MEDICAL BASELINE STUDY RESEARCH PLAN

Submitted to:
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Medical Baseline Program Team

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1 INTRODUCTION

The Medical Baseline (MBL) Allowance program was established in 1984, pursuant to Assembly Bill (AB) 2443 which amended Public Utilities (P.U.) Code Section (§) 739. This legislation directed the California Public Utilities Commission (CPUC) to provide a larger quantity of electricity and natural gas at the baseline rate to residential customers with medical needs requiring additional heating or cooling, as well as to those who are dependent on medical equipment requiring electricity. For optional rates that do not have a baseline allowance, the Commission has approved incorporation of a comparable "medical discount" in the form of an authorized line-item discount on the bills of customers who are eligible for Medical Baseline but have selected an un-tiered rate.[1] This medical discount allows customers to select the rate that is best for them while maintaining access to the support offered through Medical Baseline. The MBL Program also provides residential customers extra notifications in advance of Public Safety Power Shutoffs and other planned outages. To ensure vulnerable populations have access to adequate energy at reasonable rates, CPUC Decision (D.) 20-06-003 (June 11, 2020) directed the Investor-Owned Utilities (IOUs) to submit a Tier 3 Advice Letter (AL) establishing numeric goals for new enrollments within the MBL Program. This decision also required the IOUs to describe their plans to increase marketing and outreach to improve customer awareness and increase enrollment in the MBL Program. Resolution (Res.) E-5169, which adopted the enrollment goals for 2021-2023, allowed the IOUs to request an MBL eligible population study to develop more accurate future enrollment goals. On December 22, 2021, the IOUs filed a Motion in R.18-07-005 requesting authorization to file a Tier 3 Advice Letter requesting approval for a study of the eligible MBL population in each IOUs' respective service territory. D.23-08-049, approved the IOUs' request to hire a third-party consultant to develop a statewide study plan to produce an initial estimate of eligible customers for the Medical Baseline program and submit a joint Tier 3 AL to seek approval of the study design and budget.[2]

1.1 PROBLEM STATEMENT

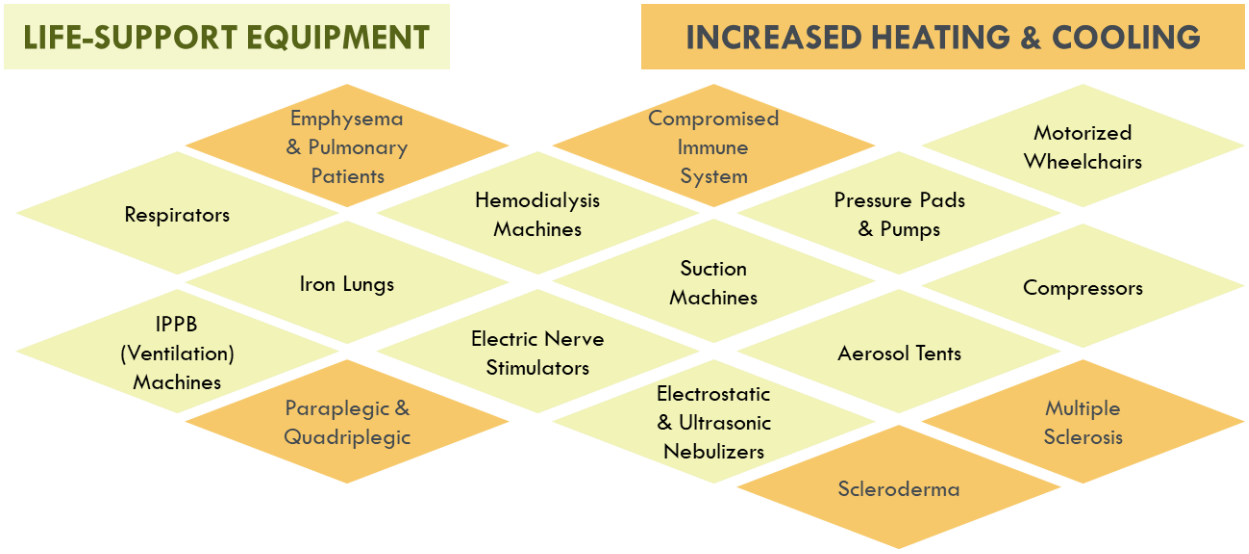
Public Utilities Code Section 739 specifies: "*The commission shall establish a standard limited allowance which shall be in addition to the baseline quantity of gas and electricity for residential customers dependent on life-support equipment, including, but not limited to, emphysema and pulmonary*

[1] The medical discount was approved for PG&E in D.22-04-004, issued in A.20-10-006. It was approved for SCE in D.22-08-001, issued in A.20-10-012. A proposed settlement that would adopt a medical discount for SDG&E is currently pending for SDG&E in A.23-01-008. While the proposed settlement is opposed on other grounds, no party opposes the adoption of a medical discount for un-tiered rates offered by SDG&E.

[2] D.23-08-049 at COL 17.

patients..."[3] It further defines *life-supporting equipment* as *"equipment which utilizes mechanical or artificial means to sustain, restore, or supplant a vital function, or mechanical equipment which is relied upon for mobility both within and outside of buildings."* Finally, the code specifically calls out several life-supporting equipment categories, along with certain medical conditions resulting in increased heating and cooling needs, which would qualify a person for the Medical Baseline Program. These can be found below in Figure 1.

FIGURE 1: MEDICAL CONDITIONS AND DEVICES FROM P.U. CODE 739



The definition and eligibility for conditions, as defined in the code, presents several difficulties for the IOUs. The first is related to the need for increased heating and cooling, for example, due to a '*compromised immune system.'* There are multiple reasons why someone may suffer from a compromised immune system, including medical conditions like cancer, diabetes, or rheumatoid arthritis. A person displaying any of these conditions may have a need for increased heating or cooling in their home, and therefore be eligible for a Medical Baseline allowance. However, there are also many with these conditions who may not require increased heating and cooling, making it difficult to sort out those whose severity is such that that have a need for additional heating and cooling allowances.

Section (c)(6) of the P.U. Code also makes it clear that anyone with a life-threatening illness is eligible for the Medical Baseline as long as it is confirmed by a licensed physician, which can open the door to a wide range of conditions, although it does not necessarily mean that everyone with those conditions is eligible.

[3] P.U. Code § 739. Section (c)(1), available at https://codes.findlaw.com/ca/public-utilities-code/puc-sect-739/.

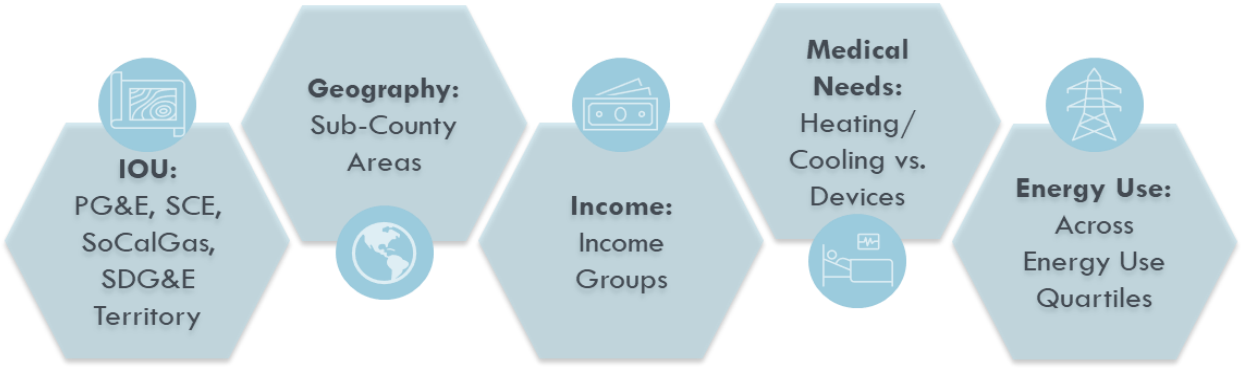
The level of complexity regarding who is, who may be, and who is not eligible for the Medical Baseline requires a sophisticated approach to developing sound estimates.

