

## Emergency Department Utilization (EDU)\*

*\*This is a risk-adjusted utilization measure that compares observed to expected rates. The exact risk weights that will be used for this measure in this Innovation Center model will be determined at a date closer to implementation. Therefore, NCQA is providing access to the specifications without the risk weights needed for calculating expected values.*

Measure title	Emergency Department Utilization	Measure ID	EDU
Description	For people 18 years of age and older, the risk-adjusted ratio of observed-to-expected emergency department (ED) visits during the measurement period.		
Measurement period	January 1–December 31.		
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Clinical recommendation statement/ rationale	Each year, approximately 1 out of 5 U.S. adults uses the ED for health care, and utilization rates have trended upward in recent years. Studies have estimated that up to 60% of all ED visits are potentially preventable or nonurgent, leading to overcrowding, increased wait times and reduction in the ability of hospital staff to provide efficient, quality care to patients with truly emergent conditions. To reduce avoidable ED visits, payers can provide appropriate disease management services, access to primary care clinics and care coordination.		
Citations	<p>Gindi, R.M., L.I. Black, &amp; R.A. Cohen. 2016. “Reasons for Emergency Room Use among U.S. Adults Aged 18–64: National Health Interview Survey, 2013–2014.” National Health Statistics Reports; No 90. Hyattsville, MD: National Center for Health Statistics.</p> <p>Sun, R., Z. Karaca, &amp; S. Wong. 2018. “Trends in Hospital Emergency Department Visits by Age and Payer, 2006–2015.” HCUP Statistical Brief #238. Agency for Healthcare Research and Quality: Rockville, MD. <a href="https://www.hcup-us.ahrq.gov/reports/statbriefs/sb238-Emergency-Department-Age-Payer-2006-2015.pdf">https://www.hcup-us.ahrq.gov/reports/statbriefs/sb238-Emergency-Department-Age-Payer-2006-2015.pdf</a></p> <p>Hu, T., K. Mortensen, &amp; J. Chen. 2018. “Medicaid Managed Care in Florida and Racial and Ethnic Disparities in Preventable Emergency Department Visits.” <i>Medical Care</i> 56: 477–83.</p> <p>Johnson, P.J., N. Ghildayal, A.C. Ward, B.C. Westgard, L.L. Boland, &amp; J.S. Hokanson. 2012. “Disparities in Potentially Avoidable Emergency Department (ED) Care: ED Visits for Ambulatory Care Sensitive Conditions.” <i>Medical Care</i> 50(12):1020–8.</p>		
Characteristics			

<b>Scoring</b> <b>Product lines</b>	Ratio. <ul style="list-style-type: none"><li>• Commercial.</li><li>• Medicare.</li></ul>
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<b>Stratifications</b>	<p>Ages as of the last day of the measurement period.</p> <ul style="list-style-type: none"> <li>• 18–44 years.</li> <li>• 45–54 years.</li> <li>• 55–64 years.</li> <li>• 65–74 years.</li> <li>• 75–84 years.</li> <li>• 18–64 years.</li> <li>• 65+ years.</li> <li>• 85+ years.</li> </ul>
<b>Guidance</b>	<p><b>Risk Adjustment Measure Specific Guidance</b></p> <p><b>Observation stays:</b> For observation stays (<u>Observation Stay Value Set</u>) that do not have a recorded admission or discharge date, set the admission date to the earliest date of service on the claim and set the discharge date to the last date of service on the claim.</p> <p><b>Which services count?</b></p> <ul style="list-style-type: none"> <li>• Use all paid, suspended, pending and denied claims when applying risk adjustment comorbidity category determination and the hospice exclusion.</li> <li>• Do not include denied claims when identifying all other events (e.g., observed events); only report claims the organization paid for or expects to pay for (i.e., claims incurred but not paid), with the exception below.</li> <li>• When confirming that an ED visit does not result in an inpatient or observation stay, all inpatient and observation stays must be considered, regardless of payment status (paid, suspended, pending, denied).</li> </ul> <p><i>For example</i>, if an ED visit is paid but an inpatient stay is denied, the ED visit resulted in an inpatient stay and is not included in the Emergency Department Utilization measure when identifying observed ED visits.</p> <p><b>Supplemental data exceptions:</b> Supplemental data may only be used for the hospice exclusion.</p> <p><b>Transfers:</b></p> <ul style="list-style-type: none"> <li>• Treat transfers <i>between</i> institutions as separate admissions.</li> <li>• Base transfer reports <i>within</i> an institution on the type and level of services provided.</li> <li>• Report separate admissions when the transfer is between acute and nonacute levels of service or between mental health/chemical dependency services and non-mental health/chemical dependency services.</li> <li>• Count only one admission when the transfer takes place within the same service category, but to a different level of care (e.g., from intensive care to a lesser level of care; from a lesser level of care to intensive care).</li> </ul> <p><b>Risk adjustment:</b> Organizations may not use risk assessment protocols to supplement diagnoses for calculation of the risk adjustment scores for these measures. The measurement model was developed and tested using only claims-based diagnoses; diagnoses from additional data sources would affect the validity of the models as they are currently implemented in the specification.</p> <p><b>General Rules</b></p> <p><b>Data collection methodology:</b> Administrative. Refer to <i>General Guideline: Data Collection Methods</i> for additional information.</p>

