COMMUNITY AND CLINICAL DATA INITIATIVE

Reporting Requirements and Wireframes

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Prepared for:
Administration for Community Living

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This and other CODI resources are available at https://mitre.github.io/CODI/.

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1 Introduction

The Administration for Community Living (ACL) seeks to leverage the Community and Community Data Initiative (CODI) model in Maryland to improve data sharing, collaboration, and coordination between healthcare providers, community care hubs (hubs), and community-based organizations (CBOs). Among the many services CBOs and hubs provide, ACL has focused the CODI implementation on social needs and social care services to meet those needs. Older adults (aged 60 years and above) and individuals with disabilities are the intended populations to benefit from this effort. This document and other CODI Maryland resources are available at https://mitre.github.io/CODI/.

CODI[1] was originally developed by the Centers for Disease Control and Prevention (CDC) and aims to improve programs, care, and services for individuals by connecting clinical and community data at the local, regional, and state levels. The CODI model offers a technical approach to linking and harmonizing data from clinical entities and CBOs to support joint efforts to improve health. A CODI toolbox[2] and other resources are available that describe prior CODI pilots in Colorado[3,4] (2018-2020) and North Carolina (2020-2023).

1.1 Background

ACL was created around the fundamental principle that older adults and people of all ages with disabilities should be able to live where they choose, with the people they choose, and with the ability to participate fully in their communities. By funding services and supports provided primarily by state agencies and CBOs, ACL helps make this principle a reality for millions of Americans. For more than a decade, ACL, in collaboration with private and public partners, has worked to build CBO business infrastructure to enhance their efficiency, sustainability, and effectiveness.[5] ACL's areas of focus most relevant to the CODI pilot include community care hubs, aging and disability resource centers (ADRCs), and nutrition programs.

Despite consistent ACL support, demonstrating the impact of social services provided by CBOs and coordinated by hubs remains challenging. The primary impediment to demonstrating impact is the fragmentation of data and lack of interoperable information systems. CBO information systems that track individual level social needs and what services an individual received remain largely disconnected from data sources that store clinical and cost information needed to quantify impact. ACL has identified the CODI model as a means to address this issue and has partnered with the Health FFRDC to develop and implement a pilot design that leverages the robust technical capacities of health information exchange organizations that are present throughout the United States.

ACL's strategic outcomes for the CODI Maryland pilot are:

1. ACL uses CODI to improve patient outcomes by providing tools to providers and payers participating in regional Health Information Exchanges that enable a better

[1] CDC CODI Webpage: https://www.cdc.gov/obesity/hcp/codi/index.html
[2] CODI Toolbox: https://phii.org/course/codi-toolbox/
[3] Childhood Obesity Data Initiative Case Study: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8781217/
[4] Childhood Obesity Data Initiative Governance Framework: https://pubmed.ncbi.nlm.nih.gov/34446639/
[5] ACL Partnerships: https://acl.gov/programs/strengthening-aging-and-disability-networks/improving-business-practices

understanding of intervention effectiveness, population outcomes, and service utilization behaviors.

2. ACL leverages this pilot to build the strategic approach and technology to support other regional networks in answering similar use cases.

ACL recruited and preselected Maryland as the regional network to co-develop an older adult focused CODI and then implement the pilot design. ACL also set the intention that CODI Maryland would feature a health information exchange (HIE) centric design to leverage existing technical infrastructure.

1.2 Pilot Design

The Health FFRDC engaged two Maryland CBOs providing social care services to older adults and the Maryland HIE to codesign the CODI pilot. To inform codesign, the Health FFRDC conducted a comprehensive needs assessment between September 2023 and December 2023. Based on learnings about the organizations, workflow, data flow, technical infrastructure, and desired functions, a pilot design was developed that involves two roles: the direct service provider (user) and the health information exchange and technical partner. Figure 1 illustrates the pilot design.

