Field Epidemiology Training Program: Noncommunicable Disease COVID-19 Toolkit

Field Project Topics, Questions, and Areas for Investigation: Suggested Examples

Updated: August 3, 2021

Field Epidemiology Training Program: Noncommunicable Disease COVID-19 Toolkit Overview

This resource is part of the Field Epidemiology Training Program (FETP): Noncommunicable Disease (NCD) and COVID-19 Toolkit. The Toolkit intends to build the capacity of Intermediate and Advanced FETP residents to incorporate NCDs within the context of their 2019 Novel Coronavirus Disease (COVID-19) pandemic response activities. The Toolkit includes a literature synthesis of key associations between COVID-19 and NCD comorbidities, a list of field project topics and questions for investigation by intermediate and advanced level field epidemiologists and suggestions for types of data needed to conduct field projects, and two case study exercises, one for intermediate and one for advanced level field epidemiologists. For this Toolkit, the NCDs of primary interest are cardiovascular disease, diabetes, chronic obstructive pulmonary disease, cancers, and mental health. Please see the [U.S. Centers for Disease Control and Prevention (CDC) website](#) for a listing of medical conditions, including many NCDs and risk factors, that increase the risk of severe illness or mortality from COVID-19[1].

Product Purpose – Field Project Topics, Questions, and Areas for Investigation: Suggested Examples

Individuals living with NCDs and their risk factors have a higher risk of severe COVID-19 disease and are more likely to die from COVID-19[1-7]. Studying NCD comorbidities and informing decision-makers and the population about the health risks posed by COVID-19 are critical for effective public health and field responses.

Effective field response also includes formulating study objectives or field project topics and questions to explore an uncertainty in an area of concern and conducting deliberate investigation. Crafting project questions is an essential, yet time-consuming, process; as such, this list of vetted project topics and questions that consider the association between COVID-19 and comorbidities in diverse global settings may serve as a valuable resource for field epidemiologists. The questions can be adapted to various settings, field projects, epidemiological studies, and investigations and serve as a starting point to guide field mentors, trainees, and graduates in planning field investigations, data collection, analysis, and related activities.

The target audience for the list of field project topics and questions is Intermediate and Advanced FETP residents. The list can be prioritized, updated, and adapted in consultation with the residents' in-country mentors, as needed.

The list was developed based on findings from three formative activities: an environmental scan, key informant interviews, and a literature synthesis. As part of the environmental scan, FETP competencies and residents' COVID-19 response activities were reviewed to create a framework for aligning potential project topics. Key informant interviews with FETP experts helped to identify domains in which FETP residents were working and potential gaps in the NCD experience of residents. Finally, the literature synthesis provided an overview of current knowledge related to NCDs and COVID-19 (as of October 2020). The list of field project topics and questions was designed to highlight areas of investigation that could fill gaps in the existing literature and use approaches and meet competencies that are suited to FETP residents.

Through conducting field investigation that examines NCDs within the context of the COVID-19 pandemic, field epidemiologists have the opportunity to identify patterns and generate evidence from low- and middle-income countries that can complement the wealth of published data that have, to date, primarily been collected in high-income countries. In addition, understanding how COVID-19 impacts local health systems and communities can inform national health authorities and decision-makers in strengthening systems to protect vulnerable populations and mitigate the harmful effects of COVID-19 and future public health emergencies.

