BLUEAP

Bologna adaptation plan
for a resilient city
Bologna città resiliente

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Adaptation strategies and heat waves impact: the case of Bologna

Break-out Session 1: "Resilience of the city in the aging society"

Giovanni Fini – City of Bologna

COMUNE DI BOLOGNA

Kyoto Club

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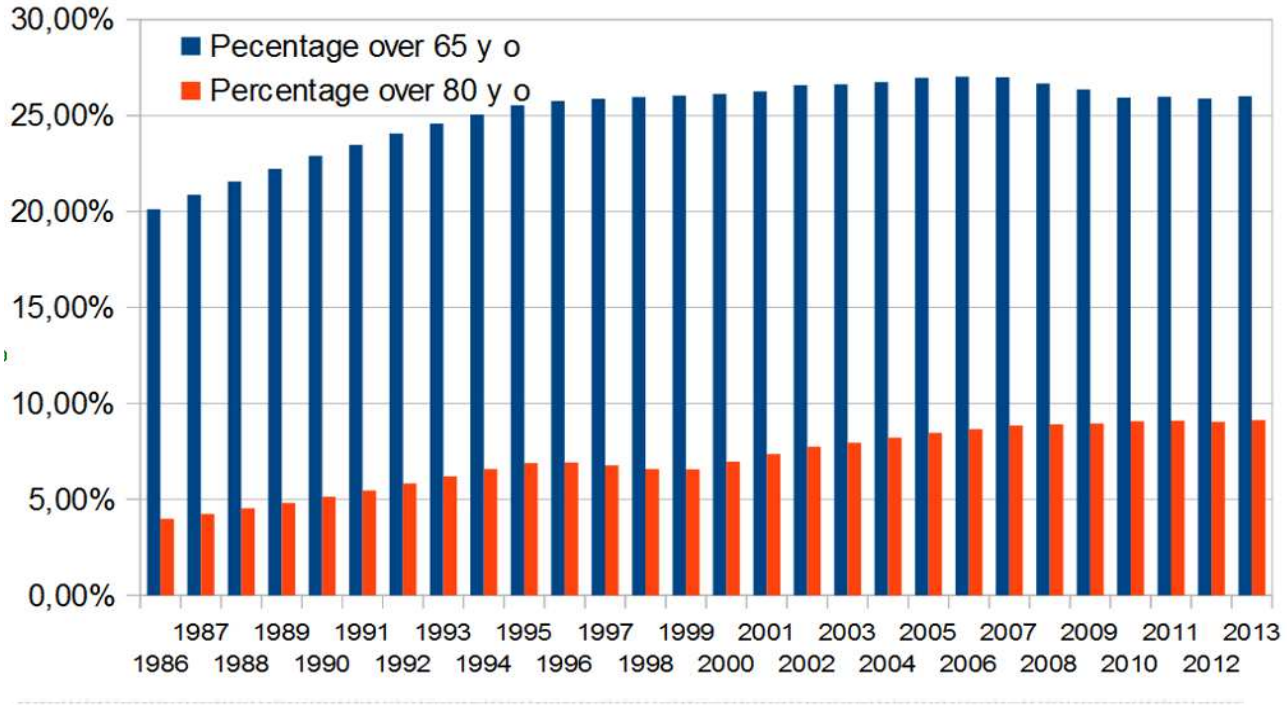
About Bologna



⑦ **Capital of *Emilia-Romagna Region*** ⑦ **Crucial railway and motorway junction**

⑦ **Population:** *373.592* ***inhabitants***
(900.000 in metropolitan area)
high percentage of elderly

⑦ **Land area:** *140,846 Km²*

⑦ Strong presence of **small and medium industry** (Emilian model)

⑦ Historical **University:** almost 100.000 *students*

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Bologna is in a particularly vulnerable location, and this is why man has always attended to its territory with special care.

Territory has been organized and structured since Roman period: natural evolution has indeed been replaced by human management, through measures such as logging, reclamation of swamplands, flood-relief works, etc.

Climate has been and still is a precious resource for the city.

The Latin word “Bononia”, from which the name of the city derives, refers to a community which builds its own existence on food and farm production.