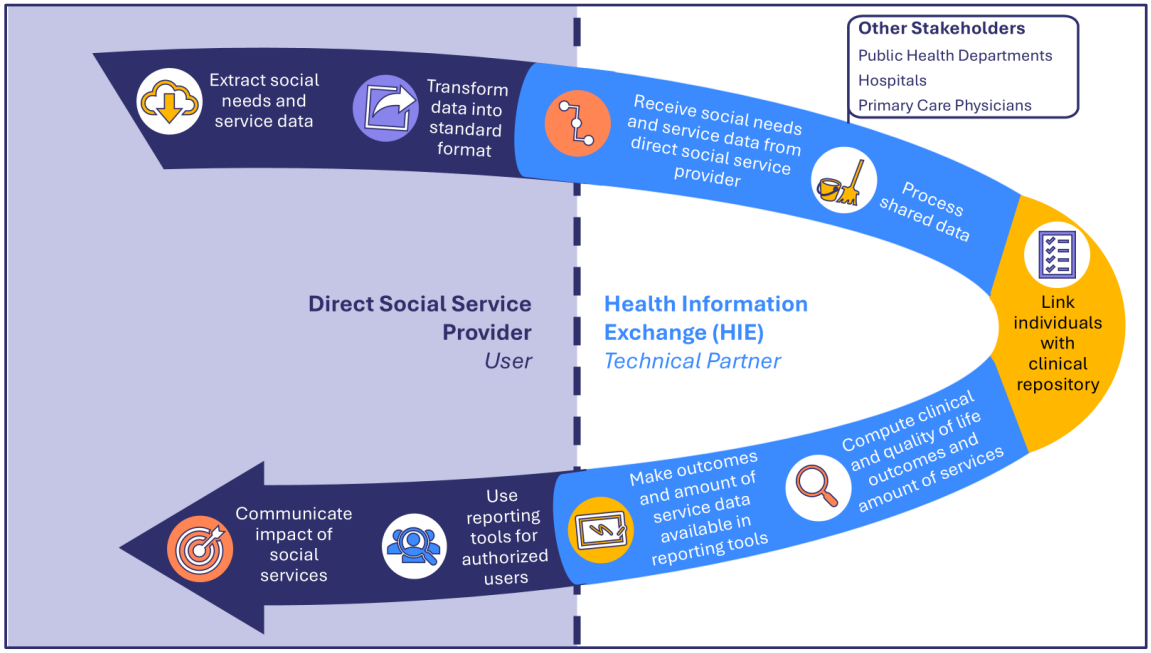

Figure 1: CODI Pilot Design

The pilot design includes the following sequence of activities:

1. Direct service provider extracts social needs and service data from their source information system.
2. Direct service provider transforms and normalizes data and then transmits data to the HIE.
3. HIE processes social needs and service data linking patients in received data with their master patient index.
4. HIE calculates the amount of services received by an individual and clinical and quality of life outcomes.
5. HIE presents outcomes to the user for the individuals that received services from their organization through reporting tools (i.e., dashboards).

Two use cases were defined to test this pilot design:

1. As a CBO, I want to measure the amount food services provided to individuals with food needs (by my organization), among older adults experiencing a care transition from hospital to home.
2. As a CBO, I want to measure the change in clinical and quality of life outcomes among individuals receiving food services from my organization.

While the two initial use cases are focused on food services, these dashboards are intended to accommodate many different types of social services such as transportation, housing, and economic supports.

1.3 Purpose

The purpose of this report is to document the methods used to collect requirements and the resulting set of requirements and wireframes for two dashboards, as of summer 2024.

The two dashboards are a service dashboard, which allows users to examine the amount of services delivered, and an outcomes dashboard, which allows users to assess clinical and quality of life outcomes among those individuals receiving services from the users organization.

The users for both dashboards are CBOs or hubs providing social care services.

1.4 CODI Data Model

As part of the CODI Maryland pilot design, the Health FFRDC created the CODI Data Model. Dashboards visualize data held in an underlying data structure such as a table or set of related tables (i.e., a database). In CODI Maryland, the underlying data structure is defined by CODI Data Model. Select dashboard requirements reference CODI Data Model tables and attributes for clarity. For more information refer to the CODI Data Model Data Dictionary.[6]

2 Requirements Method

From its inception in September 2023, CODI Maryland was designed in close collaboration with ACL and three Maryland implementation partners: MAC, an area agency on aging, aging and disability resource center, and community care hub that provides nutrition and other services in two Maryland counties; Meals on Wheels of Central Maryland (MOWCM), which provides home-

[6] Available at https://mitre.github.io/CODI/

delivered meals in four Maryland counties; and the Maryland HIE (Chesapeake Regional Information System for Patients or CRISP). MOWCM and MAC represent the perspective of dashboard users. CRISP represents an organization that is building and maintaining these dashboards.

The features, reporting interface, and user workflow were codesigned and specified with users in an iterative fashion to ensure that resulting dashboards meet their needs.

Requirements were initially extracted from a review of stakeholder engagements, including one-on-one meetings with each organization during the completion of a needs assessment. Requirements were assembled, refined, and used to generate wireframes.

