Action A1

Deliverable A.1.2.2. A report on the approached Social Stakeholders, their responses to the questionnaire on the status of their knowledge and policies for DDS event before the implementation of the project

Due Date of the deliverable: May 2018

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Executive Summary

Within the framework of European project LIFE-MEDEA and under Action A1 “Assessment of current situation and preparation of structures and procedures for the performance of MEDEA”, a questionnaire study was carried out in an effort to capture the current state of knowledge among relevant competent authorities and stakeholders in Cyprus, Crete (Greece) and Beer Sheva (Israel) about Desert Dust Storm (DDS) events and their impact on human health. Researchers from University of Cyprus, University of Crete and Soroka Clinical Research Centre mapped and contacted regulatory authorities and social stakeholders with an interest or involvement in the DDS phenomenon and its related health effects. Representatives from these organisations were asked to provide information on their knowledge, beliefs and current practices regarding DDS events and public health protection through a specifically designed semi-structured questionnaire.

A total of 6 researchers were involved across the three sites and a total of 49 representatives from regulatory authorities and social stakeholders completed the questionnaire. Results indicate that there is good knowledge regarding DDS events and their health effects among regulatory authorities and social stakeholders although there is substantial room for improvement. Notable findings include the absence of pre-defined action plans during DDS events in some areas and the unavailability of standardised responses to enquiries from the public and sensitive subgroups.

Introduction:

The region of South Eastern Mediterranean is affected by frequent and often intense Desert Dust Storms (DDS) that may last several days and be characterise by extremely high values of coarse (aerodynamic diameter between 2.5 μm and 10 μm –PM_{10}) and fine particles (aerodynamic diameter less than 2.5 μm – $PM_{2.5}$) (Querol *et al.*, 2009; Achilleos *et al.*, 2014) Cyprus, Crete and Israel are few of the most affected countries in the southeastern Mediterranean concerning the occurrences of DDS events originating from the Sahara and the deserts of the Arabian Peninsula (Pey *et al.*, 2013) and with progressing climate change, these countries are expected to experience increasing number of DDS events in the future (Goudie and Middleton, 1992).

In previous years, a number of studies from the region have reported associations of PM10 during DDS outbreaks with increased hospital admissions for asthma, chronic obstructive pulmonary disease, cardiovascular disease and increased mortality (Middleton *et al.*, 2008; Mallone *et al.*, 2011; Samoli *et al.*, 2011; Neophytou *et al.*, 2013; Vodonos *et al.*, 2014). As evidence regarding the adverse effects of DDS events is piling up, there is increased need to address the current knowledge and relevant practices of the competent authorities as well as the knowledge and perceptions of involved social stakeholders in the region regarding the health effects of DDS events. The interrelation of scientific evidence, stakeholders concerns and competent authorities' capabilities can inform a science-based stakeholder dialogue that could eventually lead to the introduction of effective, easy to implement and sustainable public health policies toward the mitigation of DDS health effects (Welp *et al.*, 2006).

Aim and Objectives:

This report aims to capture the current state of knowledge among relevant competent authorities and stakeholders in Cyprus, Crete (Greece) and Beer Sheva (Israel) about DDS events and their impact on human health. The primary objectives of this report are:

1. Evaluate the current knowledge and practices of relevant competent and regulatory authorities in Cyprus, Greece and Israel regarding the health effects of DDS events.
2. Evaluate the knowledge and perceptions of social stakeholders regarding the health effects of DDS events.

The secondary objective of this report is to:

3. Evaluate whether there is agreement between the perceptions of regulatory authorities (government authorities) and social stakeholders (patients, parents, municipalities, academics etc) regarding DDS events, related health effects and mitigation strategies.

Methods:

Data acquisition and survey procedure:

Project personnel mapped regulatory authorities and social stakeholders with potential relevance to DDS events in Cyprus, Crete (Greece) and Beer Sheba (Israel). Representatives from each authority/stakeholder were administered a semi-structured questionnaire which included questions about their knowledge of DDS events, related health effects and relevant actions their organization may take towards protecting public health from DDS events.

The questionnaire consiststed of both open-ended and closed questions in order to best acquire information on specific issues. Some of the items of the questionnaires differed depending on the status of the responder, that is whether it is representing a relevant authority or a social stakeholder. Both types of questionnaires are available in Appendix I (English versions).

Analysis:

Stakeholders' responses were collected in paper format and a combined spreadsheet dataset from all three sites was created. Descriptive statistics were calculated using STATA 12 (Version 12, StataCorp, College Station, TX, USA) and results were summarized in tables and graphs. Graphs were developed in Microsoft Excel.

