

IDENTIFY ESSENTIAL WORKERS WITH OCCUPATIONAL DATA FOR HEALTH (ODH)

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IMPLEMENTATION GUIDE FOR HEALTH CENTERS

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INTRODUCTION

This implementation guide highlights concepts, resources, and lessons learned from a group of community health centers that identified patients who are essential workers through the collection of work-related information during a pilot study.

The data elements and vocabulary used in this guide are based on The Centers for Disease Control and Prevention (CDC) National Institute for Occupational Safety and Health (NIOSH)'s Occupational Data for Health (ODH) framework for industry and occupation. This framework was condensed to align with community health center system modifications, use cases, workflows, and data collection scenarios.

Our nation continues to learn from the impacts of the pandemic and the high levels of health inequity that were exposed. We now recognize that frontline or essential workers must be identified early and supported so they can perform the uninterrupted delivery of services while protecting our communities, their families, and themselves. With the possible emergence of newer and more contagious SARS-CoV-2 variants and nationwide emergency situations, federal agencies and stakeholders have collaborated to create guidance to identify our essential workers ([Table 1](#)).

Addressing health and inequity in relation to occupation is clear within community health centers as they serve over 30 million people around the country: 14.5 million who live in poverty, 2.9 million aged 65 years and older, 19 million from a minority background, and 1.5 million who experience homelessness¹. It is vital to capture and utilize employment status, job industry (type of business) and job occupation (type of work) data to not only deliver personalized health care, but to create policies, promote safer work processes, and encourage the use of procedures that protect workers and reduce or prevent exposure to many work-related risks.

Employment status can be linked to negative health outcomes such as mental health, cardiovascular health, and mortality^{2,3}. Learning employment status can, therefore, introduce opportunities for health and service interventions.

The connection between industry, occupation, and health is demonstrated through ongoing research and experience. Examples include individuals who work in crowded conditions and are at increased risk for infectious diseases; or individuals who are exposed to chemical and radiation at work and are at risk for cancer and toxicities; or individuals who work with heavy machinery who are at risk for traumatic injury. Protections may include vaccine education, provision of personal protective equipment, provision of water for outdoor workers, or even resources for job training for unemployed patients, etc. The collection of work-related data at the community health level has the potential to prevent many health conditions and may also help identify physical and mental conditions from things like long work hours and low pay, injury, or family impacts.

We encourage you to use this *Implementation Guide for Health Centers* and learn the steps your health center can take to build Occupational Data for Health (ODH) collection systems into your Electronic Health Records (EHR).

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OCCUPATIONAL DATA FOR HEALTH (ODH) DATA MODEL

The ODH framework was developed by the National Institute for Occupational Safety and Health (NIOSH) and partners to standardize and capture data about work. It includes an information model and friendly vocabulary based on standard codes.

The Occupational Data for Health (ODH) information model is organized around seven topics⁴:

1. Employment Status
2. Retirement Dates
3. Jobs (Past or Present)
4. Longest Held (Usual) Work
5. Volunteer Work
6. Combat Zone Periods
7. Work of Household Members of Minors

NACHC worked with several pilot sites to, at the minimum, collect and code data on patient's employment status, occupation, and industry.

To capture structured data on employment status and other topics in the ODH information model, the following value sets in PHIN VADS (Public Health Information Network Vocabulary Access and Distribution System) are recommended for use. Please refer to this information as you implement a system to capture ODH and identify essential workers in your health center community.

Employment Status

The CDC defines *an employed person* as someone who currently has a job, whether full-time or part-time, and has worked at least one hour in the past week. An *unemployed person* is currently not employed but is actively seeking employment. Finally, a person who is *not in the labor force* is not currently employed and is not actively seeking employment, such as a retiree, a full-time student, or a homemaker (NIOSH, 2018).

