

"Implementation of a forecAsting System for urban heaT Island effect for the development of urban adaptation strategies" (LIFE ASTI)

Deliverable D2. Report on general public and regional authorities survey/questionnaire from educational video



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| Document Information | |
|------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Grant agreement number | LIFE17 CCA/GR/000108 |
| Project acronym | LIFE ASTI |
| Project full title | Implementation of a forecAsting System for urban heaT Island effect for the development of urban adaptation strategies |
| Project's website | https://lifeasti.eu/ |
| Project instrument | EUROPEAN COMMISSION - Executive Agency for Small and Medium-sized Enterprises |
| Project thematic priority | Climate Change Adaptation |
| Deliverable type | Report |
| Contractual date of delivery | march 2022 |
| Actual date of delivery | 26/7/2022 |
| Deliverable title | D2. Report on the general public and the local/regional authorities survey/questionnaire |
| Action | D2. Assessment of the socio-economic impacts before and after the project's implementation |
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| | |

Executive summary

Throughout the project this action monitored the implementation and effectiveness of the project through a series of indicators. KPIs were used to quantitatively monitor socio-economic indicators at specific intervals during the project and are reported in the LIFE performance tables and KPI webtool in D1. Additionally, surveys were devised to assess knowledge basis and competences of stakeholders during training events and local seminars (see D3 deliverables and E2 local training event proceedings), as well as the production of an educational video available on Youtube. From the citizens and institutional questionnaires developed in D3 (total of 400 responses for Italy and Greece combined), there is a good perception of the health risks related to heat waves in urban areas and citizens would like institutions and decision makers to address this issue more consistently by introducing adaptation and mitigation measures to improve the thermal conditions in cities and promote healthier wellbeing. The educational video developed in D2 was complemented with a survey to evaluate the understanding of the educational video by responders. The survey was developed using Google modules, with a set of 12 questions based on the content of the video: UHI monitoring, forecasting of heat waves and UHI intensity, health effects of heat waves and heat warning systems. All questions were multiple choice and devised by DEASL and ISAC-CNR. Results from the survey show how most participants had a good understanding of what an urban heat island was, how it was measured and that it was more intense at night. They recognise climate change affects the UHI intensity, and how higher temperatures in urban areas pose a risk to peoples' health both in direct and indirect terms. With reference to LIFE ASTI products, there was a good understanding of the monitoring campaign, the forecast model to predict UHI intensity and of warning systems and their use for public health prevention and awareness raising. This educational tool as well as the survey will remain operational also in the 5 years following the end of the project as foreseen in the AFTER LIFE to submit to additional cities involved, promote knowledge sharing and engagement with local stakeholders, policy makers as well as an educational resource.

LIFE ASTI general public and entities surveys

As part of the LIFE ASTI Action D are dedicated to assessing and monitoring the project performance relative to the impact of the project actions. In this framework, specific KPIs try to address this aspect through the use of surveys and questionnaires carried out with entities throughout the project (during local working tables D2 report on LWT, conferences and project meetings carried out in D2) as well as online surveys carried out in D3 and D2 to individuals from entities, the general public through social media, LIFE ASTI contact lists and local networks of experts. Work for this action can be found in D3 by ISAC-CNR based on work developed in LWT surveys submitted by MoT and DEASL during LWT in 2019 (proceedings submitted in E2). As well as a survey based on the LIFE ASTI educational video developed by DEASL and described below. This educational tool as well as the survey will remain operational also in the 5 years following the end of the project as foreseen in the AFTER LIFE to submit to additional cities involved, promote knowledge sharing and engagement with local stakeholders, policy makers as well as an educational resource.

Educational video brief description

As foreseen in Action D.2 of the LIFE ASTI project a survey on general public and authorities survey was carried out between D2 and D3, lead by DEASL and ISAC-CNR.

