Social Determinants of Health (SDOH)

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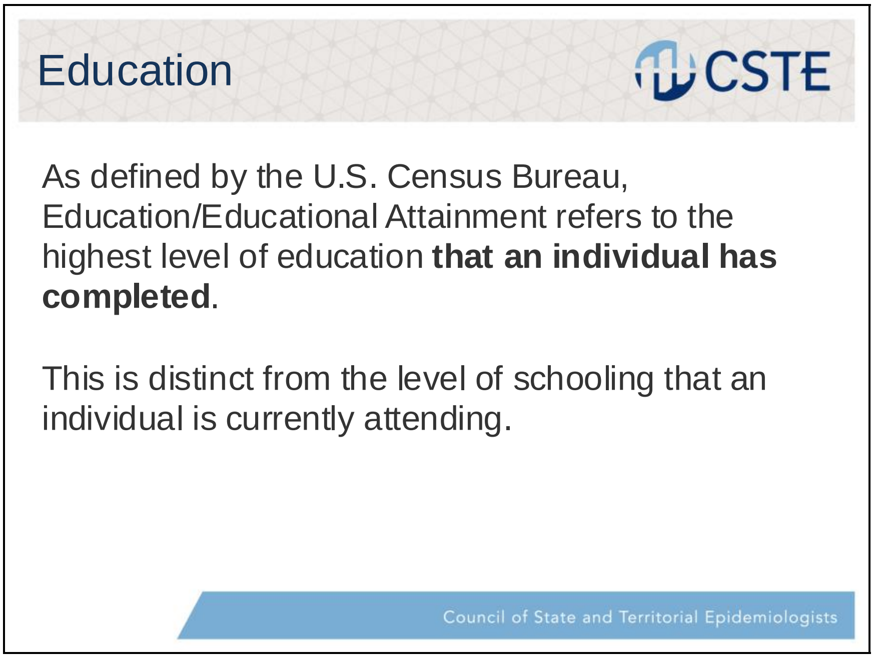
So far, CSTE's Data Standardization Workgroup has focused on a data element of Residence Type in our first two calls on Social Determinants of Health. The next data elements that will be covered in November include preferred language, education, insurance, and potentially income. Background information for preferred language was covered in a previous recording, and this recording will cover education, insurance, and income.

Background

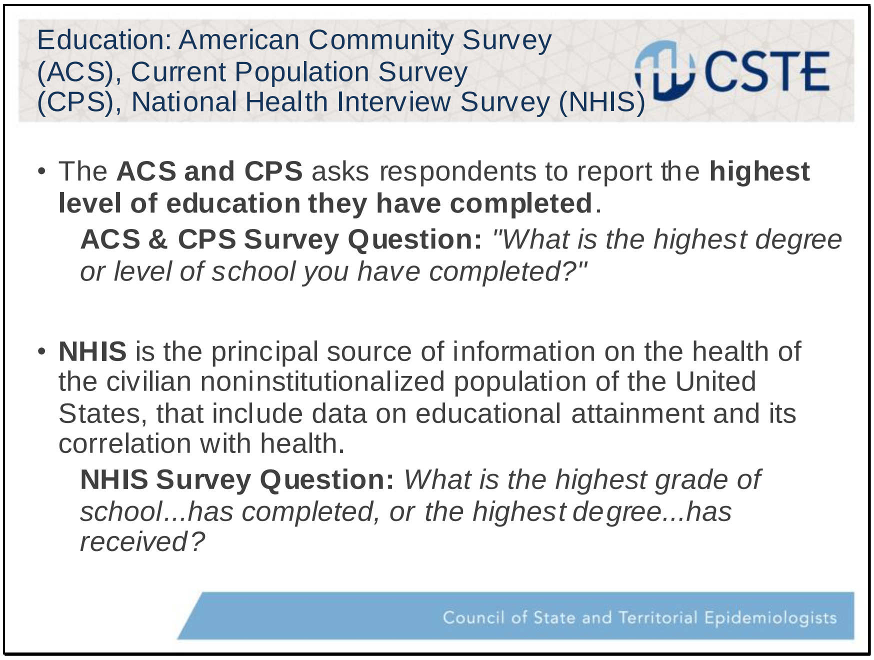


As defined by the U.S. Census Bureau, Education/Educational Attainment refers to the highest level of education that an individual has completed. This is distinct from the level of schooling that an individual is attending.

Educational attainment is important to public health as it has been shown to correlate strongly with health outcomes, access to healthcare, and health literacy. Collecting data on education allows public health professionals to analyze patterns in health behavior, access to preventive care, and susceptibility to certain health conditions across educational levels. Additionally, educational attainment is frequently used in health disparities research to understand and address inequities in health access and outcomes.

References:

About Educational Attainment (census.gov)
National Health Interview Survey (NHIS) (census.gov)
Common Education Data Standards -



The U.S. Census Bureau American Community Survey (ACS) and Current Population Survey (CPS) collect information on educational attainment by asking respondents to specify their highest level of completed education. These data are reported annually. The valid responses range from no formal education to advanced degrees such as doctorates. These data are used to understand trends in education and workforce preparedness across different regions and populations in the U.S.