Results:

Study Participants

The survey was conducted from October 2017 to April 2018 and six project personnel in total were involved, two from each country. Table 1 provides the list of organisations that took part in this survey and indicates the nature of each engaged stakeholder (regulatory authority or social stakeholder). Regulatory authorities were defined as governmental institutions involved in public protection before or during DDS events. A sublevel categorisation for regulatory authorities was created depending on whether these were Educational, Health or Environmental regulatory bodies while social stakeholders were subdivided into patients' support groups, medical associations, parents' associations, trade unions, municipalities and academic/research institutions. Overall, we have contacted 58 stakeholders and collected 49 completed questionnaires. Of the 49 completed questionnaires, 14 questionnaires were derived from regulatory authorities and 35 questionnaires from social stakeholders. The summary description of participating institutions is presented in Figure 1. Figure 2 presents the summary description of institutions that were invited but declined to participate.

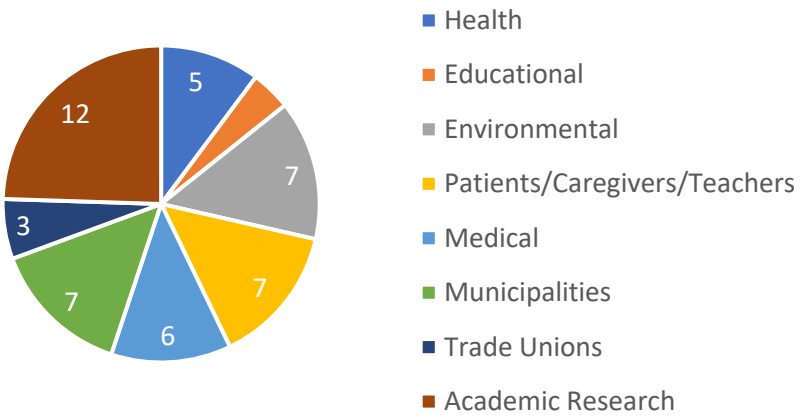

Figure 1: Summary description of participating institutions

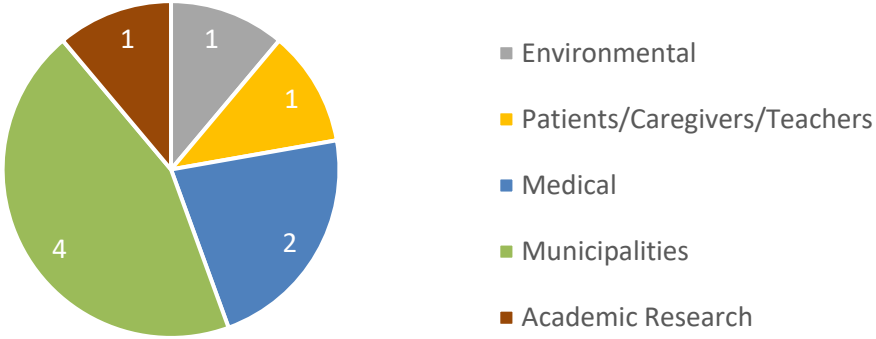

Figure 2: Summary description of institutions declining to participate in the study

Table 1: List of participating organisations from Cyprus, Greece (Crete) and Israel:

#	Country	Affiliation	Type of Stakeholder	Subcategory
1	Cyprus	Cyprus Meteorology Department, Ministry of Agriculture, Rural Development and Environment.	Regulatory	Environmental Authorities
2	Cyprus	Cyprus Department of Labour Inspection, Air quality Sector	Regulatory	Environmental Authorities
3	Cyprus	Department of Environment, Ministry of Agriculture, Rural Development and Environment	Regulatory	Environmental Authorities
4	Cyprus	Cyprus Pedagogical Institute	Social Stakeholders	Academic/Research
5	Cyprus	Ministry of Health, Educational Sector, Nursing Services	Social Stakeholders	Academic/Research
6	Cyprus	Cyprus Workers' Confederation (SEK)	Social Stakeholders	Trade Unions
7	Cyprus	Cardiac patient's support group	Social Stakeholders	Patients/Caregivers/Teachers
8	Cyprus	Cyprus National Committee on Environment and Children's Health	Social Stakeholders	Health Authorities
9	Cyprus	Pancyprian Workers Federation of Cyprus (PEO)	Social Stakeholders	Trade Unions
10	Cyprus	Research and Education Institute of Child Health	Social Stakeholders	Academic/Research
11	Cyprus	Cyprus Respiratory Society – Public Sector	Social Stakeholders	Medical Associations
12	Cyprus	Cyprus Respiratory Society – Private Sector	Social Stakeholders	Medical Associations
13	Cyprus	Terra Cypria	Social Stakeholders	Academic/Research