This survey was carried out online and comprises a questionnaire based on the educational video developed by DEASL freely available on YouTube (https://www.youtube.com/watch?v=qzmz1i0vGM8) which replaces the guided tours as these were not foreseeable under COVID-19 restrictions in place from 2020 and was delayed as a consequence. The video was presented at the final conference in Thessaloniki on the 19th May 2022. We thought an online tool which could be re-used for educational purposes would be more useful and fit the purpose of both showcasing products of the LIFE ASTI project as well as raising awareness and knowledge on health risks related to heat waves and improving response. Information on urban heat islands, temperature monitoring and warning systems was also enhanced by the video. In Rome, the video was shown in high schools were monitors were located and active collaboration was set up throughout he project, thus "giving back" to the services involved.

YOUTUBE links to LIFE ASTI Educational video

An education video was developed with communication experts and collaboration with DEASL and CNR-ISAC partners who were interviewed. Images of the Rome monitoring network as well as DEASL and ISCA-CNR premises were included as well as images of the city of Rome to give a feel of the urban conurbation and potential UHI. The video was published on the LIFE ASTI Youtube channel and promoted in social media and on the project website https://lifeasti.eu/2022/05/14/urban-heat-islands-life-asti-project-educational-video/

In order to promote understanding and a wider use of the video as training material subtitles in English, Italian and Greek were provided, and 3 versions of the video uploaded. Subtitles to facilitate understanding of the videos to a wider audience, were defined by project participants. The video was produced and edited by an external subcontractor who has expertise in scientific videos and interviews. These will be kept on the website and Youtube channel and regular reports will be issued even in the AFTER LIFE to the general public and engage with stakeholders and ensure knowledge transfer and promote the project results.



English video/English subtitles

https://www.youtube.com/watch?v=qzmz1i0vGM8&list=PL3wSEMqjaPavyOCxSpp_gmyOfl2jlWE8M&index=7

Italian subtitles

https://www.youtube.com/watch?v=XIGj0pznpf0

Greek subtitles video

https://www.youtube.com/watch?v=papRc9Cr6YE

Educational survey

A survey to evaluate understanding of the educational video was defined google modules in order to be easily accessible to all and developed in the three languages with 12 questions on the main aspects of the video: UHI monitoring, forecasting of heat waves and UHI intensity, health effects of heat waves and heat warning systems. All questions were multiple choice and devised by DEASL and ISAC-CNR personnel who were actively involved in the video and in the actions presented in the video. Surveys can be found at the following links and are included at the end of the document in each language.

Link Italian survey

https://docs.google.com/forms/d/e/1FAIpQLSeYskECdfpAB6qBmeFvT2UyjGVQjvmbP6fDJWkfO7c qMfeEzQ/viewform

Link Greek survey

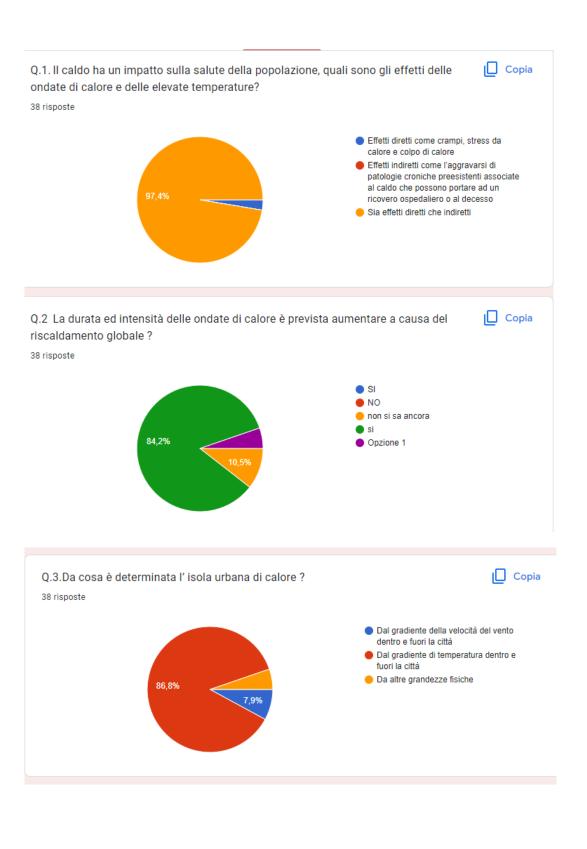
https://docs.google.com/forms/d/e/1FAIpQLSeC1Fq2YuVDGVNwwMxJBW7Lcpmw IGuYTFEqhchv DHCaoftbA/viewform