Employment Status (ODH) [PHVS_EmploymentStatus_ODH]

View: <https://phinvads.cdc.gov/vads/ViewValueSet.action?oid=2.16.840.1.114222.4.11.7129>

Industry and Occupation

For industry and occupation value sets with plain language entries that are coded to the NAICS (North American Industry Classification System) and SOC (Standard Occupational Classification), see the following PHIN VADS value sets:

Industry NAICS Detail (ODH) [PHVS_Industry_NAICS_Detail_ODH]

View: <https://phinvads.cdc.gov/vads/ViewValueSet.action?oid=2.16.840.1.114222.4.11.7900>

File: <https://phinvads.cdc.gov/vads/DownloadHotTopicDetailFile.action?filename=262439B1-DADF-E911-8181-005056ABE2F0>

Occupation ONETSOC Detail (ODH) [PHVS_Occupation_ONETSOC_Detail_ODH]

View: <https://phinvads.cdc.gov/vads/ViewValueSet.action?oid=2.16.840.1.114222.4.11.7901>

File: <https://phinvads.cdc.gov/vads/DownloadHotTopicDetailFile.action?filename=272439B1-DADF-E911-8181-005056ABE2F0>

Value sets for all other ODH topics and data elements can be found here:

File: <https://phinvads.cdc.gov/vads/DownloadHotTopicDetailFile.action?filename=A5D034FE-EA50-EB11-8197-005056ABE2F0>

Health centers frequently use existing, external information to identify the most common employers in their catchment areas. This data can be used to create a customized pre-populated industry list for selection from the NAICS. This process can be found in the ODH “A Guide to the Collection of Occupational Data for Health: Tips for Health IT System Developers” which can be downloaded at <https://doi.org/10.26616/NIOSH PUB2022101>⁵.

Health center implementers can also find the full list of ODH data elements, arranged by topic, from the following publication: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7647316/>⁴.

To map existing terminology, codes, or unstructured data related to work information and ODH value sets, it is important to follow ODH definitions for each data element. Standard definitions are essential to realize the full utility of work information for clinical care decisions and for purposes of research, public health, and population health. This allows data from multiple disparate sources to be semantically aggregated.

DATA AND RESULTS

Identifying Essential Workers

Essential workers are individuals who perform critical jobs that are necessary to maintain the health, safety, and well-being of a community during a crisis or emergency. These jobs include healthcare workers, emergency responders, food and agriculture workers, transportation workers, energy workers, and water and wastewater treatment workers among others⁶.

Essential workers can be identified by utilizing both patient occupation and industry data. These may be captured during patient intake or within community health center workflows.

Essential workers can be identified using the federal guidance and crosswalk documents in Table 1.

TABLE 1. Federal Agency Publications Identifying Essential Workers^{7,8,9}

Agencies	Publication	Description
Department of Homeland Security (DHS) Cybersecurity and Infrastructure Security Agency (CISA)	Guidance on the Essential Critical Infrastructure Workforce (ECIW): Ensuring Community and National Resilience in COVID-19 Response Guidance on the Essential Critical Infrastructure Workforce CISA	Guidance with a functional national definition of essential workers. Advisory list in the ECIW does not include standardized industry or occupation titles or codes for public health use cases.
Centers for Disease Control and Prevention (CDC) National Institute for Occupational Safety and Health (NIOSH)	Essential Worker Industry and Occupation Code Set Essential Workers Code Set NIOSH CDC	CDC NIOSH mapped standardized industry code crosswalks to identify workers in essential critical infrastructure industries as defined by CISA for research purposes. Utilizes two- to- six- digit 2017 North American Industry Classification System (NAICS) industry titles and codes, mapped to Census industry titles and codes (CICs), and paired with Census occupation titles and codes (COCs)
Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices (ACIP)	Interim List of Categories of Essential Workers Mapped to Standardized Industry Codes and Titles Categories of Essential Workers: COVID-19 Vaccination CDC	CDC and ACIP mapped 2017 NAICS industry titles and codes to the most current CISA ECIW list, categorized by recommended vaccination phase prioritization

THE COMPLETE ODH INFORMATION MODEL IN HEALTH CENTERS: CHALLENGES FOR USE

In the U.S., *employment status, industry, occupation*, and other work data are not routinely captured in the clinical setting outside of occupational medicine practices, nor are they captured as coded concepts in electronic health records (EHR). While clinicians are trained to capture a patient's occupational history as part of the social history, the information is being recorded primarily as free text narrative in notes and not as coded element(s), making it difficult to analyze or use for targeted interventions. Many EHRs have limited, if any, support for structured data elements about a person's work outside of those used for administrative and insurance purposes.

The Occupational Data for Health (ODH) framework was created to address the challenges of capturing this information for clinical applications. As the COVID-19 pandemic brought a spotlight to the ways patients working in specific industries and occupations were adversely affected, it became clear that capturing standardized work information in EHRs through the ODH framework is essential for public health policy, research, and clinical decision support that informs better preventive health measures and patient care.

