



**CLEVER
Cities**

Social Monitoring Methodology

Milan Local Cluster

Work Package	WP4
Dissemination Level	City
Lead Partner	POLIMI
Due Date	NA
Submission Date	19/05/2021

Deliverable No.	Number X
Work Package	Number 4
Dissemination Level	City
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Date	19/05/2021
File Name	CLEVER Cities WP4 – social monitoring methodology Milan Local Cluster
Status	XX
Revision	Chiara Vona, Eliante
Reviewed by (if applicable)	Karmele Herranz. TECnalia

This document has been prepared in the framework of the European project Clever Cities. This project has received funding from the European Union's Horizon 2020 innovation action programme under grant agreement no. 776604.

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This project has received funding from the European Union's Horizon 2020 innovation action programme under grant agreement no. 776604.

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Introduction

This document is not a specific deliverable of WP4. It is a handout related to social impact measurement related to the Local Monitoring Plan for the CLEVER cluster in the city of Milan.

In this document we synthesize the structure of the methodological framework used to coordinate and organize the outcomes related to the social impact of NBS interventions in CALs and their relative KPIs. This document is not a standalone and should be read through with the Local Monitoring Plan framework as dated of March 2021, in addition to the provided annex of the explained excel tool as well as the survey forms provided (online) and the questionnaires provided (offline). To date, these questions are transversal to all three CALs in Milan.¹ and are inspired by the documents and discussions with WP4 leaders and work carried out in London in June 2019.

¹ The three CALs of Milan are respectively: CAL1: Green roofs and walls; CAL 2 Giambellino 129 community garden and public green area; CAL3: Tibaldi train stop and noise barrier.

Section 1: Methodology

Introduction

The methodological background of this framework is based on the need to evaluate and monitor the advancements of social impacts related to NBS implementation in the city of Milan, for the moment. In order to create a mixed-method approach for this evaluation procedure, the assessment framework is structured vertically based on the macro- and micro indicators relevant to social well-being impact, see Figure 1. The main outcomes that were to be measured in the social monitoring framework are namely:

1. Place, Use of space and relationship with nature
2. Perceived ownership of space and sense of belonging,
3. Psychosocial issues and Social cohesion
4. Information about CLEVER interventions and NBS benefits
5. Citizen perception about safety and security

Each macro-category of these outcomes has micro-indicators underneath that correspond to a section then in the survey. The survey is structured also on four pages (one outcome per page); however, it does not exceed 20 minutes for the total filling time. Each section has one or more question, based on the number of micro-indicators correlated. Vertically, the framework is divided in different sections, as follows:

1. the target group(s) of the analysis that will benefit from the NBS intervention,
2. the measurement tools (quantitative surveys, and qualitative interviews),
3. the needs of each CAL, when this measurement should be addressed, and
4. indications on the type of questions to be elaborated.

The overall structure of the framework is controlled by **conditional formatting buttons** whereas the micro-indicator in evaluation could be marked (yes, no, n.a., or maybe). It depends on the LMT and the social evaluation team to identify the most relevant questions and needs and filling in the vertical columns of the framework, [see Figure 2](#). In this tool it is important to pinpoint for each CAL how the social impact will be measured against the following parts:

1. the target group: with whom,
2. How: the measurement tool: how the question will be evaluated (see also Question type column).
3. Where: the list of CALs and their corresponding question numbers
4. When: the pre-post greening status in each action lab in order to decide when evaluate each indicator.

MACRO/MICRO indicators
analysis of demographic data will consider: age, sex, residence vicinity, interest in the area of intervention in all monitoring periods.
<i>These target groups should be diversified and balanced in age, gender, race (if needed) and include sample of social-level outcomes and all different vulnerable groups</i>
1- Place (Use of space and relationship with nature)
1.1 Relationship with nature and well-being related to NBS
<i>importance of the green as a priority in the neighborhood/ area of intervention</i>
<i>positive impact of the green areas in your neighborhood/area of intervention (health and well-being, environmental values, air quality, biodiversity, heat in summer, aesthetics of surroundings, social cohesion and relationships)</i>
<i>did the recent emergency crisis change the use and perception of green spaces</i>
1.2 Use of space
<i>use the green areas around you or in your neighborhood (frequency of visits)</i>
<i>type of use for the green space (leisure, sport, social, relax, outdoor activity, etc.)</i>
<i>Time of use / work/ living in building/ neighborhood / area of interest (COVID)</i>
<i>relationship time with building/ neighborhood/ area of intervention</i>
<i>Activities usually carried out in the place (multiple answer)</i>
2- Perceived Ownership of space by different groups
2 Place Satisfaction (general residential, open space or building)
<i>satisfaction with the neighborhood where you live (in case of large scale intervention)</i>
<i>overall satisfaction with the building where you live (increase of green roofs and walls)</i>
<i>satisfaction with the NBS/green area of intervention around where you live (in case of urban gardening, urban parks and green noise barriers)</i>
<i>satisfaction with the building characteristics (thermal comfort, landscape aesthetics [of buildings] sound environment, lighting , availability of common spaces, local services and amenities, quality of public areas, accessibility to green spaces</i>
3- Psychosocial issues Social cohesion
3.1 Social Interaction and cohesion
<i>Social interaction, support, and cohesion (asking a favor, trust people in neighborhood, asking for help, getting along, people bond from different backgrounds, happy with relationships, asking for help)</i>
<i>talk with neighbours apart greetings</i>
3.2 Place Identity and sense of belonging
<i>evaluate sense of belonging to the building/ neighborhood/ area of intervention</i>
3.5 Local community and civic participation
<i>participation in social activities related to other people and groups</i>
<i>In favour of new common space and co-management</i>
4- CLEVER intervention / Nbs
<i>Knowledge about clever project</i>
<i>what do you know about clever interventions</i>
<i>Knowledge about NBS in general</i>
<i>Knowledge about Milan green roofs / shared gardens / green stations</i>
<i>Positive impact of clever intervention</i>
<i>in favour for CLEVER intervention</i>
<i>information about CLEVER intervention (open word data collection)</i>
<i>Willingness to pay for green roofs and walls</i>
<i>participation to co-design and co-management of intervention</i>
5- Increase of safety and security perception
5.1 Lighting and clear visibility
<i>the area is lightened, visually clear paths, no sense of fear is perceived</i>
5.2 Accessibility to green area
<i>increase of accessibility means in the area (walkability, bikeability, physical activities, etc.)</i>
5.3 Maintenance of green area
<i>status of the green area (litter, green condition, furniture, etc.)</i>
<i>Difficulty of maintenance (high cost and technical errors) / vandalism, degradation</i>
5.4 Aesthetics
<i>green increase aesthetic quality of the area (green roof, walls, parks, etc.)</i>
5.5 Activities and presence of other people
<i>interaction in spaces, variety of activities, stickiness to places help you stay</i>
6- Sociodemographic data
<i>sex/gender</i>
<i>age</i>
<i>familiar status</i>
<i>Laboral situation</i>
<i>Education</i>

Figure 1: Macro and Micro indicators in Milan CALs.

Vertically: The MACRO-MICRO indicators are developed on three levels:

The macro-indicator level (dark blue) that correspond to the Specific challenge to be measured based on the Local Monitoring Plan and the data availability from the city baseline work plan. These categories are grouped around a specific theme of impact to be measured related to the NBS intervention in the area. In case of CLEVER Action Labs, they are related to either Neighbourhood interventions along a corridor, spots interventions on buildings such as green roofs and walls, and areal nodes such as parks or community gardens.

1. The micro-indicator level (light blue) those correspond to a sub-section of the macro areas of indicators. These micro-categories correspond to aggregated area of interest. Each Macro category could have one or more sub micro-categories.

2. The third level (grey colour text) is the specific KPI that is measured accordingly using a variety of tools and across different target groups. Each KPI is related to a subjective measurement that occurs only in relation to NBS implementation such as the impact of green areas in a neighbourhood on wellbeing, air quality, heat, biodiversity, etc. That level of indicators is also measured in correspondence to each CAL needs and the time of evaluation (pre- or post-greening).

The reason for this differentiation is the need to measure a complex phenomenon such as quality of life and well-being for instance, especially if related to nature-based solutions impact, is not an easy task. Technically it is an aggregated index that encompasses, relationship with nature, uses of the green areas, frequency of use, sense of belonging to the neighbourhood/ area of intervention. Another

level of a complex aggregated index is the increase of safety and security in urban areas; that macro indicator is measured with 5 different micro-indicators levels, see Figure 1.

Horizontally: The framework in Excel tool is structured in a transversal manner to cover the following aspects:

1.1. Target groups: (who)

Target groups			Measurement tool						where			when		Question
these are indications for the sample of the respondents to be gathered during all monitoring periods.			quantitative		qualitative		visualisation		CAL 1	CAL 2	CAL 3	#	#	type
			stakeholders	residents	other Specific groups	surveys on/off	on site observations	interviews stakeholders	focus groups	diaries, moodboards	mobile apps	GRW	GIAM129	TIBALD

Figure 2: horizontal axis of the measurement framework tool.

sample of local stakeholders and residents and/or other specific groups

- Stakeholders: these are meant to be local stakeholders, UIP members to be involved on a specific CAL, the preferred measurement tool in this case is the qualitative interviews. The minimum of the interviewees is 10 in the pre-greening; however, collection of data could be until theoretical saturation.
- Residents: These are residents from same neighbourhood of the intervention in CALs and could be transversal to all UIP if it is a city scale intervention². The preferred measurement tool in this case is the quantitative analysis tools from surveys and on-site visual observations.
- Other Specific groups: specific groups of interest to the sample of surveys or interviews based on groups of interest³. The preferred measurement tool in this case are the focus groups that give more insights on the interest of the NBS intervention.

That section is preceded by a socio-demographic analysis⁴ that gives some indication on the sample and the potential control group of specific local stakeholders to be interviewed in pre-greening and post-greening phases.

1.2. Measurement Tools: (how)

This is the selection of the most adequate tool to be used for data collection.

Quantitative tools: this is supposed to be collected through a number of surveys and on-site observations.

² In Milan, this is the case of CAL1 for instance since it is a public bid for green roofs and walls around the whole city.

³ In Milan, this is the case of CAL3. Commuters related to the Tibaldi station should be surveyed. However, they might be or not residents in the area. CAL1 also has a particular specific target group which are the residents of the building where the green walls are installed and the residents in front of the window whereas the green façade is.

⁴ Socio demographic analysis should consider sex, age range and vicinity to the area of intervention. However, it should be gender, age and race balanced and should include vulnerable population sample and consider equity effects and impacts for specific groups- especially disadvantaged or underserved target groups.