14	Cyprus	Cyprus Commissioner for the Environment Office	Social Stakeholders	Environmental Authorities
15	Cyprus	Pancyprian Public Servants' Trade Union (PASYDY)	Social Stakeholders	Trade Unions
16	Cyprus	Pancyprian Association of Primary School Parents	Social Stakeholders	Patients/Caregivers/Teachers
17	Cyprus	Ministry of Education and Culture	Regulatory	Educational Authorities
18	Cyprus	Pancyprian Federation of Patients	Social Stakeholders	Patients/Caregivers/Teachers
19	Cyprus	Latsia Municipality	Social Stakeholders	Municipalities
20	Cyprus	Lakatamia Municipality	Social Stakeholders	Municipalities
21	Cyprus	Aglatzia Municipality	Social Stakeholders	Municipalities
22	Cyprus	Agios Dometios Municipality	Social Stakeholders	Municipalities
23	Cyprus	Engomi Municipality	Social Stakeholders	Municipalities
24	Cyprus	Cyprus Society of Cardiology	Social Stakeholders	Medical Associations
25	Cyprus	Ministry of Health, Medical and Public Health Services	Regulatory	Health Authorities
26	Greece (Crete)	7th Health Region Administration of Crete	Regulatory	Health Authorities
27	Greece (Crete)	Region of Crete	Regulatory	Environmental Authorities
28	Greece (Crete)	Region of Crete	Regulatory	Health Authorities
29	Greece (Crete)	Decentralized Administration of Crete-Directorate of Environment and Spatial Planning	Regulatory	Environmental Authorities
30	Greece (Crete)	Green Fund	Social Stakeholders	Academic/Research

31	Greece (Crete)	Hellenic Association for allergy and clinical Immunology	Social Stakeholders	Medical Associations
32	Greece (Crete)	Municipality of Agiou Nikolaou	Social Stakeholders	Municipalities
33	Greece (Crete)	Regional Directorate of Primary & Secondary Education of Crete (16th Primary School)	Social Stakeholders	Educational Authorities
34	Greece (Crete)	Municipality of Heraklion-Social Development Division (social policy, gender equality policies for the protection, promotion of public health)	Social Stakeholders	Municipalities
35	Greece (Crete)	Medical Association of Heraklion	Social Stakeholders	Medical Associations
36	Greece (Crete)	University of Crete-Chemistry Department	Social Stakeholders	Academic/Research
37	Greece (Crete)	Primary School Agion Paraskion Heraklion	Social Stakeholders	Patients/Caregivers/Teachers
38	Greece (Crete)	Municipal preschool education and mass sports of Heraklion Crete	Social Stakeholders	Teachers Association
39	Greece (Crete)	Heraklion Physical Education Association	Social Stakeholders	Teachers Association
40	Greece (Crete)	Archdiocese of Crete	Social Stakeholders	Educational Authorities
41	Greece (Crete)	Democritus University of Thrace | DUTH · Department of Forestry and Environmental Management and Natural Resources	Social Stakeholders	Academic/Research
42	Israel	Ben-Gurion University of the Negev	Social Stakeholders	Academic Research
43	Israel	Ministry of Health	Regulatory	Health Authorities
44	Israel	The Hebrew University of Jerusalem-Department of Geography	Social Stakeholders	Academic/Research
45	Israel	The Hebrew University of Jerusalem-School of Public Health	Social Stakeholders	Academic/Research

46	Israel	Ministry of Environmental Protection	Regulatory	Environmental Authorities
47	Israel	SCE- Shamoon College of Engineering	Social Stakeholders	Academic/Research
48	Israel	Technion- Israel Institute of Technology	Social Stakeholders	Academic/Research
49	Israel	ASRAN – Medical Students Association in the Negev	Social Stakeholders	Medical Associations

Desert Dust Storms

All responders declared that they were familiar with DDS events. With regards to the perceived frequency of this phenomenon, the median response was 6 episodes per year (range 1- 24 episodes per year) while Spring was considered as the most affected season followed by Summer, Fall and Winter. Detailed data on the responses for the perceived frequency and seasonality of DDS events are presented in Figures 3 and 4 respectively.

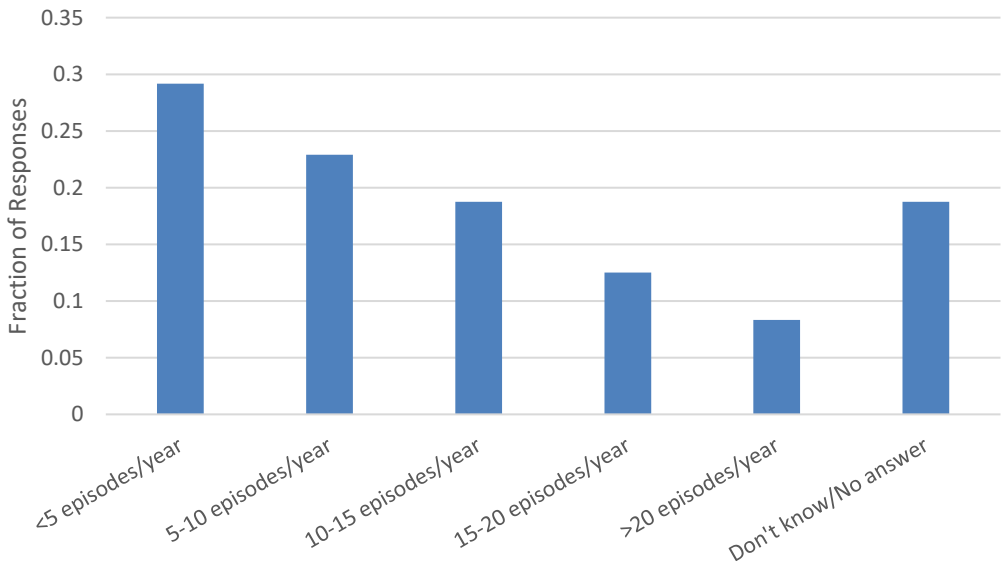

Figure 3: Perceived Frequency of DDS events.