> *(Data on School Enrollment characteristics are also available for the U.S., states, counties, selected metropolitan and micropolitan statistical areas, and selected zip codes from 2000 to present. There are over a thousand detailed tables in data.census.gov, of which over 20 are school enrollment tables.)*

The National Health Interview Survey (NHIS) is a national survey conducted by the U.S. Census Bureau on behalf of the CDC National Center for Health Statistics (NCHS). NHIS is the principal source of information on the health of the civilian, noninstitutionalized population of the US, including data on educational attainment and its correlation with health.

Reference:

About Educational Attainment (census.gov)
https://www2.census.gov/programs-surveys/acs/about/qbyqfact/EducationalAttainment_FieldofDegree.pdf
IPUMS CPS
NHIS - Data, Questionnaires and Related Documentation

Education: ACS, CPS, & NHIS Value Sets

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ACS & CPS	NHIS
No schooling completed	Never attended/kindergarten only
Nursery school	
Grades 1 through 11	Grade 1-11
12th grade—no diploma	12th grade, no diploma
Regular high school diploma	High School Graduate
GED or alternative credential	GED or equivalent
Some college credit, but less than 1 year of college	Some college, no degree
1 or more years of college credit, no degree	
Associates degree (for example: AA, AS)	Associate degree: occupational, technical, or vocational program
	Associate degree: academic program
Bachelor's degree (for example: BA. BS)	Bachelor's degree (Example: BA, AB, BS, BBA)
Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)	Master's degree (Example: MA, MS, MEng, MEd, MBA)
Professional degree beyond bachelor's degree (for example: MD, DDS, DVM, LLB, JD)	Professional School degree (Example: MD, DDS, DVM, JD)
Doctorate degree (for example, PhD, EdD)	Doctoral degree (Example: PhD, EdD)
	Refused
	Don't Know

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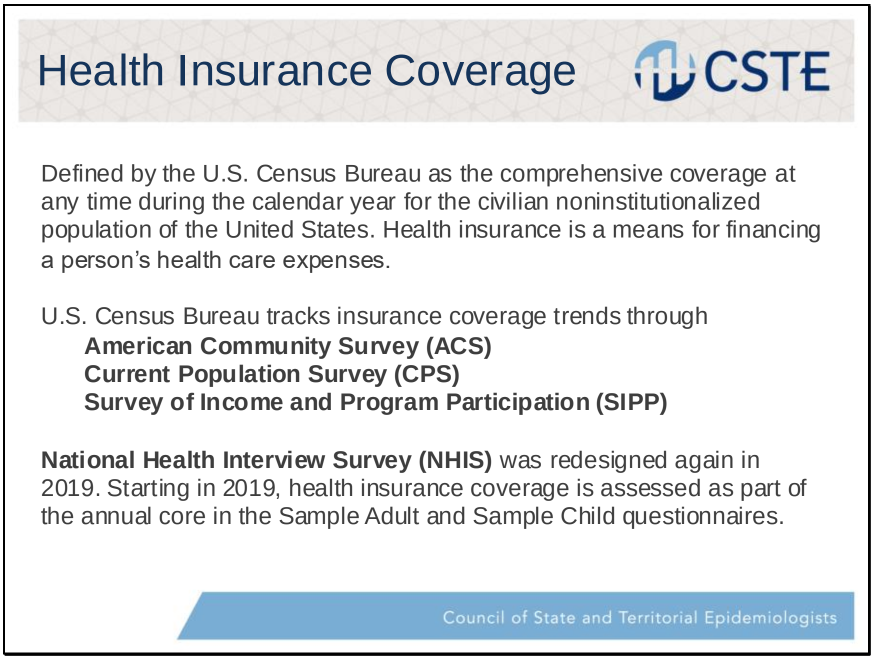
This slide shows a comparison of the response options for the ACS and CPS compared to NHIS. The response options are generally comparable, although the ACS and CPS contain a separate response for "nursery school", and have added granularity for those who have attended some college but did not receive a degree.



Different types of health insurance are often linked to various socio-economic factors, making insurance coverage a useful proxy for social determinants of health. Analyzing these connections can help reveal how insurance coverage interacts with factors like employment status, income, and geographic location, shedding light on health equity dynamics. The U.S. Census Bureau broadly defines health insurance coverage to include both public and private payers that finance medical expenditures for a specific population across diverse settings. It serves as a means for covering an individual's healthcare expenses.

The U.S. Census Bureau's surveys are critical resources for tracking population-level trends in health insurance coverage.