- Surveys: are mainly intended paper-based and online surveys⁵. They are currently being developed in approximately 4 sections respectively to the indicators in evaluation framework. They should be in the native language of the city to be more consistent and coherent with the context of the neighbourhood or the intervention in focus. Sample size of the surveys should be larger than the interviews to be significant.
- On-site observations: are to be carried by a research team (group of observers) interested in the NBS intervention. To be statistically significant, on-site observations should have a variety of counts for people using the green space in different positions (stationary and/or in movement). This count should occur within the same weather season timeframe for at least three different days during a week (weekends included) and for at least 30 consecutive days (not necessarily the same every week). For a total of 10 at least-12 days of observation in total in the pre-greening phase. The same operation should be repeated in the post-greening phase after the completion of the intervention.

Qualitative tools: these are the face-to-face interviews with local stakeholders and focus groups.

- Interviews with local stakeholders: are the face-to-face interviews conducted by the facilitator of each CAL and are pre-tested interviews formats with CAL team for a total of 10 in pre-greening phase. The control groups should be the same for the post-greening phase.
- Focus groups: are the groups of participants related in the co-design phase in CLEVER Action Labs. The relevant surveys and data collection should be done in one of co-design sessions in the pre-greening phases.

Visualisation tools: this is the creative participative methods such as mood boards, diaries, visual simulation applications and co-mapping applications.

- Diaries and mood boards: are conducted through collaborative activities such as co-design scenarios workshops (you can refer to [Tool 8.4](#) of the Clever Cities Co-creation Guidance); and are related to a sample of gender-balanced citizens that represent the whole area of interventions. The outcomes from citizens should be partially validated by the facilitators if they are asked to draw/express what they like about their neighbourhood/park/building. The facilitator should evaluate the presence of green elements in their expressions to namely correlate with their relationship with nature, their impression of green elements as aesthetic representation of quality-of-life increase; as well as the interaction between elements in the space, variety of activities and presence of other people in the drawings/expressions.
- Mobile applications (and other digital platforms): there has been encouragement to use smart apps and digital platforms to measure public participation through GIS tools that

⁵ All surveys are few pages long - max 4 pages offline or online: max 20 mins per filling time.

combine questions related to heat island, anonymous data geographically located to a specific location and/or a group of users.

- For digital mapping and public participation tool related to geo-based questionnaires, Maptionnaire map is suggested: <https://app.maptionnaire.com/en/471/>
- For the safety and security, sensafety app is suggested: <https://sensafety.org/>
- For the positive impacts of green areas to be measured in relation to quality of life and well-being related to NBS, the Green Pass integrated application is suggested <https://greenpass.io/>
- For the human comfort in spaces, ComfortUp app is suggested. It is a citizen collaboration application through which it is possible to identify the most and least comfortable places in the city in environmental terms (acoustic, thermal and space satisfaction).
(https://play.google.com/store/apps/details?id=com.tecnalia.ComfortUp&hl=en_US)
- AR4CUP application (coming soon) evaluating the psychological well-being generated by places and the sense of acceptance.
- Registration to places and places-based hashtags from social media, Google (API) websites and similar. This is a promising field of research which increasing analytical tools made available to analyse the popularity of places.

1.3. Where and when

This part of the methodology is a binary selection of yes and no cells, whereas it is only expected to select the correspondence between each micro-indicator to be measured against which CLEVER Action Lab (1,2,3) in each city.⁶ If the KPI is selected to be measured, a corresponding cell of when should be highlighted in pre-greening, post-greening or both phases.

1.4. Question type

For this part of the methodology, each city (CAL) is requested to fill in from a drop-down menu option the most relevant question type. The relevant categories of question types have been added such as:

- Binary questions: yes or no type of questions
- Multiple choice: if the question needs/allows more than one answer.
- Likert Scale: on a range from 1 to 5 type of question whereas 1= not at all, 2=negative, 3= maybe, 4=positively, 5= absolutely positive
- Ranking: is the reorganization of a certain list according to the priorities.

All kind of open-ended questions are considered in the qualitative interviews with local stakeholders.

⁶ For instance, in the case of Milan CALs some aspects related to relationship with nature in CAL1 cannot be verified in the pre-greening phases due to technical difficulties and/or accessibility to roofs in some buildings.

The case of Milan CLEVER Action Labs

In the following Figure 3, a simulation of using this tool of analysis is run on the city of Milan CALs.

On the horizontal axes, the sum- up of measurements showed the importance to focus on:

1. the perceived ownership of space by different groups and to focus on how the sense of belonging to the NBS area of intervention is important.
2. Increase of social cohesion and participation in community activities related to NBS.
3. The maintenance of the green area and the aesthetics of the interventions in terms of safety and security

On the vertical axes, the most common target group is the residents for all indicators. Then the most common measurement tool turned out to be the surveys online and offline, interviews with local stakeholders and focus groups. The overall of the macro indicators and most measurement tools are mainly highlighted to be used collectively in CAL2 and some in CAL 3. Hence, a combination of quantitative surveys and qualitative interviews are considered for complementary assessment.

The highlighted areas in the figure below show how the overall selection of the target groups and the measurement tool was evaluated. In addition, the highlighted area shows the exact CAL where the test-out of the overall methodology was aggregated and on which indicators mainly.

Some notes on the methodology and the survey form

The methodology is meant to be transversal to all the three CALs in order to coordinate and better understand if some of the surveys structure could be the same and allow some comparability in results between different CALs. However, we understand that the rest of the FR cities do not necessarily have the same macro thematic areas of social impact under evaluation. Hence, it is also a flexible tool to allow changing the macro categories and be replaced by whatever other theme of interest.

Visual observation on-site tool is considered highly important to give more insights on the actual status; however, it is not relevant to some indicators in order not to be biased by the observers themselves. Nonetheless, it is highly relevant to the type of use of the green space and the activities people carry in the space itself. It is then recommended in the post-greening phase evaluation as a major measurement.

For the pre-greening phase, we start drafting an online survey that has the same macro-indicators and then translate each micro-category into a type of question as per indicated in the last column, respectively. Some questions have then incorporated a more complete list of elements to be evaluated based on the CALs status. The survey is currently being pre-tested

with people not involved in the methodology to assure the questions are convenient, clear and easy to understand.

The CALs of Milan then required a more in-depth interviews form that are structured using the same methodology of macro-indicators; however, they have more questions with relation to pre-greening and post-greening phases as well. The data collection related to surveys and questionnaires will be interpreted once received.

The survey forms

Could be accessed through the Microsoft 365 (form online software); it is currently provided in Italian online and in English also offline.

Figure 3: Social Monitoring Methodology preview, source: POLIMI.

MACRO/MICRO indicators	Target groups			Measurement tool				where			when		Question type	Methodology TEC	cities comparative methodology analysis	Meter			
	stakeholders	residents	other specific groups	quantitative	qualitative	GRW	qn#	CAL 1	CAL 2	CAL 3	pre	post							
analysis of demographic data will consider: age, sex, residence vicinity, interest in the area of intervention in all monitoring periods.	these are indications for the sample of the respondents to be gathered during all monitoring periods.			surveys on/off	on site observations	interviews stakeholders	focus groups	GRW	qn#	GIAM129	qn#2	TIBALDI	qn#	pre	post				
These target groups should be diversified and balanced in age, gender, race (if needed) and include sample of social-level outcomes and all different vulnerable groups																			
1. Relationship with nature and well-being related to NBS in the area of intervention																			
1.1 Relationship with nature and well-being related to NBS																			
importance of the green as a priority in the neighborhood/ area of intervention	yes	yes	NA	yes	no	yes	yes	yes	19	yes	13	yes	8	yes	yes	scale	added to TEC	1	1
positive impact of the green areas in your neighborhood/area of intervention (health and well-being, environmental values, air quality, biodiversity, heat in summer, aesthetics of surroundings, social cohesion and relationships)	yes	yes	NA	yes	no	yes	yes	yes	20	yes	14	yes	12	yes	yes	ranking	added to TEC	1	1
did the recent emergency crisis change the use and perception of green spaces	no	yes	NA	yes	no	yes	yes	yes	22	no	no	no	no	yes		binary	added to TEC		
2. Place, use of space and connectedness to Nature																			
use the green areas around you or in your neighborhood (frequency of visits)	no	yes	NA	yes	yes	yes	yes	yes	21	yes	no	no	yes	yes	binary	1.2.1 frequency			
type of use for the green space (leisure, sport, social, relax, outdoor activity, etc.)	no	yes	NA	yes	yes	yes	yes	yes	7	yes	6	yes	1	yes	yes	multiple choice	1.2.3 activities	1	1
Time of use / work/ living in building/ neighborhood / area of interest (COVID)		yes	NA	yes	no	no	no	yes	10	yes	22	no	no			binary	1.2.2 time of use		
Frequency relationship time with building/ neighborhood/ area of intervention	yes	yes	NA	yes	no	no	no	yes	9	yes	8	yes	34	yes		binary	1.2.2 time of use	1	1
Activities usually carried out in the place (multiple answer)	no	yes	NA	yes	no	no	yes	no	yes	yes	yes	3	yes			multiple choice	1.2.3 activities		
3. Perceived ownership of space and sense of Belonging																			
3.1 Place Satisfaction (general residential, open space or building)																			
General satisfaction with the NBS/green area of intervention around where you live (in case of urban gardening, urban parks and green noise barriers)	yes	yes	commuters in CAL 3	yes	no	yes	yes	yes	23	yes	24	no	yes	yes	binary	2.2 Open space satisfaction			
Place Satisfaction with the building characteristics (thermal comfort, landscape, aesthetics of buildings) sound environment, lighting , availability of common spaces, local services and amenities, quality of public areas, accessibility to green spaces)	yes	yes	residents of same building in CAL 1 in pre-post	yes	no	no	no	yes	15	yes	12	yes	7	yes	yes	scale	2.3 Residential satisfaction Building neighborhood	1	1
4. Psychosocial issues and Social cohesion																			
4.1. Social Interaction and cohesion																			
Social interaction, support, and cohesion (asking a favor, trust people in neighborhood, asking for help, getting along, people bond from different backgrounds, happy with relationships)	yes	yes	same participants in pre-post	yes	yes	yes	yes	yes	13	yes	11	yes	6	yes	no	scale	3.1. place-Social interaction and cohesion	1	1
talk with neighbours apart greetings	no	yes	same participants in pre-post	yes	no	yes	yes	yes	11	yes	10	yes	4	yes	no	binary	3.1. place-Social interaction and cohesion	1	
4.2. Place identity and sense of belonging																			
evaluate sense of belonging to the building/ neighborhood/ area of intervention	yes	yes	NA	YES	no	no	yes	yes	8	yes	7	yes	2	yes	yes	binary	3.2 place- Sense of belonging	1	1
3.5 Local community and civic participation																			
participation in social activities related to other people and groups	no	yes	NA	yes	yes	yes	yes	yes	12	no	yes	5	yes	yes	binary	3.5 Local community and civic participation	1		
In favour of new common space and co-management	yes	yes	na	yes	no	no	no	yes	16-17	no	yes	13	yes	no	open ended	added to TEC			
5. Citizen perception about safety and security																			
5.1 Lighting and clear visibility																			
the area is lightened, visually clear paths, no sense of fear is perceived	yes	yes	NA	yes	yes	yes	yes	yes	29	yes	27	yes	26	yes	yes	ranking	4.4. Clever interventions - Concerns		
5.2 Accessibility to green area																			
increase of accessibility means in the area (walkability, bikeability, physical activities, etc.)	yes	yes	NA	yes	yes	yes	yes	no	yes	yes	yes	26	yes	yes	ranking	4.4. Clever interventions - Concerns			
5.3 Maintenance of green area																			
status of the green area (litter, green condition, furniture, etc.)	yes	yes	NA	yes	yes	yes	yes	yes	34	yes	27	yes	26	yes	yes	ranking	4.4. Clever interventions - Concerns	1	
Difficulty of maintenance (high cost and technical errors) / vandalism, degradation	yes	yes	na	yes	no			yes	34	yes	28	yes	27	yes	no	scale	4.4. Clever interventions - Concerns	1	
5.4 Aesthetics																			
green increase aesthetic quality of the area (green roof, walls, parks, etc.)	yes	yes	NA	yes	no	yes	yes	yes	34	yes	27	yes	26	yes	yes	ranking	4.4. Clever interventions - Concerns	1	
5.5 Activities and presence of other people																			
interaction in spaces, variety of activities, stickiness to places help you stay	yes	yes	NA	yes	yes	yes	yes	yes	29	yes	27	yes	27	yes	yes	ranking	4.4. Clever interventions - Concerns	1	
6. Knowledge about CLEVER Cities project and interventions																			
Knowledge about clever project	yes	yes	NA	yes	no	no	no	yes	24	yes	30	yes	9	yes	no	binary	4.1. Information about Clever and NBS	1	1
what do you know about clever interventions	yes	yes	NA	yes	no	no	no	yes	25	yes	31	yes	10	yes	no	open ended	4.1. Information about Clever and NBS	1	
Knowledge about NBS in general	yes	yes	NA	yes	no	no	no	yes	26	yes	32	yes	11	yes	no	open ended	4.1. Information about Clever and NBS	1	
Knowledge about Milan green roofs / shared gardens / green train stations	yes	yes	NA	yes	no	no	no	yes	27-28	yes	26	yes	23	yes	no	multiple choice	added to TEC	1	1
Positive impact of clever intervention	yes	yes	NA	yes	no	no	no	yes	29	no	yes	24	yes	no	scale	4.3. Expectation related with Nbs benefits			
in favour for CLEVER intervention	yes	yes	NA	yes	no	no	no	yes	30	no	yes	17	yes	no	binary	4.3. Expectation related with Nbs benefits			
information about CLEVER intervention (open word data collection)	yes	yes	NA	yes	no	no	no	yes	7-31-32	yes	yes	14-18	yes	no	open ended	added to TEC			
Willingness to pay for green roofs and walls	yes	yes	NA	yes	no	no	no	yes	33	no	no	yes	no	scale	added to TEC				
participation to co-design and co-management of intervention	yes	yes	NA	yes	no	no	no	yes	35	yes	29	yes	35	yes	no	ranking	4.5. Clever intervention - Participation	1	1
7. Socio-demographic data Characteristics																			
sex/gender	yes	yes	NA	yes	no	no	no	yes	2	yes	1	yes	28	yes		binary	6.1. Demographic	1	
age	yes	yes	NA	yes	no	no	no	yes	3	yes	2	yes	29	yes		binary	6.1. Demographic	1	
familiar status	yes	yes	NA	yes	no	no	no	yes	4	yes	3	yes	30	yes		binary	6.1. Demographic	1	
Laboral situation	yes	yes	NA	yes	no	no	no	yes	5	yes	4	yes	31	yes		binary	6.3. Education & Laboral situation	1	
Education	yes	yes	NA	yes	no	no	no	yes	6	yes	5	yes	32	yes		binary	6.3. Education & Laboral situation	1	
Legend																			
	QWERTY	Macro indicator		Micro indicator	NA	yes	as is			no	posed								