TABLE 2

Total and excess mortality by age group and sex in Bologna, Milan, Rome, and Turin during the summer period (June-August) 2003 compared to the reference period, Italy

Mortality	Rome				Milan			
	Observed	Excess	%	95% CI	Observed	Excess	%	95% CI
All ages	6009	944	19	15.6-21.6	2968	559	23	18.8-27.6
0-64	915	-58	-6	-12.1-0.1	372	-35	-9	-17.9-0.7
65-74	1163	51	5	-1.4-10.6	480	-23	-5	-13.1-4.0
75-84	1938	397	26	20.2-31.4	1020	305	43	33.9-51.4
85	1993	554	38	32.4-44.6	1096	312	40	31.5-48.1
Sex								
Male	2768	246	10	5.7-13.8	1299	141	12	6.1-18.3
Female	3241	698	27	23.1-31.8	1669	418	33	27.0-39.8

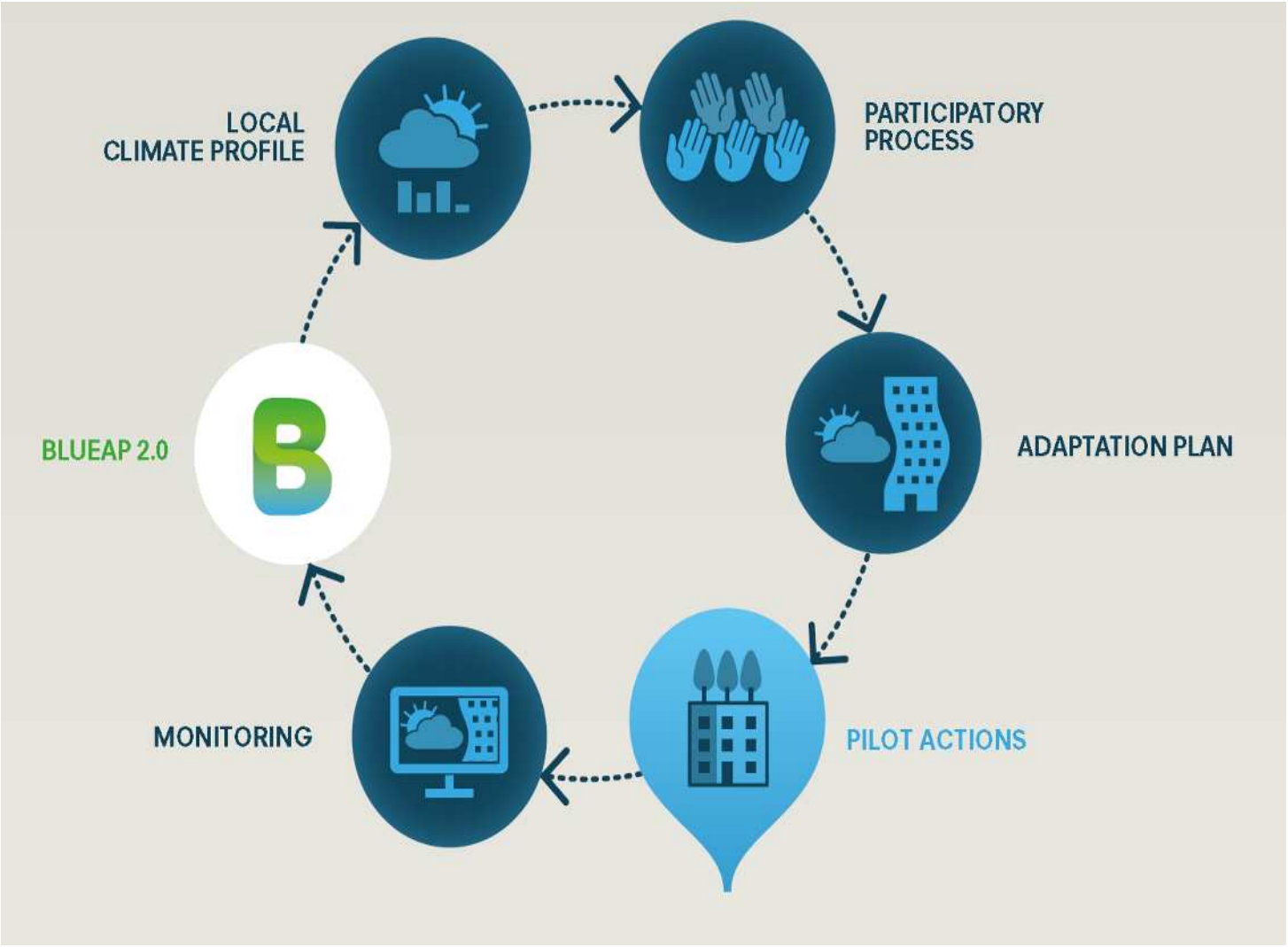
Mortality	Turin				Bologna			
	Observed	Excess	%	95% CI	Observed	Excess	%	95% CI
All ages	2332	577	33	27.5-38.3	1432	175	14	8.0-19.8
0-64	307	21	7	-4.7-19.4	154	-10	-6	-20.9-8.7
65-74	416	58	16	5.0-27.4	202	-41	-17	-28.3-5.4
75-84	752	213	40	29.5-49.5	514	92	22	11.3-32.3
85	857	285	50	39.8-59.9	562	139	33	21.9-43.8
Sex								
Male	1074	215	25	17.6-32.5	686	84	14	5.4-22.5
Female	1258	362	40	32.6-48.2	752	93	14	6.0-22.3