1.2 GOALS AND OBJECTIVES

This study is designed to help the IOUs better understand the number of MBL-eligible customers in their respective service territories, in order to directly inform the enrollment goals that the IOUs are required to provide for the five years following the completion of the Medical Baseline study report.[4]

These estimates will be developed across the following variables, highlighted below in Figure 2. Note that the granularity of the study results with respect to geography, income, and energy use quartiles, will be dependent on the level of data that can be acquired from the IOUs.

FIGURE 2: KEY VARIABLES FOR MEDICAL BASELINE POPULATION ESTIMATES



[4] D.23-08-049 at OP 6.

2 STUDY APPROACH AND METHODOLOGY

Our proposed approach follows accepted public health best practices used to produce community health assessments (CHAs). Community health assessment focuses on estimating the prevalence of health conditions in well-defined populations and characterizing patterns across subpopulations. Our study design is built on rigorous data analysis methods to produce reliable program eligibility estimates that will yield actionable insights for MBL program planning and implementation. The key activities involved in our approach to generating estimates are summarized below and visualized in Figure 3.

- **Specify MBL-Eligible Devices and Conditions:** We will work with the IOUs to define the eligibility criteria for the program and establish agreed-upon codes for medical conditions. Our team will address any ambiguities or challenges related to these criteria to help ensure accuracy in our analysis.

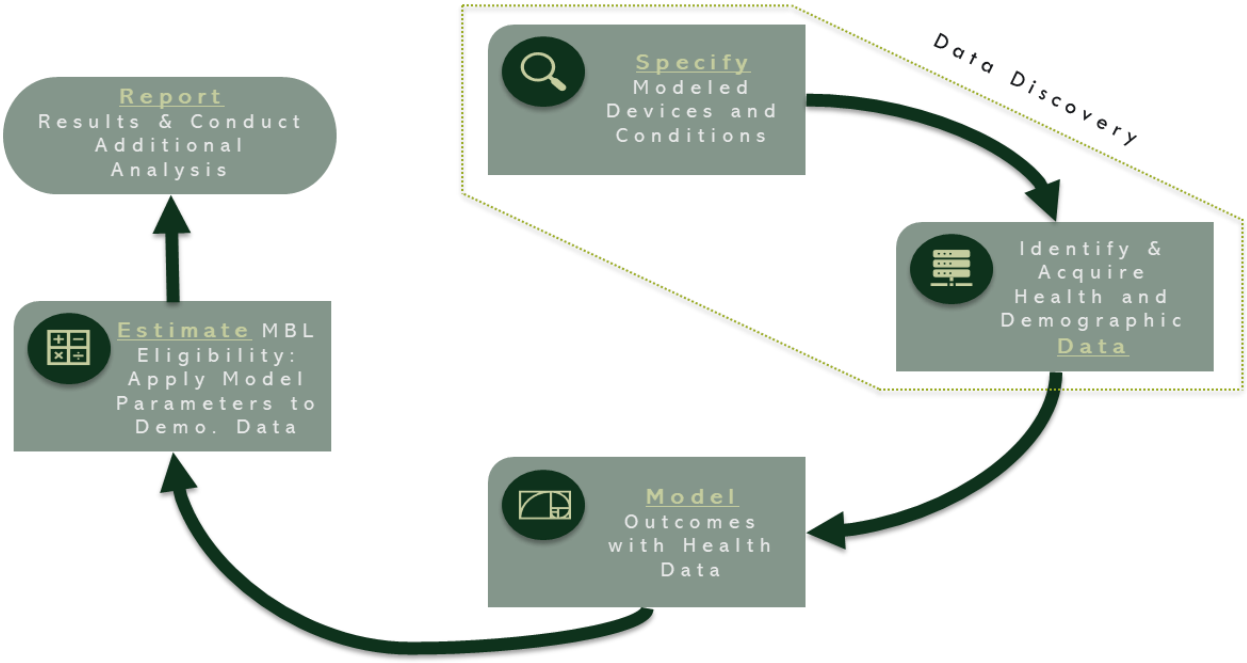
- **Identify, Acquire, and Process Data:** We will gather diverse data, encompassing demographic information and health-related data including census, health surveys, and insurance claims records. These data will undergo rigorous processing and management procedures to improve their quality.

- **Produce a Health Outcomes Model:** We will use health surveys and claims data to develop statistical models of the health outcomes related to MBL program eligibility. This health outcomes model will predict individual-level eligibility in various geographic areas based on the probabilities of individuals having MBL-qualifying conditions and/or requiring the use of MBL-qualifying devices.

- **Estimate MBL Eligibility:** We will then apply the individual-level health outcomes model to the California population by using data from the American Community Survey (ACS). Applying the individual-level model to the California population model will allow us to estimate household-level MBL eligibility from individual-level eligibility.

- **Validation & Reporting:** Our analysis will yield household-level eligibility estimates at different geographic levels. We will assess the reliability and validity of these estimates and validate our findings against alternative methods and existing data sources.

FIGURE 3: STUDY DESIGN APPROACH



2.1 DATA DISCOVERY

The data discovery phase will entail two key tasks: one, the specification of MBL-eligible devices and conditions to be included in the health outcomes model and two, the identification and acquisition of the data that will be used to construct the health outcomes and MBL-eligibility models.

Note: The list of modeled conditions and devices is for modeling purposes only.

Its purpose is not to define who is and is not eligible to participate in the program.

2.1.1 Specify Devices and Conditions

As discussed previously, the Public Utilities Code which defines the Medical Baseline program introduces some ambiguity as to who is eligible for a Medical Baseline energy allocation, so setting a boundary around the modeling parameters is crucial to ensure the models are transparent and account for the eligible conditions and devices without significantly over or underestimating the eligible population.

To begin this eligibility-specification process, our team reviewed an IOU-provided list of qualifying conditions and devices used to inform customer enrollment into the MBL program. In conjunction with

the IOUs and following feedback from the Center for Accessible Technology (CforAT),[5] we developed an operational definition of each qualifying condition and device, ultimately leading to three distinct sets of MBL-eligibility criteria to be included in the model – qualification via condition alone, qualification via use of a specific device, and qualification via condition-device combinations.

Modeled Conditions reflect conditions that are listed in medical and insurance claims data through medical codes to represent people whose conditions require additional heating and cooling.

Modeled Devices reflect devices listed in the medical and insurance claims data through medical device codes, to represent people who require devices to sustain or support life. These people require additional electricity usage to power their devices.

Modeled Condition-Device Combinations reflect combinations of conditions linked to devices, as listed in the medical and insurance claims data through medical condition codes and device codes, to represent people who have conditions serious enough to require medical devices. These people require additional electricity usage to power their devices.

A list of the conditions, devices, and condition-device combinations that will be included in our modeling can be found in Appendix A. As noted in the sidebar on the previous page, the list of conditions, devices, and condition-device combinations to be included in the health outcomes model are not intended to inform determination of Medical Baseline program eligibility. The purpose of the list is to develop a "definitional boundary" around customers who may be eligible for the Medical Baseline allowance in order to create models that will estimate the population. Some customers with conditions or devices not on this list may be eligible for the Medical Baseline allowance if a qualified medical practitioner signs off on their enrollment form.

The final step in the eligibility-specification process is identifying the relevant medical claims code(s) for each qualifying condition, device, and condition-device combination. To facilitate the transfer of health information, the National Center for Health Statistics and the Centers for Medicare & Medicaid Services have developed standardized lists of codes that correspond to medical diagnoses, procedures, and devices. Two of the most widely used sets of such codes are the International Classification of Diseases diagnostic codes (ICD) and the Healthcare Common Procedure Coding System (HCPCS), which is a set of standardized codes used in the billing and processing of health insurance claims with Medicare, Medicaid,

[5] CforAT comments and feedback can be found in Appendix B. Responses to Comments on Public Webinar and Slide Deck.

and other insurers. We will utilize these ICD-10[6] and HCPCS medical devices codes to identify the modeled conditions and devices in the health insurance claims data.

2.1.2 Identify and Acquire Health and Demographics Data

The next phase of data discovery involves identifying, acquiring, and processing data to inform both the individual-level health outcomes model and the household-level population model. In terms of the outcomes model, identifying potential data sources is straightforward, but given the highly confidential nature of medical claims data, gathering the data can be difficult and is often expensive. For the demographic model, we will rely heavily on publicly available data from the Census Bureau and California-specific population surveys.

