NIH Diversity Program Consortium
Technical Report

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Evaluation of Post-secondary Student Outcomes: Underrepresented (URG) and Well-Represented (WRG) Group Variable Construction in the Enhance Diversity Study using the November 2019 NIH Guidelines

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The Diversity Program Consortium is a national collaborative research project in which the National Institute of Health funds and works together with institutions to advance the overarching goal of developing, implementing, assessing and disseminating innovative, effective approaches to engage, train and mentor students, enhance faculty development, and strengthen institutional research and research training infrastructure.

The DPC is made up of three closely integrated initiatives: Building Infrastructure Leading to Diversity, National Research Mentoring Network, and Coordination and Evaluation Center. As one of these funded initiatives, the CEC is responsible for the longitudinal, consortium-wide evaluation of the training and mentoring interventions that other partners develop and put into practice.

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Introduction

The purpose of this technical report is to describe coding procedures for well-represented (WRG) and underrepresented (URG) groups of students in the Diversity Program Consortium (DPC) Enhance Diversity Study and subsequent consortium-wide analyses. The DPC is determining the effectiveness of innovative approaches to engage individuals from diverse backgrounds and help them prepare for and succeed in biomedical research careers. The DPC supports transformative approaches to student engagement, research training, mentoring, faculty development, and infrastructure development. The Enhance Diversity study is the evaluation of the DPC initiative and is guided by the Consortium-wide Evaluation Plan (CWEP). Consortium-wide data (CWEP data) come from surveys and institutional data. A combination of surveys are used to provide measurement of specific indicators important to the evaluation and to provide national comparisons to those in the study. One set of surveys are those conducted by the Higher Educational Research Institute (HERI) and include The Freshman Survey (HERI - TFS) and the College Senior Survey (HERI - CSS), two national surveys of undergraduates at a broad set of institutions. The DPC's Coordination and Evaluation Center (CEC) administers surveys to students at Building Infrastructure Leading to Diversity (BUILD) institutions (2015-current) and National Research Mentoring Program (NRMN) participants (2015-2019). They include an annual student follow-up survey (CEC - SAFS) and the NRMN mentee survey. Other student data sources include institutional records (IR data) and BUILD participation records (Tracker data), both available from BUILD institutions. The July 2019 Evaluation Implementation Working Group (EIWG) meeting helped identify the need to develop clear guidance on the construction of WRG and URG student groups for analyses involving the Enhance Diversity Study data.

Consistently operationalizing WRG and URG categories in reports and publications ensures greater consistency across local and consortium-wide analyses, thereby increasing the consistency and utility of DPC findings. As such, this technical report details coding recommendations for WRG and URG that are consistent with groups that National Institutes of Health (NIH) have identified as underrepresented in the biomedical research enterprise to guide primary DPC analyses. Where appropriate, this technical report also details further refined WRG and URG designations that can be considered for secondary DPC analyses. This report focuses on describing coding of WRG and URG with existing post-secondary student survey data. URG and demographic flags detailed in this technical report will be incorporated into future consortium-wide data reference file releases. This work aims to promote consistent definitions of the URG categories in publications, while also allowing for more nuanced analyses of evaluation findings.

The Process of Developing Well-represented and Underrepresented Group Designations

The primary goal of this effort was to come to a consensus on how the Enhance Diversity Study and consortium-wide DPC findings should conceptualize "underrepresented groups." Conversations regarding definitions of WRG and URG, including individuals from "disadvantaged" backgrounds, took place during the July and October 2019 EIWG meetings. The CEC conducted document and literature reviews to

examine NIH designations of URG. We also had discussions with NIH and DPC grantees to clarify the various URG designations. Literature sources included NIH announcements and notices, U.S. Department of Education announcements and publications, Census Data, National Science Foundation (NSF) announcements and publications, and peer-reviewed publications. Our searches targeted definitions used for underrepresented undergraduate student groups in STEM and biomedical research (the primary BUILD student population), with priority given to federal sources. We also consulted with HERI and the CEC to determine the best approaches for operationalizing URG categories using survey sources. We made our final decisions based on the greatest availability of data, the lowest burden on analysts, and the highest level of transferability in the field. Proposed URG and demographic flags were presented at the October 21, 2019 EIWG meeting and then updated for alignment with the November 2019 Notice of NIH's Interest in Diversity.

Underrepresented Populations in the U.S. Biomedical, Clinical, Behavioral and Social Sciences Research Enterprise

The NIH Notice of Interest in Diversity (NOT-OD-20-031) identifies four examples of groups that are underrepresented in the biomedical research enterprise.

1. Racial/ethnic groups, including:
   a. Blacks or African Americans; Hispanics or Latinos; American Indians or Alaskan Natives; Native Hawaiians and other Pacific Islanders.
   b. In addition, it is recognized that underrepresentation can vary from setting to setting; individuals from racial or ethnic groups that can be demonstrated convincingly to be underrepresented by the grantee institution should be encouraged to participate in NIH programs to enhance diversity (see Federal Register, 1997).
2. Persons with physical or mental disabilities that substantially limit one or more major life activities (see Americans with Disabilities Act of 1990, as amended).
3. Individuals from disadvantaged backgrounds. The description of this group was updated in the 2019 notice, and is now described as those who meet *two or more* of the following criteria (see NIH, 2020):
   a. Were or currently are homeless
   b. Were or currently are in the foster care system
   c. Were eligible for the Federal Free and Reduced Lunch Program for two years or more
   d. Have/had no parents or legal guardians who completed a bachelor's degree
   e. Were or currently are eligible for Federal Pell grants
   f. Received support from the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) as a parent or child
   g. Grew up in one of the following areas: a) a U.S. rural area, or b) low-income and health professional shortage area eligible zip code
4. Women from above categories (1, 2, and 3) at the graduate level and beyond in scientific fields (or women in general at senior faculty levels in most biomedical-relevant disciplines and some scientific disciplines; see NSF, 2019).

Women have been shown to be underrepresented in doctorate-granting research institutions at senior faculty levels in most biomedical-relevant disciplines, and may also be underrepresented at other faculty levels in some scientific disciplines (See data from the National Science Foundation National Center for Science and Engineering Statistics: Women, Minorities, and Persons with Disabilities in Science and Engineering, special report available at https://www.nsf.gov/statistics/2017/nsf17310/, especially Table 9-23, describing science, engineering, and health doctorate holders employed in universities and 4-year colleges, by broad occupation, sex, years since doctorate, and faculty rank.)

Upon review of NSF data, and scientific discipline or field related data, NIH encourages institutions to consider women for faculty-level, diversity-targeted programs to address faculty recruitment, appointment, retention or advancement.

Please note that NIH periodically updates its Notice of Interest in Diversity. The information above reflects the notice published November 22, 2019. This technical report focuses on describing the coding of WRG and URG for the undergraduate student population of the Enhance Diversity study.

Reference File Updates

During the DPC - Phase I (2014-2019), individual analysts were responsible for constructing URG variables. To facilitate implementation of common approaches in data analysis, the CEC will construct and distribute variables designating URG and other important demographic variables of interest in subsequent versions of the survey linking file (known as the reference file). Using common definitions across multiple analyses will support efforts to evaluate the DPC's impact on increasing URGs in biomedical and behavioral research.

In general, URG indicators will be structured as dichotomous flag variables. Missing and unknown responses will be excluded from variable construction. Table 1 lists the undergraduate student URG flag variables for which there are adequate survey or IR data items to maintain alignment with groups NIH has identified as underrepresented, including race/ethnicity and disability status. Table 1 additionally lists the undergraduate student disadvantaged background variables that will be considered as URG using Enhance Diversity Study data: homeless status, foster youth status, parent/guardian educational attainment (first generation college student status), and Pell grant eligibility. Note that, as described above, the NIH notice includes three additional statuses that the Enhanced Diversity Study has not been able to collect data on and so are not included in calculating the URG flags. Per the NIH Notice of Interest in Diversity, an individual should satisfy two or more disadvantaged background criteria to be considered underrepresented (or meet other URG guidelines). Table 1 also includes additional demographic flag variables (gender (woman), gender minority status, and sexual minority status) that may be of interest for analyses, even if not formally recognized as URG groups for undergraduate students. Composite variables, notated in the table below (*) will also be computed to capture if a student is in a population that NIH has noted is underrepresented or if they fit

either/both sexual minority or/and gender minority status at any point in time during data collection.