Suggested Topics and Questions for Intermediate and Advanced Field Epidemiology Training Program (FETP) Residents on COVID-19 and Noncommunicable Disease (NCD) Projects		
Topic 1: Prevalence and Incidence	**Data Source**[*]	**Methodologic/Analytic Considerations**
1.1 Which NCD comorbidities or risk factors are associated with COVID-19 **symptoms**?	Contact tracing and/or case investigation questions to include NCD comorbidities[8]; COVID-19 case report forms; medical records; hospitalization data; laboratory information to confirm NCD diagnosis	• Examine risk factors associated with COVID-19 symptoms among contacts of individuals with confirmed COVID-19 cases. • Please see the CDC website for the latest listing of NCDs and risk factors associated with increased risk[1]. • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.
1.2 What is the prevalence of NCD comorbidities and risk factors among individuals infected with and without SARS-CoV-2?	Contact tracing and/or case investigation questions to include NCD comorbidities[8]; COVID-19 case reports; medical records; hospitalization data; laboratory information to confirm NCD diagnosis	• An age-matched comparison group or stratification by age or sex would strengthen the methodology; other options include using NCD prevalence data prior to COVID-19 in the same community or a survey among the general population. • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.
1.3 What is the distribution of COVID-19 symptoms among individuals with NCD comorbidities or risk factors?	Contact tracing and/or case investigation questions to include NCD comorbidities[8]; COVID-19 case report forms; medical records; hospitalization data; laboratory information to confirm NCD diagnosis	• Stratify analysis to consider key variables, such as age, sex, and insurance status (where available). • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.

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[*] **Data Availability and Access:** Data availability and access, as well as sample size determination and study design, need to be discussed and developed in collaboration with FETP mentors and must take into consideration local context with attention given to feasibility of potential investigation.

Suggested Topics and Questions for Intermediate and Advanced Field Epidemiology Training Program (FETP) Residents on COVID-19 and Noncommunicable Disease (NCD) Projects		
Topic 2: Health Outcomes	**Data Source**	**Methodologic/Analytic Considerations**
2.1 What NCD comorbidities or risk factors are associated with COVID-19 mortality?	Medical records—individual patient records; hospital records (where hospital data also record NCD comorbidity); vital statistics, including mortality surveillance, if available (where records include secondary cause of COVID-19 deaths)	• Stratify analyses by age, sex, and insurance-status (where available). • Acknowledge hospital deaths data excludes community deaths or consider community deaths using medical records. • Data sources may differ for those who are sick with confirmed COVID-19 versus those who have died from a COVID-19 related illness. • Where records do not currently record NCD comorbidity, these might be added for prospective data collection. • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.
2.2 What NCD comorbidities or risk factors are associated with COVID-19 **severity**?	Medical records—individual patient records; hospital records (where hospital data also record NCD comorbidity)	• Analysis to consider definition of severity (for example, intensive care unit (ICU), mechanical ventilation, death). • Stratify analyses by age, sex, district / county/ residential zone, and insurance status (where applicable). • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.
2.3 What is the increased risk of severe COVID-19 or mortality among individuals with NCD comorbidities and risk factors?	Medical records—individual patient records; hospital records (where hospital data also record NCD comorbidity)	• Stratify analyses by age, sex, district / county / residential zone, and insurance status (where applicable). • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.

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Topic 2: Health Outcomes	**Data Source**	**Methodologic/Analytic Considerations**
2.4 How does hospitalization duration differ among COVID-19 patients with and without NCD comorbidities or risk factors?	Medical records—individual patient records; hospital records (where hospital data also record NCD comorbidity)	• Stratify analyses by age, sex, district / county / residential zone, and insurance status (where applicable). • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.
2.5 How does NCD multi-morbidity impact the risk of COVID-19 severity or mortality?	Medical records—individual patient records; hospital records (where hospital data also record NCD comorbidity); vital statistics, including mortality surveillance, if available (where records include secondary cause of COVID-19 deaths)	• Stratify analyses by age, sex, district / county / residential zone, and insurance status (where applicable). • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.
2.6 Does the type or duration of COVID-19 interventions or adjunct therapies differ among patients with different NCDs? Interventions or adjunct therapies would include supplemental oxygen therapy, mechanical ventilation, and other therapeutic treatments.	Medical records—individual patient records; hospital records (where hospital data also record NCD comorbidity)	• Stratify analyses by age, sex, district / county / residential zone, and insurance status (where applicable). • Patients on NCD treatment are best case scenario compared to those undiagnosed/untreated. • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.