Health Outcomes Model

To construct the health outcomes model, we will rely primarily on administrative records, particularly insurance claims data. Example data sources include Medicaid/Medicare, all-payer claims databases, health information exchanges (HIEs), and commercial sources of claims data. Where possible, we hope to obtain data from government and private organizations that have access to this data, but there are also several commercial sources for claims data that can be leveraged for this study. For qualifying conditions covered in health surveys (e.g., asthma), we may be able to supplement claims data with health-related survey data. For each MBL-qualifying condition and device, we will thoroughly assess potential administrative data sources. The data assessment process will include an evaluation of the availability, completeness, timeliness, and available geographic scales of each data set. After this data exploration process, we will identify and share any criteria lacking sufficient data sources and work with the IOUs to establish a criteria-specific analysis and modeling plan. Table 1 below highlights the potential sources of outcomes model data.

[6] ICD-10 represents the 10th edition of the International Classification of Diseases, which was adopted in 1990 and has been in use since 1999.

TABLE 1: POTENTIAL OUTCOMES MODEL SOURCES

	Data Source	Description
	American Community Survey: Microdata Files	Data provided at many geographic levels with some coverage of health topics.
	Behavioral Risk Factor Surveillance System (BRFSS)	Data provided at many geographic levels covering health risk factors and conditions.
	California Health Interview Survey (CHIS)	California-based data covering medical conditions, health status, and health behaviors.
	California HCAI Health Care Payments Data (HPD)	Research database of healthcare administrative data claims and encounters generated by payers and providers.
	Medicaid and Medicare Data Systems	Sources include TM-SIS (the Transformed Medicaid Statistical Information Services) and other sources from the Centers for Medicare and Medicaid Services (CMS) and Medi-Cal.
	Commercial Claims and Encounter Sources	These include clearinghouses (e.g., Optum/Clarivate), Kaiser Permanente, and other private sources.

Public (Open) Dataset Public (Restricted) Dataset Private Dataset

Demographic Population Model

To construct the demographic population model, we will use publicly available demographic survey information available from the Census Bureau. Two key data sources will be the decennial census and the American Community Survey (ACS)[7], as these datasets provide rich coverage of a range of demographic characteristics across a wide range of geographic scales (e.g., county, census tract, zip code tabulation area) at both individual and household levels. Additionally, we anticipate making use of the Behavioral Risk Factor Surveillance System (BRFSS)[8] and the California Health Interview Survey (CHIS)[9] to incorporate health-specific indicators into the population model. As with the health outcomes model, we will carefully evaluate each potential data source to ensure that any included data is of high quality and that the population model will incorporate all key demographic and health characteristics. Table 2 below highlights the potential sources of outcomes model data.

After identifying and acquiring data, all input datasets will be logged and secured on intake. All computer programs in the sequence from input to final analytic datasets will be version-controlled, with the final versions producing the analytic datasets in a reproducible manner. Metadata will be created and

[7] The American Community Survey (ACS) is an ongoing survey that provides vital information on a yearly basis about our nation and its people, available at https://www.census.gov/programs-surveys/acs/data.html.

[8] The Behavioral Risk Factor Surveillance System (BRFSS) is the nation's premier system of health-related telephone surveys that collect state data about U.S. residents regarding their health-related risk behaviors, chronic health conditions, and use of preventive services, available at https://www.cdc.gov/brfss/index.html.

[9] The California Health Interview Survey (CHIS) is the nation's largest state health survey and a critical source of data on Californians, as well as on the state's various racial and ethnic groups, available at https://healthpolicy.ucla.edu/our-work/california-health-interview-survey-chis.

maintained for all input and analytic data sets, and data processing and statistical analysis programs will be appropriately annotated and version-controlled.

TABLE 2: POTENTIAL DEMOGRAPHIC MODEL SOURCES

	Data Source	Description
	American Community Survey: Microdata Files	Data at many geographic scales and wide ranges of demographic topics (sex, age, race, etc.).
	American Community Survey: Tabular Data	Data at many geographic scales, aggregated by demographic groups and geographies.
	US Census Bureau Postcensal Estimates	Data at many geographic scales with estimates of selected decennial Census topics.
	Behavioral Risk Factor Surveillance System (BRFSS)	Demographic information about survey respondents.
	California Health Interview Survey (CHIS)	Some demographic information about survey respondents.
	Residential Appliance Saturation Survey (RASS)	Details about the percentage of the population which may have gas versus electric heating.
	IOU Customer Counts	Customer counts provide details about the total potential customer base for the IOUs. These are aggregated and therefore will not contain personally identifiable information.

Public (Open) Dataset Public (Restricted) Dataset Private Dataset

2.2 MODEL OUTCOMES WITH HEALTH DATA

As described previously, our approach for estimating MBL eligibility requires first creating a health outcomes model that predicts the statistical probabilities of individuals meeting MBL-eligibility criteria and then applying those statistical probabilities to a population model.

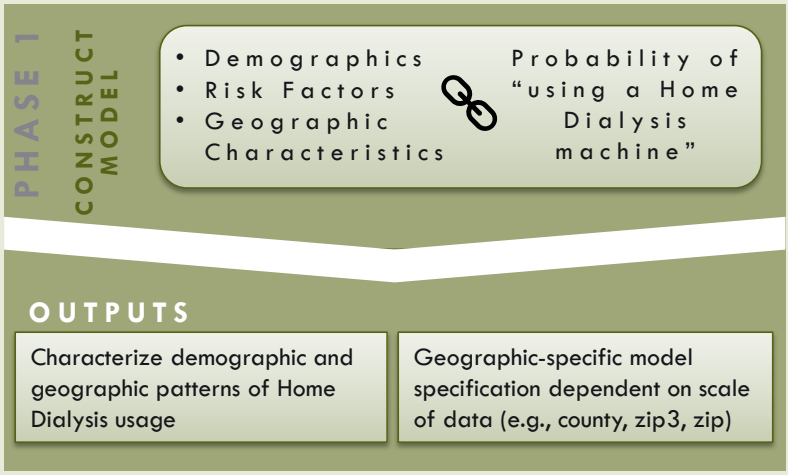
To create the health outcomes model, we will use the claims data sources discussed in the data discovery section to create statistical models of the probability of individuals having one or more of the MBL-modeled conditions, using one of the MBL-modeled devices, or meeting conditions-devices modeled criteria. An individual will be considered eligible if they meet any of these identified sets of modeled criteria.

The approach to producing estimates of health outcomes will vary by condition and device. For conditions covered in population-representative health surveys such as BRFSS, CHIS, and the ACS, these data can be used to produce direct estimates of health outcomes for demographic subgroups and geographic areas within California by using small-area estimation methods. Unfortunately, health surveys will likely have limited utility in our outcomes model. While these surveys include data about common conditions such as asthma or diabetes, they are unlikely to include information about rarer MBL-qualifying conditions and

will not contain data about the usage of medical devices. However, it is possible that other common conditions estimated from these surveys (e.g., diabetes, obesity) could be used to improve estimation for rarer conditions by their presence as covariates in the demographic modeling phase.

For most MBL-modeled criteria, especially device data, it will be necessary to use insurance claims data to construct the outcomes model. One challenge in working with claims data is that demographic information is generally of low quality and/or has low completeness, hindering the ability to productively use these variables in our outcomes model. To address this challenge, we will attempt to secure either individual-level data or aggregated data containing counts of people with health conditions or device codes from the list of MBL-modeled conditions as well as the total count of people covered by the claims system by geographic area, age group, sex, and other socio-demographic information such as insurance status. These variables would form the basis for hierarchical models that include context information to improve prediction.

EXAMPLE: CONSTRUCTING A HOME DIALYSIS MACHINE OUTCOMES MODEL



We can use an example of estimating the use of home dialysis machines at the zip code tabulation area (ZCTA) level to illustrate the two-part modeling approach.