	<p><b>Date specificity:</b> Dates must be specific enough to determine the event occurred in the period being measured.</p> <p><b>Improvement notation:</b> To interpret the ratio as better or worse than expected, the ratio must be calibrated. Organizations can calibrate ratios by dividing individual organization ratios or national percentiles by the national average ratio. Organizations may be more successful at achieving fewer ED visits than expected, given the types of cases treated by the organization (calibrated ratio with a value &lt;1.0), or may be less successful (calibrated ratio with a value &gt;1.0).</p>
<b>Definitions</b>	
<b>Outlier</b>	<p>Medicare enrollees 18–64 years of age with 6 or more ED visits in the measurement period.</p> <p>Medicare enrollees 65 years of age and older with 4 or more ED visits in the measurement period.</p> <p>Commercial enrollees 18 years of age and older with 4 or more ED visits in the measurement period.</p>
<b>Nonoutlier</b>	<p>Medicare enrollees 18–64 years of age with five or fewer ED visits during the measurement period.</p> <p>Medicare enrollees 65 years of age and older with three or fewer ED visits during the measurement period.</p> <p>Commercial enrollees 18 years of age and older with three or fewer ED visits during the measurement period.</p>
<b>PPV</b>	Predicted probability of a visit. The predicted probability of a person having an ED visit in the measurement period.
<b>PUCV</b>	Predicted unconditional count of visits. The unconditional count of ED visits during the measurement period.
<b>Initial population</b>	<p><i>Measure item count:</i> Person.</p> <p><i>Attribution basis:</i> Enrollment.</p> <ul style="list-style-type: none"> <li>• <i>Benefits:</i> Medical.</li> <li>• <i>Continuous enrollment:</i> The measurement period and the year prior to the measurement period.</li> <li>• <i>Allowable gap:</i> No more than one gap of ≤45 days during each year of continuous enrollment. No gaps on the last day of the measurement period.</li> </ul> <p><i>Ages:</i> 18 years of age and older as of the last day of the measurement period.</p> <p><i>Gender/sex criteria:</i></p> <ul style="list-style-type: none"> <li>• Administrative Gender of Female (AdministrativeGender code female).</li> <li>• Administrative Gender of Male (AdministrativeGender code male).</li> </ul>