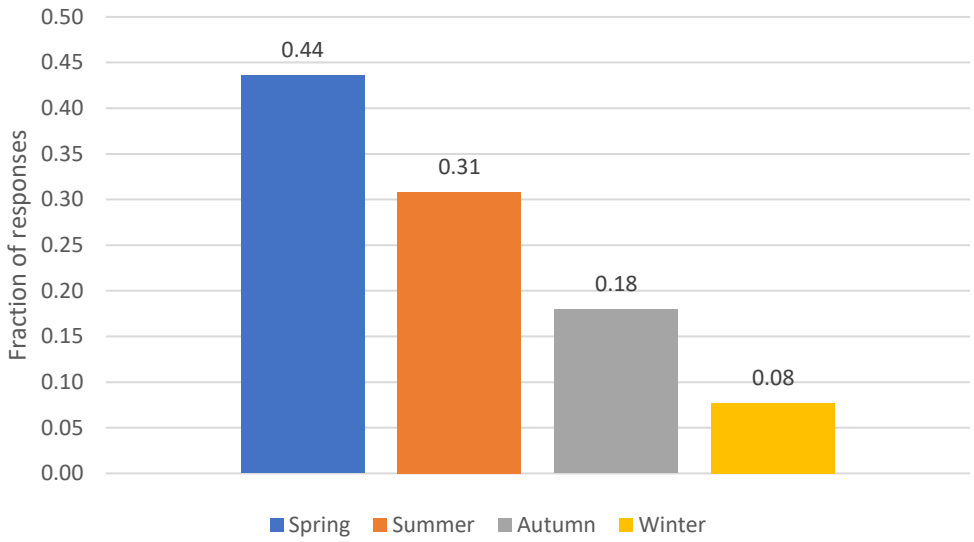

Figure 4: Perceived DDS seasonality. *Distribution of responses on the seasonality of DDS episodes. Responders were allowed to answer more than one answer.*

Health Effects related to Desert Dust Storms

Almost all responders (87.9%) were aware that DDS events may cause specific health effects. Primary sources of information were scientific articles (32%%), the Internet (22%) and coursework during their academic studies (20%). Less frequently reported sources of information were scientific conferences (11%) and televised media (10%).

Most responders from regulatory authorities (71%) instinctively acknowledged that elderly individuals and children are susceptible sub-populations in respect to DDS although this percentage was higher among social stakeholders (74% for the elderly and 77% for children). Figure 5 presents the distribution of responses regarding possible health effects related to DDS events among regulators and social stakeholders.

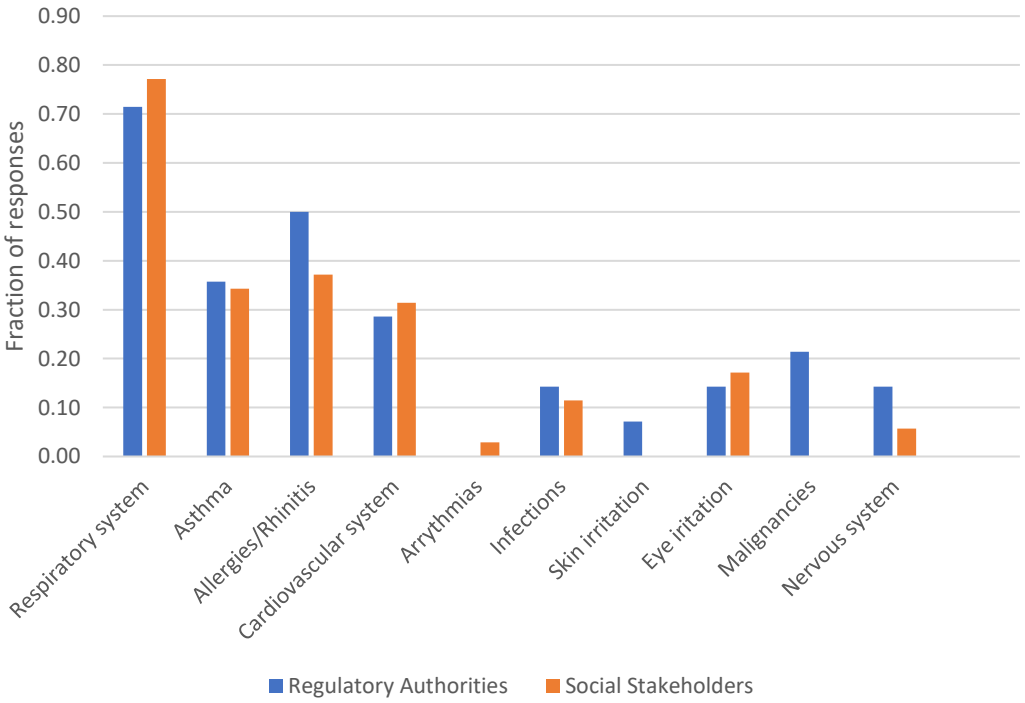

Figure 5: Health effects related to DDS events. Distribution of non-selected responses regarding DDS related health effects.