Section 2: PRE-GREENING Data Gathering and analysis

Target groups, Timeline, and dissemination methods

#	Target Groups	Timeline	Methods of dissemination	Average time elapsed	Number of respondents
CAL 1	People who live or work in the buildings where the green roof / wall will be built	November 2020- May 2021	Online + on site assisted compilation (in Via Russoli and Via Ponti)	36:45* Min	79
CAL 2	Stakeholders who took part in the participatory process of co-design of G129	May 2020 - October 2020 (Limited distribution within the MiloLab and co-design participants)	Online + on site assisted compilation	23:36 Min	19***
	Inhabitants or frequenters of Giambellino neighbourhood	March 2021-April 2021** (wider distribution with municipality newsletter)	Online + on site assisted compilation	19:07 Min	167
CAL 3	Inhabitants or frequenters of Tibaldi neighbourhood	June 2020 - September 2020	Online	19:36 Min	92
Total					338***

* In CAL1, one answer was recorded during an extensive elapsed time (24 hours) due to a human error and it artificially raised the average elapsed time, substantially.

** In CAL2, a wider online and offline campaign was carried out between March and April 2021 in order to include a younger age range in the analysis. This was in response to the predominance of older age categories noticed during the initial phases of data collection.

*** The initial test-bed questionnaires are not analyzed in this research article since the need for this analysis is obsolete; it was needed to test the questionnaires logical chain and progress but does not add major statistical information to the results. Hence the total is 357-19 = 338 questionnaires are analyzed.

Regeneration Challenge: Human Health and wellbeing

1. Relationship with nature and well-being related to NBS in the area of intervention

1.1. Relationship with nature and well-being related to NBS

We used both Likert scale and ranking type of questions to measure the importance of the green area as a priority of life of participants as well as in the neighbourhood where they live.

1.1.1. importance of the green as a priority in the neighbourhood/ area of intervention (Likert scale Q: one selection in mutual exhaustive category)

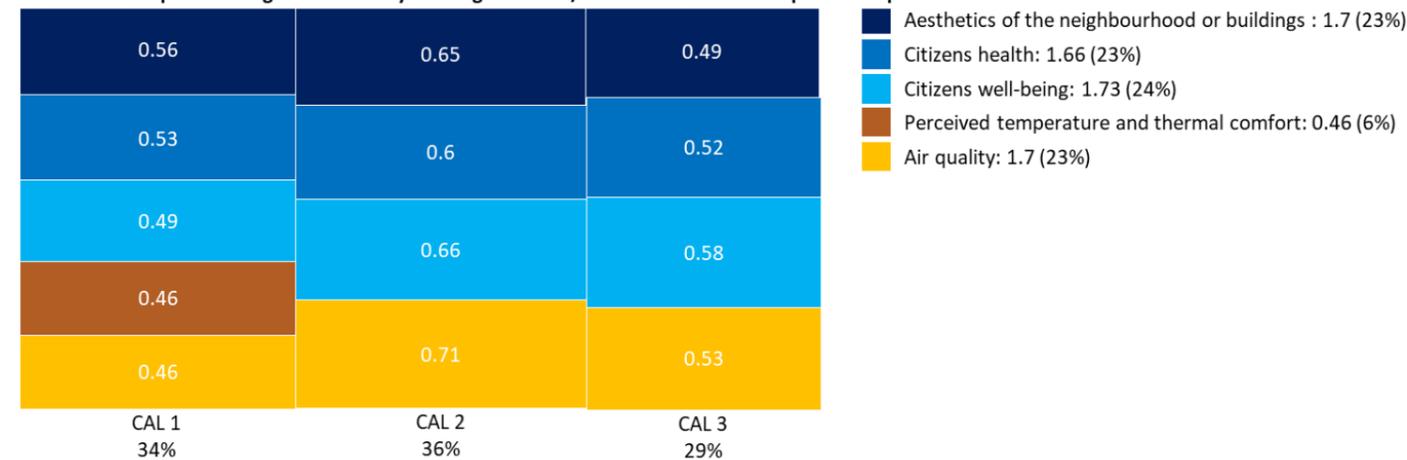
CAL 1 (79 answers)	CAL 2 (167 answers)	CAL 3 (92 answers)
<p>19. Quanto è importante per te il verde (aree verdi, alberature, aiuole, ecc. ...) nella tua vita?</p> <p>More Details Insights</p> <ul style="list-style-type: none"> ● Molto importante 63 ● Importante 13 ● Indifferente 2 ● Poco importante 1 ● Non conta nulla 0 	<p>13. Quanto è importante il verde (aree verdi, alberature, aiuole, ecc.) nella tua vita?</p> <p>More Details</p> <ul style="list-style-type: none"> ● Molto importante 144 ● Importante 20 ● Indifferente 3 ● Poco importante 0 ● Non conta nulla 0 	<p>8. Quanto è importante per te il verde (aree verdi, alberature, aiuole, ecc.), nella tua vita?</p> <ul style="list-style-type: none"> ● Molto importante 80 ● Importante 11 ● Indifferente 1 ● Poco importante 0 ● Non conta nulla 0
<p>19. How important is greenery (green areas, trees, flowerbeds, etc...) in your life?</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> Very important = $63/79=80\%$ <input type="radio"/> Important = $13/79 = 16\%$ <input type="radio"/> Indifferent = $2/79 = 3\%$ <input type="radio"/> Not very important $1/79= 1\%$ <input type="radio"/> It means nothing $0/67 = 0\%$ 	<p>14. How important is greenery (green areas, trees, flower beds, etc.) in your life?</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> Very important = $144/167= 86\%$ <input type="radio"/> Important = $20/167 = 12\%$ <input type="radio"/> Indifferent = $3/167= 2\%$ <input type="radio"/> Not very important = 0 <input type="radio"/> It means nothing = 0 	<p>8. How important is greenery to you (green areas, trees, flower beds, etc.), in your life?</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> Very important = $80/92 = 87\%$ <input type="radio"/> Important $11/92= 12\%$ <input type="radio"/> Indifferent $1/92= 1\%$ <input type="radio"/> Not very important <input type="radio"/> It means nothing
<p>The 80% of the people who highlighted the importance of the green areas in their lives, are from the residents of the same building and frequenters. While the other 2% are not satisfied from the green areas from the surrounding neighbourhood.</p>		<p>The 87% of the people who highlighted the importance of the green areas in their lives, 100% did not participate to the public event of the Tibaldi station in December 2019. While the other 2% do not know about the Tibaldi station project neither the green noise barriers developed with it.</p>

1.2. Positive impact of the greenery on environmental values

1.2.1. Positive impact of the green areas in your neighbourhood / area of intervention (health, well-being, environmental values, air quality, biodiversity, heat in summer, aesthetics of surroundings, social cohesion, and relationships) – agree / disagree scale