Table 1. Proposed Undergraduate Student URG, Disadvantaged Background, and Demographic Flag Variables for the Enhance Diversity Study and Subsequent Consortium-wide Analyses, using CWEP Data

NIH URG Designations	NIH Disadvantaged Background Designations [b]	Other Demographic Flags
URG_RACEETHNICITY[a] URG_DISABILITY	URG_HOMELESS URG_FOSTER URG_PELL URG_FGCS	WOMAN SEXUAL_MINORITY GENDER_MINORITY
URG_MEMBER*[c]		SG_MINORITY*[d]

Note. The Enhance Diversity Study has data readily available on four of the seven dimensions of the disadvantaged background domain (detailed on page two) referenced in the Notice of NIH's Interest in Diversity.
Note. Composite variables (*) include URG_MEMBER and SC_MINORITY.
Note. Maintaining alignment with the Notice of NIH's Interest in Diversity, in the Enhance Diversity Study, an individual should meet two or more aspects of the disadvantaged background criteria to qualify for URG_Member designation.
[a]Flag variables will also be created for each of the Race/Ethnicity subgroups. See URG_RACEETHNICITY section for further details. Additionally, local analysts are encouraged to consider local context for potentially expanded definitions of racial/ethnic underrepresented groups.
[b] CWEP data does not include information on three additional examples of pre-college disadvantaged backgrounds: eligible for free/reduced price lunches for two years, receipt of WIC, grew up in a disadvantaged zip code including rural or health services shortage area.
[c]URG_MEMBER is computed based upon classification in one or more of the primary URG sub-constructs: race/ethnicity, disability, and disadvantaged background (two or more: homeless, foster youth, FGCS, and Pell recipient).
[c]SG_MINORITY is computed based upon classification in GENDER_MINORITY and SEXUAL_MINORITY variables.

This report describes in detail the coding of the URG, disadvantaged background, and demographic flag variables (using 2019 survey items for illustrative purposes) and cites literature that supports the URG and WRG coding designations. The appendix lists the survey items used for variable creation across all survey timepoints and provides

response option coding details. While this technical report focuses on the four major CWEP student surveys in 2019 (TFS, CSS, SAFS, NRMN Mentee), the appendix describes detailed coding for each flag variable for all student survey items used through 2020 in the study.

During EIWG meetings, DPC colleagues discussed a range of underrepresented groups at the local level, as well as groups that programs are often designed to serve. These intended student audiences will not be represented in the CEC distributed reference files but may be of interest for secondary analyses of CWEP data. Additional student designations mentioned by sites (and often discussed in educational literature) are displayed in Table 2. Enhance Diversity Study student surveys and IR data often capture these variables, which is also indicated in the table. Analyses using these variables will likely be reserved for secondary analyses and/or research publications using CWEP data.

Table 2. Additional Student Designations of Local Interest Appearing in the Enhance Diversity Study

Student Designation	Enhance Diversity Study Data Source
Transfer Student	SAFS, IR Data
Veteran	TFS, SAFS
Delayed Entry to College	TFS, SAFS, IR Data
Part-time Student	TFS, SAFS, IR Data
English as a Second Language	TFS, SAFS

Note. SAFS=Student Annual Follow-up Survey, IR Data=Institutional Record Data, TFS=The Freshman Survey (HERI)

Describing the Coding of URG Designations in the Enhance Diversity Study

URG through Race and/or Ethnicity

The Notice of NIH's Interest in Diversity (National Institutes of Health [NIH], 2019) cites the National Science Foundation (NSF) published reports indicating that Blacks or African Americans, American Indians and Alaska Natives, Hispanics or Latinos, Native Hawaiians and other Pacific Islanders are underrepresented at many career stages in health-related sciences on a national basis (National Science Foundation [NSF], 2015). Diversity of the NIH-funded workforce further validates NSF race/ethnicity underrepresentation findings (Heggeness, Evans, Pohlhaus, & Mills, 2016). The Enhance Diversity Study uses the same designations in creating the URG_RACEETHNICITY variable. All other racial/ethnic groups, not listed above, are considered well represented.

Items that capture race/ethnicity on Enhance Diversity Study surveys (using 2019 surveys as an example) and the corresponding WRG and URG designations are displayed in Table 3. Respondents are given the opportunity to select multiple response options in each survey. If a respondent ever indicates any URG racial/ethnic group in their responses, they are coded as a URG for Race and/or Ethnicity. For "other" responses with a racial/ethnic group specified, the CEC inspects free entries for further classification. For respondents that have only selected "choose not to answer" or "other" with no specificity, no calculation for URG_RACEETHNICITY is included (response remains "unknown"). Please see the appendix for coding of each response option and notes about how these items might have shifted over time.

Table 3. WRG and URG Designations for URG_RACEETHNICITY across Enhance Diversity Study Student Surveys, 2019

WRG	URG
TFS and CSS: White/Caucasian; East Asian (e.g. Chinese, Japanese, Korean, Taiwanese); Filipina/o/x; Southeast Asian (e.g. Cambodian, Vietnamese, Hmong); South Asian (e.g. Indian, Pakistani, Nepalese, Sri Lankan); Other Asian	**TFS and CSS:** African American/Black; American Indian/Alaskan Native; Native Hawaiian/Pacific Islander; Mexican American/Chicana/o/x; Puerto Rican; South American; Other Latina/o/x
SAFS: White; Asian; Indian; Chinese; Filipino; Japanese; Vietnamese; Other Asian; Middle Eastern or North African	**SAFS:** Black or African American; American Indian or Alaskan Native; Native Hawaiian; Guamanian or Chamorro; Samoan; Other Pacific Islander; Hispanic, Latina/o/xo/a, or Spanish origin
NRMN Mentee : White; Asian; Middle Eastern or North African	**NRMN Mentee :** Hispanic, Latino/a, or Spanish Origin; Black or African American; American Indian or Alaskan Native; Native Hawaiian or Other Pacific Islander

Note. TFS=The Freshman Survey (HERI), CSS=The College Senior Survey (HERI), SAFS=Student Annual Follow-up Survey

It should be noted that prior research suggests a high level of variance among Asian subgroups in higher education. For instance, 2011 - 2013 U.S. Census estimates indicate that in California, 56% of Korean, 52% of Chinese, 29% of Vietnamese, 16% of Cambodian, and 10% of Laotians of the population 25 years and older hold a bachelor's degree or higher (The State of Higher Education in California, 2015). Some of the variability in educational attainment can be attributed to the history of different immigration streams, with children of immigrant parents with high levels of education and professional employment (e.g. more common among East and Southeast Asian and Chinese immigrants) being advantaged in college preparation and applications compared to children of refugee parents with low levels of education and unskilled jobs (e.g. more common among Hmong and Cambodian families) (Baum & Flores, 2011). This "bimodal"

pattern of education, income, and health status among Asian subgroups is well documented (Lee & Zhou, 2015; Ramakrishnan and Ahmad, 2014;Yi, Kwon, Sacks, & Trinh-Shevrin, 2016) and suggests that local evaluations may want to consider disaggregating Asian subgroups in secondary analyses to better reflect the WRG and URG population at their sites. Programs are encouraged to examine underrepresentation in race/ethnicity within their own institutional context as NIH acknowledges this can vary from setting to setting (NIH, 2019).

In addition to the WRG and URG designation for racial/ethnic subgroups, the CEC will proceed with the creation of flag variables for each racial/ethnic subgroup, with a code for "any mention" of identity within the group. Table 4 lists the proposed racial/ethnic subgroup flag variables, matched to survey response options.

