomes of interest

Primary outcomes and ICD-10 codes:

* + Deaths due to pneumonia, as coded in the International Classification of Diseases 10th edition (ICD10) as J12-J18, and subcodes.
  + Deaths due to all-cases, including any cause as coded in the ICD10.

If there are other health outcomes of interest you would include here, i.e. Deaths due to bacterial meningitis, deaths due to severe acute respiratory infection, etc.

## Control Groups

We will employ recently proposed methodological strategies which use best practices from epidemiology and biostatistics. One such strategy is the construction and use of “synthetic controls”, in which multiple comparison outcomes are integrated, in order to better address unmeasured bias and confounding using a data-driven weighting of outcomes (each unaffected by the vaccine introduction). When using ‘synthetic controls’, many comparison outcomes are used (rather than just choosing selected control outcomes). These different comparison outcomes will be weighted based on their ability to predict the outcome of interest (e.g., pneumonia) in the pre-vaccine period, forming a single composite outcome control termed a “synthetic control.” Using Bayesian frameworks all available comparison outcomes will be weighted into a synthetic control.

## Data extraction and management

## Data sources

1. Mortality data
   1. Characterize the data source in your country for death registration
   2. Describe the principle cause of death codes that will be used for the analysis (ex. Will you assess codes together or a part for: 1) primary cause of death; 2) other causes including immeadiate causes).
2. Data quality indicators for mortality databases
   1. Characterize the quality of the national mortality registry using standardized indicators used to make international comparisons
3. Study population
   1. Characterize the data sources available (census, interperiod census) for population estimates

Data will be presented for the country as a whole and by geographical regions, by age group, gender, and by year of the study period. Detailed information on the source of the annual population estimates will be obtained, including methods for annual estimates generated from census data, year and month of census considered as the original data source for such estimation, and any reports from the demographic/statistics department on the process of population estimation from census data.

1. National vaccination coverage data
   1. Characterize vaccination coverage rates following the vaccine introduction by age-groups of interest and geographic área (sub-national).

## Data management

Data will be extracted without personal identifiers and managed only by the study team. Data will be extracted in any format convenient at the country level, using either Excel, SPSS, SAS or STATA software.

## Data analysis

Data from the National Mortality Information System will be analyzed through interrupted time-series analysis. Deaths due to selected causes, condition identified as one with high case fatality in this age range will be assessed for comparison purposes.

* Descriptive analysis of mortality trends (including outcome of interest), using both absolute frequencies of death as well as rates, by age, by geography
* Descriptive analysis of population, by age grou, by geography
  + Describe methods for estimating population size
* Descriptive analysis of vaccination coverage (including description of how coverage is calculated).
* Describe interrupted time series analysis
* Describe sensitivity analysis

## Study limitations

## Study participants: roles and responsibilities

## Ethical review considerations

* Evaluation of the protocol by local Institutional Review Board
* Submission should indicate study will use secondary data sources.
* Submission should indicate that data sources do not include personal identifiers.

## *Risks*

## *Benefits*

## Dissemination of results

## Study timeline

This study will be completed in approximately XX months. The study will commence in MONTH YEAR and conclude in MONTH YEAR, considering the following proposed activities:

|  |  |
| --- | --- |
| Date | Activity |
|  | Development of study protocol  Recruitment and training for study personnel |
|  | Protocol submission to Institutional Review Board (IRB) in countries  IRB approval  Characterization of population, coverage, and mortality data in all countries |
|  | Mortality data extraction and preliminary analysis in all countries and selection of controls |
|  | Draft report on descriptive data in all countries  Time series analysis of mortality data |
|  | Validation of methodology and identification of data quality parameters required for the use of such methodology  Final study Report |
|  | Final study Report  Draft Manuscript presenting study results |

## Financing

## References