Suggested Topics and Questions for Intermediate and Advanced Field Epidemiology Training Program (FETP) Residents on COVID-19 and Noncommunicable Disease (NCD) Projects		
Topic 3: NCD Management Impacts	**Data Source**	**Methodologic/Analytic Considerations**
3.1 What is the impact of COVID-19 on patient self-management of NCDs (for example, blood pressure or blood glucose)?	Individual patient medical records; patient survey—retrospective or prospective self-report; Gross Domestic Product (GDP) or poverty data available through the World Bank or national databases	- Examine the impact of service disruptions, economics/finances, movement control/ lockdown measures, etc. - Compare patient records for outcomes (such as blood pressure or glucose control defined using established local treatment guidelines) before and during the pandemic and assess if outcomes differ among NCD patients who did and did not have COVID-19 diagnosis. - For reference, the WHO defines raised blood pressure as a systolic BP ≥140 mmHg and/or a diastolic BP ≥90 mmHg and raised blood glucose as a fasting plasma glucose value ≥7.0 mmol/L (126 mg/dl)[9]. - Results will only reflect outcomes for individuals receiving care and not those potentially most vulnerable or in need. - Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.

Suggested Topics and Questions for Intermediate and Advanced Field Epidemiology Training Program (FETP) Residents on COVID-19 and Noncommunicable Disease (NCD) Projects		
Topic 3: NCD Management Impacts	**Data Source**	**Methodologic/Analytic Considerations**
3.2 What is the impact of the COVID-19 pandemic on NCD behavioral risk factors (for example: diet, physical activity, smoking, alcohol intake)?	Survey of the general population or individuals with NCDs—retrospective or prospective self-report	• Compare reported outcomes before and after COVID-19 pandemic and associated control measures implemented. • Diet and physical activity measures should account for seasonality if using a pre/post design. • Study should also be specific about measure used for diet, which contains many components and is complex to assess. Possibilities include 24-hour recalls[10] to assess recent intake, food frequency questionnaires[11] to assess usual intake, or dietary screeners[12] to assess intake of specific foods, such as fruits and vegetables. • If surveying individuals with NCDs, results will only reflect outcomes for individuals who have been diagnosed and potentially not the most vulnerable or in need. • Considerations: where able, use existing, standardized and validated survey questions. Validated surveys to assess diet, physical activity, smoking, and alcohol use include CDC's National Health and Nutrition Examination Survey (NHANES) Dietary Recall[10], the United States' National Cancer Institute (NCI)'s NHANES Food Frequency Questionnaire[11], World Health Organization's (WHO) STEPwise Approach to NCD Risk Factor Surveillance (STEPS)[12], and the WHO's Global Adult Tobacco Survey (GATS)[13].

Suggested Topics and Questions for Intermediate and Advanced Field Epidemiology Training Program (FETP) Residents on COVID-19 and Noncommunicable Disease (NCD) Projects		
Topic 3: NCD Management Impacts	**Data Source**	**Methodologic/Analytic Considerations**
3.3 What is the impact of the COVID-19 pandemic on NCD medication adherence?	Individual patient prescription data; pharmacy records; patient survey—retrospective self-report; health system utilization data to measure system disruptions; medical records	• Compare patient records for outcomes before and after COVID-19 pandemic and associated control measures and health system disruptions. • Results will only reflect outcomes for individuals receiving care and not those potentially most vulnerable or in need. • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained. • Considerations: where able, use existing, standardized survey questions. • Evidation Health's COVID-19 Pulse Survey[14] includes examples of questions related to medication access during COVID-19.

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Topic 3: NCD Management Impacts	**Data Source**	**Methodologic/Analytic Considerations**
3.4 What is the impact of the COVID-19 pandemic on mental disorder prevalence and outcomes?	Individual patient medical records; individual patient prescription data; patient survey—retrospective self-report; health system utilization data	• Review mental disorder admission data before and during a pandemic; for patient-level data, note privacy issues and potential stigma related to mental health data use. • If conducting a survey, mental health status can be assessed using a validated diagnostic instrument for the conditions of interest (for example, depression, etc.). • Medical record review results will only reflect outcomes for individuals receiving care and not those potentially most vulnerable or in need. • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained. • Considerations: where able, use existing, standardized survey questions. Validated tools include CDC's NHANES Depression Screen[15] and the Center for Epidemiologic Studies Depression Scale (CESD)[16]. • Kaiser Family Foundation Coronavirus Poll[17] includes examples of mental health questions related to COVID-19.