Local Policies and Action Plans

Approximately 42% of regulatory authorities and 22% of social stakeholders receive questions from the general public or vulnerable populations regarding adverse health effects of DDS. Of the remaining participants, 21% of regulatory authorities and 11% of social stakeholders did not know whether their organization receives questions. Among the

regulatory authorities that receive questions, only three of them (50%) provide standardized replies according to a pre-determined action plan. None of the social stakeholders receiving questions from the public, provides standardized replies. Furthermore, of all the social stakeholders asked, approximately only one third (29%) considers that a national policy regarding DDS is in place in their respective state. Another third of the social stakeholders (34%) considered that a national policy regarding DDS events is missing while the remaining 37% did not know whether a national policy exists or not. Within regulators the proportion of responders considering that legislation regarding DDS events is in place was still low, but relatively higher compared to social stakeholders (43% versus 29%). Four regulators (29%) did not consider that a national policy exists while another four stakeholders (29%) did not know this.

Table 1 provides an overview of the responses participants provided when asked to assess the relevance of different public policy actions towards protecting vulnerable populations from DDS events. In general, regulatory authorities provided higher ratings to most categories. Involvement of mass communication media and the performance of information activities at the community level received the highest rating from regulators. The development of training materials for future professionals was equally rated by both groups. Other findings include generally higher ratings for all proposed actions from health authorities as compared to the ratings provided by educational and environmental authorities. Similarly, medical associations also tended to give higher ratings to the proposed actions compared to other social stakeholders.

Indoor Air Quality

Both regulatory authorities and social stakeholders agree that DDS events result in increased concentration of air pollutants in indoor environments, although there was some disagreement regarding the magnitude of this effect. More than half of the participants from social stakeholders (51.4%) consider that DDS events result in higher concentrations in indoor environments to some extent. Another significant fraction of social stakeholders reported that indoor concentrations are increased a lot (32.4%) while a smallest percentage considers that the increase in indoor concentrations due to DDS events is small

(13.5%). Participants from regulatory authorities provided slightly more conservative estimates as 27.3% reported that indoor concentrations are increased only by a small amount, 45.6% to some extent and 27.3% a lot.

Both groups were also in agreement regarding the usefulness of air cleaning devises as a measure to mitigate the negative impacts of DDS events. A positive response was provided by 72.7% of participants from regulatory authorities and by 70.3% of participants from social stakeholders. Almost all of the remaining responders, replied that they were unaware of the usefulness of indoor air cleaners and only 3 social stakeholders (8.1%) reported that they do not believe that air-cleaners would mitigate the negative impacts of DDS events.

With regards to the annual cost of using such indoor air cleaners, a total of 29 responses were collected out of 49 participants (8 responses from regulatory authorities and 21 from social stakeholders). There was high agreement between the groups regarding the median and interquartile range (IQR) of the amount a household would be willing to spend for such devise per year. The median amount for regulatory authorities was 150 Euros/year with an IQR of 72.5-235, while the median amount for social stakeholders was 120 Euros with an IQR of 100-300, (p_{value}=0.767).

Table 2: Expressed relevance of actions for the protection of vulnerable populations from DDS events.

	Expressed relevance of action *									
	Regulatory authorities				Social Stakeholders					
Action	Health (n=5)	Educational (n=2)	Environmental (n=7)	All regulatory authorities (Mean) (n=14)	Patients/ Caregivers/ Teachers (n=7)	Medical associations (n=6)	Trade unions (n=3)	Academic/ Research (n=12)	Municipalities (n=7)	All social stakeholders (Mean) (n=35)
Epidemiological environmental studies	9.0	9.5	8.0	8.8	7	9.2	8.7	8.2	8.3	8.3
Development of training materials for future professionals	9.0	8.0	8.0	8.3	7.5	9.3	9	7.9	8.6	8.5
Government action through advocacy (Lobbying)	9.0	8.5	6.5	8.0	6.4	7.2	9.3	7.8	7.9	7.7
Legislative action/Policy development	10.0	8.5	8.0	8.8	6.7	8.8	10	7.8	8.1	8.3
Media Involvement to raise awareness	10.0	10.0	8.5	9.5	8.6	8.3	8.3	8.8	9	8.6
Information activities at the community level	10.0	8.0	7.0	8.3	8.4	7.2	6.3	7.1	6.3	7.1
Include topic as part of school curriculum	10.0	7.5	5.5	7.7	6.6	7.7	7.3	7.1	8.3	7.4
Development of interdisciplinary and inter-sectoral networks	8.0	8.5	7.0	7.8	8.4	7.8	8	6.8	7.4	7.7

*Mean Estimate, Scale 1 - 10: 1 refers to “not relevant at all” and 10 refers to completely relevant. Results are expressed as means.