The Health FFRC then convened ACL and Maryland implementing partners in five wireframe review sessions (3/13/24, 3/28/24, 4/3/24, 4/17/24, 4/24/24) to discuss and iterate on dashboard functionality. Between sessions, wireframe feedback was catalogued and implemented. Requirements were also updated accordingly. Wireframes were reviewed again with Maryland implementing partners to confirm that feedback was implemented as intended. Including both the user and dashboard implementer perspectives ensured that the wireframes and requirements reflect both what the user wants and what the creator can build.

The Health FFRDC then categorized requirements as follows:

- **Data Features:** Requirements for sources and characteristics of the data that will be presented on the dashboards
- **Parameters and Filters:** Requirements outlining selections the user should be able to make to customize dashboard presentations and outputs
- **Services Analytics:** Requirements for the analytics available on the services dashboard
- **Outcomes Analytics:** Requirements for the analytics on the outcomes dashboard
- **Navigation:** Requirements for features of the dashboard that lead to other capabilities and/or functionalities

The Health FFRDC prioritized the requirements as critical, moderate, or minimal based on business value (Table 1).

Table 1. Guidelines for Establishing Requirement Business Value

Level	Business Value Guidelines
Critical	▪ Extremely important to most or all stakeholders ▪ Extreme impact on usability of system ▪ Critical to the success of the system
Moderate	▪ Important to a moderate number of stakeholders ▪ Moderate significant impact on usability of system
Minimal	▪ Important to only few or even no stakeholders ▪ Minor impact on usability of system

3 Requirements Summary

This section lists the requirements defined by dashboard type.

3.1 Services Dashboard

The purpose of the services dashboard is to help users examine the amount of food services delivered. Table 2 describes requirements for the service dashboard.

Table 2: Services Dashboard Requirements

ID	Priority	Requirement Category	Requirement Name	Requirement Description
1.1	Critical	Data Features	Data Source	The service dashboard will present only social service data received from CBOs. Users for the service dashboard are staff from data-contributing CBOs.
1.2	Critical	Data Features	Demographic Attribute Source	The dashboard will present demographic attributes (age, race, ethnicity, sex) as they are documented in the CBO-contributed data to ensure an exact match with the source information systems.
1.3	Critical	Data Features	Service Organization	The dashboard will only display data for services delivered by the user's organization.
1.4	Critical	Data Features	Service Organization	The CBOs user will only see data on the service dashboard for their own organization.
1.5	Critical	Data Features	Data Type	The dashboard will present aggregated and cross-sectional data (rather than longitudinal or individual level).
1.6	Critical	Data Features	Small Cell Suppression	The dashboard will suppress small cells as appropriate to protect patient privacy.
1.7	Minimal	Data Features	Data Latency	The dashboard will display the date of most recent data refresh to inform the user's selection of service time-period.
1.8	Critical	Parameters and Filters	Service Time Period	The user will be able to set and change a time-period (service time-period) for the dashboard.
1.9	Minimal	Parameters and Filters	Exclusions	The user will be able to exclude individuals whose services terminated during the time-period.
1.10	Critical	Parameters and Filters	Age Range	The user will be able to select an age range (minimum age – maximum age). Age will be calculated based on the start date of the service time-period.
1.11	Moderate	Parameters and Filters	Report Filters	The user will be able to customize the dashboard by selecting filters for: ▪ Service type ▪ Service unit ▪ Service subtype ▪ Program enrollment ▪ Subgroup of interest ▪ Payment source

ID	Priority	Requirement Category	Requirement Name	Requirement Description
1.12	Critical	Parameters and Filters	Default Report Filters	The dashboard will default to showing data with zero applied filters (all service types, subtypes, and units).
1.13	Critical	Parameters and Filters	Display of Active Filters	The dashboard will display the user-selected filters (example: unit type: meals; subtype: fresh).
1.14	Critical	Parameters and Filters	Removal of Active Filters	The user will be able to remove active filters.
1.15	Moderate	Navigation	Export	The user will be able to export a report to PDF. The exported document will include a date stamp and report parameters specified by the user.
1.16	Moderate	Navigation	Outcomes Dashboard	The dashboard will display a tab or button to allow users to be transferred to or from the outcomes dashboard retaining the filters that have been selected.
1.17	Critical	Service Analytics	Total Individuals	The dashboard will display the total number of individuals receiving services during the service time period and based on user-defined filters.
1.18	Critical	Service Analytics	Total Services	The dashboard will display the total amount of services provided during the service time-period and based on user-defined filters.
1.19	Critical	Service Analytics	Average Services per Individual	The dashboard will display the average number of services calculated as the total services divided by the total individuals during the service time-period and based on user-defined filters.
1.20	Moderate	Service Analytics	Map	The dashboard will present a zoomable map displaying total amount of services and total individuals provided during the service time-period and based on user-defined filters, aggregated by zip code or ZIP Code Tabulation Areas (ZCTAs).[7] A color-coded legend will be provided. Users will be able to hover over each zip code and see total amount of services for that specific zip code.
1.21	Moderate	Service Analytics	Map Toggle	The dashboard will allow the user to toggle the map display between total amount of services or total number of individuals.
1.22	Critical	Service Analytics	Total Days	The first row of the table on the dashboard will indicate how many days are covered by the selected time-period and display total services, total individuals, and average services per individual.