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Topic 4: Long-term Impacts of COVID-19	**Data Source**	**Methodologic/Analytic Considerations**
4.1 What are the chronic health conditions associated with COVID-19?	Patient survey—retrospective self-report; medical records; hospitalization data	• Compare symptoms and health conditions developed by patients who developed COVID-19 in the months following recovery with those who did not develop COVID-19. • The use of a comparison group may help to differentiate which health conditions are associated with COVID-19 and which are the result of disruptions in health services or delays in seeking care. • Stratify analyses by age, sex, district / county / residential zone, and insurance status (where applicable). • Analysis could assess outcomes at set time points after individuals had COVID-19 (such as 3, 6, and 12 months). • Given availability of medical records and underdiagnosis of many NCDs, study may rely on self-reported diagnoses, which are an imperfect measure. • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.
4.2 What proportion of COVID-19 patients treated in a health facility develop chronic complications (for example, acute lung injury, acute kidney injury, or mental ill health)?	Individual patient medical records; health facility records	• Analysis to consider chronic complications identified from hospital/clinic data. • An age-matched comparison group would be needed to assess differences in risk that might be associated with a history of COVID-19. • Analysis could assess outcomes at set time points after individuals had COVID-19 (such as 3, 6, and 12 months). • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.

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Topic 5: Health System Impacts: NCD Treatment/Services	**Data Source**	**Methodologic/Analytic Considerations**
5.1 What NCD services have been disrupted during COVID-19?	Health service utilization data; survey with health system staff and NCD patients	• Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.
5.2 How does the continuity of care for NCD patients during the COVID-19 pandemic differ among patients with different NCDs or risk factors? For example, routine screening and appointments for patients with diabetes or cardiovascular disease, treatment for patients with cancers, etc.	Primary healthcare (PHC) clinic data on service delivery; patient survey—self-report on service utilization before and during the pandemic	• Define measurement for change in capacity to treat a variety of NCDs over the course of the pandemic, such as changes in the frequency of patient visits.
5.3 How does the continuity of care for NCD patients during the COVID-19 pandemic differ among primary, secondary, and tertiary (or country-specific equivalent) levels of care?	PHC clinic data on service delivery; hospital data on service delivery	• Define measurement for change in capacity to treat a variety of NCDs over the course of the pandemic across facilities, such as changes in frequency of patient visits.

Suggested Topics and Questions for Intermediate and Advanced Field Epidemiology Training Program (FETP) Residents on COVID-19 and Noncommunicable Disease (NCD) Projects		
Topic 6: New Delivery Models	**Data Source**	**Methodologic/Analytic Considerations**
6.1 What proportion of NCD patients are receiving care through new models (for example, telemedicine, community-based)?	Health system service delivery records; health system data on telemedicine availability and utilization over the course of the pandemic; patient survey—retrospective self-report	• Health systems may record the delivery method for care in patient medical records, or as a system operational report.
6.2 What proportion of NCD patients receiving telemedicine consultations achieve or maintain targets for disease management (for example, blood pressure or glucose control)?	Patient survey—retrospective self-report to include education, income, and occupation to measure socioeconomic status[18]; individual medical records	• Compare NCD outcomes among patients that received telemedicine and those who did not. • Other differences between these patient populations should be assessed to account for characteristics that might be associated with care seeking and treatment outcomes, such as age, sex, district / county / residential zone, insurance status (where applicable), and socioeconomic status. • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.
6.3 What proportion of NCD patients receiving community-based visits from health extension workers achieve or maintain targets for disease management (for example, blood pressure or glucose control)?	Patient survey—retrospective self-report; individual medical records	• Compare NCD outcomes among patients who received community-based visits and those who did not. • Other differences between these patient populations should be assessed to account for other characteristics that might be associated with care seeking and treatment outcomes, such as age, sex, district / county / residential zone, insurance status (where applicable), and socioeconomic status. • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.