Link English survey

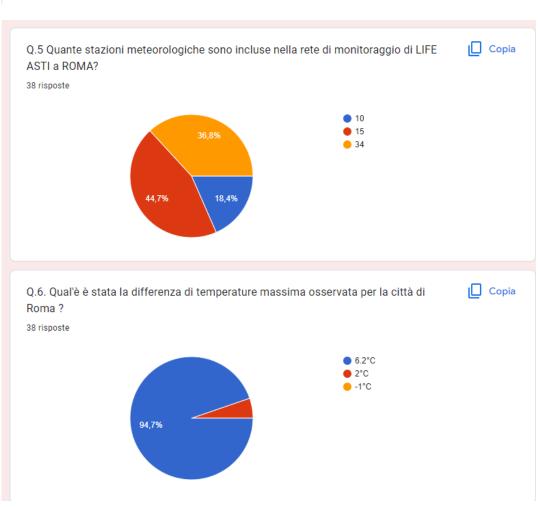
https://docs.google.com/forms/d/e/1FAIpQLSfo81RmUvgPGAKu9XyeaXgfkGG-oF2MMu1OEqsrDhbX9Tz-kw/viewform

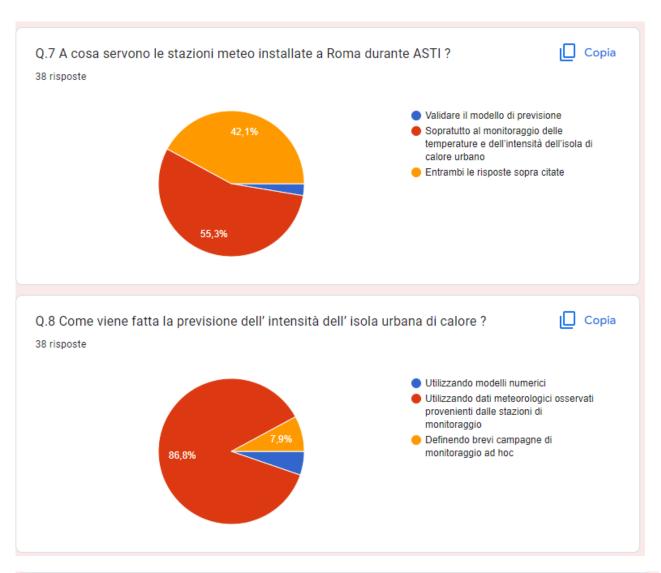
Survey results

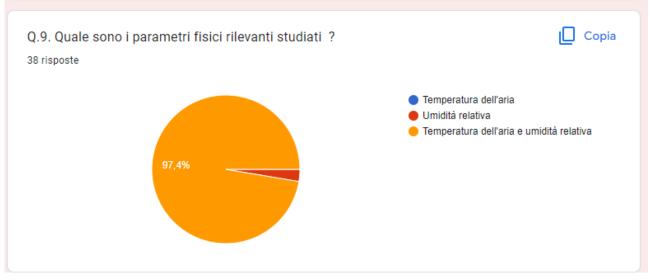
40 people compiled the Italian survey mostly students from high schools in which the weather monitors were set up as well as respondents who are linked to DEASL social media. While 10 people compiled the survey in greek language. Results from survey are shown below. Most respondents from both Italy and Greece, understood the concepts shown in the video in terms of the health effects of heatwaves, with over 90% reporting that high temperatures and extreme events have both direct and indirect effects on health. The survey showed a good understanding of what the urban heat island is and how it is measured and monitored. Specifically over 65% of respondents reported the UHI intensity is strongest at night and most responders correctly identified the intensity of the UHI in Rome (+6.2°C). Regarding the monitoring and forecasting of UHI, the majority of responders recalled the use of monitors set up in LIFE ASTI (for monitoring and predictive purposes) correctly identified meteorological variables measured. Finally, warning systems and LIFE ASTI web HHWS and UHI tools were described in the video to promote awareness and understanding of what the tools entailed and there use. Participants understood these were based on the association between temperature and mortality, that levels of warning were graded (4 level of warning, level 3 being the highest risk).

