

21.2 Level of chronic stress (Perceived stress)

Project Name: proGIreg (Grant Agreement no. 776528)

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Perceived stress	Health and Wellbeing
Description and justification	This is an indicator of the level of psychological stress experienced by the participants based on a validated questionnaire. Stress reduction is one of the well-established mechanisms underlying the health benefits of the green spaces. However, evidence from natural experiments is lacking.
Definition	Perceived stress on a scale from 0 (low stress) to 4 (high stress)
Strengths and weaknesses	A strength of this indicator is that it is obtained by using a validated and widely used questionnaire to assess psychological stress. A limitation is that the indicator is self-reported, and participants may misreport their actual perceived stress.
Measurement procedure and tool	The indicator is obtained using a survey which is taken by a sample of the general population. The survey includes the Perceived Stress Scale questionnaire, which includes 4 items on the amount of time in the last month that the participant felt a certain way. The answers are on a scale from 0 (never) to 4 (very often). This survey is repeated before and after the implementations of NBS in order to observe a potential change in mental health status.
Scale of measurement	General population in residential neighbourhoods
Data source	
Required data	Questionnaire data
Data input type	Continuous variables
Data collection frequency	Twice; once before the implementation of the nature-based solutions and once after.
Level of expertise required	Low
Synergies with other indicators	This indicator is related to other indicators on mental health.
Connection with SDGs	Good health and wellbeing: if the implementation of NBS is associated with decreased stress, NBS contribute to improved health and wellbeing.

Opportunities for participatory data collection	The questionnaires are self-reported and as such are reported by the citizens themselves.
Additional information	
References	Cohen, Kamarck & Mermelstein. 1983. A global measure of perceived stress. <i>Journal of Health and Social Behavior</i> ; 24, 4.

21.3 General wellbeing and happiness

Project Name: CONNECTING Nature (Grant Agreement no. 730222)

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General wellbeing and happiness	Health and Wellbeing
Description and justification	<p>Cross-disciplinary literature operates with a variety of concepts to delineate general wellbeing (WB) and happiness, such as (subjective) wellbeing (SWB), happiness, life satisfaction (LS), experienced utility, and quality of life (Larson, Jennings, & Coutier, 2016; MacKerron & Mourato, 2013). Cervinka, Röderer, and Hefler (2012) categorize WB as an umbrella-term that includes experiences of positive emotional states and processes ranging from short-term to long-term, from current positive feelings (positive affect) to habitual dispositions (personality-factors), and that encompasses pleasurable affect as well as general life satisfaction. A growing body of empirical evidence documents the otherwise intuitive notion that people who are more connected with nature and engage in nature's beauty (i.e., experience positive emotional responses when witnessing nature's beauty) report more subjective well-being (Frumkin, Bratman, Breslow, Cochran, Kahn Jr., Lawler, Levin, Tandon, Varanasi, Wolf, & Wood, 2017; ; Howell, Dopko, Passmore, & Buro, 2011; Howell & Passmore, 2013; Larson et al., 2016; Pritchard, Richardson, Sheffield, & McEwan, 2019; Zhang, Howell, & Iyer, 2014). MacKerron and Maurato (2013) document theoretical and empirical evidence for at least three reasons for thinking that experiences of natural environments will be positively related to health, wellbeing and happiness:</p> <ol style="list-style-type: none"> 1. the existence of direct pathways by which such experiences affect the nervous system, bringing about stress reduction and restoration of attention;