	<p><b>Exclusion: Episodes for persons in hospice or using hospice services.</b></p> <p>Persons who use hospice services (<u>Hospice Encounter Value Set</u>; <u>Hospice Intervention Value Set</u>) or elect to use a hospice benefit any time during the measurement period. Organizations that use the Monthly Membership Detail Data File to identify these persons must use only the run date of the file.</p>
<b>Measure observation</b>	<p><b>Calculation of Observed Events</b></p> <p><b>Step 1.</b> Count each visit to an ED once, regardless of the intensity or duration of the visit. Count multiple ED visits on the same date of service as one visit. Identify all ED visits during the measurement period using either of the following:</p> <ul style="list-style-type: none"> <li>• An ED Visit (<u>ED Value Set</u>).</li> <li>• A procedure code (<u>ED Procedure Code Value Set</u>) <b>with</b> an ED place of service code (POS code 23).</li> </ul> <p>Do not include ED visits that result in an inpatient stay (<u>Inpatient Stay Value Set</u>) or an observation stay (<u>Observation Stay Value Set</u>).</p> <p><b>Step 2.</b> Exclude encounters with any of the following:</p> <ul style="list-style-type: none"> <li>• A principal diagnosis of mental health or chemical dependency (<u>Mental and Behavioral Disorders Value Set</u>).</li> <li>• Psychiatry (<u>Psychiatry Value Set</u>).</li> <li>• Electroconvulsive therapy (<u>Electroconvulsive Therapy Value Set</u>).</li> </ul> <p><b>Step 3.</b> For the remaining ED visits, calculate the number of visits per person and remove visits for outlier persons. Report these persons as outliers.</p> <p><b>Step 4.</b> Calculate the total using all ED visits identified after completing steps 1–3. Assign each remaining ED visit to an age and stratification category using the reporting instructions below.</p>
<b>Risk adjustment factors</b>	<p><b>Risk Adjustment Determination</b></p> <p>For each person among nonoutliers, identify risk adjustment weights based on comorbidity, age and gender. Weights are specific to product line (Medicare Under 65, Medicare 65 Plus and commercial). Refer to the reporting indicator column in the risk adjustment tables to ensure that weights are linked appropriately.</p> <p><b>Comorbidities:</b></p> <p><b>Step 1.</b> Identify all diagnoses for encounters during the year prior to the measurement period. Include the following when identifying encounters:</p> <ul style="list-style-type: none"> <li>• Outpatient visits, ED visits, telephone visits, nonacute inpatient encounters and acute inpatient encounters (<u>Outpatient, ED, Telephone, Acute Inpatient and Nonacute Inpatient Value Set</u>) with a date of service during the year prior to the measurement period.</li> <li>• Acute and nonacute inpatient discharges (<u>Inpatient Stay Value Set</u>) with a discharge date during the year prior to the measurement period.</li> </ul>

**Step 2.** Assign each diagnosis to one or more comorbid Clinical Condition (CC) category using Table CC—Mapping in the Risk Adjustment Shared Tables. If the code appears more than once in Table CC—Mapping, it is assigned to multiple CCs.

Exclude all diagnoses that cannot be assigned to a comorbid CC category. For persons with no qualifying diagnoses from face-to-face encounters, skip to *Risk Adjustment Calculation*.

All digits must match exactly when mapping diagnosis codes to the comorbid CCs.

**Step 3.** Determine HCCs for each comorbid CC identified. Refer to Table HCC—Rank.

For each person's comorbid CC list, match the comorbid CC code to the comorbid CC code in the table, and assign:

- The ranking group.
- The rank.
- The HCC.

For comorbid CCs that do not match to Table HCC—Rank, use the comorbid CC as the HCC and assign a rank of 1. One comorbid CC can map to multiple HCCs; each HCC can have one or more comorbid CCs.

**Step 4.** Assess each ranking group separately and select only the highest ranked HCC in each ranking group using the "Rank" column (1 is the highest rank possible).

Drop all other HCCs in each ranking group, and de-duplicate the HCC list if necessary.

- *For example*, assume a person with the following comorbid CCs: CC-85, CC-17 and CC-19 (assume no other CCs).
  - CC-85 does not have a map to the ranking table and becomes HCC-85.
  - HCC-17 and HCC-19 are part of Diabetes Ranking Group 1. Because CC-17 is ranked higher than CC-19 in Ranking Group Diabetes 1, the comorbidity is assigned as HCC-17 for Ranking Group 1.

The final comorbidities for this person are HCC-17 and HCC-85.

**Table HCC—Rank**

Ranking Group	CC	Description	Rank	HCC
NA	CC-85	Congestive Heart Failure	NA	HCC-85
Diabetes 1	CC-17	Diabetes With Acute Complications	1	HCC-17
	CC-18	Diabetes With Chronic Complications	2	HCC-18
	CC-19	Diabetes Without Complications	3	HCC-19

**Step 5.** Identify combination HCCs listed in Table HCC—Comb.

Some combinations suggest a greater amount of risk when observed together. For example, when diabetes *and* CHF are present, an increased amount of risk is evident. Additional HCCs are selected to account for these relationships.

Compare each person's list of unique HCCs to those in the *Comorbid HCC* columns in Table HCC—Comb and assign any additional HCC conditions.