Social Stakeholders Involvement in applied policy measures

Among the 35 social stakeholders participating in the study, the majority (69%) believe that vulnerable groups and decision makers receive only partial information on the potential health impacts of DDS events.

A small proportion of social stakeholders (23%) receive direct warnings regarding DDS events, usually only one day before the initiation of the event. Nevertheless, only 9% actively disseminate information regarding the DDS health effects to the public, specific vulnerable groups or their members.

Summary of findings:

Our results indicate that the study participants are familiar with DDS events and their frequency. Also study participants were characterised by good knowledge of DDS related health effects, especially regarding complications of the respiratory system, although an important percentage of responders acknowledged that their main source of information was the internet and televised media.Both social stakeholders and regulatory authorities (to a greater degree) receive questions from the general public and vulnerable population groups. However, in many cases the responses provided are not standardised and are not part of a pre-specified action plan. Furthermore, many social stakeholders and even regulators considered that a national policy regarding DDS events is absent in their country. There was a high agreement between social and regulatory stakeholders regarding the possibility of increased indoor air pollutants' concentration following DDS events although there was some disagreement regarding the magnitude of the effect. Similarly, both groups of participants consider that indoor air cleaners could be a useful measure to mitigate the negative health effects of DDS events.

With regards to societal actions that could further protect vulnerable populations from DDS events, regulatory authorities and social stakeholders provided similarly high ratings for "media involvement to raise awareness" and "development of training materials for future professionals". Both groups gave lower ratings to the "development of inter-disciplinary and inter-sectoral networks" and "inclusion of the topic in the school curriculum". There was some disagreement between the two groups, on the performance of "information activities at the community level" where regulators provided higher ratings compared to social stakeholders.

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Appendix I

A. Questionnaire for Competent Authorities:

Survey Assessment on Knowledge and Policies for Dust Desert Storm protection

MEDEA

Participant:
Organisation Name:
Person Interviewed:
Role in Organisation:
Questionnaire Administered By:
Contact Info:
Address:
Telephone Number: E-mail:

Instructions for completion of this questionnaire:

The following questions regard your current state of knowledge about Desert Dust Storm (DDS) events and their impact on humans as well as your current state of knowledge regarding policy measures that aim on reducing the impact of DDS events on humans. The information collected through this questionnaire will allow the researchers of LIFE-MEDEA project to evaluate the state of knowledge of different social stakeholders in Cyprus, Greece and Israel regarding these events.

Please answer all the questions. There are no right or wrong answers! If you are not sure how to answer, choose the response that seems closest to your situation.

Thank you for your collaboration.

PART A

Awareness

1.1	Do you know what are Desert Dust Storm (DDS) events?	☐ Yes ☐ No
1.2	How often do DDS events occur?	☐ _____times Per year ☐ I don't know
1.3	Do you know which season of the year do dust storms occur more frequently?	☐ Autumn ☐ Winter ☐ Spring ☐ Summer ☐ I don't know
1.4	Are you aware that air pollutants associated with DDS events are hazardous for humans?	☐ Yes ☐ No (please go to **question 1.9**)
1.5	If you selected **Yes in Question 1.4**, how did you learn about the adverse effects associated with DDS events? (please check all that apply)	☐ Courses/workshops ☐ Conferences ☐ Articles ☐ Internet ☐ Other (please specify):_____
1.6	If you selected **Yes in Question 1.4**, when did you first learn about the adverse effects associated with DDS events?	☐ Before 2005 ☐ Before 2010 ☐ Before 2015 ☐ I don't remember
1.7	If you selected **Yes in Question 1.4**, could you list the possible adverse effects associated with DDS?	1._____ 2._____ 3._____ 4._____
1.8	If you selected **Yes in Question 1.4**, could you name vulnerable population subgroups that are more likely to experience adverse effects due to DDS?	1._____ 2._____ 3._____ 4._____
1.9	Please indicate whether your organization receives questions from the general public or vulnerable subgroups regarding the adverse effects of DDS events.	☐ Yes ☐ No ☐ I don't Know
1.10	If you selected **Yes in Question 1.9,** could you specify how often do you receive questions from vulnerable populations on the adverse effects of DDS pollutants.	☐ Often ☐ Sometimes ☐ Never ☐ I don't Know