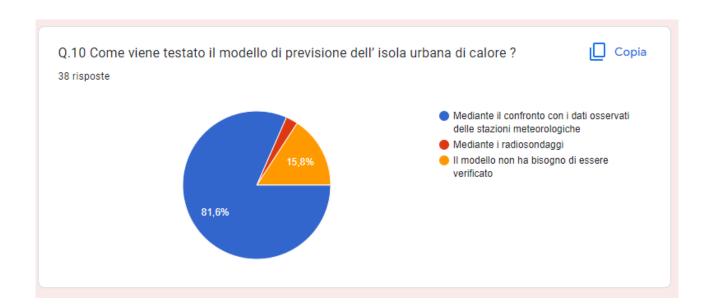


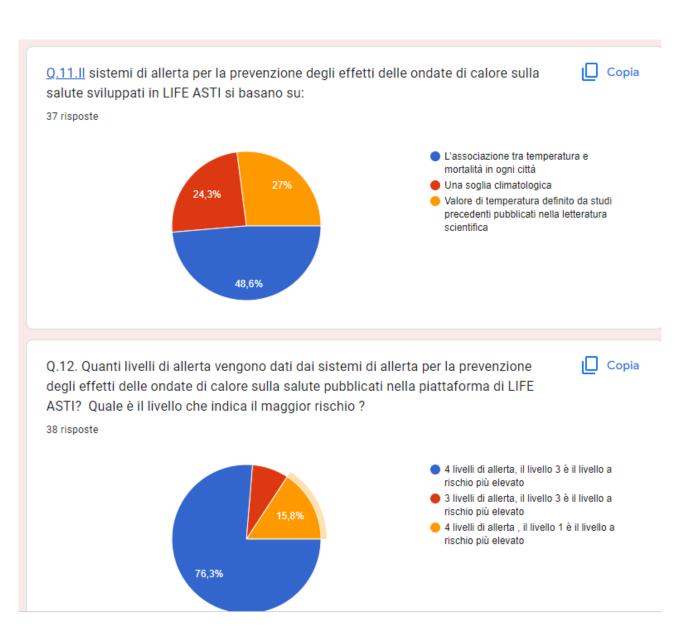




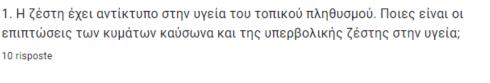




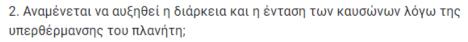




Survey results – Greek language



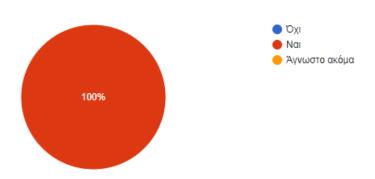






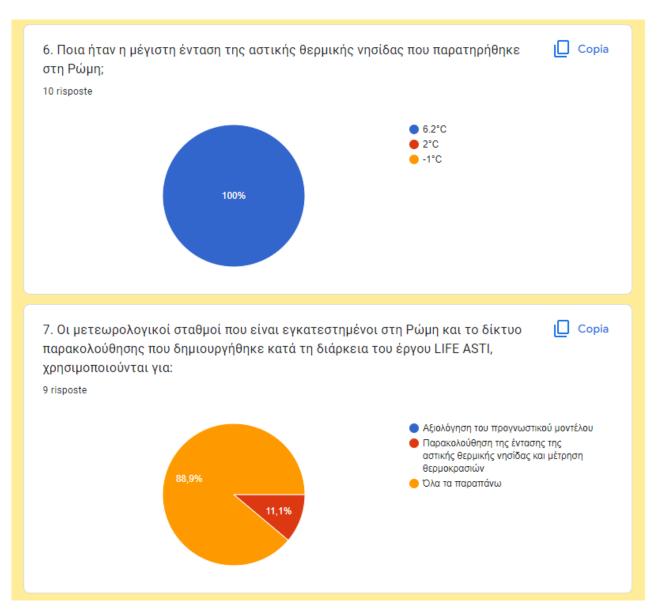
Copia

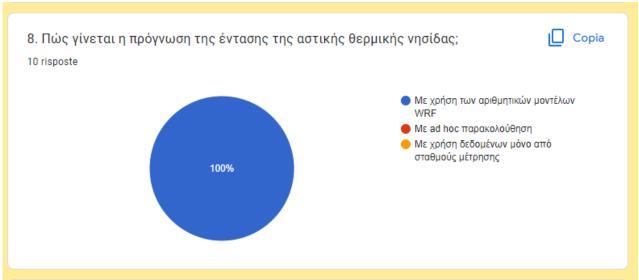
10 risposte



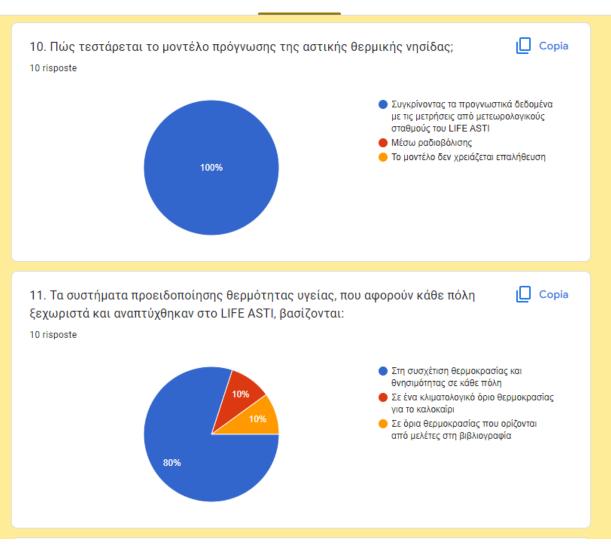


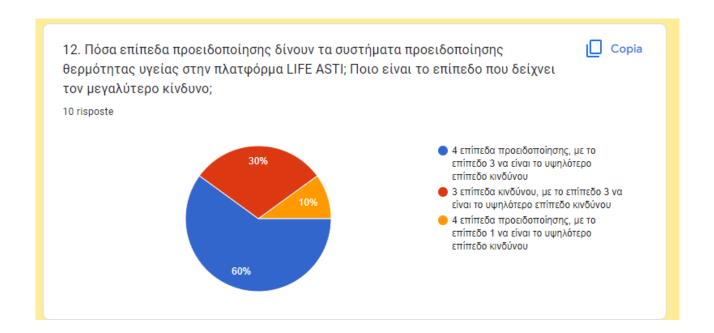












SURVEY conclusions

Most respondents from both Italy and Greece, understood the concepts shown in the video both in terms of what the urban heat island is and how it is measured and monitored as well as the role of climate change in increasing temperatures and extreme heat wave events, thus enhancing the urban heat island intensity in urban areas making residents more at risk. Furthermore, the survey provided evidence on the health effects of heatwaves, with the aim of raising awareness and knowledge among citizens on the health risks associated to extreme heat. The last part of the video and survey focused on LIFE ASTI tools, specifically warning systems and UHI forecasting tools available on the project website and APP to promote dissemination, uptake and use of tools in each city. From the survey respondents got a clear understanding of what risks and tools provided. These tools are freely available on the project website and will be used in replication cities as mentioned in the after-LIFE plan and replication guide as well as by external stakeholders in other cities or contexts as an educational/training material and evaluation tool such as schools, environmental and public health research and policy.