CAL 1 (79 answers)	CAL 2 (167 ANSWERS)	CAL 3 (90 answers)
<p>20. Quanto sei d'accordo o in disaccordo con le seguenti affermazioni? Penso che il verde urbano abbia un effetto positivo su ...</p> <p>More Details</p> <p> ■ Fortemente in disaccordo ■ In disaccordo ■ Né d'accordo, né in disaccordo ■ D'accordo ■ Fortemente d'accordo ■ Non so / preferisco non rispondere </p>	<p>14. Quanto sei d'accordo o in disaccordo con le seguenti affermazioni? Penso che il verde urbano abbia un effetto positivo su ...</p> <p>More Details</p> <p> ■ Fortemente in disaccordo ■ In disaccordo ■ Né d'accordo, né in disaccordo ■ D'accordo ■ Fortemente d'accordo ■ Non so / preferisco non rispondere </p>	<p>12. Quanto sei d'accordo o in disaccordo con le seguenti affermazioni? Penso che il verde urbano abbia un effetto positivo su ...</p> <p>More Details</p> <p> ■ Fortemente in disaccordo ■ In disaccordo ■ Né d'accordo, né in disaccordo ■ D'accordo ■ Fortemente d'accordo ■ Non so / preferisco non rispondere </p>
<p>Aesthetics of the neighbourhood and building 55.7%</p> <p>Health of citizens 53.2 %</p> <p>Citizens well-being 49.4 %</p> <p>Temperature and thermal comfort 45.6%</p>	<p>Quality of air is the most pertinent category 70.7 %</p> <p>Citizens well-being 65.9 %</p> <p>Aesthetics of the neighbourhood and building 65.3 %</p> <p>Health of citizens 60.5 %</p>	<p>Citizens well-being is the major category 57.6 %</p> <p>Quality of air and air pollution 53.3 %</p> <p>Health of citizens 52.2 %</p> <p>Aesthetics of the neighbourhood and building 48.9%</p>

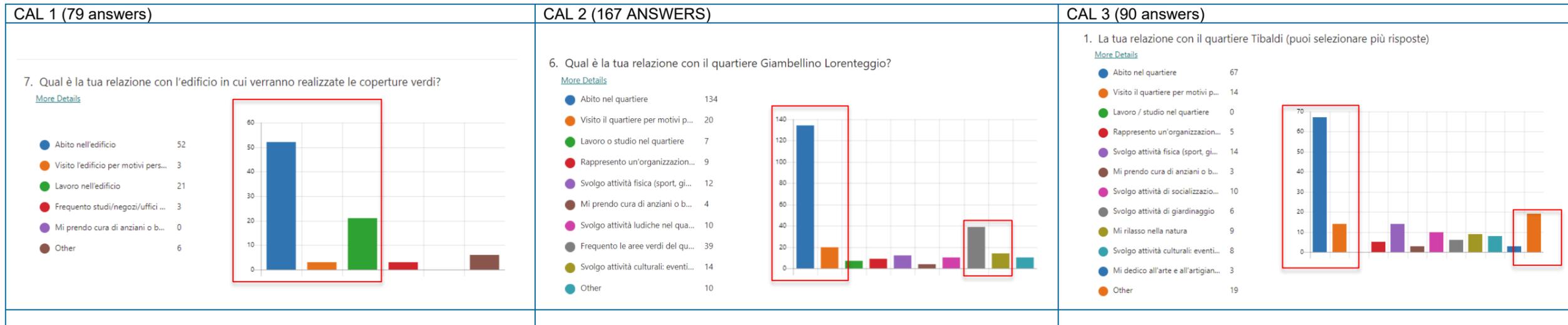
1.2. Positive impact of the green areas in your neighborhood/area of intervention in personal opinion



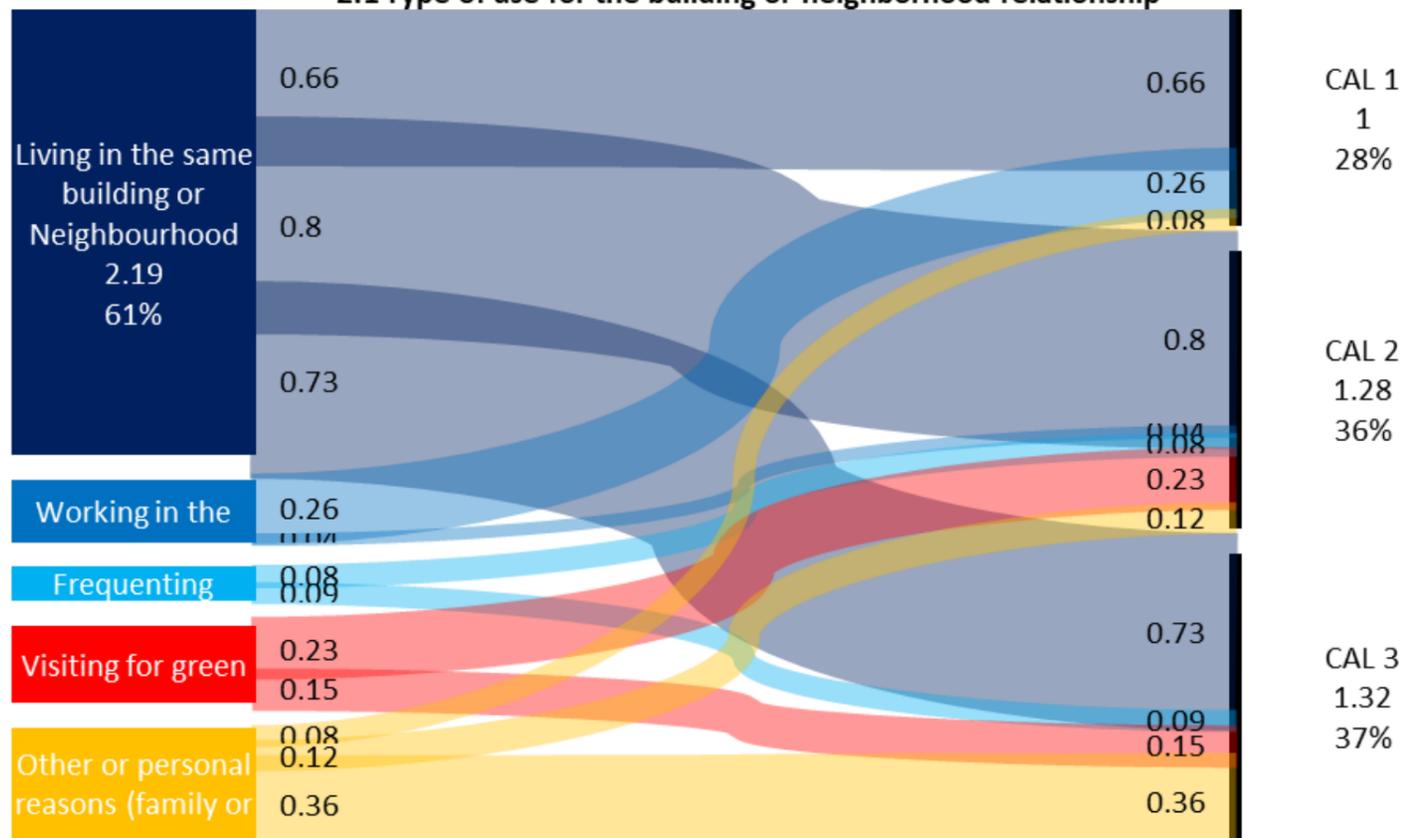
2. Place, use of space and connectedness to Nature

2.1. Type of use for the building or neighbourhood relationship

(Living in the same building or Neighbourhood, working in the same building or neighbourhood, leisure, sport, Cultural activities social, relax, outdoor activity, etc.)



2.1 Type of use for the building or neighborhood relationship



2.2. Frequency relationship time with building/ neighbourhood/ area of intervention

CAL 1 (79 answers)	CAL 2 (167 ANSWERS)	CAL 3 (90 answers)
<p>9. All'incirca da quanto tempo vivi/lavori/frequenti l'edificio?</p> <p>More Details Insights</p> <ul style="list-style-type: none"> Da meno di 6 mesi: 4 Da meno di 1 anno: 3 Da meno di 5 anni: 6 Da più di 5 anni: 66 	<p>8. All'incirca da quanto tempo vivi/lavori/frequenti il quartiere Giambellino Lorenteggio?</p> <p>More Details Insights</p> <ul style="list-style-type: none"> Da meno di 6 mesi: 1 Da meno di 1 anno: 4 Da meno di 5 anni: 29 Da più di 5 anni: 133 	<p>34. All'incirca da quanti mesi o anni vivi/lavori/frequenti il quartiere Tibaldi?</p> <p>More Details Insights</p> <ul style="list-style-type: none"> Da meno di 6 mesi: 3 Da meno di 1 anno: 3 Da meno di 5 anni: 9 Da più di 5 anni: 77 
<p>From all the 84 % who have been for more than 5 years in relationship with the building whereas the clever interventions are taking place, 92% have been either residents, or high frequenters that visit the building at least once daily (relation to Q10).</p>	<p>From the 82% who have been for more than 5 years in relationship with the neighbourhood whereas the clever interventions are taking place, 86% have selected the green areas in the neighbourhood as very important for them (Q13).</p>	<p>From the 84% who have more than 5 years relationship with the neighbourhood whereas the clever interventions are taking place, 94% have not been involved in the Tibaldi station public event (Q21) while they think the green areas of the neighbourhood are important (Q8)</p>