The community health centers that have piloted the use of ODH listed barriers and challenges they and other community health centers may need to address when implementing ODH:

1. Challenges to address with Electronic Health Records (EHR) Systems

- Limited financial and technical resources to customize and continually manage structured fields and smart forms.
- Limited backend terminology support for the complete and detailed ODH NAICS and SOC codes representing industry and occupation.
- Limited vendor support, delaying or lengthening customization and implementation timelines.

2. Challenges to Address with Staffing and Other Resources

- Limited informatics and data staffing support.
- Difficult to identify provider/staff champions that understand the value of, and are committed to, capturing data on work information as represented in the ODH information model and vocabulary.
- When patients and staff do not understand the value of collecting work information, it can hinder implementation and data collection.

Addressing Implementation Challenges and Identifying Opportunities

For organizations with informatics and/or data science teams:

It is essential to build a strong partnership with these teams. They can address customization, timelines, data representation, linkages, and mapping necessary to include ODH data elements in the existing EHR systems. These teams are also critical for technical resources and the continued management of structured fields and smart forms. Informatics specialists with terminology expertise can find solutions to implement the complete and detailed ODH NAICS and SOC codes representing industry and occupation in their system's backend through liaison work with EHR vendors.

For health centers without in-house informatics support:

Reach out to health center control networks (HCCNs) or other supportive organizations to assist with closing some of these data-related gaps. Staff training is also crucial to clarify why it is important to capture work-related information from patients, and how to address the reluctance some patients feel when asked to share this information due to privacy issues.

Familiarization with ODH content, the rationale behind each ODH topic, continued development of clinical use cases, and open discussion among end-users as well as feedback from patients will help continuously improve data capture and quality. When administrators, providers, and staff understand the value of ODH, and can help advocate for its collection and use then successful implementation and change management can occur more easily.

NACHC offers this easy explainer—[Occupational Data for Health \(ODH\)](#)—for administrators and staff, with a case study example to illustrate why it's important to collect ODH, how to collect it, and how to use it.

The graphic is a white rectangular document with a blue header and footer. The header contains the NACHC logo and the title 'OCCUPATIONAL DATA FOR HEALTH (ODH)'. The main body of the document is divided into sections: 'Why it is needed. How to collect it. How to use it.', 'WHAT IS OCCUPATIONAL DATA FOR HEALTH (ODH)?', 'WHY IS IT IMPORTANT TO COLLECT ODH?', 'HOW CAN HEALTH CENTERS COLLECT ODH SUCCESSFULLY?', and a 'TIPS' box. The footer contains contact information.

**NATIONAL ASSOCIATION OF
COMMUNITY HEALTH CENTERS**

OCCUPATIONAL DATA FOR HEALTH (ODH)

**Why it is needed.
How to collect it.
How to use it.**

The world has learned, through the experience with COVID-19, why some categories of workers are called "essential." Essential workers are the key to our ability to obtain fresh food, health care, and public transport in a crisis. Many health center patients are essential workers. NACHC wonders: have they experienced more health burdens during the pandemic than others? Without collecting Occupational Data for Health (ODH), health centers cannot find essential workers and address their needs.

WHAT IS OCCUPATIONAL DATA FOR HEALTH (ODH)?

Occupation is among the most important social determinants of health (SDOH). It tells us:

- whether and how someone is exposed to pollutants, toxins, or disease
- about someone's socio-economic status and income level, which provides information about their social needs and financial security
- whether someone has access to employer-provided health insurance

Occupational data are often missing in the EHR. It is currently not standard practice to capture this information or match it to health trends for care planning.

WHY IS IT IMPORTANT TO COLLECT ODH?

Using ODH, health centers can actively identify at-risk populations based on their job and exposure risk.

- For example, a person who renovates old homes may be at risk for asbestos exposure and therefore asbestos-related lung disease. Or, when health centers match COVID-19 data with occupational data, care teams can identify vaccination status, COVID-19 risks, exposure risks, and assess health care needs for populations whose jobs put them at risk for certain illnesses.

HOW CAN HEALTH CENTERS COLLECT ODH SUCCESSFULLY?

It is not always easy to get answers to questions like:

- Are you currently working?
- What is your profession and current job role?
- What industry do you work in?

Some patients are hesitant to answer. They do not know how the data will be used, or who will see it. To establish trust, patients should be told, ideally through conversations but also in writing, that the data is **ONLY** used to help care teams understand health-risks and provide appropriate care.