SURVEY texts

LIFE ASTI - Urban heat island intensity and health effects

| 1. | Q.1. Heat has an impact on local population's health. What are the effects of heat waves and extreme heat on health? |
|----|----------------------------------------------------------------------------------------------------------------------|
| | Contrassegna solo un ovale. |
| | a. Direct effects like heat cramps, heat stress and heat stroke |
| | b. Indirect effects like worsening of chronic conditions that may lead to hospitalization and death |
| | c. Both direct and indirect effects |
| | |
| 2. | Q. 2. Is the duration and intensity of heat waves expected to increase due to global warming? |
| | Contrassegna solo un ovale. |
| | yes |
| | no not known yet |
| | |
| 3. | Q.3. What determines the urban heat island? |
| | Contrassegna solo un ovale. |
| | The gradient of wind speed in and out of the city The temperature gradient inside and outside the city |
| | Population density |

| 4. | Q.4. When is the urban heat island most intense? |
|----|-------------------------------------------------------------------------------------------------------------------------|
| | Contrassegna solo un ovale. |
| | During the dayAt nightDepends on the city |
| 5. | Q.5. How any weather stations are included in the LIFE ASTI urban heat island monitoring network in Rome? |
| | Contrassegna solo un ovale. |
| | |
| | |
| 6. | Q.6. What was the maximum urban heat island intensity in terms of temperature difference observed for the city of Rome? |
| | Contrassegna solo un ovale. |
| | 6.2°C |
| | 2°C |
| | 1°C |
| 7. | The weather stations installed in Rome and the monitoring network set up during the ASTI LIFE project are used to: |
| | Contrassegna solo un ovale. |
| | validate the forecasting model monitor the urban heat island intensity and measure temperatures all the above |
| | |

| gns Iy |
|---------------------------------------------------------------------|
| |
| |
| eters forecast? |
| |
| |
| asting model tested? |
| |
| erved data from LIFE ASTI weather |
| stems developed in LIFE ASTI are based |
| |
| e and mortality in each city d for summer studies in the literature |
| |

Q.12 How many levels of warning are given by the heat health warning systems on the LIFE ASTI platform? What is the level that indicates the greatest risk?
Contrassegna solo un ovale.
4 levels of warning, level 1 being the highest level of risk
3 levels of risk, level 3 being the highest level of risk

4 levels of warning, level 3 being the highest level of risk

THANK YOU FOR COMPLETING THE LIFE ASTI QUESTIONNAIRE ON URBAN HEAT ISLANDS. For more information on the project go to our website https://lifeasti.eu/



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Google Moduli

LIFE ASTI - Isola di calore urbano ed effetti sulla salute

| 1. | delle ondate di calore e delle elevate temperature? |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Contrassegna solo un ovale. |
| | Effetti diretti come crampi, stress da calore e colpo di calore |
| | Effetti indiretti come l'aggravarsi di patologie croniche preesistenti associate al caldo che possono portare ad un ricovero ospedaliero o al decesso |
| | Sia effetti diretti che indiretti |
| | |
| 2. | Q.2 La durata ed intensità delle ondate di calore è prevista aumentare a causa del riscaldamento globale ? |
| | Contrassegna solo un ovale. |
| | Opzione 1 |
| | si |
| | on non si sa ancora |
| | |
| 3. | Q.3.Da cosa è determinata l' isola urbana di calore ? |
| | Contrassegna solo un ovale. |
| | Dal gradiente della velocità del vento dentro e fuori la città |
| | Dal gradiente di temperatura dentro e fuori la città |
| | Da altre grandezze fisiche |
| | |

| 4. | Q.4. Quando è maggiormente intensa l' isola urbana di calore ? |
|----|----------------------------------------------------------------------------------------------------|
| | Contrassegna solo un ovale. |
| | Di giorno Di notte Dipende dalla città |
| 5. | Q.5 Quante stazioni meteorologiche sono incluse nella rete di monitoraggio di LIFE ASTI a ROMA? |
| | Contrassegna solo un ovale. |
| | |
| | |
| 6. | Q.6. Qual'è è stata la differenza di temperature massima osservata per la città di Roma ? |
| | Contrassegna solo un ovale. |
| | 6.2°C |
| | 2°C |
| | -1°C |
| | |
| 7. | Q.7 A cosa servono le stazioni meteo installate a Roma durante ASTI ? |
| | Contrassegna solo un ovale. |
| | Validare il modello di previsione |
| | Sopratutto al monitoraggio delle temperature e dell'intensità dell'isola di calore urbano |
| | Entrambi le risposte sopra citate |
| | |