Regeneration challenge 3: Social cohesion and environmental justice

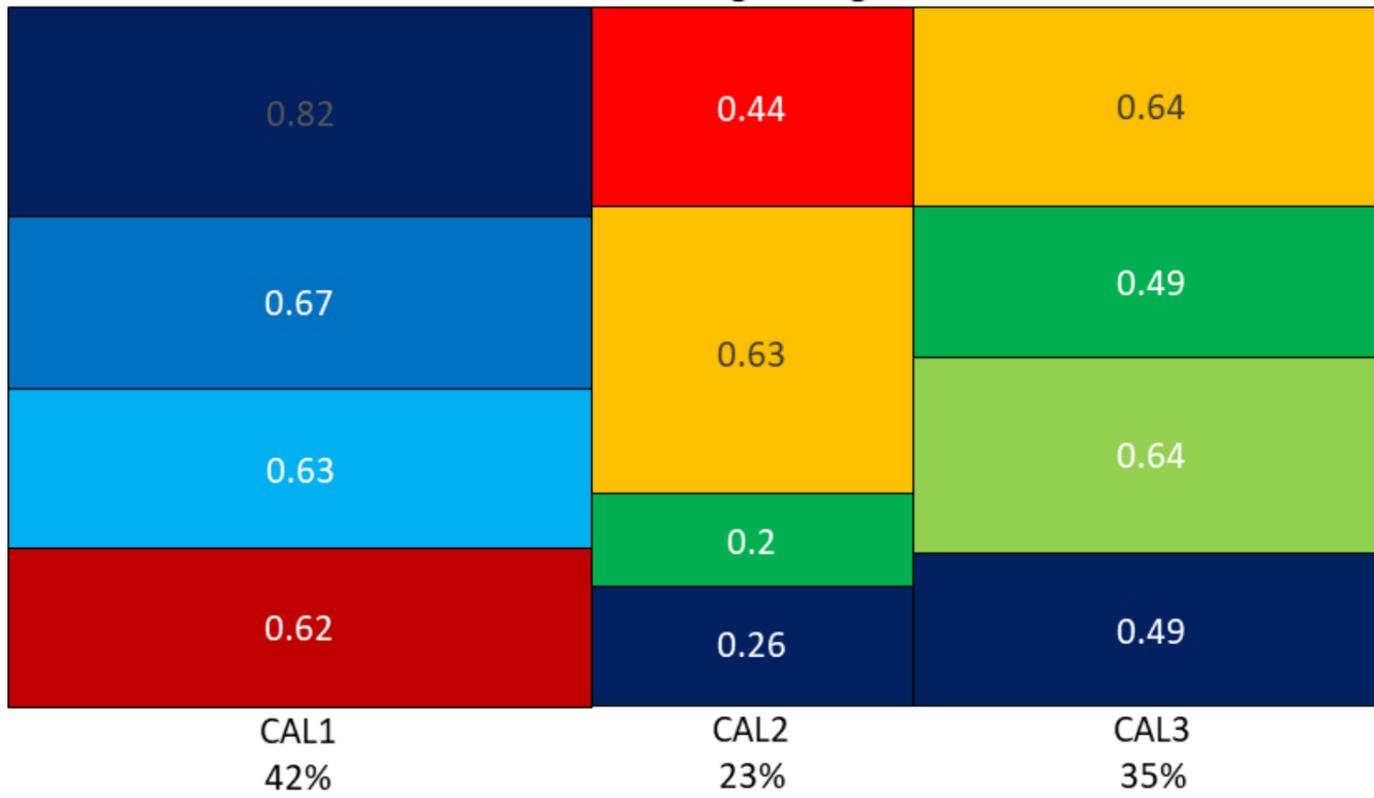
3. Perceived ownership of space and sense of Belonging

We used both binary and scale questions to measure equally the place satisfaction in all 3 CALs.

3.1. Place Satisfaction with the building or neighbourhood characteristics

CAL 1 (79 answers)	CAL 2 (167 ANSWERS)	CAL 3 (90 answers)
<p>23. Complessivamente sei soddisfatto delle aree verdi del tuo quartiere?</p> <p>More Details</p> <ul style="list-style-type: none"> ● Molto soddisfatto: 21 ● Soddisfatto: 41 ● Neutrale / non le conosco: 9 ● Non soddisfatto: 7 ● Per niente soddisfatto: 1 	<p>24. Sei soddisfatto delle aree verdi di Giambellino Lorenteggio?</p> <p>More Details</p> <ul style="list-style-type: none"> ● Molto soddisfatto: 3 ● Soddisfatto: 45 ● Neutro / non le conosco: 23 ● Non soddisfatto: 88 ● Molto insoddisfatto: 8 	<p>NOT QUESTIONED</p>
<p>15. Quanto sei soddisfatto delle seguenti caratteristiche dell'edificio?</p> <p>More Details</p> <p>Legend: Molto soddisfatto (dark orange), Soddisfatto (orange), Neutrale (light orange), Non soddisfatto (grey), Per niente soddisfatto (blue), Non so / preferisco non rispondere (dark blue)</p> <ul style="list-style-type: none"> Isolamento acustico Confort termico Luminosità Vista Disponibilità di spazi comuni Qualità degli spazi comuni Disponibilità di aree verdi Qualità delle aree verdi Manutenzione e pulizia Vicinanza a parchi e giardini 	<p>12. Quanto sei soddisfatto delle seguenti caratteristiche del quartiere Giambellino?</p> <p>More Details</p> <p>Legend: Molto soddisfatto (dark orange), Soddisfatto (orange), Neutrale (light orange), Non soddisfatto (grey), Per niente soddisfatto (blue), Non so / preferisco non rispondere (dark blue)</p> <ul style="list-style-type: none"> Ambiente e paesaggio Il quartiere in generale Servizi pubblici Accessibilità economica e convenienza dei prezzi dei servizi Manutenzione e pulizia Sicurezza Estetica degli edifici 	<p>7. Quanto sei soddisfatto delle seguenti caratteristiche del quartiere Tibaldi?</p> <p>More Details</p> <p>Legend: Molto soddisfatto (dark orange), Soddisfatto (orange), Neutrale (light orange), Non soddisfatto (grey), Per niente soddisfatto (blue), Non so / preferisco non rispondere (dark blue)</p> <ul style="list-style-type: none"> Ambiente e paesaggio Estetica degli edifici Il quartiere in generale Servizi pubblici Trasporti e logistica Accessibilità economica e convenienza dei prezzi dei servizi Manutenzione e pulizia Sicurezza

3.1 Place Satisfaction with the building or neighborhood characteristics

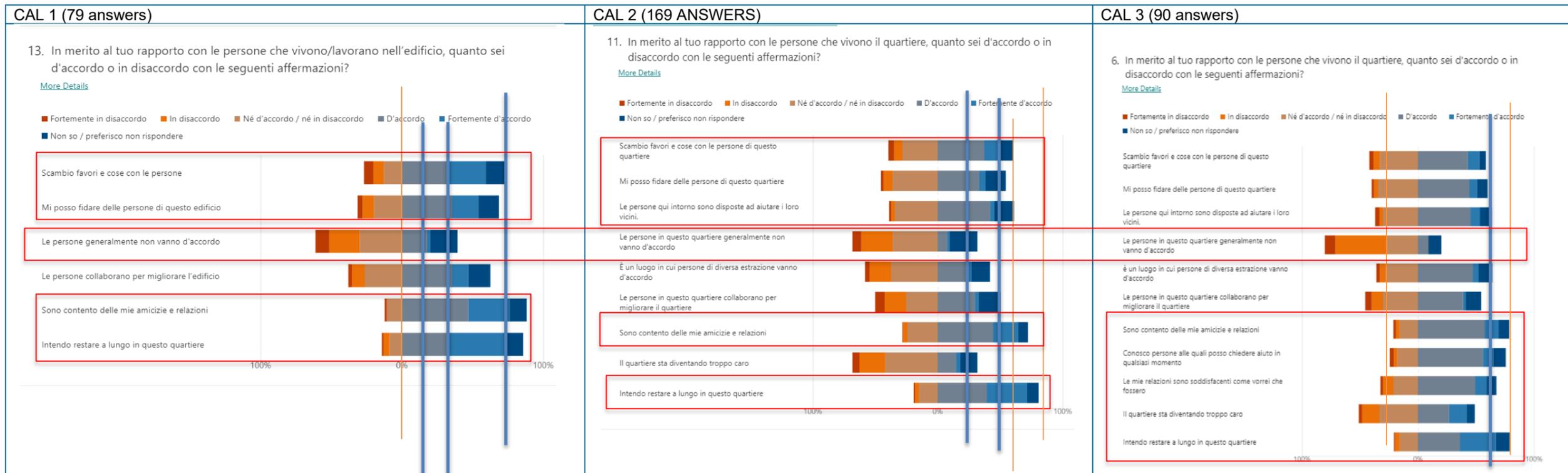


- Proximity to parks and green areas: 0.82 (13%)
- Maintenance and Cleaning of the area : 0.67 (10%)
- Availability of common spaces : 0.63 (10%)
- Economic accessibility and services prices: 0.44 (7%)
- Public services availability : 1.27 (19%)
- Environment and Landscape attributes: 0.69 (11%)
- Transportation and logistics : 0.64 (10%)
- Aesthetics of the neighbourhood or buildings : 0.62 (10%)
- The neighborhood in general: 0.75 (11%)

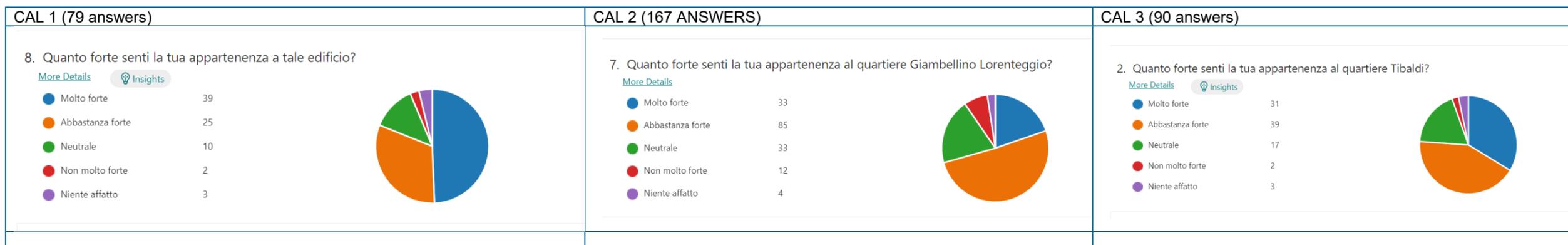
4. Psychosocial issues and Social cohesion