[7] ZCTA description: https://help.healthycities.org/hc/en-us/articles/115006016767-What-is-the-difference-between-ZIP-Codes-and-ZCTAs

ID	Priority	Requirement Category	Requirement Name	Requirement Description
1.23	Moderate	Service Analytics	Recorded Sex	The dashboard will display the total services, total individuals, and average services per individual by the following administrative sex groups: ▪ Male ▪ Female ▪ Declined to answer ▪ Unknown
1.24	Moderate	Service Analytics	Ethnicity	The dashboard will display the total services, total individuals, and average services per individual by the following ethnicity groups[8]: ▪ Hispanic or Latino ▪ Non-Hispanic or Latino ▪ Declined to answer ▪ Unknown
1.25	Moderate	Service Analytics	Race	The dashboard will display the total services, total individuals, and average services per individual by the following race groups[8]: ▪ White ▪ Black or African American ▪ American Indian or Alaskan Native ▪ Asian ▪ Native Hawaiian or Other Pacific Islander ▪ Other ▪ Two or more Races ▪ Declined to answer ▪ Unknown

3.1.1 Applicable Data Model Tables and Attributes

Table 3 lists the CODI Data Model tables and attributes required to populate the service dashboard. Tables and attributes are identified in ALL CAPS as they are defined in the CODI Data Model Data Dictionary.

Table 3: CODI Data Model Tables and Attributes Required by the Services Dashboard

Table	Attributes	Notes
DEMOGRAPHIC	PATID BIRTH_DATE SEX RACE HISPANIC	Provides data for demographic attributes. Notably, DEMOGRAPHIC also stores patient identifiers that are not required for service dashboard functionality but are required for data processing and linkage.
ASSET_ENROLLMENT	ASSET_ENROLLMENT_ID PATID PAYER_SOURCE ASSET_END_DATE	Provides payer source and link to individual. Provides end date to identify service termination.

[8] Office of Management and Budget Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity: https://www.govinfo.gov/content/pkg/FR-1997-10-30/pdf/97-28653.pdf

Table	Attributes	Notes
ASSET_DELIVERY	ASSET_DELIVERY_ID PATID PROGRAMID ASSET_ENROLLMENT_ID ASSET_TYPE ASSET_SUBTYPE DELIVERY_ORGANIZATIONID DELIVERY_QUANTITY DELIVERY_UNIT DELIVERY_START_DATE DELIVERY_END_DATE	Provides type, subtype, and unit for report filters. Provides dates for comparison to service time period. Provides quantity for total and average amount of services. Provides link to enrollment record and individual. Provides link to programs for report filters.
PRIVATE_ADDRESS_HISTORY	PATID ADDRESSID ADDRESS_STREET ADDRESS_DETAIL ADDRESS_CITY ADDRESS_ZIP5 ADDRESS_STATE ADDRESS_PREFERRED ADDRESS_PERIOD_START ADDRESS_PERIOD_END	Provides data needed for map requirements. Address data also provides identifiers for data processing and linkage. Provides link to individual.
PROGRAM	PROGRAMID PROGRAM_NAME	Provides program name.
QUESTION	QUESTION_ID QUESTIONNAIRE_ID QUESTIONNAIRE_NAME ITEM_ID TEXT	Provides data for subgroups of interest in the form of questionnaires and questions.
QUESTION_RESPONSE	QUESTION_RESPONSE_ID QUESTIONNAIRE_ID ITEM_ID PATID AUTHORED ANSWER_VALUE_STRING ANSWER_VALUE_CODE ANSWER_VALUE_CODE_SYS	Provides data for subgroups of interest in the form of question responses. Provides link to the individual and questions.