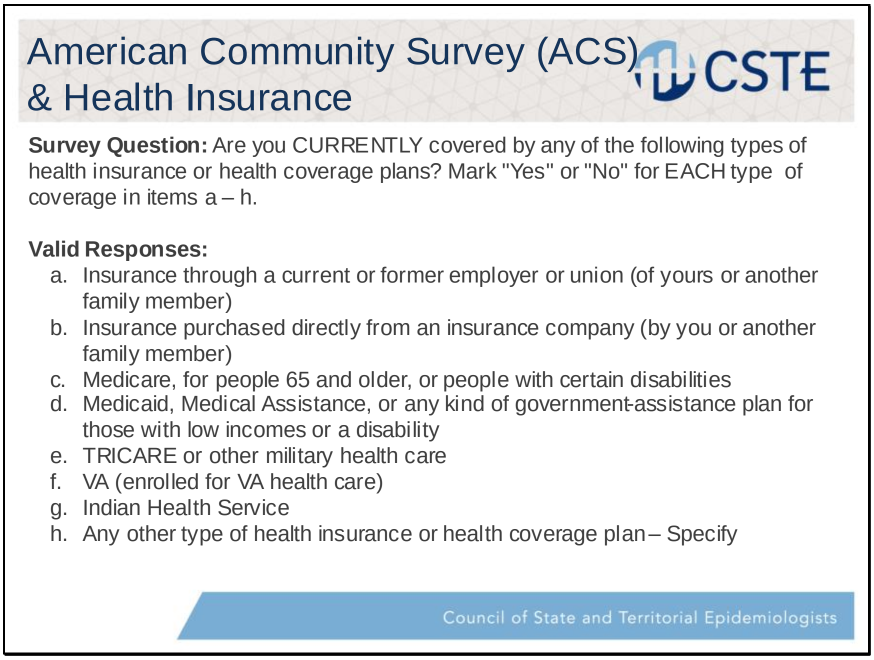
•Among these, the American Community Survey (ACS) provides ongoing, detailed annual data on social, economic, housing, and demographic characteristics in the U.S.

•The Current Population Survey (CPS), conducted by the Census Bureau and the Bureau of Labor Statistics (BLS), offers comprehensive estimates on labor force participation, income, poverty, and health insurance coverage.

•Additionally, the Survey of Income and Program Participation (SIPP) provides longitudinal data on income, employment, government program participation, and health insurance status over time.

In 2019, the National Health Interview Survey (NHIS), began including health insurance coverage as part of its annual core in the Sample Adult and Sample Child questionnaires. This addition further supports comprehensive tracking of insurance coverage across diverse population segments.

Reference:
Health Insurance
Health Insurance Coverage in the United States: 2023

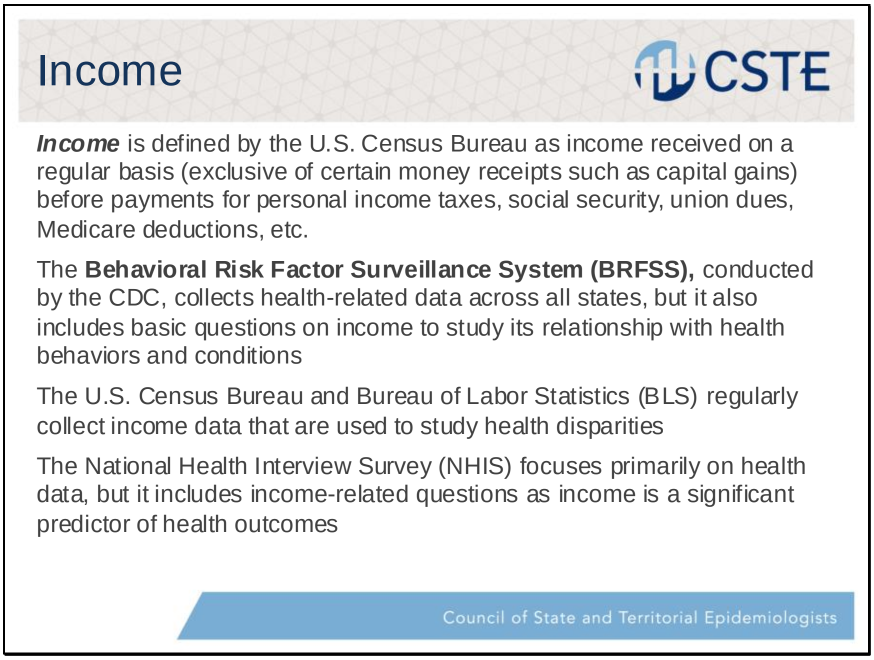


The ACS Health Insurance Survey Question is "Are you CURRENTLY covered by any of the following types of health insurance or health coverage plans? Mark "Yes" or "No" for EACH type of coverage"

The valid responses include categories of insurance that capture if someone is insured through their employment, privately, or through various federal insurance mechanisms like Medicare, Medicaid, Military, or IHS:

a. Insurance through a current or former employer or union (of yours or another family member)
b. Insurance purchased directly from an insurance company (by you or another family member)
c. Medicare, for people 65 and older, or people with certain disabilities
d. Medicaid, Medical Assistance, or any kind of government-assistance plan for those with low incomes or a disability
e. TRICARE or other military health care
f. VA (enrolled for VA health care)
g. Indian Health Service
h. Any other type of health insurance or health coverage plan – Specify

ACS-1(GQ)(INFO)(2022) English



Health data collection tools often include questions about household or individual income to explore its impact on health outcomes.