In the first modeling phase – creating the health outcomes model – we obtain any available demographics, insurance claims data, and geographic information to characterize users of home dialysis machines. These variables form the inputs to a hierarchical model to estimate an individual's likelihood of using a home dialysis machine. The outputs of the first phase of modeling are demographic and geographic patterns of home dialysis usage in California and any geographic-specific information that can be collected from the input data (e.g., county, zip code, etc.). Taken together, this model and output allow us to estimate an individual's likelihood of using a home dialysis machine based on their demographic characteristics and geographic location.

Claims-based outcome models can also be improved by incorporating comorbidity data. For example, the presence of certain chronic conditions (e.g., diabetes) is likely highly predictive of MBL-eligibility. Comorbidity covariates identified in claims data must also be present in the population model to improve estimation – but, as discussed above, many chronic conditions can be identified using health surveys and are also included in the ACS microdata.

There may be cases where it is not possible to identify data for an MBL-modeled condition with the geographic detail necessary to construct models with context-level variables. In this scenario, models will be constructed using any available demographic variables. These models would assume, for example, that the relationship between demographics and MBL-eligibility does not vary by location. Models would be constructed by age, sex, and other socio-demographic information, and form the basis for a simple predictive model that could be applied to ACS microdata. This approach would be expected to yield less precise estimates than the models that can incorporate geographic data.

Additionally, it is possible that we may be unable to identify data sources for MBL-modeled criteria that involve rare conditions (e.g., scleroderma) or infrequently used devices (e.g., iron lungs). While the rarity of these conditions and devices means they likely provide only modest impact to MBL-eligible estimates, the study will attempt to account for these situations using meta-analysis-based estimates. This meta-analysis-based technique is often used in public health for estimating conditions that are severely under-reported, such as Alzheimer's Disease.

Where possible, we will use hierarchical models to generate health outcomes predictions, as these models can include individual demographic and health characteristics, as well as location-specific information. To produce these hierarchical models, individual-level MBL eligibility will be estimated using a dataset that includes both the health outcome and relevant demographic (e.g., age) and/or geographic features (e.g., county of residence), allowing the model to incorporate various sociodemographic and geographic variables. These demographic variables will be included in the model as independent variables, ultimately allowing the estimated parameters produced by the model to be applied to the population model constructed using the identified demographic data. Our intention to link the two models via demographic and geographic characteristics explains why analyzing the coverage of the geographic and demographic variables is a central component of our input dataset evaluation process.

While it is possible to construct models for individual health conditions and devices, individuals are eligible if they meet any qualifying criteria. Therefore, it is preferable to simultaneously model the probability of eligibility across all conditions. The study requires two separate simultaneous models: one for the devices and conditions requiring electricity and one for conditions requiring the use of gas (heating). Where possible, we will attempt to acquire data that gives simultaneous information for qualifying conditions and devices. This will allow us to construct estimates of MBL-eligibility that directly accounts for individuals who might qualify for MBL in multiple ways, while also allowing us to characterize the relative contribution of conditions and devices to the overall estimate. In those situations where a device/condition cannot be modeled simultaneously we will establish straightforward assumptions to allow for the estimate to be combined with other estimates. To the extent possible, we will group qualifying conditions and develop approaches to validly combine separate probability components. Once

established, the health outcomes model will estimate the likelihood that an *individual* qualifies for MBL. These individual estimates will be extrapolated to the *household* level in the next modeling phase.

2.3 ESTIMATE MEDICAL BASELINE ELIGIBILITY

After creating and combining our health outcomes models to predict individual-level eligibility for MBL, we will then apply the produced coefficients to a California population model to produce household-level estimates. Producing eligibility estimates at the household level is a key task for this study, as MBL enrollment occurs at the household, rather than the individual level.

To create the population model, we will use the sources identified in the data discovery phase, particularly the ACS microdata. The ACS samples entire households and publicly-releases a portion (1% each year) of individual-level survey responses with detailed demographics (e.g., sex, race/ethnicity) for each person in the household. Additionally, the ACS also releases a sample of household-level responses. For both individual- and household-level responses, the microdata files also include survey weights to help contextualize the estimated frequency of a particular combination of demographic characteristics at the population level. The ACS microdata also contains replicate weights which allow for estimation of uncertainty.

The smallest geographic scale for which ACS microdata is available is the Public Use Microdata Area (PUMA) level. PUMAs are Census Bureau-defined geographic areas that are distinct and must contain at least 100,000 people. These are redefined after each decennial census – as of the 2020 census, there are 281 PUMAs in California. Because of the need to apply the individual-level probabilities from the health outcomes model to produce household-level estimates, we will use PUMAs as our primary geography, as this enables us to leverage the individual-to-household links available in the ACS microdata.

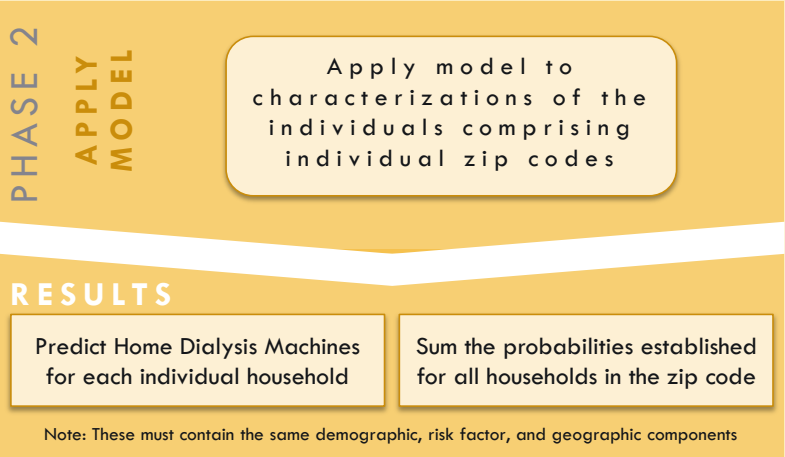
We will create the population model and household MBL-eligibility estimates at the PUMA level by using two common techniques for producing model-based estimates – small area estimation and multilevel regression with poststratification. Model-based estimates (MBEs) are widely used in federal statistics systems, health services research, and public health. Small area estimation refers to a set of statistical techniques to produce estimates for sub-populations, usually geographic areas, when there is little or no data to produce direct estimates. Small area estimation techniques will be a core statistical tool for producing MBL-eligibility estimates at all desired geographic scales, as no representative dataset exists that will directly assess whether individuals or households in a particular geographic area qualify for MBL.

Multilevel regression with poststratification (MRP) is a statistical approach to correct for known differences between the sample used to construct a model and a target population. In MRP, a statistical model estimated on a nonrepresentative sample (e.g., health insurance claims data) is applied to a known

population using covariates from the model that are known for the population. To construct our estimates, we will use MRP whenever possible to include context-level information that may improve the MBL-eligibility model, such as area-based socioeconomic status or metropolitan statistical area (MSA) information.

After constructing the population model of California using the ACS microdata and the model-based estimation approaches described above, the probability coefficients from the health outcomes model will be applied to individual household members to estimate household eligibility. Because IOU customers enroll in MBL at the household level, a household will be classified as MBL-eligible if any member of the household is predicted by the model to be MBL-eligible. We will then aggregate these household-eligibility probabilities to estimate the number of MBL-eligible households within each PUMA. The proportion of households classified as MBL-eligible in the model is thus derived from a combination of both the individual probabilities of being eligible and the demographic composition of households in each PUMA.

EXAMPLE: APPLYING A HOME DIALYSIS MACHINE OUTCOMES MODEL



In this second phase of modeling, we apply the model and outputs from the first phase to a population model that characterizes individuals living within each ZCTA. This population model is constructed from Census Bureau demographic data about the characteristics of the people who reside within each California ZCTA.

By applying the model created during the first phase that predicts an individual's likelihood of using a home dialysis machine based on their demographic characteristics and geographic location to this ZCTA-level characterization of the California population, we can predict the likelihood of individuals within a particular ZCTA using a home dialysis machine. Importantly, because the ZCTA characterization of the population consists of individuals who also have associated household-level data, we can use those linkages to estimate the likelihood that a household contains a person who requires the use of a home dialysis machine. Finally, we sum the probabilities of each household within the ZCTA having a person who uses a home dialysis machine to create a ZCTA-level estimate for households with a home dialysis user.