Record high temperatures were observed across Europe during the summer of 2003. In Italy, the highest monthly mean was registered in many cities in August, with record maximum temperatures above 35°C for several consecutive days.

The heat waves recorded between June and August 2003 are associated with significant health effects; a total of 944 excess deaths were observed in Rome (+19%), 577 (+33%) in Turin, 559 (+23%) in Milan and 175 (+14%) in Bologna.

In Bologna, temperatures were less extreme throughout the summer, compared to other Italian cities, and heat wave periods were shorter, with less impact on mortality, and 62 excess deaths during the August heat wave (3-17 August). When subdividing by age group, excess mortality increased dramatically with age; the greatest impact observed in the old (75-84 years) and the very old (85+ years) age groups. In the latter group, mortality increased by 33% in Bologna.

Since then Italian cities enhanced their emergency programs for managing heat waves which is an evolving problem due to climate change.



Project: BLUE AP (LIFE11 ENV/IT/119)

Coordinator: Comune di Bologna

Partners: Kyoto Club, Ambiente Italia, ARPA Emilia Romagna

Project duration: 36 months (01/10/2012-30/09/2015)

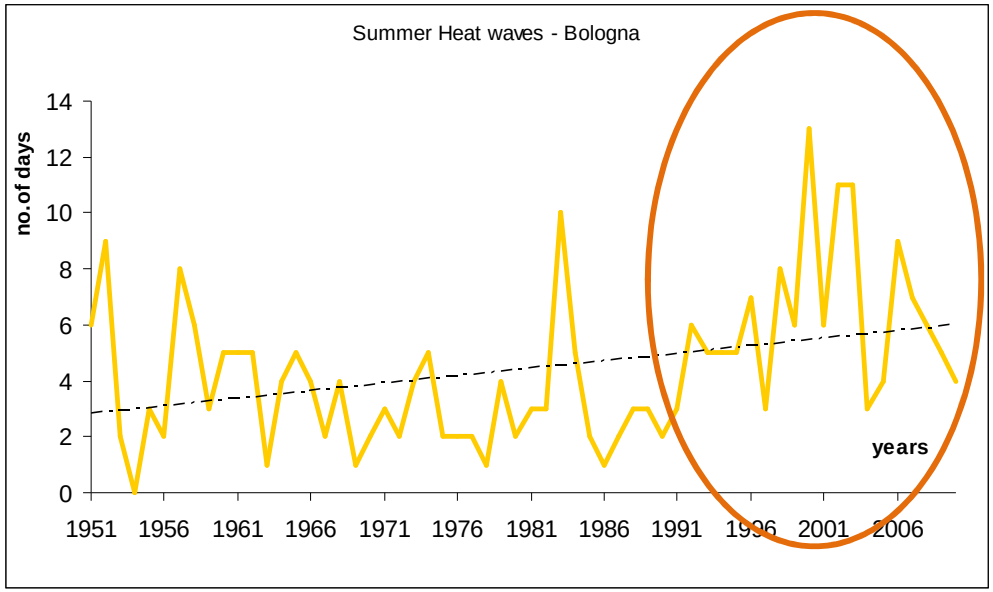
Main objectives: In the context of European initiatives to improve awareness and actions regarding climate change, the BLUEAP project aims to support activities which will lead to the production and adoption of the climate change adaptation plan for Bologna.

Climate analysis

Production of a compehensive information system (Local Climate Profile), well oriented to support the participatory planning process, to select better and effective strategies, useful as baseline framework to monitor and to periodically improve the actions defined by the process.