4.1. Social Interaction and cohesion

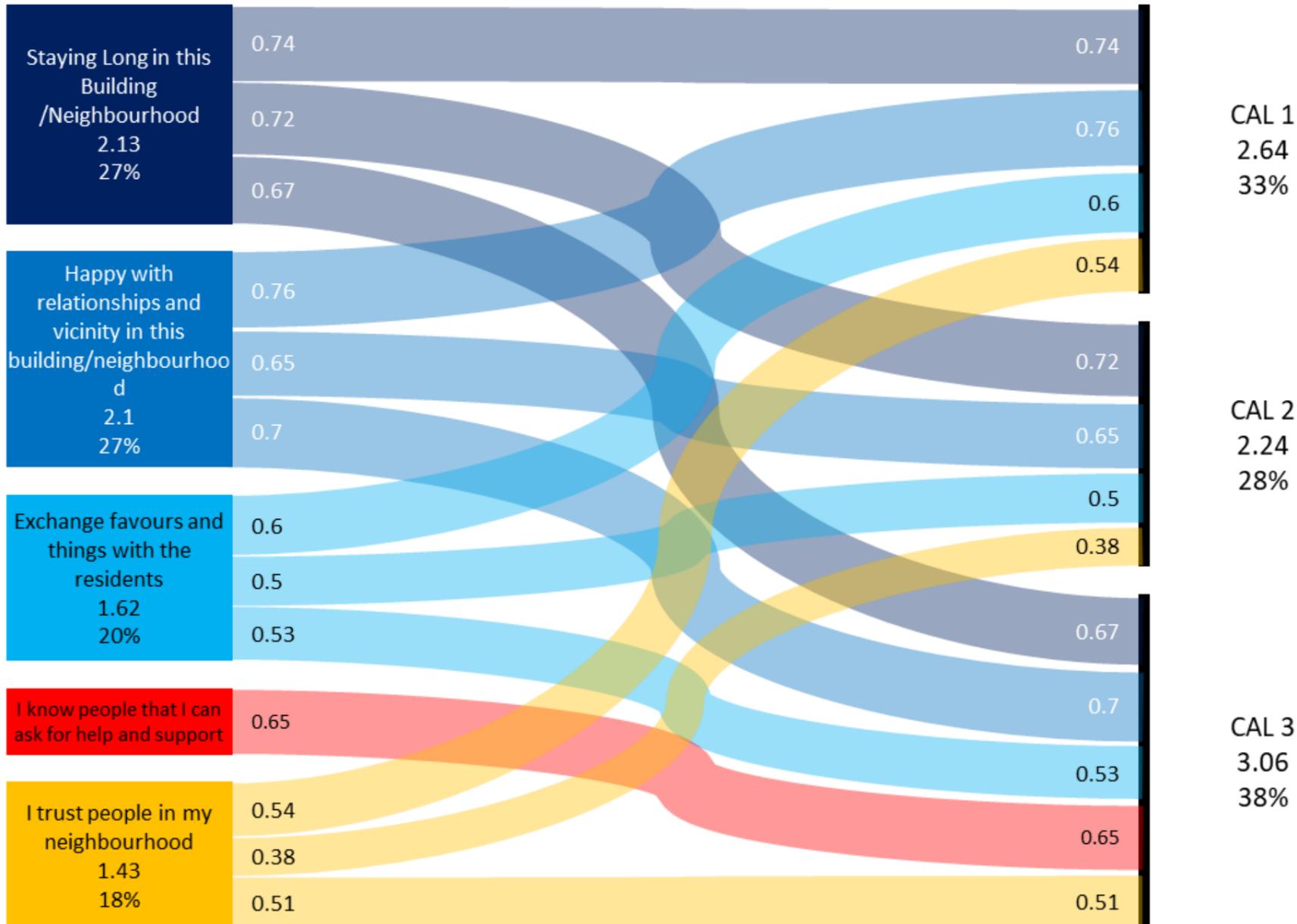
4.1.1. Social interaction, support, and cohesion (asking a favour, trust people in neighbourhood, asking for help, getting along, people bond from different backgrounds, happy with relationships, asking for help)



4.2. Place identity and sense of belonging



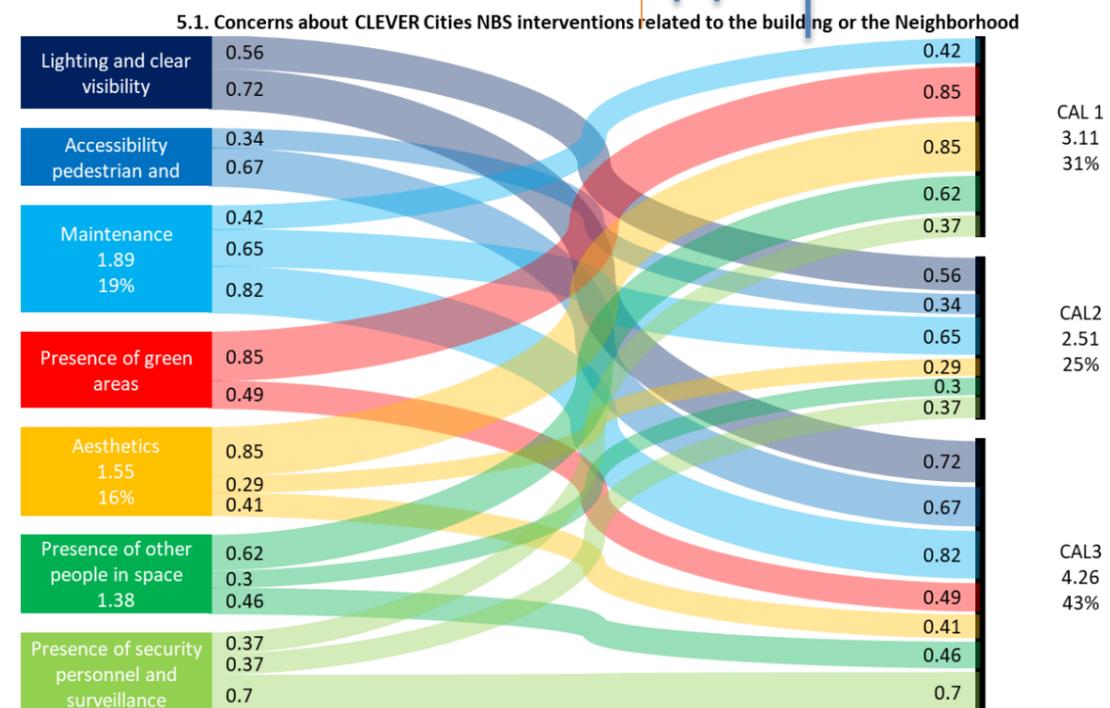
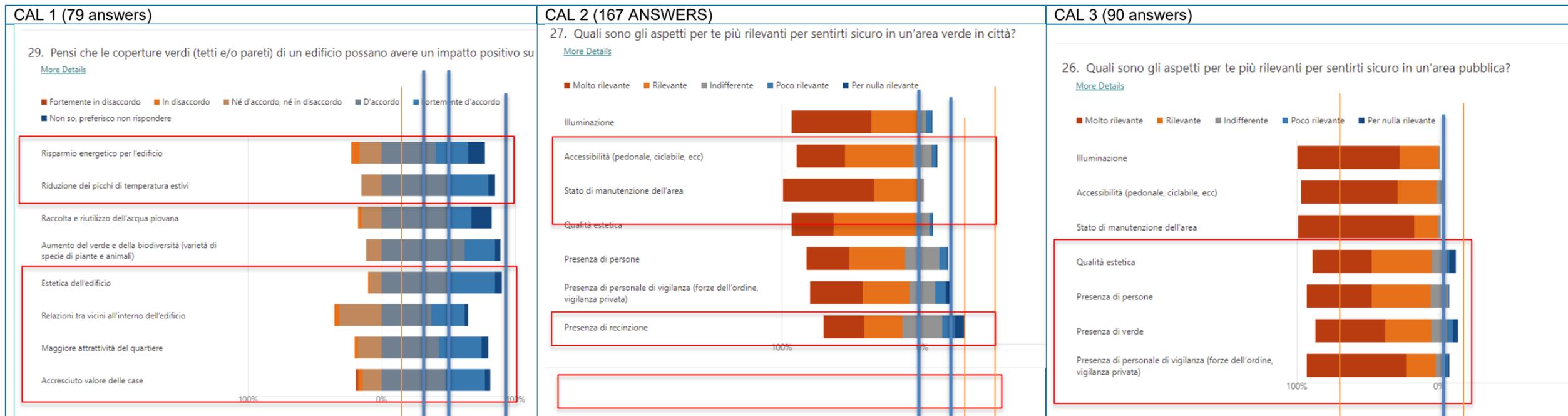
4.1. Place Social interaction, support and Cohesion



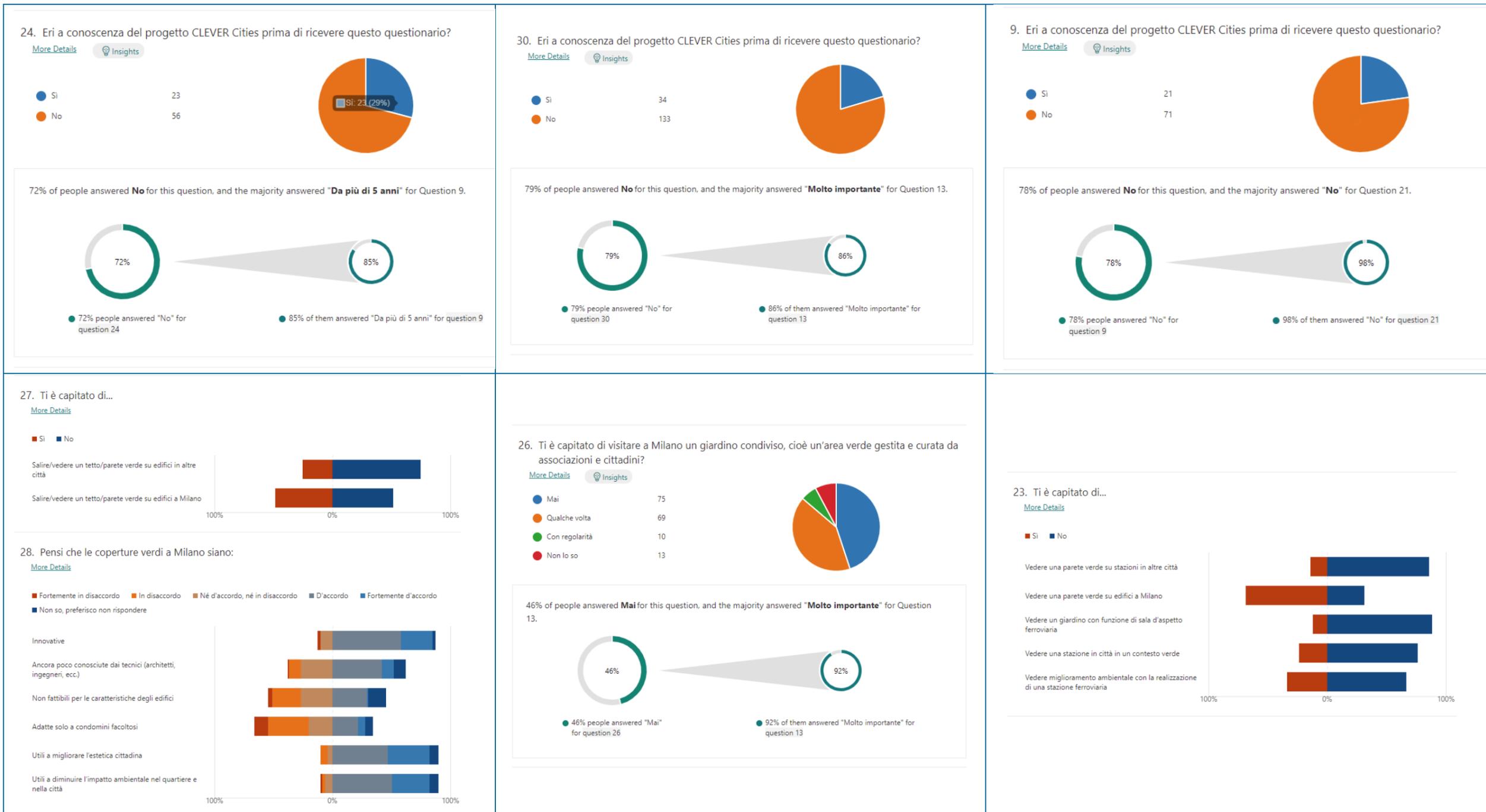
Regeneration Challenge 4: Citizen security