Following the creation of a well-functioning statistical model of MBL-eligible households at the PUMA level, we will use small area estimation or spatial allocation techniques to generate eligibility estimates at the requested, downscaled geographies – IOU service territories, census tracts, and zip code tabulation areas (ZCTAs). For each geographic scale, we will produce an estimate of $\mathbf{M}_a$, the number of MBL eligible

households in the geographic area ***a,*** by estimating $\mathbf{M}_a = \mathbf{N}_a\mathbf{p}_a$ where $\mathbf{N}_a$ is the number of households in an area ***a***, and $\mathbf{p}_a$ is the proportion of households in area ***a*** that are predicted to be eligible for the program.

Downscaling of the PUMA estimates will be possible due to the demographic information contained in the ACS microdata that will accompany the model-based eligibility estimates. These demographic characterizations are also available in the tabular ACS data, which provides aggregated survey responses for various demographic and household characteristics at a variety of geographic scales, including census tracts and ZCTAs. This overlapping demographic information enables a wide variety of spatial interpolation techniques to downscale the PUMA estimates to the smaller census tract and ZCTA scales, while retaining consistency with the PUMA-level eligibility estimates.

The output of this second phase of modeling will be household-level MBL-eligibility estimates at all requested geographic scales. These high-resolution estimates will be constrained to sum to the estimates at the PUMA-level, and so they will essentially allocate the qualifying individuals by geography. Estimates will also be accompanied by calculations of their associated uncertainty, a key component of our efforts to provide valid and reliable estimates.

2.4 VALIDATION AND REPORTING

Validation

We will use two approaches – comparative evaluation and estimate reliability calculations – to validate our estimates. First, we will conduct a comparative evaluation to assess the alignment of our estimates with those produced by other sources, such as CDC Places,[10] NYU City Health,[11] and the AskCHIS Neighborhood Edition.[12] Second, we will quantify the reliability of our estimates using standard statistical measures, such as relative standard error (RSE).

To enable comparative evaluation of MBL-eligibility estimates, we will identify areas of overlap between our MBL estimates and alternative estimates produced using small-area techniques and published in national sources such as those listed above. These systems produce estimates within California at the census tract and zip code levels for common health conditions, enabling some direct comparison of estimates for individual-level prevalence of certain MBL-qualifying conditions. Conducting this

[10] CDC Places: Local Data for Better Health, available at https://www.cdc.gov/places/about/index.html

[11] NYU City Health Dashboard: Empowering Cities to Create Thriving Communities. The dashboard offers data on over 40 measures of health and drivers of health for over 970 cities across the U.S, including across California, available at https://www.cityhealthdashboard.com/metrics

[12] UCLA Center of Health Policy Research: AskCHIS (California Health Interview Survey) Neighborhood Edition, available at https://healthpolicy.ucla.edu/our-work/askchis-ne.

comparative analysis will involve identifying which of our model indicators overlap with those contained in these pre-existing systems and then locating any potential geographic alignment (e.g., census tract level) between our estimates and those previously published for the selected indicators. In this comparative analysis, we will understand and compare the methodologies used to produce estimates and, where possible, directly compare our estimates to those from other sources, noting areas of convergence and divergence.

The comparative evaluation process is potentially constrained in two ways. First, the existing systems have restricted geographic ranges. While they may provide estimates at some geographic levels (e.g., census tracts) included in the study, they will certainly not cover all high-resolution and custom geographies for which we will produce MBL-estimates (e.g., IOU service territories). Second, because the estimates we are producing are for novel combinations of health indicators, demographics, and geographies, the comparative evaluation process will be limited to estimates for more common health indicators, produced at more moderate geographic scales, and containing few demographic variables. In other words, we can only compare what is comparable and given the rarity of conditions, the specificity of devices, and the geographic scales of this study, the potential extent of what is directly comparable may be quite narrow due to scope limitations of the current systems. However, being able to directly compare estimates for common conditions that are well-covered in survey data (e.g., asthma) will help us to validate our approach, increasing confidence in the estimates produced for rarer conditions that may not be directly comparable.

In addition to comparative evaluation, we will analyze our produced estimates by computing measures of statistical reliability and assess our statistical models using standard model-fitting diagnostics. These calculations will illuminate the magnitude of the uncertainty and error associated with the estimates, particularly for those generated at high-resolution geographic scales and for rare MBL-qualifying conditions and devices. We will assess the reliability of estimates using standard criteria such as RSE and modifications to RSE appropriate for rarer conditions. In cases of low reliability, it may be warranted to further assess variability to enable aggregation of contiguous geographic entities (e.g., combining two adjacent census tracts to reduce uncertainty) subject to specific criteria. This data-driven regionalization would yield higher reliability estimates with limited impact on the utility and subsequent application of the estimates to support MBL-program enrollment efforts.

Our produced estimates will account for and report their associated statistical uncertainty. This uncertainty in the MBL-estimates, which results from both the uncertainty in the health outcomes model and the uncertainty in the population characterization, can be appropriately accounted for using Monte Carlo techniques, which are widely used in statistics to predict the probabilities of uncertain events. While computing these error statistics and capturing uncertainty, we will document the decreasing reliability of estimates produced at increasingly finer geographic scales and investigate any suspicious error rates. For

example, it should be the case that ZCTA and census tract demographic estimates have higher associated uncertainty than estimates produced at larger geographic scales, such as PUMAs. Were this not the case, this would warrant additional investigation.

By combining comparative evaluation and calculations of internal reliability, we will gain insight into the quality and accuracy of our estimates. Based on the outcomes of this evaluation process, we will, as needed, adjust our approach to further refine estimates.

Reporting

Study reporting will include preliminary, draft, and final estimates in spreadsheet format, along with thorough and transparent model documentation. Additionally, we will produce a draft and final report. The reports will include an executive summary and introduction, study methods and data sources, and detailed results and references. The draft estimates and reports will be reviewed by multiple stakeholders. We will track all comments and questions, provide responses and, where necessary, make updates. If desired, our modeling framework can also be used to produce subsequent estimates and allows for these to be updated using future versions of the input datasets.

APPENDIX A MODELED CONDITIONS, DEVICES, AND CONDITION-DEVICE COMBINATIONS

As discussed previously in Section 2, our approach hinges on establishing a list of the predominant conditions and devices that will be modeled to estimate the California population eligible for the Medical Baseline program. As noted, this list is used for modeling purposes only and is not meant to indicate that conditions or devices not on this list are necessarily ineligible. Each application for the MBL Program is considered by the IOUs on its own merits. The following tables, Table 3 through Table 5 provide the list of conditions, devices, and condition-device combinations that will be modeled.

A.1 MODELED CONDITIONS

Modeled Conditions reflect conditions that are listed in medical and insurance claims data through medical codes to represent people whose conditions require additional heating and cooling.

TABLE 3: MODELED CONDITIONS

#	Condition Name	Heating/ Cooling Needs
1	AIDS	✓
2	Arthritis (rheumatoid)	✓
3	Autonomic Dysfunction	✓
4	Autonomic Dysreflexia	✓
5	Erythromelalgia	✓
6	Hemiplegia	✓
7	Lupus and Systemic Lupus Erythematosus (SLE)	✓
8	Multiple Sclerosis	✓
9	Paraplegia	✓
10	Quadriplegia	✓
11	Scleroderma	✓
12	Sickle Cell Disease	✓
13	Spinal Cord Injury	✓

A.2 MODELED DEVICES

Modeled Devices reflect devices listed in the medical and insurance claims data through medical device codes, to represent people who require devices to sustain or support life. These people require additional electricity usage to power their devices.