Table 4. Racial/Ethnic Subgroup Designations across Enhance Diversity Study Student Surveys, 2019

Racial/Ethnic Flag Variable	Survey Response Options
WRG_WHITE	**TFS and CSS:** White/Caucasian **SAFS and NRMN Mentee:** White
WRG_ASIAN	**TFS and CSS:** East Asian (e.g. Chinese, Japanese, Korean, Taiwanese); Filipina/o/x; Southeast Asian (e.g. Cambodian, Vietnamese, Hmong); South Asian (e.g. Indian, Pakistani, Nepalese, Sri Lankan); Other Asian **SAFS and NRMN Mentee:** Asian Indian; Chinese; Filipino; Japanese; Vietnamese; Other Asian
WRG_MENA	**SAFS and NRMN Mentee:** Middle Eastern or North African
URG_BLACK	**TFS and CSS:** African American/Black **SAFS and NRMN Mentee:** Black or African American
URG_LATINX	**TFS and CSS:** Mexican American/Chicana/o/x; Puerto Rican; South American; Other Latina/o/x **SAFS and NRMN Mentee:** Hispanic, Latino/a, or Spanish Origin
URG_AIAN	**TFS and CSS:** American Indian/Alaskan Native **SAFS and NRMN Mentee:** American Indian or Alaskan Native
URM_NHPI	**TFS and CSS:** Native Hawaiian/Pacific Islander **SAFS:** Native Hawaiian; Guamanian or Chamorro; Samoan; Other Pacific Islander **NRMN Mentee:** Native Hawaiian or Other Pacific Islander

URG through Disability

The Notice of NIH's Interest in Diversity (NIH, 2019) cites the American with Disabilities Act (ADA) which "defines an individual with a disability as a person with a physical or mental impairment that substantially limits one or more major life activities" (Sec. 12102). Individuals with disabilities have lower educational attainment across science fields of study (NSF, 2012). The Enhance Diversity Study uses the same URG designations to the extent possible in creating the URG_DISABILITY flag variable.

Items that capture disability status on Enhance Diversity Study surveys (2019) and the corresponding WRG and URG designations are illustrated in Table 5. While the TFS and SAFS capture disability status for an individual, neither survey specifically captures whether or not "a disability substantially limits life activities." The SAFS does a better job at capturing impact on life activities through the addition of the "serious" qualifying language for various physical, mental, or emotional conditions one may experience. The lack of alignment between the TFS and SAFS questions with the ADA definition of persons with a disability remains a limitation of the Enhance Diversity Study. Please see the appendix for coding of each response option and notes about how these items might have shifted over time.

It should be noted that the CEC inspects cases for which we have both TFS and SAFS data to examine the extent to which disability status might shift over time. The URG_DISABILITY flag variable is computed using an "IF EVER" rule for whether a disability was reported. Respondents indicating "other" for disability are coded positively as URG, while a "choose not to answer '' response is considered "unknown" and no value for URG_DISABILITY is assigned. The CEC plans to include items assessing disability status for each subsequent survey. The survey/time varying variable will allow for inspection of potential shifts in responses over time.

Table 5. WRG and URG Designations for URG_DISABILITY across Enhance Diversity Study Student Surveys, 2019

WRG	URG
TFS: "No" for EACH item (Learning disability, ADHD, Physical disability, Chronic illness, Psychological disorder, Other)	**TFS:** "Yes" for ANY item (Learning disability, ADHD, Physical disability, Chronic illness, Psychological disorder, Other)
SAFS: "No, none of these statements are true for me" (I am deaf or have serious difficulty hearing; I am blind or have serious difficulty seeing, even when wearing glasses; I have serious difficulty concentrating, remembering, or making decisions because of a physical, mental, or emotional condition; I have serious difficulty walking or climbing stairs; I have difficulty dressing or bathing; I have difficulty doing errands alone such as visiting a doctor's office or shopping because of a physical, mental, or emotional condition)	**SAFS:** "Yes, at least one of these statements is true for me" (I am deaf or have serious difficulty hearing; I am blind or have serious difficulty seeing, even when wearing glasses; I have serious difficulty concentrating, remembering, or making decisions because of a physical, mental, or emotional condition; I have serious difficulty walking or climbing stairs; I have difficulty dressing or bathing; I have difficulty doing errands alone such as visiting a doctor's office or shopping because of a physical, mental, or emotional condition)
	SAFS: "Yes" I have registered with my school's Office of Disability/Student Accessibility

Note. TFS=The Freshman Survey (HERI), SAFS=Student Annual Follow-up Survey

Note. To be assigned a *yes value* for URG_DISABILITY, "Yes" would have been reported at any point in time.

Note. While "Yes, I have registered with my school's office of Disability/Student Accessibility" can be used to assign a *yes value* for URG_DISABILITY, a response of "No," should be treated as "unknown," as it is completely feasible for an individual to meet the definition of persons with a disability, while choosing not to register with the Office of Disability (assuming one even exists). It is important that both SAFS disability status items are inspected for computation of the URG_DISABILITY flag.

Consider for URG through "Disadvantaged Backgrounds"

The U.S. Department of Education's report on Advancing Diversity and Inclusion in Higher Education (2016) points to adverse childhood experiences and family resources playing a significant role in an individual's progress throughout the higher education to employment pipeline. NIH acknowledges that students from low socioeconomic status (SES) backgrounds obtain bachelor's and advanced degrees at significantly lower rates than individuals from higher SES backgrounds, leading to underrepresentation in biomedical research (NOT-OD-20-031). NIH outlines seven ways an individual could be

considered from a "disadvantaged background" (see above, p. 2, #3.a-g), and notes that two or more of the seven criteria should be met for designation as URG (apart from other URG criteria). Four of the disadvantaged background aspects, measured in at least one of the Enhance Diversity Study student surveys (homeless, foster youth, Pell grant receipt, and parent/guardian education level) are considered for URG designation, as displayed in Table 6. Supporting literature and considerations in variable construction and usage are detailed under each of the disadvantaged background sub-sections.

Table 6. Disadvantaged Background Variable Flags for Consideration in Designation as URG across Enhance Diversity Study Student Surveys, 2019

Disadvantaged Background Variable	Consider for WRG	Consider for URG
URG_HOMELESS	**TFS:** "No" for, In your lifetime, have you been homeless for at least one month?	**TFS:** "Yes" for, In your lifetime, have you been homeless for at least one month?
URG_FOSTER	**SAFS:** "No" for, At any time since you were 13, were you in foster care or were you a dependent of the court?	**SAFS:** "Yes" for, At any time since you were 13, were you in foster care or were you a dependent of the court?
URG_FGCS	**TFS and SAFS:** "Yes" EITHER parent/guardian has obtained a College degree, Some graduate school, Graduate degree	**TFS and SAFS:** "No" NEITHER parent/guardian has obtained a College degree, Some graduate school, Graduate degree
URG_PELL	**TFS:** "No" to received Pell Grant financial aid **SAFS:** "No" to received Pell grant funding for financial aid	**TFS:** "Yes" to received Pell Grant financial aid **SAFS:** "Yes" to received Pell Grant funding for financial aid

Note. TFS=The Freshman Survey (HERI), SAFS=Student Annual Follow-up Survey

Note. To be assigned a positive value (Consider for URG) for any of the disadvantaged background items, "Yes" would have to have had to been reported on any survey to date, at any point in time.

Note. To be designated as URG through disadvantaged background, an individual should meet two or more of the seven criteria indicated by NIH (which also include eligibility for Free or Reduced Lunch, receipt of Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and residential zip code that would indicate a rural area or low-income and health professionals shortage age).

Experienced Homelessness (3.a)

During the 2014-2015 school year, 2.5% of U.S. public school children were considered homeless (National Center for Educational Statistics [NCES], 2017), meaning they lacked a "fixed, regular, and adequate nighttime residence" (ESSA: McKinney-Vinto Homeless Assistance Act, 2015, Subtitle VII-B). School experiences and educational attainment are negatively impacted by the host of health, safety, and emotional well-being challenges that homeless children face (Buckner, 2008). Additionally, homeless youth are more likely to have characteristics that are also associated with negative schooling experiences and lower educational attainment such as undocumented migrant status, English Language Learner status, and foster youth status (NCES, 2017).