1.11	If you answered **Yes in question 1.9,** please indicate whether responses provided to these questions are standardized according to pre-determined action plan.	☐ Yes ☐ No ☐ I don't know
1.12	Are you aware whether there is national legislation or policy regarding DDS events?	☐ Yes ☐ No ☐ I don't know
1.13	If you selected **Yes in Question 1.9,** please specify whether your organization is part of national policy regarding DDS events.	☐ Yes, my organization is involved in a national policy regarding DDS events. ☐ No, my organization is not involved in national policy regarding DDS events. ☐ I don't know
1.14	Based on your experience, which of the listed actions are most relevant in protecting vulnerable populations from DDS events? Use a number between 1 and 10 with 1 referring to "not relevant at all" and 10 referring to "completely relevant"	☐ Developing epidemiological environmental studies ☐ Developing training materials for future professionals ☐ Encouraging government action through advocacy ☐ Legislative action/Policy development ☐ Involvement of the media to raise awareness ☐ Raising community awareness through information and communication activities ☐ Including the topic as part of the school curriculum ☐ Encouraging cooperative interdisciplinary and participative inter-sectoral networks ☐ Others (please specify)_____
1.15	Do you believe that DDS events result in increased concentration of air pollutants in indoor environments (Houses/ classrooms/workplace)?	☐ Yes, by a lot ☐ Yes, by some amount ☐ Yes, by small amount ☐ No ☐ I don't know
1.16	Do you believe that the use of indoor air cleaning devices could mitigate the negative impacts of DDS events?	☐ Yes ☐ No ☐ I don't Know

1.17	If you selected **Yes in Question 1.16**, what would be the yearly amount that you would be willing to pay for the use of indoor air cleaning devices?	_____per device per year (including electricity and maintenance cost)

PART B

Applied Policy Measures for Early Warning Systems		
2.1	Is your organization responsible to issue warnings regarding DDS events?	☐ Yes ☐ No ☐ I don't know
2.2	If you answered **Yes in question 2.1**, please specify whether the responsibility to issue warnings for DDS events has been established by national legislation?	☐ Yes ☐ No ☐ I don't know
2.3	If you answered **Yes in question 2.1**, please specify the threshold level of which pollutant(s) a warning is issued.	☐ Pollutant(s):_____ ☐ Threshold level:_____ ☐ I don't know
2.4	If you answered **Yes in question 2.1**, please specify whether there are established procedures and chain of command for the dissemination of warnings for DDS events?	☐ Yes ☐ No ☐ I don't know
2.5	If you answered **Yes in question 2.1**, please specify whether your organisation is responsible to warn the public, a particular population subgroup (e.g. elderly), or other organisations.	☐ General public ☐ A particular population subgroup (Please specify)_____ ☐ Other organisations (Please specify)_____ ☐ All of the above ☐ I don't know
2.6	If you answered **Yes in question 2.1**, please specify whether your organisation is involved in a consultation with international agencies on early warning on DDS events?	☐ Yes (Please specify international organisation)_____ _____ ☐ No ☐ I don't know

2.7	If you answered **Yes in question 2.1** please specify whether national standards for the operation of early warning systems for DDS events have been set?	☐ Yes ☐ No ☐ I don't know
2.8	If you answered **Yes in question 2.1** please specify whether the procedures for early warning systems have been standardized with regional authorities and neighbouring countries.	☐ Yes ☐ Partly ☐ No ☐ I don't know
2.9	If you answered **Yes in question 2.4**, please indicate whether the warning dissemination chain is enforced through national legislation	☐ Yes ☐ Partly ☐ No ☐ I don't know
2.10	If you answered **Yes in question 2.4** please specify whether the functions, roles and responsibilities of each actor in the warning dissemination chain are specified in national legislation.	☐ Yes ☐ Partly ☐ No ☐ I don't know
2.11	Are communication and dissemination systems tailored to the needs of individual communities or different age groups (e.g. radio or television for those with access or mobile applications and social media feeds for youngsters, sirens, warning flags or messenger runners for remote communities)?	☐ Yes ☐ Partly ☐ No ☐ I don't know
2.12	Are mechanisms in place to inform the community when the DDS event has ended?	☐ Yes ☐ No ☐ I don't know
2.13	How would you rate the ability of early warning systems for DDS events to inform the general public in time? Use a number between 1 and 10 with 1 referring to "not satisfactory at all" and 10 referring to "completely satisfactory"	Rate: _____
2.14	Has the community's ability to respond effectively to early warnings been assessed by your organization?	☐ Yes ☐ No ☐ I don't know
2.15	If you answered **Yes to question 2.15**, please indicate whether response to	☐ Yes ☐ Partly

	previous DDS events has been analysed and whether lessons were learnt and incorporated into future capacity building strategies.	☐ No ☐ I don't know

B. Questionnaire for Social Stakeholders

Survey Assessment on Knowledge and Policies for Dust Desert Storm protection

MEDEA

Participant:
Organisation Name:
Person Interviewed:
Role in Organisation:
Questionnaire Administered By:
Contact Info:
Address:
Telephone Number: E-mail:

Instructions for completion of this questionnaire:

The following questions regard your current state of knowledge about Desert Dust Storm (DDS) events and their impact on humans as well as your current state of knowledge regarding policy measures that aim on reducing the impact of DDS events on humans. The

information collected through this questionnaire will allow the researchers of LIFE-MEDEA project to evaluate the state of knowledge of different social stakeholders in Cyprus, Greece and Israel regarding these events.