TABLE 4: MODELED DEVICES

#	Device Name	Additional Electricity Needs
1	Aerosol Tent	✓
2	Apnea Monitor	✓
3	Breather Machine (IPPB)	✓
4	Continuous Positive Airway Pressure (CPAP) (BIPAP)	✓
5	Dialysis Machine (CYCLER)	✓
6	Electrostatic Nebulizer	✓
7	Feed Pump	✓
8	Gastric Electric Stimulators	✓
9	Hemodialysis Machine	✓
10	Hospital Bed	✓
11	Infusion Pump	✓
12	Inhalation Pulmonary Pressure	✓
13	Intracranial pressure (ICP) Remote Monitors	✓
14	Iron Lung	✓
15	Left Ventricular Assist Device (LVAD)	✓
16	Lympha Press Device	✓
17	Merlin EEG Device	✓
18	Medical Air Mattresses	✓
19	Motorized Wheelchair / Electric Scooter	✓
20	Neuropace RNS Monitors	✓
21	(Oxygen) Compressor / Concentrator	✓
22	Oxygen Generator	✓
23	Pacemaker Monitor / Defibrillator	✓
24	Power-Hoyer Lift	✓
25	Pressure Pad	✓
26	Pressure Pump	✓
27	Respirator (All types)	✓
28	Robotic Prosthetic	✓
29	Sit-Stand Chairs	✓
30	Suction Machine	✓
31	Total Artificial Heart (TAH-t)	✓
32	Ultrasonic Nebulizer	✓
33	Vest Airway Clearance System	✓

A.3 MODELED CONDITION-DEVICE COMBINATIONS

Modeled Condition-Device Combinations reflect a combination of conditions and a linked device listed in the medical and insurance claims data through medical condition codes and device codes, to represent people who have conditions serious enough to require medical devices. These people require additional electricity usage to power their devices.

TABLE 5: MODELED CONDITION-DEVICE COMBINATIONS

#	Condition Name	Heating/ Cooling Needs	Additional Electricity Needs	Device Name
1	Amputation (Phantom Limb)		✓	Electronic Nerve Stimulators (TENS), Robotic Prostheses
2	Amyotrophic Lateral Sclerosis (Als)		✓	Ventilators, CPAPs, Wheelchairs/Scooters, Respirators, Suction Machines, Inhalation Pulmonary Pressure
3	Arthritis (Osteoarthritis)		✓	Wheelchairs
4	Asthma	✓	✓	Nebulizers
5	Atrioventricular Block		✓	Pacemakers
6	Bradycardia		✓	Pacemakers
7	Bronchiectasis		✓	Vest/Airway Clearance Systems, Suction Machines, Ventilators
8	Cancer		✓	Infusion Pumps, Hospital Beds, Feeding Tubes/Pumps
9	Central Pain Syndrome		✓	Electronic Nerve Stimulators (TENS)
10	Cerebral Palsy		✓	Feeding Tube/Pumps, Infusion Pumps, Wheelchairs/Scooters
11	Chronic Fatigue Syndrome (CFS)		✓	Electric Beds, Wheelchairs/Scooters
12	Chronic Kidney Disease		✓	Dialysis Machines, Hemodialysis Machines
13	Chronic Obstructive Pulmonary Disease (COPD)		✓	Oxygen Concentrators, Breather Machines, Nebulizers, CPAPs, Pulse Oximeters, Suction Machines, Respirators
14	Chronic Pancreatitis		✓	Feeding Tubes
15	Chronic Subdural Hematomas		✓	Intracranial Pressure (ICP) Remote Monitors
16	Chronic Venous Insufficiency (CVI)		✓	Lympha Press Devices
17	Congestive Heart Failure	✓	✓	Oxygen Concentrators, CPAPs, Defibrillators, LVADs, Pulse Oximeters, TAH-Ts
18	Coronary Artery Disease (CAD)		✓	Defibrillators, TAH-Ts, Pulse Oximeters
19	Crohn's Disease		✓	Feeding Tubes/Pumps, Infusion Pumps
20	Cystic Fibrosis		✓	Nebulizers, Oxygen Concentrators, Vest/Airway Clearance Systems, Breather Machines, Ventilators, Respirators, Suction Machines
21	Diabetes (Type I & Type 2)	✓	✓	Infusion Pumps
22	Emphysema		✓	Oxygen Concentrator/Compressors, Respirators,
23	Epilepsy		✓	Electronic Nerve Stimulators, Merlin EEG Devices, Neuropace RNS Monitors
24	Guillain-Barré Syndrome		✓	Breather Machines, Respirators
25	Heart Disease	✓	✓	LVADs
26	Huntington's Disease		✓	Respirator
27	Hydrocephalus		✓	Intracranial Pressure (ICP) Remote Monitors
28	Idiopathic Intracranial Hypertension (IIH)		✓	Intracranial Pressure (ICP) Remote Monitors
29	Interstitial Lung Disease		✓	Respirators, Ventilators

#	Condition Name	Heating/ Cooling Needs	Additional Electricity Needs	Device Name
30	Intestinal Fistulas		✓	Feeding Tube/Pumps, Infusion Pumps
31	Long Qt Syndrome (LQTS)		✓	Pacemakers
32	Lymphedema		✓	Lympha Press Devices
33	Muscular Dystrophy		✓	Feeding Tubes/Pumps, Infusion Pumps, Wheelchairs/Scooters, Breather Machines, CPAPs, Respirators, Suction Machines, Vest Airway Clearance Systems
34	Myalgic Encephalomyelitis (ME)		✓	Electric Beds, Wheelchairs/Scooters
35	Myasthenia Gravis (Mg)		✓	Respirators, Suction Machines
36	Myofasial Pain Syndrome		✓	Electronic Nerve Stimulators (TENS)
37	Obesity (Morbid)		✓	Wheelchairs/Scooters
38	Obesity Hypoventilation Syndrome (OHS)		✓	Respirators, CPAPs, Nebulizers
39	Parkinson's Disease		✓	Deep Brain Stimulators, Wheelchairs/Scooters, Feeding Tubes/Pumps
40	Peripheral Artery Disease (PAD)	✓	✓	Compression Devices
41	Primary Ciliary Dyskinesia (PCD)		✓	Vest Airway Clearance Systems, Nebulizers, Oxygen Concentrators
42	Pulmonary Fibrosis		✓	Oxygen Concentrators, Nebulizers, Inhalation Pulmonary Pressure, Pulse Oximeter, Respirators, Suction Machines, Vest Airway Clearance System
43	Pulmonary Hypertension		✓	Nebulizers
44	Pulmonary Sarcoidosis		✓	Oxygen Concentrators, Pulse Oximeters, Nebulizers, CPAPs
45	Severe Peripheral Neuropathy		✓	Electronic Nerve Stimulators (TENS)
46	Short Bowel Syndrome		✓	Feeding Tubes/Pumps, Infusion Pumps
47	Sick Sinus Syndrome (SSS)		✓	Pacemakers
48	Sleep Apnea or Obstructive Sleep Apnea		✓	CPAPs, BIPAPs, Apnea Monitors
49	Spina Bifida		✓	Wheelchairs/Scooters
50	Stroke		✓	Wheelchairs/Scooters
51	Tachy-Brady Syndrome		✓	Pacemakers
52	Traumatic Brain Injury (TBI)	✓	✓	Specific Cooling Devices (Ex. Cooling Helmet)

APPENDIX B RESPONSES TO COMMENTS ON PUBLIC WEBINAR AND SLIDE DECK

Comments received during the Webinar:

Melissa Kasnitz (Center for Accessible Technology): When you say a goal is to determine how often MB should be updated, do you mean how often the enrollment goals should be updated?

- **Response:** That is correct. For the purposes of this study, we are only interested in enrollment goals. We are going to do this study once and then see how many years forward we can set targets. Then we will have to evaluate whether we need to update the study at certain intervals, or in what cases we need to update this study. We have updated the slide deck to make this clear in the slides.

Melissa Kasnitz (Center for Accessible Technology): Why is income part of the estimate? The MB program is not an income-based program?

- **Response:** We are including income as part of the estimate so that it can potentially be used by the IOUs as they seek to increase MBL enrollment. We expect that both MBL eligibility rates and MBL program uptake will vary geographically in a manner that is highly correlated with income.

  In universal (not income-based) programs that require participants to certify their qualification, households with lower incomes tend to participate at lower rates. We anticipate that the MBL program, which requires potential enrollees to have a medical practitioner complete documentation certifying their qualifying condition or device usage, likely follows this trend. Likewise, for several conditions we would expect MBL eligibility itself to vary based on complex factors such as health care access and medication adherence that is highly impacted by socio-economic status. Income, then, is useful for understanding current program participation and guiding IOU efforts to increase participation amongst households who may most benefit from the program.