A single item on homelessness in Enhance Diversity Study surveys appears on the TFS in 2018 and 2019, "In your lifetime, have you been homeless for at least one month?" Respondents indicating "Yes" for experienced homelessness are coded positively for the URG_HOMELESS disadvantaged background flag variable. CSS, SAFS, and NRMN Mentee surveys do not capture experiences with homelessness. Please see the appendix for coding of each response option and notes about how this item might have shifted over time.

Foster Youth Status (3.b)

In 2017, there were 442,995 children in foster care (Child Welfare Information Gateway, 2019). Research suggests that former foster youth experience lower levels of retention and graduation in higher education, being more likely to drop out of college by the end of their first year (21% vs. 13%) and before bachelor's degree attainment (34% vs. 18%) than their non-foster care peers (Daw, Dworsky, Fogarty, & Damashek, 2011). Financial, academic, socio/emotional, and logistical challenges have been cited as reasons for lower degree completion for former foster youth (Dworsky & Perez, 2009).

A single item regarding foster youth status in the Enhance Diversity Study is included on the TFS 2016-2018 and the SAFS in 2019 and 2020 (for first-time survey responders), "At any time since you were 13, were you in foster care or were you a dependent of the court?" Respondents indicating "Yes" for foster care/dependent of the court are coded positively for the URG_FOSTER disadvantaged background flag variable. Respondents indicating "I do not know" or "I choose not to answer" for foster care/dependent of the court are considered "unknown" and no value for URG_FOSTER is assigned. CSS, and NRMN Mentee surveys do not capture foster youth status. The item is an imperfect measure as it prompts respondents to answer from a frame of reference of "since you were 13," which is more restrictive than the NIH guideline of "were or currently are." Given the median age of foster youth in 2017 was 7.7 years (Child Welfare Information Gateway, 2019), it is likely that foster youth numbers are undercounted in the data files, a study limitation. Please see the appendix for coding of each response option and notes about how this item might have shifted over time.

Parent/Guardian Educational Attainment (3.d)

A widely used approach in operationalizing "disadvantaged educational background" utilizes parent/guardian educational attainment. At the most basic level, a first-generation college student (FGCS) is one who is enrolled in postsecondary education and whose parents do not have any postsecondary education experience. Compared to their continuing-generation college student peers, who have at least one parent with some postsecondary education experience, first-generation college students face increased challenges in higher education (Redford, Hoyer, & Ralph, 2017). The field of educational research often examines the challenges that first-generation college students face in navigating college attendance and graduation and on identifying the needed support for educational success (Cataldi, Bennett, & Chen, 2018; Martinez, Sher, Krull, & Wood, 2009).

There is a continuum of parental experiences with higher education that can influence a student's educational social capital. In addition to both parents/guardians having no postsecondary experience, one or both parents may have applied (but not attended), attended (but not graduated), or graduated with an Associate's Degree (versus a Bachelor's). For a full picture, the highest degree(s) attained must also be considered. The various educational experiences within families are connected with differences in social networks and family resources which impact student success in higher education (Thorngren, 2017).

Prior research has assessed how the operationalization of FGCS status shapes educational outcomes (Toutkoushian et al., 2018; Toutkoushian et al., 2019). For instance, Toutkoushian et al. (2018) examined eight different ways to operationalize *first-generation college student* (looking at differential effects on student application and college enrollment (2-yr. and 4-yr.) based on whether one or both parents had only a high school diploma, started an Associate's degree, finished an Associate's degree, or started (but did not complete) a Bachelor's degree. The relationship between FGCS status and three outcomes (e.g., took a college entrance exam, applied to college, and enrolled in college) varied by first-generation student definitions. Ultimately, students with parents who had little to no post-secondary education did more poorly than those who had parents with more higher education experience and/or higher education degree attainment (Toutkoushian et al., 2018). The study's findings suggest that students who reported both parents with no college education fare worse than all other groups on application and enrollment measures.

To better understand how four-year public institutions were defining first-generation college students, Thorngren (2017) surveyed 562 colleges and found over half (55%) were using the definition of at least one or more parents/guardians having attended college, but neither earning a degree. There were a multitude of other definitions, with the second most common being both parents/guardians having completed high school but neither parent having ever enrolled in college. The variety of approaches in defining first-generation college students heightens the importance of defining an approach in a given research study.

There are two well recognized approaches in determining whether an individual has first generation student status that will be used to create flag variables in the reference file. The primary approach to determining first-generation college student status places a focus

on whether either parent or guardian has *graduated from college,* with a bachelor's degree. If neither parent/guardian has a college degree, a student is considered first generation (Redford, Hoyer, & Ralph, 2017). Studies suggest that students who fit this definition face significant hurdles for college entrance (Toutkoushian et al., 2018) and were less likely to obtain a college degree, relative to counterparts with at least one parent or guardian who had a college degree (Toutkoushian et al., 2019).

The TFS (and SAFS for first-time survey responders) include the item, "What is the highest level of formal education obtained by your parents/guardians?" Ordinal response options for each parent/guardian include, "Junior high/Middle school or less, High school graduate, Postsecondary school other than college, Some college, College degree, Some graduate school, and Graduate degree." These responses will be used to define the first-generation college student flag variable (URG_FGCS) when students respond that *neither parent/guardian has obtained a college degree or higher*. Respondents indicating "I do not know" or "I choose not to answer" for parent/guardian education level are considered "unknown" and no value for URG_FGCS is assigned. This first approach most closely follows the Notice of NIH's Interest in Diversity (NOT-OD-20-031) and is the most commonly used approach in four-year public institutions (Thorngren, 2017). A known limitation in the Enhance Diversity Study is that the survey response option "college degree" does not distinguish between Associate and Bachelor's degree attainment, with Bachelor's degree attainment being the guidelines used by NIH. Please see the appendix for coding of each response option and notes about how these items might have shifted over time.

A more conservative approach, used by the U.S. Department of Education, classifies a student as first generation only when neither parent or guardian has *attended college*. Students that fit this definition are likely to face the greatest amount of educational hurdles (Toutkoushian et al., 2018). This conservative approach is used in HERI analyses and publications (e.g., Eagan et al., 2016). To allow researchers flexibility in analysis independent of NIH guidelines, we will include a second flag variable (URG_FGCSATTEND) that indicates that the student reports *neither parent has some college or higher*. Please see the appendix for coding of each response option and notes about how these items might have shifted over time.

In the CEC's preliminary analyses of a subset of Enhance Diversity Study data, changing from a strict (no parent/guardian college attendance) to a broader (no parent/guardian college graduation) definition of first generation student, the proportion of students fitting the first generation designation increases from 20% to 33% of students. Both versions of first-generation student status will be provided to enhance comparisons with other literature of CWEP findings. However, URG_FGCS will be the only FGCS variable used in calculating the composite URG_MEMBER variable (further described below), maintaining alignment with NIH criteria. Researchers should describe which definition of FGSC that they use in all DPC-affiliated publications.

Pell Grant Receipt (3.e)

Another approach to operationalizing "disadvantaged" is using Enhance Diversity Study data on Pell Grant recipient (vs. eligibility) status. Pell Grant status is often used as a proxy for low family income (e.g. in the 2014 and 2019 BUILD RFAs - see references). One of the challenges with using the Pell Grant as a proxy for "disadvantaged" is that it undercounts the percentage of low-income students enrolled in institutions of higher education (Delisle, 2017). In the United States, in order to access financial aid, students must complete the Free Application for Student Federal Aid (FAFSA) that includes documentation of family income. Studies show that many eligible students do not submit FAFSA applications (King, 2004; Kofoed, 2015). The trends, which are more pronounced for lower-middle income students, show that independent students apply at lower rates than dependent students, with up to 24% of independent students with incomes under $10,000 not applying for financial aid (King, 2004). The unclaimed aid totals are estimated to be $24 billion annually (Kofoed, 2015). Changing Pell Grant take-up rates, as well as changing eligibility requirements and maximum award amounts over time (Delisle, 2017; Executive Office of the President, 2014) also pose challenges with using the measure.

