CIVITAS
Sustainable and smart mobility for all
2030

CIVITAS indicators

Citizen health – Version 2 (SOC_HL_HL2)

DOMAIN

Transport	Environment	Energy	**Society**	Economy

TOPIC	**Health**	
IMPACT	**Improving respiratory health** *Reducing the incidence of bronchitis, pneumonia, and asthma*	**SOC_HL**

Category

Key indicator	Supplementary indicator	State indicator

CONTEXT AND RELEVANCE

Respiratory health refers to the condition of individuals' respiratory systems, reflecting the presence or absence of diseases such as bronchitis, pneumonia, and asthma. It is influenced by multiple environmental, behavioural, and socio-economic factors, including air quality, exposure to pollutants, smoking habits, occupational hazards, access to healthcare, housing conditions, and climatic variables. Poor respiratory health can also be exacerbated by long-term exposure to traffic-related emissions and other forms of urban pollution.

This indicator measures the prevalence of select respiratory conditions, namely bronchitis, pneumonia, and asthma, among citizens in the pilot city. It provides an indication of the population's respiratory health status, and it allows to track how respiratory health in the pilot city evolves in response to changes in transport-related emissions. **The indicator is relevant when the policy action aims to reduce the incidence of respiratory conditions. A successful action is reflected in a LOWER value of the indicator.**

DESCRIPTION

The indicator is a **score** representing the incidence and severity of respiratory conditions in the pilot area, namely bronchitis, pneumonia, and asthma. The indicator is **dimensionless**.

METHOD OF CALCULATION AND INPUTS

The indicator is calculated as a weighted score reflecting the incidence and severity of respiratory conditions affecting residents of the experiment city, based on data from medical authorities on consultations and hospitalizations due to respiratory diseases. **The indicator should be computed exogenously** based on the specified inputs, and its resulting value should be coded into the supporting tool.

Method	
Calculation of the indicator based on data from medical authorities	Significance: **1.00** 

INPUTS

The following information is needed to compute the indicator:

a) **The number of consultations in the past six months by residents of the experiment city with respiratory specialists**, categorized by reason for referral.
b) **The number of hospitalizations in the past six months among residents of the experiment city due to respiratory conditions,** categorized by reason for hospitalization.
c) **The number of residents in the experiment city.**

METHOD OF CALCULATION

The indicator should be computed **exogenously** according to the following steps:

- **Retrieval of the data on respiratory health consultations and hospitalizations from local medical authorities**, including the specific reason for each case, namely bronchitis, pneumonia, or asthma. The data should include all consultations and hospitalizations of residents in the pilot city and exclude those of individuals who reside elsewhere.

- **Retrieval of the number of inhabitants within the pilot city.** This information can be obtained from census data.

- **Association of a numeric weight to each respiratory condition based on their relative severity.** Between bronchitis, pneumonia and asthma, the latter is considered the most severe, as it is typically chronic. It can significantly impair quality of life, and it may require continuous treatment or emergency care during acute episodes. Pneumonia has an intermediate level of severity, being an acute but generally short-term respiratory infection that can lead to serious complications if untreated. Bronchitis is weighted lowest, since it is generally a transient inflammatory condition of the airways, typically treated effectively with standard medical care. For these reasons, **bronchitis** is assigned **weight 1**, **pneumonia** is assigned **weight 2**, and **asthma** is assigned **weight 3.**

- **Association of a numeric level to each type of medical event, assigning 1 to consultations and 2 to hospitalizations** to reflect their relative severity.

- **Calculation of the respiratory disorder indicator by aggregating the data on consultations and hospitalization** and by weighing them by the severity of the respiratory condition and by the severity of the health event (see equation below).

EQUATIONS

The respiratory disorder indicator is computed as:

$$RsHl = \frac{(\sum_m \sum_c E_{m,c} * w_c * u_m) * 100}{Pop * w_{max} * u_{max}}$$

Where:

$E_{m,c}$ = Number of medical events of type *m* for respiratory condition *c*

w_c = Weight of respiratory condition *c* (numerical value 1-3, as discussed in the *Method of calculation* section)

u_m = Weight of medical event of type *m* (numerical value 1-2, as discussed in the *Method of calculation* section)

Pop = Population in the pilot city

Note that $w_{max} * u_{max}$ is a normalization constant, representing the maximum possible severity of a single medical event. Using the weights proposed in this factsheet, the normalization constant equals 6, which results from multiplying the severity weight of respiratory condition asthma (3) with the weight of medical event hospitalization (2).

ALTERNATIVE INDICATORS

This indicator measures the respiratory health of residents of the experiment city based on data from local medical authorities. Alternative indicators for assessing transport-related health dimensions are **SOC_HL_HL1**, and **SOC_HL_HL3**.

SOC_HL_HL1 measures respiratory health in the experiment area using data from a sample survey, asking a sample of respondents to report on their respiratory disorders. Although it is less significant because it relies on self-reported and sample data, it allows for finer spatial analysis since surveys can target sub-city areas. Meanwhile, the indicator described in this factsheet uses data from medical records, which allows for greater significance but is typically limited to city-level aggregation due to strict privacy regulations on personal data. **SOC_HL_HL3** similarly draws on medical data to measure the incidence of insomnia in the experiment city.