  An important note is that we do not intend to model individual or household income, but rather to use "area-based poverty measures" (ABPMs) to quantify estimated income by geographic area. ABPMs are commonly used in public health to understand geographic variation in medical conditions. ABPMs identify geographic areas – typically counties and census tracts – that have high, extreme, persistent, or enduring poverty.

Melissa Kasnitz (Center for Accessible Technology): There may be devices that are not prescription based, but a doctor may both recommend the use of the device (and certify eligibility of the individual for MB). Is this going to be captured in the model, or is this an example of something that won't be captured in the model?

- **Response:** This is an example of someone who won't be captured by our approach. It is beyond the scope of our study, but it would also be incredibly difficult to estimate. In the future, the use

of free text medical notes might be used to capture situations like this, but the data would be hard to acquire, and the analysis would be very expensive. Additionally, it is likely relatively rare that electricity-consuming life sustaining devices are not prescribed.

"Cindy" Xian Ming Li (CPUC): Can you talk a bit more about what would be done for validation? What alternative methods and existing sources were you planning on using?

- **Response:** Where possible, we will be validating our estimates against existing systems that use small-area estimation techniques to produce health condition estimates, such as NYU City Health, CDC Places, and Ask CHIS Neighborhood Edition. These systems produce estimates within California at various geographic scales, enabling some direct comparison of estimates for individual-level prevalence of certain MBL-qualifying conditions. This comparative analysis will involve identifying overlaps in conditions and geographic areas between our estimates and those published in these systems, as areas of overlap will enable direct comparison.

  While our direct comparison will be constrained by the restricted geographic ranges of these systems and the low likelihood of published estimates existing for the rarer MBL-eligible conditions and medical devices, there is value in being able to directly compare estimates for common conditions that are well-covered in survey data (e.g. asthma). Comparing our estimates wherever possible against those published in these systems will help us to validate our approach, increasing confidence in the estimates produced for rarer conditions that may not be directly comparable. In other words, we will evaluate our methods with conditions, such as asthma and diabetes, that we can verify at similar geographic scales as a check on our overall methods and techniques.

  In addition to direct comparison, we will also formally assess the reliability of estimates using standardized error measures (e.g., Relative Standard Error) and model-fit measures (R^2). Estimates will also account for and report their associated uncertainty.

  We have provided additional detail in Section 2.4 of the Study Plan.

Ankit Jain (CPUC): Will you be applying your methodology to historical years to see if there are any discernible trends in the MB eligible population as a function of demographic/risk/geographic characteristics? Or will the forecasting be based on a snapshot in time? I'm wondering if it would be worth extrapolating trends to future years.

- **Response:** What we are proposing here is right out of the world of public health surveillance. In public health surveillance, the goal is to set up a measure that you can follow through time so that you can see the present in the context of the past and potentially do some of that forecasting.

  Right now, our analysis plan involves collecting multiple years of data and so our data will be somewhat retrospective, over a short or mid-run time horizon. But we are collecting the data to support our current year estimates rather than past years. But if we are collecting say 5 or 8 or 10 years of data, it very well could be the case that we could see emerging trends in the data. That

is not something that we've designed into the study so far. We can go in and look at the trends and insofar as they suggest the future, it's a really interesting suggestion to attempt to use this information to forecast future years, and after the study is completed, this seems like a worthwhile recommendation for when the collective group of stakeholders might wish to repeat the study if based on any discernible trends.

Post Webinar Written Comments from CforAT:

CforAT appreciates that the description of the study design plan and methodology is clear that the conditions and devices it identifies for use in modeling do not reflect eligibility for participation in the Medical Baseline program (Slides 13-14). CforAT emphasizes that eligibility for MBL (or the parallel medical discount for untiered rates) can be granted through an appropriate medical provider's certification of need based on conditions or devices that are not identified in either the statute or the study plan.

Nevertheless, CforAT provides the following list of additional devices and conditions that may be appropriate to incorporate in the study model, as they are likely to cause increased electricity usage by households where a resident has the condition or uses the device.

Additional devices that may be appropriate to consider for inclusion in the study (regardless of the condition that causes an individual to require the device) including; Medical mattresses (alternating pressure mattress; low air loss mattress), Power-Hoyer Lift; Sit-Stand Chairs.

- **Response:** We have reviewed the proposed conditions and devices with the IOU MBL program managers. We have made some adjustments to our list of modelled conditions, devices, and/or condition-device combinations in response to these suggestions. Additionally, we believe that individuals diagnosed with some of these conditions, such as Angelman syndrome, will be captured by our original modeling approach, as they use MBL-eligible devices already included in the modeling plan.

  The following table highlights the list of conditions and devices requested for additional review by CforAT. Within the table we provide our response for each. Please keep in mind that, although we may not include some of these conditions in our modeling, this does not mean that they automatically will not be eligible for the MBL. In some cases, our research indicates that the incidence of cases that are severe enough to qualify them for MBL is relatively rare, so if we were to include all occurrences of these conditions in our estimate, we would overestimate the MBL-eligible population.

TABLE 6: PROPOSED CONDITIONS/DEVICES FROM CforAT AND RESPONSES

Proposed Conditions	Associated or Proposed Devices	Response
Angelman Syndrome This syndrome can involve severe seizures, requiring the use of power-dependent devices for monitoring and communication	Seizure monitoring systems, mobility aids, communication devices	**Response:** Our models include qualified seizure monitoring systems or mobility aids, so those with severe enough conditions would be modeled based on their devices. **Note:** Communication devices are not eligible for MBL as they are considered covered under the baseline allowance. **Action:** No further action.
Prader-Willi Syndrome Disorder often requires continuous monitoring and environmental controls to manage severe obesity and related complications	Environmental controls to manage temperature, as well as monitoring systems for weight management and safety	**Response:** Based on our research, the prevalence of these conditions is very rare. Additionally, there is not enough information to model the percentage of individuals with these conditions that are severe enough to need additional heating and cooling allowances. **Action:** No further action.
Duchenne Muscular Dystrophy (DMD) Progressive muscle-wasting condition that often requires power-dependent mobility and respiratory support devices	Power wheelchairs, ventilation support, and adaptive devices for daily living	**Response:** Already on condition-device combo list (under Muscular Dystrophy). **Action:** No further action.
Severe Hearing Loss or Deafness May require cochlear implants or other electrically powered devices	Cochlear implants, hearing aids that need regular charging, and communication devices	**Response:** We do not plan on including this in the model. Most hearing aid devices are battery operated, and we also must follow the statue, and this does not qualify as a life support device. **Action:** No further action.
Severe Visual Impairment May require electrically powered devices	Screen readers, braille displays, and other assistive technology	**Response:** We do not plan on including this in the model. These are considered ineligible devices. **Action:** No further action.
Organ Transplant Recipients Recipients may require home monitoring equipment	Home monitoring systems	**Response:** We do not plan on including this in the model. These would be considered short-term monitoring equipment, and therefore are ineligible. **Action:** No further action.

Proposed Conditions	Associated or Proposed Devices	Response
Autonomic Dysreflexia (Severe) Condition triggered by changes in temperature / leads to temperature sensitivity Impacts people with spinal cord injuries	Blood pressure monitoring devices, air conditioning units (to control temperature triggers)	**Response:** We agree that we should include Autonomic Dysreflexia as a modeled condition. This could require additional heating and cooling. **Action:** We will include the condition of Autonomic Dysreflexia in our model based on the need for additional heating and cooling.
Severe Anemia Can require regular blood transfusions or oxygen therapy, which can be managed at home with the help of power-dependent equipment	Blood transfusion equipment	**Response:** This is something that would likely be rare outside of medical facilities. Sometimes blood transfusions can be given at home by a visiting nurse, but it is rare. There are certain rules on who can and cannot get a transfusion at home. **Action:** No further action.
Severe Food or Chemical Sensitivities May require power-dependent devices to maintain a safe living environment	Air purifiers, home air filtration systems, specialized refrigerators, or freezers for safe food storage	**Response:** Air filtration systems or purifiers do not have a specific medical device code. Additionally, they are listed as ineligible devices by the IOUs. Refrigeration is considered an essential use of electricity covered under the standard baseline allowance. **Action:** No further action.
Severe Allergies or Anaphylaxis Risk May require air filtration systems to reduce allergens	Air filtration systems.	**Response:** Air filtration systems or purifiers do not have a specific medical device code. Additionally, they are listed as ineligible devices by the IOUs. **Action:** No further action.
Huntington's Disease May require respiratory support	Respirators	**Response:** We agree that this is a condition and device that should be included in our model. **Action:** Include condition of Huntington's Disease and a device of a Respirator as a condition-device combo.
Primary Immunodeficiency Disorders May require regular infusions and a controlled environment, both of which can be power-dependent	Infusion pumps for immunoglobulin therapy, air filtration systems	**Response:** We capture infusion pumps as eligible devices; therefore, these individuals should already be accounted for in our model. **Action:** No further action.