One of the reasons that Pell Grant recipient status continues as a proxy for family socioeconomic status is because awards go to low-income students. In 2011-2012, median Pell Grant family income was $17,300 (Delisle, 2017). A second reason that use of the measure continues is that it is publicly and widely available, with the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS) requiring institutions of higher education to submit data on Pell Grant awards (Delisle, 2017). The number of students receiving Pell Grants, and the amount of awards, may be the only financial information available across colleges and universities, continuing to make it of interest to researchers (Delisle, 2017). Despite the known limitations with the measure, Pell Grant *recipient status* is the best proxy for 3.d "disadvantaged background" using Enhance Diversity Study data.

The flag variable, URG_PELL, indicates a student reported ever receiving a Pell Grant on TFS or SAFS (for first time responders). Respondents indicating "I choose not to answer" for Pell Grant receipt are considered "unknown" and no value for URG_PELL is assigned. CSS and NRMN Mentee surveys do not capture information on Pell Grant receipt. A known limitation in the Enhance Diversity Study is that the Pell Grant survey items do not capture current or earlier *eligibility* for a Pell Grant, as NIH criteria suggest, likely resulting in an undercount of "disadvantaged," a limitation common in similar studies (Delisle, 2017; King, 2004; Kofoed, 2015). Please see the appendix for coding of each response option and notes about how the item might have shifted over time.

Disadvantaged Background Items Unavailable for Flag Variable Creation

Disadvantaged background items not adequately covered to date in the Enhance Diversity Study include eligibility for Free or Reduced Lunch (3.c), receipt of Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (3.f), and residential zip code that would indicate a rural area or low-income and health professionals shortage age (3.g).

The Federal Notice for Poverty Guidelines is used to determine financial eligibility for certain federal programs, including free and reduced price lunch (FRPL) and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (U.S. Department of Health and Human Services [HHS], 2019). The Food and Nutrition Service (FNS) of the USDA sets eligibility for free lunch at 130%, and for reduced-price lunch at 185%, of the federal income poverty guidelines ($32,630 and $46,435 respectively for a family of four in year 2018-2019) (Child Nutrition Programs: Income Eligibility Guidelines, 2019). Eligibility for WIC includes incomes up to 185% of the FPL (USDA, FNS, 2019). These thresholds are updated every year according to the poverty thresholds established by the U.S. Census Bureau and adjusted by the Consumer Price Index.

TFS gathers family income estimates from survey respondents. The survey asks students to indicate the "best estimate of [their] parents'/guardians' total income last year" (before taxes). Students may choose from 12 ordinal response options, including "Less than $15,000," "$15,000 to $24,999," … "$259,000-$499,000," and "$500,000 or higher."

There are several challenges identified with using student-reported family income and the federal poverty guidelines to identify eligibility for the FRPL or WIC. The first is that the Enhance Diversity Study does not ask students about their "family size," a necessary variable to identify federal poverty levels (FPL) which vary by household size. While imperfect, HERI typically handles this by designating a reported income below the FRPL for a family of four (default) as "low-income" (K. Eagan, personal communication, 2019). Second, survey response options have shifted over time on TFS versions and ranges provided do not fall squarely above or below federal poverty lines making classification of responses imprecise. Third, federal poverty guidelines are higher in Alaska (where one of the BUILD sites is located) and Hawaii, with family-of-four levels (2019) ranging from $25,750 in 48 states, to $29,620 in Hawaii, to $32,190 in Alaska. The TFS response options $25,000-$29,000 and $30,000-$59,999 would prove difficult to classify each student into 130% and 185% FPL across sites. Fourth, given family income is only asked on the TFS and the item is restricted to *last year*, we would be missing the bigger picture of childhood/adolescence (K-12 school lunch program) and early childhood (WIC eligibility includes pregnant women, infants, and children up to age five (FNS, 2019) SES. Fifth, we would be dealing with missing data for the study participants that entered the sample after their freshman year. The final challenge in utilizing past family income to identify FRPL or WIC eligibility is the limitation inherent in student-report of parental income. Students tend to have difficulty providing accurate estimates of family income since they are often not aware of their parents and other family members' incomes (Betts, 1996; Soria, Weiner, & Lu, 2014). It should also be noted that NIH guidelines specify *the receipt of support from WIC as parent or child* and not just family eligibility for WIC, further complicating use of income as a determinant of disadvantaged background. Given the challenges in identifying FRPL and WIC eligibility/receipt through family income data, the CEC will not create either flag variable at this time.

High school zip code, which was collected during some survey waves and may be available from institutional student records, could be used as a proxy for residential zip code with an unknown level of error. Given the risk of inaccurate assignment of students and the extensive resources needed for coding, the CEC will not create a flag variable based on zip code data at this time.

Defining Additional Demographic Flag Variables in the Enhance Diversity Study

In addition to the primary WRG and URG designations described above, the CEC will provide flag variables for potentially important demographic variables that may be included in primary and/or secondary analyses involving Enhance Diversity Study data, at both the national and local levels: woman, sexual minority status, and gender minority status. Table 7 lists the demographic flag variable names and indicates survey responses that will be assigned 0/1 values (with corresponding labels) across Enhance Diversity Study surveys.

Table 7. Additional Demographic Flag Variables across the Enhance Diversity Study Student Surveys, 2019

Demographic Variable	Value=0	Value=1
WOMAN	**"Man"** **TFS and CSS:** Man/Trans Man **SAFS and NRMN Mentee:** Man, Trans Man	**"Woman"** **TFS and CSS:** Woman/Trans Woman **SAFS and NRMN Mentee:** Woman, Trans Woman
SEXUAL_MINORITY	**"Sexual Majority"** **TFS and CSS:** Heterosexual/Straight	**"Sexual Minority"** **TFS and CSS:** Gay, Lesbian, Bisexual, Queer, Pansexual, Asexual, Not listed above
GENDER_MINORITY	**"Gender Majority"** **TFS and CSS:** "No," identify as transgender <u>AND</u> **TFS CSS:** Man/Trans Man, Woman/Trans Woman **SAFS and NRMN Mentee:** Man, Woman	**"Gender Minority"** **TFS:** "Yes," identify as transgender **TFS:** Gender queer/Gender non-conforming, Identity not listed above **CSS:** Gender queer/Gender non-conforming, Different identity w/ free response **SAFS and NRMN Mentee:** Gender queer/Gender non-conforming, Different identity

Note. TFS=The Freshman Survey (HERI), CSS=College Senior Survey (HERI), SAFS=Student Annual Follow-up Survey
Note. For individuals who are designated as either a sexual or gender minority, or both, a flag variable (SG_MINORITY) will be created.

Demographic Flag Variable for Woman

Women, as a binary gender category, have received the majority of biomedical undergraduate degrees for some time (Valantine, Lund and Gammie, Life Sciences Education, 2015). At the same time, the Notice of NIH's Interest in Diversity notes that women from underrepresented racial/ethnic groups, women with disabilities, and women from disadvantaged backgrounds "face particular challenges at the graduate level and beyond in scientific fields" (NOT-OD-20-031, 2019). Further, NIH "encourages institutions to consider women for faculty-level, diversity-targeted programs to address faculty recruitment, appointment, retention or advancement" (NOT-OD-20-031, 2019). Given the career progression focus of the DPC and considering gender will be an important variable in many primary and secondary analyses using Enhance Diversity Study data, a flag variable for women will be created.

Research shows women from underrepresented minority (URM) backgrounds are less likely than men and women from well-represented backgrounds, and less likely than men from URM backgrounds, to report employment interest in research universities after completing their doctoral training (Gibbs, McGready, Bennett, & Griffin 2014). Based on a sample of 1,500 recent biomedical science Ph.D. graduates, women from URM backgrounds are most likely to report higher interest in non-research careers, relative to men and women from well-represented backgrounds and men from URM backgrounds (Gibbs et al., 2014). Moreover, rates of faculty representation for women in Science, Technology, Engineering, and Math (STEM) is low in the U.S. (Li & Koedel, 2017). Based on a sample of faculty from 40 selective public universities ranked highly by the 2016 U.S. News & World Report, across universities, women comprised 18% to 31% of faculty in STEM fields, compared to 47% to 53% of faculty in non-STEM fields (Li & Koedel, 2017). These disparate career trends by gender highlight the importance of examining gender in the Enhance Diversity Study.