TIPS

- Help patients and staff understand how occupational data are used and how workers benefit
- When possible, let patients enter the data directly into the EHR with a tablet. Some health centers create short-cuts to help, but make sure that these link to standardized codes!
- Enrollment Specialists can help put patients at ease in their own language and enter data in the EHR. To expedite data entry, a search interface, or a searchable Excel spreadsheet with the full list of occupations from U.S. Census Bureau's North American Industry Classification System (NAICS) can make it easier to find job/industry categories.

To learn more, contact Informatics@nachc.com

EXAMPLE USE CASES/USER STORIES TO ILLUSTRATE THE VALUE OF ODH

Various user stories were collected and prepared by NIOSH Work Group members to demonstrate the usefulness of the ODH data elements in clinical outcomes. The following are examples that can be used by implementers to demonstrate its utility to decision makers in their health centers or healthcare organization.

1. Patient Care

A 42-year-old man presents with asthma. His symptoms of wheezing and cough began 6 months ago. For the past year, he has worked in an autobody shop, painting cars. This occupation and industry (job) is identified by a clinical decision support tool as one associated with work-related asthma. An occupational medicine consultant identifies isocyanates in the paints he uses as a likely cause for his asthma. Changing to a job without exposure to these paints results in resolution of symptoms over a period of 3 months.

2. Population health

A practice that routinely collects occupation information during registration uses the population health tool to analyze the occupations of the patients in its care population. Notable is the number of patients who are housepainters who mostly spoke Portuguese. In follow-up discussions with some of these patients, it is revealed that much of their work involves removing lead paint from older houses. Screening for lead poisoning is instituted based on occupation, and educational materials in Portuguese are provided to patients through the health IT systems. These patients are now aware of important preventive measures to take while working.

A community health center that piloted the collection of occupation and industry information from their patients determined that many of their patients were working at dairy farms. An exploratory analysis found that this population of dairy farm workers disproportionately had diagnoses of asthma and other respiratory illnesses. The health center proceeded to treat patients' respiratory conditions and offer a COVID vaccine clinic for workers and their families at the dairy farm work site, in collaboration with the farm-owner. (see case study: [ODH Information Sheet - English](#))