Data for service type and subtype filters may be documented in ASSET_DELIVERY and ASSET_ENROLLMENT as the services delivered can differ from the services that are planned to be delivered. Additionally, it is possible that only enrollment information is available for a given service. The service dashboard is designed to present data about what services were delivered and documented in the ASSET_DELIVERY, rather than what services were planned to be delivered and documented in ASSET_ENROLLMENT. When service delivery data is unavailable, planned delivery data from ASSET_ENROLLMENT could be considered for substitution; the requirements and design for this scenario have not been specified.

Similarly, multiple data sources may be available for demographic attributes within a single organization or between multiple organizations. Selecting a single unified approach to sourcing demographic attributes is recommended to avoid the complexity of combining demographic data across sources. However, if the quality of demographic data degraded, implementers should

reconsider this approach; the requirements and design for this scenario have not been specified.

3.2 Outcomes Dashboard

The purpose of the outcomes dashboard is to help users identify how services rendered have created a change in a selected outcome measure, thus providing evidence of the intervention's efficacy. Table 4 lists the requirements for the outcomes dashboard.

Table 4: Outcomes Dashboard Requirements

ID	Priority	Requirement Category	Requirement Name	Requirement Description
2.1	Critical	Data Features	Data Source	The outcome dashboard will present social service data received from CBOs and clinical data, linked at the individual level. Users for the service dashboard are staff from data-contributing CBOs.
2.2	Critical	Data Features	Demographic Attribute Source	The dashboard will present demographic attributes (age, race, ethnicity, sex) as they are documented in the CBO-contributed data to ensure an exact match with the source information systems.
2.3	Critical	Data Features	Service Organization	The dashboard will only display data about individuals receiving services delivered by the user's organization.
2.4	Critical	Data Features	Service Organization	The CBO's user will only see data on the outcome dashboard for individuals that received services from their own organization.
2.5	Critical	Data Features	Data Type	The dashboard will present aggregated and cross-sectional data (rather than longitudinal or individual level).
2.6	Critical	Data Features	Small Cell Suppression	The dashboard will suppress small cells as appropriate to protect patient privacy.
2.7	Minimal	Data Features	Data Latency	The dashboard will display the date of most recent service data refresh to inform the user's selection of service time-period.
2.8	Critical	Parameters and Filters	Service Time Period	The user will set a time-period (service time-period) for the dashboard.
2.9	Minimal	Parameters and Filters	Exclusions	The user will be able to exclude individuals whose services terminated during the time-period.
2.10	Critical	Parameters and Filters	Outcome Measure	The user will select which measure they would like the dashboard to present.
2.11	Minimal	Outcome Analytics	Measure Documentation	The user can access details of how data for the measures were obtained and calculated.

ID	Priority	Requirement Category	Requirement Name	Requirement Description
2.12	Critical	Parameters and Filters	Outcome Time Period	The user will select over what period of time they would like to view outcomes as: ▪ Service time-period ▪ Service time-period + 6 months ▪ Service time-period + 9 months ▪ Service time-period + 12 months
2.13	Critical	Parameters and Filters	Age Range	The user will be able to select an age range (minimum age – maximum age) via a slider bar or text entry. Age will be calculated based on the start date of the service time period.
2.14	Moderate	Parameters and Filters	Report Filters	The user will be able to customize the dashboard by selecting filters for: ▪ Service type ▪ Service unit ▪ Service subtype ▪ Program enrollment ▪ Subgroup of interest ▪ Payment source All selected filters will be displayed on the dashboard.
2.15	Critical	Parameters and Filters	Default Filters	The dashboard will default to showing data with zero applied filters (all service types, subtypes, and units).
2.16	Moderate	Parameters and Filters	Display of Active Filters	The dashboard will display the user-selected filters (example: unit type: meals; subtype: fresh).
2.17	Critical	Parameters and Filters	Remove Active Filters	The user will be able to remove active filters.
2.18	Moderate	Navigation	Export	The user will be able to export a report to PDF. The exported document will include a date stamp and report parameters specified by the user.
2.19	Moderate	Navigation	Services Dashboard	The dashboard will display a tab or button to allow users to be transferred to the services dashboard retaining the filters that have been selected.
2.20	Critical	Outcome Analytics	Total Individuals	The dashboard will display the total number of individuals receiving services during the reporting time period.
2.21	Critical	Outcome Analytics	Total Individuals Eligible for Measure	The dashboard will display the total amount of individuals eligible for the measure. Eligible individuals are defined as having sufficient data available in the pre-intervention time period, service time period, and outcome time period. The dashboard will also calculate and present the number of individuals excluded from the measure.
2.22	Critical	Outcome Analytics	Pre-Intervention Measure	The dashboard will display average pre-intervention data for the selected measure by demographic.