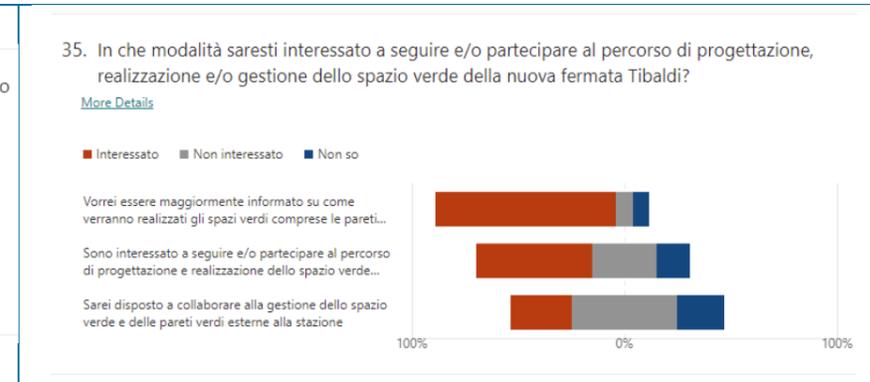
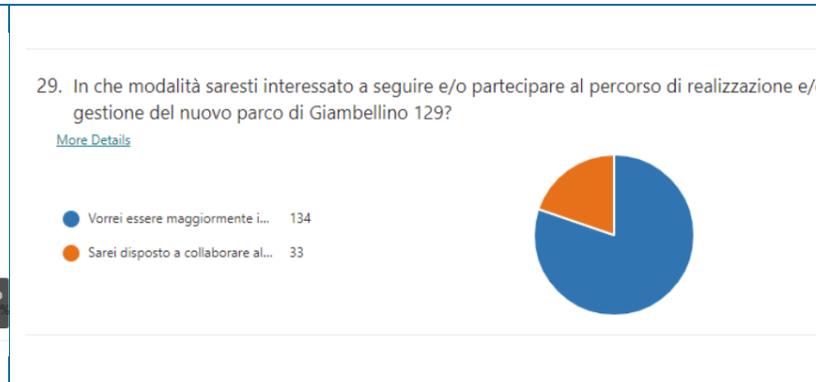
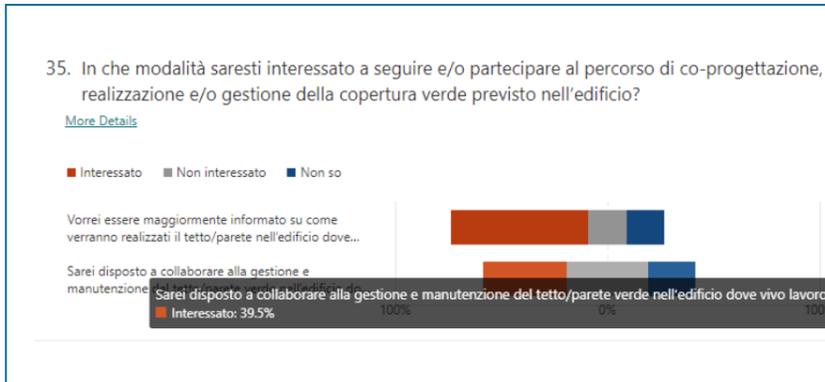
5. Citizen perception about safety and security

5.1. Concerns about CLEVER Cities NBS interventions related to the building or the Neighbourhood

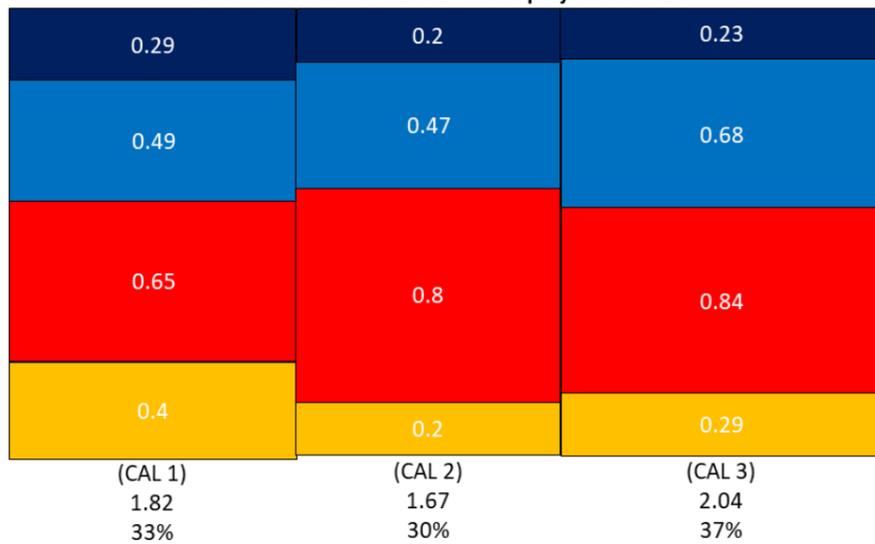


6. Knowledge about CLEVER Cities project and interventions





Information about CLEVER Cities project and NBS



- Knowledge about CLEVER Cities project generally before the questionnaire: 0.72 (13%)
- Knowledge about Milan green roofs / shared gardens / green stations respectively : 1.64 (30%)
- I want to be more informed about how the roof / wall will be built in the building or Neighbourhood where I live / work: 2.29 (41%)
- I want to collaborate in the co-management and co-maintenance of the green roof/ wall in the building or Neighbourhood where I live/work: 0.88 (16%)

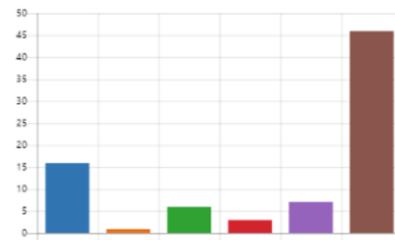
7. Socio-demographic data Characteristics



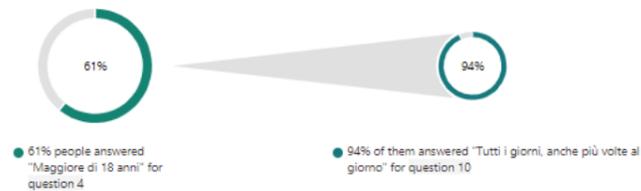
4. Hai figli? In quale fascia di età?

[More Details](#) [Insights](#)

Non ho figli	16
0-5 anni	1
5-10 anni	6
10-13 anni	3
13-18 anni	7
Maggiore di 18 anni	46



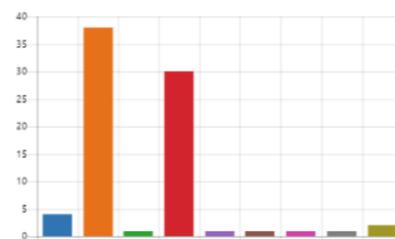
61% of people answered **Maggiore di 18 anni** for this question, and the majority answered **"Tutti i giorni, anche più volte al giorno"** for Question 10.



5. Occupazione

[More Details](#) [Insights](#)

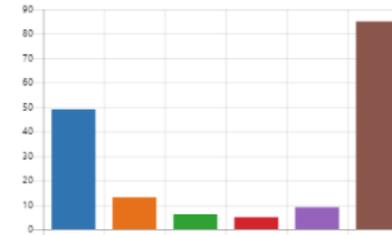
Disoccupato	4
Dipendente o lavoratore auto...	38
Lavoratore autonomo con dip...	1
Inattivo / pensionato	30
Casalingo/a	1
Inattivo - Malato o disabile a l...	1
Studiante (a tempo pieno o pa...	1
Preferisco non rispondere	1
Other	2



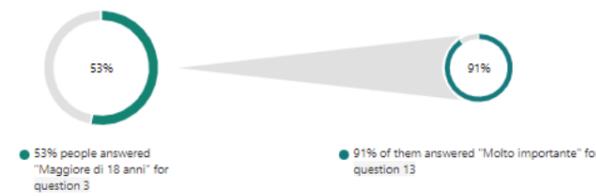
3. Hai figli? In quale fascia di età?

[More Details](#) [Insights](#)

Non ho figli	49
0-5 anni	13
5-10 anni	6
10-13 anni	5
13-18 anni	9
Maggiore di 18 anni	85



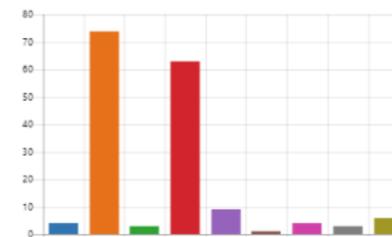
53% of people answered **Maggiore di 18 anni** for this question, and the majority answered **"Molto importante"** for Question 13.



4. Dal punto di vista situazione lavorativa attualmente sei:

[More Details](#) [Insights](#)

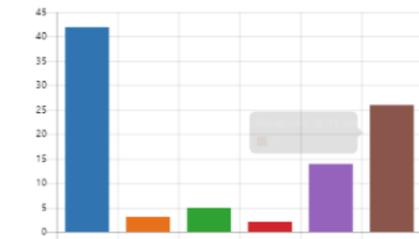
Disoccupato	4
Dipendente o lavoratore auto...	74
Lavoratore autonomo con dip...	3
Inattivo / pensionato	63
Casalingo/a	9
Inattivo - Malato o disabile a l...	1
Studiante (a tempo pieno o pa...	4
Preferisco non rispondere	3
Other	6



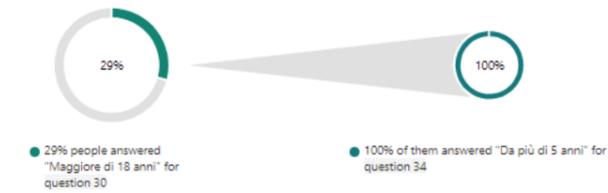
30. Hai figli? In quale fascia di età?

[More Details](#) [Insights](#)

Non ho figli	42
0-5 anni	3
5-10 anni	5
10-13 anni	2
13-18 anni	14
Maggiore di 18 anni	26



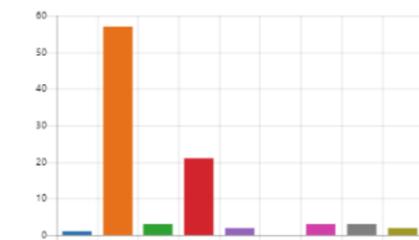
29% of people answered **Maggiore di 18 anni** for this question, and the majority answered **"Da più di 5 anni"** for Question 34.