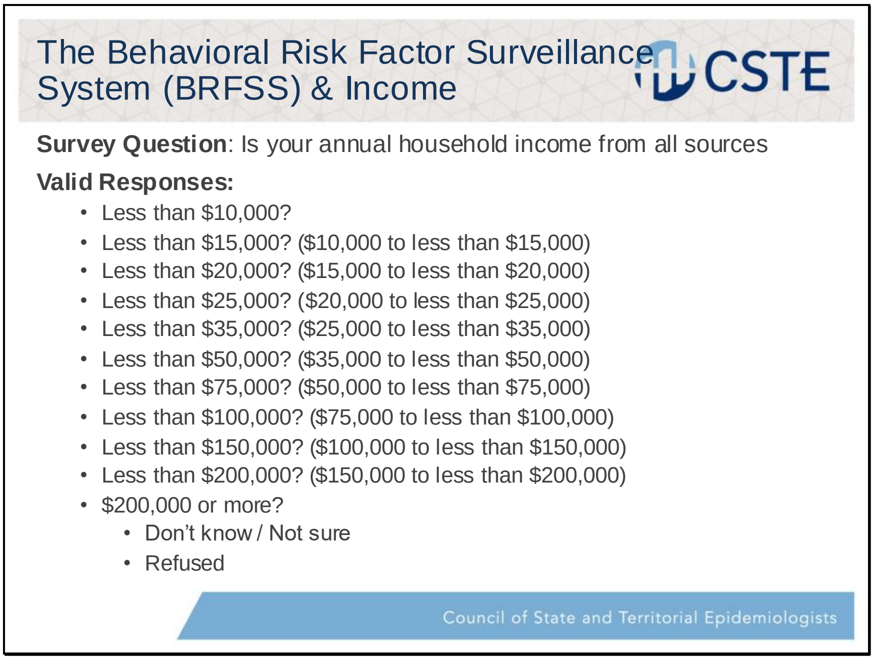
Income is defined by the U.S. Census Bureau as income received on a regular basis (exclusive of certain money receipts such as capital gains) before payments for personal income taxes, social security, union dues, Medicare deductions, etc.

Income can be divided into earned and unearned income, net and gross income, and disposable income. It can be measured at the individual or household level.

The Behavioral Risk Factor Surveillance System (BRFSS), conducted by the CDC, collects health-related data, but it also includes basic questions on income to study its relationship with health behaviors and conditions. Other agencies or surveys to collect data on income include the U.S. Census Bureau and Bureau of Labor Statistics (BLS) and the National Health Interview Survey (NHIS).

Reference:

About Income
CDC - BRFSS - BRFSS Frequently Asked Questions (FAQs)
Survey Description, National Health Interview Survey, 2019



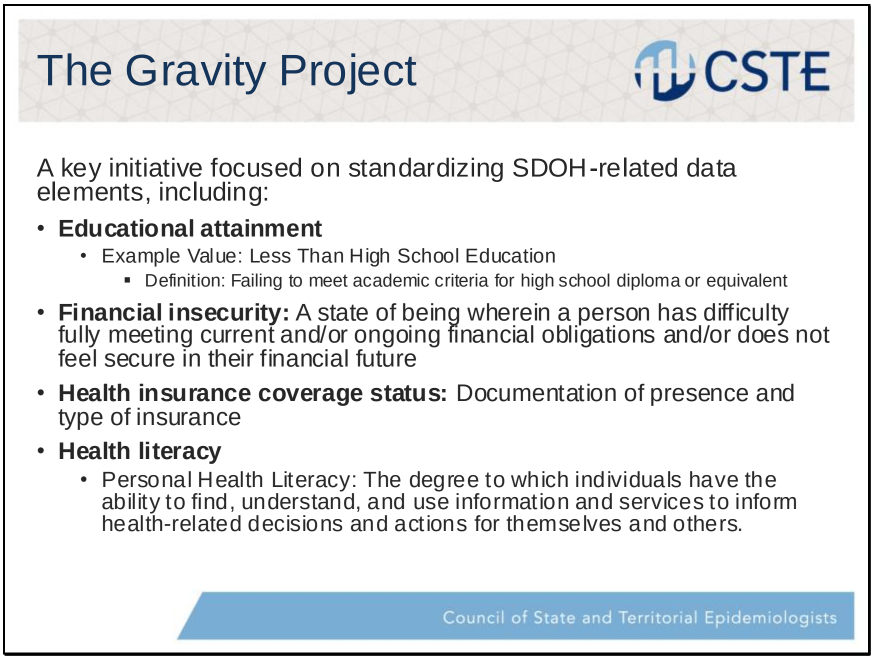
BRFSS collects data about U.S. residents regarding their health-related risk behaviors and events, chronic health conditions, and use of preventive services. It includes a question on income, which is "Is your annual household income from all sources..."

With a list of valid responses between <$10,000 to >$200,000:

- Less than $10,000?
- Less than $15,000? ($10,000 to less than $15,000)
- Less than $20,000? ($15,000 to less than $20,000)
- Less than $25,000 ($20,000 to less than $25,000)
- Less than $35,000 ($25,000 to less than $35,000)
- Less than $50,000 ($35,000 to less than $50,000)
- Less than $75,000? ($50,000 to less than $75,000)
- Less than $100,000? ($75,000 to less than $100,000)
- Less than $150,000? ($100,000 to less than $150,000)?
- Less than $200,000? ($150,000 to less than $200,000)
- $200,000 or more

- Do not read:
    - Don’t know / Not sure
    - Refused

Reference: [2023 BRFSS Questionnaire]



The Gravity Project is a multisector initiative dedicated to standardizing SDOH data. It designs data elements to be integrated with Electronic Health Records (EHRs) and with the goal of eventual incorporation into United States Core Data for Interoperability (USCDI). The Gravity Project's work is also closely aligned with CMS initiatives like the Accountable Health Communities Model and other value-based care models that consider SDOH.