All four of the 2019 Enhance Diversity Study student surveys capture gender identity: TFS, CSS, SAFS (for first-time survey responders), and NRMN Mentee. Responses including "Woman" and "Trans Woman" are coded as woman. Respondents indicating "Gender queer/Gender non-conforming" or "different identity" for gender identity are considered "unknown" and no value for URG_FGCS is assigned. Please see the appendix for the coding of each response option and notes about how these items might have shifted over time.

Demographic Flag Variables for Sexual Minority and Gender Minority

In August of 2019, the Sexual and Gender Minority Research Office (SGMRO) issued a notice regarding Sexual and Gender Minority (SGM) Populations in NIH-Supported Research. The notice states: "SGM populations include, but are not limited to, individuals who identify as lesbian, gay, bisexual, asexual, transgender, two-spirit, queer, and/or intersex. Individuals with same-sex or -gender attractions or behaviors and those with a difference in sex development are also included. These populations also encompass those who do not self-identify with one of these terms but whose sexual orientation,

gender identity or expression, or reproductive development is characterized by non-binary constructs of sexual orientation, gender, and/or sex" (NOT-OD-19-139).

SGM individuals face unique health challenges. As such, the National Institute on Minority Health and Health Disparities (NIMHD) and the Agency for Healthcare Research and Quality (AHRQ) designated SGM populations as a health disparity population (Sexual and Gender Minority Research Office, 2019). There is currently inadequate research on SGM representation in biomedical research to determine if they are underrepresented or not. Provision of an analysis flag in the Enhance Diversity study facilitates research on SGM students in biomedical research.

Two of the 2019 Enhance Diversity Study student surveys capture sexual orientation: TFS and CSS. Responses of "gay, lesbian, bisexual, queer, pansexual, asexual, and not listed above," are coded positively for sexual minority status. Please see the appendix for the coding of each response option and notes about how these items might have shifted over time.

All four of the 2019 Enhance Diversity Study student surveys capture gender minority status: TFS, CSS, SAFS (for first-time survey responders), and NRMN Mentee. Responses including "Different identity" and "Gender queer/Gender non-conforming" are coded as sexual minority. Please see the appendix for the coding of each response option and notes about how these items might have shifted over time.

Composite Flag Variables for URG_MEMBER and SG_MINORITY

In addition to the primary flag variables described above, composite flag variables will be created for individuals belonging to an underrepresented group and/or individuals from sexual and gender minority (SGM) populations. The URG_MEMBER flag variable captures underrepresented group membership in any form, at any point in time. URG_MEMBER is computed based upon classification in one or more of the primary URG sub-constructs: race/ethnicity, disability, and disadvantaged background (two or more: homeless, foster youth, FGCS, and Pell recipient). If at any point in time during the Enhance Diversity Study an individual's responses are coded positively for any primary URG designation, a value "Yes, URG" will be assigned to the URG_MEMBER flag variable.

For individuals who are designated as either a sexual or gender minority, or both, a flag variable (SG_MINORITY) will be created. SG_MINORITY is a composite variable, computed based upon classification in GENDER_MINORITY and SEXUAL_MINORITY variables. If at any point in time during the Enhance Diversity Study an individual's responses are coded positively for sexual or gender minority, a value "Yes, SGM" will be assigned to the SG_MINORITY flag variable.

Considerations for Future Studies

This technical report details recommendations for WRG and URG designations consistent with populations NIH has identified as underrepresented in the US biomedical research enterprise to guide primary DPC analyses. Those involved in future research and evaluation efforts should consider explicitly using survey items that capture demographic characteristics useful in categorizing individuals into URG or WRG categories, namely: race and ethnicity, gender, physical and mental disability, and disadvantaged background experiences (homeless, foster care, parent/guardian education level, zip code (rural area or low-income and health professional shortage area), receipt of Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and eligibility for Federal Free and Reduced Lunch and/or Federal Pell grants). Particular attention should be paid to the use of qualifying phrases in formatting of survey items to ensure that data has been collected in a way that accurately operationalizes URG categories (e.g. "*were or currently are* homeless," "eligible for Federal Free and Reduced Price Lunch *for two years or more,*" "*grew up* in a U.S. rural area," "a disability that *substantially limits one or more major life activities*"). Researchers and evaluators are encouraged to describe and operationalize definitions of WRG and URG used in all DPC-affiliated publications. It is our hope that this technical report helps promote consistent definitions of the URG categories in DPC publications, while also allowing for more nuanced analyses of evaluation findings.

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Appendix - Enhance Diversity Study Student Survey Items with Coded Response Options (2015-2020)

For all flag variables described, coding for Under-Represented Group (URG) and Well-Represented Group (WRG) unless otherwise noted.

0 = WRG
1 = URG
Missing value = Unable to determine

1. **URG_RACEETHNICITY**
   Coding for URG or WRG is indicated next to each item. In the survey, each response is coded as 0, 1, or missing value.

   HERI Survey Item(s)
   TFS: (2019 #12; 2018 #11; 2017 #11; 2016 #10; 2015 #38*)
   YFCY: (2016 #2)
   Interim: (2016 #2)
   CSS: (2019 #3; 2018 #3; 2017 #2)
   Are you: (Mark all that apply)

   White/Caucasian **= 0**
   African American/Black **= 1**
   American Indian/Alaskan Native **= 1**
   East Asian (e.g. Chinese, Japanese, Korean, Taiwanese) **= 0**
   Filipina/o/x **= 0**
   Southeast Asian (e.g. Cambodian, Vietnamese, Hmong) **= 0**
   South Asian (e.g., Indian, Pakistani, Nepalese, Sri Lanka) **= 0**
   Other Asian **= 0**
   Native Hawaiian/Pacific Islander **= 1**
   Mexican American/Chicana/o/x **= 1**
   Puerto Rican **= 1**
   South American **= 1**
   Other Latina/o/x **= 1**
   Other **= missing value**
   *Filipina/o/x is classified as Southeast Asian in 2015 surveys

   CEC Survey Items Since 2019
   For each endorsed item below, additional follow-up items are provided for detail.
   SAFS: (2019 #44, 2020 #41) (for first-time survey respondents)

NRMN Mentee: (2019 #58)

Are you: (Mark all that apply)

White – For example, German, Irish, English, Italian, Polish, French, etc. **= 0**

Hispanic, Latino/a, or Spanish Origin – For example, Mexican or Mexican American, Puerto Rican, Dominican, Salvadoran, Peruvian, Mestizo, Chicano, etc. **= 1**

Black or African American – For example, Jamaican, Haitian, Nigerian, Ethiopian, Somali, Creole, Caribbean, etc. **= 1**

American Indian or Alaskan Native – For example, Navajo Nation, Blackfeet Tribe, Mayan, Aztec, Quechua, Native Village of Barrow Inupiat Traditional Government, Nome Eskimo Community, etc. **= 1**

Asian – For example, Chinese, Filipino, Asian Indian, Vietnamese, Korean, Japanese, etc. **= 0**

Native Hawaiian or Other Pacific Islander – For example, Native Hawaiian, Samoan, Guamanian or Chamorro, Tongan, Fijian, Marshallese, etc. **= 1**

Middle Eastern or North African – For example, Lebanese, Iranian, Egyptian, Syrian, Moroccan, Algerian, Armenian, etc. **= 0**

Some other race, ethnicity, or origin (Specify: _____) **= inspect for further classification; missing value if left blank and no other answers provided**

CEC Survey Items Prior to 2019

Select all boxes that apply and/or enter details in the space below.

SAFS: (2018 #71; 2017 #49) (for first-time survey respondents)

Are you Hispanic, Latino/a, or Spanish Origin?