Local climate dynamics
Land use and infrastructures
Heat waves impact risks
Flooding rise
Water quality
Water scarcity risks
Potential local resources

What about extreme of temperature?



Note:

- increasing trend in seasonal heat weaves; the signal is more intense during summer
- The signal is more intense after 1990.

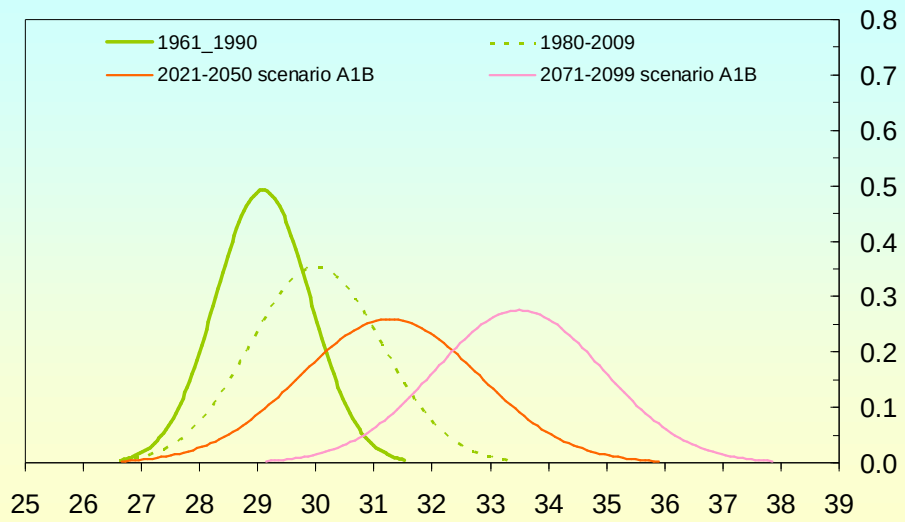
Future climate scenarios at Bologna constructed with statistical downscaling

TEMPERATURE

Climate change projections (EM) of seasonal minimum and maximum temperature at Bologna, over the periods 2021-2050 and 2071-2099.

	Winter	Spring	Summer	Autumn
Tmin 2021 2050	1.2°C	1.6°C	2.5°C	1.7°C
Tmax 2021 2050	1.5°C	2.1°C	2.5°C	2°C
Tmin 2071-2099	2.8°C	3.7°C	5.5°C	3.4°C
Tmax 2071 2099	3°C	4.1°C	5.5°C	4°C

Probability Density Functions (PDFs) of maximum temperature at Bologna station during summer season, different periods



The project "Prevention of heat waves" defines actions to prevent the risks that high summer temperatures can cause the elderly, with health, social or economic fragility.

The project is usually working from mid- June to mid-September each year.

The specific action of the City is directed to the construction of a network of solidarity in support of the elderly people and their families ; The network is made possible by the contribution of voluntary associations , social centers and pharmacies , along with the work city services.

The network partners
The project is implemented by the Municipality of Bologna in collaboration with the Health Services of Bologna, ARPA (Regional Agency for Environmental Prevention of Emilia Romagna), Civil Defense of the Municipality with operational coordination of Cup2000.
Min voluntary associations involved are: AUSER (Association for the self-management of services and solidarity), the Provincial Committee of Bologna of the Italian Red Cross, Anteas G.Fanin (National Association of Senior Citizens Active Solidarity), Ancescao (National Association Social Centers). Even the parishes of Bologna can involve citizens to participate actively in the project.
Active collaboration is also provide by pharmacies participating in the Bologna Federfarma and municipal pharmacies AFM.

COMUNE DI BOLOGNA

Comune italiano di circa 380.000 abitanti, è capoluogo dell'omonima provincia e della regione Emilia-Romagna e costituisce uno nodo strategico della rete stradale e ferroviaria nazionale.
comune.bologna.it

Kyoto Club

Organizzazione non profit costituita da imprese, enti locali e associazioni impegnati nel raggiungimento degli obiettivi di riduzione delle emissioni di gas serra assunti con il Protocollo di Kyoto.
kyotoclub.org

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Agenzia Regionale per la Protezione dell'Ambiente e organo tecnico della Regione Emilia-Romagna svolge attività di controllo ambientale e monitoraggio delle attività umane ed il loro impatto sull'ambiente.
arpa.emr.it

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