Some data elements related to the topics we're covering today include:

- **Educational attainment**
  - Definition is still in progress but a definition for one of the valid responses is provided. Less Than High School Education is defined as failing to meet academic criteria for high school diploma or equivalent. A no longer maintained value set for level of education from Gravity, Bachelor's degree (e.g., BA, AB, BS), Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA), High school graduate, Never attended/kindergarten only, Some college, no degree and others.
- **Financial insecurity:** A state of being wherein a person has difficulty fully meeting current and/or ongoing financial obligations and/or does not feel

secure in their financial future

- **Health insurance coverage status:** Documentation of presence and type of insurance
- **Health literacy**
    - Personal Health Literacy: The degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others.

Apart from the data elements and their definitions included in the slide, the section on literacy includes 13 concepts on digital literacy, which are still a work in progress.

Digital Literacy Definitions (Work in progress)

- Inadequate digital literacy skills, Inadequate basic digital literacy skills, Inadequate digital literacy skills affecting health care, Inadequate digital literacy skills affecting employment opportunities, Inadequate digital literacy skills affecting education opportunities, Requires plain language intervention to support digital literacy, Requires translation service to support digital literacy, Requires language interpretation service to support digital literacy, Requires culturally responsive service to support digital literacy, Requires assistive technology to support digital literacy, Adequate digital literacy skills, Adequate basic digital literacy skills, and Digital Resilience.

U.S. Core Data for Interoperability (USCDI)

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- **Education Data Element** (Level 0: Not represented by a terminology standard)

  Definition: The knowledge and skills gained through education, the credentialing linked to the completion of various levels of schooling, and the quality of education.

  - *Vocabulary Standard(s): LOINC, SNOMED CT, ICD-10-CM, CPT*

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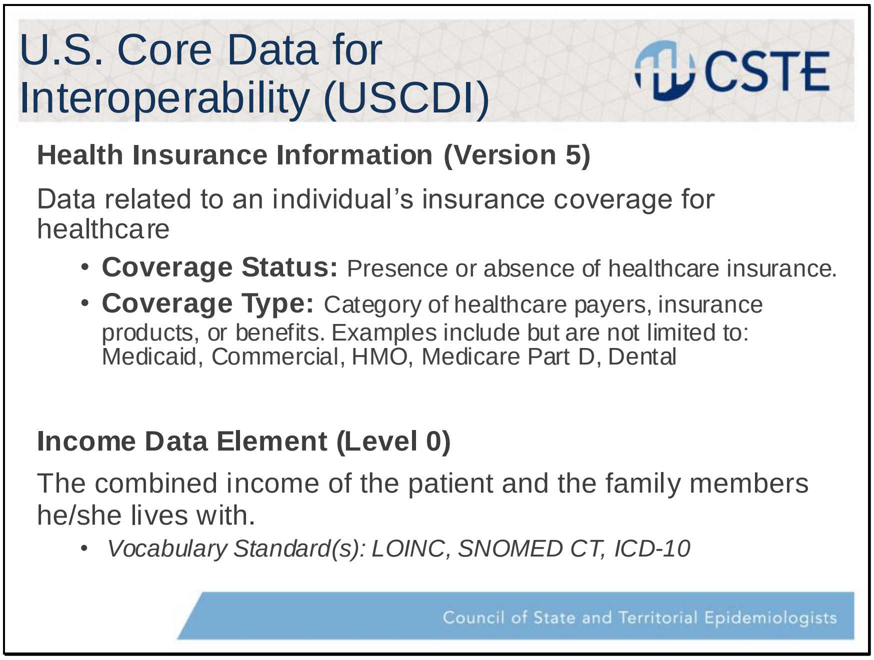
The Education Data Element is one of the preliminary SDOH data elements described by USCDI and has a maturity of Level 0, which means it is not in the current version of USCDI and is not yet represented by a terminology standard, requires more feedback, further refinement, or evidence of implementation. This education data element has been submitted by the Gravity Project with the goal of eventual incorporation into USCDI.

Reference: Education | Interoperability Standards Platform (ISP) (healthit.gov)



USCDI data elements related to insurance coverage that are currently in the published version 5 include:

Coverage Status (Insured Yes/No)
Presence or absence of healthcare insurance.
Coverage Type
Category of healthcare payers, insurance products, or benefits. Examples include but are not limited to Medicaid, commercial, HMO, Medicare Part D, and dental.

There are other data elements under the USCDI Health Insurance Information class that convey identifiers related to health insurance such as a group ID, payer ID, or relationship to subscriber:

Relationship to Subscriber
Relationship of a patient to the primary insured person.
Member Identifier
Sequence of characters used to uniquely refer to an individual with respect to their insurance.
Subscriber Identifier
Sequence of characters used to uniquely refer to the individual that selects

insurance benefits.