Please answer all the questions. There are no right or wrong answers! If you are not sure how to answer, choose the response that seems closest to your situation.

Thank you for your collaboration.

PART A

Awareness		
1.1	Do you know what are Desert Dust Storm (DDS) events?	☐ Yes ☐ No
1.2	How often do DDS events occur?	☐ _____times Per year ☐ I don't know
1.3	Do you know which season of the year do dust storms occur more frequently?	☐ Autumn ☐ Winter ☐ Spring ☐ Summer ☐ I don't know
1.4	Are you aware that air pollutants associated with DDS events are hazardous for humans?	☐ Yes ☐ No (please go to **question 1.9**)
1.5	If you selected **Yes in Question 1.4**, how did you learn about the adverse effects associated with DDS events? (please check all that apply)	☐ Courses/workshops ☐ Conferences ☐ Articles ☐ Internet ☐ Other (please specify)_____
1.6	If you selected **Yes in Question 1.4**, when did you first learn about the adverse effects associated with DDS events?	☐ Before 2005 ☐ Before 2010 ☐ Before 2015 ☐ I don't remember

1.7	If you selected **Yes in Question 1.4**, could you list the possible adverse effects associated with DDS?	1._____ 2._____ 3._____ 4._____
1.8	If you selected **Yes in Question 1.4**, could you name vulnerable population subgroups that are more likely to experience adverse effects due to DDS?	1._____ 2._____ 3._____ 4._____
1.9	Please indicate whether your organization receives questions from the general public or vulnerable subgroups regarding the adverse effects of DDS events.	☐ Yes ☐ No ☐ I don't Know
1.10	If you selected **Yes in Question 1.9,** could you specify how often do you receive questions from vulnerable populations on the adverse effects of DDS pollutants	☐ Often ☐ Sometimes ☐ Never ☐ I don't Know
1.11	If you answered **Yes in question 1.9,** please indicate whether responses provided to these questions are standardized according to pre-determined action plan.	☐ Yes ☐ No ☐ I don't know
1.12	Are you aware whether there is national legislation or policy regarding DDS events?	☐ Yes ☐ No ☐ I don't know
1.13	If you selected **Yes in Question 1.9,** please specify whether your organization is part of national policy regarding DDS events.	☐ Yes, my organization is involved in a national policy regarding DDS events. ☐ No, my organization is not involved in national policy regarding DDS events. ☐ I don't know
1.14	Based on your experience, which of the listed actions are most relevant in protecting vulnerable populations from DDS events? Use a number between 1 and 10 with 1 referring to "not relevant at all" and 10 referring to "completely relevant"	☐ Developing epidemiological environmental studies ☐ Developing training materials for future professionals ☐ Encouraging government action through advocacy ☐ Legislative action/Policy development

		☐ Involvement of the media to raise awareness ☐ Raising community awareness through information and communication activities ☐ Including the topic as part of the school curriculum ☐ Encouraging cooperative interdisciplinary and participative inter-sectoral networks ☐ Others (please specify)_____
1.15	Do you believe that DDS events result in increased concentration of air pollutants in indoor environments (Houses/ classrooms/ workplace)?	☐ Yes, by a lot ☐ Yes, by some amount ☐ Yes, by small amount ☐ No ☐ I don't know
1.16	Do you believe that the use of indoor air cleaning devices could mitigate the negative impacts of DDS events?	☐ Yes ☐ No ☐ I don't Know
1.17	If you selected **Yes in Question 1.16**, what would be the yearly amount that you would be willing to pay for the use of indoor air cleaning devices?	_____per device per year (including electricity and maintenance cost)

PART B

Applied Policy Measures for Effects of DDS		
2.1	Do you believe that information on the potential impacts of DDS events is being disseminated to vulnerable communities and decision makers?	☐ Yes ☐ Partly ☐ No ☐ I don't Know
2.2	Does your organisation provide access to information to the general public/vulnerable subgroups regarding DDS events and potential effects?	☐ Yes ☐ No ☐ I don't Know
2.3	If you selected **Yes in Question 2.2**, could you specify the methods used by your organization for the provision of this information to the general public/vulnerable subgroups?	☐ Leaflets ☐ Radio/TV advertisements ☐ Internet ☐ Other (please specify)_____

2.4	Does your organization receive a warning about DDS event?	☐ Yes ☐ No ☐ I don't Know
2.5	If you answered **Yes in question 2.4**, please indicate how many days before on average, you receive a warning about a DDS event.	☐ Same day warning ☐ 1day warning ☐ 2 days warning ☐ 3 days warning or more
2.6	Please indicate whether special action plans are initiated in your organization as a response to a DDS event (e.g. dissemination of information, provision of services at home)	☐ Yes ☐ No ☐ I don't Know If Yes, please Specify: _____ _____