ID	Priority	Requirement Category	Requirement Name	Requirement Description
2.23	Critical	Outcome Analytics	Post-Intervention Measure	The dashboard will display average post-intervention data for the selected measure by demographic.
2.24	Critical	Outcome Analytics	Change in Outcome	The dashboard will calculate the difference between the pre- and post-intervention measures to indicate how the measure has changed on average.
2.25	Moderate	Outcome Analytics	Graph	There is an option for the dashboard to display the association between service amount and selected outcome through a graphical display.
2.26	Critical	Outcome Analytics	Total (for # of days)	The first row of the table on the dashboard will indicate how many days are covered by the selected time period and display total individuals receiving services, total individuals eligible for the measure, average pre-intervention measure, average post-intervention measure, and average change in measure.
2.27	Moderate	Outcome Analytics	Recorded Sex	The dashboard will display the total services, total individuals, and average services per individual by the following administrative sex groups: ▪ Male ▪ Female ▪ Declined to answer ▪ Unknown
2.28	Moderate	Outcome Analytics	Ethnicity	The dashboard will display the total services, total individuals, and average services per individual by the following ethnicity groups[9]: ▪ Hispanic or Latino ▪ Non-Hispanic or Latino ▪ Declined to answer ▪ Unknown
2.29	Moderate	Outcome Analytics	Race	The dashboard will display the total services, total individuals, and average services per individual by the following race groups[9]: ▪ White ▪ Black or African American ▪ American Indian or Alaskan Native ▪ Asian ▪ Native Hawaiian or Other Pacific Islander ▪ Other ▪ Two or more Races ▪ Declined to answer ▪ Unknown

[9] Office of Management and Budget Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity: https://www.govinfo.gov/content/pkg/FR-1997-10-30/pdf/97-28653.pdf

3.2.1 Applicable Data Model Tables and Attributes

Table 5 lists the CODI Data Model tables and attributes required to build and populate the outcome dashboard. Tables and attributes are identified in ALL CAPS as they are named and defined in the CODI Data Model Data Dictionary.

Table 5: Data Model Tables and Attributes Required by the Outcomes Dashboard

Table	Attributes	Notes
DEMOGRAPHIC	PATID BIRTH_DATE SEX RACE HISPANIC	Provides data for demographic attributes. Notably, DEMOGRAPHIC also stores patient identifiers that are not required for service dashboard functionality but are required for data processing and linkage.
ASSET_ENROLLMENT	ASSET_ENROLLMENT_ID PATID PAYER_SOURCE ASSET_END_DATE	Provides payer source and link to individual. Provides end date to identify service termination.
ASSET_DELIVERY	ASSET_DELIVERY_ID PATID PROGRAMID ASSET_ENROLLMENT_ID ASSET_TYPE ASSET_SUBTYPE DELIVERY_ORGANIZATIONID DELIVERY_QUANTITY DELIVERY_UNIT DELIVERY_START_DATE DELIVERY_END_DATE	Provides type, subtype, and unit for report filters. Provides dates for comparison to service time period. Provides quantity for total and average amount of services. Provides link to enrollment record and individual. Provides link to programs for report filters.
PRIVATE_ADDRESS_HISTORY	PATID ADDRESSID ADDRESS_STREET ADDRESS_DETAIL ADDRESS_CITY ADDRESS_ZIP5 ADDRESS_STATE ADDRESS_PREFERRED ADDRESS_PERIOD_START ADDRESS_PERIOD_END	Provides data needed for map requirements. Address data also provides identifiers for data processing and linkage. Provides link to individual.
PROGRAM	PROGRAMID PROGRAM_NAME	Provides program name.
QUESTION	QUESTION_ID QUESTIONNAIRE_ID QUESTIONNAIRE_NAME ITEM_ID TEXT	Provides data for subgroups of interest in the form of questionnaires and questions.

Table	Attributes	Notes
QUESTION_RESPONSE	QUESTION_RESPONSE_ID QUESTIONNAIRE_ID ITEM_ID PATID AUTHORED ANSWER_VALUE_STRING ANSWER_VALUE_CODE ANSWER_VALUE_CODE_SYS	Provides data for subgroups of interest in the form of question responses. Provides link to the individual and questions.