*If there are overlapping combinations, use both sets of combinations.* Based on the combinations, a person can have none, one or more of these added HCCs.

- *For example*, for a person with comorbidities HCC-17 and HCC-85 (assume no other HCCs), assign HCC-901 in addition to HCC-17 and HCC-85. This *does not* replace HCC-17 and HCC-85.

**Table HCC—Comb**

Comorbid HCC 1	Comorbid HCC 2	Comorbid HCC 3	HCC-Combination	HCC-Comb Description
HCC-17	HCC-85	NA	HCC-901	Combination: Diabetes and CHF
HCC-18	HCC-85	NA	HCC-901	Combination: Diabetes and CHF
HCC-19	HCC-85	NA	HCC-901	Combination: Diabetes and CHF

**Risk adjustment****Risk Adjustment Calculation**

Calculation of risk-adjusted outcomes (counts of ED visits) uses predetermined risk weights generated by two separate regression models. Weights from each model are combined to predict how many visits each person might have during the measurement period.

**For each nonoutlier person in the initial population, assign PPV risk weights.**

**Step 1.** For each person with a comorbidity HCC Category, link the PPV weights.

**Step 2.** Link the age-gender PPV weights for each person.

**Step 3.** Sum all PPV weights associated with the person (comorbidities, age and gender).

**Step 4.** Calculate the predicted probability of each person having at least one visit based on the sum of the weights for each person using the formula below.

$$PPV = \frac{e^{(\sum PPV \text{ WeightsForEachPerson})}}{1 + e^{(\sum PPV \text{ WeightsForEachPerson})}}$$

Truncate the final PPV for each person to 10 decimal places. Do not truncate or round in previous steps.

**For each person in the initial population, assign PUCV risk weights.**

**Step 1.** For each person with a comorbidity HCC Category, link the PUCV weights. If a person does not have any comorbidities to which weights can be linked, assign a weight of 1.

**Step 2.** Link the age-gender PUCV weights for each person.

**Step 3.** Calculate the predicted unconditional count of visits in the measurement period by multiplying all PUCV weights (comorbidities, age and gender). Use the following formula:

$$\text{PUCV} = \text{Age/Gender Weight} * \text{HCC Weight}$$

**Note:** Multiply by each HCC associated with the person. For example, assume a person with HCC-2, HCC-10, HCC-47. The formula would be:

$$\text{PUCV} = \text{Age/gender Weight} * \text{HCC-2} * \text{HCC-10} * \text{HCC-47}$$

Truncate the final PUCV for each person to 10 decimal places. Do not truncate or round in previous steps.

**Expected count of ED visits.** Calculate the final person-level expected count of ED visits for each category using the formula below:

$$\text{Expected Count of ED Visits} = \text{PPV} \times \text{PUCV}$$

Round the person-level results to 4 decimal places using the .5 rule and sum over all persons in the category.

**Step 4.** Use the formula below to calculate the covariance of the predicted outcomes for each category. For categories with a single person ( $n_c=1$ ), set the covariance to zero. Do not round the covariance before using it in step 5.

$$\text{COV}_c = \frac{\sum_{m=1}^{n_c} (\text{PPV}_m - \text{mean}(\text{PPV})_c) \times (\text{PUCV}_m - \text{mean}(\text{PUCV})_c)}{n_c - 1}$$

Where:

$c$	denotes an individual category
$n_c$	is the number of persons in the category indicated by $c$
$m$	is an individual person within the category indicated by $c$
$\text{PPV}_m$	is the truncated PPV for the person denoted by $m$
$\text{mean}(\text{PPV})_c$	is the unrounded and untruncated mean PPV in the category indicated by $c$
$\text{mean}(\text{PUCV})_c$	is the unrounded and untruncated mean PUCV
$\text{PUCV}_m$	is the truncated PUCV for the person denoted by $m$ in the category indicated by $c$

**Step 5.** Once the covariance between PPV and PUCV for a given category is calculated, it can be used as indicated in the formula below to calculate the variance for that category.