No (Response option = 1 on survey) **= 0**

Yes (Response option = 2 on survey) **= 1**

Choose not to answer (Response option = 3 on survey) **= missing value**

SAFS: (2018 #72(*); 2017 #50) (for first-time survey respondents)

What is your race? Check all that apply

White **= 0**

Black or African American **= 1**

American Indian or Alaskan Native **= 1**

Asian Indian **= 0**

Chinese **= 0**

Filipino **= 0**

Japanese **= 0**

Vietnamese **= 0**

Other Asian = **0**
Native Hawaiian = **1**
Guamanian or Chamorro = **1**
Samoan = **1**
Other Pacific Islander = **1**
*Other (Specify) **= inspect for further classification; missing value if left
blank**

Note. Table 4 lists in detail survey response options for Enhance Diversity Study student surveys (2019) that should load to each of the racial/ethnic subgroup reference file flags: WRG_WHITE; WRG_ASIAN; WRG_MENA; URG_BLACK; URG_LATINX; URG_AIAN; and URM_NHPI.

2. URG_DISABILITY

Note. Survey items addressing disability status are not included on the CSS surveys.

TFS: (2019 #49; 2018 #47)
Interim: (2016 #40)

Do you have any of the following disabilities or medical conditions? (Mark Yes or No for each item)
 Learning disability (dyslexia, etc.)
 Attention deficit hyperactivity disorder (ADHD)
 Autism spectrum disorder
 Physical disability (speech, sight, mobility, hearing, etc.)
 Chronic illness (cancer, diabetes, autoimmune disorders, etc.)
 Psychological disorder (depression, etc.)
 Other

WRG: No (response option = 1 on survey) for ALL items = 0
URG: Yes (response option = 2 on survey) for at least ONE item = 1

SAFS: (2020 #39; 2019 #41)
Are any of the following statements true for you?
- · I am deaf or have serious difficulty hearing
- · I am blind or have serious difficulty seeing, even when wearing glasses
- · I have serious difficulty concentrating, remembering, or making decisions
  because of a physical, mental, or emotional condition

- · I have serious difficulty walking or climbing stairs
- · I have difficulty dressing or bathing
- · I have difficulty doing errands alone such as visiting a doctor's office or shopping because of a physical, mental, or emotional condition

No, none of these statements are true for me (response option = 1 on survey) **= 0**

Yes, at least one of these statements is true for me (response option = 2 on survey) **= 1**

I choose not to answer (response option = 3 on survey) **= missing value**

SAFS: (2020 #40; 2019 #42)

Have you registered with your school's Office of Disability/Student Accessibility?

No (response option = 1 on survey) **= missing value**

Yes (response option = 2 on survey) **= 1**

I choose not to answer (response option = 3 on survey) **= missing value**

SAFS (2018 #70; 2017 #48)
NRMN Mentee: (2016 #37; 2018 #53)

Please indicate Yes or No for each of the following:

Are you deaf or do you have serious difficulty hearing?

Are you blind or do you have serious difficulty seeing, even when wearing glasses?

Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?

Do you have serious difficulty walking or climbing stairs?

Do you have difficulty dressing or bathing?

Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor's office or shopping?

WRG: No (response option = 1 on survey) for ALL items = 0
URG: Yes (response option = 2 on survey) for at least ONE item = 1

3. URG_HOMELESS

Assessment of homelessness is limited to TFS beginning in 2018.

TFS: (2018 #28; 2019 #30)

In your lifetime, have you been homeless for at least one month?

No (response option = 1 on survey) **= 0**
Ye (response option = 2 on survey) **= 1**

4. URG_FOSTER

Note. Survey items addressing foster youth status are included in the following surveys: TFS 2016-2018 and SAFS 2019 and 2020.

TFS: (2018 #20; 2017 #21; 2016 #22)
SAFS: (2020 #10; 2019 #11 for first-time survey responders only)
At any time since you were 13, were you in foster care or were you a dependent of the court?
No (response option = 1 on survey) **= 0**
Yes (response option = 2 on survey) **= 1**
I do not know or I choose not to answer **= missing value**

5. URG_PELL

Note. Survey items addressing Pell Grant receipt are included only on TFS and SAFS since 2019 (for first-time survey respondents).

TFS: (2019 #26; 2018 #26)
Did you receive any of the following forms of financial aid? (Mark Yes (response option = 2 on survey) or No (response option = 1 on survey) for each item)
Military grants
Work-study
Pell Grant **(No = 0; Yes = 1)**
Need-based grants or scholarships
Merit-based grants or scholarships

SAFS: (2020 #13; 2019 #14)
Have you received any Pell grant funding for financial aid?
No (response option = 1 on survey) **= 0**
Yes (response option = 2 on survey) **= 1**
I choose not to answer (response option = 3 on survey) **= missing value**

6. **URG_FGCS** (primary construct - neither parent or guardian graduated with a bachelor's degree)

   Note. Survey items addressing educational attainment of parents/guardians are not included on the CSS, NRMN Mentee, or YFCY surveys.

   TFS: (2019 #36; 2018 #34; 2017 #35; 2016 #36)
   SAFS: (2020 #12; 2019 #13; 2018 #16) (for first-time survey respondents)
   Interim: (2016 #18*)
   What is the highest level of formal education obtained by your parents/guardians?
   Parent /Guardian 1
   Parent/Guardian 2
   > Junior high/Middle school or less (response option = 1 on survey)
   > Some high school (response option = 2 on survey)
   > High school graduate (response option = 3 on survey)
   > Postsecondary school other than college (response option = 4 on survey)
   > Some college (response option = 5 on survey)
   > College degree (response option = 6 on survey)
   > Some graduate school (response option = 7 on survey)
   > Graduate degree (response option = 8 on survey)
   > I choose not to answer (response option = 9 on survey)

   *No "I choose not to answer" option in Interim 2016

   WRG: Yes, EITHER parent/guardian has obtained a College degree, Some graduate school, Graduate degree = 0
   URG: No, NEITHER parent/guardian has obtained a College degree, Some graduate school, Graduate degree = 1 = First Generation College Student (FGCS (graduation))

7. **URG_FGCSATTEND** (secondary construct - neither parent or guardian entered/attended college)

   Note. Survey items addressing educational attainment of parents/guardians are not included on the CSS, NRMN Mentee, or YFCY surveys.

   TFS: (2019 #36; 2018 #34; 2017 #35; 2016 #36)
   SAFS: (2020 #12; 2019 #13; 2018 #16; 2020 #12) (for first-time survey respondents)
   Interim: (2016 #18*)

What is the highest level of formal education obtained by your parents/guardians?
Parent /Guardian 1
Parent/Guardian 2

        Junior high/Middle school or less (response option = 1 on survey)
        Some high school (response option = 2 on survey)
        High school graduate (response option = 3 on survey)
        Postsecondary school other than college (response option = 4 on survey)
        Some college (response option = 5 on survey)
        College degree (response option = 6 on survey)
        Some graduate school (response option = 7 on survey)
        Graduate degree (response option = 8 on survey)
        I choose not to answer (response option = 9 on survey)

*No "I choose not to answer" option in Interim 2016

WRG: Yes, EITHER parent/guardian has obtained Some college, College degree, Some graduate school, Graduate degree = 0
URG: No, NEITHER parent/guardian has obtained Some college, College degree, Some graduate school, Graduate degree = 1 = First Generation College Student (FGCS_ATTEND (attendance))

8. URG_MEMBER*

URG_Member is a composite variable, computed based upon classification in primary URG sub-constructs: URG_RaceEthnicity, URG_Disability, and disadvantaged background (two or more: URG_Homeless, URG_Foster, URG_Pell, and URG_FGCS) (1-7, above).

WRG: IF NO to ALL of the primary URG designations at ALL times = 0
URG: IF YES to ANY of the primary URG designations at ANY point in time = 1
(URG_RaceEthnicity + URG_Disability is equal to or greater than 1 = 1, or, URG_Homeless + URG_Foster + URG_Pell + URG_FGCS is equal to or greater than 2 = 1)

9. WOMAN

Gender = 0 = Man
Gender = 1 = Woman

TFS: (2019 #2)
What is your current gender identity?

Man/Trans Man (response option = 1 on survey) **= 0**

Woman/Trans Woman (response option = 2 on survey) **= 1**

Gender queer/Gender non-conforming (response option = 3 on survey) **= missing value**

Identity not listed above (response option = 4 on survey) **= missing value**

TFS: (2018 #1)

What is your current gender identity?