| 8. | Q.8 Come viene fatta la previsione dell' intensità dell' isola urbana di calore ? |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Contrassegna solo un ovale. |
| | Utilizzando modelli numerici Utilizzando dati meteorologici osservati provenienti dalle stazioni di monitoraggio Definendo brevi campagne di monitoraggio ad hoc |
| 9. | Q.9. Quale sono i parametri fisici rilevanti studiati ? |
| | Contrassegna solo un ovale. |
| | Temperatura dell'aria Umidità relativa Temperatura dell'aria e umidità relativa |
| 10. | Q.10 Come viene testato il modello di previsione dell' isola urbana di calore ? |
| | Contrassegna solo un ovale. |
| | Mediante il confronto con i dati osservati delle stazioni meteorologiche Mediante i radiosondaggi |
| | Il modello non ha bisogno di essere verificato |
| 11. | Q.11.II sistemi di allerta per la prevenzione degli effetti delle ondate di calore sulla salute sviluppati in LIFE ASTI si basano su: |
| | Contrassegna solo un ovale. |
| | L'associazione tra temperatura e mortalità in ogni città |
| | Una soglia climatologica |
| | Valore di temperatura definito da studi precedenti pubblicati nella letteratura scientifica |

12. Q.12. Quanti livelli di allerta vengono dati dai sistemi di allerta per la prevenzione degli effetti delle ondate di calore sulla salute pubblicati nella piattaforma di LIFE ASTI? Quale è il livello che indica il maggior rischio?

Contrassegna solo un ovale.

| 4 livelli di allerta, il livello 3 è il livello a rischio più elevato |
|------------------------------------------------------------------------|
| 3 livelli di allerta, il livello 3 è il livello a rischio più elevato |
| 4 livelli di allerta , il livello 1 è il livello a rischio più elevato |

Grazie per aver completato il questionario LIFE ASTI. Per ulteriori informazioni sul progetto consulta il nostro sito https://lifeasti.eu/a titolo



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Google Moduli

LIFE ASTI-Ένταση αστικής θερμικής νησίδας και επιπτωσεις στην υγεια

| 1. | 1. Η ζέστη έχει αντίκτυπο στην υγεία του τοπικού πληθυσμού. Ποιες είναι οι επιπτώσεις των κυμάτων καύσωνα και της υπερβολικής ζέστης στην υγεία; |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------|
| | Contrassegna solo un ovale. |
| | Άμεσες επιπτώσεις όπως θερμικές κράμπες, θερμικό στρες και θερμοπληξία. |
| | Εμμεσες επιπτώσεις όπως επιδείνωση χρόνιων παθήσεων που μπορεί να οδηγήσουν σε νοσηλεία και θάνατο. |
| | Άμεσες και έμμεσες επιπτώσεις. |
| | |
| 2. | 2. Αναμένεται να αυξηθεί η διάρκεια και η ένταση των καυσώνων λόγω της υπερθέρμανσης του πλανήτη; |
| | Contrassegna solo un ovale. |
| | ΄΄Οχι |
| | Ναι |
| | ΄΄ Άγνωστο ακόμα |
| | |
| 3. | 3. Τι καθορίζει την αστική θερμική νησίδα; |
| | Contrassegna solo un ovale. |
| | Η διαβάθμιση της ταχύτητας του ανέμου εντός και εκτός πόλης |
| | Η διαβάθμιση θερμοκρασίας εντός και εκτός πόλης |
| | Η πυκνότητα του πληθυσμού |
| | |