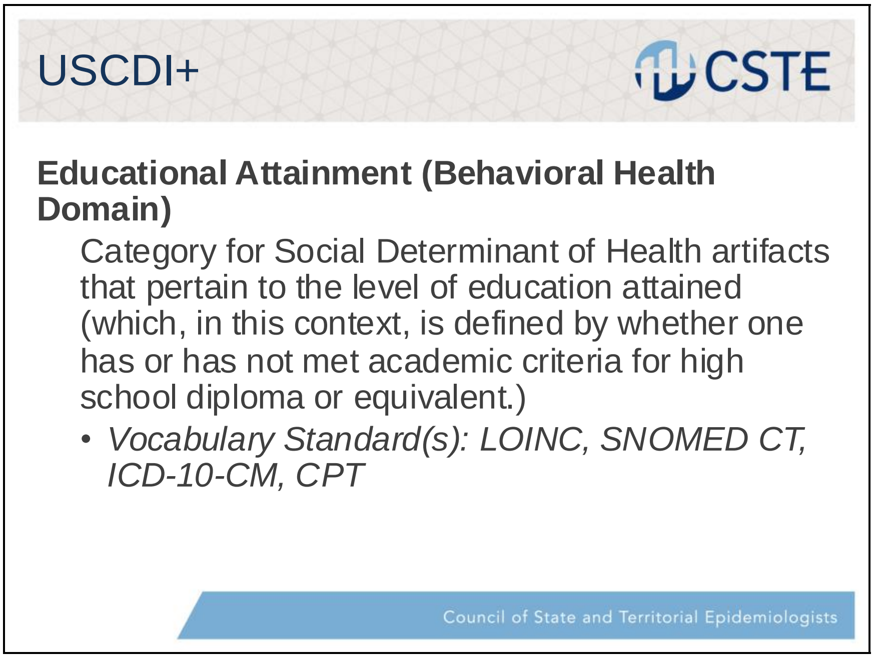
Group Identifier

Sequence of characters used to uniquely refer to a specific health insurance plan.

Payer Identifier

Sequence of characters used to uniquely refer to an insurance payer

USCDI also contains an Income Data Element at Level 0, which means this element is in progress and there is no applicable terminology standard. This data element was submitted by the Gravity Project.



USCDI+ is a service ONC provides to federal and industry partners to establish, harmonize, and advance the use of interoperable data element lists that extend beyond the core data in regular USCDI in order to meet specific programmatic and/or use case requirements. A data element for educational attainment is available under the USCDI+ Behavioral Health Domain:

Educational Attainment (Behavioral Health Domain)
Category for Social Determinant of Health artifacts that pertain to the level of education attained (which, in this context, is defined by whether one has or has not met academic criteria for high school diploma or equivalent.)

ELR & eCR

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ELR

- PV1-20: Financial Class
  - Vocabulary Standard: User-defined Table 0064 - Financial class
- Education and income are not captured in any standard field

eCR

- Education, insurance, or income are not transmitted in a standardized way

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In electronic laboratory reporting (ELR), PV1-20 contains the financial class(es) assigned to the patient for the purpose of identifying sources of reimbursement. However, this is a user-defined table and is hardly populated by ELR senders. ELR does not capture education or income in any standard field.

In electronic case reporting (eCR), both CDA and FHIR do not capture education, insurance coverage, or income in a standardized way.

Case Notifications to CDC
Message Mapping Guides (MMGs)

CSTE

Carbon Monoxide MMG			
Data Element Name	**Data Element Description**	**Data Type**	**Value Set Name**
Education	Indicate the highest degree or level of school completed at the time of the event.	Coded	Education (CO)

Preferred Concept Name
Eighth grade or less
Ninth to twelfth grade but no diploma
High school graduate or GED completed
Associate degree (e.g., AA, AS)
Bachelor's degree (e.g., BA, AB, BS)
Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA)
Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLB, JD)
Other
Some college credit but no degree

The Carbon Monoxide Message Mapping Guide (MMG) for case notifications to CDC includes a data element for education that indicates the highest degree or level of school completed at the time of the event.

Case Notifications to CDC
Message Mapping Guides (MMGs)

CSTE

Respiratory & Invasive Bacterial Diseases (RIBD) MMG			
Data Element (DE) Name	**Data Element Description**	**Data Type**	**Value Set Name (VADS Hyperlink)**
Attending Higher Education College	Is patient (15-24 years only) currently attending college?	Coded	Yes No Unknown (YNU)
Grade in School	Year of college	Coded	School Year (RIBD)
Name of College / University	Name of College / University	Text	N/A
Insurance	Insurance	Coded	Insurance Type (RIBD)