The outcomes dashboard is designed to demonstrate change in clinical outcomes, which is likely to require tables and attributes that hold clinical data. For example, CODI Maryland partners will build and deploy a diabetes control outcome and would require attributes from ENCOUNTER, CONDITION, DIAGNOSIS, LAB_RESULT_CM, and potentially PRESCRIBING.

The outcomes available on the outcome dashboard are user defined and may vary. As such, the CODI Data Model data model table and attributes needed to compute those outcomes are subject to user specifications. The specifications for computing outcomes that have yet to be defined by a user are not included in the table above.

4 Wireframes Summary

Based on the requirements defined in Section 3.1 and 3.2, the Health FFRDC constructed the below wireframes to illustrate the desired functionality of the services and outcomes dashboards.

A wireframe is a representation of a graphical user interface that helps a team align on requirements by demonstrating what key interface elements will exist on a page and how they will function and interact with each other. Wireframes help to focus a conversation on usability and accessibility, surfaces problems and questions early, and saves time during development stages.

4.1 Service Dashboard Wireframe

Figure 2 shows the desired functionality of the services dashboard based on requirements summarized in Table 2.

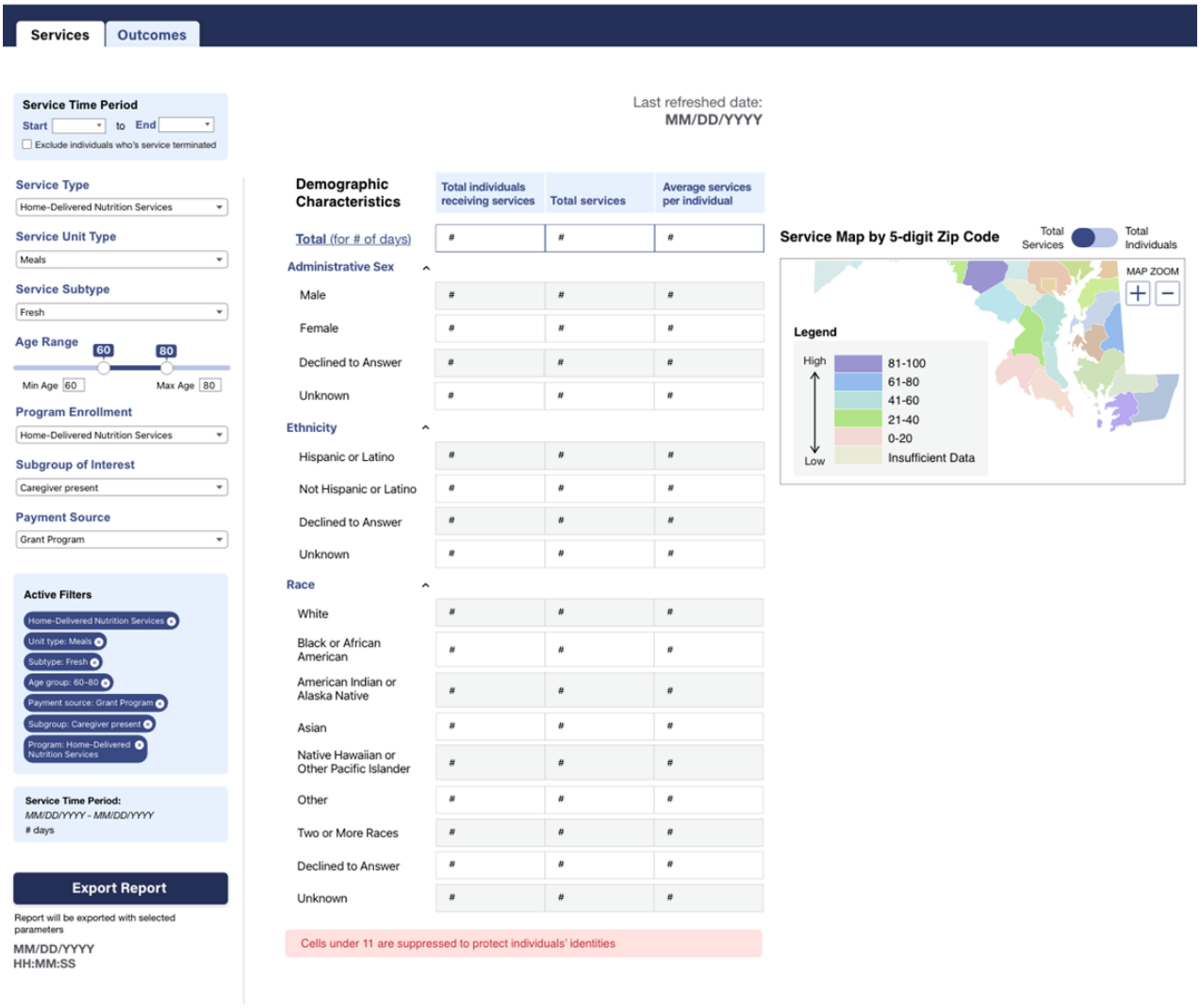

Figure 2: Service Dashboard Wireframe

4.2 Outcomes Dashboard Wireframe

Figure 3 shows the desired functionality of the outcomes dashboard based on requirements summarized in Table 4.