| 4. | 4. Πότε είναι εντονότερη η αστική θερμική νησίδα; |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Contrassegna solo un ovale. |
| | Κατά τη διάρκεια της ημέρας |
| | ΄΄ Τη νύχτα |
| | Εξαρτάται από την πόλη |
| 5. | 5. Πόσοι μετεωρολογικοί σταθμοί περιλαμβάνονται στο δίκτυο παρακολούθησης αστικής θερμικής νησίδας του LIFE ASTI στη Ρώμη; |
| | Contrassegna solo un ovale. |
| | 10 |
| | <u></u> |
| | <u></u> |
| | |
| 6. | 6. Ποια ήταν η μέγιστη ένταση της αστικής θερμικής νησίδας που παρατηρήθηκε στη Ρώμη; |
| | Contrassegna solo un ovale. |
| | 6.2°C |
| | 2°C |
| | -1°C |
| | |
| 7. | 7. Οι μετεωρολογικοί σταθμοί που είναι εγκατεστημένοι στη Ρώμη και το δίκτυο παρακολούθησης που δημιουργήθηκε κατά τη διάρκεια του έργου LIFE ASTI, χρησιμοποιούνται για: |
| | Contrassegna solo un ovale. |
| | Αξιολόγηση του προγνωστικού μοντέλου |
| | Παρακολούθηση της έντασης της αστικής θερμικής νησίδας και μέτρηση θερμοκρασιών |
| | Όλα τα παραπάνω |

| 8. | 8. Πώς γίνεται η πρόγνωση της έντασης της αστικής θερμικής νησίδας; |
|-----|-----------------------------------------------------------------------------------------------------------------------------------|
| | Contrassegna solo un ovale. |
| | Με χρήση των αριθμητικών μοντέλων WRF Με ad hoc παρακολούθηση |
| | Με χρήση δεδομένων μόνο από σταθμούς μέτρησης |
| 9. | 9. Ποιές είναι οι μετεωρολογικές παράμετροι πρόγνωσης; |
| | Contrassegna solo un ovale. |
| | Θερμοκρασία. |
| | Υγρασία |
| | Θερμοκρασία και υγρασία |
| | |
| 10. | 10. Πώς τεστάρεται το μοντέλο πρόγνωσης της αστικής θερμικής νησίδας; |
| | Contrassegna solo un ovale. |
| | Συγκρίνοντας τα προγνωστικά δεδομένα με τις μετρήσεις από μετεωρολογικούς σταθμούς του LIFE ASTI |
| | Μέσω ραδιοβόλισης |
| | Το μοντέλο δεν χρειάζεται επαλήθευση |
| | |
| 11. | 11. Τα συστήματα προειδοποίησης θερμότητας υγείας, που αφορούν κάθε πόλη ξεχωριστά και αναπτύχθηκαν στο LIFE ASTI, βασίζονται: |
| | Contrassegna solo un ovale. |
| | Στη συσχέτιση θερμοκρασίας και θνησιμότητας σε κάθε πόλη |
| | Σε ένα κλιματολογικό όριο θερμοκρασίας για το καλοκαίρι |
| | Σε όρια θερμοκρασίας που ορίζονται από μελέτες στη βιβλιογραφία |

12. Πόσα επίπεδα προειδοποίησης δίνουν τα συστήματα προειδοποίησης θερμότητας υγείας στην πλατφόρμα LIFE ASTI; Ποιο είναι το επίπεδο που δείχνει τον μεγαλύτερο κίνδυνο;

Contrassegna solo un ovale.

| 4 επίπεδα προειδοποίησης, με το επίπεδο 3 να είναι το υψηλότερο επίπεδο κινδύνου |
|----------------------------------------------------------------------------------|
| 3 επίπεδα κινδύνου, με το επίπεδο 3 να είναι το υψηλότερο επίπεδο κινδύνου |
| 4 επίπεδα προειδοποίησης, με το επίπεδο 1 να είναι το υψηλότερο επίπεδο |
| κινδύνου |

ΕΥΧΑΡΙΣΤΟΥΜΕ ΓΙΑ ΤΗ ΣΥΜΠΛΗΡΩΣΗ ΤΟΥ ΕΡΩΤΗΜΑΤΟΛΟΓΙΟΥ. Για περισσότερες πληροφορίες σχετικά με το έργο https://lifeasti.eu/a



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