	$Variance_c = \sum_{m=1}^{n_c} (PPV_m \times PUCV_m)^2 \times \left( 1 + (1 - PPV_m)^2 + \left( \frac{2 \times COV_c}{PPV_m \times PUCV_m} \right) \right)$ <p>Where:</p> <p><math>c</math> denotes an individual category</p> <p><math>n_c</math> is the number of persons in the category indicated by <math>c</math></p> <p><math>m</math> is an individual person within the category indicated by <math>c</math></p> <p><math>PPV_m</math> is the truncated PPV for the person denoted by <math>m</math></p> <p><math>PUCV_m</math> is the truncated PUCV for the person denoted by <math>m</math></p> <p><math>n_c</math> is the number of persons in the category indicated by <math>c</math></p> <p>Round the variance for reporting to 4 decimal places using the .5 rule.</p>
<b>Summary of changes</b>	<ul style="list-style-type: none"> <li>Integrated the Risk Adjustment General Guidelines into the <i>Guidance</i> section.</li> <li>Removed the definition of “classification period” and put the time frame in the <i>Risk adjustment comorbidity category determination</i> section.</li> <li>Added administrative gender codes to the initial population.</li> </ul>
<b>Data element tables</b>	<p><b>Reporting: Number of nonoutliers</b> The number of nonoutlier persons for each age group, reported as the NonOutlierPersonCount.</p> <p><b>Reporting: Number of outliers</b> The number of outlier persons for each age group, reported as the OutlierPersonCount.</p> <p><b>Calculated: Number of persons in the initial population</b> The number of persons in the initial population (including outliers) for each age group and totals. Calculated by IDSS as the PersonCount.</p> <p><b>Calculated: Outlier rate</b> The number of outlier persons (OutlierPersonCount) divided by the number of persons in the initial population (PersonCount), multiplied by 1,000 for each age group and totals. Calculated by IDSS as the OutlierRate.</p> <p><b>Reporting: Number of observed events among nonoutlier persons</b> The number of observed ED visits for each age group, reported as the ObservedCount.</p> <p><b>Calculated: Observed visits per 1,000 nonoutlier persons</b> The number of observed ED visits (ObservedCount) divided by the number of nonoutlier persons in the initial population (NonOutlierPersonCount), multiplied by 1,000 for each age group and totals. Calculated by IDSS as the ObservedRate.</p> <p><b>Reporting: Number of expected events among nonoutlier persons</b> The number of expected ED visits for each age group, reported as the ExpectedCount.</p>

**Calculated: Expected visits per 1,000 nonoutlier persons**

The number of expected ED visits (ExpectedCount) divided by the number of nonoutlier persons in the initial population (NonOutlierPersonCount), multiplied by 1,000 for each age group and totals. Calculated by IDSS as the ExpectedRate.

**Reporting: Variance among nonoutlier persons**

The variance (*Risk Adjustment Calculation*, PUCV, step 5) for each age group, reported as the CountVariance.

**Calculated: O/E ratio**

The number of observed events among nonoutlier persons (ObservedCount) divided by the number of expected events among nonoutlier persons (ExpectedCount) for each age group and totals. Calculated by IDSS as the OE.

Organizations that submit HEDIS data to NCQA must provide the following data elements.

**Table EDU-2/3: Data Elements for Emergency Department Utilization**

Metric	Age	Data Element	Reporting Instructions
EmergencyDepartmentUtilization	18-44	NonOutlierPersonCount	For each Stratification
	45-54	OutlierPersonCount	For each Stratification
	55-64	PersonCount	NonOutlierPersonCount + OutlierPersonCount
	18-64	OutlierRate	OutlierPersonCount / PersonCount (Per mille)
	65-74	ObservedCount	For each Stratification
	75-84	ObservedRate	1000 * ObservedCount / NonOutlierPersonCount
	85+	ExpectedCount	For each Stratification
	65+	ExpectedRate	1000 * ExpectedCount / NonOutlierPersonCount
	Total	CountVariance	For each Stratification
		OE	ObservedCount / ExpectedCount

**Rules for Allowable Adjustments**

**Copyright and use:** The “Rules for Allowable Adjustments of HEDIS” (the “Rules”) describe how NCQA’s HEDIS measure specifications can be adjusted for other populations, if applicable. The Rules, reviewed and approved by NCQA measure experts, provide for expanded use of HEDIS measures without changing their clinical intent.