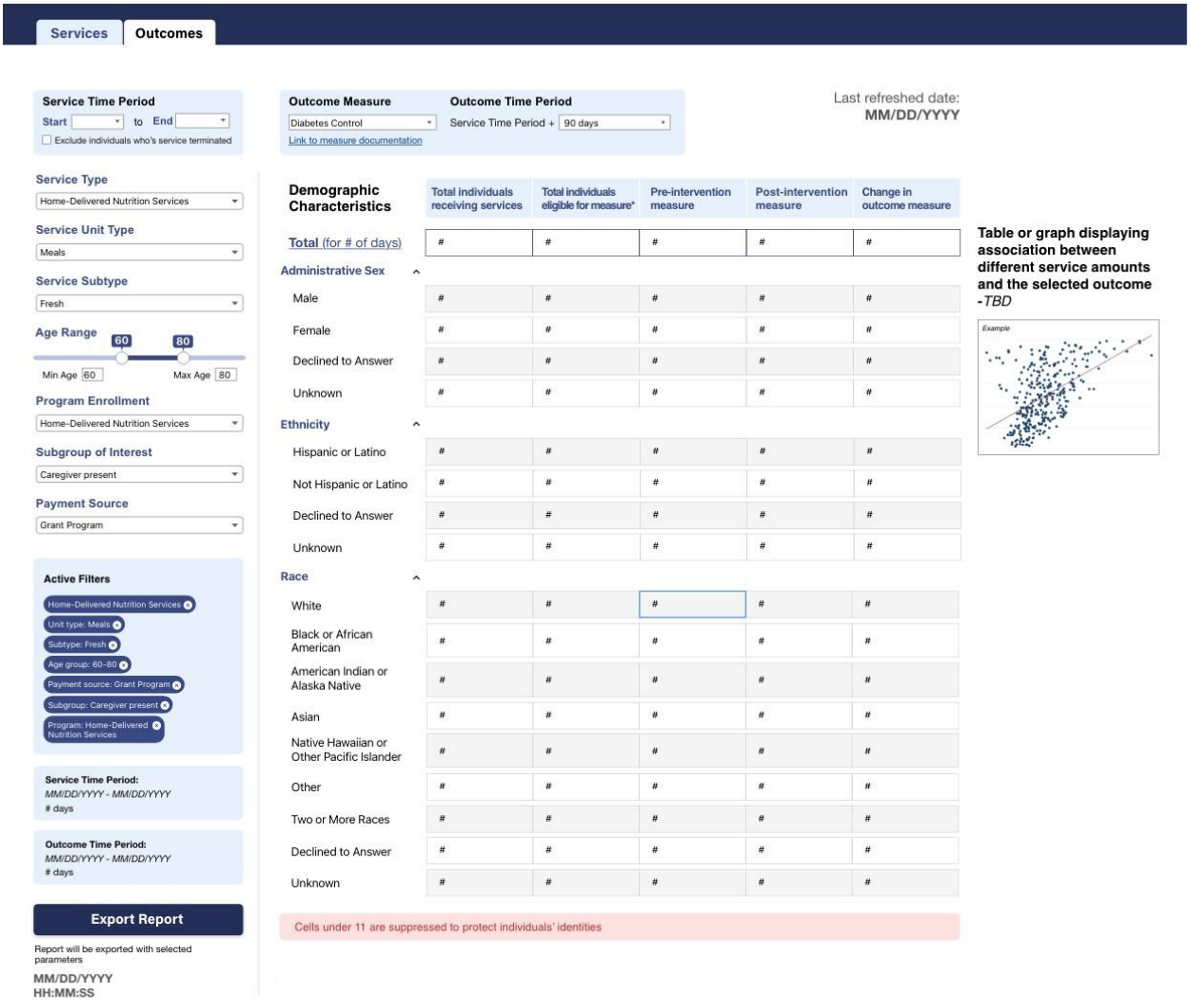

Figure 3: Outcomes Dashboard Wireframe