Proposed Conditions	Associated or Proposed Devices	Response
Hypoglycemia Unawareness (Severe) Dangerous drops in blood sugar without warning may require continuous monitoring and insulin delivery, which are power-dependent	Continuous glucose monitors (CGMs) and insulin pumps	**Response:** These battery-powered monitoring devices and insulin pumps require minimal electricity to recharge and are considered ineligible by the IOUs. **Action:** No further action.
Gastrointestinal Motility Disorders May require electrically powered devices for nutrition and symptom management	Gastric electrical stimulators or feeding pumps	**Response:** We agree that Gastric electrical stimulators should be included on the modeled devices list. Feeding pumps are already being modeled as eligible devices. **Action:** Include Gastric Electric Stimulators as a modeled device.
Chronic Pain Syndromes (Severe) May require electrically powered devices to deliver pain relief	Spinal cord stimulators, implanted pain pumps	**Response:** "Chronic Pain Syndromes" would be a set of conditions, not a specific diagnosis. Not all conditions that would fall under *Chronic Pain Syndromes* would be severe enough to warrant a Medical Baseline allocation and not all these conditions would use stimulators as treatment. We have identified Myofasial Pain Syndrome with transcutaneous electrical nerve stimulation as a condition-device combination we believe would be reasonable to model that would be severe enough and utilize electronic nerve stimulators. **Action:** Include a condition-device combination of Myofasial Pain Syndrome with transcutaneous electrical nerve stimulation in our model.
Severe Peripheral Neuropathy Causes debilitating pain and mobility issues that may be managed with electrically powered devices	Pain management devices such as transcutaneous electrical nerve stimulation (TENS) units, specialized footwear or orthotics that might require charging	**Response:** We agree that Peripheral Neuropathy should be a condition that is included in the model when paired with a TENS device. **Action:** Included Peripheral Neuropathy as a condition along with TENS as the device, for a condition-device combination.
Fibromyalgia (Severe)	TENS units for pain management	**Response:** Most fibromyalgia cases would not be severe enough to rise to

Proposed Conditions	Associated or Proposed Devices	Response
May require pain management treatment		the level of life-sustaining or life-supporting. Therefore, we would not include this in our model. **Action:** No further action.
Mitochondrial Diseases May require power-dependent devices to manage symptoms	Feeding pumps, ventilators, mobility aids, and possibly cooling vests	**Response:** Individuals with these conditions will already be included in modeling if they are using a qualifying device such as feeding pumps, ventilators, and mobility aids. Cooling vests would be considered ineligible. **Action:** No further action.
Severe Neuropathic Pain Disorders (e.g., Complex Regional Pain Syndrome - CRPS) May require power-dependent devices for pain relief and control symptoms	TENS units, spinal cord stimulators, temperature control devices	**Response:** "Severe Neuropathic Pain Disorders" would be a set of conditions, not a specific diagnosis. Not all conditions that would fall under *Severe Neuropathic Pain Disorders* would be severe enough to warrant a Medical Baseline allocation and not all of these conditions would use stimulators as treatment. We have identified Central Pain Syndrome with transcutaneous electrical nerve stimulation as a condition-device combination we believe would be reasonable to model that would be severe enough and utilize electronic nerve stimulators. Additionally, Peripheral Neuropathy would be included, but we have addressed this separately above. We do not believe CRPS would rise to the level of life-sustaining or life-supporting. Therefore, we would not include it in our model. **Action:** Include a condition-device combination of Central Pain Syndrome with transcutaneous electrical nerve stimulation in our model.
N/A	Medical Mattresses (alternating pressure mattress; low air loss mattress)	**Response:** Hospital beds and pressure pads are already included as eligible devices. These would be included with this list, but we will add Medical Air Mattresses to make it clear.

Proposed Conditions	Associated or Proposed Devices	Response
		Action: Include Medical Air Mattresses in the modeled devices list.
N/A	Power-Hoyer Lift	**Response:** We consider these devices to be eligible. **Action:** Include Power-Hoyer lifts as eligible devices in our modeled device list.
N/A	Sit-Stand Chairs	**Response:** We consider these devices to be eligible. **Action:** Include Sit-Stand chairs as eligible devices in our modeled device list.

APPENDIX C RESPONSES TO COMMENTS ON DRAFT RESEARCH PLAN NARRATIVE

Center for Accessible Technology (CforAT) has provided two comments for consideration on the Draft Medical Baseline Research Plan Narrative that was posted for public review on August 30, 2024. We have provided their comments and our responses below.

Comment:

Center for Accessible Technology (CforAT) represents the interests of utility customers with disabilities and medical vulnerabilities who depend on reliable and affordable access to electricity to support their health and safety. This population is disproportionately low-income. While the Medical Baseline program is not income-based, it is an important form of support for many customers with limited economic resources. CforAT has long advocated for improved outreach to ensure that eligible customers are aware of the program and that they enroll. CforAT has also long advocated for the type of study that is now being developed. We appreciate the work that has gone into the development of the Medical Baseline study plan and look forward to the development of information about the eligible population.

CforAT has two recommendations for modifications to the study plan as follows:

1. In the initial introduction and review of the Medical Baseline program (p. 1), CforAT recommends that you add an additional explanation about the availability of a medical discount for customers eligible for Medical Baseline who select a rate that does not have tiers. As noted in the introduction, the statutory program "provides a larger quantity of electricity and natural gas at the baseline rate to residential customers with medical needs…" For optional rates that do not have a baseline rate, the Commission has approved incorporation of a comparable "medical discount" in the form of an authorized line-item discount on the bill of a customer who is eligible for Medical Baseline but has selected an untiered rate. This medical discount allows customers to select the rate that is best for them while maintaining access to the support offered through Medical Baseline.

2. In the previous materials circulated to stakeholders regarding the Medical Baseline Study, the consultants designing the study were clear that the list of specific devices and conditions that were being modeled, were not intended to inform any determination program eligibility. The materials describing the study design specifically stated that the list of conditions and devices selected for modeling "doesn't necessarily reflect who is (or more importantly who is not eligible) [sic] but reflects how we model these eligible conditions." (Medical Baseline Study Draft Study Design Deck, Slide 13). This is an extremely important point which should be restated in the study plan to be clear that a person can be certified by a medical professional as eligible for Medical Baseline (or the medical discount) if they have a condition or use a device that impacts their need for energy use, even if that condition or device is not expressly incorporated in the study. This

clarification should be incorporated into the discussion of specifying devices and conditions in the draft Study Plan (pp. 5-6)

Thank you for incorporating these items into the final Study Plan. If you have any questions or wish to discuss these recommendations further, please feel free to reach out to CforAT.

Response:

Thank you for taking the time to review our research plan narrative and providing your feedback. Please see our responses:

1. We have added the following suggested text into the introduction section (page 1).

   "For optional rates that do not have a baseline allowance, the Commission has approved incorporation of a comparable "medical discount" in the form of an authorized line-item discount on the bills of customers who are eligible for Medical Baseline but have selected an un-tiered rate. This medical discount allows customers to select the rate that is best for them while maintaining access to the support offered through Medical Baseline."

2. We have added the following clarifying text into Section 2.1.1 Specify Devices and Conditions (page 6).

   "As noted in the sidebar on the previous page, the list of conditions, devices, and condition-device combinations to be included in the health outcomes model are not intended to inform determination of medical baseline program eligibility. The purpose of the list is to develop a "definitional boundary" around customers who may be eligible for the Medical Baseline allowance in order to create models that will estimate the population. Some customers with conditions or devices not on this list may be eligible for the Medical Baseline allowance if a qualified medical practitioner signs off on their enrollment form."