**Adjusted HEDIS measures may not be used for HEDIS health plan reporting.**

The measures under the Risk Adjusted Utilization domain allow two types of *Rules for Allowable Adjustments* sections:

1. *Rules for Allowable Adjustments for Risk-Adjusted Measurement.* This section must be followed for adjustments when calculating the full measure specifications, which includes all risk adjusted rates (expected rates, risk adjustment, O/E) and calculation components (count of index stays, observed events).

2. *Rules for Allowable Adjustments for Observed Measurement (rates without risk adjustment).* This section must be followed when adjusting the calculation of observed events only. When applying these adjustments, organizations must not include risk adjustment logic.

The intent of including the two different types of Rules is to allow organizations to adjust measures without compromising the measures' validity. Risk adjustment is based on statistical prediction models that are specifically calibrated for each measure.

**The following are the Rules for Allowable Adjustments for Risk-Adjusted Measurement of the Emergency Department Utilization measure (observed ED visits, risk adjustment determination, risk adjustment weighting, expected ED visits, O/E, variance).**

#### **ADJUSTMENTS ALLOWED**

- *Benefits.* Organizations are not required to use a benefit.
- *Telehealth:* Services/events that allow the use of synchronous telehealth visits, telephone visits and asynchronous telehealth (e-visits, virtual check-ins) may be stratified to identify services performed via telehealth. This adjustment is not allowed for events, numerators and exclusions that do not allow the use of telehealth.

#### **ADJUSTMENTS ALLOWED WITH LIMITS**

- *Other.* Organizations may only adjust the initial population criteria to focus on an area of interest defined by gender, sociodemographic characteristics or geographical region. NCQA recommends evaluating risk model performance and validity within adjusted populations. Organizations may not adjust for a clinical subpopulation (e.g., persons with a diabetes diagnosis).
- *Measurement period adjustments.* Organizations may only change the measurement period by 1 year.
- *Observed event.* Organizations may include denied claims to calculate the observed events. The value sets and logic may not be changed.
- *Outlier.* Organizations may include denied claims to calculate these events. Organizations may not adjust the outlier logic.
- *Risk adjustment determination, risk adjustment weighting, expected count of ED visits, variance.* Organizations may include denied claims to calculate these events. Risk adjustment determinations, weighting and calculations of expected events logic may not be changed.

#### **ADJUSTMENTS NOT ALLOWED**

- *Product lines.* Organizations may not adjust product lines.
- *Attribution.* Organizations are required to use enrollment criteria.
- *Ages.* The age determination dates may not be changed.

- *Supplemental data.* Supplemental data may not be used to identify initial population, denominator and numerator events.
- *Exclusions.* The hospice exclusion must be applied. Logic may not be changed.

**The following are the Rules for Allowable Adjustments for Observed Measurement of the Emergency Department Utilization measure observed events (observed ED visits).**

#### **ADJUSTMENTS ALLOWED**

- *Product lines.* When adjusting this measure to assess for observed events only, organizations are not required to use product line criteria; product lines may be combined, and all (or no) product line criteria may be used.
- *Ages.* The observed event age range may be expanded. Age determination dates may be changed (e.g., select, “age as of June 30”).
- *Attribution.* Organizations are not required to use enrollment criteria.
- *Benefits.* Organizations are not required to use a benefit.
- *Other.* Organizations may use additional initial population criteria to focus on a population of interest such as gender, race and ethnicity, socioeconomic, sociodemographic characteristics, geographic region or another characteristic.
- *Measurement period adjustments.* Organizations may adjust the measurement period.
- *Exclusions.* The hospice exclusion is not required.
- *Outlier.* Organizations may adjust the outlier logic. The outlier logic is not required to be applied. The outlier thresholds may be expanded or reduced. Denied claims may be used to calculate these events.
- *Telehealth.* Services/events that allow the use of synchronous telehealth visits, telephone visits and asynchronous telehealth (e-visits, virtual check-ins) may be stratified to identify services performed via telehealth. This adjustment is not allowed for events, numerators and exclusions that do not allow the use of telehealth.
- *Supplemental data.* Supplemental data may be used to identify initial population, observed event, exclusion and numerator events.

#### **ADJUSTMENTS ALLOWED WITH LIMITS**

- *Observed events.* Organizations may include denied claims to calculate the observed events. The value sets and logic may not be changed.