Man (response option = 1 on survey) **= 0**

Woman (response option = 2 on survey) **= 1**

Trans Man (response option = 3 on survey) **= 0**

Trans Woman (response option = 4 on survey) **= 1**

Gender queer/Gender non-conforming (response option = 5 on survey) **= missing value**

Different identity (response option = 6 on survey) **= missing value**

TFS: (2017 #1; 2016 #1; 2015 #1)
CSS: (2017 #1)
YFCY: (2016 #1)
Interim: (2016 #1)

Your sex

Male (response option = 1 on survey) **= 0**

Female (response option = 2 on survey) **= 1**

CSS: (2020 #5)

What is your current gender identity?

Man/Trans Man (response option = 1 on survey) **= 0**

Woman/Trans Woman (response option = 2 on survey) **= 1**

Non-binary (response option = 3 on survey) **= missing value**

Gender queer/Gender non-conforming (response option = 4 on survey) **= missing value**

Identity not listed above (please state): [Free response] (response option = 5 on survey) **= inspect for further classification; missing value if left blank**

CSS: (2019 #2)

What is your current gender identity?

Man/Trans Man (response option = 1 on survey) **= 0**

Woman/Trans Woman (response option = 2 on survey) **= 1**

Gender queer/Gender non-conforming (response option = 3 on survey) **= missing value**

Different identity (please state): [Free response] (response option = 4 on survey) **= inspect for further classification; missing value if left blank**

CSS: (2018 #1)
What is your current gender identity?
Man (response option = 1 on survey) **= 0**
Woman (response option = 2 on survey) **= 1**
Trans Man (response option = 3 on survey) **= 0**
Trans Woman (response option = 4 on survey) **= 1**
Gender queer/Gender non-conforming (response option = 5 on survey) **= missing value**
Not listed above (response option = 6 on survey) **= missing value**

SAFS: (2020 #43) (for first-time survey respondents)
What is your current gender identity?
Man (response option = 1 on survey) **= 0**
Trans Man (response option = 2 on survey) **= 0**
Woman (response option = 3 on survey) **= 1**
Trans Woman (response option = 4 on survey) **= 1**
Gender queer/Gender non-conforming (response option = 5 on survey) **= missing value**
Different identity (response option = 6 on survey) **= missing value**
I choose not to answer (response option = 7 on survey) **= missing value**

SAFS: (2019 #45; 2018 #73) (for first-time survey respondents)
NRMN Mentee: (2019 #59)
What is your current gender identity?
Man (response option = 1 on survey) **= 0**
Woman (response option = 2 on survey) **= 1**
Trans Man (response option = 3 on survey) **= 0**
Trans Woman (response option = 4 on survey) **= 1**
Gender queer/Gender non-conforming (response option = 5 on survey) **= missing value**
Different identity (response option = 6 on survey) **= missing value**
I choose not to answer (response option = 7 on survey) **= missing value**

10.SEXUAL_MINORITY

Note. Survey items addressing sexual orientation have not appeared on the SAFS, NRMN Mentee, or Interim surveys.

Sexual Majority (No, not a Sexual Minority) = 0
Yes, a Sexual Minority = 1

TFS: (2019 #3; 2018 #2)
CSS: (2019 #8; 2018 #7)
What is your sexual orientation?
       Heterosexual/Straight (response option = 1 on survey) **= 0**
       Gay (response option = 2 on survey) **= 1**
       Lesbian (response option = 3 on survey) **= 1**
       Bisexual (response option = 4 on survey) **= 1**
       Queer (response option = 5 on survey) **= 1**
       Pansexual (response option = 6 on survey) **= 1**
       Asexual (response option = 7 on survey) **= 1**
       Not listed above (response option = 8 on survey) **= 1**

TFS: (2017 #46; 2016 #47; 2015 #48)
CSS: (2017 #8)
What is your sexual orientation?
       Heterosexual/Straight (response option = 1 on survey) **= 0**
       Gay (response option = 2 on survey) **= 1**
       Lesbian (response option = 3 on survey) **= 1**
       Bisexual (response option = 4 on survey) **= 1**
       Queer (response option = 5 on survey) **= 1**
       Other (response option = 6 on survey) **= 1**

CSS: (2020 #8)
What is your sexual orientation?
       Heterosexual/Straight (response option = 1 on survey) **= 0**
       Asexual (response option = 2 on survey) = **1**
       Bisexual (response option = 3 on survey) **= 1**
       Gay (response option = 4 on survey) **= 1**
       Lesbian (response option = 5 on survey) **= 1**
       Pansexual (response option = 6 on survey) **= 1**
       Queer (response option = 7 on survey) **= 1**
       Not listed above (response option = 8 on survey) **= 1**

11. GENDER_MINORITY

Note. Survey items addressing gender identity only appeared on the NRMN Mentee survey in 2019.

Gender Majority (No, not a Gender Minority) = 0
Yes, a Gender Minority = 1

TFS: (2019 #1; 2017 #2)
YFCY: (2016 #4)
CSS: (2020 #4; 2019 #1; 2017 #2)
Do you identify as transgender?

    Yes (response option = 2 on survey) **= 1**

    No (response option = 1 on survey) **= see gender identity item on survey**

TFS: (2019 #2)
What is your current gender identity?

    Man/Trans Man (response option = 1 on survey) **= 0 (ONLY if answer to #1 on same survey = "No")**

    Woman/Trans Woman(response option = 2 on survey) **= 0 (ONLY if answer to #1 on same survey = "No")**

    Gender queer/Gender non-conforming (response option =3 on survey) **= 1**

    Identity not listed above (response option = 4 on survey) **= 1**

TFS: (2018 #1)
What is your current gender identity?

    Man (response option = 1 on survey) **= 0**

    Woman (response option = 2 on survey) **= 0**

    Trans Man (response option = 3 on survey) **= 1**

    Trans Woman (response option = 4 on survey) **= 1**

    Gender queer/Gender non-conforming (response option =5 on survey) **= 1**

    Different identity (response option = 6 on survey) **= inspect for further classification; most likely = 1**

YFCY: (2016 #5)
What is your current gender identity?

    Man/Trans Man (response option = 1 on survey) **= 0 (ONLY if answer to #1 on same survey = "No")**

    Woman/Trans Woman (response option = 2 on survey) **= 0 (ONLY if answer to #1 on same survey = "No")**

    Non-binary (response option = 3 on survey) **= 1**

    Gender queer/Gender non-conforming (response option =4 on survey) **= 1**

    Identity not listed above (please state): [Free response] (response option = 5 on survey) **= inspect for further classification; most likely = 1**

CSS: (2019 #2)
What is your current gender identity?

      Man/Trans Man **= missing value**

      Woman/Trans Woman **= missing value**

      Gender queer/Gender non-conforming **= 1**

      Different identity (please state): [Free response] **= inspect for further classification; most likely = 1**

CSS: (2018 #1)
What is your current gender identity?

      Man (response option = 1 on survey) **= 0**

      Woman (response option = 2 on survey) **= 0**

      Trans Man (response option = 3 on survey) **= 1**

      Trans Woman (response option = 4 on survey) **= 1**

      Gender queer/Gender non-conforming (response option =5 on survey) **= 1**

      Not listed above (response option = 6 on survey) **= 1**

SAFS: (2019 #45; 2018 #73) (for first-time survey respondents)
NRMN Mentee: (2019 #59)
What is your current gender identity? (SAFS 2019 #45)

      Man (response option = 1 on survey) **= 0**

      Woman (response option = 2 on survey) **= 0**

      Trans Man (response option = 3 on survey) **= 1**

      Trans Woman (response option = 4 on survey) **= 1**

      Gender queer/Gender non-conforming (response option =5 on survey) **= 1**

      Different identity (response option = 6 on survey) **= 1**

      I choose not to answer (response option = 7 on survey) **= missing value**

12. SG_MINORITY*

SG_Minority is a composite variable, computed based upon classification in Gender_Minority and Sexual_Minority (10-11, above).

No, SGM: NO to BOTH Sexual_Minority and Gender_Minority at ALL times = 0
Yes, SGM: IF YES to EITHER Sexual_Minority or Gender_Minority at ANY point in time (Sexual_Minority + Gender_Minority is equal to or greater than 1) = 1

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