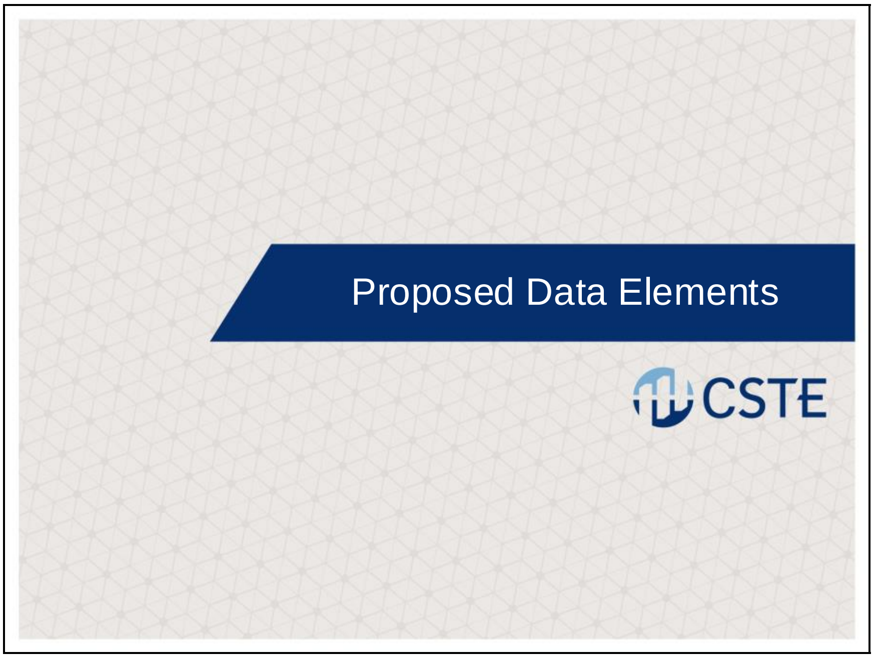
School Year (RIBD): Freshman, Sophomore, Junior, Senior, Graduate Student, Other, Unknown

Insurance Type (RIBD): Incarcerated, Indian Health Service – Regular, Managed Care (Private), Managed Care Unspecified, Medicaid, Medicare, Military/VA Insurance, Other Insurance, Private Health Insurance, Uninsured, Unknown

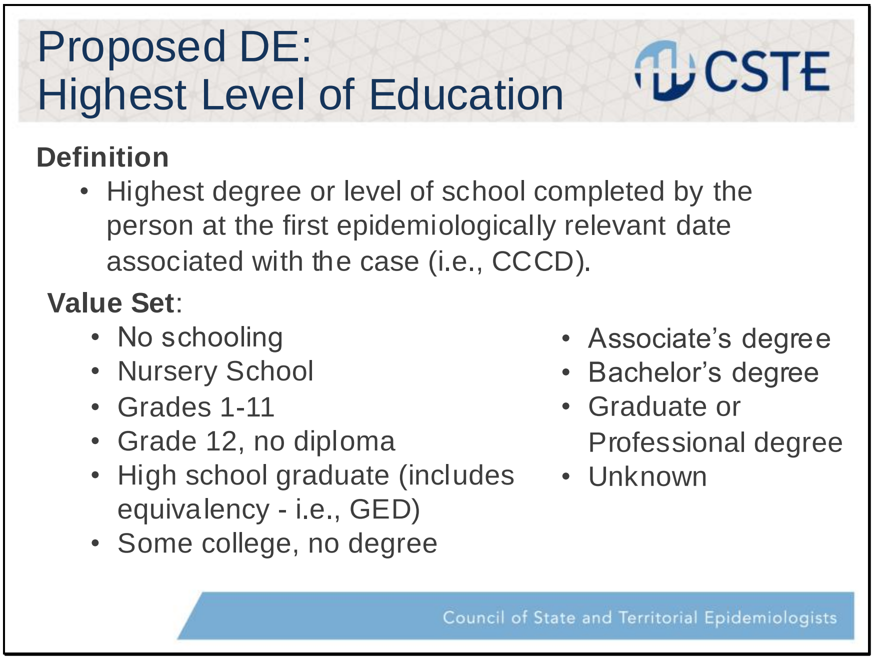
Also pertaining to "Education", the RIBD MMG includes a set of data elements related to education. These include: Is the patient (15-24 years only) currently attending college, their grade in school, and the name of the college or university.

The RIBD MMG is also the only condition-specific MMG that includes an Insurance data element. This data element is a repeating element and has a value set with the following values: Incarcerated, Indian Health Service, Managed Care (Private), Managed Care Unspecified, Medicaid, Medicare, Military/VA insurance, Other, Private Health Insurance, Uninsured, and Unknown

Currently no MMGs collect information about income.