Suggested Topics and Questions for Intermediate and Advanced Field Epidemiology Training Program (FETP) Residents on COVID-19 and Noncommunicable Disease (NCD) Projects		
Topic 7: Barriers to Care	**Data Source**	**Methodologic/Analytic Considerations**
7.1 What are the barriers (structural, personal, and/or financial) to accessing care for NCDs during COVID-19?	Clinical staff survey; patient survey—retrospective self-report; local policy data on control measures	• Potential barriers might include fear of infection; reduced transport; increased cost of accessing care; patient belief treatment NCD treatment unavailable during the pandemic; patient belief NCD not a treatment priority during COVID-19; economic factors, such as loss of a job. • Considerations: where able, use existing survey questions that define barriers related to pandemic; consult local authorities for details on control measures.

Suggested Topics and Questions for Intermediate and Advanced Field Epidemiology Training Program (FETP) Residents on COVID-19 and Noncommunicable Disease (NCD) Projects		
Topic 8: Access to Medicines	**Data Source**	**Methodologic/Analytic Considerations**
8.1 What are the impacts of the COVID-19 pandemic and associated disruptions on access to essential NCD medicines?	Pharmacy data on supply/dispensing; pharmacist survey; patient survey—retrospective self-report	• Assess differences among individuals with different comorbidities, age groups, socioeconomic groups. • Potential reasons for the disruptions might include economic factors, such as not being able to afford routine medication; lack of supply; transportation; fear of infections when accessing medicines. • Patient survey to assess NCD medication adherence to inquire whether patients are able to obtain their medication, whether they have maintained or reduced dose, and reasons why (for example, lack of availability, fear of scarcity, problematic symptoms).
8.2 What are the impacts of new models of medicine delivery (for example: multi-month scripts, community health worker delivery) on NCD medicine availability during COVID-19?	Pharmacy data on supply/dispensing; pharmacist survey; patient survey—retrospective self-report	• Tailor to the new models implemented in respective area(s). • Survey to include adherence questions as above.
8.3 What is the prevalence of willingness to receive COVID-19 vaccine among individuals with and without NCD comorbidities and risk factors?	Patient survey—self-report	• Assess differences among individuals with and without different NCD comorbidities, age groups, socioeconomic groups, district / county / residential zone.
8.4 What is the incidence of adverse events following COVID-19 vaccination for individuals with NCD comorbidities and risk factors?	Individual medical records; clinic records; patient survey—retrospective self-report	• Assess differences among individuals with different NCD comorbidities, age groups, district / county / residential zone. • Protection of personally identifiable information (PII) and data must be considered during data collection, as well as how confidentiality and anonymity will be maintained.

Suggested Topics and Questions for Intermediate and Advanced Field Epidemiology Training Program (FETP) Residents on COVID-19 and Noncommunicable Disease (NCD) Projects		
Topic 9: Education / Information / Behavior	**Data Source**	**Methodologic/Analytic Considerations**
9.1 What do individuals with NCDs know about their increased risk for COVID-19 (due to comorbidity)?	Knowledge, Attitudes, and Practices (KAP) survey[19]	• Assess differences among individuals with different NCD comorbidities, age groups, socioeconomic groups, district / county / residential zone, and vaccination status. • Examples of peer-reviewed COVID-19 and NCD related KAP surveys are available in the reference page.[20-22]
9.2 What COVID-19 prevention and mitigation measures do individuals with NCDs practice?	Knowledge, Attitudes, and Practices (KAP) survey[19]	• Assess differences among individuals with different NCD comorbidities, age groups, socioeconomic groups, district / county / residential zone, and vaccination status. • Examples of peer-reviewed COVID-19 and NCD related KAP surveys are available in the reference page.[20-22]
9.3 What COVID-19 prevention and mitigation messages resonate with individuals with NCDs?	Knowledge, Attitudes, and Practices (KAP) survey[19]	• Assess differences among individuals with different comorbidities, age groups, socioeconomic groups, district / county / residential zone, and vaccination status. • Examples of peer-reviewed COVID-19 and NCD related KAP surveys are available in the reference page.[20-22]

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