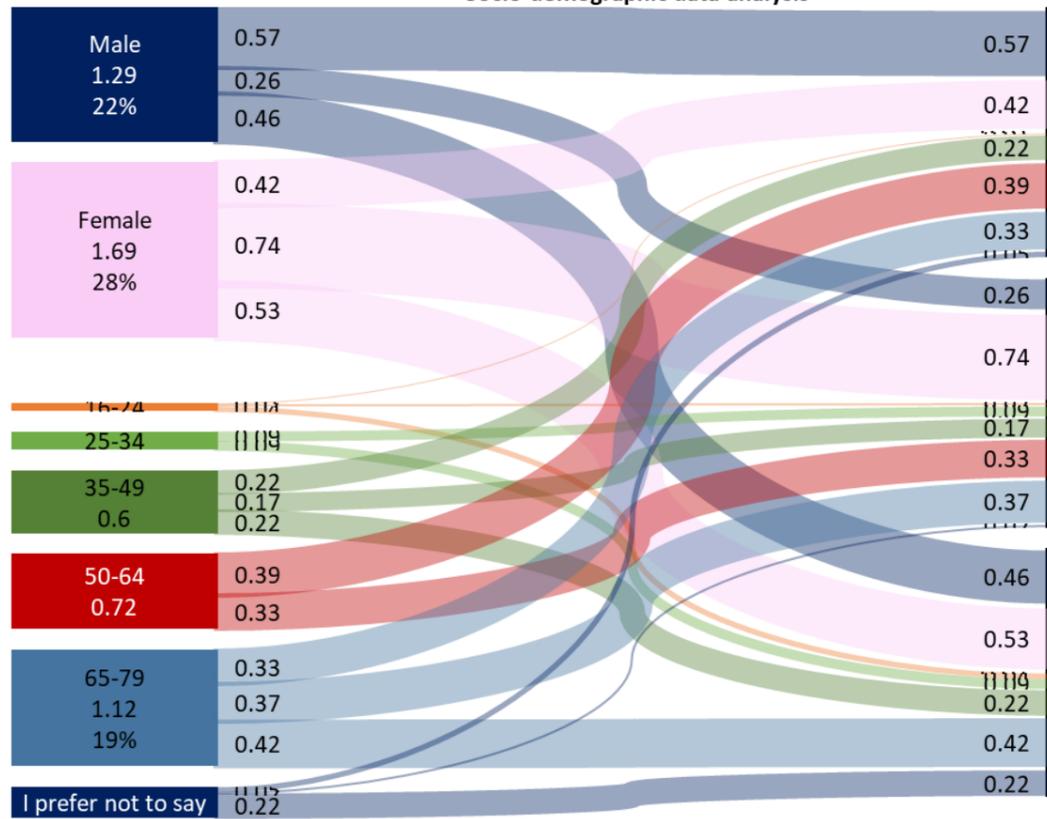
31. Occupazione

[More Details](#) [Insights](#)

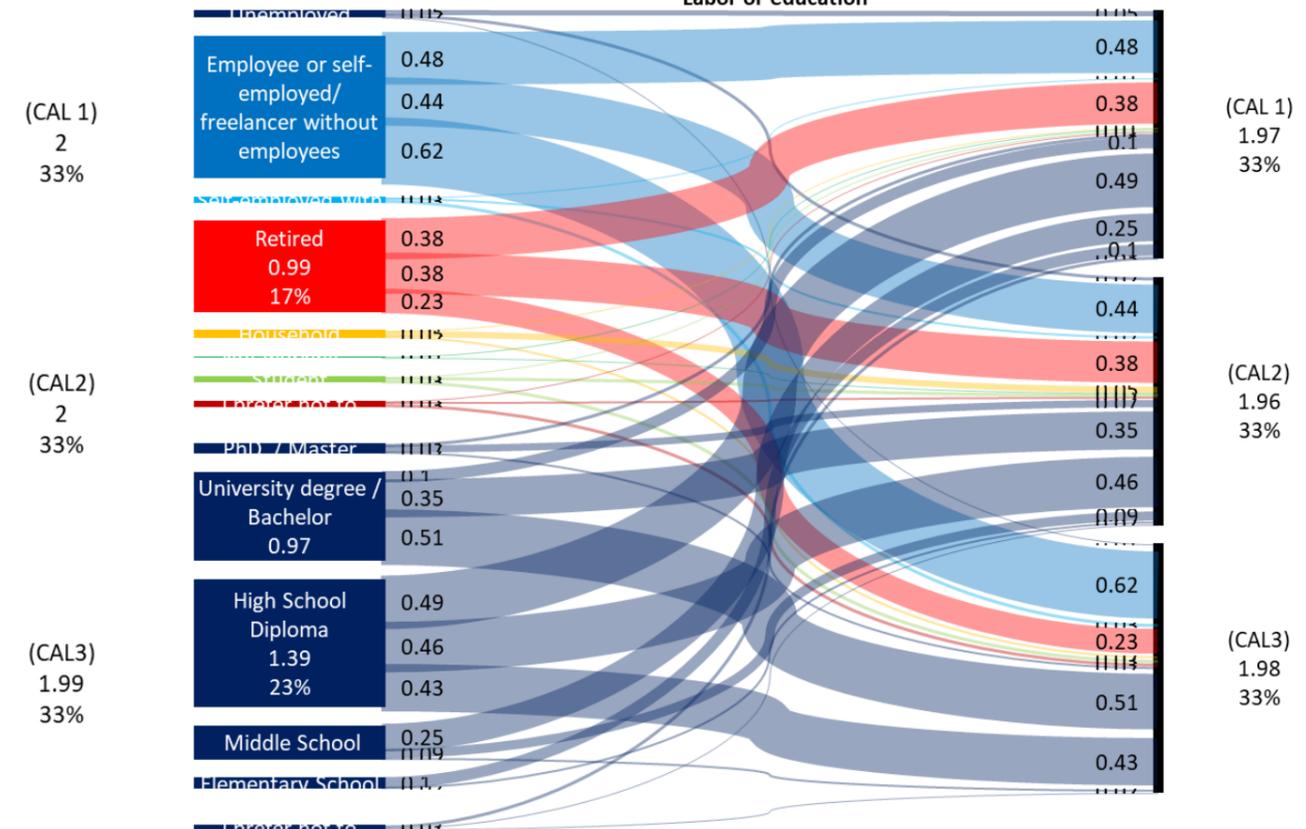
Disoccupato	1
Dipendente o lavoratore auto...	57
Lavoratore autonomo con dip...	3
Inattivo / pensionato	21
Casalingo/a	2
Inattivo - Malato o disabile a l...	0
Studiante (a tempo pieno o pa...	3
Preferisco non rispondere	3
Other	2



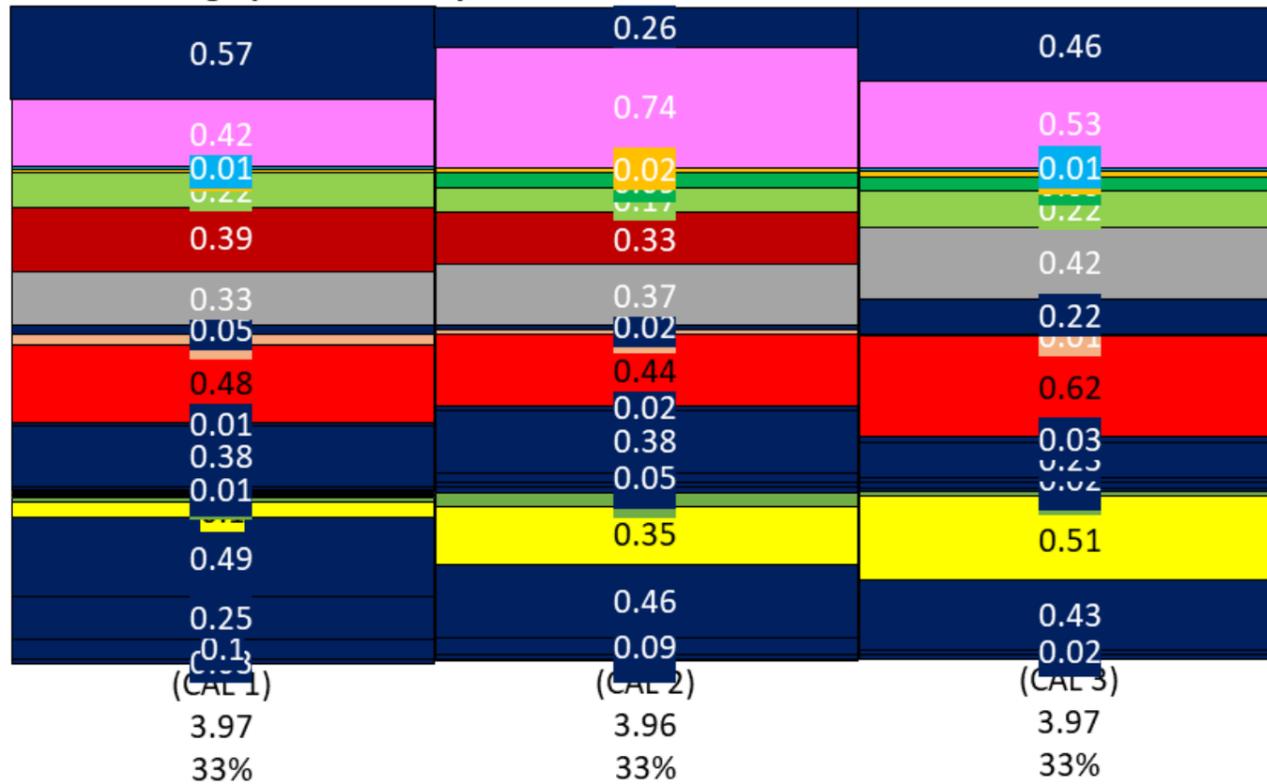
Socio-demographic data analysis



Labor or education



Socio-demographic data analysis



- Male: 1.29 (11%)
- Female: 1.69 (14%)
- I prefer not to say: 0.02 (0%)
- 16-24: 0.08 (1%)
- 25-34: 0.18 (1%)
- 35-49: 0.6 (5%)
- 50-64: 0.72 (6%)
- 65-79: 1.12 (9%)
- I prefer not to say: 0.29 (2%)
- Unemployed: 0.09 (1%)
- Employee or self-employed/ freelancer without employees: 1.54 (13%)
- Self-employed with employees: 0.06 (1%)
- Retired: 0.99 (8%)
- Household: 0.09 (1%)
- Not working – disability or long-term sick leave: 0.02 (0%)
- Student: 0.07 (1%)
- I prefer not to answer: 0.06 (1%)
- PhD. / Master: 0.11 (1%)
- University degree / Bachelor: 0.97 (8%)
- High School Diploma: 1.39 (12%)
- Middle School: 0.36 (3%)
- Elementary School: 0.12 (1%)
- I prefer not to answer: 0.05 (0%)