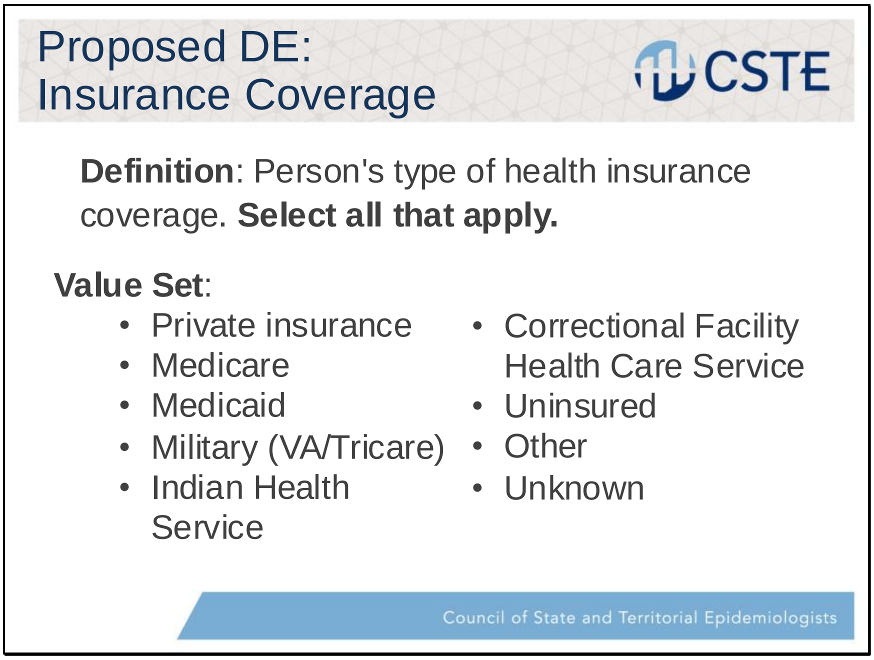
On our calls on November 8th and 15th, in addition to preferred language, we'll talk about the following three potential data elements.



The first data element is "Highest Level of Education", which is defined as the "Highest degree or level of school completed by the person at the first epidemiologically relevant date associated with the case (i.e., CCCD)."
The suggested value set here ranges from "no schooling" to "graduate or professional degree".

No schooling: individuals who have never attended any school or educational institution, either formal or informal
Nursery school: individuals who have completed nursery school or preschool
Grades 1-11: individuals who have completed between first and eleventh grade in primary or elementary school, but have not progressed beyond eleventh grade
Grade 12, no diploma: individuals who have attended high school (grade 12) but did not receive a high school diploma
High school graduate: individuals who have received a high school diploma or an equivalent, such as a General Educational Development (GED) certificate
Some college, no degree: individuals who have attended college or post-secondary education but have not earned a degree
Associate's degree: individuals who have completed a two-year college

program
Bachelor's degree: includes individuals who have completed a four-year college program at a university or college. Examples include a Bachelor of Arts (BA) or Bachelor of Science (BS)
Graduate or Professional degree: includes individuals who have earned an advanced degree beyond a Bachelor's degree, such as a Master's degree (e.g., MA, MS, MBA), Professional degree (e.g., MD, JD, DDS), or Doctorate degree (e.g., PhD, EdD)



This second data element is "Insurance Coverage" and is defined as a "Person's type of health insurance coverage". The value set aligns with those defined by the Census Bureau surveys and includes options for private insurance, Medicare, Medicaid, Military (VA/Tricare), Indian Health Service, Correctional Facility Health Care Service, Uninsured, Other, and Unknown. Health Insurance Glossary

- **Private insurance:** Private health insurance is coverage by a health plan provided through an employer or union, purchased by an individual from a private health insurance company
- **Medicare**: is a federal health insurance program for individuals who are 65 years or older, certain younger people with disabilities, and people with End-Stage Renal Disease. It has multiple parts (A, B, C, &D)
- **Medicaid**: is a state and federal program that provides health coverage to eligible low-income individuals and families. Other forms of public health insurance may include Children's Health Insurance Program (CHIP) and other state-specific public health programs for low-income residents
- **Military health insurance (such as TRICARE or CHAMPVA):** refers to coverage provided to active-duty service members, veterans, and their families through programs like TRICARE and CHAMPVA

- **Indian Health Service**: provides healthcare services to American Indians and Alaska Natives through a network of hospitals, clinics, and health stations operated by the IHS or tribes
- **Correction Facility Health Care Service**: Refers to health care services provided by a correction facility while incarcerated or detained. Note: Someone who is incarcerated or detained can still bill Medicaid for certain services or may have their Medicaid coverage temporarily suspended. They might still be required to pay a co-pay to receive services
- **Uninsured:** refers to individuals who did not have any form of health insurance
- **Other**: includes any other form of health insurance that does not fit into the main categories listed above. It may include coverage through state-specific health programs, student health insurance plans, or temporary insurance options that don't fall under traditional private or public plans
- **Unknown**: Refers to individuals with insurance status that is not provided or cannot be verified.

For Discussion: Income

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Definition: Person's annual household income.

Value Set:

- Less than $10,000
- $10,000-$14,999
- $15,000-$19,999
- $20,000-$24,999
- $25,000-$34,999
- $35,000-$49,999
- $50,000-$74,999
- $75,000-$99,999
- $100,000-$149,999
- $150,000-$199,999
- $200,000 or more
- Unknown

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Finally, if time allows we will have some discussion of income. Currently no MMGs collect information on income, and as a part of background research the CDC team didn't identify any programs who receive data from NNDSS that have a use case for receipt of income information. Therefore, we won't be discussing income as a potential core data element, however if time allows we can talk as a group about what a standardized data element for income should look like if this were to be needed for a condition in the future, or if jurisdictions would like to collect it on their own in a way that's similar to others.

Next Steps

Remaining SDOH DEST calls:

- November 8th, 1-2pm ET
- November 15th, 1-2pm ET

No DEST calls in December!

Next large DSWG call:

- December 13th, 1-2pm ET