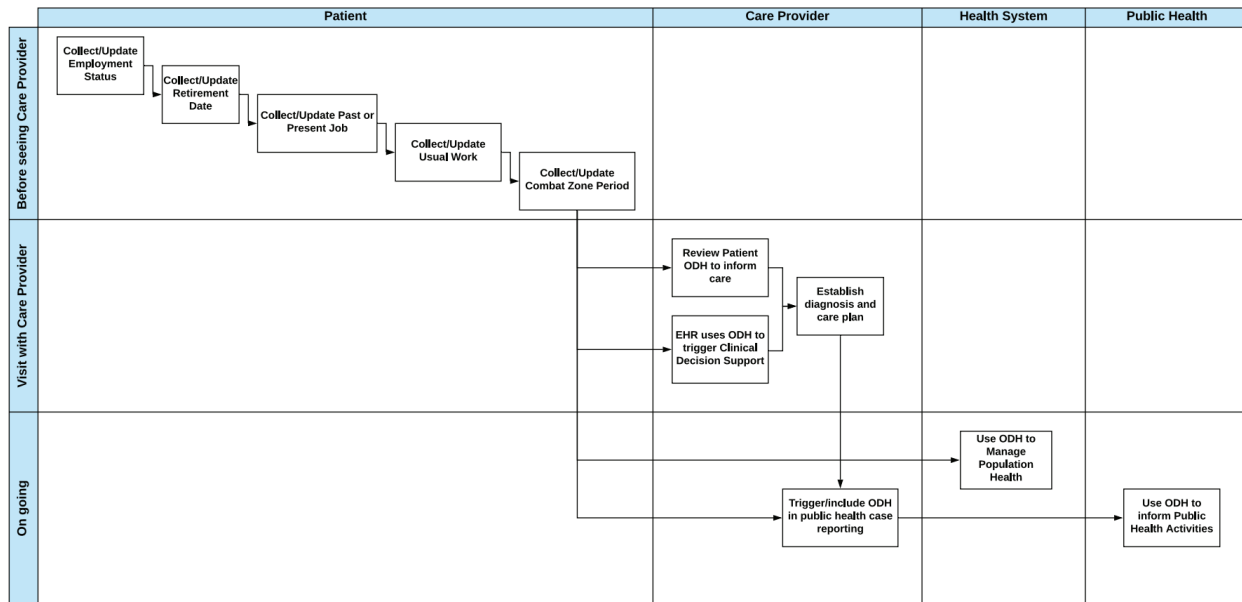
3. Public health

A 19-year-old man presents to an emergency department with flu-like symptoms. His occupation is a farm worker and the industry in which he works is peach farming. Based on this information, the physician asks about his activities during right before symptom onset. He was at work, picking peaches. Laboratory testing confirms a diagnosis of pesticide poisoning. As required by state law, a report is sent by the healthcare organization through their health IT systems to the state health department. A health department epidemiologist analyzes reported cases from all nearby healthcare facilities and sees that several such cases were persons working for the same employer. The state health department then worked with the employer to assess and reduce exposure to pesticides.

SAMPLE DATA COLLECTION AND REPORTING WORKFLOW

The ODH framework was based on a logical workflow approach: e.g., how the data would likely be collected, stored, and ultimately used^{10, 11, 12}. In Figure 1, horizontal lanes represent timing and vertical lanes are the actors involved. This can be used as a sample or basis that can be customized to the workflow of each health center. More recommendations can be found in the ODH developer guide (see page 11).

Figure 1. Sample workflow to collect and use Occupational Data for Health (ODH) data



Implementing ODH within community health centers involves customizing a subset of the ODH topics and data elements found in each topic, depending on the use cases, situations, and workflows. This supports a phased-in approach as the collection and use of ODH matures within a healthcare organization. ODH industry and occupation data elements for jobs have been included in version 3 of the United States Core Data for Interoperability (USCDI) with their code value sets hosted in PHIN VADS.

OCCUPATIONAL DATA FOR HEALTH (ODH) INTEROPERABILITY AND MESSAGING TEMPLATES

When a health center or organization needs to report on or send data elements from the ODH framework, adherence to messaging standards is needed. Topics within the ODH framework are aligned to Health Level Seven (HL7) standard messaging templates, which also reflect the most recent vocabulary and messaging requirements. These sections are defined in the following places:

- HL7 Structured Documents, Public Health and Emergency Response, and Health Standards Integration Work Groups, sponsors. HL7 CDA® R2 Implementation Guide: Consolidated CDA Templates for Clinical Notes; Occupational Data for Health – U.S. Realm. http://www.hl7.org/implement/standards/product_brief.cfm?product_id=522
- HL7 Orders and Observations Work Group, Infrastructure and Messaging Work Group, Conformance Work Group, et al., sponsors. HL7 Version 2.9 Messaging Standard – An Application Protocol for Electronic Data Exchange in Healthcare Environments. http://www.hl7.org/implement/standards/product_brief.cfm?product_id=516
- HL7 Public Health Work Group. HL7 FHIR Release 4.0.1 Profile: Occupational Data for Health (ODH) <http://hl7.org/fhir/us/odh/>
- IHE PCC Technical Committee. IHE Patient Care Coordination (PCC) Technical Framework Supplement: CDA Content Modules, Revision 2.7 – Trial Implementation. https://www.ihe.net/resources/technical_frameworks/#pcc

For health center implementers and their EHR developers or liaisons, recommendations, and suggestions to manage and use ODH (e.g., maintaining, rendering, exchanging, analyzing, etc.) are expressed in the following HL7 functional profile:

- HL7® EHRS-FM Release 2 Functional Profile: Work and Health, Release 1 – U.S. Realm, Informative Document 2019 Apr (WHFP), sponsored by the HL7 Electronic Health Records Work Group (http://www.hl7.org/implement/standards/product_brief.cfm?product_id=498)

The referenced functional profile includes standardized business requirements suggested for EHR software developers. The profile contains a hierarchical framework of criteria that describe valuable system features for each function and to which an EHR system can conform to achieve the function.

CONSIDERATIONS:

Some patients are hesitant to answer questions like “are you currently working?”. They may become suspicious of how the data will be used or who will see it. To establish trust, patients can be comforted through conversations but also in writing to clarify that this data is ONLY used to help care teams understand health-risks and provide appropriate care. Patients may be invited to enter the data themselves on a tablet, or with support from enrollment specialists.

Thinking through the steps and considerations outlined in this Implementation Guide for Health Centers will allow your health center to more successfully collect and utilize ODH.

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